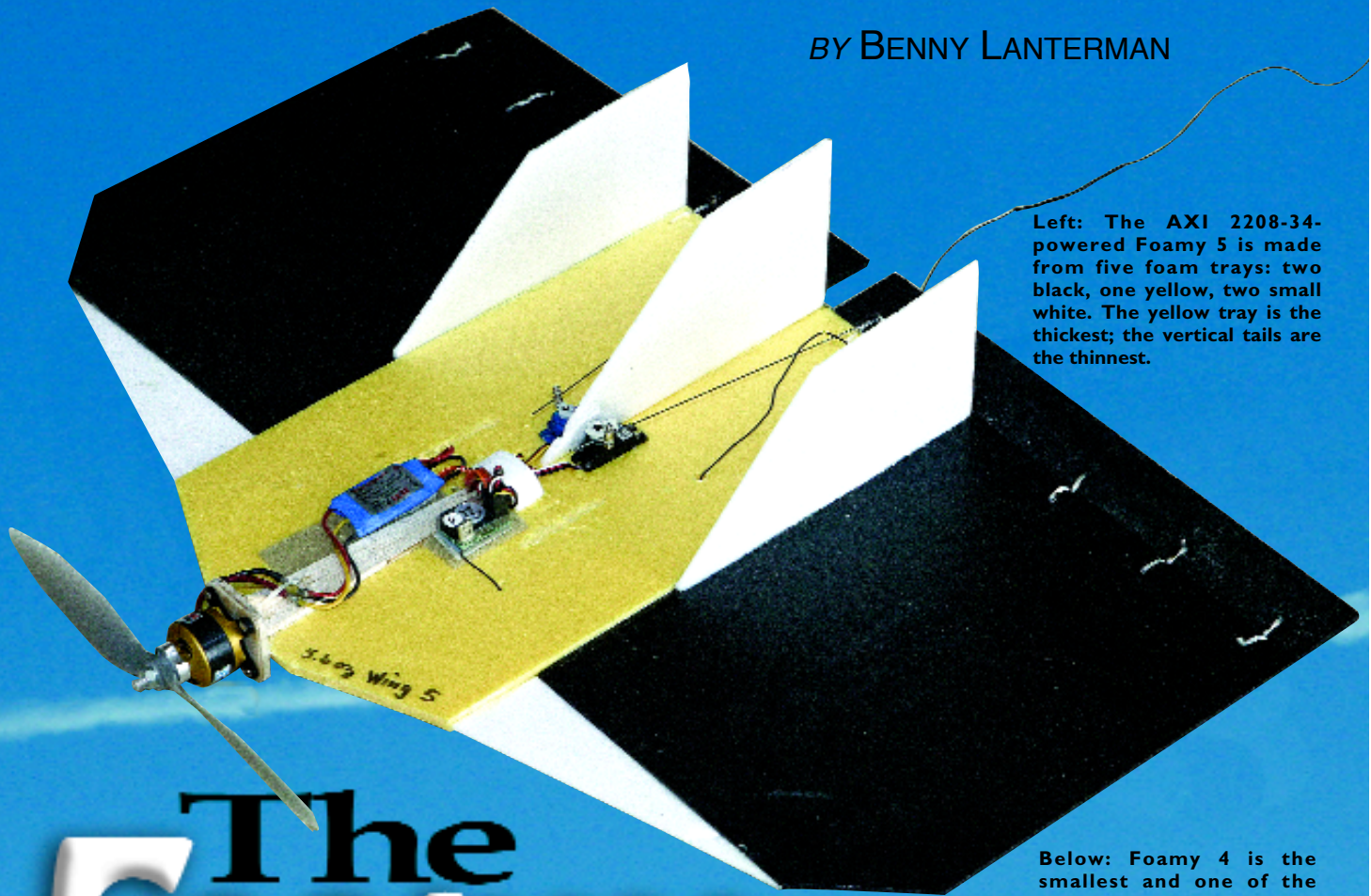


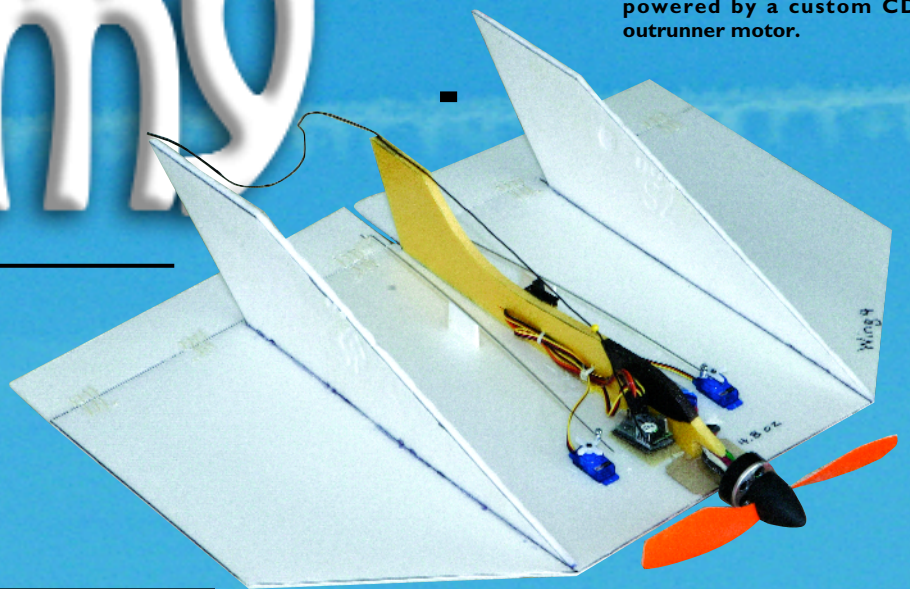
BY BENNY LANTERMAN



Left: The AXI 2208-34-powered Foamy 5 is made from five foam trays: two black, one yellow, two small white. The yellow tray is the thickest; the vertical tails are the thinnest.

# The Foamy

A simple-to-build RC foam flying wing that's easy to personalize



Below: Foamy 4 is the smallest and one of the fastest in the series when powered by a custom CD outrunner motor.

**ONE OF THE** joys of living in today's world is that the difference between wonders caused by science and wonders caused by magic is getting harder to differentiate. This applies to our radio-control hobby.

The small receivers, servos, and motors have given us the ability to put controls on almost anything we want to fly, from airplanes weighing less than an ounce (surely magic) to turbo jet-powered, flame-shooting monsters (definitely magic and science).

Much of the available magic is found in our trash! The modern foam tray used in supermarkets (and other stores) is brought into our houses while performing its prime purpose and then unceremoniously dumped into the wastebasket. The tray is an airplane waiting to happen; you just have to cut away everything

that isn't an airplane and let the magic out.

Another source of foam trays is a company such as Leftovers, etc. here in Saint Charles, Missouri. Most larger cities have a similar facility.

It is a recycling center that supplies free and affordable materials to teachers and crafters, and among the many items available are foam trays. You can find these trays in many different sizes and thicknesses, and it might be worth eating some broccoli to get a piece of foam with the right dimensions.

For those who are unfortunate enough to live far away from a recycling center and who never go to a supermarket, foam sheets are available with the product name Depron. This material is available in several thicknesses and is a lot of fun with which to work.

Whether it is tray or Depron, you should look for foam that is  $1/16$ - $1/8$  inch thick (3mm-4mm) with a smooth surface skin. Use the thicker size for the inner wing and fuselages and thinner material for the outer wing and vertical tails.

If all you can find are several smaller pieces of foam, you can glue them together in a pleasing geometric pattern and cut your parts out of it. I did that with the black, yellow, and white Foamy 5 model.

**The Airplane:** Foamy is an airplane—or series of airplanes—that is based on the low-aspect-ratio flying wing. Many vertical tail and fuselage configurations can be added to the basic design to get many different looks.

The flying wings presented here are only some of what can be made from foam trays and are examples of how little material is required to produce a flyable airplane. The simplest model is made from only four

pieces of foam: one wing, one vertical, and two elevons. (I don't count the motor mount.)

I experimented with single and multiple vertical tails, rectangular- and oval-planform wings, more delta-looking wings, and many different profile fuselage shapes. The model's configuration is your choice. Even a fully contoured fuselage could be made from the foam with no problems.

Let your imagination be your limit. I'll include a simple process to determine whether or not your design will work before you commit any radio gear and money to the project.

## CONSTRUCTION

The first and only step is to gather the foam and see what you can make with it. Well, it is almost that easy; I encourage experimentation and variation with this material.

As simple as the Foamy is, I don't recommend it as a first airplane. It is fully aerobatic and responsive in pitch and roll. Except for Foamy 6 (which is large, light, and slow), this design is fairly fast.

I was fortunate enough to find a large tray that was suitable to use as the main wing on some of the Foamy configurations and some small trays for the fuselages and vertical tails. Another model was constructed from several colors and thicknesses of foam trays.

The foam is easy to cut with a sharp blade, and it can be glued with any foam-safe adhesive. I use foam-friendly cyanoacrylate and find that I can build an airplane in just a few minutes. When in doubt, try a few test pieces of foam and verify that your glue and foam are compatible.

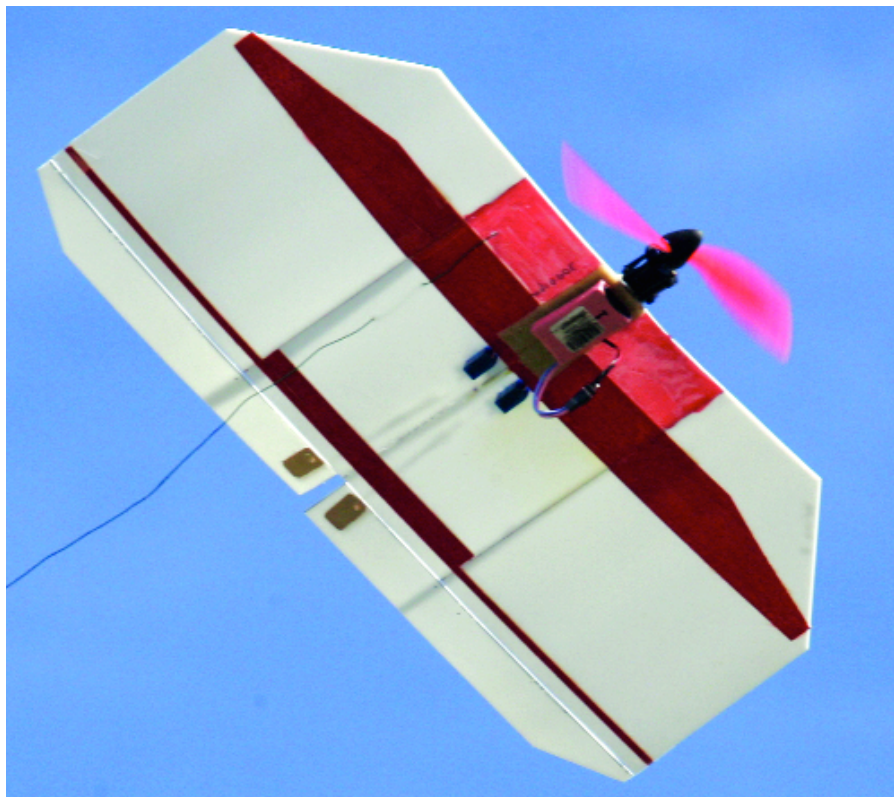
Butt joints seem to be strong, but if you put a large motor on the Foamy you should reinforce any questionable area with a small strip of thin foam or balsa on either side. I haven't had any joint problems with the airplanes that are shown.

Well, I did have one problem. I was holding Foamy 4 fairly low by one vertical tail (while I was busy talking and walking) and stepped on the antenna wire. I was left with a surprised look, a tail in my hand, and an airplane on the ground. However, that was the only damage and it was simple to fix.

I have presented plans for a typical model. Foamy 1 started out as a rectangle and flew fine, but the angular wingtip sweep looks nice and helps determine which way the airplane is going at any given time. It is unnecessary to adhere blindly to any of the dimensions I give you; just get close.

You can use the following information to determine whether or not your changes will allow the airplane to fly. It is my quick and easy method of determining your design's aerodynamic worth and the CG for the first flight.

Cut and glue together only the foam and balsa reinforcement parts of your airplane, adding the elevons with pieces of tape. With



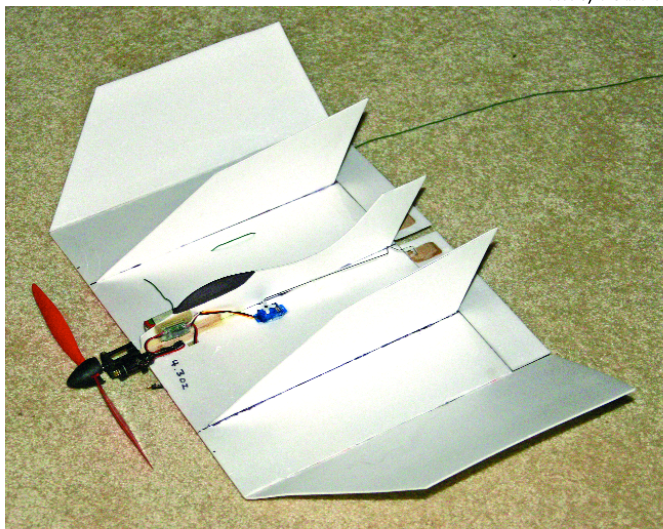
Foamy 1's bottom shows red balsa stiffeners. Benny initially planned to use markers to color the whole bottom red, but test areas on foam showed that permanent markers would dissolve it slightly.



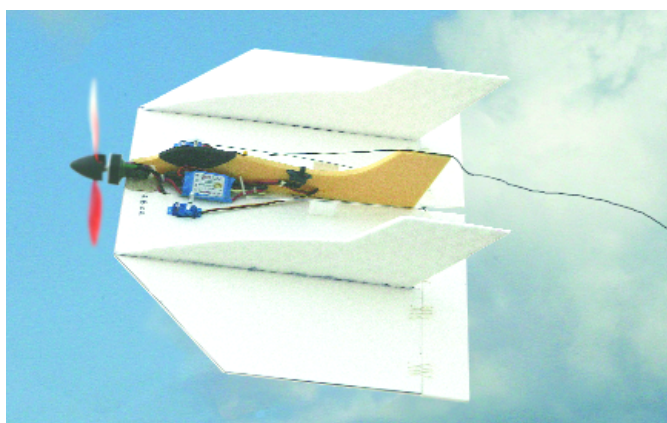
Foamy 1 launches nice and stable. Servos sticking through the wing's bottom give a good holding point for launching. They are inadequate for holding higher-power Foamys.



**Foamy 5** in the test-glide phase. Weight is added to the nose and elevons are adjusted until it glides well. Mark the location on the wing bottom and use it as a safe starting point for the first flight.



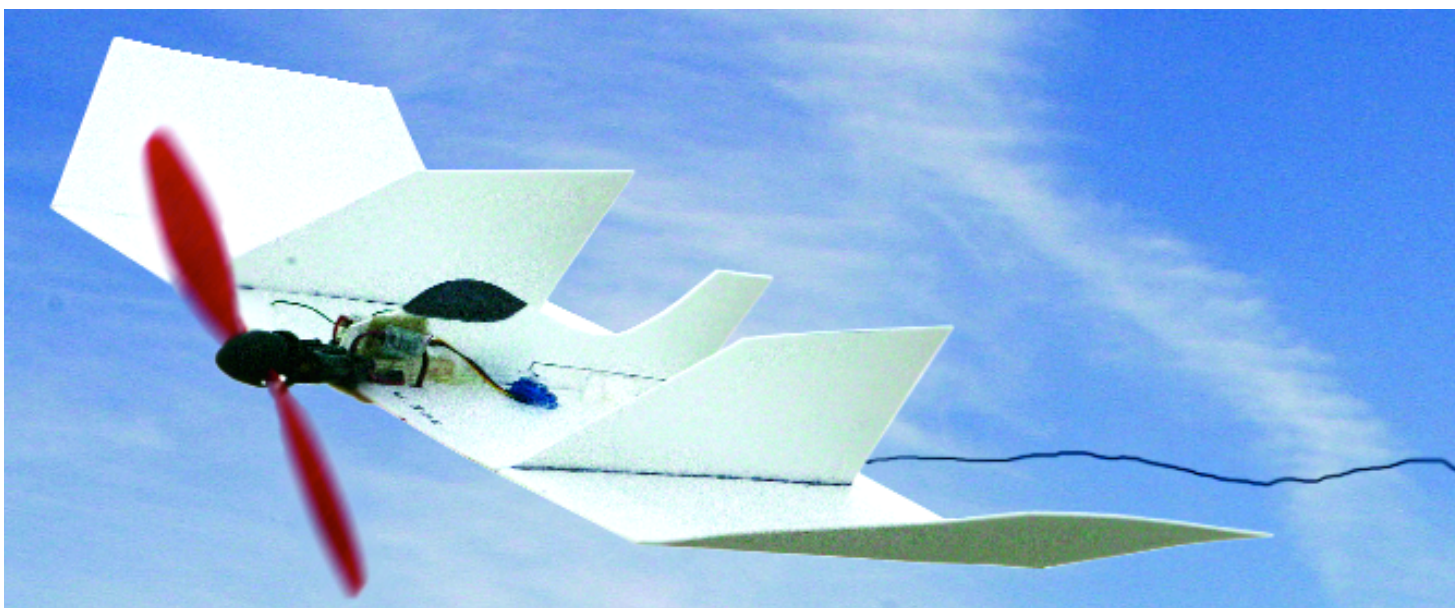
**Foamy 6** is the slowest, lightest version tried. Its stock GWS motor was previously used on a Pico Stick. Note the large tip dihedral that stabilizes the Foamy in roll, still allowing full pitch control to be maintained.



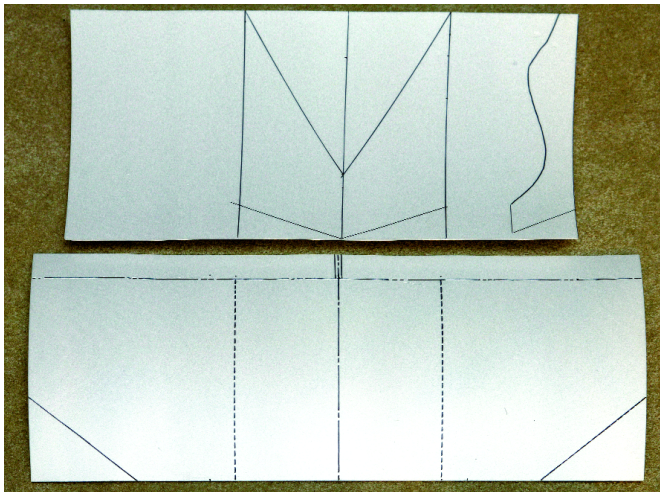
**Foamy 2** is leaving major sonic booms in its wake. (Some imagination is needed.) The oversized Jeti Advance ESC for Li-Poly cells was employed to make use of what was available in the model shop.



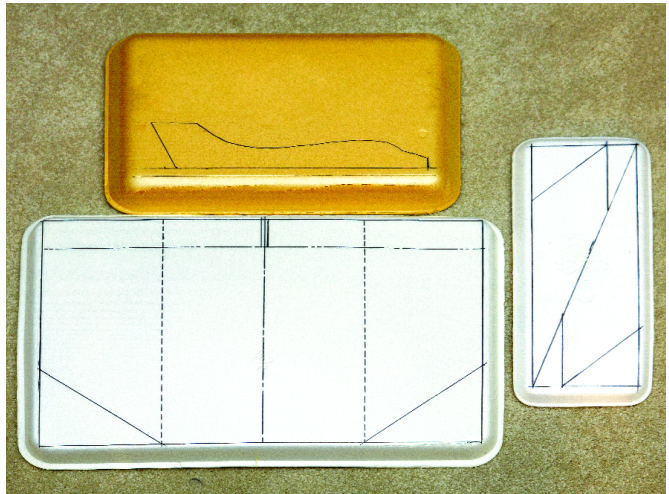
**Twin Foamy** was an experiment in using twin motors. Although it uses Jeti brushless outrunners, it would fly well with small GWS IPS geared motors.



**Foamy 6** on a low pass. Its slow speed makes it a good intermediate airplane. Even though it is the slowest Foamy to date, it is still fast compared to a Pico Stick.



**Sheets of 3mm Depron (12 x 24 inches) are used to make Foamy 6. This is simplicity itself. All that is needed to finish the model is a motor mount and radio gear.**



**The foam trays used to construct Foamy 4. A fairly large one was used to make the main wing. The dashed lines are where the vertical tails are located.**

no radio, motor, or batteries, it becomes a light, simple glider.

Adjust the elevons slightly up (use tape to hold them in place) and add weight to the model's nose to balance the airplane at roughly 20% of the wing chord. Make adjustments to the nose weight and elevons until the aircraft glides nicely. If you are really off in your CG guess, the foam glider will gently flop to the floor.

Once you get an okay glide, mark that CG location on the foam wing. Add the radio gear, motors, and batteries in the proper fashion, per the manufacturers' recommendations.

I won't get too detailed with installation notes since the Foamy shouldn't be considered as a first model. A design such as the GWS Pico Stick would be a better choice. (Mine still works fine after many years, motors, and flights.)

Move the various pieces of equipment around to keep the CG in the same location as on the nonpowered glider, and use sticky-back Velcro to fasten the receiver and ESC. Use the photos as a general guide for equipment locations. You can temporarily tape the receiver, servos, etc. in place to see if the CG is going to work.

Cut holes in the wing and push the servos through with a bit of glue to hold them in place. Set the initial elevon deflections (you can use tape or your favorite hinges on the elevons) to be the same as used by the glider. The model (if not the pilot) will be in fine shape for the first flight.

I have used motors ranging from the little workhorse GWS IPS geared units and hand-wound CD-drive conversions to the elegant brushless golden anodized AXI 2208-34. With any lightweight equipment the airplane will weigh less than 4.5 ounces without batteries.

I have used a small seven-cell, 280 mAh NiMH pack with the GWS motor system and two- or three-cell, 700 mAh Li-Poly packs for the brushless motors. I selected propellers per the motor manufacturer's suggestions.

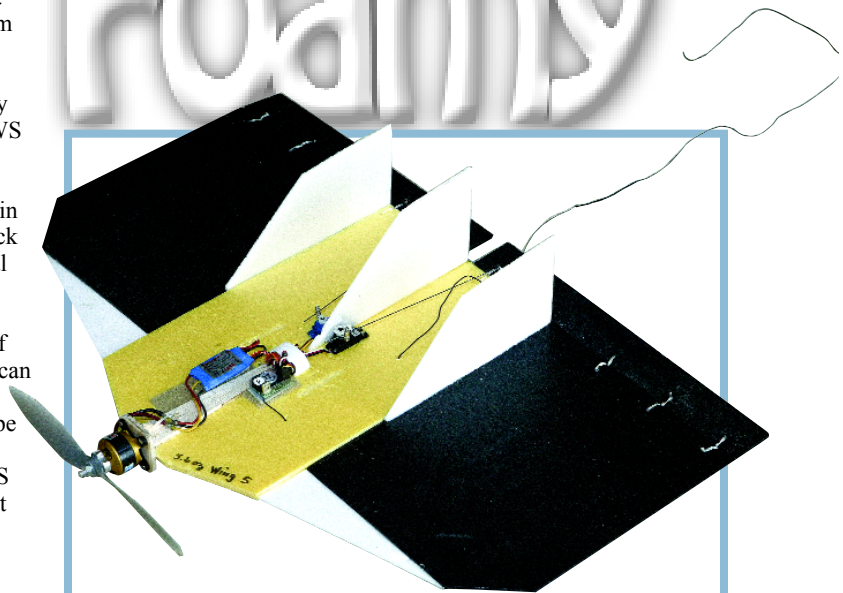
I have been using the small, single-conversion receivers that GWS and Hitec make. I have used a large variety of ESC brands, but I have used the Jeti the most. In each case the unit has been appropriate for the motor and battery pack. Use string to tie down any loose wires so it looks fairly neat.

The motor is attached to a hardwood stick with balsa fill added as necessary to fit the power plant that is used. Although we never crash, remember that the stick should be the weakest link—weak enough to break instead of the motor on those rare nose-down arrivals.

**Flying:** The magic takes wing at the flying field. A gentle toss will set the airplane flying straight and level. Trim as needed and be prepared to have a great deal of relaxed fun. With almost zero cost in materials for the airplane, the scary part of flying disappears.

Take along foam-friendly cyanoacrylate and kicker to do field

# The Foamy



**Type:** RC sport electric

**Wingspan:** 24 inches

**Weight:** 4.5 ounces (without batteries)

**Wing area:** 268 square inches

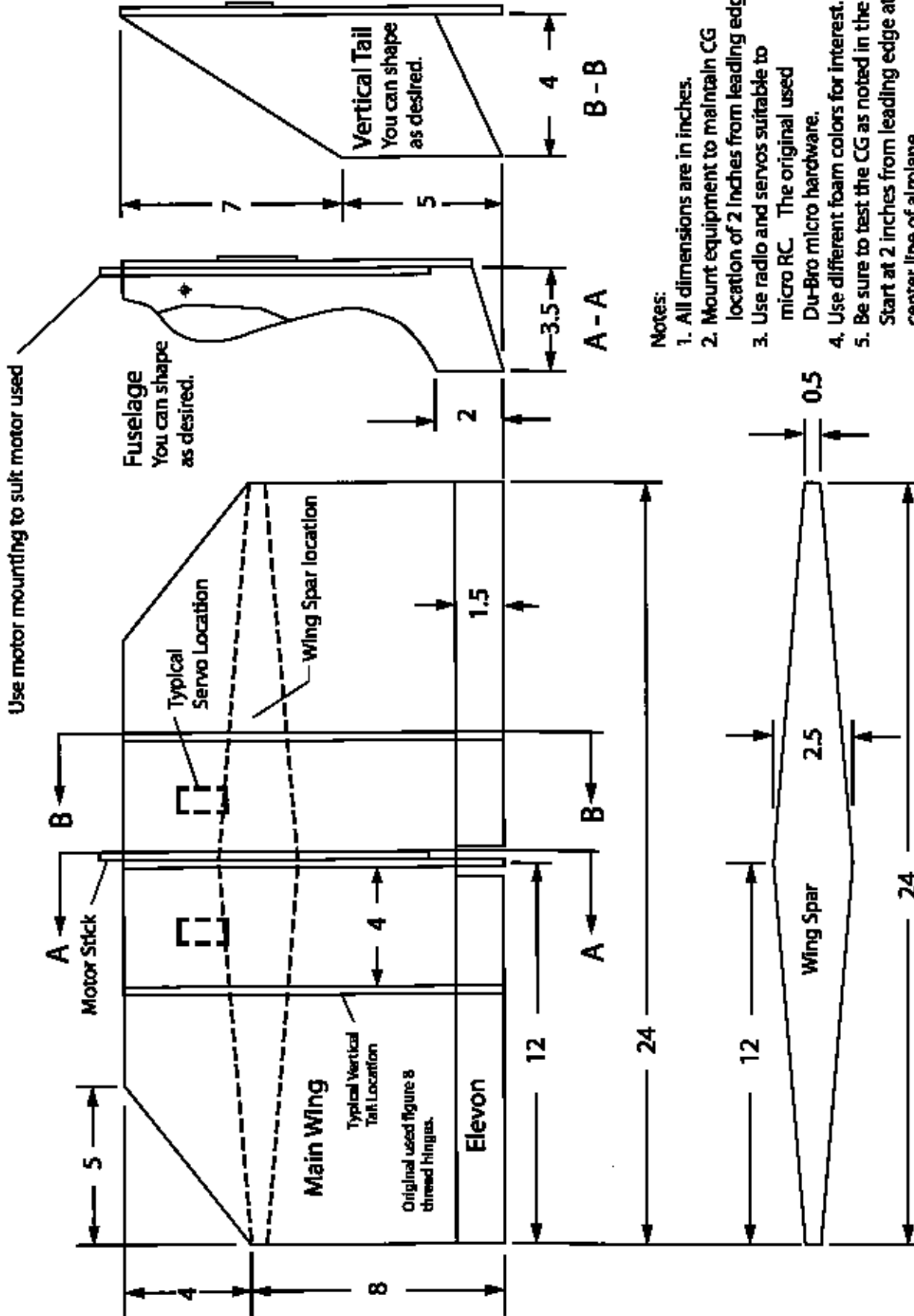
**Length:** 12 inches (without motor)

**Power:** AXI 2208-34 motor with 30- to 50-watt output, 8- to 10-amp ESC, two- to three-cell, 800 mAh Li-Poly battery

**Radio:** Three channels minimum with two micros servos

**Construction:** 3mm-6mm foam

**Covering/finish:** Magic Marker, foam-safe paint



Use motor mounting to suit motor used

Fuselage  
You can shape  
as desired.

Vertical Tail  
You can shape  
as desired.

Typical  
Servo Location

Wing Spar location

Main Wing

Typical Vertical  
Tail Location

Original used figure 8  
threaded hinges.

Elevator

Wing Spar

Wing Spar = 1/16 Balsa

Notes:

1. All dimensions are in inches.
2. Mount equipment to maintain CG location of 2 inches from leading edge.
3. Use radio and servos suitable to micro RC. The original used Du-Bro micro hardware.
4. Use different foam colors for interest.
5. Be sure to test the CG as noted in the text. Start at 2 inches from leading edge at the center line of airplane.

# Foamy

by Ben Lanterman



Copyright © 2007 by Ben Lanterman

repairs, and fly all day! The large, flat piece of foam is a great-flying airplane with flight characteristics dependent on weight, size, and power.

There is one thing to watch out for (and the embarrassing reason why I almost called the model the "Whacker"). Make sure you have a good grip on the Foamy when checking the motor.

I was holding the airplane too loosely, and it pivoted in my hand enough to allow the propeller to hit the heel of my hand several fierce whacks. A half dozen oozing cuts put home the lesson: the little motors should be treated with care and respect.

A large, light Foamy 1 or Foamy 6 with the small GWS motor flies gently. It might loop if you hold the dive long enough and

are lucky. It will roll more easily, but not all that well. It is a bit like a butterfly, but I have flown one in nearly 15 mph winds. Using the tip dihedral makes the airplane roll stable and helps the more inexperienced pilot.

The same airplane with an AXI brushless motor is a different machine. Straight flight under full power is surprisingly fast, yet slow flight is still very nice. You can do continuous loops and rolls, and go straight up for a long time.

Foamy 1 has made many flights and, as the resident test bed, received my first small brushless motor. While doing a series of fast, small loops on its first flight, I noticed it was developing more and more dihedral until the wing folded in the center.

I throttled back and the Foamy slowly fluttered down and settled on the runway (another good thing about the light foam wings). I put glue in the break and added a 1/16-inch-thick, 2-inch-wide balsa wing spar at the 25% chord position. In the photos it is seen as the red-marked area under the wing. No problems have resurfaced since that addition.

Foamy 4 with the Custom CD or small AXI brushless outrunner motor is a true speed demon with amazing looping and rolling performance. For this variation I recommend the thicker foam. Performance in the wind is great, and it will be flying when other types of models are grounded.

The other Foamys have varying components and characteristics. They have been a lot of fun to fly. Each one is different and leads me to try something else. No boring airplanes here!

I am presently wondering how rounded surfaces would look and thinking about the benefits of a full fuselage. A single tail would be okay too, if you like that kind of configuration. A recent addition has been the twin Foamy that is shown. It flies nicely and has a great twin sound.

Something fun and educational is to take one of the models, scissors, extra pieces of foam, tape, foam-friendly cyanoacrylate, and cyanoacrylate kicker to the flying field. There you can experiment with wing extensions, wing strakes, vertical tail sizes, control-surface sizes, and anything else you can think of. What you can do is limited only by how much magic you are willing to let out of the foam. **MA**

Benny Lanterman  
benlanterman@charter.net



**PACIFIC COAST FREESTYLE CHAMPIONSHIPS**

**POWERED BY**

**FROMEGO SCALE AVIONICS**

**July 26<sup>th</sup> - 29<sup>th</sup> 2007**

Sharp's Green Acres  
Malalla Radio Control Association  
Malalla Oregon [www.malorca.com](http://www.malorca.com)

**\$5000 CASH PURSE!**

**MANY OTHER PRIZES!**

*2 DAYS OF IMAD, (BASIC PILOT DEPENDENT).*  
*IMAD TROPHY & AWARDS CEREMONY, FOLLOWED BY A STEAK DINNER DONE NORTHWEST STYLE.*

**SUNDAY**  
*HAIR BACK, JUNK YARD, 3D FREESTYLE THROWDOWN, 3 ROUNDS FLOWN TO MUSIC.*

**Ya can't win it if you don't fly!**

**Event Sponsors**

**Event Coverage**  
Live Flyinggiants Coverage: [www.flyerggiants.com](http://www.flyerggiants.com)  
Forum Coverage: [www.flyerggiants.com](http://www.flyerggiants.com) & [www.downtownthebeek.com](http://www.downtownthebeek.com)

**Desert Aircraft**  
**Dons Hobbies**  
**Coyote Hobbies**  
**Troybuilt Models**  
**Prestige Impressions**  
**FROMEGO**  
**SCALE AVIONICS, LLC**

For more details visit  
[www.fromego.com](http://www.fromego.com)



**Basic RC Helicopter Training Program on DVD**

75-minute instruction on the setup and operation of RC helicopters. No RC experience necessary. Many hints, tips, tricks, and techniques to make you a better pilot - sooner! Topics include: 30- vs 60-size machines, the importance of mechanical balance, using training gear, simulators, how to side hover, nose-in hover, fly figure-eights, fly circuits, more! Most topics apply to gas & electric helis.

DVD \$19.95 US Postage \$2.35 1<sup>st</sup> Class  
Buy on-line at: [www.chocoverview.com](http://www.chocoverview.com)

713-937-1727

CREATIVE MEDIA GROUP / P.O. BOX 41267  
HOUSTON TX 77241-1267