Before the Moth

Continuing his series on historic aircraft he has flown, ***David Ogilvy*** *assesses the de Havilland DH51 of 1924*

Above: note the DH51's unusual tailskid and the large G on the rudder -mandatory on all British civil aircraft until 1928
Below: the diminutive DH53

Not all good aeroplanes gain worthwhile production orders. Before the Moth series became established as the most historically significant mass-produced light aircraft of all time, much heart-searching must have been carried out in the de Havilland stable at Stag Lane, Edgware. The Moth did not just happen to happen, for immediately before it were two designs each at the opposite end of the light aeroplane range. Between them, these machines showed clearly that neither quite filled the bill to serve the needs of the prospective private owner and amateur pilot.

Despite its design number, the DH51 surfaced later than the diminutive DH53. The 53 first saw daylight under its wheels in late 1923 and made some impact at the Daily Mail light aeroplane trials at Lympne in October that year. It covered 59.3 miles on a gallon of petrol, but with an all-up weight of only 565 lbs it was too small, too low-powered and proved generally inadequate for serious touring. The 750cc Douglas motorcycle engine with which it was fitted gave constant trouble.

By contrast, the DH51 was relatively large, with a span of thirty-seven feet (more than a World War 2 Spitfire) and a permitted weight of 2,240 lb. Everything about it was big, with a sensibly roomy cockpit and accommodation for three in tandem, although it became more established later in a two-seat configuration with a detachable fuselage panel over the front 'hole'. Although powered at first by a 90hp RAF 1a engine, this had only single ignition and failed to suit the airworthiness authorities of the time; greater success came when power was standardised on the V-8 Airdisco.

This engine is quite interesting. Basically a war-surplus Renault, it was acquired, modified and marketed by the Aircraft Disposal Company (ADC) which, of course, provided the basis for the type name. Producing 120 hp in its civilian form and ideally suited in power output for a machine of the 51's size and weight, it was of greater overall calibre than needed for the popular-to-be light aeroplanes of the twenties. As a result, the Airdisco was virtually sliced down the middle and each half produced the basis for the ADC Cirrus 1 which, with its four upright cylinders in line, produced 60 hp in return for a weight of only 290 lb. This came to power the first DH60 Moth in 1925.

The first DH51 to fly, in July 1924, was G-EBIM. It spent much of its life in Australia and after conversion to a floatplane capsized in Sydney Harbour at the age of seven. The second, G-EBIQ (the letter Q is no longer used in registrations) survived only a little longer, to be scrapped at Hanworth in 1933. The third and last (in all senses) had – and indeed has –

a much greater claim to a place in the history book.

G-EBIR first flew in September 1925, and early in the following year went to Nairobi to become the first aircraft to be registered in Kenya. Registration systems changed with the expansion of civil aviation, and after four months in which 'IR flew as G-KAA, Kenya was allocated its own prefix and this long-lived machine became VP-KAA for the next forty-three years. Through a co-operative venture which included considerable help from Hawker Siddeley Aviation – later absorbed into today's BAE Systems – (as successors to the de Havilland Aircraft Co) 'KAA was airfreighted home to England in a vast Blackburn Beverley for permanent preservation by the Shuttleworth Collection at Old Warden in Bedfordshire. H-SA refurbished G-EBIR at their Hawarden (Chester) works and, after a long time away from home, the last DH51 came back to live only about forty miles from where is had been built fifty years previously.

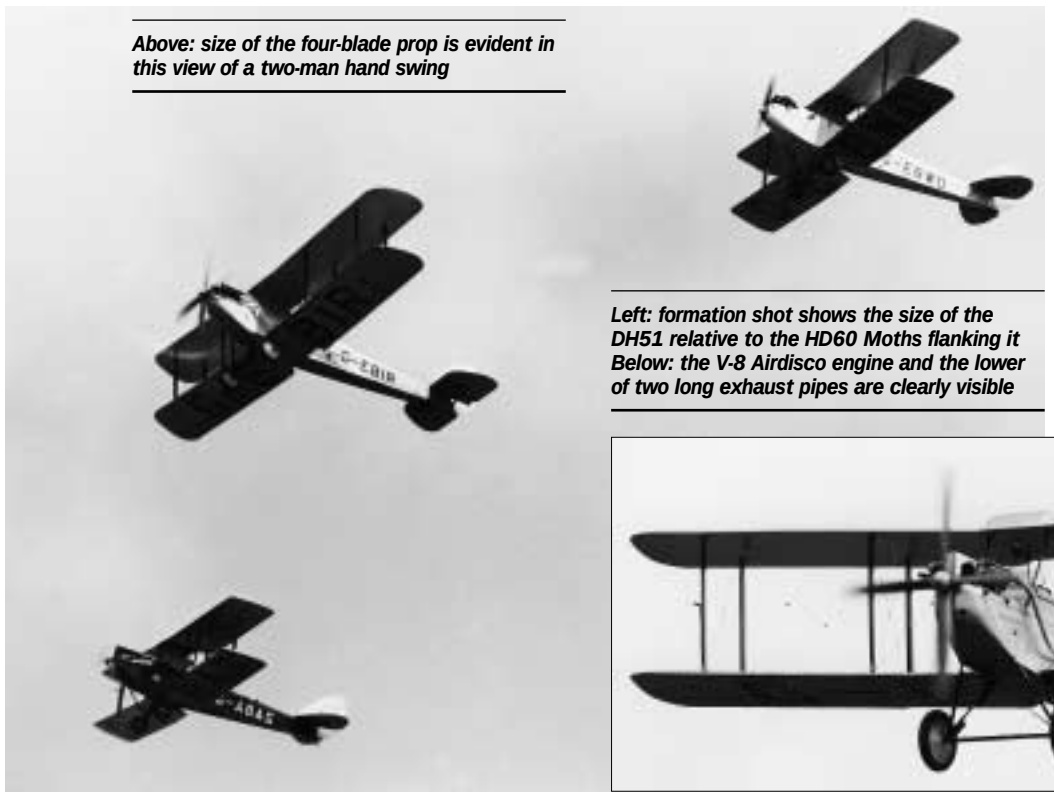
As a two-bay biplane with a relatively shallow fuselage, the DH51 has a strong external resemblance to the famous DH9 of World War 1, which proved so successful in a variety of post-war civil roles. A large four-bladed wooden propeller gives the 51 a certain added character, which helps to augment the impression of size.

With a V-8 engine, the 51 has long pipes running down both sides of the cockpit, but at different heights to ease cockpit access. There is a hinged flap on the left side of the front cockpit to make passenger entry more straightforward than that for the pilot, who has no such facility. The bucket seats have fixed upholstery and these provide a level of comfort that I have not met in any other open-cockpit type, while the spade-grip control column (surely not original?) wrongly gives an almost fighterish impression. Vintage-style instruments, few in number but with large traditional dials, cover the basic needs of airspeed, height, engine power and oil pressure. Other trade tools within easy reach are a cheese-cutter for fore-and-aft trim, acting via a spring balance directly on the elevator, and a pair of pull-for-on fuel cocks for main and reserve supplies, which just come from different levels in the one tank of thirty gallons capacity.

Start procedure is unusual for a light aeroplane intended for private use. Although the propeller can be hand-swung, the rapidity with which the four blades follow each other creates an added hazard. The Airdisco boasts a third (starter) magneto; current for this is generated by energetic winding from within, whilst engineers perform a rather similar external cranking operation in slightly slower motion. Although an established method for getting some of the heavier engines into action in the twenties and thirties, it is one that is more normally associated with military aircraft.

Once running, the Airdisco is a smooth operator when within its 'happy' range. G-EBIR has insisted on retaining a flat spot

Above: size of the four-blade prop is evident in this view of a two-man hand swing



Left: formation shot shows the size of the DH51 relative to the HD60 Moths flanking it Below: the V-8 Airdisco engine and the lower of two long exhaust pipes are clearly visible

near the low end of the rev scale, for although adjustments to carburettor balancing have moved the trouble area both up and down the scale, it refuses to be eliminated. Yet many engines have settings that are best avoided and this one makes no bones about the bits that it dislikes.

On a cold start, oil pressure rises to a bare 30 lb. To a modern mind this is cause for concern, but once the engine gets warm the situation seems serious. However, there is no need for alarm, as the Airdisco (like its successor, the Cirrus) has a splash as opposed to a pressure-fed oil circulation system and a data plate provides consolation by quoting 5-8 lb as the normal operating range. This, however, is at the front of the engine and cannot be seen by the pilot. The engine heats quickly and prefers to avoid long ground running. When long runs are essential for test purposes, a special ground-use cowl can be fitted to deflect an increased air supply to wherever it is needed.

Most tailskid, brakeless aeroplanes can create taxying problems and the DH51 generates its own. Normally a skid is fixed to the sternpost (as on the DH60 Moth) or it is movable with the rudder (Tiger Moth) and the latter arrangement makes the taxying task much easier; G-EBIR though, has neither of these, with a floating, bungee-balanced skid which points in the direction in which one has been, but offers little hope or help for where one wishes to go. In practice, though, this behaves more effectively than it feels.

Once the problem of alignment has been overcome, take-off is easy. There is very little swing tendency and when it is ready the 51 unsticks on its own, which is quite soon. Climb performance is creditable, with a return of nearly 800 feet per minute. It is during the early flight stage that a modification, or more correctly a re-conversion to original, shows to great advantage. When G-EBIR arrived at Old Warden, it had the most immovable and purposeless set of ailerons imaginable. One pilot described the feeling as though they were set in concrete, while I feared on my first flight that I had taken off with control locks in position. This, I thought, must have been a prime reason for the type failing to sell.

How wrong I proved to be. During a routine inspection, a Shuttleworth engineer discovered that all the fittings existed for setting-up differential ailerons, although at that time they were set to travel in equal amounts both ways. What a transformation. With no handbook or other guidelines, the sensible solution seemed to be to use Tiger Moth figures. These worked admirably; through no fault of the designer, what had been a dull and uninspiring machine to fly became a living thing. If flown in proper biplane tradition with sensible rations of rudder, the newly-activated ailerons provided a control balance that made turn entry and exit into remarkably smooth sequences.

There is nothing very special about the DH51, except that it is unbelievably docile, except in rough conditions, when it reveals a marked lack of control response. Unlike the little DH53, which indulged in some sharp practices including aileron snatch just before the stall, the larger machine seems to have no aerodynamic vices. The stall, which provides one of the best indications of any aeroplane's manners, is almost indefinable as a precise occurrence. From a leisurely entry, the 51's nose eventually finds its way down at a figure below the minimum reading on the ASI (where there is a +10 position error). Clearly a modern altimeter would show signs of unwinding, but only by using a bit of determined effort and 'entering with intent' can a positive and pronounced break-away be induced. Even then the wings remain on the level.

Performance is unexceptional, but adequate. With 1,800 rpm the cruise is about 90 mph, but to achieve this the eight cylinders drink about eleven gallons per hour. Range and endurance, though, are adequate, with a maximum flight time of about two-and-half hours.

With an approach at 55-60 mph IAS, the landing holds no surprises, but the large wheels and low pressure tyres offer a far more comfortable touch-down and subsequent roll than the first DH60 Moths that followed so soon after. Certainly the 51 will not tolerate a crosswind, and the natural weathercock tendency is accentuated by the strange tailskid attachment that I have already mentioned.

As my original assessment of the reason for the DH51's market failure was so grossly wrong, I must assume that sheer size maimed its chances. By the volume of materials alone, it must have cost a lot to build; hangarage bills would be high; the large engine drank fairly heavily. All these misfortunes add up to tell a tale that is easy to understand, but as G-EBIR really is such a likeable flying machine, it is unfortunate that customers failed to materialise. The DH51, though, was definitely not a failure. It proved the need for a smaller, less expensive and lower-powered aeroplane, and from this was born the DH60 Moth. Without that original Moth, which initially was supplied on a heavily subsidised basis to six flying clubs, the private flying movement would have taken many more years to gel. Fortunately one of those very early Moths – G-EBLV, delivered new in 1925 to the Lancashire Aero Club – survives to this day as an active flying machine. That, though, forms a separate story. ■