Selecting Parachutes for Egglofting

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One of the most commonly asked questions is what size or type of parachutes you should use in egglofting competition. Unfortunately there is no easy answer; it's probably more art than science.

In egglofting one of the obvious goals is to bring the egg, or eggs, down unbroken and in one piece. While proper cushioning of the eggs plays a large part, parachute size and selection is also vitally important. Obviously the larger the parachute the softer the eggs will land - however if you use too large a parachute, the model may drift away and not be recoverable. If you use too small a parachute, the model may fall too fast and the egg could be damaged by a hard landing. Finding the happy medium between these two options is the art of selecting a proper parachute.

Let's look at the types of parachutes commonly used and the pros and cons to each.

The first to consider is what is usually considered a "competition-style" parachute made from a very thin and lightweight material - our "Over Easy" parachutes are an example of this type. The canopy material is very thin with the shroud lines going all the way over the top of the parachute for increased strength. The advantage of this type of parachute is it's light weight. In addition, due to the thinness of the material, a very large 'chute can be packed into a small space. The main disadvantage is that the thin canopy material is more likely to tear or have some other type of failure due to it's relative fragility. These 'chutes are slightly more difficult to fold and pack properly than the next ones we will look at.

Next a more conventional type of model rocket parachute canopy (such as one normally included in an Estes or Quest kit, or our "Sport 'Chute"), thicker than the competition type. If you add over the top shroud lines (as is standard in our or "Heavy-Duty Sport 'Chutes") these parachutes work well as egglofting chutes. They are stronger than the competition-style parachutes, due to the thicker canopy material, and less likely to fail. For the same reason, these parachutes are slightly heavier than comp 'chutes, and cannot be packed into as small a space.

Nylon (or other cloth) chutes may also be used. Most commercially made parachutes (such as the ones we carry by Top Flight) are practically indestructible under normal flight conditions. This strength comes at the cost of weight and space - it would require a much larger area to put the same diameter cloth 'chute as compared to the two types of parachutes we've already discussed. A "Thin Mil" nylon 'chute takes much less space than a standard thickness, and in most cases is nearly as strong.

Next let's look at the types of competitions.

In egglofting altitude events, the highest tracked altitude (as in NAR competition), or the closest

to a specific altitude (as in the Team America Rocketry Challenge event) is the winner. The egg(s), of course, must be returned and unbroken. In these types of events, generally the smallest parachute that can return the egg(s) safely is the best choice. Unless space inside the model for the recovery device is at an absolute minimum, and/or weight is a critical issue, the most reliable parachute is the preferable option.

In duration events, the flight is timed from first motion on the pad until it lands, and the longest timed flight is the winner. As a larger parachute will obviously bring a model down more slowly than a smaller one (under the same conditions, of course), a larger parachute made of thinner and lighter material is normally the best selection for this type of event.

There are other important factors influencing parachute selection, some of which are noted below.

Field Size - The larger the field you are flying on, the bigger 'chute you can safely use without running the risk of losing the model.
Weather Conditions - Wind is the main condition that will need to be considered when choosing a parachute - on a calm day the model will be more likely to come down more or less "straight" rather than being blown by winds, therefore on a calm day you can use a larger parachute than you would on a windy day. The wind conditions also go hand-in-hand with field size when choosing parachute size.

Packing - The way a parachute is packed into the model is crucial. If packed too tightly or poorly, a parachute may not be ejected properly from the body and/or may not deploy (open) properly. Plastic 'chutes (whether they are the polyester types generically referred to as "Mylar", such as our Comp Chutes, or the thicker plastic as in an Estes parachute) are much more susceptible to deployment problems than cloth 'chutes. Such problems are usually happen when you try to put too large a 'chute into too small a space. Plastic parachutes will tend to stick to themselves, especially on humid days, and especially so if packed too tightly.

There are many ways to pack a parachute; one method is described by Wolfram von Kiparski as follows:

On a flat surface dusted liberally with talcum powder, lay out your parachute flat. Dust it with talcum powder. Fold it in half to make a semicircle. Make sure the shroud lines are lined up on top of each other. Dust with talcum powder again. Remember, before you fold, dust with powder. Now take one "corner" of the semicircle, and fold the chute halfway. You're not folding it in half again! If one "corner" is at 0 degrees, and the other is at 180 degrees, bring one corner over to 90 degrees - halfway. Now carefully flip the whole chute over, and fold the other "corner" over like you did on the other side. Examine it until you notice that you have folded the chute into an "S" shape. See? Repeat this process again and again until you can't stand it any longer. Remember to dust with powder before folding. When you are finished folding, the whole chute should be folded in zig-zag pleats. The object of doing this is so that no folds are trapped inside of another fold. To finish up, fold the chute lengthwise two or three times, and wrap the shroud lines carefully around the bundle. Parachutes folded this way open very quickly when released. Try it at home a few times to get the hang of it. Remember that practice makes perfect!

Also do not skimp on the recovery wadding!

So, the answer to the question "what parachute should I use for egglofting?" is, "it depends…"

Parachute Size - A properly padded/protected single egg, along with a fairly lightweight 'comp-style model (such as our "Eggstravaganza" models), can be safely recovered on a 'chute as small as 12" or 15". A 15" to 18" 'chute can recover a light dual egg model. These would be the smallest recommended sizes, recommended only if the space in the model is very limited and/or the field size is very small or wind conditions make recovery with a larger parachute iffy. 15" to 24" for single eggs and 18" to 30" for dual egg models would be preferable minimum sizes for light models (duration models of course preferably using larger size parachutes). Many TARC-style models tend to be larger and heavier, and would therefore need larger 'chutes. For duration models, on a calm day with a good size field, the general rule is to "put in as big a 'chute as you can fit in"!

Parachute Type - If reliability is the top priority (such as in a TARC model), go with a nylon 'chute if space and weight are not an issue. Next choice would be a heavier plastic type (like our "Heavy-Duty Sport 'Chutes"). For duration events the normal first choice is the thin, comp-style, with the heavier plastics second.

We'd recommend that you have a variety of sizes and styles of parachutes on hand, attached using snap-swivels, so that you may chose and change 'chutes depending on the prevailing conditions.

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