

Build a diminutive de Havilland. . .

DH 53 Humming

THE DH 53 WAS ONE of the more successful ultra-lights designed to take part in the 1923 Daily Mail Trials at Lympne. Of unmistakable de Havilland appearance the DH 53 boasted none of the freakish characteristics exhibited by many of the other competitors at the Trials but was a sensibly-arranged and robust machine, although, interestingly to aeromodellers' eyes, the fuselage verticals and spacers were not fixed directly to the longerons; the ply covering serving to tie together the structure. At certain points steel tubing cross-struts were employed; but the majority of the structure was wood, in accordance with contemporary de Havilland practice.

Two prototypes were built for the Trials, both equipped with 750cc Douglas motorcycle engines — a powerplant which was to cause problems at Lympne. Despite this, the DH 53s performed most impressively and although no prizes were won they were clearly the best all-rounders. Once he had been eliminated Capt. Broad in the first prototype performed a fine sequence of aerobatics for the crowd's benefit. Not long after the trials the first machine, which had by now received the registration G-EBHX, was re-engined with an inverted Blackburne Tomtit V-twin and with other modifications this machine was flown with distinction during the following year. The DH 53's reliability and general competence resulted in an order from the RAF for eight machines, six of which made a noteworthy appearance at the 1925 RAF Pageant.

Despite a lack of orders from the civil market the RAF craft appeared under private ownership after disposal from that service, and thus appeared at airfields up and down the country for a while longer. Particularly notable was the silver and

green G-EBXN which, re-engined with a Bristol Cherub, survived until 1940. The careers of the civil machines have been documented in various publications (notably the Putnam book 'de Havilland Aircraft since 1909' and Richard Riding's 'Ultralights', both of which — coincidentally — are soon to be reviewed in this magazine). Five DH 53s were built for overseas including three for Australia, about which we will learn more presently; but the type's main claim to fame is that it pointed the way to the more substantial Moth as a desirable 'club' machine.

All the way from down-under comes Jim Fullarton's 1/8th scale ultralight for 0.8cc motors

What of the prototypes? The second, originally named Sylvia II and subsequently registered G-EBHZ was sold engineless to a group of RAF officers who entitled themselves the Seven Aero Club, fitted an ABC Scorpion and flew 'HZ — not entirely without incident — at a number of race meetings.

Its ultimate fate is not certain but it seems it was sold after a final appearance in September 1926. The first DH 53 passed into active private ownership but eventually languished in a Kent back garden until rediscovery — and subsequent rebuilding by the de Havilland Technical School. An ABC Scorpion was fitted, several modifications made, and after trials this famous little machine was handed over to the Shuttleworth Collection where it still lives happily, although its flying career has been

crippled by engine unreliability which has meant more rebuilding and subsequent display solely as a static exhibit.

The DH 53 in Australia

From down-under, Jim Fullarton continues:

Three aircraft of this type were imported into this country, where they had long, if somewhat chequered lives VH-UAC and UAD, fitted with Blackburne engines were imported by the Dept. of Civil Aviation in 1924 for use by their officers, one of whom attended the lightplane trials in that year, though not as a competitor as the aircraft had been made in this country. Both were sold to the Aero Club of NSW in 1930, who refitted them with Bristol Cherub engines (the fuselage being cut back to accommodate this motor) and thereby started a tale of woe for future owners. The Cherubs were heavier than the Blackburnes, and to keep below the design weight limit, the Department — never noted for flexibility in such matters — put a limit of two gallons on the quantity fuel that could be carried!

The club sold 'UAC to a Mr Goodson in Queensland, who seemed to do quite well with it, amassing 100 hours flying time before selling it to Mr Caldwell, of Sydney. It was at this period that I made my only sighting of a '53 in full flight, when Mr Caldwell flew over Coogee beach advertising a popular brand of wine. After a couple of forced landings, it was sold to someone in Samoa and its subsequent fate is unknown.

'UAD was sold in 1932 to Mr Vern Cerche of Melbourne who is best known as the man who taught the late Reg Ansett to fly, thus helping to inaugurate Ansett ANA which to-day operates as Australia's major private domestic airline. Mr Cerche operated it for some years — being only a lightweight himself, perhaps he could

Jim's 45in. Humming Bird is fitted with a PAW80, shown here with strictly non-flying metal prop. Builders could further enclose the motor once thrust line adjustments have been made.



Bird

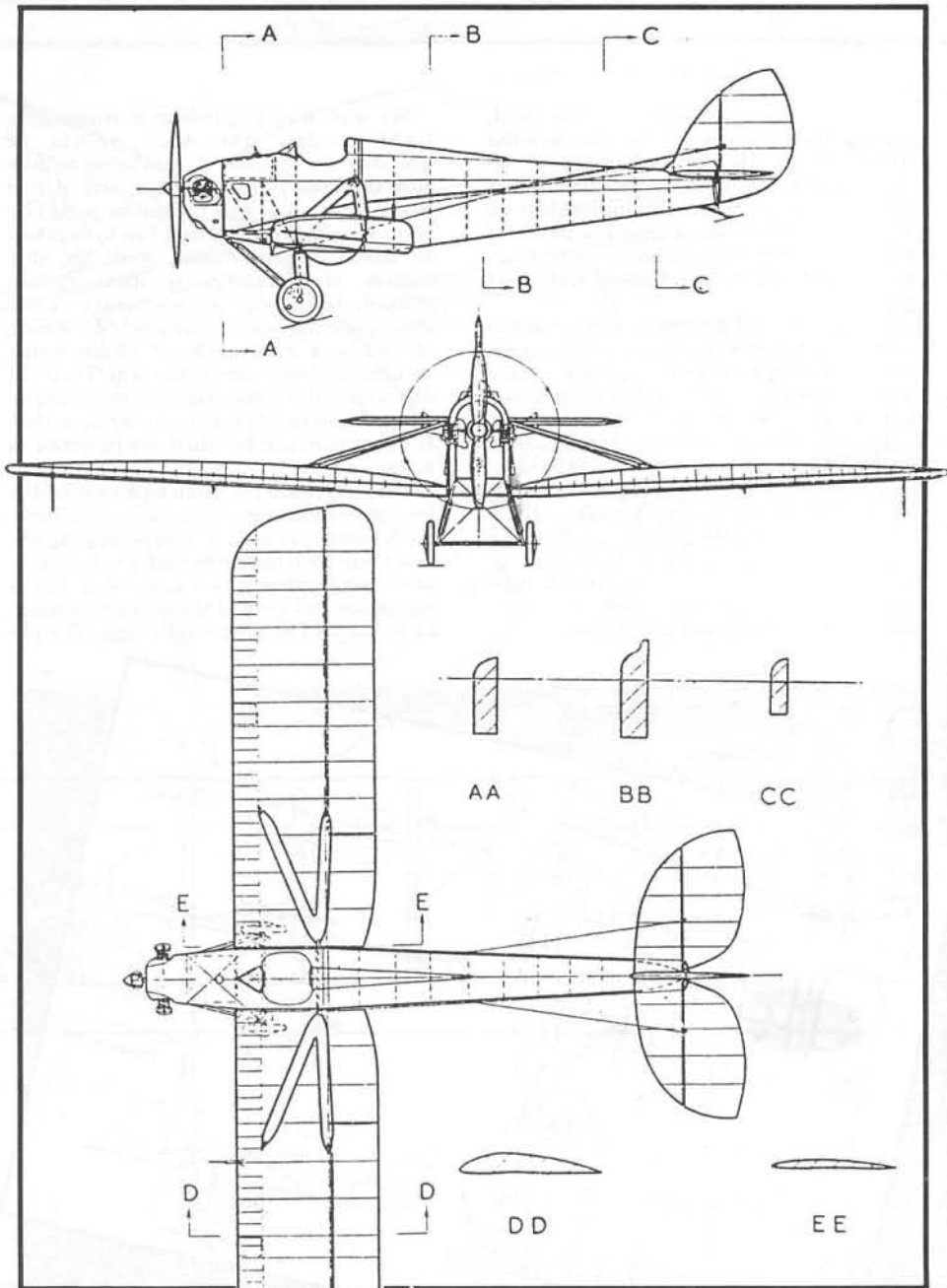
carry more fuel — but after some vicissitudes it was sold in 1944 to a former colleague of the writer's, Ernie Rose. It was not in an airworthy condition at this stage, and after investigating the weight limitation problem, Ern gave up hopes of restoration and it was eventually scrapped after the war.

Though less is known of its origins, it was the third Australian DH 53, serial 118, which really distinguished itself. It was taken to the Northern Territory in 1929 by the famous Flying Doctor, Clyde Fenton, but crashed on its first take-off. The remains languished in a hangar at Wyndham for some years before being taken in hand and painstakingly restored by another flying doctor, Ralph Coto, who fitted a 40hp. Aeronca engine and a seventeen-gallon tank. Then in May 1937, although the DH 53 was unregistered and even unlettered, Dr Coto set out for Perth, a flight of 1500 miles over some of the most inhospitable terrain in Australia. He arrived there six-and-a-half days later with only one forced landing *en route*. Despite this amazing performance, the Department would not grant a C of A, so Dr Coto donated it to the Perth Technical College; its ultimate fate was to be burned as rubbish some years later.

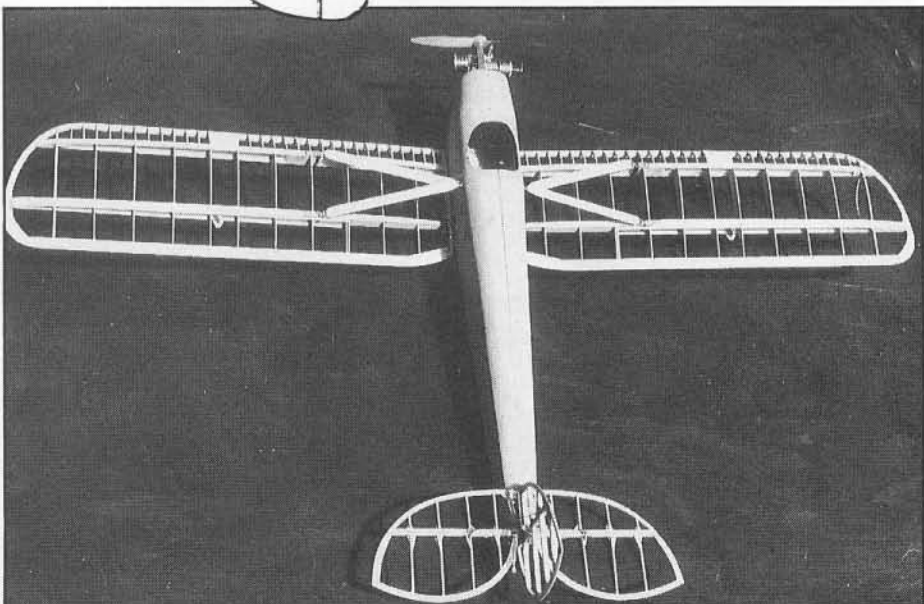
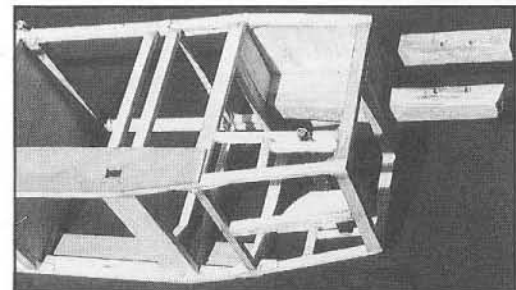
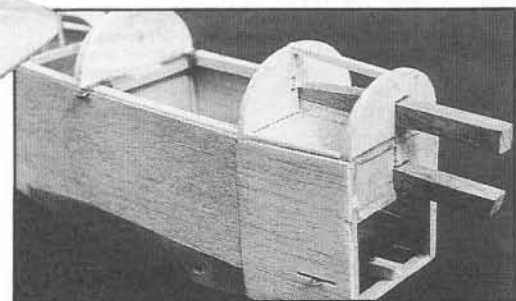
Building the model

In 1930, the late Norman Lyons, founder and Chief Commissioner of the Model Aeroplane Association of Australia, published the plans for a 30in. model of the DH 53, one of which was then in service with the Aero Club of NSW. The model could hardly have been described as an instantaneous success, due principally to the rather unfortunate decision to construct the entire fuselage out of cane pith!

A year or so later, however, one of our members built one with a balsa framed



Above: Eddie Riding's 1/72nd scale Aeromodeller drawing helps with documentation. Bristol Cherub-engined version detailed here. Look for more full-size G-EBHX photo gen next month. Below left: Bearers, strut lugs and rudder bar shown in these construction shots with complete framework at right.



fuselage, and found that it flew well, raising the scale record for our club—the 'Bondi Black Hawks'—from 15 to 45 seconds. After that, we all built '53s, and in the first State Scale Championship in May, 1933, the writer's struck a patch of good air in the last round to come from behind and win with a time of sixty-four seconds.

Given that background, it is not hard to understand that when looking for a scale subject a couple of years ago my choice almost inevitably fell on this snub-nosed lightweight from the early '20s.

The model presented here placed second in F/F Scale at our 1985-86 Nationals, largely because of a 20-point bonus caused by it being the only entry to make a take-off from the roughly grassed surface. As reported in *Aeromodeller* last year, it suffered from an unduly tight left turn under power, a failing which has since been cured with a dose of sidethrust.

My aim was to produce a reasonably light model, but with points of concentrated stress well reinforced to take care of those hard landings; and it has worked out quite well in this respect. The short nose means that care has to be taken to avoid tail-heaviness, and for this reason, the fuselage is quite lightly framed, depending for its strength on the sheet covering (*very scale-like! GC*) which should be a light grade of 1.5mm balsa sanded to about 1mm at the rear. To avoid distortion, the sides and bottom should be sheeted before adding the formers, so that the structure can be laid down inverted on a flat surface.

The turtleback is 0.8mm balsa applied in two pieces joining along the top stringer. PVA cement is used — and wrapping the assembly with old rubber strip to hold it in place while drying is a good idea. Ply is recommended around the cockpit opening, as balsa proved a bit fragile here. The ply

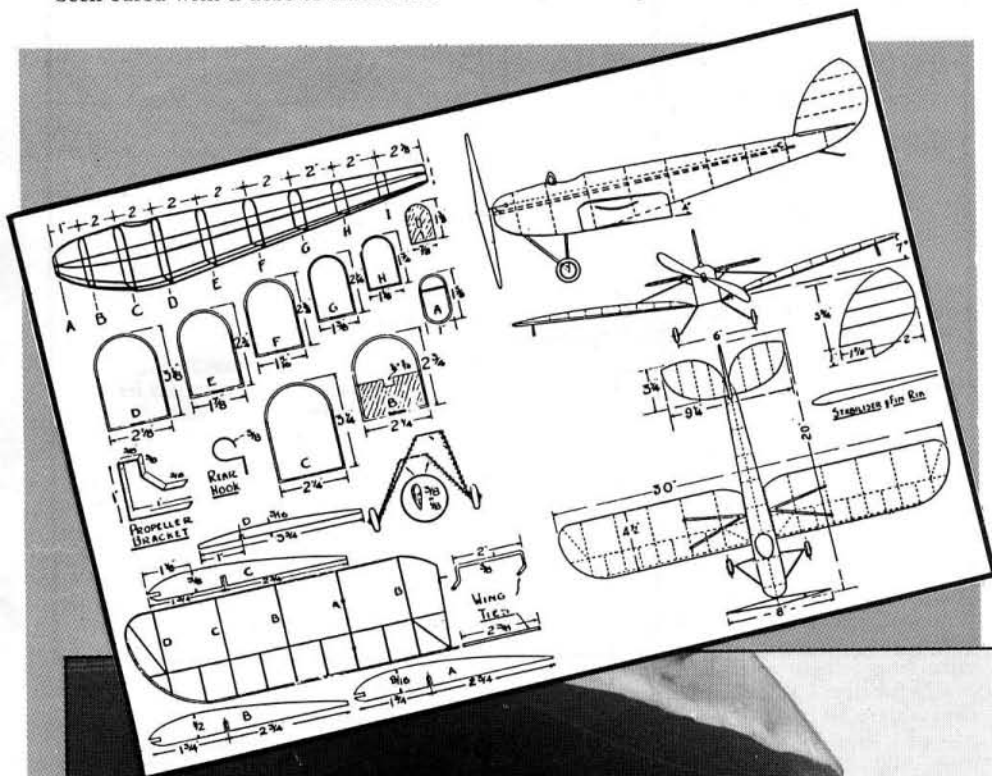
should be soaked and preformed around a can of suitable diameter. The cutout is edged with plastic tube, slit to fit.

The undercarriage works on a different principle to the full sized version, as the telescopic rear leg slides freely in the brass tube, and the spring action comes mainly from the torsion bar effect where it bolts onto the firewall. This is backed up by a piece of valve rubber or a spring slipped over the rear leg before assembly. The tank is soldered up from shim brass with flanged end caps, the whole being shaped around a wooden form block. The control column assembly is slipped into place from inside. It locates in holes made in the fuselage sides, after which the horns are inserted from outside and epoxied in place.

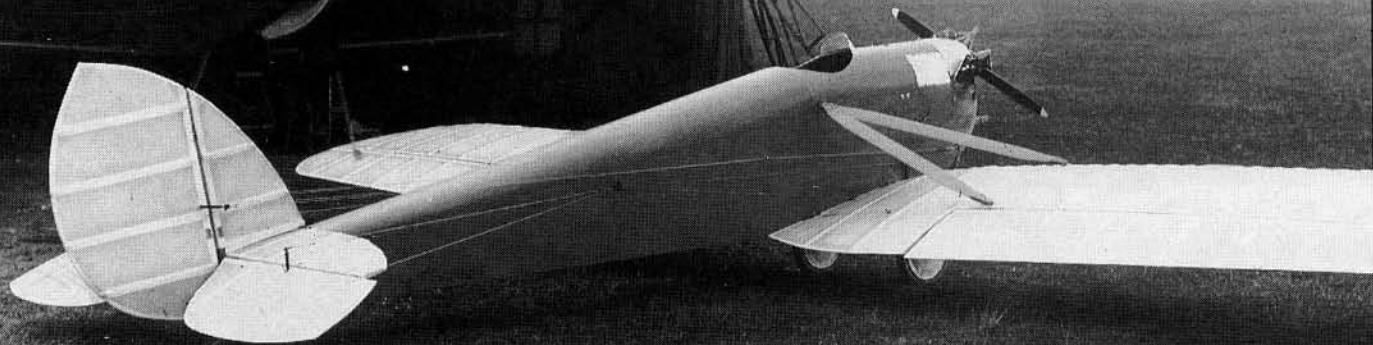
The dummy cylinder may be turned from bar or purchased as a spare. I found that it makes a convenient place for stowing ballast. The cowl is carved from soft balsa in several pieces; one block below the bearers, and one above, with smaller pieces being used to fill around the cylinders. As a fireproofing measure, I lined the exhaust area with aluminium foil.

Flying surfaces

Tail outlines and wingtips are laminated from strips. To achieve this you will need to cut forms to the inside contour from sheet. The strips are then soaked in boiling water and held against the forms to dry, using pinned blocks of balsa. They are then coated with PVA cement and again positioned against the forms, working on a base of non-stick oven paper. The double taper in wing thickness, which is characteristic of this aircraft, means that both L.E. and T.E. have also to be tapered; and when pinning down, don't forget to wedge the T.E. to the correct reflex angle. The I-beam spars have their webs between the ribs, to which they should be securely cemented to maintain continuity. To help get the webs level with the rib slots prior to fixing the top cap strip, they may be sanded with a file made by



*The prototype — later registered G-EBHX — is seen at de Havilland's Stag Lane airfield when absolutely brand, spanking new. Douglas flat twin engine fitted at this stage. Despite practical lines the type's main claim to fame is that it helped to point the way to the larger, more robust DH Moth as a club and private-owner machine; it was underpowered for everyday use. Drawing, above shows 1st September, 1930 presentation in the Australian magazine *Flying*, referred to in text.*



sticking a strip of sandpaper to a 6mm piece of balsa. Both spars are blocked in solid at the strut fittings. The root rib is built up from strips to accommodate the locating pegs, which should be checked to fit the fuselage holes at this stage. The unusual size of the ailerons made me worry about possible warping, so I decided to keep them integral with the wing, leaving just a gap in the covering to simulate a hinge line. The false riblets are made a little oversize and sanded to match the adjacent ribs after fitting.

The wings are held on by bands under the fuselage - a trifle untidy, but very effective - and as they carry full flight loads, be sure to epoxy those hooks securely. The struts are built up on a spruce core, to which the fittings are fixed with epoxy and thread binding, after which the balsa fairing is added. The lower ends of the struts are first attached to the wing spars and the whole thing is then set up on blocks with the fuselage horizontal and the wing at the correct dihedral. The upper fitting is screwed to the fuselage lug, and then epoxied to the rear strut, being held with a spring peg until dry. The front strut is then attached to the rear at the top, and the balsa fairing added. Believing that discretion is the better part of valour, I have just about doubled scale dihedral; if anyone wants to try the correct amount (about 38mm) I wish them luck, but hope that they have access to the legendary field covered with long green grass.

Finish and flying!

Wings are covered with heavyweight tissue and, the tail surfaces with the lighter grade; both are doped silver. The fuselage colour is dark blue. For crash resistance, at least during the test period, the tail is held on with rubber bands, and located with V-shaped keys, but when everything is sorted out it may be fixed. The external control wires are simulated with light nylon fishing line, looped and secured with cyano through short lengths of brass tube at the ends to look like turnbuckles. Rudder lines are double, and all are attached at the rear with open hooks made of pins, so that they can be disconnected.

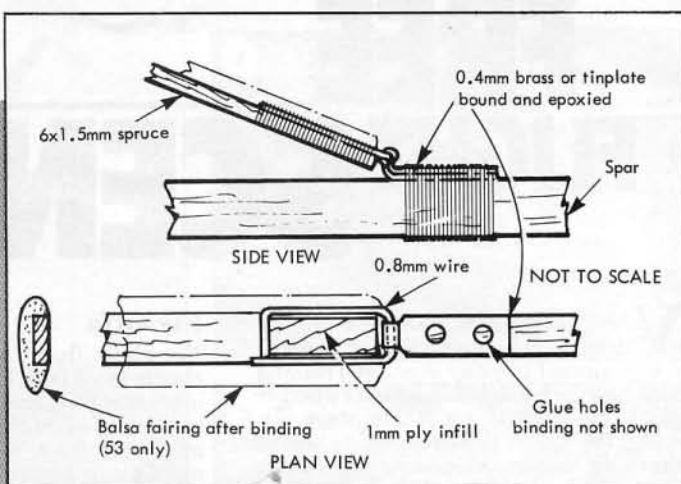
Trimming flights should be preceded by plenty of hand glides, preferably down a slope, adjusting elevators and rudder to get a flat glide with a slight right turn. Longitudinal stability is good; the only problem area on the prototype being that left power turn mentioned previously. Torque alone would not seem to account for this, and I blame the effect of rotating slipstream on the rather large rudder. I corrected it with about five degrees of right thrust, as attempts to counter with rudder produced a right spiral on the glide. The PAW 80 provides more than enough power; I use an 8x4 prop cut down to six inches to reduce the area of rotating slipstream. Good flying!

References

Aeromodeller 3-view from September 1945.
Model Aircraft Nov. 1960.
Aeroplane Monthly Dec. 1978 and April 1985.

Thanks to: Arthur Smith and Colin Parker for help with photographs; Paul Straney and Alwyn Smith for other data.

Diagram at right shows the strut fitting. Straightforward hinged arrangement may be adopted on other scale models.



At right and bottom, flanking our shot of the finished model, are further construction shots to help builders: G-EBHX now has royal blue fuselage, silver surfaces and registration in black on wings, white on fuselage. Angled wing trailing edge at root is correct for restored machine, if not original. Dummy cylinder is fixed to bearers by simple bracket; small tinplate tank is fitted to bulkhead.

