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DE HAVILLAND DH-2

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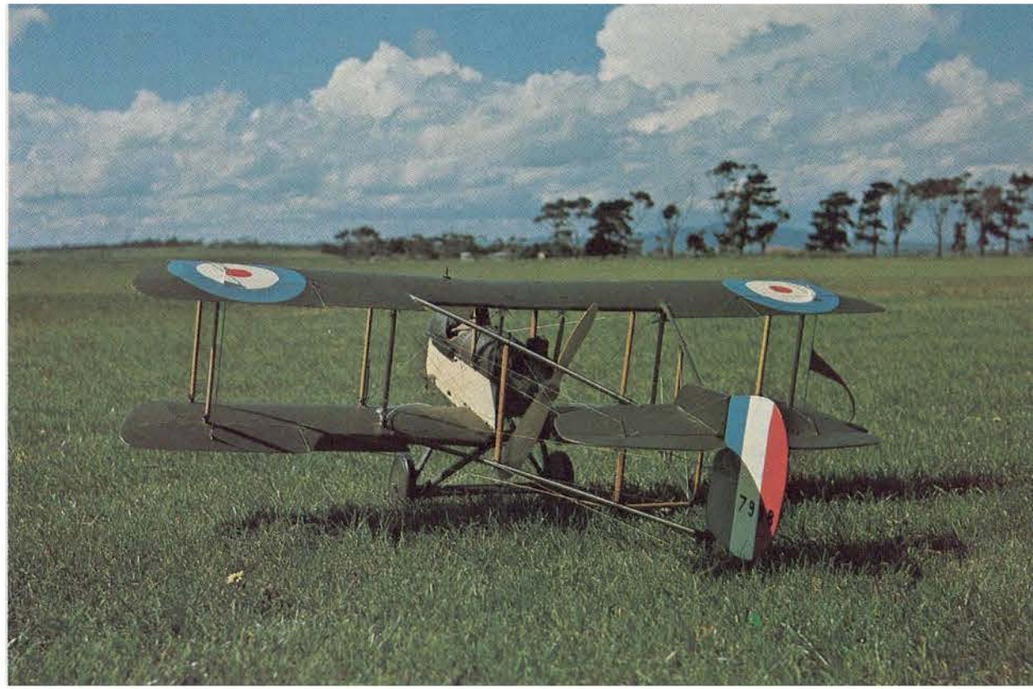
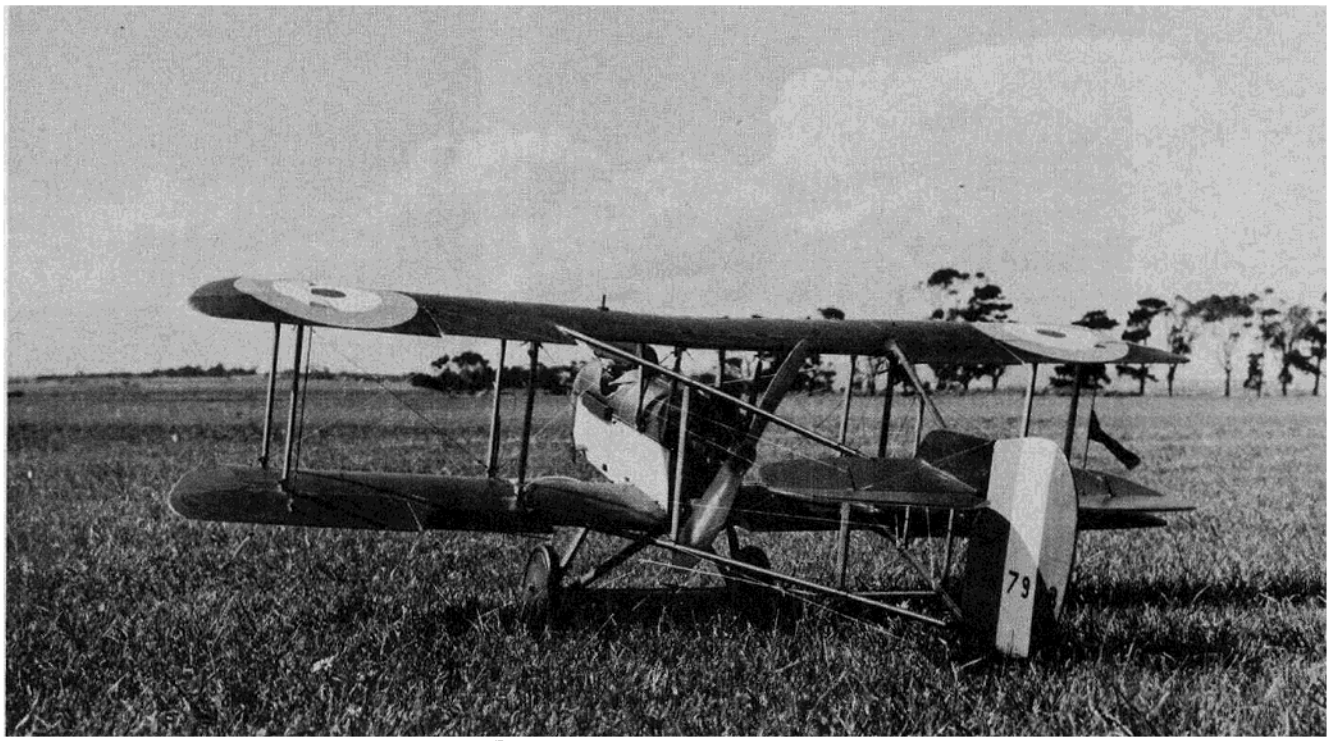
BY A.W. MEEK



PHOTOGRAPHS BY PETER DALTON



GENERAL:

● If ever there was a plane that truly deserved the title of "Wood, Wire and Fabric," it is the De Havilland DH-2.

The first prototype DH-2 was completed in 1915, and its first engagement and victory over the enemy came in March 1916, while attached to No. 24 Squadron. The DH-2's proved themselves to be superior to the Fokker monoplanes but, with the appearance of the fast and well-armed Albatros in the autumn of 1916, they became outclassed and in June 1917 were detached from operational service. The last recorded flight was in March 1918. No. 24 Squadron was originally formed by Captain L.G. Hawker, however, towards the decline of the DH-2's, Hawker was killed in combat by the now famous Manfred Von Richthofen in one of the longest individual air combats of the war.

The DH-2 was generally considered to be a most effective fighter, but suffered from the susceptibility of tail booms to breakage when hit by any detached part of the rotary engine, the early engines being subject to losing cylinders.

However, overlooking the defects, I believe even Snoopy would be quite willing to trade in his kennel for a DH-2 - - - what better mount for a World War I pilot?

The initial model prototype was completed in May 1971 and, up until to date, has been undergoing many design improvements. The model, unfortunately, wasn't one that flew straight off the drawing board but, in fact, staggered off and fell over the edge! The .35 cubic inch Enya was soon replaced by an OS H60F. However, after much repairing, design improvements and determination, the model is a joy to fly and can now be handled by an intermediate type RC pilot.

The model is easily started by hand flicking with a chicken stick or, better still, an electric starter. I use a permanent extension to the glow plug, and use a long tube to adjust the needle valve. Thus, no chewed-up fingers.

The model will taxi on the ground except in strong winds. To take off, you just point her upwind, apply throttle, the tail lifts off the ground and, before you know it, you're airborne. It has no tendency to ground loop. Flying speed is very realistic, and it performs maneuvers like the full size conterpart. Due to the high drag of all the wires, landings are best performed with about quarter throttle. Bring her in with power and cut back on touchdown. She will soon drop her tail and roll to a stop. (Even if you do bungle it and she tips onto her nose, the motor will not stop and there are no broken blades.) You can now taxi her back to the pits to the applause of the crowd. What satisfaction, what a show-off you're becoming! Oh well, you will have to fly it somewhere, and why keep it hidden.

The model is as true to scale as my information would allow, with a few modifications for longer life and ease of construction. Reference was made to *Profile Publications Volume No. 91; August 1966 Aero Modeller, Aircraft Described No. 153, and Aircraft Illustrated Extra No. 7.* There is, therefore, some room for further improvements depending on how scale you wish to go. If you do wish to go super scale, it is advisable for you to obtain a decent size 3-view and then check your blueprints to them, as blueprints are not the most accurate on reproduction.

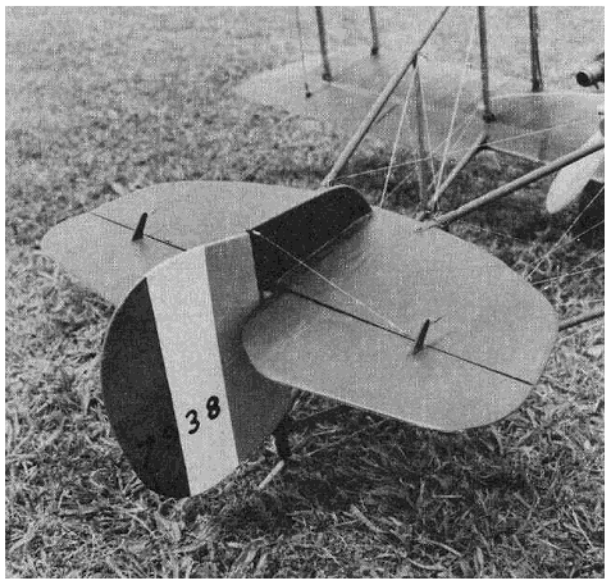
The plans were redrawn and rechecked from my original outlines, and have taken three months to do. I even found errors in my original layouts. The plans should supply all the necessary information for building, but I will supplement them with some detail notes for those who have the patience to read the instructions before building.

FUSELAGE:

Cut out the fuselage from 1mm ply using the pattern shown. Only half the pattern is drawn, but you should be able to duplicate the other half about the centerline shown. Epoxy on the doublers and drill all holes. Cut out the formers and, without losing your temper, epoxy the formers to the fuselage. You may find it easier to first mark the centerlines and positions of the formers on the inside of the fuselage and moisten the outside of the ply to aid in bending. Now clamp the whole mess together, ensuring everything is aligned, and allow to cure overnight.

WINGS

The wings can now be commenced and are quite straightforward. The inter-strut connectors (Detail D) are then epoxied to the 1mm ply ribs. Don't forget the 1/4" ply block and 1/8" screw for the aileron bellcranks underneath the two bottom wings. The wings should now be covered and painted to save messing about between struts etc., later. I still cover my models with tissue as it is cheap and looks realistic on vintage models. The model was painted for realism with colored dope, obtained by mixing Humbrol paint with clear dope, any thinners lying on top of the paint being removed before mixing. The wings, as is the whole model, are then painted with Estapol Scandinavian Matt Varnish for a dull weathered appearance. When dry, warp the wings into alignment, using a heater and then cold air. If your wife doesn't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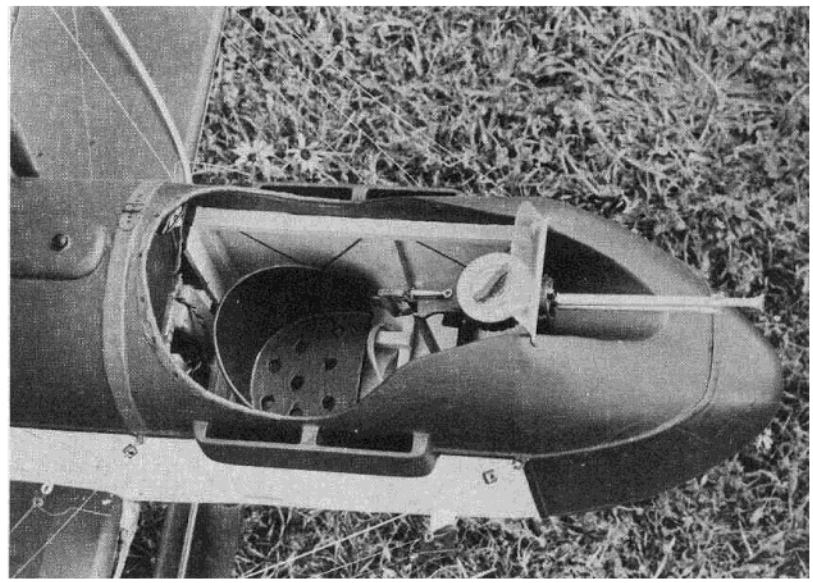

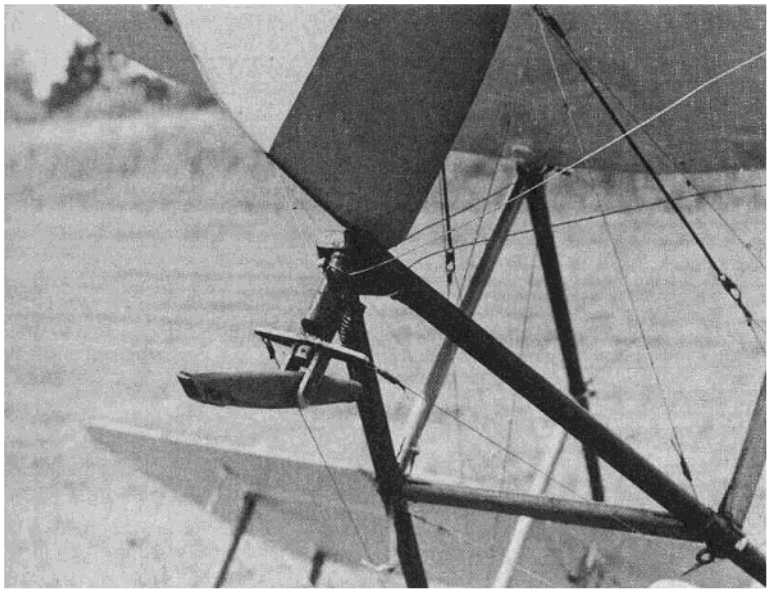

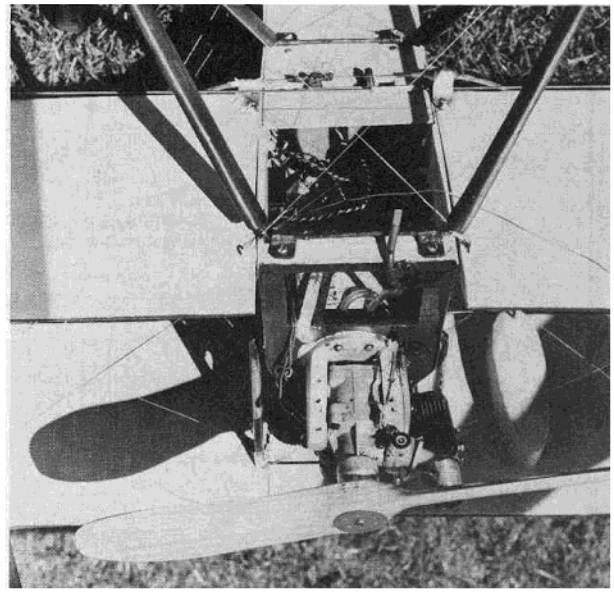

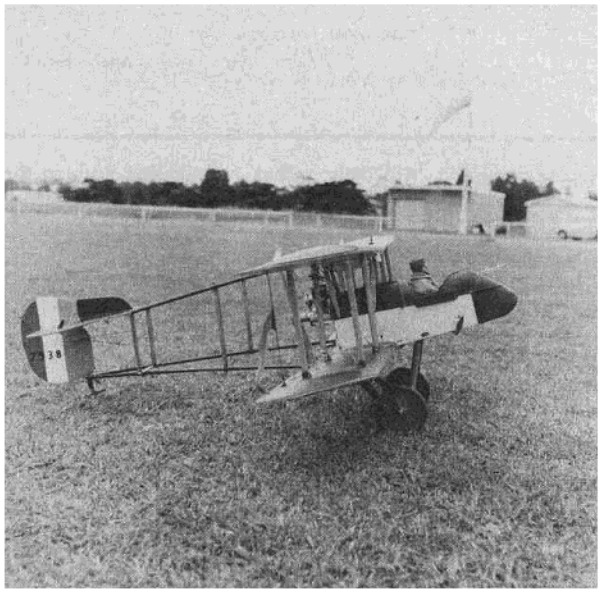

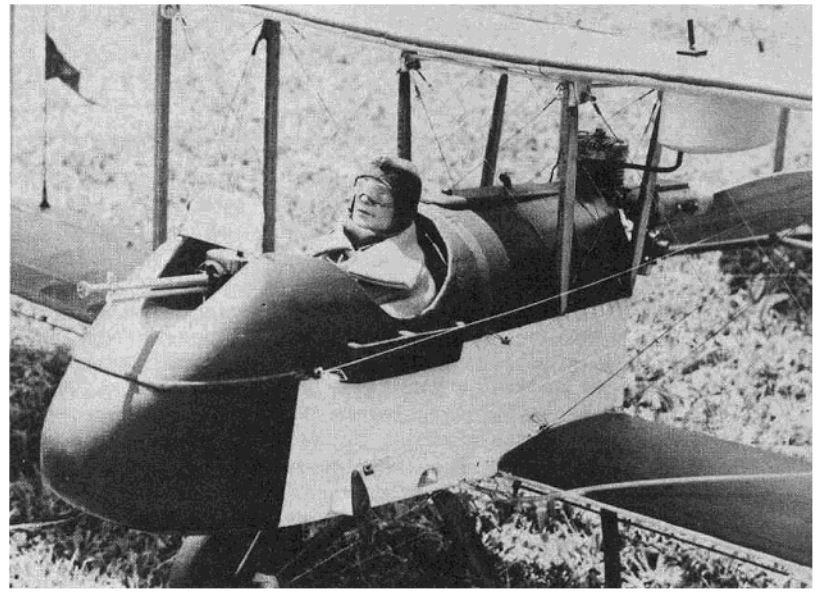

notice, the fridge will supply this by holding the wing below an open freezer door.

RADIO INSTALLATION

Note that the fuselage floor is fully detachable, allowing access to the radio gear. I have shown my radio installation, which was achieved after much experimentation. Points to note are that the throttle and elevator servos are staggered to allow access to the mounting screws. Bellcranks are also used to isolate the servos and thus help to prevent damage and control throw. Note that the effective radius of each of the bellcranks in a closed loop system, for example the rudder, and must all be equal in length to prevent stretching of the control cable.

LANDING GEAR

The landing gear is built-up from 1/8" music wire. Use silver solder if you have the equipment. As I didn't, I joined lengths together by using brass tubing as a sleeve and soldering. For other joints, I bound them with copper wire and soldered. 1/8" balsa sheet and white glue were used for fairing the legs.

WING SADDLE

The wing saddle was similarly made except for the struts. These are formed from 1/4" ply with a hole drilled through the middle and placed in position before bending in the bottom legs. The wing saddle was used to increase the rigidity of the structure and enable easier assembly and tear-down. It is not noticeable under normal conditions but, if you feel game, you could, with some alteration, leave it out. Also, rig the saddle only after it has been mounted in the fuselage, otherwise you will never get it on. The wings can now be bolted on with 1/8" diameter bolts and the rigging attached. Note that for wires attached to the fuselage, I am using 1/16" Du-Bro Collars to allow disassembly of the fuselage from the wings. The remaining connections are made by crimping short pieces of small brass tubing and, finally, soldering. I have found this a must, as the wires do take a considerable load and, if they start lengthening, can cause problems. When I was first designing the DH-2, there was some doubt as to whether all that metal rigging would cause interference to the radio reception, but I am now pleased to say that it doesn't. However, to ensure maximum reception, I trail the aerial out half-way under the bottom wing and let the remainder dangle.

REAR SECTION

The stabilizer, rudder, rear tail booms and struts are now built. The long hole for the rudder pin was achieved by sharpening the end of a long piece of 1/8" music wire into a chisel-type point, mounting it into a bench-mounted horizontal drill, and slowly turning and aligning the block of spruce while guiding the drill through. It is easier to drill the hole first before building the rudder, as this will save scrap. Carefully cover the rudder, as it will easily warp. After repairing mine a few times, it has developed some warps, but this has not affected its flying.

The attachment of tail booms to the tailplane is achieved by using 1/4" I.D. aluminum tube slit halfway up the sides and flattened out. The 3/8" top booms will have to be turned down at their ends to accept the tube. This was achieved by taking a piece of the tube about 3" in length, nicking one end with a sanding disc to form teeth around its edge and mounting it into the drill. The boom is then pushed up the tube and the teeth will remove the required amount of outer skin, a sort of 'circumferential saw.'

Now build up the rear section, but do not epoxy in the interbeam struts until everything has been aligned and the tail booms fixed to the wings. They can thus be moved to obtain the correct alignment. Set the fuselage and wings, minus landing gear, evenly on a flat floor at 0° incidence. Now place the tail booms and tailplane in place, jacking up to the right height and alignment. After double checking everything, carefully fill in the cavities between ribs and ends of booms with "Plasti-Bond" or similar plastic filler, thus fixing the tail booms into position. The struts can now be fixed in position and the rigging completed. Note that the rigging wires are as taut as possible without distorting the frames. However, the control cables are only taut enough to prevent sloppy control surfaces. If they are too taut, they put undue load on the servos due to friction. For lubrication, I spray all moving parts with "R.P.7," a moisture control agent. This is especially successful for the bellcranks and elevator dowel to fuselage bearings.

WHEELS:

The wheels on most models always turn out to be an expensive item, especially scale wheels, so if you want to save money this is what to do. First obtain some plastic pram (doll carriage) wheels, we can obtain them for about 60 cents each, here in Australia. Using a bolt through the axle hole, mount one in an electric drill and proceed to turn off that hard black plastic tire by using a file or strong knife. You will observe that a hollow rim will be left. Now, taking a piece of calico, or old sheet, cut out two circles slightly bigger than the wheel. Sew them up with the wheel inside, so that they form a tight cover. Now pop over an "O" ring of suitable size or make a tire out of a piece of rubber tube. A wire through the center will help to hold it in position while gluing and aid in keeping it on the rim. The wheel covers can now be doped as per the wings and, if the axle holes are too big, they can be easily bushed with a piece of plastic or nylon tube.

POWER:

For propulsion, I now use very reliable OS H60F, converted to reverse rotation. This is accomplished by rotating the front housing through 90° anti-clockwise (when viewed looking onto the prop). A normal 12" x 6" propeller is then mounted on backwards. As I had a broken Kavan muffler, the end result of a flying bomb or stunter as the case may be, this converted quite effectively to an acceptable muffler. Although I am left with a large hole, the spinning propeller in close proximity to it appears to break up the noise. The built-in inclination of the firewall should set the motor at the correct upthrust of approximately 3° and 0° sidethrust. I also use "Silastic" between motor bearers and firewall mounting to make the motor shakeproof.

FUEL TANK:

Do you want to save some more money? Well, make your own fuel tank. I always make mine, as I find them quite easy and they can be tailor made. It may be noted that I did not reverse the clunk, and it points to the front of the plane without any ill effect. In making my tanks, I use old tin cans or, preferably, tin ice cream containers for the material. A dummy tank is first formed out of foam, and then a pattern is drawn from this. The main secret in soldering is to have reasonably clean surfaces, a hot tinned iron, and "Bakers Soldering Fluid." The solder will follow this fluid almost anywhere and makes soldering a breeze. I do not know whether it is sold in America, but maybe you have a substitute. The clunk assembly and vents are soldered in place prior to the last side being sealed and, on completion, the whole thing is pressure tested under water for leaks (blow it up by mouth, if necessary).

By the way, don't forget the pilot. A 10" doll is ideal. I made a suit of clothes for mine out of the material from a pair of old Boy Scout shorts. If you can borrow your wife's sewing maching, you might surprise yourself as to how easy it is to use. The clothes were stuffed with foam, head and hands stuck on, and there he is.

By the way, the DH-2 will fit diagonally into the back of a station wagon when it is fully assembled, and this is the best way to transport it. Please do not look too closely at the scale propeller in the photos. I inadvertently put on one I had left over from my Junkers J9!

Well, I hope you have as much joy and satisfaction as I am now reaping out of my DH-2. If you have any problems, feel free to write to me at 4 Ruhamah Avenue, North Geelong, Victoria 3215, Australia. □

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