



"Most Beautiful" Biplane Returns as

■ **FLEET!**—What a magic reaction this one word evokes when mentioned in the vicinity of almost anyone who flew in the 30's. Eyes grow reflective, smiles begin to curve and you can sit back and relax to several hours of reverent remembrance. Oh well!—suffice to say, the Fleet was, and still is, a perfect example of the old-time biplane loved by so many. She was both maneuverable and stable; not too small, not too big and with all her curves in just the right places. In short, an ideal modeling project.

There were several different Fleet designs incorporating different makes and styles of engines, both in-line and radial. The in-line F-10-G Fleet, requiring no dummy engine to reproduce, was my first choice and was designed, built and flown several years ago. Since then, desiring the beauty found only in the radial engined F-6 Fleet, I have designed and built two more models the last of which is presented here. This third version is my latest attempt to combine the good features of the first two with the accepted best construction features of today's championship models. A little scrutiny will show features developed and perfected in the "Hog" series that would be hard for anyone to improve on, particularly me.

The primary purpose of this project was to produce a model that looked like the real thing *in the air* without sacrificing flight ability or everyday ruggedness. I wanted a scale model capable of sport and championship flying throughout the flying season . . . one that would

show itself on the flying field, not on the piano at home. I have therefore departed from scale only where scale design interfered with these characteristics and the final result is a model to satisfy the flyer's demands and still look like the real thing in the air.

Departures from scale include top wing dihedral, enlarged stabilizer, symmetrical airfoil and wing incidence angles. The real Fleet had no top wing dihedral and flying surfaces were all at zero angle of incidence.

Construction Notes—Cap strips are omitted from top of wing ribs to give a more scale-like wing; the cap strips on bottom of ribs providing ample strength where it won't show. This also applies to the stabilizer construction in that the anti-warp diagonals are $\frac{1}{8}$ inch below the rib top surface and thus provide their reinforcement without showing on the top covering.

The wing spar construction is a copy of the most popular type in use today with a new twist which was suggested by Guy Oliver of San Antonio and which I like very much. Instead of adding the webbing between the spars and each rib after wing is assembled, the $\frac{3}{32}$ by $\frac{3}{4}$ webbing strip is marked and slotted half way through for each rib and is then glued to the bottom $\frac{1}{4}$ sq. cap. The ribs

are shown with their webbing slot. Simply pin the spar over the plan, slip the ribs into their slots and glue the top $\frac{1}{4}$ sq. cap strip to the ribs and webbing. Makes for accurate wing alignment and speedy, strong assembly.

Elmers white glue was found very satisfactory in attaching all fuselage blocks and doublers, contact cement for attaching wood strips to wire landing gear and cabane struts and Duco household cement for windshield assembly. $\frac{1}{4}$ inch black spaghetti split down the middle is sewn to the cockpit outlines with an in-and-out stitch. I could find no glue that would hold this material as satisfactorily and the sewing adds another touch of realism.

Although not shown on the plans I found it possible to cut a number of lightening holes in the plywood fuselage sides without substantially decreasing the strength of these members. Just be sure to have plenty of wood connecting the main fuselage stress points at landing gear, wing struts and motor mount. I also found it necessary to add a $\frac{3}{16}$ sq. top longeron to each side from the rear cockpit to leading edge of stabilizer. Access to the receiver and servos is through the bottom wing opening and batteries are installed and replaced by removing the top cowl block and gas

Designed and flown by William M. Neukom
Photographs by Robert H. Haack

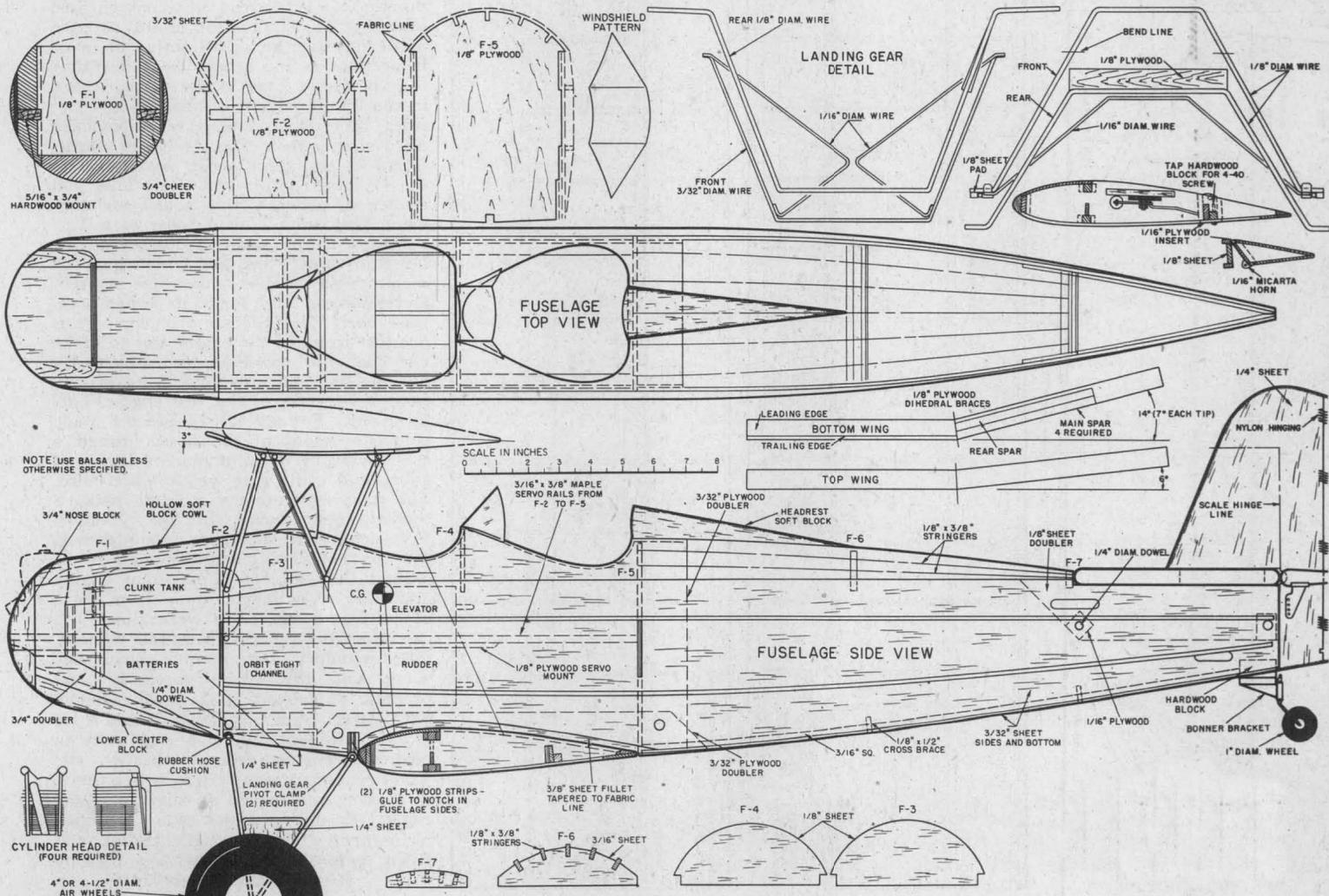
tank. The servos are mounted to their ply base and, by installing this assembly last, it can be slid fore and aft on the hardwood rails to locate your model's C.G. on the point shown on the plans. It can then be attached permanently with blind nuts and screws or wood screws and the elevator, rudder and throttle control rods can then be made to the correct length.

The 1/8 wire cabane struts should be very carefully bent and attached to F2 and the 1/8 ply bar behind F3 before installing them in the fuselage. A little care here will save a lot of fuming and sweating later on when final top wing alignment is checked and adjusted. These struts hold the wing in proper alignment horizontally and also must produce a wing mount with the proper wing angle of incidence. After the fuselage top cowl is planked these struts can be brought to scale size by gluing 1/8 sq. balsa strips to the back of each and wrapping with nylon or fibreglass. Cut a V-groove down the front side of the strip where it glues to the wire and sand off the back corners. The landing gear struts are treated in the same way, the 1/8 sq. strips being glued and wrapped to the front and back of each wire and 1/8 sheet added



Author Bill Neukom with latest of three Fleets. Power is K&B 45 mounted for zero downthrust, 2 degrees right thrust . . . which will vary from model to model.

Radio Model



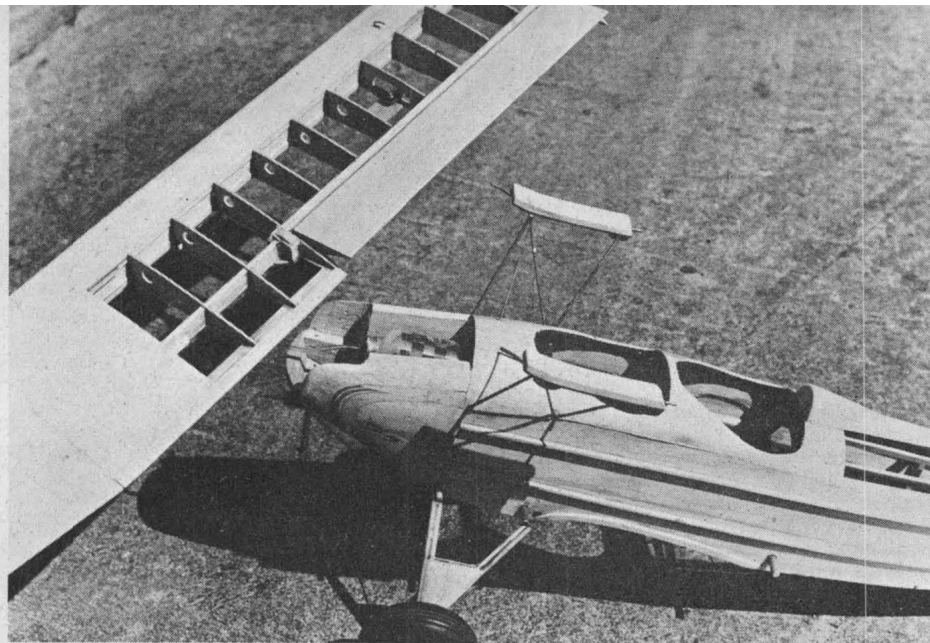
Beautiful R/C Fleet ...

as shown to each side of the V to simulate the shock absorber covers.

The wing mount pad is made by soaking strips of 1/16 ply in hot water, clamping to a wood block shaped to the curve of the under side of the wing and dried in the oven. These are fastened to the wire cage with 1/16 ply blocks glued around the wire strut extensions to the curved ply strips with soft balsa padding, cut to the same curve, glued across the wire to both ply strips.

A short note on wing alignment can be added here before installing the mounting pads just described. Mount both wings and stabilizer to fuselage, block up wheels and tail until the stabilizer is perfectly level. Wings should then check at plus 3° incidence for the top wing and 0° for the bottom with equal amount of dihedral on each side. A jig can be made from the plans, 1/8 sheet, to fit the top wing rib curve so that a bubble level when placed on the wing will show level when wing is at the proper angle. Or, rig up a protractor such as described by Chuck Hollinger in the *Air Trails Model Annual* for 1956. I strongly advise the latter as the protractor is a handy tool that can be used for years and will measure all angles on your models from wing incidence to thrust and dihedral.

If any wing misalignment is found in the wire mount, one handy way to re-

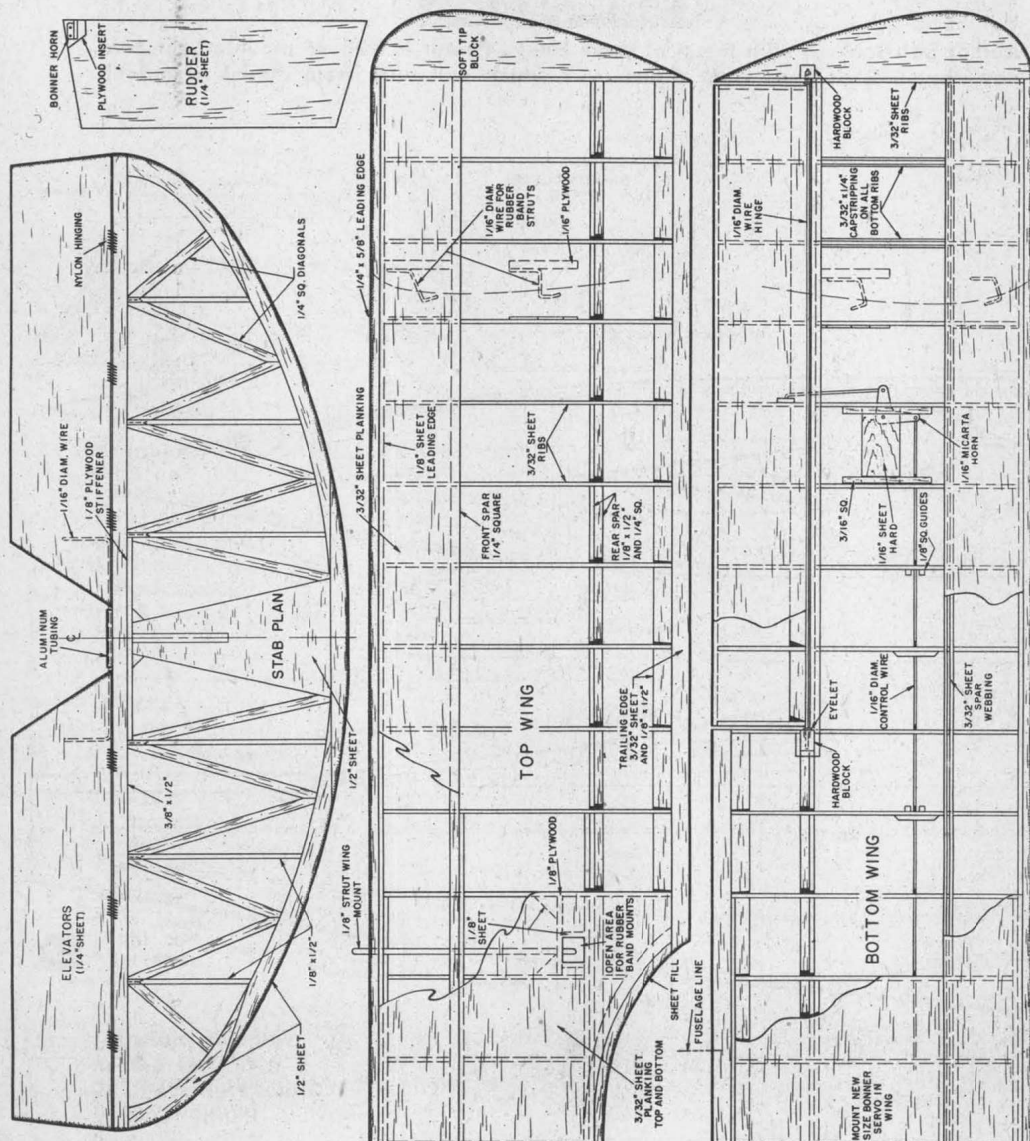


align it is to pull the wire cage toward the correcting position by stretching rubber bands from it to the wing or landing gear dowels, tail or nose and then heating the joints with your iron. This, of course, is assuming your joints have already been wrapped and soldered. The bands will help pull the heated joints into correct alignment and hold them

there till cool. A little patience here will be amply rewarded later on the flying field.

The outer wing N struts are not structurally required on this model but they do add the final touch of realism and, as such, are desirable. My first two Fleets had wire struts that plugged into 1/2 A fuel line sockets in the wings. They were very realistic and I was very happy with them until I saw what they did to my hand-rubbed finish each time a wing was pushed out of position on a bad landing or crash—so many holes and patches that before long the wings looked like Richthofen had used them for target practice. (I fly from a small, rough field y'know). My final strut effort, as used here, may not be as attractive on close inspection as the others were but they look perfectly good in the air and that, in the final analysis, is what counts. Besides, they do no damage when knocked off. I simply took some 3/8 Nylon elastic, found in any dime store, sewed it into six 4" loops and, when dyed blue and stretched between the hooks on each wing, they suited my purpose to a T.

I have not yet made a dummy engine for this third Fleet and may never do so although the one I made for my second model added a lot to its appearance. (See box.) The difficult problem here is not just to make the engine but to make one that will stand up under everyday use and be readily removable for inspection and service of the real engine, batteries, etc. For my second Fleet I made a plaster mold of the nose, formed a shell over this from numerous layers of gauze and white glue which, when hard, was removed from the mold to make a realistic nose mount for the cylinders. Five holes were cut in its circumference, the top hole being large enough to fit around the cylinder of the real engine and dummy cylinders made from discs of cardboard and balsa were glued into the other four holes with contact cement. The cylinders were painted black and silver and the entire assembly fuel proofed. It looked good on the model but was far from being rugged and a lot of the nose cone had to be cut away to clear the engine, exhaust, throttle, etc. The new epoxy resins might prove useful in making a mock-up of this type more rugged so do what you will. I merely recommend thorough flight testing and flying before bothering with a dummy



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Fleet

engine, then some cold rainy day when the birds are all grounded you can sit down at your bench and work on the problem in peace. Good luck—I hope you enjoy your Fleet as much as I have mine!

I would like to thank both Chuck Hollinger and Guy Oliver whose great help made this model possible.

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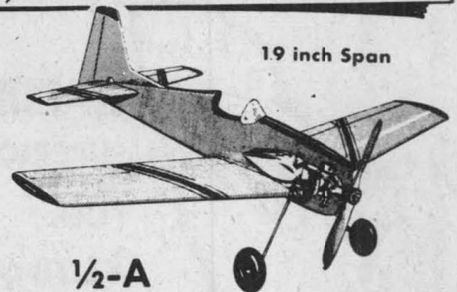
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