AL WILLIAMS' FAMOUS . . .

GRUMMAN GULFHAWK

BY LOU PERRETTI

Scale R/C For .61's and Proportional

AL WILLIAMS' famous Gulfhawk, the Grumman G-22 has always been the apple of my eye. This chubby little re-orange bipe is a sight to behold in action. The lack of good dependable proportional equipment was the main reason I didn't venture into this project in years past – I'm not the type of guy that pays $500 or more only to watch a beautiful scale ship bite the dust! Then, a few months ago, I received my E. K. Logictrol 7 from Harvey Thomassian with the assurance that my rig was thoroughly flight tested, and that if I followed the charging instructions, no loss of signal or glitches would be experienced. Let me say here and now that I have never had a finer piece of equipment in my possession – I was off one and one-half turns on my receiver tuning slug and never lost signal for one moment! Need I say more? Here was the equipment for the Gulfhawk project!

After installing the new gear into the Grumman's fat belly, getting all linkages, incidences, and thrust settings properly established, I proceeded to paint and put the final trim lines on the little bipe. I was fortunate in having one of the RC'ers from the WRAMS who actually worked on the G-22 help with these details.

The day finally arrived for the Grumman's first flight. It was the first Sunday of October – a beautiful warm day with no wind to speak of, and a clear blue sky with just a few puffs of clouds here and there. I don't know how the word got around, but when I arrived at the field, there was a waiting crowd! If I didn't fly that day I think I would have been tarred and feathered!

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With no way out, I gassed old fat belly cup, checked my controls, and everything was "go." A flying buddy, Gene Hauer, had the battery leads on the Merco 61 before I even knew what happened. I primed the mill, flipped the prop, and the Merco coughed. I flipped the prop again and it caught and proceeded to rev up. I let the excess prime run out, the motor sounding husky in the radial cowling. Slowly I brought back the throttle until she was purring like a kitten. I nodded to Gene and he lifted the Grumman and set her lightly on the center of the strip.

All eyes were focused on the little fat bipe. Nobody cranked engines or checked out equipment. The WRAMS member who worked on the full-scale G-22 was so close that Gene had to move him out of the way. The moment of truth was at hand! I pushed the throttle all the way and the Merco sprang to life. The Grumman began to roll slowly, then faster and faster. I was watching constantly for any veering tendencies, having been told by a "professional" that bipes are no good as they always ground loop!

At about fifty feet down the runaway the Grumman's tail was high and she was moving straight as a dart. I eased back ever so slowly on the stick and she broke ground, climbing out nice, straight, and steady. No one can properly voice the beauty one beholds watching this scale creation performing like its scale counterpart, the afternoon sun was reflecting off this bright red-orange ship with its blue-white sunbursted wing and tail in a manner that would be impossible to describe. It was literally breath-taking!

The Grumman Gulfhawk handled beautifully. Up she went to about 800 feet – rolls, loops, inverted flight . . . beautiful! Enough for the first flight. I throttled back to one-quarter throttle, and went into my landing pattern approach to the left on the final leg. I was still too high, so we went around again, this time at full retarded throttle and a little down trim. This baby doesn't want to come down! Now she's starting to settle nicely. I lined her up on the runway about one-quarter mile out at about 150 feet altitude, and she's settling like a real lady. Her main gear touched down about fifty feet in front of me, the tail wheel still high. I eased back on the stick and the tail wheel touched and settled as she rolls by. The spectator applause was tremendous!

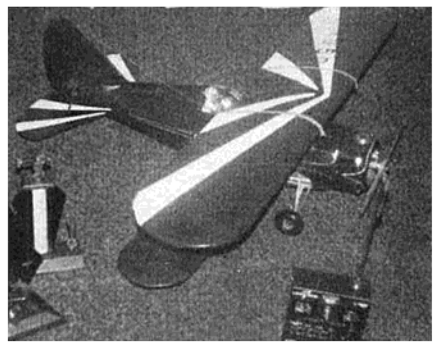
The RC'er that worked on the full-scale G-22 was pumping my arm and slapping me on the back so hard that I almost dropped my Logictrol transmitter! What a feeling of accomplishment!

To date, I have many flights on the Grumman, each better than the preceding one. I hope that many of you will build this scale bipe and enjoy the feeling of pride and accomplishment the building and flying of this ship will bring you.

Construction

The construction of the G-22 looks much more complicated than it really is. If you follow the construction steps, as listed here, the ship should go together quite easily. The method of construction is easy, yet strong and non-time consuming. The first step is to cut out all of the body formers from the specified materials. I used Sig R/C grade balsa and found this to do the job nicely.

The next step is to drill and cut out all the holes marked – tank and cabane mounts, landing gear, plus motor mounting and throttle linkage holes, cowl mount block and lead balancing holes. Next, cut the two crutch beams, tapering and marking each position on the crutches for former location. Wet the crutches thoroughly and pre-bend each one slightly, being careful not to



crack them by too much pressure.

Double glue firewall A to the crutches, then the tail former and tail block using wood clamps or rubber bands to hold the crutches on the formers. Now put formers B, C, D, and all others in place while the crutches are still damp. You should glue a temporary scrap crutch crossbar, made from 3/16" balsa, first at formers C, D, E, and F, so that the crutch piece will not force these formers, splitting them as they dry.

Once all the formers are glued in place and thoroughly dry, glue the lower wing well crutches in position. Cement the hatch cover base in place and glue in the aft fuselage stringers. The next step is to mount the landing gear, cabane spring wire struts, and tail wheel gear.

By this time your hatch base should be dry. Take a piece of wax paper and lay this across the hatch cover opening, then proceed to build the hatch right on the fuselage so that proper alignment is insured.

Now cut the battery holder block and then insert the throttle push rod and motor mount (either Tatone radial or built-up) plus the tank with feed-through tubing. When this operation is completed, sand the entire structure so that the planking will be smooth and not lumped in various spots. Before planking, dope all formers and the crutch members back to Former C, inside and out, so that any fuel leakage will not deteriorate the structure from the inside. Use the butyrate dope full strength.

Now we are ready for the planking operation. 1/16" balsa sheet is used. First, remove the hatch frame, then plank the fuselage and hatch cover. When completed, sand the entire fuselage, being careful not to sand too deep as we are only using 1/16" material.

After this, insert the forward hatch hold-down dowel and all other wire hold downs. Glue in place. The next step is to complete the cabane structure, binding the wire with copper wire wrappings. Check alignment and incidence angles carefully, then solder all joints. Build up the fairings for the cabane struts. Complete the scale gear with built-up balsa and wire shock assembly.

Next, cut out notches for the elevator and control rod slots. Take a straight piece of 3/16" stock balsa, or a three foot ruler, and rubber band on to the cabane structure as if it were a wing. Now glue in the stab, lining it up horizontally with the simulated top wing. Next, use some balsa filler to cover all marks and bruises, then sand smooth.

I used four coats of AeroGloss wood sealer on the fuselage. If the cowl is built-up, use filler coat inside and out. The cowl itself is so spacious that I found that I didn't need an exhaust extension as there is plenty of distance between the engine and cowl. But remember that fuel will eat up raw wood, so seal it well! Drain holes should be drilled in the bottom of the cowl. The cowl should be mounted so that there is at least 1/8" space between the cowl and firewall for adequate engine cooling. Be sure to mount the elevator and rudder before using the sanding sealer.

Important: The elevator throw should be limited to 1/4" up or down, for a total of 1/2" thrown. The rudder should be the maximum you can swing. Bipes need a lot of right and left and little up and down.

The wings are straightforward. The top wing has no dihedral, and is set at zero degree incidence. Bottom wing does have dihedral and 1 degree positive incidence. After this, put in the cockpit detail with scale pilot (Williams Bros. Standard 2"). Servo mounting is by way of a built-up platform. This is not illustrated since there are so many different types of radio installation, and each RC'er is familiar with his own equipment and methods for installing same. My EK servos were mounted

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three side by side and one in the top wing. Balance point is 50% of the top wing chord.

Painting and Covering

I used red Silron (Royal Products) on the wings, applying three coats of AeroGloss clear, soft sanding after each. The body is painted directly over the wood without any additional covering material. The paint used was a quart of AeroGloss Cub Orange, mixing Insignia Red to a point where the paint becomes an orange with a very mild leaning toward the red side. **Mix all paint at once!** Thin slightly so that the paint flows easily. Five coats of color were used, sanding after the first three coats and working control surfaces free after each coat had dried. The final two coats were thinned out and no sanding was employed.

You are now ready for painting the trim. Mask very carefully, for you are working with three different colors — red-orange, dark blue, and white. After this is completed, give the entire ship a coat of clear dope. The latter adds lustre as well as preserving the color from hot fuels.

Paint the cabane outer wing struts with Silvair Aluminum. Main gear wheel wells and shocks are also painted with this color. You are now ready to mount the engine, radio gear, and servos. Add the auto body repair lead weight until the ship balances about 1 degree nose heavy with the balance point at 50% of the chord of the top wing. Six degrees of down thrust and three degrees of right thrust were used on the motor. I swing a 12/5 Top Flite prop on the Merco 61 for pulling power as well as realistic flight.

Flying

Trim the tail wheel slightly left with the rudder neutral so that it will compensate for the slight pull to the right developed by engine torque. Don't be afraid of power on the takeoff — the Grumman needs a 59 or 61 to take off in 50 feet. Once the ship is airborne and at a safe altitude, you will back off to about half throttle to cruise, and three quarters throttle and up for aerobatics. Inverted flight is a dream because the engine down thrust tends to keep the nose from dropping while in the inverted flight position.

Landing should be with a little down trim. It's hard to stall out this plane and the descent is like the elevator when dead stick if too much up-trim is used. I tried this up trim procedure on a few landings to find out how little space I could use up on landing. If you try it, the Grumman will amaze you, for she's actually stalled out without being in a nose-high attitude, but she will not flare out with this trim setting. The elevator can be in the full-up position but no flare — it will just come down in that up-trim position. Horizontal control will always be with you. I haven't tried it yet, but I'll bet that if someone was holding the tail and the engine was wide open with right aileron applied, this baby would give you a right roll right on the ground!

Enough said. If you want a real sweetheart, here she is. Enjoy it like I am doing, and at the same time, have an R/C ship that has no peer.