

## EGGLOFTING

by Dan Wolf

**R**arely a contest is flown without an egglofting event of some type. This issue we present two plans suitable for "B" and "C" engine egglofting.

One plan is a variation (little variation actually) on the "Two Minute Egg" design by George Gassaway. The other plan is John DeMar's "Slick Chick", designed specifically for the eggloft altitude event.

The Two Minute Egg and its derivatives (of which there are many) have been around for a long time. I first saw the 2 Minute Egg plan featured in the September 1979 issue of "View From ZENITH". The distinctive characteristic of this design is the long tapered shroud that makes up the bulk of the rocket. This shroud offers a unique advantage in eggloft duration by providing minimum drag with its "tear drop" shape while providing plenty of room to pack a large parachute. In the popular and fun B Eggloft Duration event, chute sizes of 48" and 54" are not uncommon. The other distinctive feature of the design is the small egg capsule. Made from the two large halves of plastic "Easter" eggs, the correct sized egg is usually made from a hard brittle plastic with 4 ribs on the inside for reinforcement. These ribs must be removed before using.

Apogee Components adapted the 2 minute egg style design in their popular line of egglofter kits, but they use the larger diameter and heavier Apogee Nova Egg Cone egg capsule. Because the base of the Nova Egg Cone extends down into the shroud quite a ways, the Apogee kit egglofters have a longer shroud than most of the scratch built "Easter" egg versions. The Nova Egg Cone does offer one significant advantage however, it does a much better job at protecting the egg. It may be wise to have both styles on hand at a contest until your experience yields a high success rate with the Easter egg version.

The "Slick Chick" also uses the small Easter egg capsule. John's plan uses a small shroud to smooth out the transition from the egg capsule to the body tube however. This design has worked well for John and he has had many top flights in egglofting since designing it in 1991.

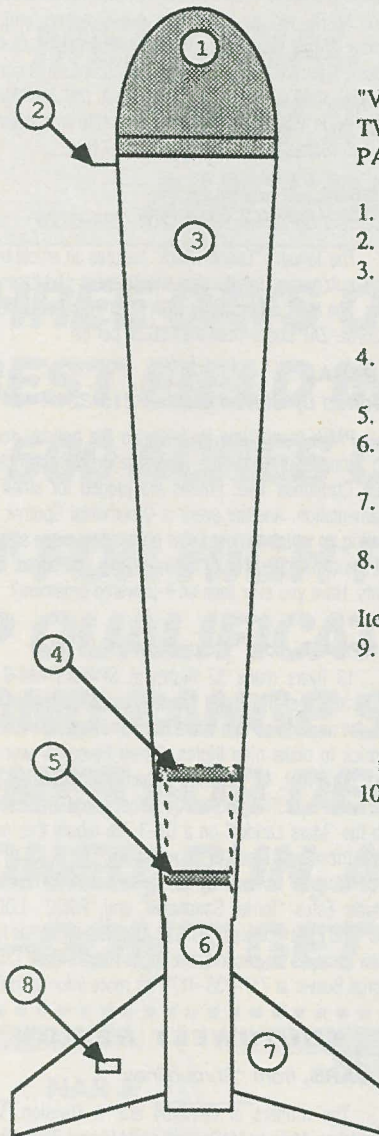
The two plans are fairly simple but a few explanations are in order. My eggloft duration plan shows the two egg halves as forming the complete capsule, while John's shows a half inch extension ring in between. The reason John includes this is because not all USDA Large hen's eggs are the same. The Pink Book specifies a maximum diameter of 45 millimeters but no minimum diameter and no length requirements. Thus, in a typical carton of eggs,

several will not fit in the Easter egg capsule. There are two ways around this. First, pick your egg early, taking your capsule up to the range head and trying all the eggs to find the one that fits the best. Second, if no eggs fit, use the extension ring John shows.

My plan includes launch lugs while John's does not. I'm a firm believer in launch lugs for egglofters, either fixed or a pop lug. Tower launching allows the tail of the rocket to move

around too much (Apogee offered a "pop" tail ring assembly that should work when flying out of a tower but we haven't seen it used much at). Whatever, the method, some way of keeping that rocket going in the direction you want it to go is needed. Small lugs made of music wire work nicely and add little drag to the relatively large diameter egg-lofter anyway. John has had some success flying out of the tower so I presented his plan "lug less."

### "Variation On a 2 Minute Egg" by Dan Wolf B & C Eggloft Duration



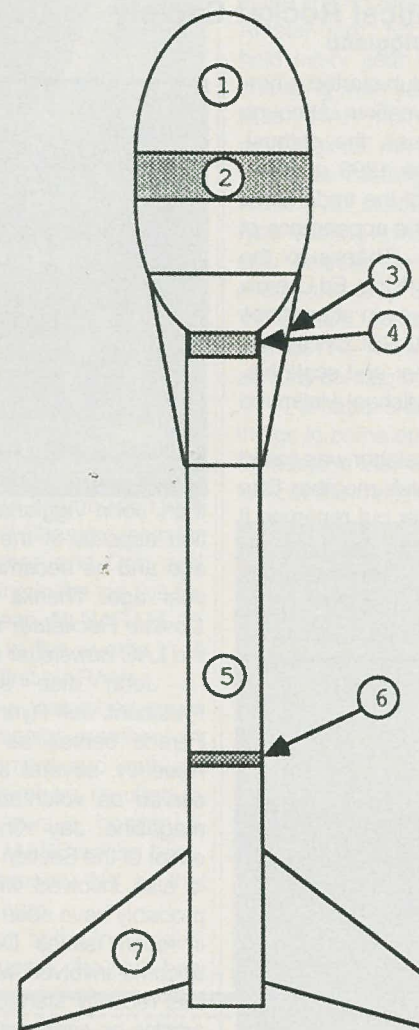
#### "VARIATION ON A TWO MINUTE EGG" PARTS LIST

1. 1.75" OD plastic "Easter" egg
2. Music Wire Launch Lug
3. Cardboard Shroud, use formula from Stine's book or for 8.5", R1 = 6.2", R2 = 14.75", Angle = 25°
4. Centering Ring, Estes BT-20 to BT-50, AR-2050
5. Engine Block
6. Body tube, 4" length of Estes BT-20
7. Fins, make from 3/32" balsa or 1/32" plywood, or 20 mil waferglass
8. 3/16" launch lug

#### Items not shown

9. Shock cord, two parts, make lower section from 100 lb. Kevlar or .012" wire cable, long enough to stop just below top of shroud. Top half is 24" to 36" length of 1/8" elastic shock cord.
10. Parachute, 36" to 54" thin mylar or "dry cleaner" bag material.

### "Slick Chick" by John DeMar B & C Eggloft Altitude

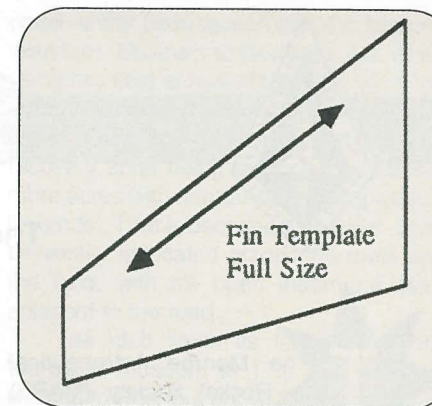


#### "Slick Chick" Parts List

1. 1.75" OD plastic "Easter" egg
2. Spacer Ring, 1/2" wide by 43 to 45 mm inside diameter ring, make from heavy paper or cut down a larger diameter body tube.
3. Shroud, 2" long, make from thin card stock.
4. Engine block, glue to bottom of egg capsule.
5. Body tube, 7" to 9" BT-20.
6. Another engine block
7. Fins, make from 3/32" balsa or 1/32" plywood, or 20 mil waferglass

#### Items not shown

8. Shock cord, 36" of 100 lb. Kevlar with 4" section of 1/8" elastic spliced in near payload end.
9. Parachute, 14" to 18".



John's plan was originally more involved, and used a number of Apogee Components parts. I've tried to list options so that they can be built "Apogee less" due to the uncertainty of getting these parts in the future. For the Kevlar, try Walmart or a tackle shop. Look for Kevlar fishing line under the brand name "Stren".

#### Flying Tips

Egglofters have a tendency to weathercock severely. Thus the importance of the launch lugs. Also, try tilting the rod/launcher with the wind, so that as it does weathercock, the resulting boost will (hopefully) be closer to vertical. Flying strategy is important here too. At the Finger Lakes Fall Classic last September, Jeff Ryan made one qualified flight and then he waited out the wind, and put up his second flight late in the day, after the winds had calmed. The result was a near vertical boost and the winning flight.

In duration, large chutes are no good unless they open. For dry cleaner bag chutes, put the entire chute and some baby powder in a garbage bag and shake it vigorously until the plastic chute material is thoroughly impregnated with the powder. Smaller chutes will deploy easier. Use a 36" for starters and work up to bigger chutes as your experience allows.

One problem with Easter egg/shroud egglofters is drag separation. There isn't much to hold the capsule on the top of the rocket so often times the capsule will separate at the end of the thrust stage. To prevent this, tape the capsule to the shroud with two small pieces of Scotch "magic" tape 180° apart. This keeps the capsule firmly attached until ejection.

Another problem many have with egglofters is spitting the engine. You could try an engine clip, but notice that both of the plans show the fins mounted about 3/16" above the end of the body tube. Once the engine has been friction fitted, a wrap of mylar tape around the engine/body tube junction will keep the engine in the rocket.

Last but not least, don't forget the rules of egglofting. First, you can't catch the model, it must touch the ground first. Second, don't open the egg capsule until you're back at the returns table. And finally, don't forget that all eggloft events are single best flight so if you "crack up" on the first one, pull out that back up model and "go for broke" on the second flight.