BRINGING BRITISH COLUMBIA'S AVIATION PAST INTO THE FUTURE

CANADIAN MUSEUM OF FLIGHT

TECHTALK: DH TIGER MOTH

The Canadian Museum of Flight is presenting a series of informal technical talks on aircraft in its fleet. These talks will cover topics ranging from the history of the company; the history of the aircraft type; its development; production methods and places; the history of the engine and its development.
Also covered will be the challenges in maintaining and flying these classic aircraft in today's environment; how the mechanics find the parts and how the pilots keep current on flying a 70 year old flying machine designed before the dawn of the jet age.
This will be followed by details of how the aircraft is prepared for flight; how the engine is started; followed by an engine start and flight.
During the procedings a draw will be conducted entitling the lucky winner to a flight in the aircraft being discussed (some conditions apply).

The Tiger Moth, with a 120 h.p. D.H. Gipsy III (inverted type) Engine, fulfils all primary, intermediate and advanced training requirements. It exhibits the characteristics of the high-powered, high-performance types in which pupils will ultimately fly, yet it is economical both in first cost and upkeep.

TIGER MOTH

AS SUPPLIED FOR TRAINING & COMMUNICATION
TO THE
BRITISH ROYAL AIR FORCE

'AB-INITIO' . INTERMEDIATE . ADVANCED & AEROBATIC TRAINING

Fully illustrated Specification will be forwarded upon request.

THE DE HAVILLAND AIRCRAFT COMPANY LIMITED, STAG LANE AERODROME, EDGWARE, MIDDLESEX ENGLAND
Associated Companies in Australia, Canada, India, and South Africa. Licensees, Selling and Service Agents throughout the World.

The History of the de Havilland Moth family

By 1931 the basic wooden DH60 Moth had evolved into an aircraft with a welded steel tube fuselage and 120hp engine, a combination more than capable of satisfying a growing requirement for initial training aircraft with added capacity for actual or pseudo military aggression. Bearing this in mind the de Havilland Aircraft Company decided there was still potential development to be wrung out of their current airframe and even more from the engine.

On 10 July 1931, an aircraft identified as a 'DH Training Moth T1' fitted with a Gipsy II engine, was weighed at the de Havilland factory at Stag Lane. In most respects she was identical with the final specification of another aircraft which had been tested using identity E.3, DH60T G-ABNY (1724), one of three destined for China, fitted out with bomb racks and provision for wireless, electrical generation and camera guns. The exception was that Training Moth T1 was fitted with swept mainplanes, the top set staggered forward of the lower wings. Her centre of gravity in this configuration was closely compared with No 1724 and found to be further forward, the difference noted as being due to an increased tare weight and 'the forward shift of petrol.'

The prototype DH60 Moth

The increase in tare weight was accounted for by the addition of 'a controlled slot locking device' and 'a (four) drop door fuselage.' The petrol tap was described as being 'cockpit controlled' rather than positioned on the cabane where it could not have been reached from the rear cockpit. With the addition of petrol, oil and crew the Training Moth T1 was 11lb over the then maximum permitted aerobatic weight, a detail in need of attention. According to Richard Clarkson, the solution adopted in the case of three similarly afflicted DH60Ms supplied to the Royal Danish Navy in February 1931 as Type LB III, 1682-1684, was simply to select the lightest components, a practicality which resulted in a saving of 18lb per machine.

The new configuration of the T1 Moth had been achieved by moving the whole of the cabane structure forward of the front cockpit, removing the petrol tank from immediately above the occupants head, thus satisfying both the current views of the Canadian Government who had already declared its opposition to purchasing more aircraft in the old configuration, and as importantly, compliance with the Air Ministry's latest trainer specification 15/31. Sweeping the wings was viewed as the most practical and economical method of recovering some of the inevitable loss of balance. It is most probable that the T1 Moth was in fact No 1705 (G-ABKS), which carried the test marks E.4 and was flown by production test pilot Jack Tyler on 21 July and by Hubert Broad later in August. E.4 never qualified for a Certificate of Airworthiness before, in this period of intense experimentation, initiative and progress, as a cobbled together test specimen, she was declared redundant and dismantled.

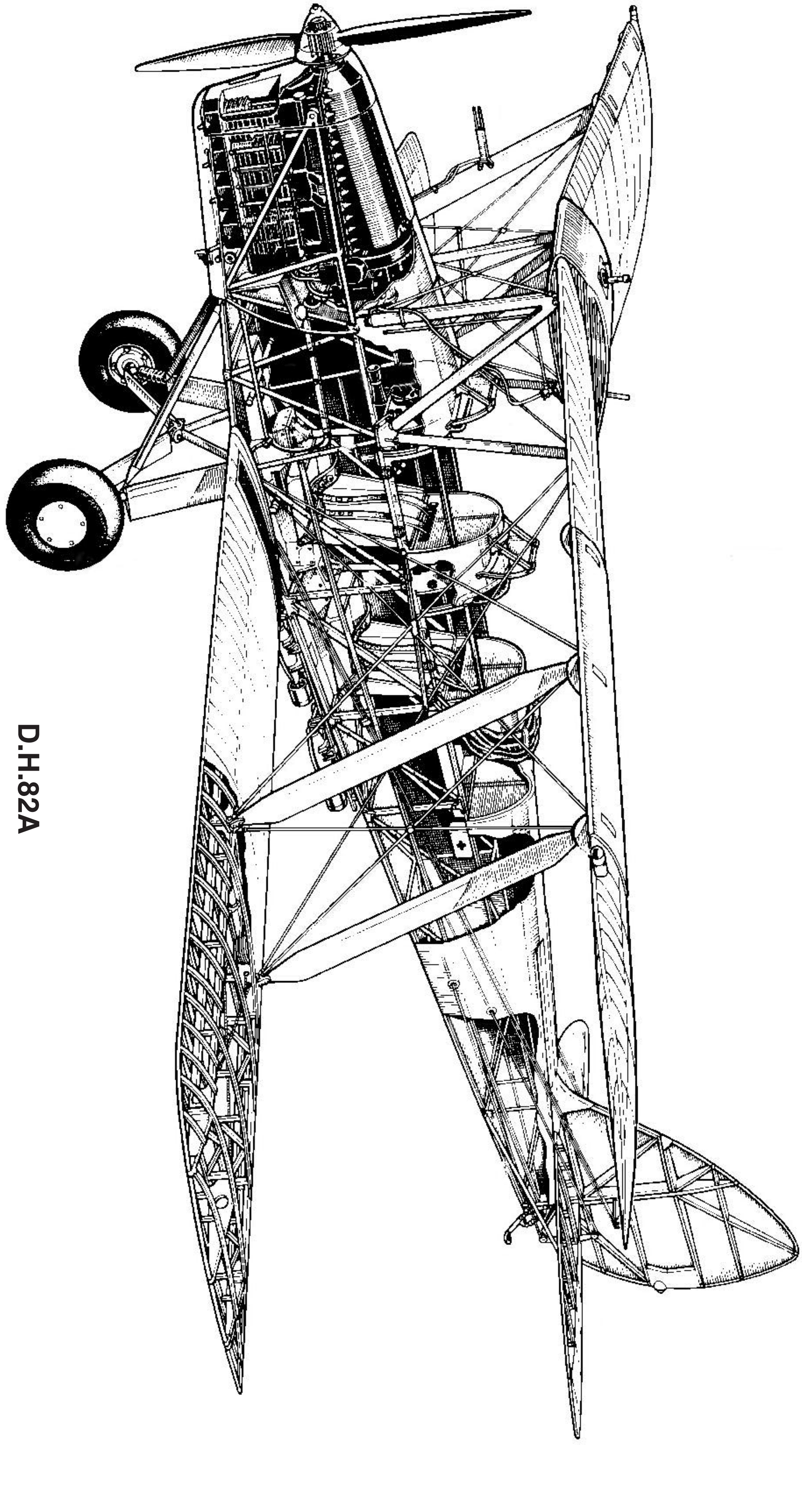
To comply with a further Air Ministry requirement, any prospective training aeroplane had to be given a name, one beginning with the letter 'T' (for Trainer), and de Havilland chose the name previously applied to their experimental DH71 monoplane: *Tiger Moth*. The first new aircraft built with swept wings to be designated a DH60T Tiger Moth was No 1726, fitted with an inverted Gipsy III engine and registered G-ABNI to the de Havilland Aircraft Company Ltd. on 25 June 1931.

DH Training Moth T1 with unswept wings

Sales Director Francis St. Barbe was concerned about the new Canadian trainer specifications of which he had been advised during an extended visit to the Dominion at the beginning of the year, a country still suffering from the effects of the Depression and with a government counting the pennies and demanding quality aircraft manufactured against very precise operational requirements.

In August G-ABNI was despatched with haste to the de Havilland Company works in Toronto where her arrival was greeted with anything but enthusiasm. The second DH60T Tiger Moth, G-ABNJ (1727), wearing identity E.5, was delivered by Hubert Broad to the Aeroplane and Armament Experimental Establishment (A&AEE) at Martlesham Heath on 18 August, where the general impression gained from the trials which began four days later was favourable, except that in the opinion of her test pilots, landing in a crosswind put her into-wind wing tip perilously close to the ground and that when taxying across uneven territory, any down-aileron was liable to make contact with the surface.

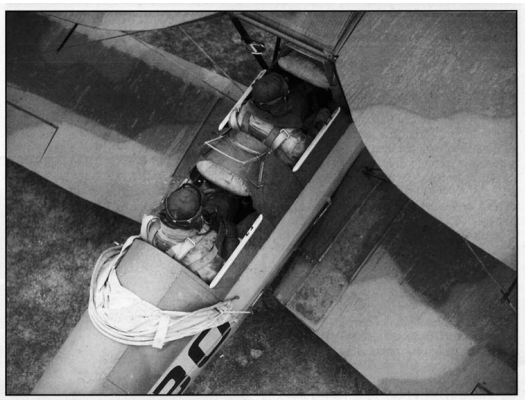
At Stag Lane, DH60T Tiger Moth G-ABPH (1732), was re-rigged to accept additional dihedral on the lower wings



D.H.82A

only, adequately solving both problems. Hubert Broad flew her to Martlesham Heath on 3 September from where it was reported that the change in rigging had created no adverse effect on handling. In this new configuration the A&AEE's report cleared the aircraft as a military trainer of a type which would be acceptable to the Air Ministry. In support of a prospective order from the Portuguese Government, in December, Hubert Broad delivered G-ABPH to Carlos Bleck, the Company's agent in Lisbon, where she was sold to the government and absorbed into the military.

The Design Department at Stag Lane decided that a sufficient number of major alterations had now been embodied in the basic DH60 for a new Type Number to be applied to the Tiger Moth. This was not a hasty decision, for all design and stress calculations, modification summaries and flight test reports collectively formed the aircraft Type Record held by the Design Authority. A change of Type Number usually signalled an entirely new design of aircraft requiring a new Type Record to be established, a time consuming and expensive exercise. By October 1931 the inevitability of a change of Type Number was accepted within the Company and the next available was DH82. However, to avoid cost and excessive administrative effort, the Type Record for the DH82 Tiger Moth continued to be referenced to the key type, the DH60X, under whose protection it has remained.



The DH82 employed a modified upper wing

de Havilland D.H.82 Tiger and Menasco Moths in Canada

Following its incorporation in March 1928, de Havilland Aircraft of Canada operated in a sales and service role for its parent company's products and undertook modifications to make them more suitable for Canadian operating conditions. In 1935 the company attempted to sell British-built D.H.82A Tiger Moths to the Canadian Government but with no results, and on 2 October, 1936, P. C. Garratt, DHC's new manager, proposed building D.H.82As in Canada if a minimum order for twenty was received. This is the first known instance of a proposal to start manufacturing operations by DHC. A contract was shortly awarded for twenty-five D.H.82As to DND specification C/18/36, and they were required to be built in Canada with changes that the RCAF called for to meet its operating conditions.

The D.H.82A was the final development of the highly successful D.H.60 Moth, which had originally been fitted with the 60 hp A.D.C. Cirrus engine, later with the more powerful D.H. Gipsy I and II, and finally with the inverted 120 hp Gipsy III. When the D.H.60T with the inverted Gipsy was tried out by the RAF, improved access to the front cockpit was asked for and was achieved by sweeping back the wings. This new version was given a new type number, the D.H.82, and the name Tiger Moth. The original D.H.82 had the Gipsy III engine and when the Gipsy Major I was fitted the type became the D.H.82A.

On 22 March, 1937, a meeting was held with the RCAF to agree on details of the design changes and on 14 May a set of drawings arrived from England. New buildings were started, and the British-built D.H.82A CF-AVG (c/n 3348) was dismantled and stripped to serve as a master pattern.

The changes required were:

Fuselage. A 2-inch (5-cm) thick foam rubber crash pad was to be fitted around the instruments. A cockpit canopy, dimensionally similar to those already installed by DHC on five British-built D.H.82As, to be constructed similarly to the Fleet 7's. A cockpit heating system was to be installed consisting of a hot-air muff around the exhaust pipe and suitable ducting. Other detail changes in the cockpit were called for.

Wings. Wider walkways were wanted on each lower wing, and plywood leading edges on the lower wings. Hand holds were to be fitted on the lower wingtips. Interplane struts were to be made of steel tubing, and the ailerons were to be mass balanced.

Engine installation. The engine cowls were to be hinged on the aircraft centre-line for improved access. Enlarged filler necks were to be fitted to the fuel and oil tanks and an insulating cover provided for the oil tank.

Undercarriage. Heavier axles were to be installed to take the additional loads imposed by operation on skis.

Work proceeded rapidly and the Canadian prototype, RCAF 237, designated D.H.82A(Can) to indicate the changes, was first flown on 21 December, 1937, by P. C. Garratt, at Downsview on the outskirts of Toronto. Twenty-eight D.H.82A(Can)s were completed, the RCAF order of 25, and three civil machines, CF-CFJ, CF-BNF and CF-BNC. Although designated D.H.82A(Can), CF-BNF was fitted with a 125 hp Menasco C.4 and was considered the trial installation for the almost identical D.4 installation which was to go into production on the Menasco Moths. CF-BNF was first flown by J. Bruce Douglas at Downsview on 30 June, 1940.

DHC received an order for 200 welded fuselage frames from the parent company in June 1938 and shipment of them (c/ns E1-E200) started in the autumn. These are believed to constitute the first North American contribution received by Britain for the impending war with Germany. On receipt of several foolscap pages listing snags on the fuse-

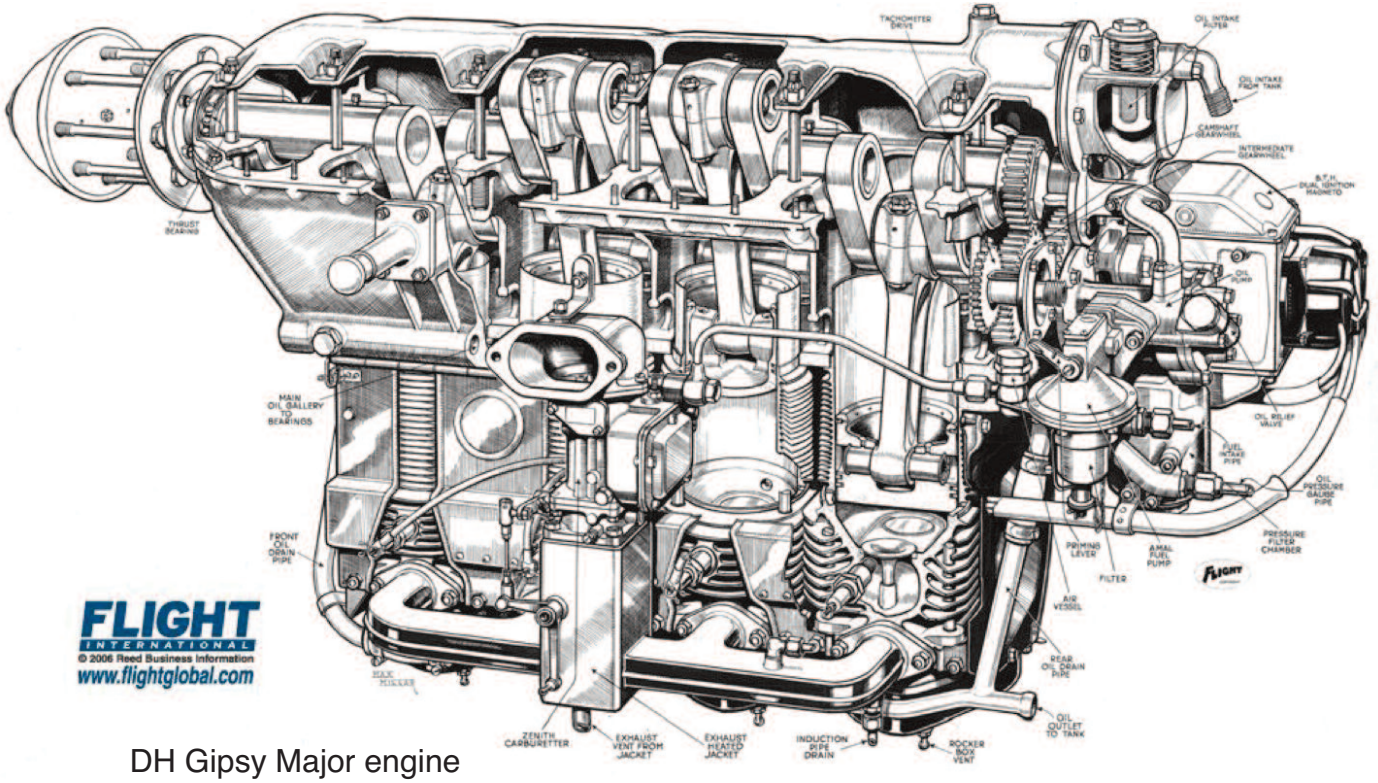
lages, C. D. Long had to go to England to show that the components were built to the British drawings but did not take into account 'the unrecorded lore of Stag Lane and Hatfield.'

Following manufacture of the D.H.82A(Can)s, further engineering changes were introduced which resulted in the D.H.82C. The designation D.H.82B had already been used by the parent company for the Queen Bee target aircraft. These changes, to DND specification AP/3/39, included the fitting of wheel brakes and a tailwheel. This required the wheels being moved forward about 9 3/4 in (24.7 cm) to prevent nosing over on brake application, and the front undercarriage members were shortened to do this. American instruments, of smaller size than the original British, were installed which permitted a more logical instrument layout and a reduction in panel size which in turn permitted a reshaping of the coaming between the cockpits to improve the view from the rear cockpit. The 'cheese cutter' elevator trim was replaced by trim tabs controlled by a wheel in each cockpit. The elevators were mass balanced to compensate for the weight of the tabs. The RCAF also wanted a new type of cockpit canopy, jettisonable in an emergency and higher than that on the D.H.82A(Can). Also included was the fitting of the higher-powered Gipsy Major 1C engine.

The D.H.82C prototype, RCAF 4001, was first flown on 12 March, 1940, at Downsview by J. B. Douglas. The various Canadian modifications added weight and, in some cases, drag, so inevitably the Canadian D.H.82C was less nimble than its British counterpart although better fitted for Canadian operations. The supply of Gipsy Major 1C engines was endangered by possible enemy action, and the 125 hp Menasco D.4 was selected as an alternative; however it was both heavier and less powerful than the Gipsy Major 1C and would reduce the aircraft's performance.

Ten Menasco-powered aircraft were delivered as primary trainers, and a further 126 as wireless trainers with the British T.1083 transmitter and R.1082 receiver installed between the cockpits. The wireless installation in the Menasco Moth was greatly facilitated by the fact that the Menasco engine, unlike the Gipsy had a generator drive; D.H.82Cs converted by the RCAF for wireless training had to have a motor generator unit installed. German submarines also threatened the supply of British wireless equipment so the RCAF made an experimental installation of North American equipment, an AT-1 transmitter and AR-2 receiver, in the front cockpit of Menasco Moth 4934 to prove the installation. The installation was satisfactory but never went into production as the supply of British equipment was not interrupted.

The Menasco Moth Is, the primary trainers, suffered from the lower power and increased weight of the engine, but the Menasco Moth IIs, the wireless trainers, with the additional load of wireless equipment, had a performance that was only marginal. In the cold air of winter they were permitted to fly on skis up to a gross weight of 1,923 lb (873 kg) but in summer the weight was originally supposed to be kept down to the normal gross by limiting fuel but this was impractical and the gross weight on wheels was increased to 1,908 lb (828 kg). The wireless schools in western Canada stopped flying during the midday heat in the summer months due to inadequate performance. After the Menasco Moth IIs were replaced by Fleet 60 Forts, they were converted by the RCAF to Menasco Moth Is.



DH Gipsy Major engine

Production rates of the Tiger and Menasco Moths were:

1938 – 28, 1940 – 339, 1941 – 647, 1942 – 534, total 1548. (Figures from RCAF aircraft acceptance dates.)

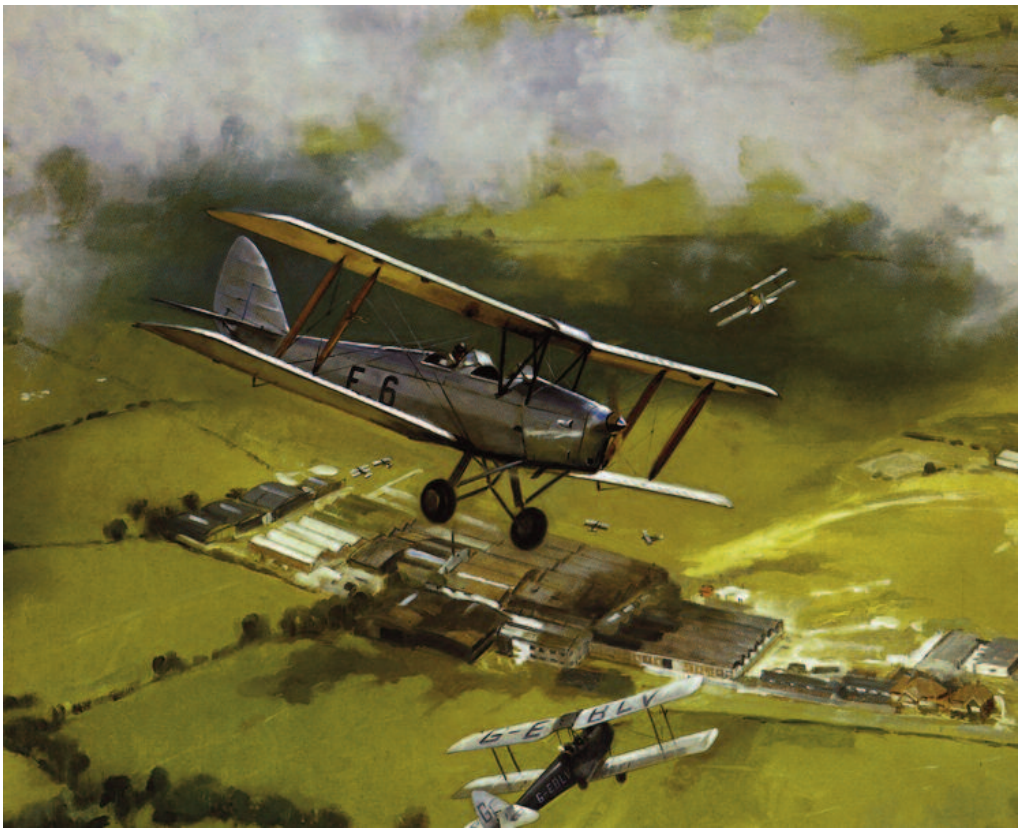
The DHC-produced D.H.82s and the Fleet 16s did all the elementary flight training for the British Commonwealth Air Training Plan until the summer of 1942 and the D.H.82s outnumbered the Fleet 16s by over three to one. Both did their job well, and, although the D.H.82's flying characteristics may not be considered to have been quite as pleasant as the Fleet 16's, it is just possibly because of this that the Tiger and Menasco Moth were usually considered to produce the better pilots.

The award of a George Cross followed an accident to Menasco Moth II 4833. The aircraft crashed while returning to its base at Calgary on 10 November, 1941, and the student wireless operator, LAC K. M. Gravell, although burnt and having lost an eye, got out of the burning machine. He returned to the wreck to help the trapped pilot, Fl Off J. Robinson. A school teacher dragged Gravell away and extinguished the flames on his clothing, but Gravell died from his burns and was posthumously awarded the George Cross for his action.

The Tiger Moth served largely without experiencing troubles during its career. However, in one instance the automatic wing slots opened at high speed and caused a wing failure. Investigation showed that the slots had no beneficial effect and were ordered to be wired closed or removed on 31 May, 1941, and then ordered to be removed.

At the end of the war Tiger and Menasco Moths became available as war-surplus material and were quickly bought by flying clubs, small operators and private owners, and appeared in large numbers on the civil register. Some were used as seaplanes fitted with Edo 1835 floats. They have remained a popular type for those with a nostalgic interest in the biplane and have now tended to become 'collectors' items. At present, 59 D.H.82s appear on the Canadian civil register, with a few more in the USA and under reconstruction, with several in aviation museums.

Source: Canadian Aircraft Since 1909, Molson & Taylor



This painting by Eddie Miller depicts the first flight of the DH 82 Tiger Moth at Stag Lane, England on 26 October 1931.

CMF Pilot's Notes: DH82C Tiger Moth

General Information:

Throttle:	Large lever
Mixture:	Small lever (aft rich)
Canopy open release:	Below throttle
Cabin heat:	Pull knob right fwd of stick on floor
Fuel lever:	Use spring to hold in on position
To fuel:	Use ladder on right side and use side step and top of cowl

No carb heat control (automatic)

Walk around:
Open cowl right side (prop vertical)
Drain cock ON for fuel sample (ensure fuel on)
Clean oil screen (6 full turns)
Check oil and fuel quantity (oil tank on left side of fuselage)

Before Start:
Cold – Prime by pulling on cable at bottom of firewall for approx 10 sec. Make sure fuel stops running.
Wait a few minutes before starting.
Warm – Approx ½ jab of throttle to prime
Pull prop through 8 blades (mags off)
If flooded – Open throttle, mixture cut-off, turn prop 12 blades backwards

Start:

Park Brake	On
Throttle:	Idle or slightly cracked
Mags:	Front cockpit, ON; Rear cockpit, fwd. switch ON, rear switch OFF
Idle:	500 - 600 RPM

Taxi:
Adjust park brake so brake is felt at end of rudder travel (approx ¼ brake)

Run – up:
1500 RPM
Check mags
Trim – Full forward

Take – off:
Full throttle
Climb 55 – 60 MPH
Left rudder for climb

Cruise:
1900 RPM (2100 Max)
90 – 95 MPH

Approach:
Check Park Brake is still partially on (approx ¼)
60 – 65 MPH
Over fence 50 – 55 MPH
Stall – 40 MPH

CMF Tiger Moth information

Flown for the first time on October 26, 1931, the Tiger Moth was derived from the DH 60 Moth. The Moth design, with the fuel tank directly above the front cockpit, restricted cockpit access for air force pilots wearing a parachute. The solution was to move the upper wing forward and sweep the wings back for correct positioning of the centre of lift. Initially the DH 82 was powered by a 120 hp Gipsy III engine, but the DH 82A received the 130 hp Gipsy Major. More than 1,000 Tiger Moths were delivered before World War 2, and subsequently 4,005 were built in the U.K. and shipped all over the world; 1,747 were built in Canada between 1938 and 1942, 1,085 in Australia and 345 in New Zealand.

The first Canadian-produced Tiger Moth flew in December 1937, with some being powered by the Menasco engine. The majority were DH 82Cs, powered by the 140 hp DH Gipsy Major 1C engine and with enclosed cockpits, cockpit heaters, brakes and tail wheels. Other changes to make them more suitable for operation in Canada included wider walkways on the lower wings, mass-balanced ailerons, metal interplane struts and heavier axles.

The Tiger Moth was a basic trainer with the BCATP (British Commonwealth Air Training Plan) during WW2, whereby aircrew from all over the British Commonwealth trained in Canada; and with the RAF in India, South Africa and elsewhere. In 1940, there were 120 Tiger Moths based at Boundary Bay, near Vancouver, BC.

The Museum's Tiger Moth was recorded as 'taken on strength' by No. 2 Training Command on 29 October 1941. It was erected at No. 8 Repair Depot in Winnipeg. It was sent to Mid-West Aircraft in Winnipeg, Manitoba for overhaul, 5 March to 8 May 1943 and flew until 27 June 1944 when it was listed as 'pending disposal.' This was followed by storage at No. 8 Repair Depot at No. 26 Elementary Flying Training School at Neepawa, Manitoba, where it was reported with 2366:20 total time, 1158:35 since overhaul. It was 'struck off charge' and handed over to War Assets Corporation for disposal on 13 March 1945.

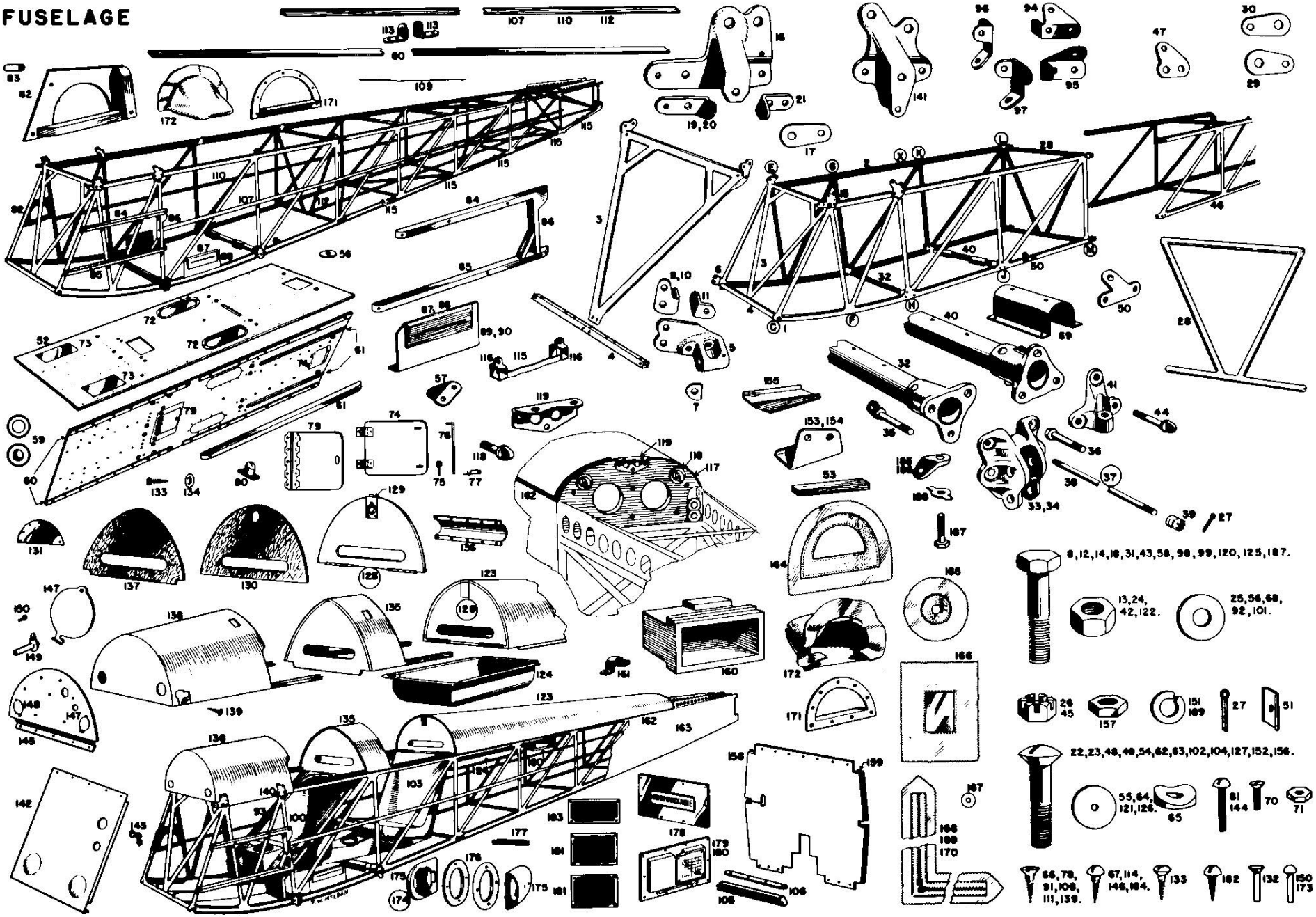
Restoration of this airplane was accomplished under the first grant ever received from the British Columbia Provincial Government in 1983. The airplane was built up to display condition from a small pile of bare frames and parts, employing laid off apprentice aircraft mechanics under the direction of Harry Fordham and Bill McGarrigle. This is the Canadian version and accurate for the type.

In 1999 volunteers of the Museum restored the Tiger Moth to airworthy condition – it flew again on 4 August, 1999. At that time the RCAF numbers on the side of the aircraft were changed from 5875 (original number) to 4236 in memory of Ted Harris, a museum member / volunteer who sadly passed away before the Tiger Moth once again took to the skies. Tiger Moth 4236 was the first aircraft in which Mr. Harris soloed. The aircraft now has 2485 hours flying time.

The Tiger Moth is one of the Museums flight worthy aircraft and can be seen at many events around the Lower Mainland of Vancouver promoting our rich Canadian history.

Technical Details:
Serial: C1178, RCAF 5875, C-GMFT
Engine: 145 hp de Havilland Gipsy Major I four cylinder inline
Maximum speed: 110 mph (177 km/h)
Empty weight: 1,215 lb (552 kg)
Loaded weight: 1,825 lb (829 kg)
Span: 29 ft 4 in (8.9 m)
Length: 23 ft 11 in (7.3 m)
Height: 8 ft 10 in (2.7 m)
Wing area: 239 sq ft (22.2 sq m)

FUSELAGE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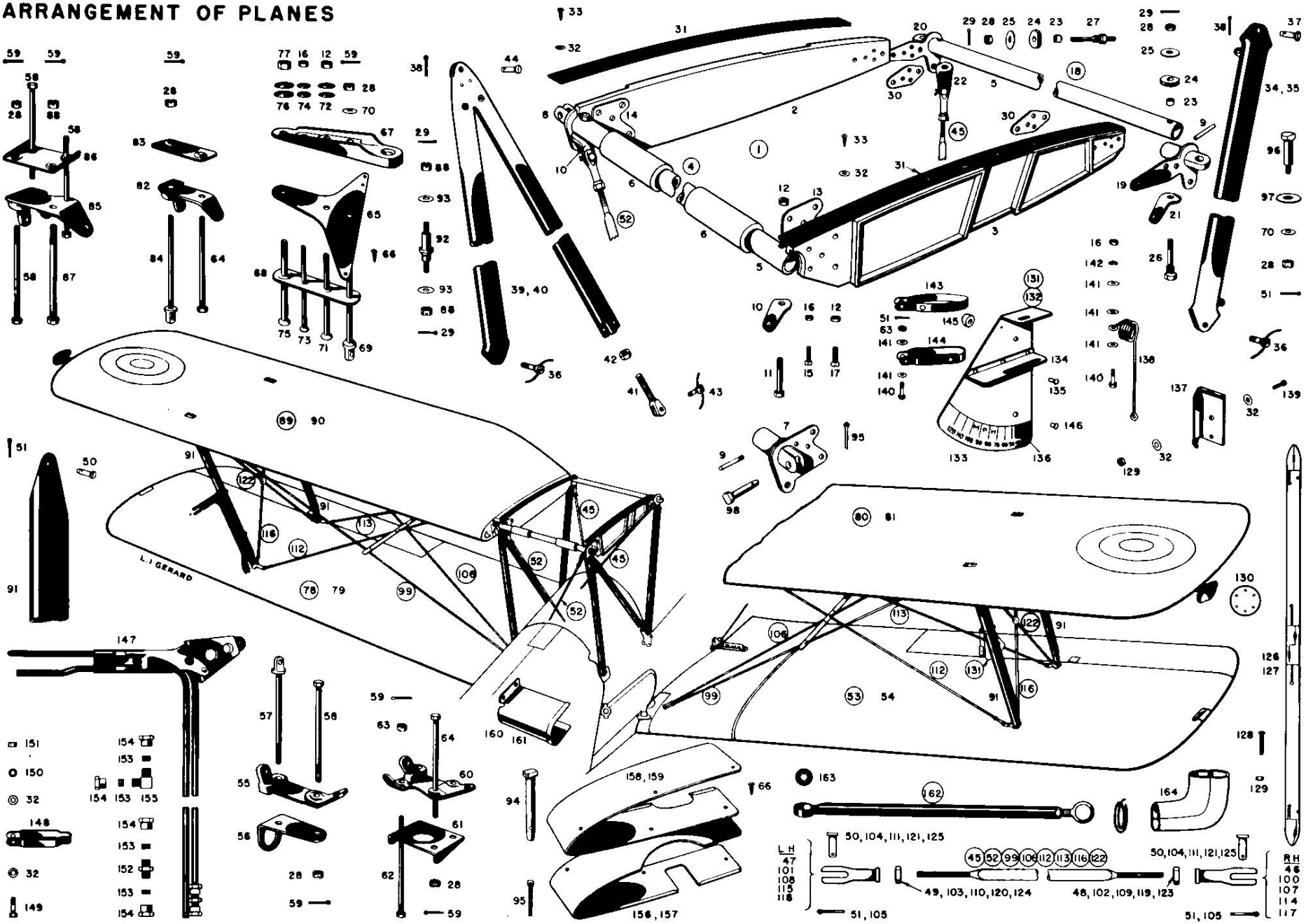
ARRANGEMENT OF PLANES



The Moth series of aircraft from de Havilland

DH51 (1924)
Length: 26 ft 6 in (8.08 m)
Wingspan: 37 ft 0 in (11.28 m)
Height: 9 ft 9 in (2.97 m)
Wing area: 325 ft² (30.19 m²)
Empty weight: 1,342 lb (609 kg)
Max. takeoff weight: 2,240 lb (1016 kg)
Powerplant: 1 × ADC Airdisco air-cooled V8 engine, 120 hp (89 kw)
Maximum speed: 108 mph (94 knots, 174 km/h)
Stall speed: 43 mph (37 knots, 69 km/h)
Service ceiling: 15,000 ft (4,570 m)

DH53 Humming Bird (1923)
Length: 19 ft 8 in (6 m)
Wingspan: 30 ft 1 in (9.17 m)
Height: 7 ft 3 in (2.21 m)
Wing area: 125 ft² (11.6 m²)
Empty weight: 326 lb (148 kg)
Loaded weight: 565 lb (257 kg)
Powerplant: 1 × Blackburne Tomtit inverted vee, two cylinder engine, 26 hp (19 kW)
Maximum speed: 63 kn (73 mph, 118 km/h)
Cruise speed: 52 kn (60 mph, 97 km/h)
Range: 130 nmi (150 mi, 242 km)
Service ceiling: 15,000 ft (4,570 m)

DH60 Moth (1925)
Length: 23 ft 11 in (7.29 m)
Wingspan: 30ft (9.14 m)
Height: 8 ft 9½ in (2.68 m)
Wing area: 243 sq ft (22.6 m²)
Empty weight: 920 lb (417 kg)
Loaded weight: 1,750 lb (794 kg)
Powerplant: 1 × de Havilland Gipsy I, 4 cylinder, upright, inline engine, 100 hp (75 kW)
Maximum speed: 105 mph (169 km/h)
Cruise speed: 85 mph (137 km/h)

DH80 Puss Moth (1929)
Length: 25 ft 0 in (7.6 m)
Wingspan: 36 ft 9 in (11.2 m)
Height: 7 ft 0 in (2.1 m)
Wing area: 222 ft² (20.6 m²)
Empty weight: 1,265 lb (575 kg)
Loaded weight: 2,050 lb (932 kg)
Powerplant: 1 × de Havilland Gipsy III 4-cylinder, aircooled inline, 120 hp (97 kW)
Maximum speed: 128 mph (196 km/h)
Range: 300 mi (483 km)
Service ceiling: 17,500 ft (3,335 m)
Rate of climb: 630 ft/min (192 m/min)

DH82 Tiger Moth (1931)
Length: 23 ft 11 in (7.34 m)
Wingspan: 29 ft 4 in (8.94 m)
Height: 8 ft 9 in (2.68 m)
Wing area: 239 ft² (22.2 m²)
Empty weight: 1,115 lb (506 kg)
Loaded weight: 1,825 lb (828 kg)
Powerplant: 1 × de Havilland Gipsy Major I inverted 4-cylinder inline, 130 hp (100 kW)
Maximum speed: 109 mph at 1,000 ft (97 kts, 175 km/h at 300 m)
Cruise speed: 67 mph (59 kts)
Range: 302 miles (250 nm, 486 km)
Service ceiling: 13,600 ft (4,145 m)
Rate of climb: 673 ft/min (205 m/min)

DH82A (Mod) Jackaroo (1957)
The Thruxton Jackaroo first flew in 1957 and was constructed from a standard Tiger Moth. The fuselage centre section was cut in half longitudinally and the side frames moved further apart by installing new cross frames. A wider undercarriage was added plus extra fairings at the wing root and fuel tank. The nose was extended by moving the engine forward by 8 inches and the rear fuselage also lengthened to add baggage space. The result - a four seat cabin biplane.
Specifications are similar to the DH 82.

DH83 Fox Moth (1932)
Length: 25 ft 9 in (7.85 m)
Wingspan: 30 ft 10⅝ in (9.42 m)
Height: 8 ft 9½ in (2.68 m)
Wing area: 261½ ft² (24.3 m²)
Empty weight: 1,071 lb (487 kg)
Loaded weight: 2,000 lb (909 kg)
Powerplant: de Havilland Gipsy III, 120 hp (97 kW)
Maximum speed: 106 mph (92 knots, 171 km/h)
Cruise speed: 91 mph (79 knots, 147 km/h)
Range: 425 mi (370nmi, 684 km)
Service ceiling: 12,700 ft (3,870 m)
Rate of climb: 450 ft/min (2.3 m/s)

DH84 Dragon (1932)
Capacity: one, pilot, 6-10 passengers
Length: 34 ft 6 in (10.52 m)
Wingspan: 47 ft 4 in (14.43 m)
Height: 10 ft 1 in (3.07 m)
Wing area: 376 ft² (34.9 m²)
Empty weight: 2,300 lb (1,045 kg)
Loaded weight: 4,200 lb (1,909 kg)
Powerplant: 2 × de Havilland Gipsy Major 1 4-cylinder air-cooled inverted inline, 130 hp (97 kW)
Maximum speed: 128 mph (206 km/h)
Cruise speed: 109 mph (95 knots, 167 km/h)
Range: 545 mi (450 nmi, 833 km)
Service ceiling: 12,500 ft (3,800 m)
Rate of climb: 612 ft/min (3.1 m/s)

DH85 Leopard Moth (1933)
Length: 24 ft 6 in (7.47 m)
Wingspan: 37 ft 6 in (11.43 m)
Height: 8 ft 9 in (2.67 m)
Wing area: 206 ft2 (19.1 m2)
Empty weight: 1,290 lb (586 kg)
Loaded weight: 2,225 lb (1,011 kg)
Powerplant: 1 × de Havilland Gipsy Major 4-cylinder air-cooled inverted inline, 130 hp (97 kW)
Maximum speed: 137 mph (221 km/h)
Cruise speed: 119 mph (192 km/h)
Range: 715 mi (622 nmi, 1,151 km)
Service ceiling: 21,500 ft (6,560 m)

DH86 Express (1934)
Crew: Two (pilot and co-pilot)
Capacity: 10-12 passengers
Length: 46 ft 1 in (14.1 m)
Wingspan: 64 ft 6 in (19.7 m)
Height: 13 ft 3 in (4 m)
Wing area: 638 ft² (59.3 m²)
Empty weight: 6,250 lb (2,830 kg)
Loaded weight: 10,250 lb (4,650 kg)
Powerplant: 4 × de Havilland Gipsy Six inline engine, 200 hp (150 kW) each
Maximum speed: 166 mph (267 km/h)
Range: 748 mi (1,200 km, 640 nmi)
Service ceiling: 17,400 ft (5,300 m)
Rate of climb: 925 ft/min (280 m/min)

DH87 Hornet Moth (1934)
Length: 24 ft 11½ in (7.61 m)
Wingspan: 31 ft 11 in (9.73 m)
Height: 6 ft 7 in (2.01 m)
Wing area: 244.5 ft² (22.7 m²)
Empty weight: 1,241 lb (564 kg)
Loaded weight: 1,950 lb (886 kg)
Powerplant: 1 × de Havilland Gipsy Major I 4-cylinder air-cooled inverted inline engine, 130 hp (97 kW)
Maximum speed: 124 mph (200 km/h)
Cruise speed: 105 mph (91 kn, 169 km/h)
Range: 620 mi (539 nmi, 998 km)
Service ceiling: 14,800 ft (4,500 m)
Rate of climb: 690 ft/min (3.51 m/s)

DH88 Comet (1934)
Length: 29 ft (8.8 m)
Wingspan: 44 ft (13.4 m)
Height: 9 ft (2.7 m)
Wing area: 213 ft² (19.7 m²)
Empty weight: 3,000 lb (1,400 kg)
Loaded weight: 5,550 lb (2,520 kg)
Powerplant: 2 × de Havilland Gipsy Six R, 223 hp (166 kW) each
Maximum speed: 255 mph (415 km/h)
Range: 2,925 mi (2,541 nmi, 4,710 km)
Service ceiling: 19,000 ft (5,800 m)
Rate of climb: 1,200 ft/min (6.2 m/s)

DH89 Dragon Rapide (1934)
Capacity: Crew: 1, 8 passengers
Length: 34 ft 6 in (10.5 m)
Wingspan: 48 ft 0 in (14.6 m)
Height: 10 ft 3 in (3.1 m)
Wing area: 340 ft² (32 m²)
Empty weight: 3,230 lb (1,460 kg)
Loaded weight: 5,500 lb (2,490 kg)
Powerplant: 2 × de Havilland Gipsy Six inline engine, 200 hp (149 kW) each
Maximum speed: 157 mph (136 kn, 253 km/h) at 1,000 ft (305 m)
Range: 573 mi (498 nmi, 920 km)
Service ceiling: 16,700 ft (5,090 m)
Rate of climb: 867 ft/min (4.3 m/s)

DH90 Dragonfly (1935)
Length: 31 ft 8 in (9.65 m)
Wingspan: 43 ft 0 in (13.11 m)
Height: 9 ft 2 in (2.79 m)
Wing area: 256 ft² (23.78 m²)
Empty weight: 2,500 lb (1134 kg)
Max. takeoff weight: 4,000 lb (1814 kg)
Powerplant: 2 × de Havilland Gipsy Major II inverted inline engines, 142 hp (109 kw)
Maximum speed: 144 mph (232 km/h)
Range: 625 mi (1,000 km at full load.
Service ceiling: 18,100 ft (5,515 m)
Rate of climb: 875 ft/min (4.5 m/s)

DH94 Moth Minor (1937)
Length: 24 ft 5 in (7.44 m)
Wingspan: 36 ft 7 in (11.15 m)
Height: 6 ft 4 in (1.93 m)
Wing area: 162 ft² (15.05 m²)
Empty weight: 983 lb (446 kg)
Max. takeoff weight: 1,550 lb (703 kg)
Powerplant: 1 × de Havilland Gipsy Minor 4-cylinder inline engine, 90 hp (67 kw)
Maximum speed: 118 mph, (190 km/h)
Cruise speed: 100 mph (161 km/h)
Range: 261 nmi (300 mi, 483 km)
Service ceiling: 16,500 ft (5,030 m)
Rate of climb: 620 ft/min (3.15 m/s)
Wing loading: 9.57 lb/ft² (46.7 kg/m²)