

D.H. GYPSY MOTH
Designed By: Gordon E. Whitehead

TYPE AIRCRAFT

Stand-Off Scale

WINGSPAN

45 Inches

WING CHORD

6 1/2 Inches

TOTAL WING AREA

540 Square Inches

WING LOCATION

Biplane

AIRFOIL

Flat Bottom

WING PLANFORM

Constant Chord

DIHEDRAL, EACH TIP

1 Inch

OVERALL FUSELAGE LENGTH

36 Inches

RADIO COMPARTMENT AREA

(L) 5 3/4" x (W) 2 3/8" x (H) 2 1/4"

STABILIZER SPAN

14 1/2 Inches

STABILIZER CHORD (incl. elev.)

4 1/2 Inches (Avg.)

STABILIZER AREA

55 Sq. In.

STAB AIRFOIL SECTION

Flat

STABILIZER LOCATION

Top of Fuselage

VERTICAL FIN HEIGHT

5 Inches

VERTICAL FIN WIDTH (incl. rudder)

6 Inches

REC. ENGINE SIZE

.15 — .20 Cu. In.

FUEL TANK SIZE

2 Ounce

LANDING GEAR

Conventional

REC. NO. OF CHANNELS

4

CONTROL FUNCTIONS

Rud., Elev., Ail., Throt.

BASIC MATERIALS USED IN CONSTRUCTION

Fuselage	Balsa & Ply
Wing	Balsa, Ply & Spruce
Empennage	Balsa
Wt. Ready-To-Fly	55 Oz.
Wing Loading	14.5 Oz/Sq. Ft.

D.H. GYPSY MOTH

By Gordon E. Whitehead

Gordon Whitehead, well-known for his Scale designs, comes up with one more of his winning .15 to .20 powered Stand-Off Scale ships which we are proud to present to our readers.

instead of 6% RAF 15; and the wings are banded on. All this emphasizes that the ship is a sport model. A glance at the plans will show that she is quite lightly built. So if you're a lousy flier, get in some practice, and if you're between average and ace, please don't add excess weight by beefing her up, as you'll ruin the performance. She's strong enough to stand up to anything in the air, and flexible enough to survive many a rough landing. Mine has had hundreds of flights, and even more landings as I like doing 'touch and go's', but I'll say a word or two about flying technique later.

My Gypsy's color scheme is that of Amy Johnson, and you shouldn't have too much difficulty finding an attractive scheme. In fact, I never let the absence of a good scheme prejudice my choice of subject. If diligent research is fruitless, then I merely paint the ship the scheme I'd have put on the real one!

CONSTRUCTION NOTES

The fuselage is a simple box structure, with all sheet sides just like the full size ship, and the only complicated part is the engine cowl. The empennage employs an interesting structure, which is light and strong. The wings are cantilevers, but the interplane struts usefully share out lifting loads, even though the elastic wing bracing is only decorative.

Fuselage: Choose light balsa, but not brittle stock. The diagonal joint between the cowl sides and fuselage, and the

narrowing of the cowl towards the nose, mean that the ply cowl sides need to be pre-twisted as shown on the plan — a simple task, but best done first so that the jugged sides can be drying out while you do something else. Contact glue F1A to F1, and doublers D1, and D2 to the fuselage sides. Cement 1/8" square and 1/8" x 3/16" balsa longerons and uprights to the sides. Glue P1 in place. Join the fuselage sides with F1/1A and F2A, ensuring squareness, also gluing in place the cabane supports S1, and the 1/2" x 1/8" balsa cross braces at front and rear of lower wing seat. When set, join the tail end with the 1/4" square tail post, epoxying the tail skid in place. Fit all formers and 1/8" square bottom cross braces. Bind the cabane struts in place, carefully incorporating the slight forward slope of the main 'verticals' then solder the top joints, epoxy the binding and, finally, add the top decking. Glue the ply cowl sides, M1 and C3 together, butt-joining the lot in place on F1. First check the twist in the cowl sides by dry pre-assembly. If wrong, re-soak with more or less twist as needed. Make the top cowlings referring to the photos (but not to the paint finish!). Fit the ply bottom piece, bottom 1/16" sheet and check the tank fitting. Add the 1/2" sheet stab seat.

Empennage: The sandwich method used is really strong, but my model needed 1 ounce of tail weight to optimize the C.G. position. Therefore, very light 1/4" sheet may be in order, provided you don't nylon cover or tar it. Remember the tail moment is long — however, I like built-up tailplanes, so have no difficulty in selecting my method! Butt-join 1/32" sheet to the full width of the stab or fin/rudder and cut out the complete outline in one piece. Build the outline, spars, and 'ribs' on one side, pinning down flat until dry, then turn the job over



Of the many thousands of D.H. 60 Gypsy Moths which were made between 1925 and the mid-1930's, only about 36 examples remain, 7 of which are in the U.S.A. So if you want a Gypsy, you'll either have a long wait, or will have to make do with a model! The first scale model I ever saw performing was a big, light 5' span, single channel Gypsy Moth back in 1958, and I've had a soft spot for the ship ever since. One day, the urge became unbearable, the drawing paper came out . . . and there she was!

The model is not far from scale. The engine compartment is slightly wider than scale in order to accommodate the HB .20; the wing section is 12% Clark Y



and repeat the process. Sand to section, then marvel at how light, yet stiff, the surfaces are. Separate the moving surfaces.

Wings: I once read that wood is a poor building material when used in compression, but good in tension. Shortly afterwards, I had 3 out of 4 top spars on one side of a small biplane collapse in compression after a particularly hairy snap maneuver. Luckily, the bottom spars didn't collapse, so I was able to have another 3 flights before going home! However, I now make the top spars of my biplanes of spruce, instead of balsa, and of bigger section than the bottom spars. Other people solve the strength problem by using I-beams, D-boxes, or veneered foam! Sand smooth the exposed face of each spar. Then lay down the bottom spars, and trailing edge for each wing panel, add all ribs, followed by top spars, leading edge and tips. I built the bottom wing as per top wing, and ran each panel through the Dremel with the table tilted to cut off the ailerons. Join the bottom wing panels with the center section, not forgetting the 1/8" ply doubler to support the landing gear. Fit the servo and links. The top center section tank parts are fitted after joining the top wing panels. The secret of building a light, strong, yet warp-free, wing is to leave the wing pinned down as long as possible — easy when the plan shows all 4 panels! Don't forget the riblets. The method shown

isn't as tedious as you would think, and the final effect is most rewarding.

Finishing: My model's fuselage was tissueed, and had 3 coats of sanding sealer well rubbed down under 2 sprayed coats of colored butyrate dope. I sprayed the sides silver in the region of the registration letters, masked off the letters and sprayed the green top coat. I hand painted the cowling lettering.

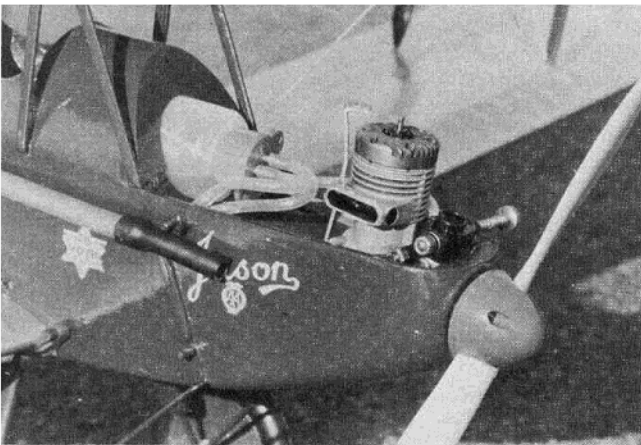
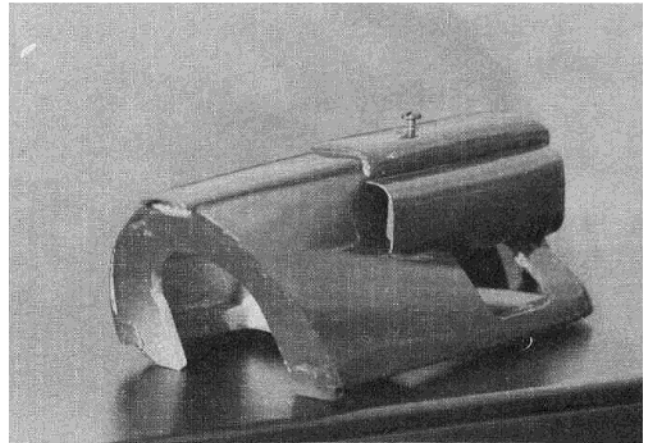
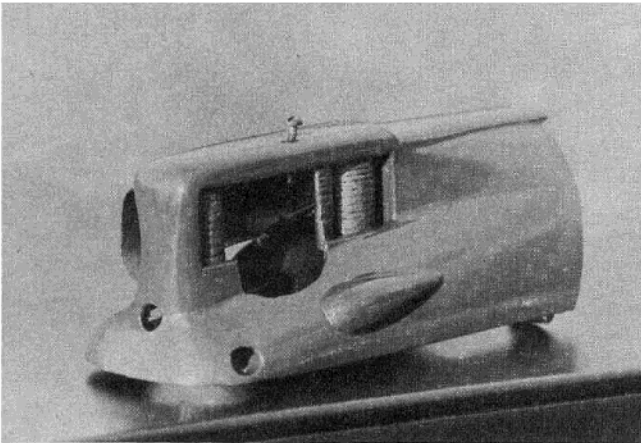
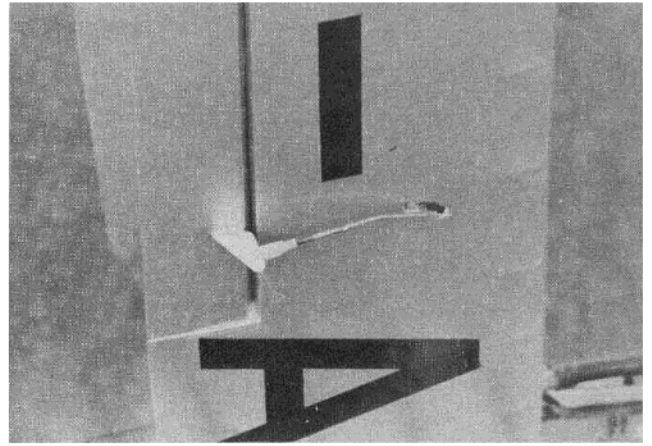
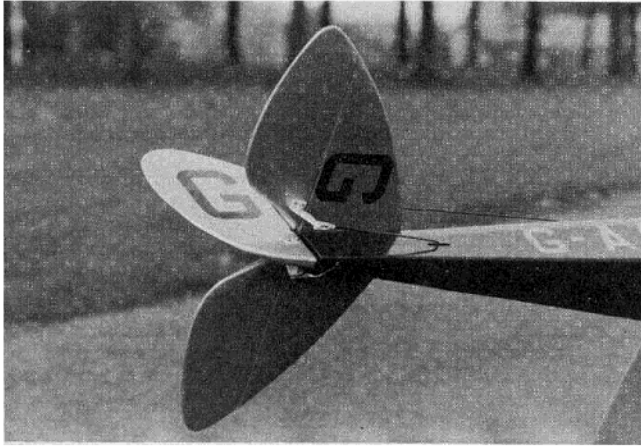
I Solarfilm'd the flying surfaces. The edges are rather narrow, so one has to be careful with the heat gun, otherwise the adhesive will soften, and the material will shrink away from the leading edge, etc. Wing letters were knife cut from black film and ironed on at low temperature.

Radio Installation: My old mini Futaba gear went in with 3 linear servos abreast. The flat pack nicad went under the receiver, after a bit of gouge work on F1A. The switch and charging socket are in the pilot's cockpit. Control throws are on the plan.

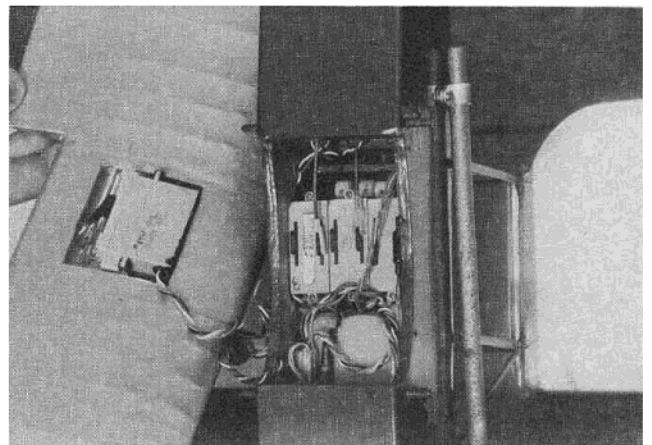
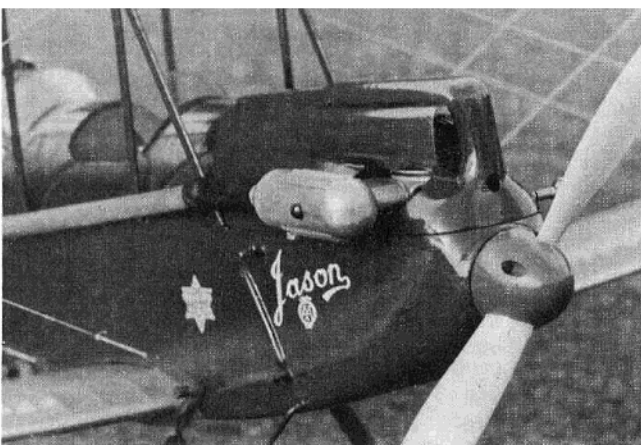
Flying: Don't go to the flying field until you have the engine really behaving. Flying pleasure is immeasurably enhanced by a good throttling engine, and you won't want to merely fly this ship about the sky on one throttle setting. My first flight with this model was made in a 15 kt wind on, believe it or not, a slope soaring ridge! Naturally I didn't learn an awful lot about her behavior, except that she is easy to land. However, I've designed, built, and flown about 35

successful RC models to date (plus some failures), so I have more than average confidence. A few days later in a more appropriate location, I was able to verify her viceless nature, but the 10" long 1/4" I.D. exhaust pipe seen in the photos was appreciably lowering the power. I installed a 5" long 3/8" I.D. copper tube bent to direct exhaust poop down below the cockpits, and power was regained. When taxiing on grass, you'll have to 'tip' the motor to raise the tail for steering. A steerable tail skid fixed to the rudder would be a boon. For take-offs, use full power — she'll float into the air as gracefully as the full size. I needed about 1/8" down at the elevator trailing edge for normal cruise trim, but no rudder or aileron offset.

The Gypsy will climb quite steeply and quickly, and rolls quite quickly too. She loops very gracefully, and if you throttle back the engine when she reaches about 10 o'clock, she'll slow down and coast over the top at an acceptably slow speed. Don't gun the engine until she's level, or you'll spoil the illusion. She cruises very prettily and with a nice 'ail' at between 1/4 and 1/2 throttle (9/4 Tornado, 5% nitro). A good .15 should provide enough urge, but a .20 is ideal. You, and any onlookers, will really enjoy watching her chug around at just above head height. Once you've trimmed her to fly hands off, a touch of aileron, 'on-off', is all that is needed to guide her one way



TOP ROW, LEFT: Bottom view of tail showing control linkage hook-up to rudder and elevator. **TOP ROW, RIGHT:** Aileron horn and rod on bottom of lower wing. **ABOVE RIGHT:** Left side view of top engine cowl. **ABOVE LEFT:** Right rear view of cowl. Made from balsa and aluminum sheet. **LEFT:** Cowl removed. Note bracket for hold-down screw also tank filler and vent lines routed out side of fuselage for easy access. **BELOW LEFT:** K & B .19 is well hidden but with good ventilation. Note muffer extension to keep oil residue away from lower wing and fuselage. **BELOW RIGHT:** Lower wing removed showing 4 servos installed. Again note muffer extension.



or the other. To perform loops, stall turns, and Split S's, you'll need full throttle on entry, but closed throttle from half way. Rolls, and flick rolls need full power all the way. In a spin, she rotates quickly, but descends slowly and exits quickly on neutralizing the controls. She needs full up, full rudder/aileron, and only enters a true spin about 1 in every 4 attempts.

Stalls are fairly abrupt, with no wing drop. However, because of the abrupt stall, 3-pointers are not possible. I've found that compared with monoplanes, small bipes like this suffer from a larger drag rise at high angles of attack. A tail low wheeler is the best landing tactic, to keep above stalling speed. A double area tail might remove this characteristic, but I'm not worried by it.

Well, I've enthused about her for long enough. She's a picture in the air, whether doing aerobatics or just chugging. I think you would enjoy owning a Gypsy Moth. □

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