- CHAPTER 1 -

INTRODUCTION and DESCRIPTION

1.1 Description (Plates 1.1, 1.2, 1.3)

The DHC-1 Chipmunk is an all-metal single engined low-wing monoplane with fixed conventional undercarriage. It accommodates two in tandem arrangement with duplicate controls and instruments at each position. In this manual reference will be made to the various versions of the Chipmunk which are classified as follows:

a) DHC-1A-1
Licensed in the A.R.B. acrobatic (i) category at 1930 lb. all-up weight and fitted with the de Havilland Gipsy Major 1C engine.

b) DHC-1A-2
Licensed in the A.R.B. acrobatic (i) category at 1930 lb. all-up weight and fitted with the de Havilland Gipsy Major 10 engine.

c) DHC-1B-1
Licensed in the A.R.B. acrobatic (ii) category at 1930 lb. all-up weight and fitted with the de Havilland Gipsy Major 1C engine.

d) DHC-1B-2
Licensed in the A.R.B. acrobatic (ii) category at 1930 lb. all-up weight and fitted with the de Havilland Gipsy Major 10 engine.

All versions may be equipped with a wood or metal fixed pitch propeller.

1.2 Fuselage

The all-metal stressed skin fuselage consists of two major sections bolted together. The joint, which provides a means of disassembling the fuselage for repairs or replacements, is reinforced by a lap strip riveted to front and rear sections. The forward section which contains the cockpits comprises four main longerons, pressed formers and a series of modified "Z" section stringers which distribute the loads over the skin. The firewall forms the front of this section. The engine mounting is attached to the forward ends of the longerons. The main wing attachment fittings are supported by a built-up "U" shaped belt frame located beneath the front cockpit seat. This frame transmits the spar loads across the fuselage. The wing leading edge attachment point is joined to a similar built-up frame forward of the front instrument panel.

The cockpit enclosure includes a fixed plexiglas windscreen carried on a tubular steel structure which serves as a crash pylon to protect the occupants in the event of overturning. The balance of the canopy, which is fitted with breakout panels, slides rearward to clear both cockpits.

1.2 Fuselage (cont'd)

The top surface of the rails on which the canopy slides can be used as levelling pads both longitudinally and transversely.

The rear fuselage is a straight tapered conical section, the skin of which is single curvature throughout. It is a semi-monocoque structure consisting of pressed formers, modified "Z" section stringers and a stressed skin.

A transverse tube is built into the rear fuselage through which a rope or bar may be passed to facilitate handling the machine.

The rear bulkhead of this section is strengthened to take the tailplane front attachment, the rudder post and the tailwheel strut fittings.

A detachable tailcone fairs in the junction of the rudder, tailplane and elevators and completes the lines of the rear fuselage.

1.3 Wings

The wings are cantilever structures incorporating an all-metal "D" nose box beam, which arries flight and landing loads, and a fabric covered rear section which supports the flaps and ailerons on a false spar.

The "D" nose consists of the single main spar, nose ribs and the leading edge skin which is reinforced with spanwise stringers. The wing root attachment points are located at the top and bottom of the main spar and on a short dummy spar fitted near the leading edge. The under-carriage legs are attached to special nose ribs, inboard of which are the fuel tank compartments.

The ribs aft of the main spar are attached to the "D" nose and are fabric covered except for a walkway area adjacent to the fuselage, which is metal skinned and rubber covered.

Flaps and ailerons are fabric covered metal structures. The ailerons are internally mass-balanced. A metal trailing edge tab, adjustable on the ground, is fitted to the starboard aileron as required. The wings are fitted with detachable pressed metal tips. Wing fillets fair each wing into the fuselage and when removed provide access to the attachment points, brake lines and electrical services.

1.4 Tail Assembly

The tail unit consists of a tailplane built as a single unit, with divided aerodynamic-and mass-balanced elevators having coupled torque tubes and a single control lever, a single fin and an aerodynamic-and mass-balanced rudder.

1.4 Tail Assembly (cont'd)

The tailplane is an all-metal cantilever structure with front and rear flanged spars. The front spar is bolted to the rear bulkhead of the fuselage, and two brackets fixed to the rear spar are connected by struts to the bottom of the bulkhead.

The elevators each comprise a metal spar to which a preformed leading edge, horn balance and ribs are riveted. The elevator is fabric covered. An all-metal tab, which is adjustable in flight, is provided on the starboard elevator.

The fin, which is attached to the fuselage at two points, is an all-metal cantilever structure. The front fitting is made accessible by the removal of a fillet at the base of the fin. This fillet is carried forward to meet the centre canopy rail forming a dorsal fin. The rudder post, which is the rear spar of the fin, is bolted to the rear face of the aft bulkhead to provide additional stiffening for the attachment of tailplane struts and the tailwheel yoke.

The rudder is of similar construction to the elevators and is fitted with a trailing edge tab which may be adjusted on the ground.

1.5 Landing Gear

The landing gear consists of two main undercarriage units, one attached to each "D" nose and a castoring tailwheel unit. All undercarriage units are fixed.

The main (6.00-6) undercarriage unit consists of a Goodyear wheel and brake assembly, and a single cantilever leg contains the compression rubber shock absorber unit. The hydraulic brakes are differentially controlled from the rudder bar. Parking brakes are applied by means of a brake lever in each cockpit.

The tailwheel assembly is attached to the rear fuselage bulkhead and to fittings on the front spar of the tailplane. It consists of a flattened tubular steel yoke, a fully castoring fork fitted with a friction damper and shock strut.

1.6 Flying and Engine Controls.

Standard flying controls consisting of a stick type control column and pivoted rudder bar are fitted in each cockpit. The control movements are transmitted by connecting rods and cables running over pulleys. Either control column is readily detachable for passenger flying.

Longitudinal, lateral and directional trim is obtained by the tabs on the movable control surfaces.

1.6 Flying and Engine Controls (cont'd)

Access to the flying control cables in the fuselage is obtained by means of detachable panels on the control box located centrally on the cockpit floor, and by removal of the tailcone. In the wings the aileron controls are accessible by means of hand holes and zippered openings in the fabric on the lower side of the wing, and by removal of the wing root fillets.

The engine controls are fitted in each cockpit on the port side of the fuselage. Motions are transmitted by means of push-pull rods.

1.7 Power Unit

The power unit which is attached to the front fuselage by four bolts, comprises engine and mounting, propeller, fireproof bulkhead, oil tankand cooler system, cowling and accessories.

Air intake scoops on the engine cowlings provide air for the carburetter, oil cooler and generator cooler, the latter being required on only the Major 10 installation.

1.8 Fuel System

The fuel supply is actuated from either cockpit by a lever on the control box. Filler necks and fuel contents gauges are located on the inboard wing upper surface, easily visible from the cockpits.

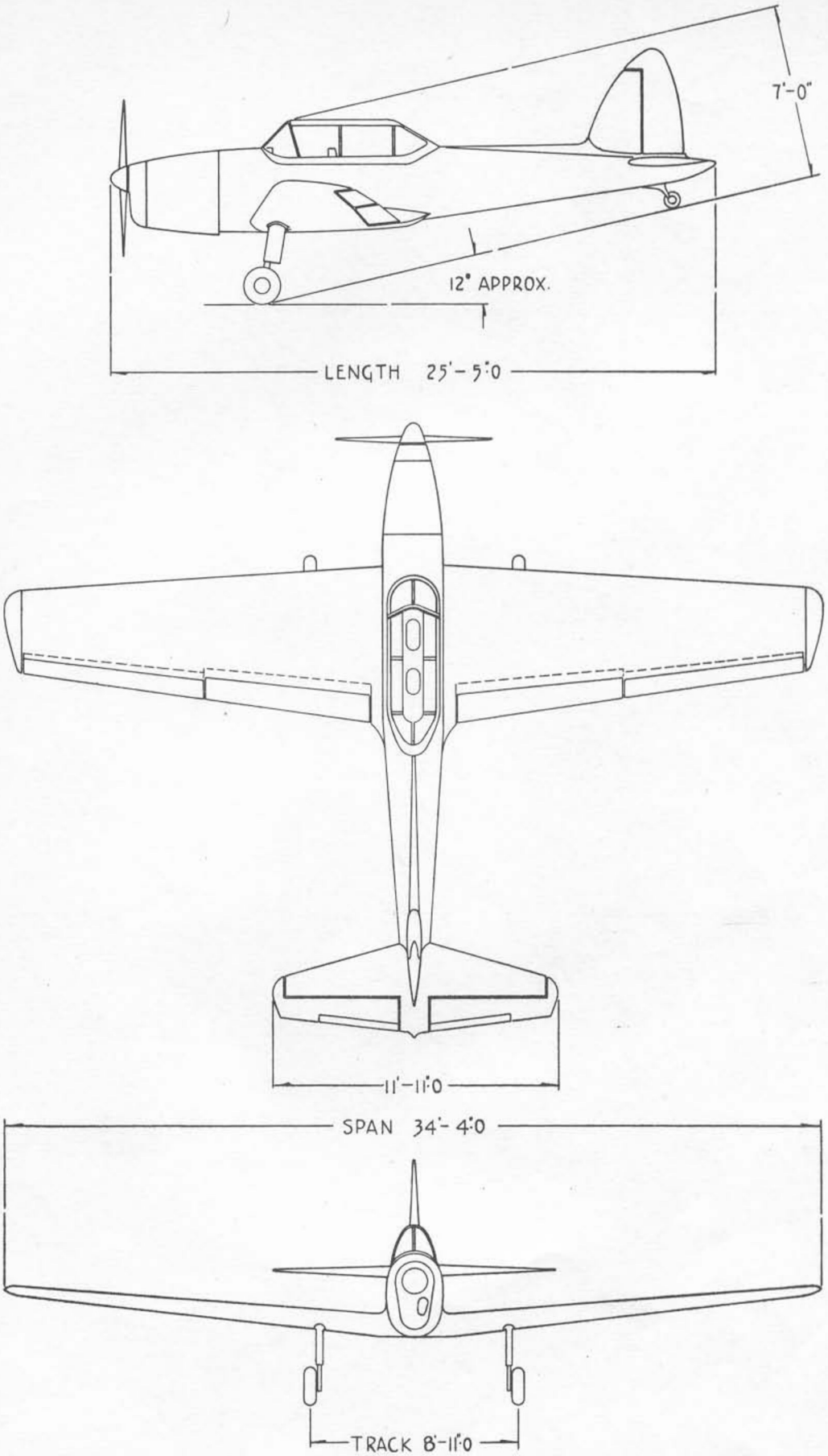
1.9 Power Services

All types are equipped with a vacuum service supplied by Venturi tubes with the Gipsy Major 1C installation, and by a vacuum pump when the Gipsy Major 10 is installed.

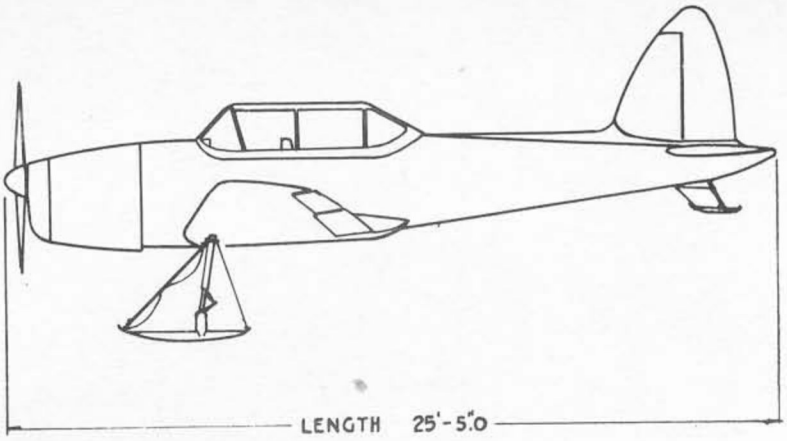
With the Gipsy Major 10 a 24 volt electrical service is provided by two 12 volt batteries in series and an engine-driven generator. On Gipsy Major 1C installation a battery-operated electrical system may be fitted as special equipment.

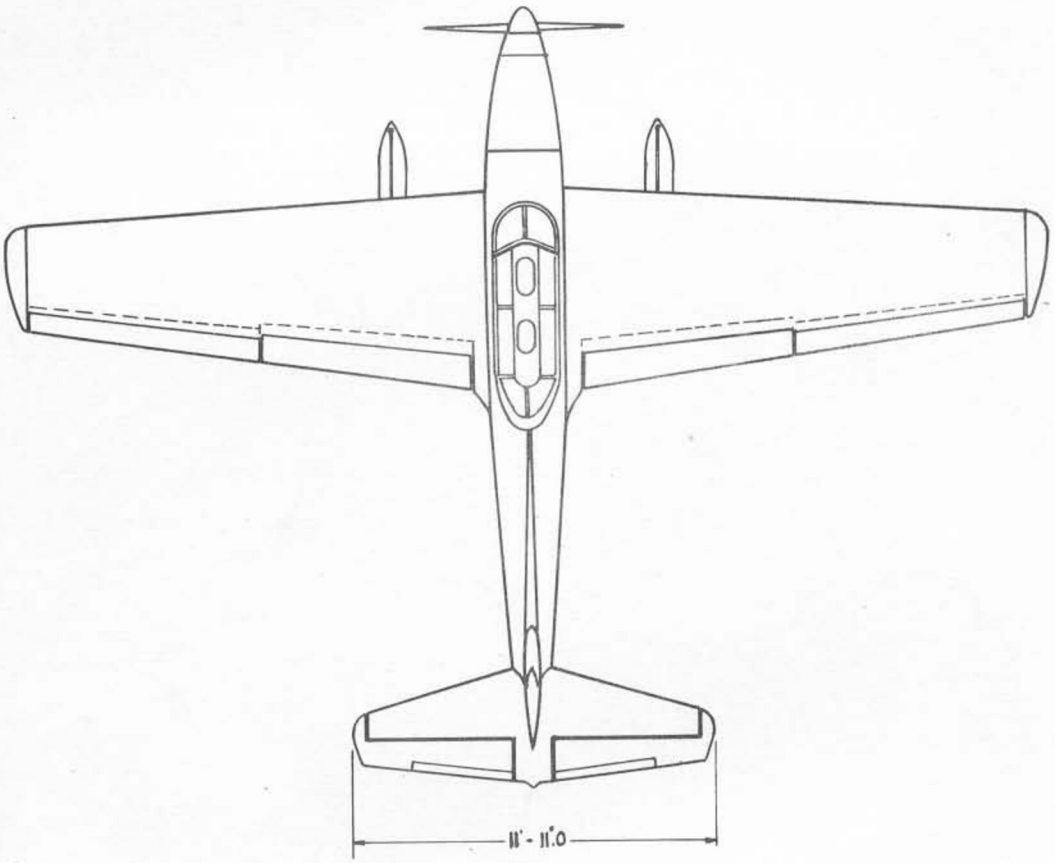
1.10 Strength - Load Factors

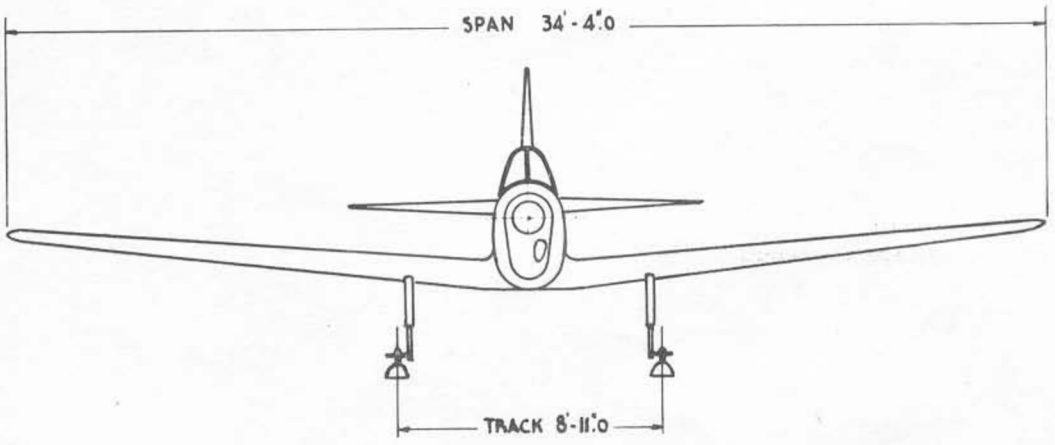
The minimum airframe strength is to the Requirements of the Air Registration Board (Great Britain) as specified in B.C.A.R. Vol. 1, Section D.3, Issue 3. To provide factors adequate to the exigencies of primary training, certain components have strengths well in excess of the Requirements.



DHC 1-CHIPMUNK · · · ON WHEELS PLATE Nº 1.1

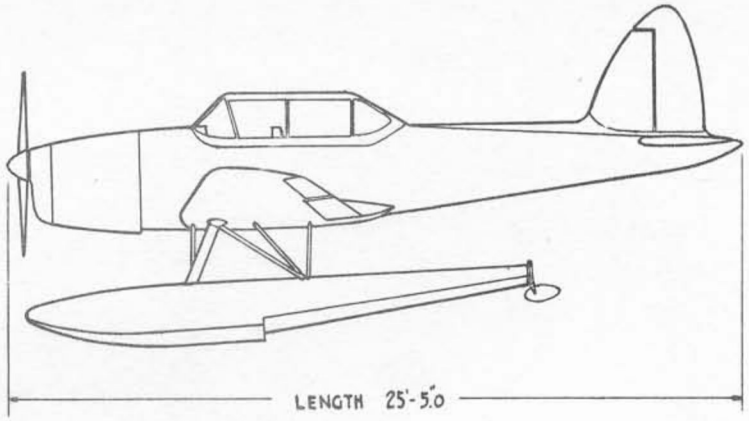


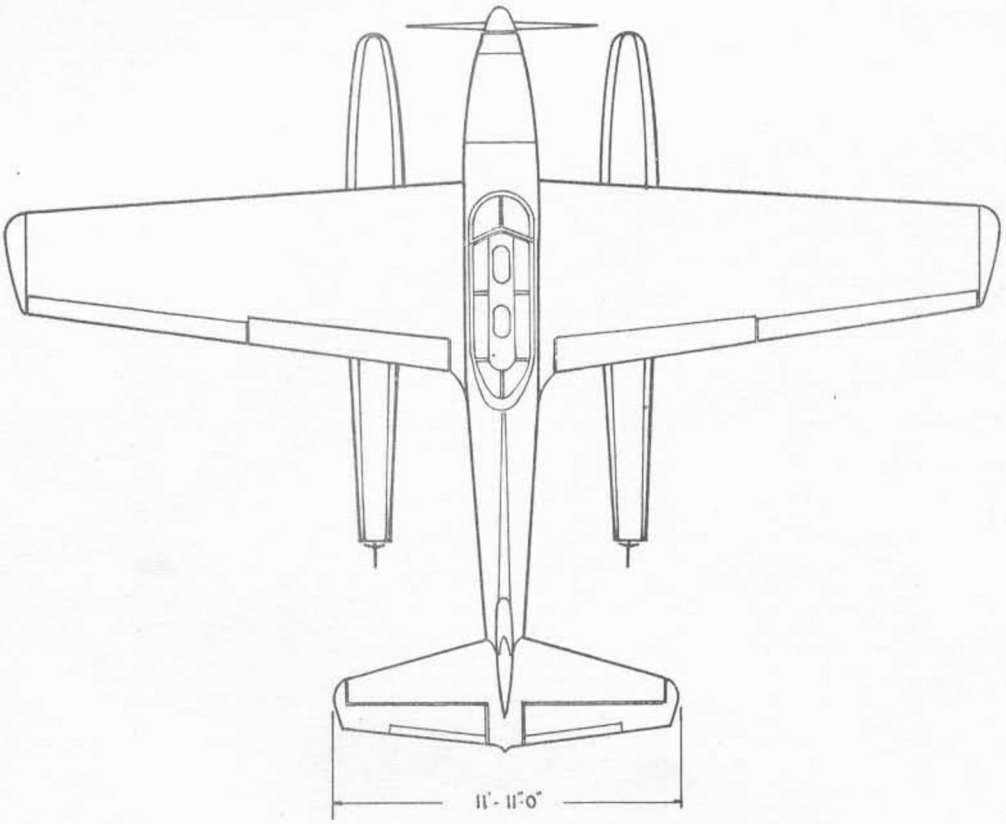


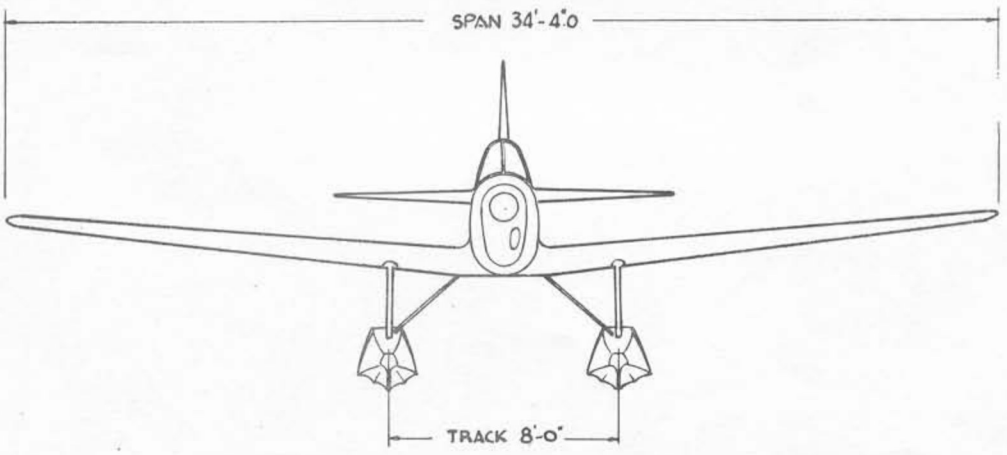


DHC 1 - CHIPMUNK · · · ON SKIS

PLATE № 1-2







DHC 1 – CHIPMUNK ••• ON FLOATS PLATE Nº 1.3