An FM Product Review:

The Birdworks' R/C Gull

By David Garwood

Want the "ultimate" reality in model soaring? Try it with this novel but effective design.

PHOTOGRAPHY: DAVE GARWOOD

It's a bird! It's a plane! No, it's a bird. Well what do you know, it *is* a plane. It's the *R/C Gull*.

Gulls are the ultimate slope soarers. Low wind, high wind; good slope, poor slope; sunny days, cloudy days—gulls are out there flying. I marvel at their ability to soar and their adaptability to conditions, and for years I've wondered what it would be like to fly a gull. Steve Hinderks' *R/C Gull* helps to answer that question, and presents a mighty interesting glider design in the process.

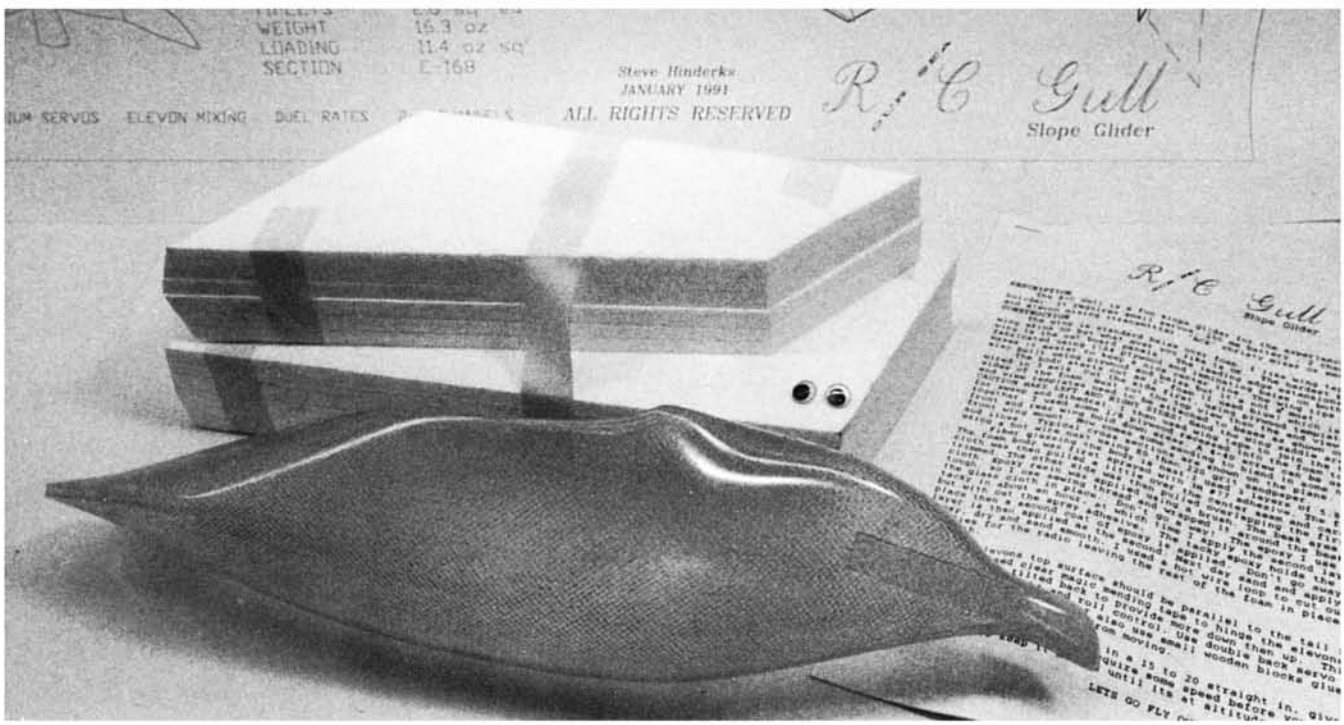
Sub-kit contents

The sub-kit contains a superbly molded fiberglass gull body fuselage, plans, instructions, foam wing cores, and eyes. The modeler provides all wood, hardware, and finishing materials. Steve will also sell the plans alone for the truly confident builder. The sub-kit costs $75 plus $7 shipping, while the plans are $12 postpaid.

The blue line plans are beautifully drawn, a pleasure to look at and to work with. The 7-page instruction booklet contains 15 exceptionally clear diagrams and a materials list. The instructions are occasionally confusing and in one place incomplete (the recommended elevon control throws are missing) but present no problems that experienced modelers can't handle. For those who don't have the base of building experience, Steve offers a two hour construction video tape for $15 postage paid. The video covers the building process in abundant detail and includes exciting flying footage. I built my gull by following the instruction given in the tape, and used it as my source for recommended control throw specs.

Construction

The fiberglass fuselage is prepared by installing wing attachment blocks. It's finished with primer paint, auto body glazing putty to fill the few pin holes around the seam, sanding, and a top coat of spray enamel. The eye and beak markings were painted with acrylic artist colors, using the drawings on the plans as a guide. The tail is made of 1/64 plywood between sheets of 3/32 balsa, covered with



Inside the kit box you find the fiberglass "body", foam wing cores, plans, and instructions, and "eyes" of the *R/C Gull*.

Ultracote, and attached to the body with thick CyA. I used Goldberg Jet CA and Jet epoxy throughout the project.

The wing is made of four foam cores covered with 1/16 inch balsa sheet. Templates are given for the inner panel sub-leading edges and outer panel rounded leading edges, and tip blocks. The foam cores are covered with 1/16 inch balsa sheeting in the customary manner. I used Cheetah Models Wing Skin Mounting Tape. Steve's construction video gives an excellent method of making sure the wing skins are stuck down tight at the front when applying the leading edges.

The elevon linkages are torque tubes which are installed between the wing skins. There's one part I couldn't find on the materials list, 14-inch control rods with 4–40 threads. I used .093 music wire with DuBro No. 189 Aileron Horn Wire Ball Links, and it's worked fine.

The only construction problem I had in the entire project was the torque rod in the specified 1/8 O.D. aluminum tube would not fit between the wing skins at the specified location near the trailing edge without making a bump in the wing surface. The solution for me was to move the torque tube forward by about 3/32 inch. This makes the elevons 3/32 inch wider, but it's worked out fine in practice.

Steve specifies three options for the elevon control system: transmitter, on-board channel mixer, or mechanical mixer. I used the ACE R/C Christy Mixer. This works well because there's abundant room in the fuselage for radio equipment, and wing removal is simpler when unplugging the servo leads rather than breaking down a mechanical linkage.

Steve gives an ingenious method for burying an antenna tube in the wing, including a way to navigate through the "gullhedral" break. I'll be using this method on future foam wing airplanes.

Wing sections are joined with epoxy and the joints reinforced with fiberglass tape. After final sanding I covered the wing and tail with white, gray and black Goldberg Ultracote, patterning it after the Herring Gull photographs 243 and 247 in P.J. Grant's *Gulls—A Guide to Identification* (1986 Buteo Books, Vermillion, SD). The last step before balancing is to add clear tiplets, which are hardly visible in flight but essential to smooth flying.

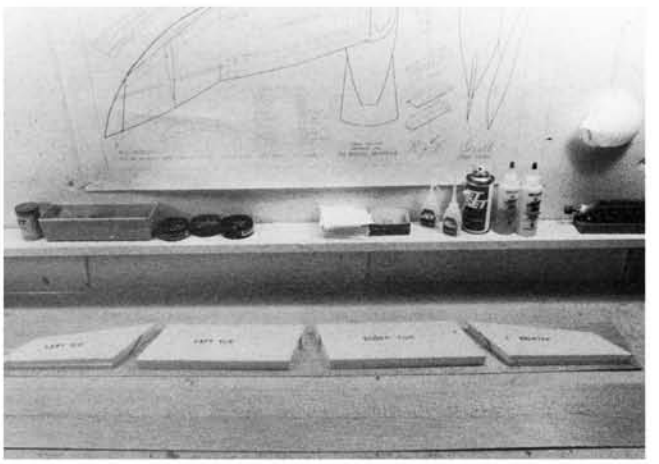
Scotch Plastic Tape (Cat. 190) from the hardware store was quite helpful in this project and I used three colors: white for covering the seam between the tail and the body, clear for elevon hinges, and brown for feet markings.

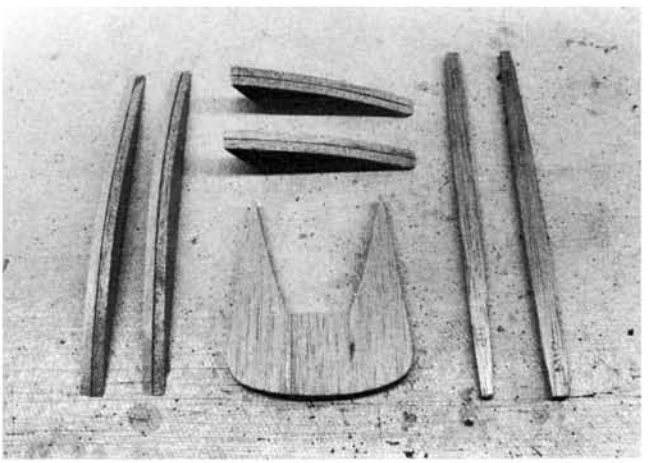
While there are relatively few steps involved in building this model, the cutting, shaping, and sanding time is relatively high, due to the number of rounded shapes and the balsa-ply-balsa sandwich construction on some parts. I made good use of a motorized hobby tool.

My *R/C Gull* took 37¾ hours to build, and weighs 19 ounces for a wing loading of 13.3 ounces per square foot. The specified wing loading range is 11-14, and mine could have been built lighter by using micro servos and by eliminating the on-board elevon mixer with a computer radio.

Flying the *R/C Gull*

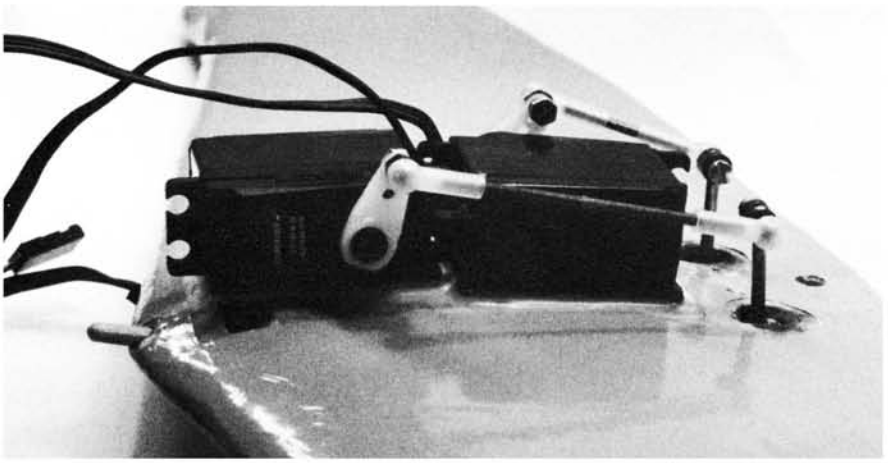
Connecticut flying buddy Al Dion and I launched from a 65-foot ocean facing dune in a 15 mph wind and the *R/C Gull* flew quickly to the bottom of the hill. The flight was under full control, but the gull would not stay in the air. The model felt as if the balance point were too far forward, we adjusted the balance point, and also adjusted the control linkages to give more up elevator—and the model would still not stay up. The *R/C Gull* is cer-



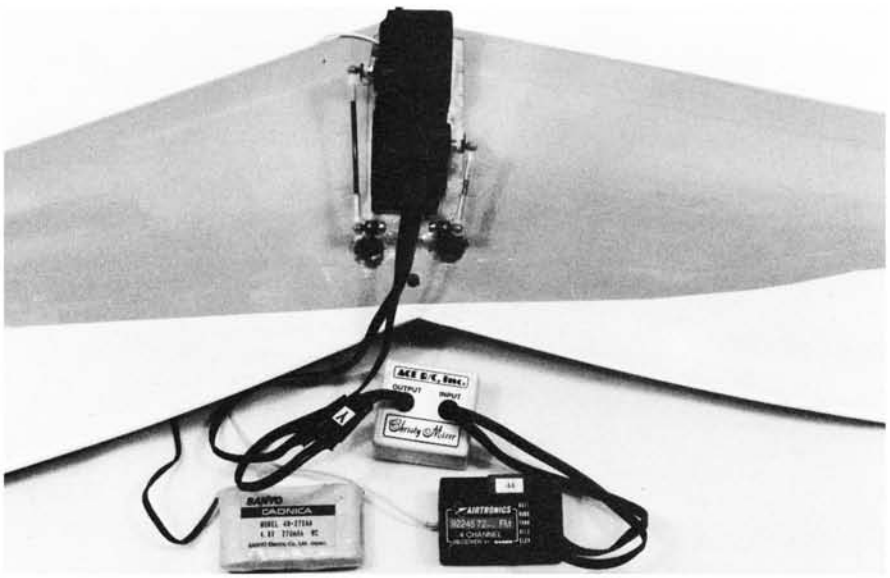


Four-part wing cores for the 41-inch span model rest on 1/16-inch balsa sheeting **(above left)** made by gluing 3-inch sheets together, edge to edge. Outer leading edges, tailfeathers, and wingtips are made of 1/64 inch plywood, sandwiched between balsa **(above right)**. They're the only parts that need fabrication.

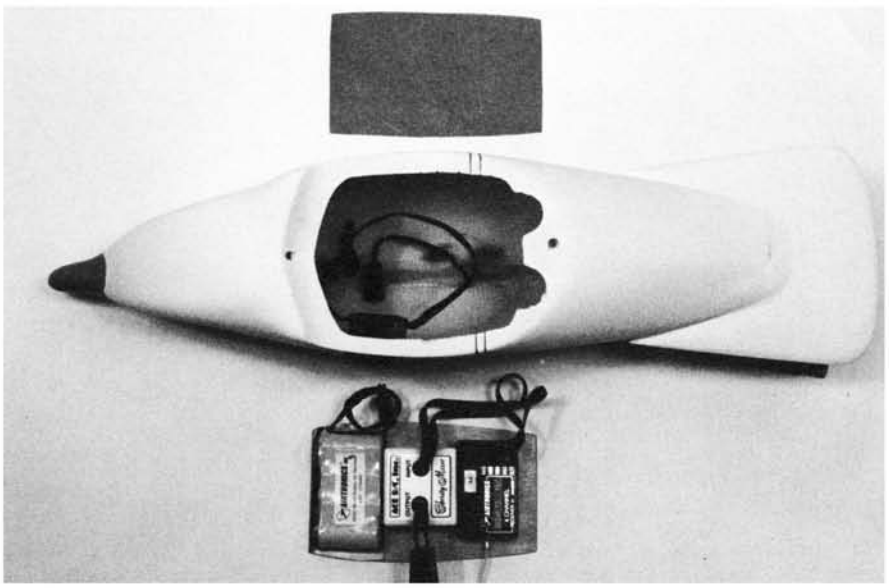
The Birdworks' R/C Gull



Mounted on ply plates with double sided adhesive in the wing's center section, the servos are set at neutral position, with offset servo arms to give more down than up elevon throw for smooth inverted flight.



View of the wing's underside shows the mounted servos hooked to radio gear **(above)** that consists of a 250 mAh flat battery pack, ACE Christy Mixer, and Airtronics 92245 receiver. The radio gear mounts on a ply plate **(below)** that is then fastened inside the body/fuselage with RTV silicone The pattern for the ply plate was made from the trial and error fit of a piece of cardboard shown.



tainly rugged; in 15 forced landings at the bottom we had no more damage than a snapped wing mounting dowel and torn aileron hinge tape, both designed to be breakaway parts.

During our test-and-fiddle period the wind was steadily increasing. When it hit 24 mph, with copious whitecaps on the ocean, we launched again and the *R/C Gull* took off like, well... like a bird. With a fully symmetrical airfoil and a wing loading of 13 ounces per square foot, this airplane needs some serious lift to fly. When you have that lift, however, flying the *R/C Gull* takes your breath away.

The first flight lasted about 15 minutes and the *R/C Gull* was joined by several live gulls. Generally, about one out of 20 passing gulls slows down to take a look at, or to fly with a slope soarer, but with this model it was more like one in five. Flying silently among these sea birds gives you a strong feeling of connection with the animal world.

On the second flying day, my son Louis (age 14) and I logged two half-hour flights in 28 mph wind gusting to 40 on the same seacoast slope. Our comments in the logbook are "superb rolls", "very fast", "responds accurately to control input", and "penetrates with no problem." Interestingly, we weren't able to get the *R/C Gull* to loop. Even after building speed in a dive, it would climb to twice the

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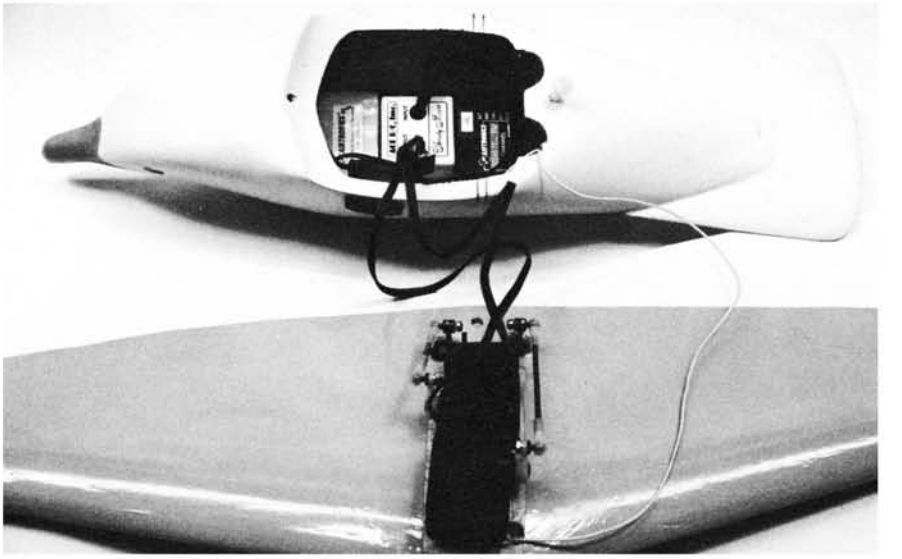
height of the hill and blow back over the hill—it wouldn't pull over into the loop. Lou and I concluded the fast and agile *R/C Gull* looks great in the air and flies much better aerobatics than some "famous" slope soarers.

The third day I flew the *R/C Gull* for the camera, and my wife Paula took the flying photos you see here. The site was an 85-foot Atlantic Coast dune in an 18 mph steady, straight-in wind. Again, the model flew great. Still no loops, but aside from this minor deficiency I have nothing but praise for the *R/C Gull's* flight and aerobatic performance.

The *R/C Gull* is a formidable slope machine. Remember, Steve Hinderks designed it as an aerobatic slope soarer that happens to look like a gull. Rolls, including slow rolls and point rolls are smooth and positive. Inverted flight is nearly as fast as upright and the model maintains its altitude very well, and even climbs while inverted.

My *R/C Gull* now flies with the balance point 3 1/16 inches behind the point of the shoulder on the fuselage (no tip stall with CG here), elevator throws of 1/2 inch up and 5/8 down, and aileron throws of 1/4 inch up and 3/8 down.

Nothing I've flown at the slope has generated greater interest among sailplane flyers and casual observers alike as the *R/C Gull*.



The gulls wing mounts to the body with a dowel in the leading edge, and a nylon bolt in the trailing edge. The radio on/off switch mounts on the side of the fuselage.

If you're the type who will build and fly a gull, you probably knew it long before you read this article. Steve Hinderks has done all the hard work for us: design, flight testing, and fiberglass molding. Now us ordinary blokes can have an *R/C Gull*. While construction assumes knowledge of foam wing and fiberglass finishing techniques, and flying requires experience with small, fast aileron slope soarers, neither is more difficult than other small slope planes.

The *R/C Gull* delivers exciting aerobatic performance and more—it gives you an idea of what it's like to fly a gull.

Dave flies the *R/C Gull* in an 18 MPH breeze from an Atlantic coastal dune. Fast and agile, it rolls better than many other slope ships.

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