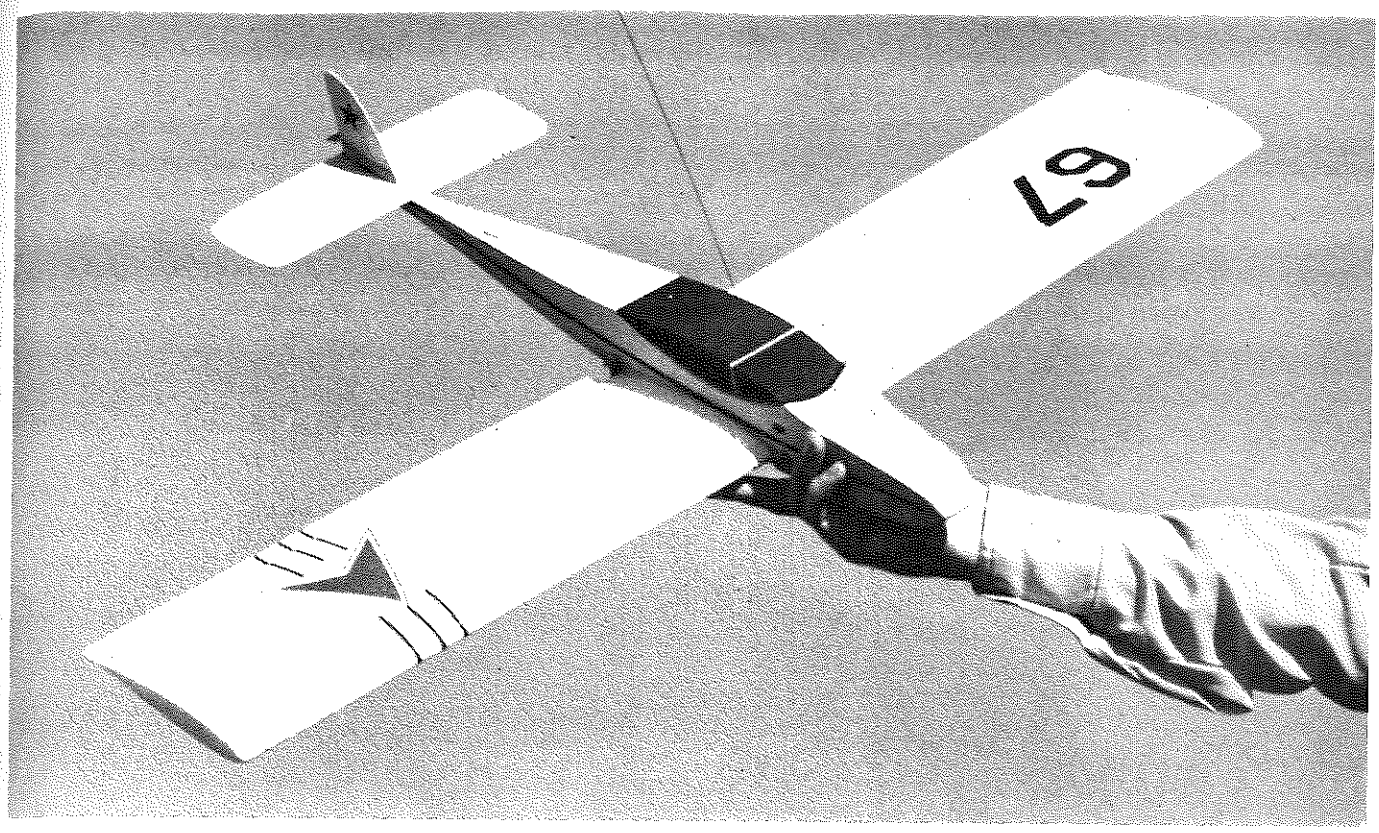


aerobatic MERLIN sailplane

PHOTS BY JACK HEADLEY

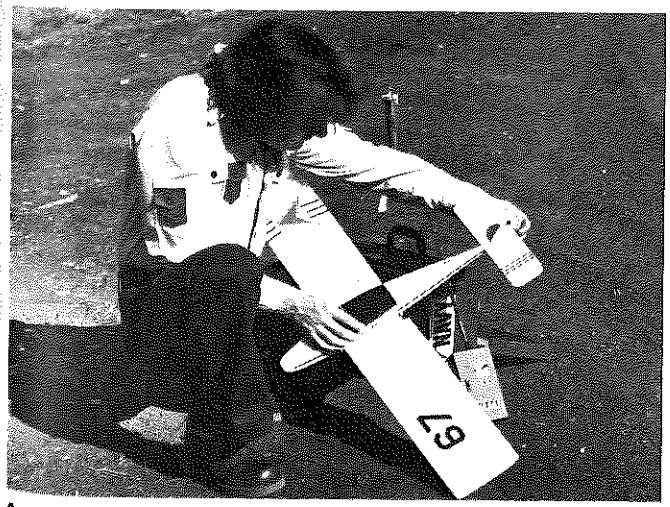
By KEVIN FLYNN . . . A whole bundle of fun in a small package. That's the best way to describe this little foam-winged, single-channel aerobatic glider. A small, 2-channel mini-system is also not out of the question.

• Merlin started out as part of a long series of experiments with Galloping Ghost models, both power and gliders, using rudder only. Now called pulse proportional, which sounds more elegant, I decided to carry on once again. So, putting away my 5-channel Kraft, I rummaged through the radio drawer in my workshop and found my old Testors single-channel pulse proportional. No matter what I tried, it just would not work. After ten years, I guess it had given up (The Ghost). Anyway this gave me a good excuse to buy a new one.

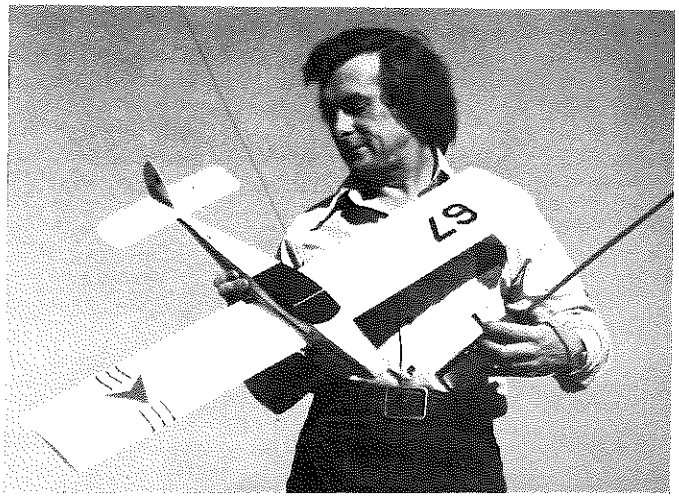
Reading my latest issue of **Model Builder**, I noticed the Ace Commander Radio is now available on 72 mHz. Perfect! Off went a check to Missouri for one complete outfit, plus the Stomper Actuator and the little adaptor for push-pull operation. This is a handy little system, so small and light. The extra actuator comes with its own battery pack.

Now for a model. I wanted something quick to build, so I chose a glider using a set of Ace foam wings (No. 13L-192). This is beginning to sound like a commercial message for Ace, but they do have excellent products (Your 30 seconds are up, so back to the story).

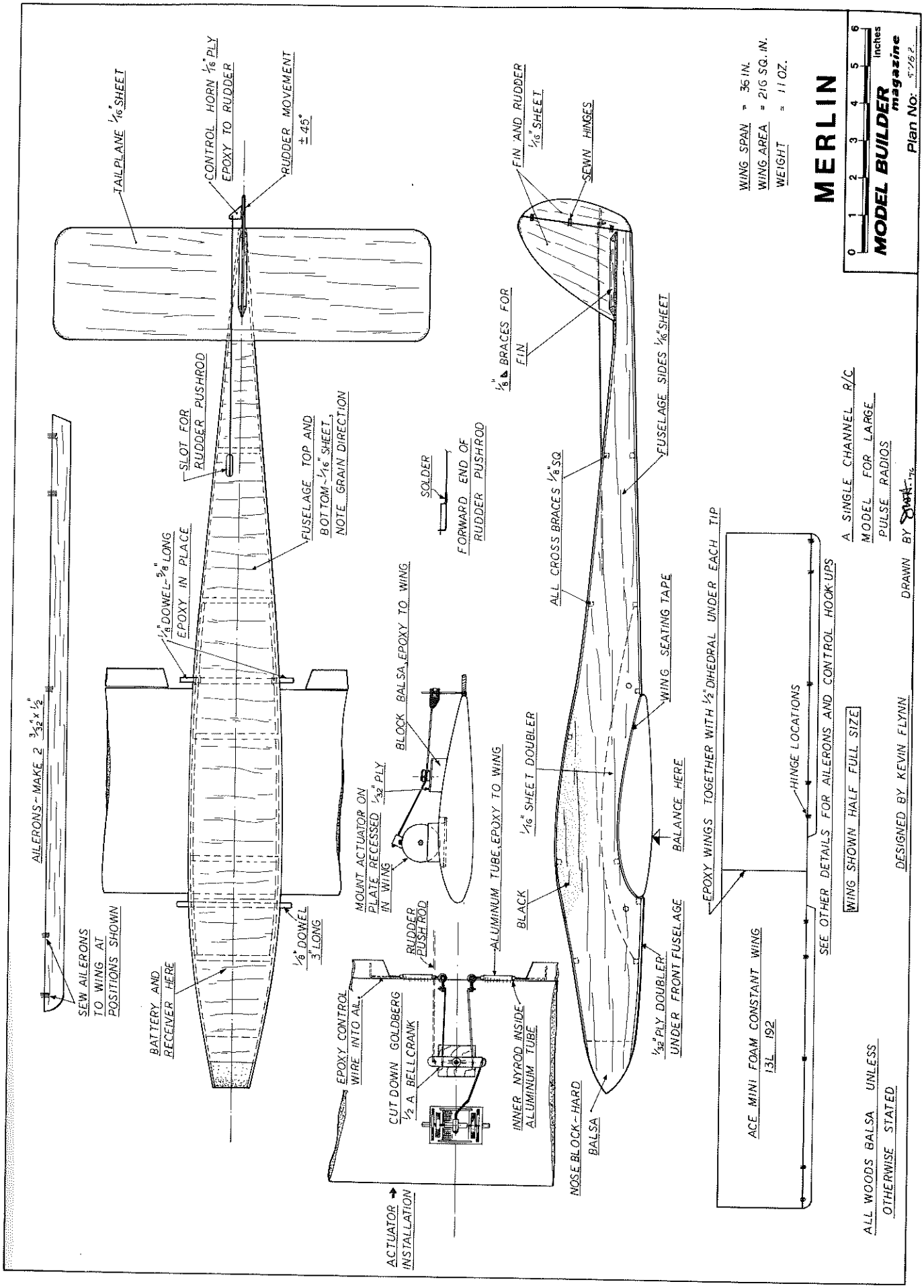
As I said, my experiments had gone on for some time before



An amazing number of maneuvers can be performed with Merlin's coupled rudder and aileron controls.



Kevin Flynn has a pleased "By Jove, it works!" expression after a fun flying session with Merlin.



FULL SIZE PLANS AVAILABLE — SEE PAGE 144

switching to full-house radio. Coupling the elevator to the rudder linkage to get a small amount of up-elevator in turns to keep the nose of the aircraft up, was one of the experiments. This worked very well, but I will save that for another time.

For The Merlin, I wanted a little different approach again. How about ailerons instead of rudder? I had tried this with a two-channel glider and it was disappointing without the rudder. The turns were flat instead of banked, also this model just did not have the speed for aerobatics. I decided to try and come up with a coupled rudder-aileron system, using several different set-ups on the bench. Some were pretty mickey mouse and would bind up. This idea of using a bellcrank with extra holes seemed to work fine; it ran on the bench for 90 minutes without a hitch.

This prototype test allowed time out for me to have a brew and watch some TV, oh yes, and also take a look at my wife again. Aeromodelling wives are a special breed, and if you have one, don't let her get away, they are very hard to find . . . a most understanding species.

With the equipment checked out, I was ready for the model. With it sketched out roughly on graph paper, I started to build. Suddenly I realized I had only used 3 sheets of 1/16 balsa, a couple of pieces of 1/8 square, and some wire. This was the most inexpensive model I had ever built. With the Ace foam wing at $2.95, the total cost was around $6.00, and it could be built in one day (honestly, with Hot Stuff).

To sum up a long story, the model worked out beyond expectation. It will roll, do many maneuvers other sailplanes will not do, and, if you are easy on the stick, it will soar with the best of them. Just keep the rudder movement small. It may require some adjustment for individual models. Overall, it is easy to build and very easy to fly. If you are ready, why not start building your Merlin, the Aerial Magician.

CONSTRUCTION

Begin by cutting out fuselage sides from medium straight-grained 1/16 balsa. Next, cut out the 1/16 balsa wing doublers and glue in place. Be sure to make one left and one right side. Use a slow-drying glue, such as Titebond or white glue, and pin to a good flat surface. While this is setting up, cut out tailplane, fin, and rudder; also the small balsa nose block.

Next, glue the Ace foam wing together with 5-minute epoxy. Use only 1/2 inch dihedral under each tip. This is a small amount, but has proven quite sufficient in our flight tests. The ailerons are cut from hard 1/16 sheet balsa, or if you have a strip of 3/32 by 1/2 laying around, you can use this instead. Epoxy the wire control rods into the ends of the ailerons. When dry, sew the ailerons to the wings with button thread. After you have completed this, spread some epoxy on the foam wing at the sewn points for reinforcement.

That field box isn't as large as it seems . . . it's just that everything else in the photo is rather small.

The actuator is fixed to a small 1/16 plywood base and epoxied to the wing as shown on the plan. Mount a Goldberg or Top Flite nylon 1/2A bellcrank on a small balsa block and glue in position on the wing. Remove the bellcrank from its mount and drill an extra hole for the rudder pushrod and actuator arm. Bend the aileron couplings from 1/32 wire, also the small linkage from the actuator to bellcrank. Hook everything together and check for freedom of movement.

The rudder pushrod is made up at this time, with a small clip on one end for the bellcrank. It is installed permanently in the fuselage and just clipped to the bellcrank each time the wing is attached for flying.

Remove the fuselage sides from building board, and epoxy the noseblock in place. Add all 1/8 square cross-braces and wing dowels. Now cover top and bottom with 1/16 quarter-grain balsa. This makes a very light strong body without the use of longerons. Sand lightly and cut hole for rudder pushrod.

Glue on the tailplane and fin, not forgetting the 1/8 fin braces. Sew the rudder to the fin with fine thread. Glue a small piece of 1/16 ply, cut as shown on plan, and glue to rudder. Clip rudder pushrod to bellcrank and fix wing to body, gently feeding the rudder pushrod through the body and out the rear.

Place everything in a neutral position (ailerons and rudder), and bend the pushrod down through the ply control horn. Fix a blob of solder on the end of the pushrod to hold it secure. Now remove the wing carefully, unclip the rudder pushrod from the bellcrank, and that's that! If you use 5-minute epoxy and Hot Stuff or Zap, the fuselage can be built in an hour or less. This is one of the easiest and quickest building airplanes I have ever put together.

FINISHING

The original model was left in a natural finish, with two coats of clear dope on the fuselage and a light sanding. The canopy was drawn on with a black felt marking pen. The wing was trimmed with tape and/or Monokote trim. Weight was a factor on the finish of my model, but if it is windy at your local hill, the model can be covered with Econokote, as this works well on foam with a low temperature iron setting.

FLYING

This is the part I dislike . . . well at least the first flight. It seems that whatever model I build, when it comes to that first flight, I always get a funny feeling, and with this airplane I really did not know what to expect. Let's see now, I said a few

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holes, making sure you will clear the axles and set-screws in the hub. I use M2.6 screws, so I drill the holes first with a No. 45 drill (tap-size) and can now use the plate as a drilling guide, after clamping it in place with machinist clamps. With the plate as a guide, drill the tap-size holes in the blade retainer seesaw. Remove the plate and tap the seesaw only for M2.6 screws . . . 4-40 may also be used, but select the appropriate tap drill sizes. The tap-size holes in the plate should now be redrilled for proper screw clearance . . . use a No. 39 drill for the M2.6 screws. The unit may now be reassembled for flight testing. During the drilling operation, use a new rubber damper or otherwise assure the hub is correctly centered in the seesaw so that subsequent blade tracking will be easy.

Coming up soon will be an article on a twin-tandem rotor R/C helicopter, designed and flown by Gilbert Laforest, of Montreal, Canada. Perhaps many of you had the opportunity of viewing this unusual machine on its first test flights at the August '77 Greenville Nationals. We're sure you'll be intrigued by the chopper and especially by the custom radio system designed to operate control functions you've probably never even thought of. 'Til next month then, BCNU. •

Merlin . . . . . *Continued from page 39*

wind prayers before I went to bed last night, and the C.G. is somewhere under the wing, so everything is set.

Off to the local hill. When we arrived, I took the model from the car, put everything together, and checked the radio (As usual, it worked perfectly).

I noticed by now we had drawn a crowd. Nobody was flying. The wind Gods had let me down. Just a gentle breeze . . . nothing would stay up. But I had my pride. When I switched the model on, everything was flapping away, and after a few snide remarks from the locals about thrashing itself to death, and that it would never fly, I asked my chief copilot and ego builder, Jack Headley, to take the model up the hill a little further and throw it off. He eagerly agreed, and dashed off up the hill. Switch on again, everything OK just like I had done it a hundred times before. Jack launched the model, and to my surprise, it went off perfectly. It actually flew with no adjustments necessary . . . nice tight turns, but maybe it could do with a bit less rudder, I thought.

Well, the first flight lasted about 5 minutes. Seemed like 5 hours to me. I made a 90 degree turn downwind to pick up a little speed, then 180 degrees toward me (The turns are almost vertical banks if enough control is used), and the airplane landed about 6 feet away. Not wanting to press my luck, we switched off, put the model into Jack's car, and drove off. I still don't think those guys at the hill believed what they saw that day. I remember their expressions as we left . . . complete disbelief in what they had seen. Little did they know I felt the same way!

Since that original flight, the only modification that has been made to the model, is the addition of strips of aluminum, cut from a coke can, and glued underneath the rear of the tail plane, to act as a type of elevator trim, which is very gently bent up or down depending on wind conditions. Apart from this, no adjustments have been necessary, and the model performs flawlessly.

If aerobatic gliders are your bag and you do not want to spend a fortune, MERLIN is for you. It will provide many hours of enjoyable flying. •

Plug Sparks . . *Continued from page 69*

and windiest! The columnist estimated 15 to 20 mph winds early in the morning, followed by increasing winds up to 30 mph-plus at 10:00. It was a day to try the hardiest of free flighters.

But, to their credit, the Australian O/T Buffs came to fly and fly they did! Some fellows, like Paul Brown with a Kielkraft Slicker, took one flight; watched it go the length of two fields in less than a minute and then strain itself through a grove of eucalyptus trees.

Howard Gostelow, the Free Flight Category Director (imagine the Event Director telling him where to get off), was smart enough to process two models, as his Comet Interceptor suffered the same fate as the Slicker, but did it up better by going through a five-strand barb wire fence. His rubber model (the backup) was good for one flight and then no wings!