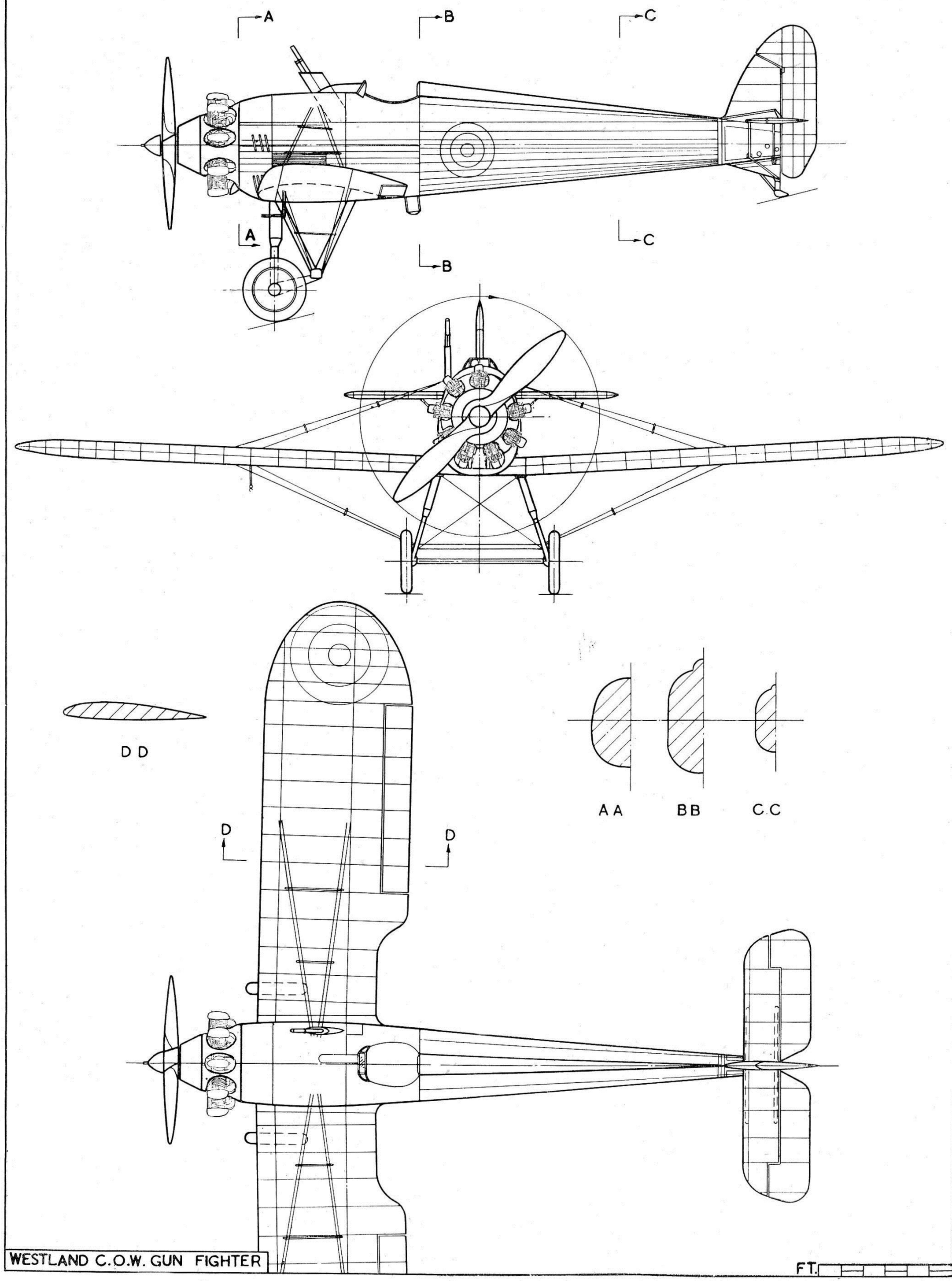
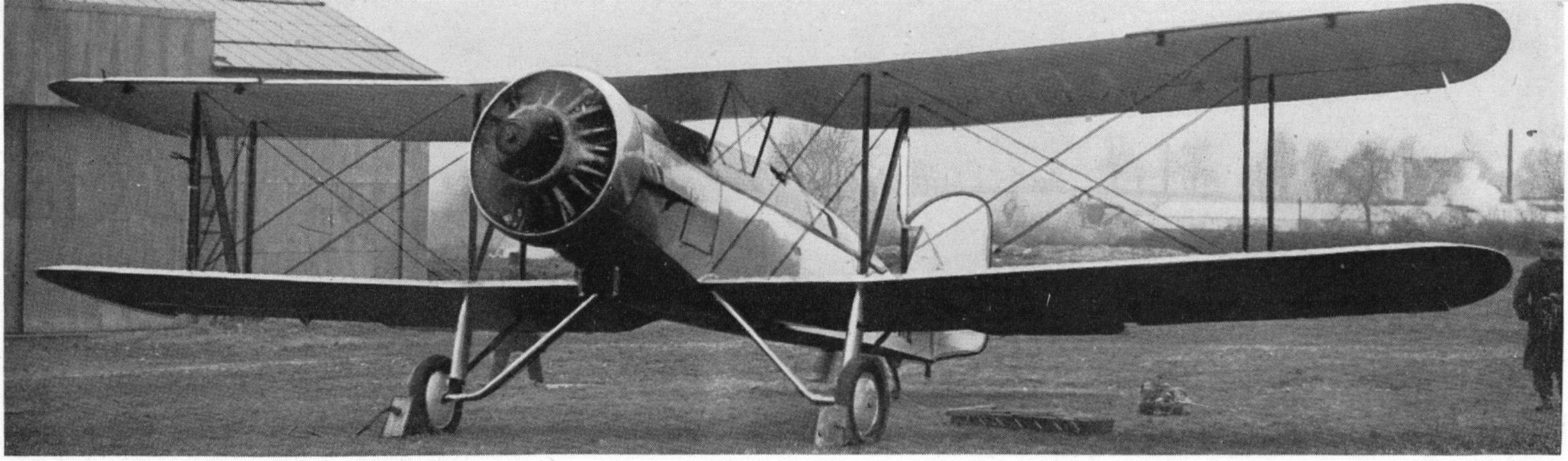




Fox Photos

THE P.V.3 BIPLANE

In the final phase of the biplane era, marked by the successful Wapiti and Wallace machines, the Westland design team produced, as a Private Venture, an aeroplane capable of combining Army Co-operation and General Purpose duties with Fleet Air Arm requirements and, although the type did not go into production, the only example built had an interesting and exciting career.

Known as the P.V.3, the design was based on that of the previous General Purpose and Army Co-operation biplanes, but was arranged to incorporate a wide-track divided type undercarriage—to facilitate the slinging of a 1,000-lb. torpedo—and to have folding wings for shipboard stowage.

First flight-tested by Flt.-Lt. Louis G. Paget, A.F.C., in 1931, the P.V.3 was being used for experimental work at the time machines were being sought for the 1933 Houston-Mount Everest Expedition. Investigation showed that, when lightened and fitted with the fully supercharged Bristol Pegasus S.3 engine, its performance was more suited than any other type for this arduous and exacting adventure.

Modifications to the fuselage, involving the removal of military equipment and the conversion of the rear cockpit to a closed cabin, were made with the co-operation of members of the Expedition, and the final tests, made by Mr. H. J. Penrose, were completely successful. On January 25th, 1933, accompanied by Air Commodore P. F. M. Fellowes, D.S.O., leader of the Expedition, he set out from Westland aerodrome to perform a test climb which would prove that Everest could be cleared by a comfortable margin. They returned after an absence of an hour and forty minutes, having taken the P.V.3 to a height of over 35,000 feet, where the temperature was less than 60 degrees centigrade.

For the Expedition the P.V.3 was renamed the Houston-Westland and, with the converted Wallace, made the first historic flights over Mount Everest. With the successful conclusion of the Expedition's work the Houston-Westland was returned to Yeovil, and later had a long period of service as a flying test-bed for experimental engines of the Bristol Aeroplane Company.

SPECIFICATION

TYPE.—Two-seat General Purpose, Army Co-operation and Fleet Air Arm biplane.

POWER.—One 575-h.p. Bristol Jupiter XFA nine-cylinder supercharged air-cooled radial engine.

CONSTRUCTION.—The fuselage structure was similar to that of the Wapiti and Wallace—square duralumin tubing joined by bolted and tubular-riveted fish-plates—the portion aft of the front cockpit being covered with fabric, while the front fuselage was fitted with readily detachable metal panels. The wings were of fabric-covered duralumin construction, with a wide top centre-section and stub wings in the lower plane. Streamlined steel "N" struts joined the centre-section and stub wings at their outboard limits, while the outer wings, which were joined by built-up duralumin struts, were hinged to fold for shipboard stowage, the folded width being 20 ft. 4 ins. The ailerons were interchangeable between port and starboard and upper and lower planes.

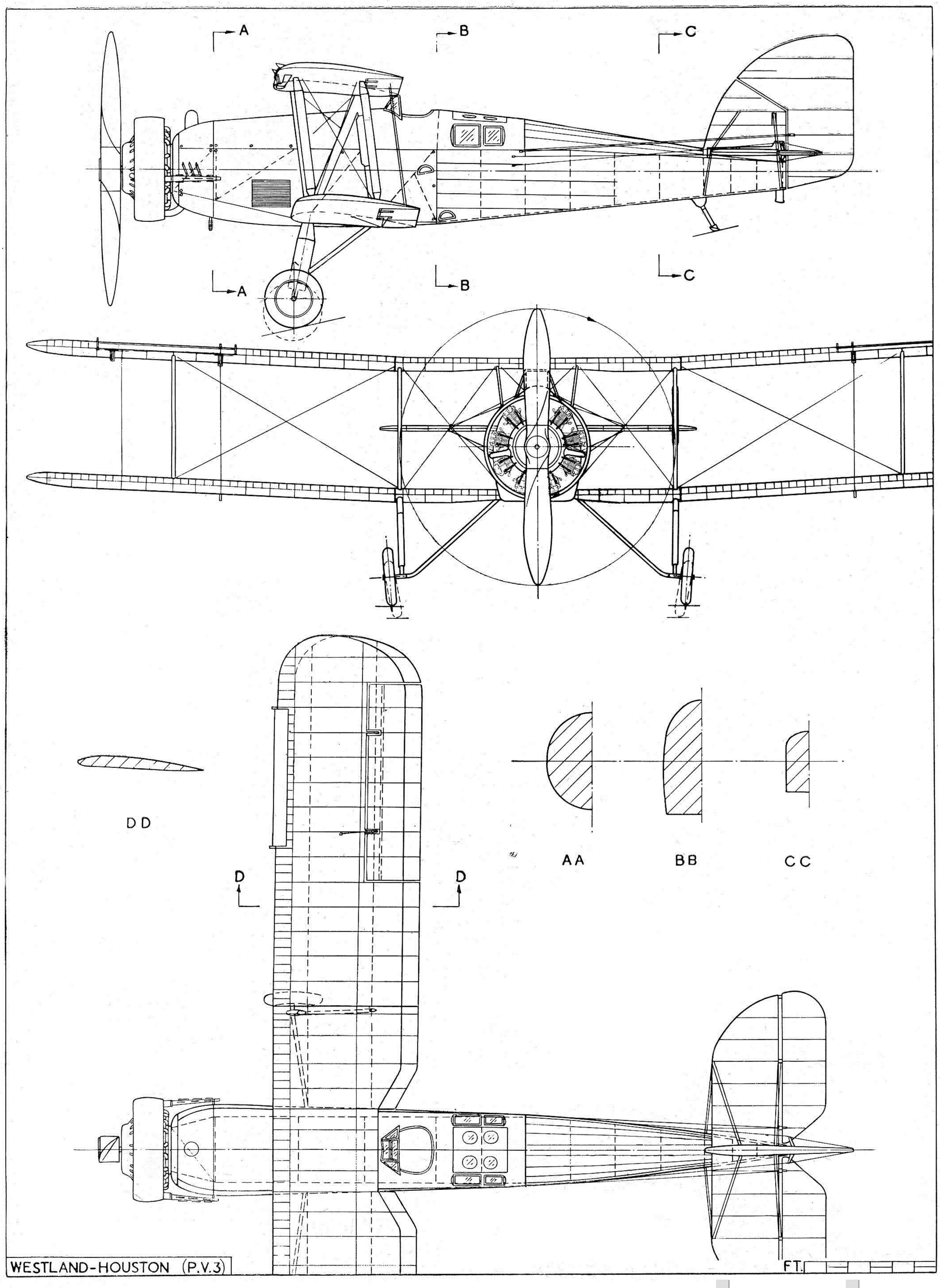
EQUIPMENT.—One synchronised Vickers gun, operated by the pilot, and one Mk. III Lewis gun, mounted on a No. 7 Scarff ring over the rear cockpit. Bomb load combinations—in place of a 1,000-lb. torpedo—ranged from two 550-lb. to four 112-lb. or sixteen 20-lb. bombs, or combinations of a similar weight. Provision was also made for three 250-litre oxygen cylinders, with two masks; two-way radio equipment; and a F.24 type camera.

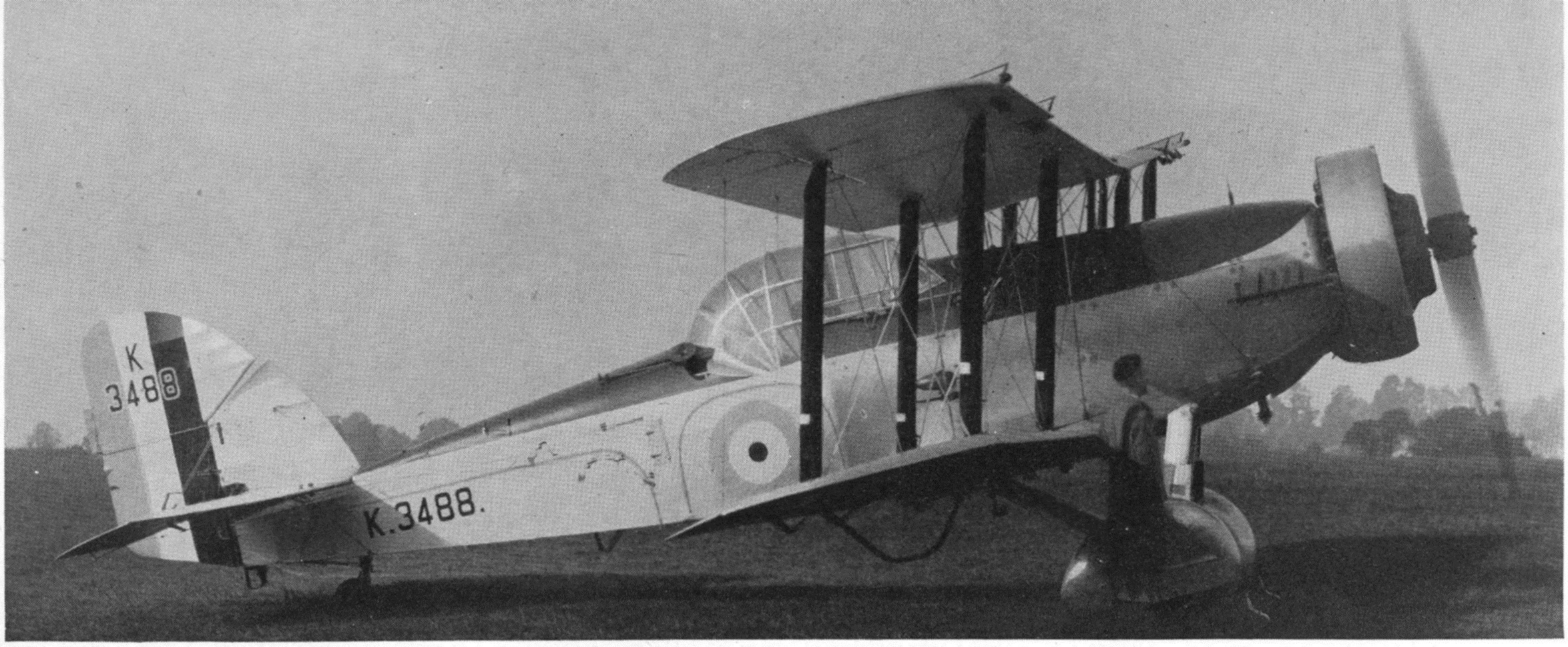
DIMENSIONS.—Span: 46 ft. 6 ins. (14.17 m.). Length: 34 ft. 2 ins. (10.41 m.). Height: 11 ft. 8 ins. (3.55 m.). Wing chord: 5 ft. 9¼ ins. (1.75 m.). Wing section: D.H.9A. Wing area: 500 sq. ft. (46.4 sq. m.). Sweepback: 4 ins. (.101 m.). Stagger: 9 ins. (.228 m.). Dihedral: 3 deg. Incidence: 3 deg. Wheel track: 12 ft. 10 ins. (3.91 m.). Weight, empty: 3,460 lbs. (1,569.4 kg.). Weight, loaded: 5,600 lbs. (2,540.1 kg.).

PERFORMANCE.—Speed: 163 m.p.h. (262.3 km./h.) at 13,000 feet (3,964 m.). Landing speed: 59 m.p.h. (94.9 km./h.).

Climb: To 5,000 feet (1,525 m.) in 4.7 minutes.
To 10,000 feet (3,050 m.) in 8.9 minutes.
To 15,000 feet. (4,575 m.) in 13.4 minutes.
To 20,000 feet (6,100 m.) in 20 minutes.

Ceiling (military version): 26,000 feet (7,928 m.).





THE WALLACE

In the year 1931 a British Empire Exhibition was held in Buenos Aires, Argentina, at which Westland was represented by a special A.S. Panther-engined Wapiti, G-AAWA, piloted by Mr. H. J. Penrose. This machine embodied the accumulated experience gained with the first 500 Wapitis constructed, and was fitted with a lengthened fuselage and braked undercarriage.

After a successful tour in South America the machine was returned to Yeovil, where further refinements were made, including the fitting of a divided axle chassis, improvements to the fuselage lines, and the installation of a Pegasus engine with Townend ring. By this time both the performance and the appearance of the aircraft differed considerably from that of the standard Wapiti and it was given the designation P.V.6, under which it successfully completed Air Ministry acceptance trials as a general-purpose machine.

With the placing of a production order the type was given the name of Wallace, but the original machine, again returned to Yeovil, underwent yet another change and was converted for service with the Houston-Mount Everest Expedition.

The very successful realisation of the Expedition's object brought this veteran aircraft once more into Westland hands, this time to be converted back into a standard Wallace and issued to a Squadron.

On the early Wallace machines the cockpits were of the open type, with a Scarff gun-ring over the rear cockpit, but the type is now best remembered by reason of a later development. This was the fitting of a transparent cabin over both cockpits, thus making it the first R.A.F. aeroplane to be so equipped. Apart from the greatly increased comfort, this enabled the Wallace to use its rear gun with increased accuracy when operating at maximum speed.

The Wallace had a long period of service with the Royal Air Force, and with the various Auxiliary Squadrons, and although succeeded by the Lysander and other general-purpose types it has also found use as a target-tower in the present war.

SPECIFICATION

TYPE.—Two-seat general-purpose biplane.

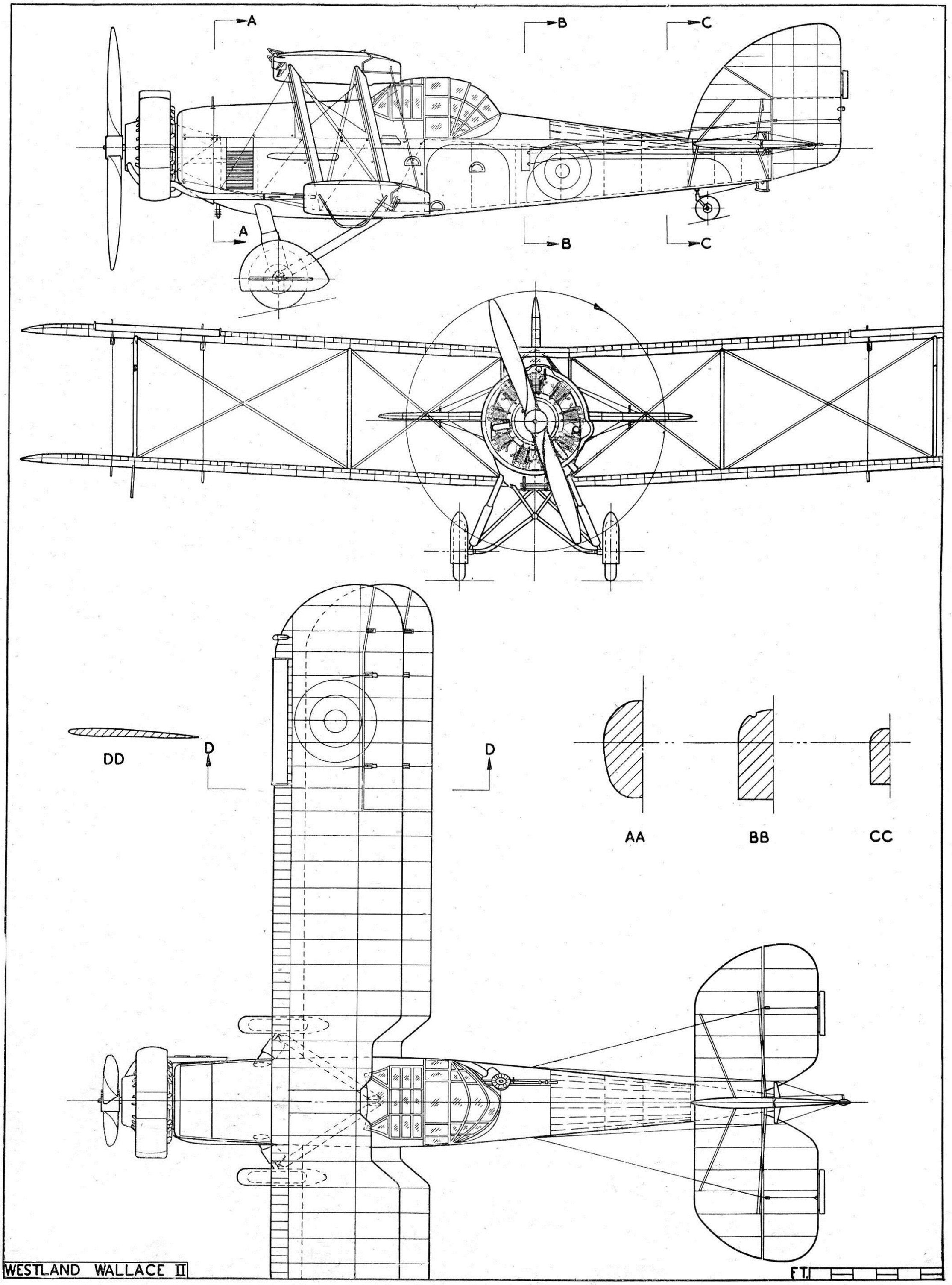
POWER.—One 655-h.p. Bristol Pegasus IV nine-cylinder air-cooled radial engine.

CONSTRUCTION.—The constructional system was similar to that employed in the Wapiti, the main points of difference being the rounded fuselage, totally enclosed cockpits and the divided-type braked undercarriage.

EQUIPMENT.—By the addition and rearrangement of various items of equipment the Wallace could be used for bombing, fighting, army co-operation, long-range patrol, training and as a seaplane. Standard armament consisted of a synchronised Vickers gun in the port front fuselage, operated by the pilot, with the observer's Lewis gun mounted in the aft decking. Oxygen, radio and photographic apparatus were carried, in addition to a 500-lb. bomb load.

DIMENSIONS.—Span : 46 ft. 5 ins. (14.1 m.). Length : 34 ft. 2 in. (10.4 m.). Height: 11 ft. 6 ins. (3.5 m.). Wing chord : 5 ft. 9 ins. (1.75 m.). Wing area : 488 sq. ft. (45.4 sq. m.). Wheel track : 6 ft. 10 ins. (2.1 m.). Weight, empty : 3,680 lbs. (1.670 kg.). Weight, loaded : 5,750 lbs. (2,610 kg.).

PERFORMANCE.—Speed : 180 m.p.h. (289 km./h.) at 15,000 ft. (4,575 m.).
Landing speed : 61 m.p.h. (98 km./h.).
Climb : To 10,000 ft. (3,050 m.) in 6.2 minutes.
To 20,000 ft. (6,100 m.) in 14.2 minutes.
Service ceiling : 30,000 feet (9,150 m.).



THE P.V.7

While the Wapiti and Wallace biplanes were yet giving good service with the Royal Air Force, thoughts were turning towards a successor capable of carrying a still greater load, and, in 1931, the Air Ministry issued a new General Purpose Specification—No. G.4/31—from which the Westland team produced a pleasing two-seat high-wing monoplane design, known as the P.V.7.

This machine, which was a further link in the Westland high-wing monoplane line, was capable of fulfilling all the standard general-purpose requirements and could, alternatively, be used as a torpedo-bomber, carrying an externally slung 1,000-lb. torpedo or an equivalent bomb load.

The preliminary test-flights at Yeovil, in the hands of Mr. H. J. Penrose, produced extremely satisfactory results and there were high hopes that the machine would have a long production run. However, while undergoing extended official trials at Martlesham Heath, the P.V.7 was unfortunately wrecked.

Mr. Penrose, who was flying the machine solo at the time, was engaged in making a series of dives under overload conditions and, while travelling at high speed in rough air, the port rear outrigger strut failed under an unexpected down-load. The resulting fracture brought about the collapse of the complete wing structure and, as it broke away from the machine, it severed the empennage. The pilot made what must be one of the first parachute escapes from an enclosed-cockpit military aeroplane, emerging through one of the small side doors of the coupé and eventually landing unhurt some distance from the wreckage.

The inevitable delay caused by the necessary investigation into the cause of the accident rendered the risk of building a further Private Venture too great, and the type, despite its great promise, was dropped. However, it paved the way for the next design, the Lysander, with results that are now a matter of world history.

SPECIFICATION

TYPE.—Two-seat general-purpose and torpedo-bomber high-wing monoplane.

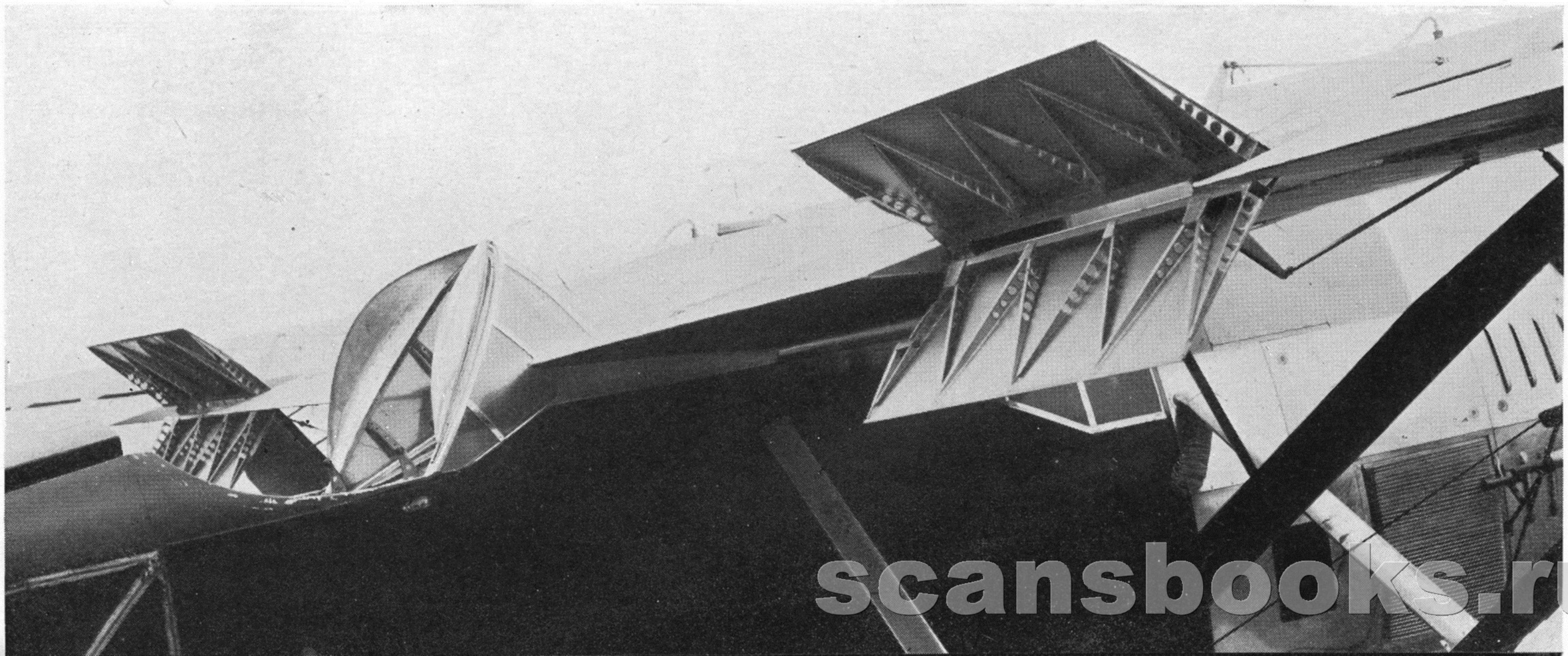
POWER.—One 722-h.p. Bristol Pegasus III M.3 nine-cylinder air-cooled radial engine.

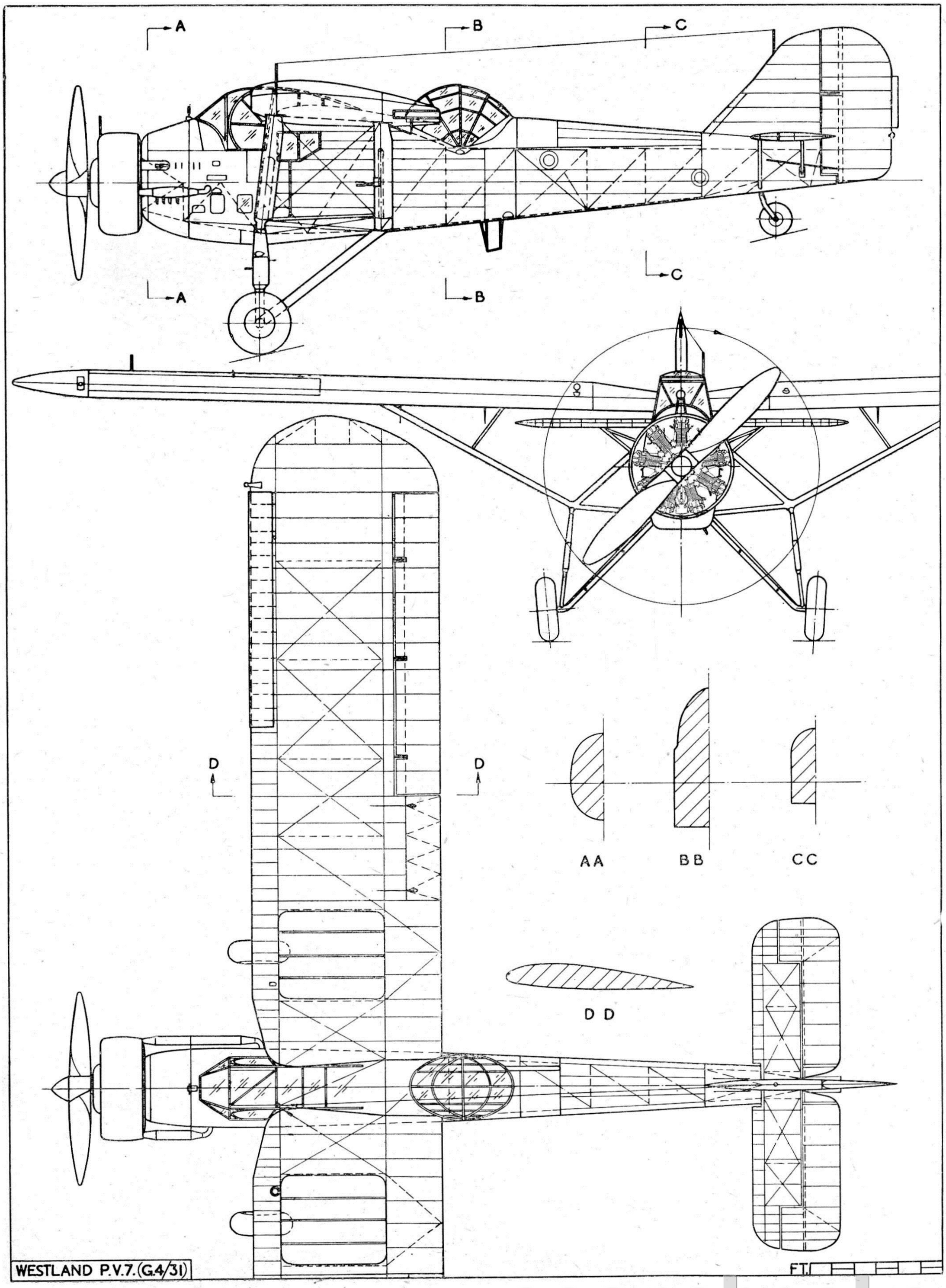
CONSTRUCTION.—The fuselage was of the standard Westland type, built up of square-section steel and duralumin tubing secured by flitch plates and tubular rivets. The pilot's cockpit was situated well forward, on the line of the leading-edge, while the gunner's cockpit was placed amidships, immediately aft of the trailing-edge. Both crew positions were protected by transparent covers, the aft cockpit being fitted with a patent segmental hood, which could be folded forward to allow free use of the machine-gun. The wings were of fabric-covered metal construction and fitted with the patent Westland electroscope split trailing-edge flaps, which acted as air-brakes. The main wing-bracing struts were of the lifting type, their area contributing to the wing area totals.

EQUIPMENT.—A synchronised Vickers gun, operated by the pilot, was fitted in the front fuselage, while a free Lewis gun was mounted in the after top decking. Provision was made for a 1,000-lb. torpedo, or an equivalent bomb load, carried externally under the fuselage.

DIMENSIONS.—Span : 60 ft. 3 ins. (18.36 m.). Length : 38 ft. 8 ins. (11.88 m.). Height : 12 ft. (3.65 m.). Chord : 8 ft. 6 ins. (2.69 m.). Wing area : 537 sq. ft. (49.8 sq. m.). Wing section : R.A.F.34. Wheel track : 12 ft. (3.65 m.). Dihedral : 1¾ deg. Incidence : 3 deg. Weight, empty : 4,515 lbs. (2,048 kg.). Weight, loaded : 7,172 lbs. (3,395 kg.).

PERFORMANCE.—Speed : 173 m.p.h. (278.4 km./h.) at 5,000 ft. (1,525 m.).
Climb : To 5,000 ft. (1,525 m.) in 3.5 minutes.
To 10,000 ft. (3,050 m.) in 8 minutes.
Absolute ceiling : 22,700 ft. (6,922 m.).





THE F.7/30

The Battle of Britain, in 1940, was largely won by the terrific fire power of the eight-gun Hurricane and Spitfire fighters and, at that time, many people thought the idea of multi-gun fighters was an innovation born of necessity. Such was not the case, however, for this type of aircraft had been developed over a number of years, one of the earliest examples being the Westland F.7/30, a biplane first flown by Mr. H. J. Penrose in the year 1934.

The F.7/30 was designed to an Air Ministry Specification, issued in 1930, for a high-speed single-seat fighter incorporating the 600-h.p. Rolls Royce Goshawk engine, the main feature of which was a long shaft connecting the airscrew and the gears built into the engine. This form of motive power enabled the engine mass to be positioned near the machine's centre of gravity amidships, with the pilot and his armament placed well forward, between the airscrew and the engine.

In the early stages of the design the F.7/30 was drawn as a monoplane, following the Westland trend, but as the Specification required the machine to have a low landing speed it was finally decided to produce it in biplane form, with a much lower maximum speed.

The four synchronised Vickers guns were arranged in the fairing of the front fuselage, two on either side, their fire converging in cone form on a point ahead of the machine. The information gained from tests of this and other similar gun installations has had an important bearing on modern air armament ideas.

Due to the concentration of weight around the F.7/30's centre of gravity an exceptionally high degree of manœuvrability was obtained, while the arrangement of the pilot's cockpit gave a range of vision which has seldom been equalled in fighter aircraft. The Specification, unfortunately, was not developed and the type did not go into production, but the only specimen had a useful career as an experimental machine.

SPECIFICATION

TYPE.—Single-seat fighter biplane.

POWER.—One 600-h.p. Rolls Royce Goshawk liquid-cooled vee-type engine, with gears and shaft airscrew drive.

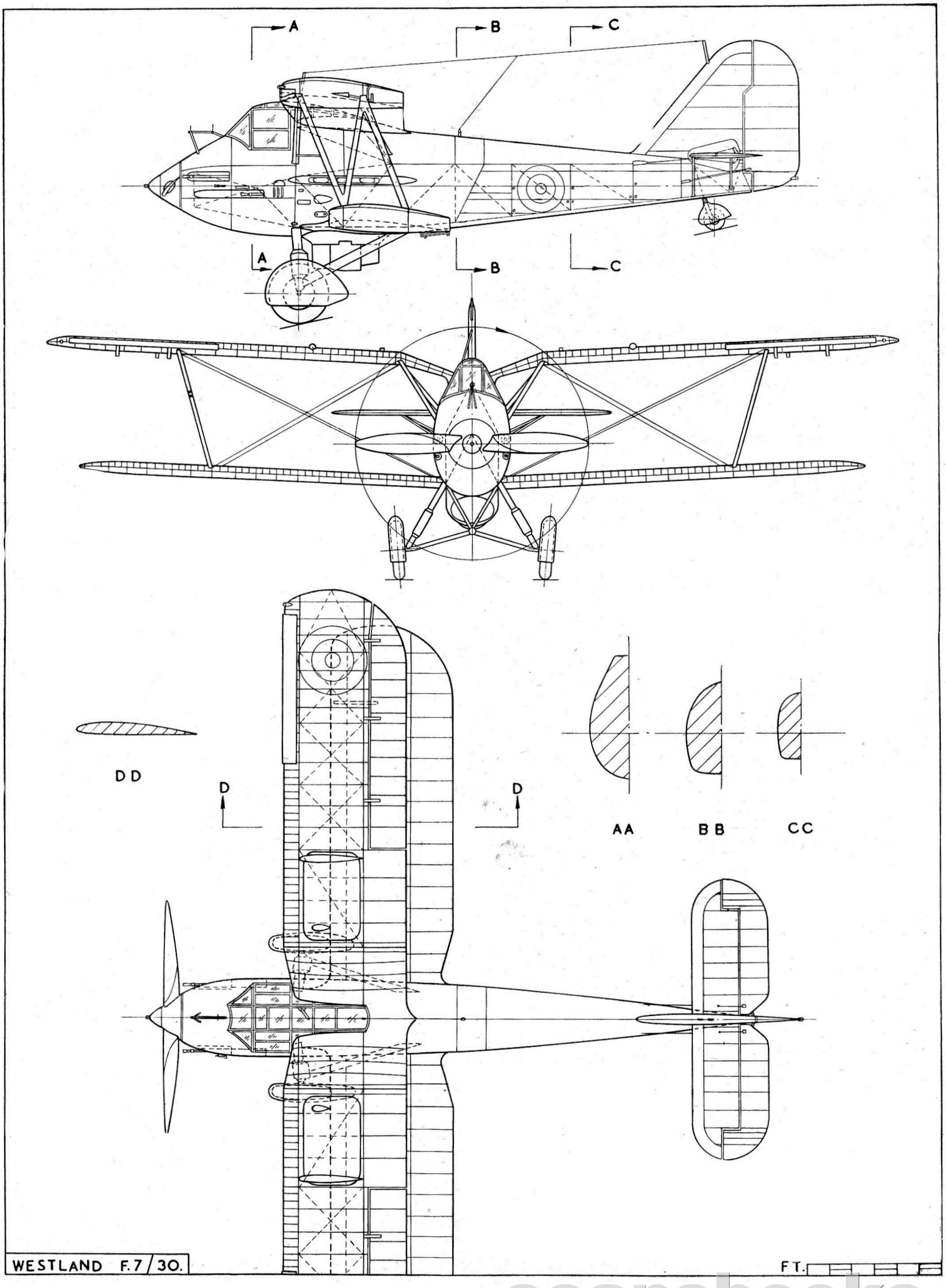
CONSTRUCTION.—The fuselage was of square-section duralumin tubing, arranged in the standard Westland form. Detachable metal panels extended from the airscrew to a point aft of the engine installation, the remainder of the fuselage being fabric covered. The wings were of duralumin, fabric covered. Automatic slots and ailerons were fitted to the upper main planes only.

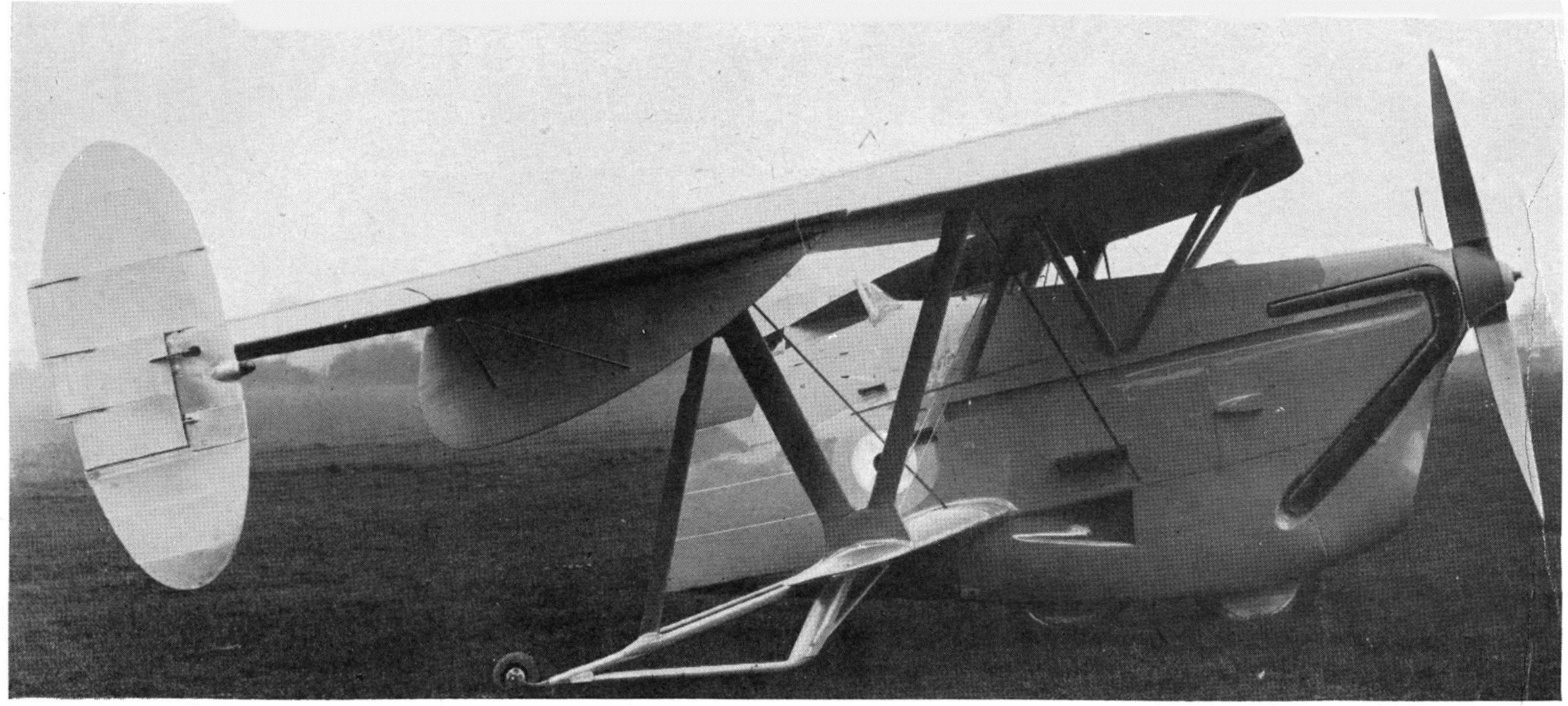
EQUIPMENT.—Four synchronised Vickers guns were fitted, with racks for a number of small bombs. Provision was also made for two-way radio, night-flying, and oxygen equipment.

DIMENSIONS.—Span : 38 ft. 6 ins. (11.7 m.) top plane, 33 ft. 5 ins. (10.1 m.) bottom plane. Length : 29 ft. 6 ins. (8.9 m.). Height : 10 ft. 9 ins. (3.2 m.). Wing chord : 5 ft. 6 ins. (1.67 m.). Wing area : 370 sq. ft. (34.37 sq. m.). Wing section : R.A.F. 28. Wheel track : 6 ft. 6 ins. (1.98 m.). Dihedral : 2½ deg. Incidence : 2½ deg. Weight, empty : 3,624 lbs. (1,643.9 kg.). Weight, loaded : 5,170 lbs. (2,345 kg.).

PERFORMANCE.—Speed : 185 m.p.h. (287.7 km./h.) at 15,000 ft. (4,575 m.).

Climb : To 10,000 ft. (3,050 m.) in 7½ minutes.
To 15,000 ft. (4,575 m.) in 11½ minutes.
To 20,000 ft. (6,100 m.) in 17½ minutes.





THE PTERODACTYL MARK V

The fourth Pterodactyl, and third and final Westland-Hill production, was the Pterodactyl Mk. V, which made its appearance in 1932. This machine was an impressive two-seater fighter, powered with a 600-h.p. Rolls Royce Goshawk engine, and differed noticeably from previous Pterodactyl designs. The most striking departure was the tractor arrangement of the engine, as opposed to the earlier " pusher " types, while the wings were in sesquiplane form, with the upper plane raised above the fuselage.

The military advantages foreshadowed in the first Pterodactyl were brought to practical form in the Mark V, the rear cockpit, immediately aft of the pilot, being fitted with an electrically-operated twin-gun turret. The unobstructed field of fire from this position has only been equalled by the tail gun-turrets of modern multi-engined bombers and, with a performance equal to that of its contemporary, the Hawker Hart, the Pterodactyl V was an ideal fighter type.

Test flights, by Mr. H. J. Penrose, showed that with this example the tailless type had attained a degree of performance, stability and control equal to the conventional aeroplane. It was demonstrated to be fully aerobatic and even capable of inverted flight, but, although so successful as an experimental machine, certain secondary problems rendered a degree of re-design necessary for production.

However, the Pterodactyl Mk. V proved to be the last of Captain Hill's designs to be produced before he accepted the Chair of Engineering Science at London University, but recently (1942) he registered further tailless aircraft designs, and there is every hope that more will be seen of a type of aeroplane which may show outstanding advantages for jet propulsion.

SPECIFICATION

TYPE.—Two-seat tailless fighter sesquiplane.

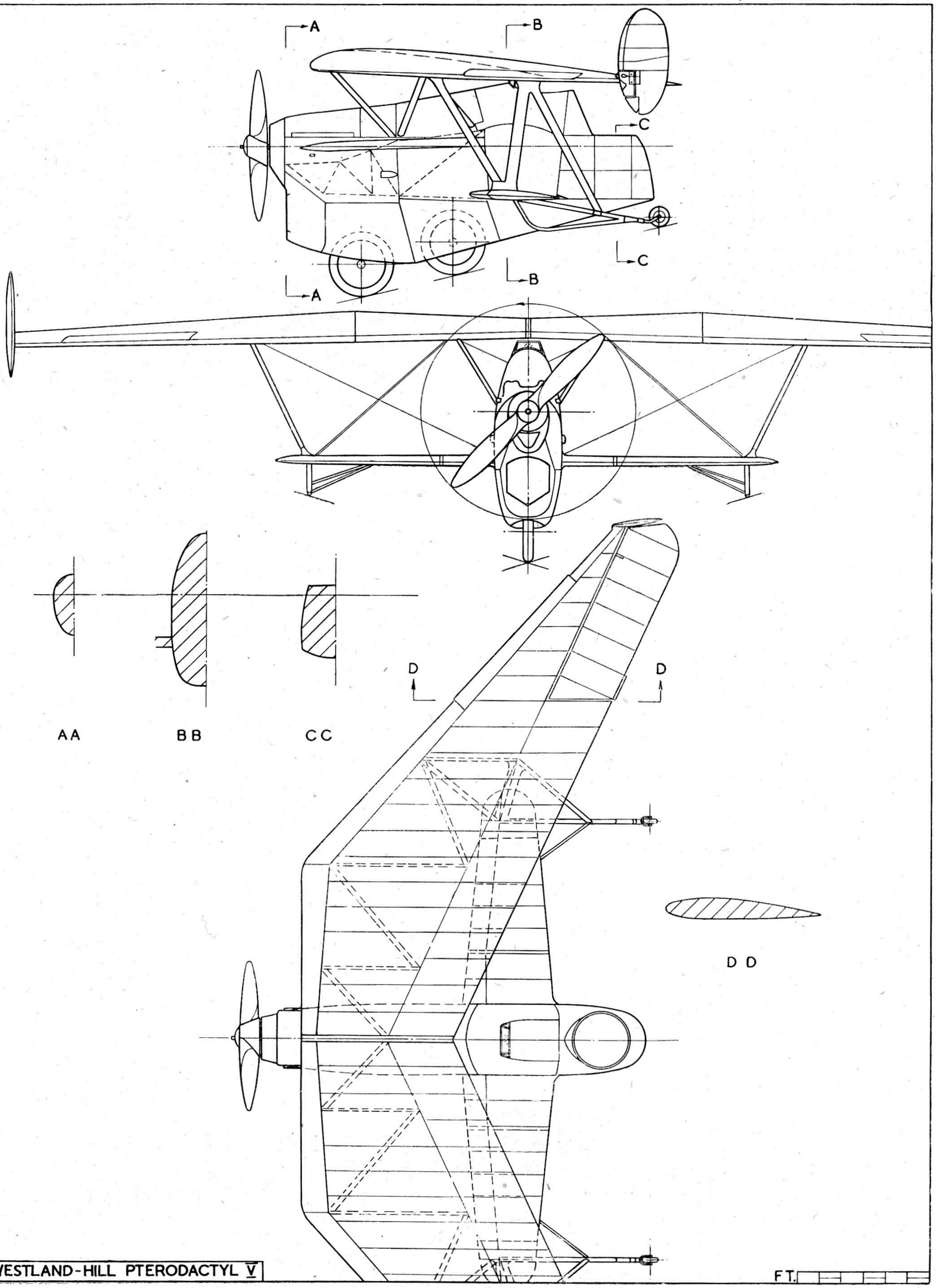
POWER.—One 600-h.p. Rolls Royce Goshawk steam-cooled vee-type engine.

CONSTRUCTION.—The fuselage structure was of plate-jointed square-section steel and duralumin tubing, covered with detachable metal panels. The pilot's cockpit was placed aft of the main plane trailing edge, with the rear gunner's position immediately behind. The wing spars and ribs were built up of duralumin tubes and sections, fabric covered, and fitted with the characteristic Pterodactyl " elevons." The small lower plane, although contributing a useful share of lift, mainly served a structural purpose and assisted in the distribution of the stresses set up in inverted flight. The two-wheel tandem undercarriage was arranged in a rocking frame, connected to the fuselage by a single oleo-leg. The rear wheel was braked, while ground steering was effected by turning the front wheel through a small angle.

EQUIPMENT.—Two synchronised Vickers guns, operated by the pilot, were fitted in channels on either side of the fuselage. Provision was also made for a special electrically-operated multi-gun turret to be fitted in the rear gunner's position. The standard fighter bomb load could be carried, also oxygen and two-way radio equipment.

DIMENSIONS.—Span : 46 ft. 8 ins. (14.22 m.). Length : 20 ft. 6 ins. (6.24 m.). Height : 11 ft. 8 ins. (3.55 m.). Mean wing chord : 6 ft. 8½ ins. (2.04 m.). Wing area : 396 sq. ft. (36.7 sq. m.). Wing section : R.A.F. 34. Sweepback : leading edge 47½ deg., trailing edge 65 deg. Incidence : 2 deg. at elbow, 5½ deg. at centre line. Weight, empty : 3,534 lbs. (1,602 kg.). Weight, loaded : 5,100 lbs. (2,313 kg.).

PERFORMANCE.—Speed : 190 m.p.h. (305.7 km./h.) at 15,000 ft. (4,575 m.).
Landing speed : 66 m.p.h. (106.2 km./h.) .
Climb : 1,450 ft. (426.7 m.) per minute at 12,000 ft. (3,659 m.).
Service ceiling : 30,000 ft. (9,150 m.).



WESTLAND-HILL PTERODACTYL V

F.T.

THE C.29 AUTOGIRO

Rotating-wing aircraft and helicopters hold the interest of many in the world of aviation, and their unique operational uses are beyond dispute, but the problems and limitations connected with their design and manufacture are such that, up to the present, little progress has been made in producing large commercial machines on these lines.

In 1934, however, the Westland design staff, in co-operation with Señor Cierva, of the Cierva Autogiro Company, produced a large five-seat cabin autogiro, powered with a 600-h.p. Armstrong Siddeley Panther engine. It was much larger and heavier than anything of its kind previously attempted. The Cierva Company was responsible for the rotors and rotor mechanism, the direct control system being employed, while the airframe was designed and built by Westland.

Test of this machine, which was known as the C.29 Autogiro, disclosed vibration problems with the rotor system, which could not be immediately solved. In the circumstances it was decided to shelve this particular design, until further experience had been gained with other experimental autogiros, but the untimely death of Señor Cierva ultimately prevented development of this work.

SPECIFICATION

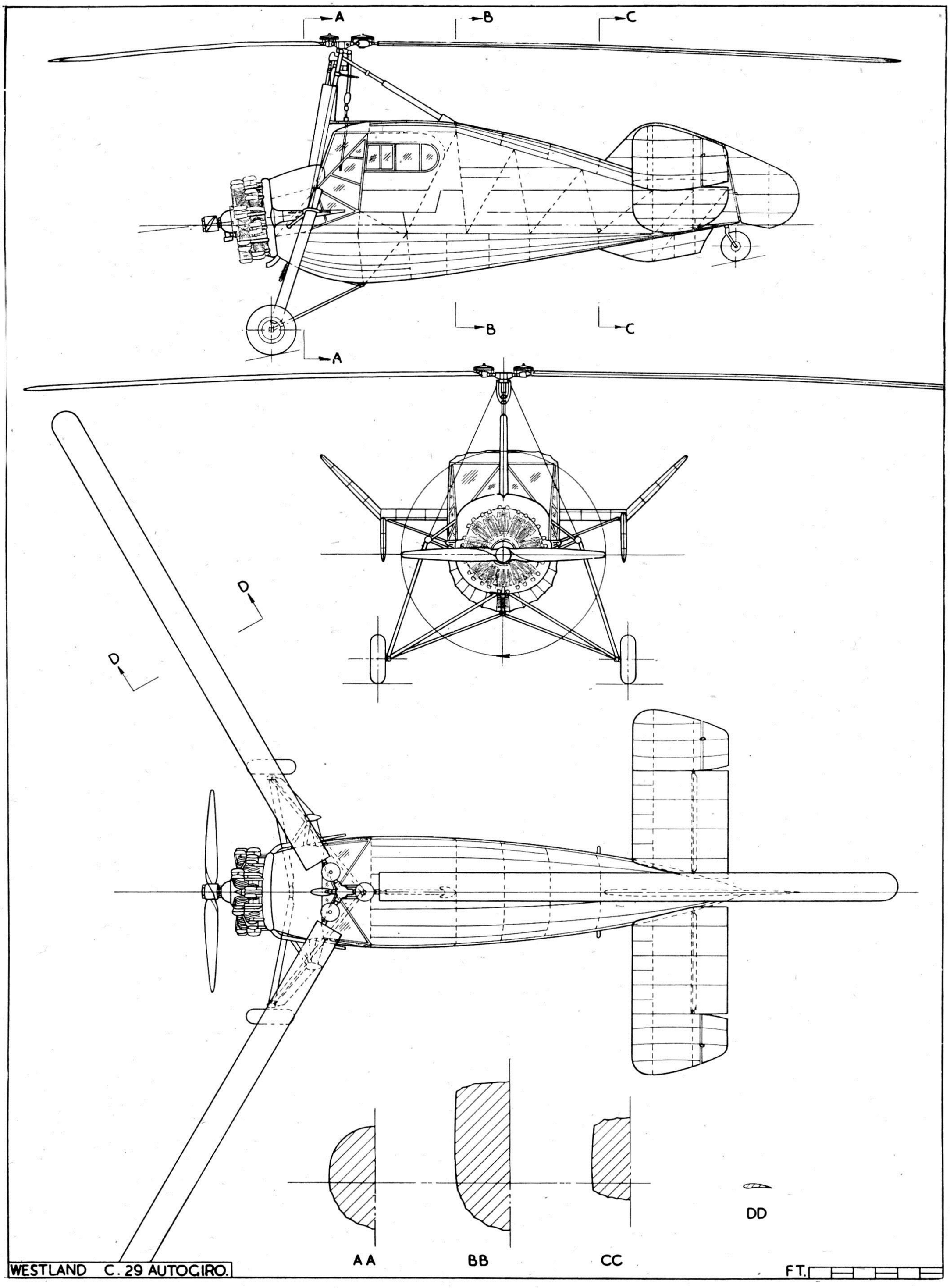
TYPE.—Experimental five-seat cabin autogiro.

POWER.—One 600-h.p. Armstrong Siddeley Panther fourteen-cylinder double-bank air-cooled radial engine.

CONSTRUCTION.—The fuselage was of square-section steel and duralumin tubing, arranged in the characteristic Westland style, with composite stringers and formers to give a deep oval section. The fabric-covered tailplane and vertical and oblique fins were built up of duralumin tubing and pressings, the aerofoil section of the port half of the tailplane being inverted, to offset airscrew torque effect. The seating in the roomy cabin was arranged in the 2-3 plan, as in a car.

DIMENSIONS.—Rotor Diameter : 50 ft. (15.23 m.). Length : 38 ft. (11.58 m.). Height : 12 ft. 9 ins. (3.88 m.). Rotor chord : 1 ft. 3 ins. (0.38 m.). Rotor section : Got. 606. Wheel track : 11 ft. 3 ins. (3.42 m.). Weight, empty : 3,221 lbs. (1,461 kg.). Weight, loaded : 5,000 lbs. (2,268 kg.).

PERFORMANCE (Estimated).—Speed : 160 m.p.h. (257.4 km./h.).
Landing speed : 21 m.p.h. (33.7 km./h.).
Climb : 1,500 ft. (475 m.) per minute.



THE LYSANDER

In 1934 the Air Ministry issued a Specification for an Army Co-operation aircraft, for which Westland submitted a design. In the extraordinarily short time of a year, from the acceptance of their tender, the Company had flown their answer, a high-wing cabin monoplane which has since become even more famous and widely known than the celebrated Wapiti.

Known as the Lysander, the machine was the first aeroplane to be built from designs made under the technical direction of Mr. W. E. W. Petter, B.A. In it the Westland team, headed by Mr. Arthur Davenport, designed an aeroplane which was a worthy descendant of the little Widgeon I, by way of the Wizard, Witch, Wessex and P.V.7 high-wing monoplanes.

When the design of the Lysander was initiated the practical advice of serving Army Co-operation pilots was sought, so that every necessary quality to facilitate their duties could be incorporated. The result was the first fully slotted and flapped machine ever to go into Service use and which, despite its heavy wing loading, could land and take off on a football pitch with astonishing ease. It was also a relatively simple matter to make perfect three-point landings without touching the Lysander's controls, by adjusting the engine revolutions to give the requisite rate of descent in a semi-stalled glide.

The prototype Lysander was initially test-flown by Mr. H. J. Penrose, and the second prototype, K.6128, was sent out to the North-West Frontier of India, for tests on active service.

Besides those at Home and in the East, four Squadrons of Lysanders saw service in France and Belgium in the early days of the Second World War and, during the evacuation which followed the fall of France, in 1940, they were used to drop parachuted supplies to the heroic defenders of Calais. As the tide of war flowed on the Lysander was adapted to varied operational uses and became, among other things, a night-fighter, ground attacker, target-tower, glider tug and air-sea rescue machine. In the latter form it was used to locate air crews forced down in the sea, drop them dinghies and supplies and direct their rescue by fast motor launches, its ability to fly slowly, under complete control, proving invaluable in this work.

Incidentally, the machine became so well known that aircraft spotters divided their classifications into two sections—aeroplanes and Lysanders !

SPECIFICATION

TYPE.—Two-seat Army Co-operation high-wing monoplane.

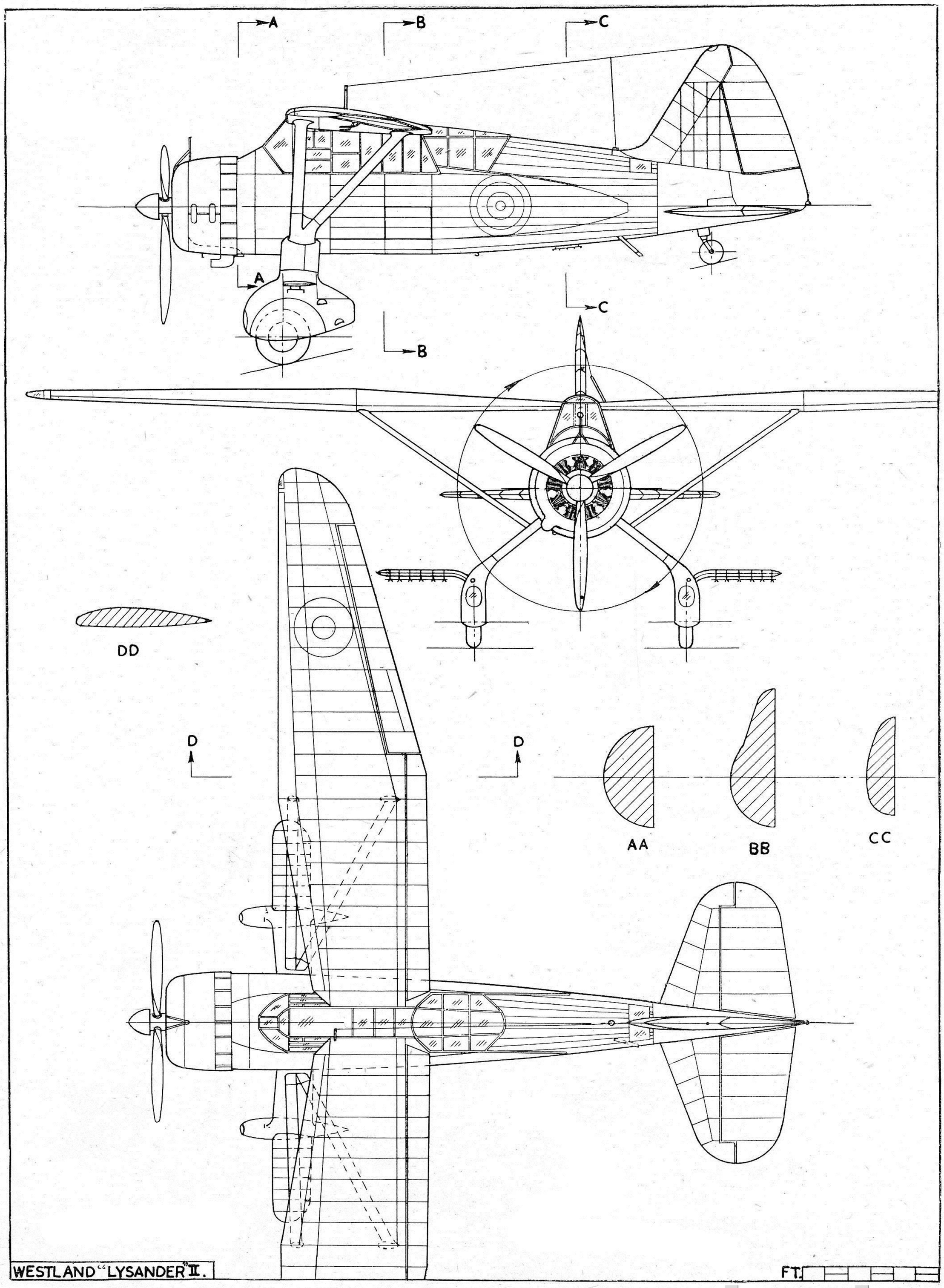
POWER.—One 890-h.p. Bristol Mercury XII nine-cylinder air-cooled radial engine.

CONSTRUCTION.—The front fuselage was a rectangular structure built up of square-section duralumin tubes and bolted to the rear section, which was of welded seamless steel tubing, also arranged in rectangular form. The faired oval fuselage section was obtained by the use of detachable panels, fabric covered on wooden formers and stringers. The single-spar wings were of all-metal construction, with a metal covering extending from the leading edge to the main spar, the slotted flaps were arranged so that they were automatically lowered by the opening operation of the root slats. The divided-type undercarriage members were formed from a single light alloy extrusion of box form.

ARMAMENT.—One fixed Browning machine-gun, operated by the pilot, was fitted in each wheel spat, firing forwards outside the airscrew disc. Free twin Browning machine-guns were mounted in the rear cockpit, while twelve light anti-personnel bombs could be carried under stub wings.

DIMENSIONS.—Span : 50 ft. (15.23 m.). Length : 30 ft. (9.14 m.). Height : 11 ft. (3.35 m.). Wing area : 260 sq. ft. (24.15 sq. m.). Wheel track : 9 ft. (2.74 m.). Dihedral : 3 deg. Incidence : 2 deg. Weight, empty : 4,044 lbs. (1,834 kg.). Weight, loaded : 5,833 lbs. (2,645 kg.). Maximum overload : 7,500 lbs. (3,544 kg.).

PERFORMANCE.—Speed : 237 m.p.h. (381.4 km./h.) at 10,000 feet (3,050 m.).
Stalling speed : 65 m.p.h. (104.6 km./h.).
Climb : To 10,000 feet (3,050 m.) in 5.5 minutes.
To 15,000 feet (4,575 m.) in 9.5 minutes.
To 20,000 feet (6,100 m.) in 15.6 minutes.



THE C.L.20 AUTOGIRO

It is true that man has conquered the air and annihilated distance, but his victory will not be truly complete until he is able to perform with the same degree of skill as Nature's aviators, the birds, with their control of wide speed ranges and ability to take off and land safely in very confined spaces.

Many experiments have been made to achieve this desirable end, but only with light rotating-wing—or autogiro—aircraft has any measure of success been attained. With these machines it is now possible to fly quite slowly, in perfect safety, and to take off and alight in areas comparable to the size of a tennis court, but the problems attaching to the design and operation of large commercial aircraft of this type have still to be overcome.

The development of the successful light autogiro, however, has been in two stages, the first being that in which the rotors revolved in a fixed plane in relation to the fuselage, and flight evolutions were effected by a set of normal aeroplane controls. The second stage was reached with the direct-control autogiro, in which the rotor hub could be moved and the plane of the rotors varied in relation to the fuselage, thus effecting directional control.

At this stage the question of comfort arose, and Westland, in conjunction with the Cierva Company and M. Lepere, produced the C.L.20 Autogiro, a neat two-seat side-by-side cabin machine.

This experimental aircraft, which was successfully flight-tested by the Cierva Company's pilot, Mr. R. A. C. Brie, would have undoubtedly proved extremely popular with private owners, but the shadow of impending hostilities prevented its production in quantity and closed, for the time being, Westland interest and activity in this field of aeronautics.

SPECIFICATION

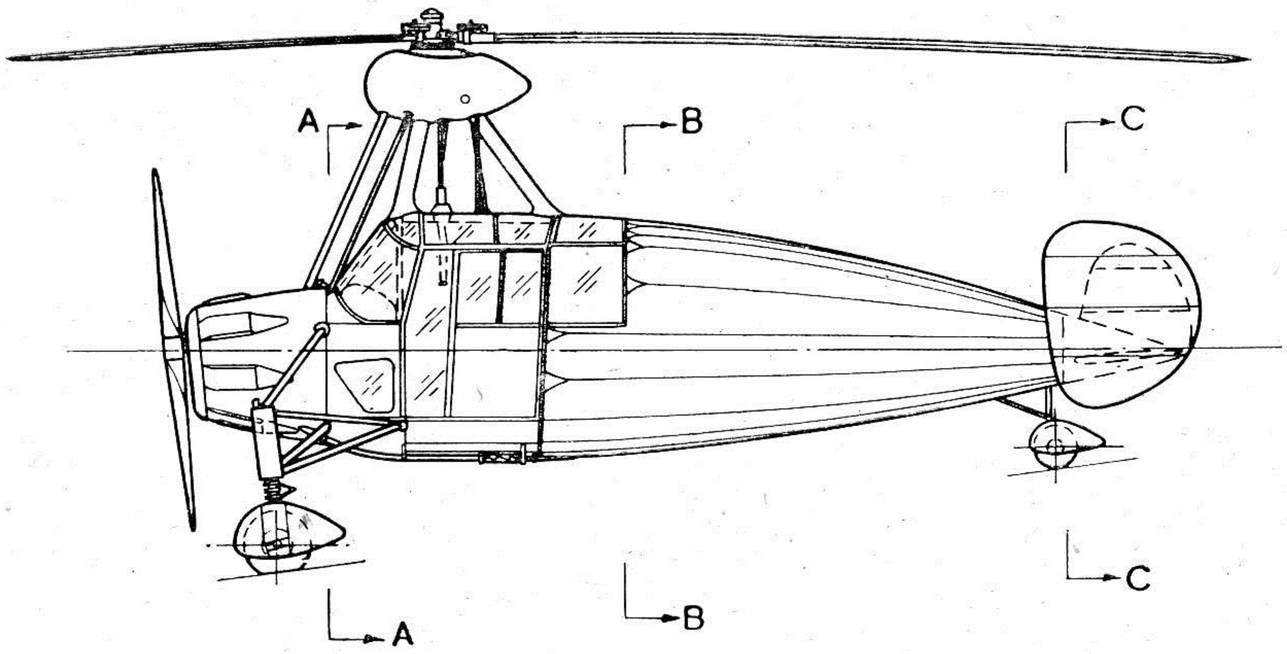
TYPE.—Two-seat side-by-side cabin autogiro.

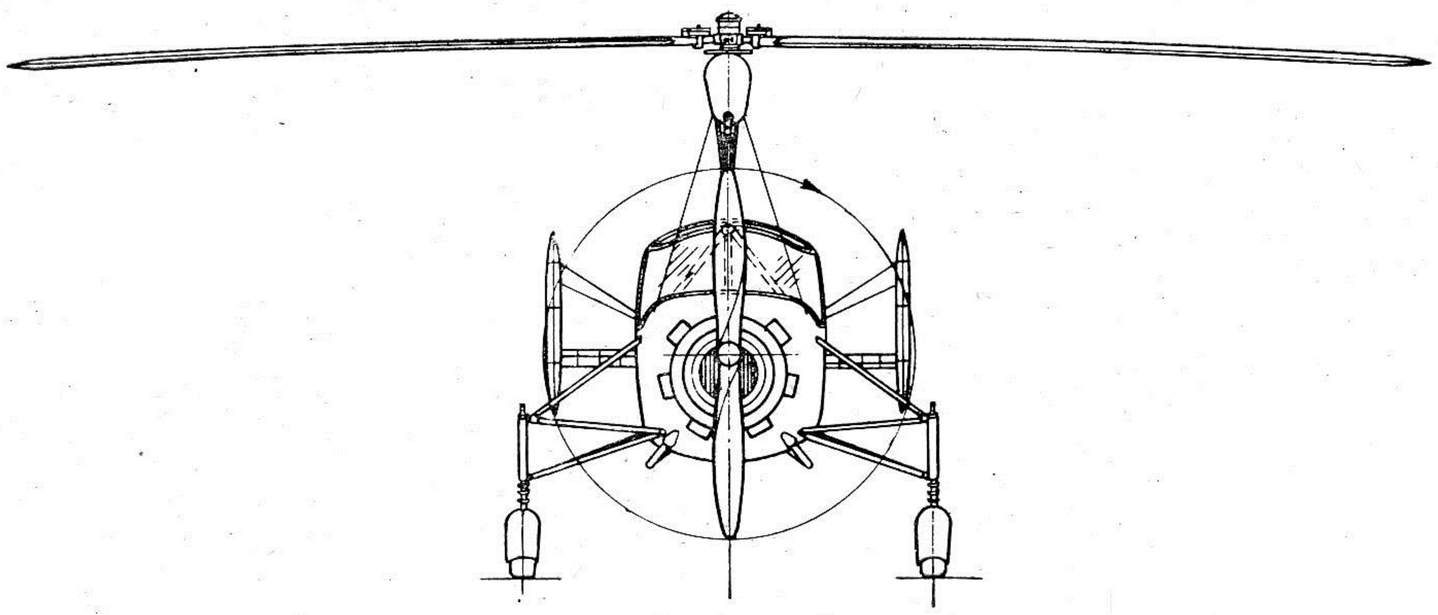
POWER.—One 90-h.p. Pobjoy Niagara " S " seven-cylinder air-cooled radial engine.

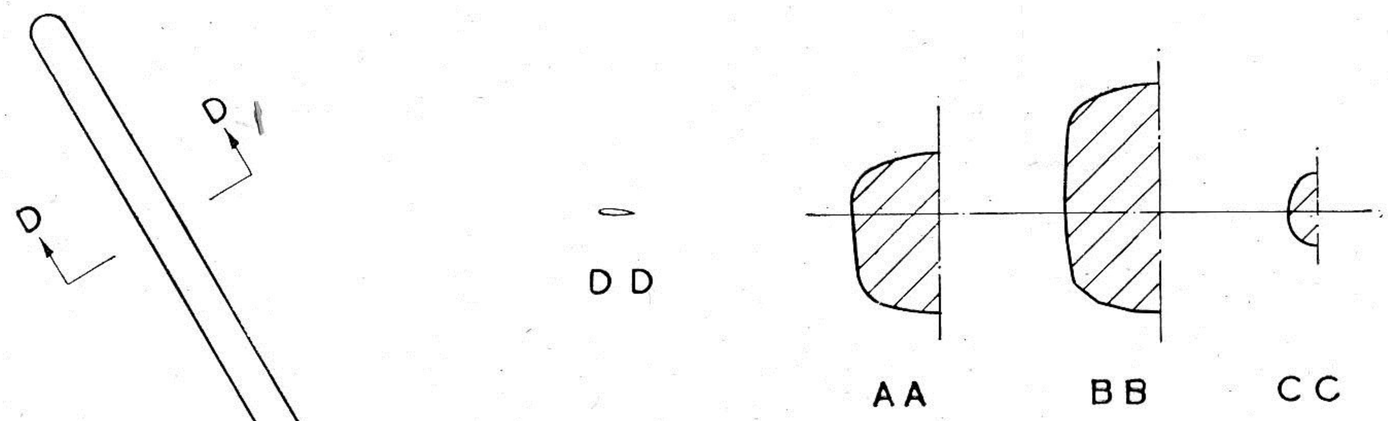
CONSTRUCTION.—The fuselage was of welded seamless steel tubing, triangulated and faired to a streamline form by the use of stringers and fabric covering. A large door was fitted on either side of the cockpit and transparent panels, running right down to the bottom longeron, gave an excellent forward and downward range of vision. The three-blade direct control rotor was arranged to fold, to facilitate parking and storage. Three vertical fins gave directional stability, while the tailplane was designed so that the aerofoil section of one half was inverted, and set at a negative angle of incidence, to counteract airscrew torque.

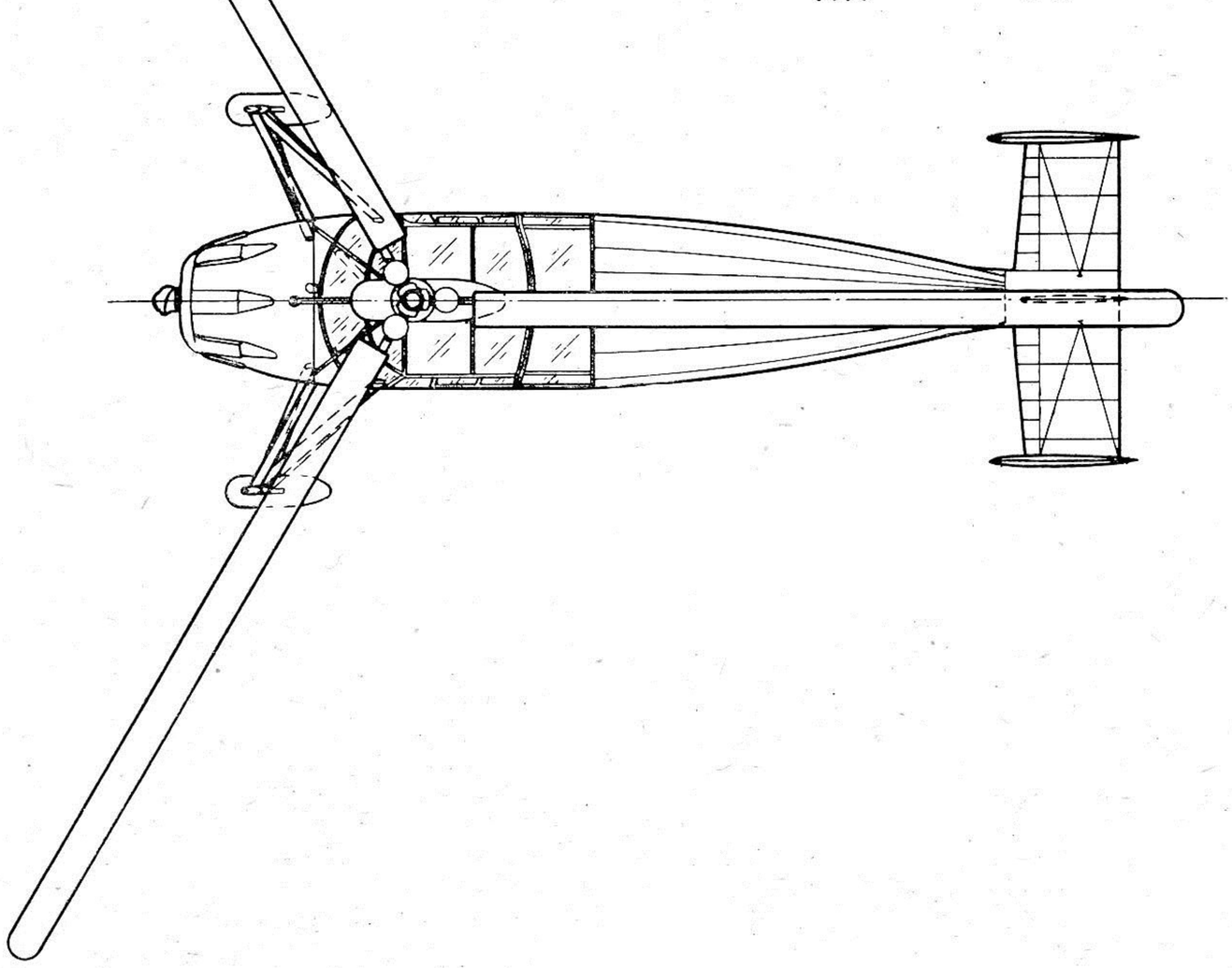
DIMENSIONS.—Rotor diameter : 32 ft. (9.75 m.). Length : 20 ft. 3 ins. (6.17 m.). Height : 10 ft. 3 ins. (3.12 m.). Wheel track : 8 ft. (2.43 m.). Weight, empty : 840 lbs. (381 kg.). Weight, loaded : 1,400 lbs. (635 kg.).

PERFORMANCE.—Speed : 106 m.p.h. (170.59 km./h.). Landing speed : 25 m.p.h. (40.23 km./h.).









WESTLAND AUTOGIRO C.L.20.

FT.

THE WHIRLWIND

Although not the most recent type of aeroplane produced by Westland Aircraft, the Whirlwind fighter monoplane is the latest machine about which information may be released, and its extremely interesting story is a fitting finale to the first twenty-nine years of Westland history.

The design of the Whirlwind was commenced in 1936, to an Air Ministry Specification—No. F.37/35—for a small twin-engined single-seat fighter, and the prototype was first flown by Mr. H. J. Penrose in the second week of October, 1938.

After very satisfactory handling and gun-firing acceptance trials the Whirlwind was put into production, and Royal Air Force Squadrons began receiving them in June, 1940—an event noteworthy because this aeroplane was the first Westland fighter ever to be produced in quantity for the R.A.F., and further it was the first single-seat twin-engined fighter to be used in numbers by any of the belligerent powers. It proved to be highly manœuvrable, and its speed at low altitudes was as great as, if not faster than, its contemporary single-seat fighters.

Until information was released, early in 1942, the existence of the Whirlwind was supposed to be a closely guarded secret, but there is evidence that both friends and enemies knew quite a lot about it. Just how much is not yet known, but at any rate there is a story that two Dorniers encountered an unarmed Whirlwind above the clouds over Southern England, in the stirring year of 1940. The bombers appeared to recognise the Whirlwind's outline, turned tail, and promptly dived for cloud cover—little knowing that the test-pilot was about to make an equally hasty departure via the clouds in the opposite direction !

The basic feature of the Whirlwind was its concentration of fire-power and it was to facilitate this, and give a good fighting view, that the twin-engined arrangement was adopted. In service the machine, armed with four fixed 20 mm shell-guns, was mainly employed in shooting up enemy shipping along the French coast and in train-wrecking. A later bomb-carrying version, known as the Whirlibomber, destroyed railway viaducts and harbour installations in north-western France. Also, for a time, the Whirlwind was used as a night-fighter and on bomber escort duties and, in the latter case, covered formations of medium bombers as far into enemy territory as Cologne.

SPECIFICATION

TYPE.—Single-seat twin-engined low-wing fighter monoplane.

POWER.—Two 885-h.p. Rolls Royce Peregrine liquid-cooled vee-type engines.

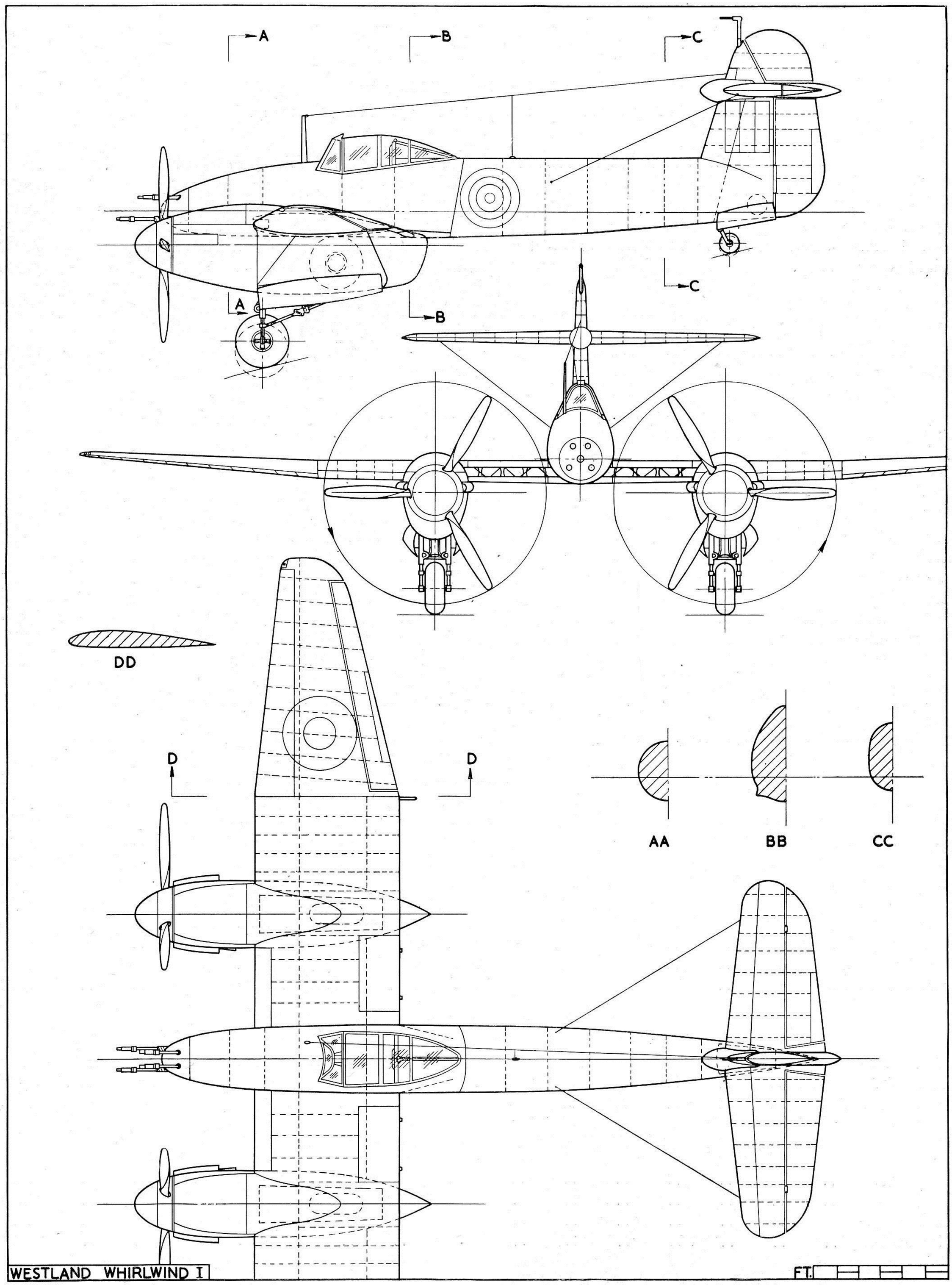
CONSTRUCTION.—The fuselage was of relatively thick-skin monocoque construction, planked longitudinally and using a minimum of formers. The single-spare wings, of stressed-skin metal construction, were built in three units, a large centre-section, housing the engines, being let into, but detachable from, the fuselage. High-lift Fowler-type trailing-edge flaps were fitted from aileron to aileron. Large area Handley Page slots were fitted to the outer wings, materially increasing the maximum lift coefficient, but later they were locked shut, since it was found that the machine's behaviour at the stall was still excellent, although the landing speed was somewhat increased. A hitherto untried feature was the position of the coolant radiators, fitted within the wings, and receiving air from leading-edge ducts between the fuselage and engine nacelles. The undercarriage was of the backward retracting type, the wheels being totally enclosed in the rear of the engine nacelles when drawn up. The tailwheel was also fully retractable.

ACCOMMODATION.—The pilot's cockpit, behind the fuselage nose, was over the rear half of the wing chord, giving wide ranges of unobstructed vision, and was fitted with the usual amount of armour protection. The close proximity of the radiator ducts enabled the cockpit to be comfortably warmed at all altitudes.

EQUIPMENT.—Four fixed 20 mm Hispano shell-guns, mounted in the fuselage nose, was the standard armament, but it was also possible to fit combinations of shell-guns and machine-guns. In the Whirlibomber high-explosive bombs were slung on external racks, on the underside of the wings outboard of the engines. Provision was also made for two-way radio, airscrew de-icing and tropical equipment, in addition to the standard fighter equipment.

DIMENSIONS.—Span : 45 ft. (13.7 m.). Length : 32 ft. 9 ins. (9.98 m.). Height : 11 ft. 7 ins. (3.52 m.). Chord : 5 ft. $6\frac{3}{4}$ ins. (1.69 m.). Wing Area : 250 sq. ft. (13.2 sq. m.). Wing section : N.A.C.A. (23017-08). Wheel track : 12 ft. 9 ins. (3.88 m.). Dihedral : inner 1 deg., outer 4 deg. Incidence : nil. Weight, empty : 7,840 lbs. (3,698.52 kg.). Weight, loaded : 10,270 lbs. (4,658.37 kg.).

PERFORMANCE.—Speed : 360 m.p.h. (579.37 km/h.) at 15,000 feet (4,575 m.).
Landing speed : 80 m.p.h. (128.75 km./h).
Climb : To 15,000 feet (4,575 m.) in 5.8 minutes.



WESTLAND STAFF

The following table gives the main functional divisions and official positions and names of the senior staff, with the year they joined the Company.

GENERAL ADMINISTRATION AND COMMERCIAL DIVISION

Position	*Official*	*Date of joining the Company*
Managing Director	Eric Mensforth, M.A., M.I.Mech.E., M.I.P.E.	1938
Contracts Officer and Personal Assistant to Managing Director	T. H. Burleigh, A.R.Ae.S., F/Lt. (R.A.F.O.)	1936
London Manager	Lt.-Colonel W. Sorel, D.S.O.	1940

ENGINEERING AND TECHNICAL DIVISION

Technical Director	W. E. W. Petter, B.A., A.F.R.Ae.S.	1929
Chief Designer	A. Davenport, F.R.Ae.S.	1915
Assistant Chief Designer	F. J. W. Digby, M.A., A.F.R.Ae.S.	1922
Chief Production Designer	H. C. Harrison, A.F.R.Ae.S., A.M.I.Mech. E.	1936
Assistant Chief Production Designer	C. E. J. Tucker	1926
Chief Draughtsman	G. S. Holroyd, Dip : City and Guilds Mech.Eng.	1927
Experimental Engineer	W. M. Widgery	1923
Chief Stressman	A. C. Kidney, A.F.R.Ae. S.	1928
Design Co-ordinating Officer	D. P. Edkins, M.A., A.F.R.Ae. S.	1936
Assistant Designer	S. A. Seager, A.F.R.Ae.S.	1917
Assistant Designer	R. P. Cox	1926
Assistant Designer	R. R. Warren	1937
Assistant Designer	S. T. A. Richards	1928
Senior Experimental Pilot	H. J. Penrose, F.R.Ae.S.	1925
Senior Production Pilot	J. H. H. Hill, F.O. (R.A.F.O.)	1940
Second Production Pilot	J. Ramsden, Lieut., R.N. (retd.)	1940

WORKS ADMINISTRATION AND PRODUCTION DIVISION

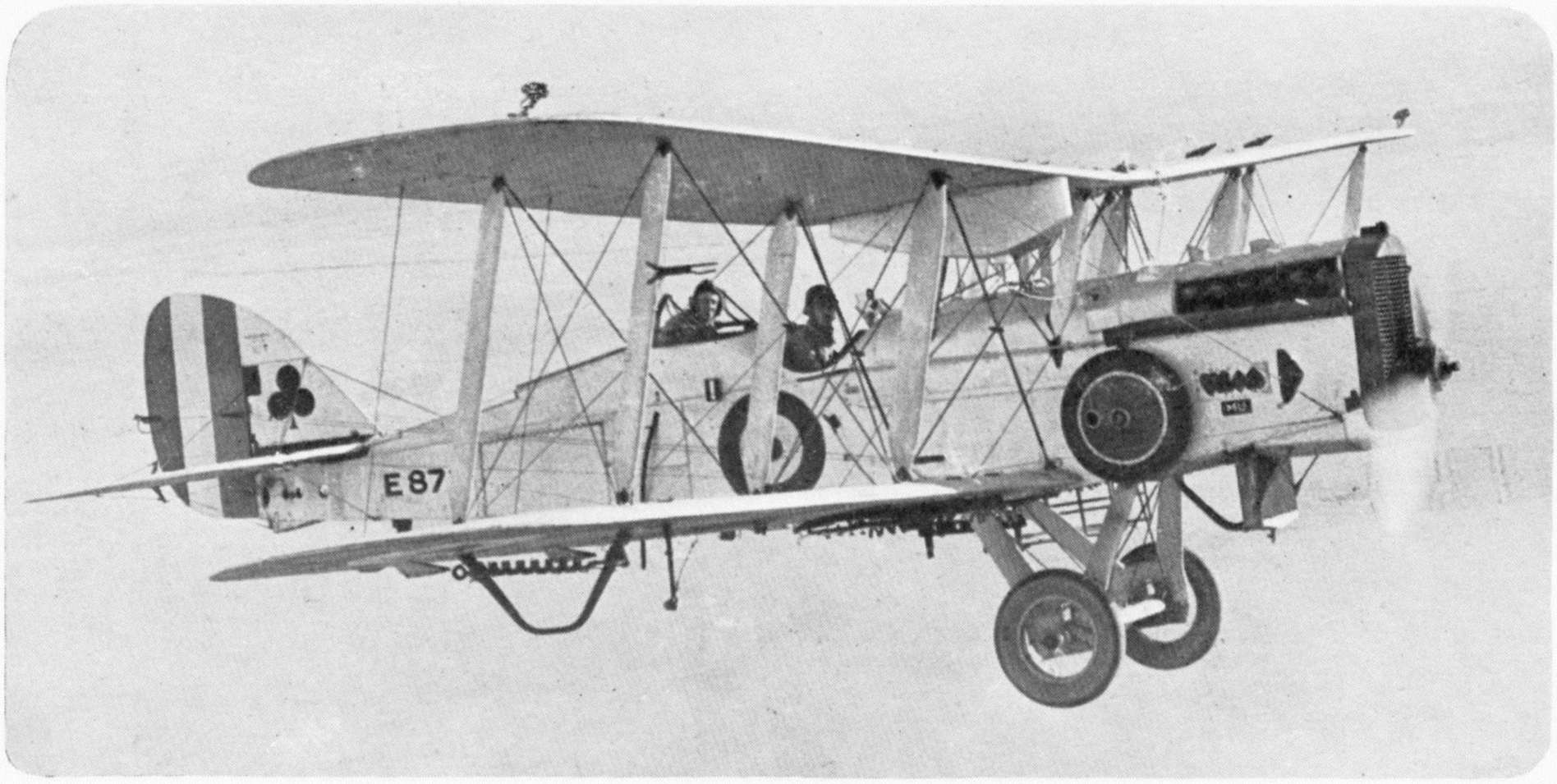
Works Director (and Deputy Managing Director)	John Fearn, M.I.Mech.E.	1935
Personal Assistant to Works Director	J. Pollitt	1939
Works Manager	E. C. Wheeldon, M.I.P.E.	1938
Buyer	W. L. Magnus	1928
Subcontracts Officer	E. K. Matthews	1927
Works Office Controller	H. L. Mabbott	1940
Planning Office Controller	H. Heaney	1935
Works Engineer	F. P. Donovan, M.B.E., M.I.P.E., F/Lt. (R.A.F.O.)	1935
Personnel Officer	E. C. Faithful	1940
Medical Officer	Dr. J. McMaster, M.D., F.R.C.S.	1942
Production Superintendent	W. A. Dove	1935
Metallurgical Engineer	F. C. Dowding	1936
Embodiment Loan Officer	B. de la Perrelle (Major, Home Guard)	1936

INSPECTION DIVISION

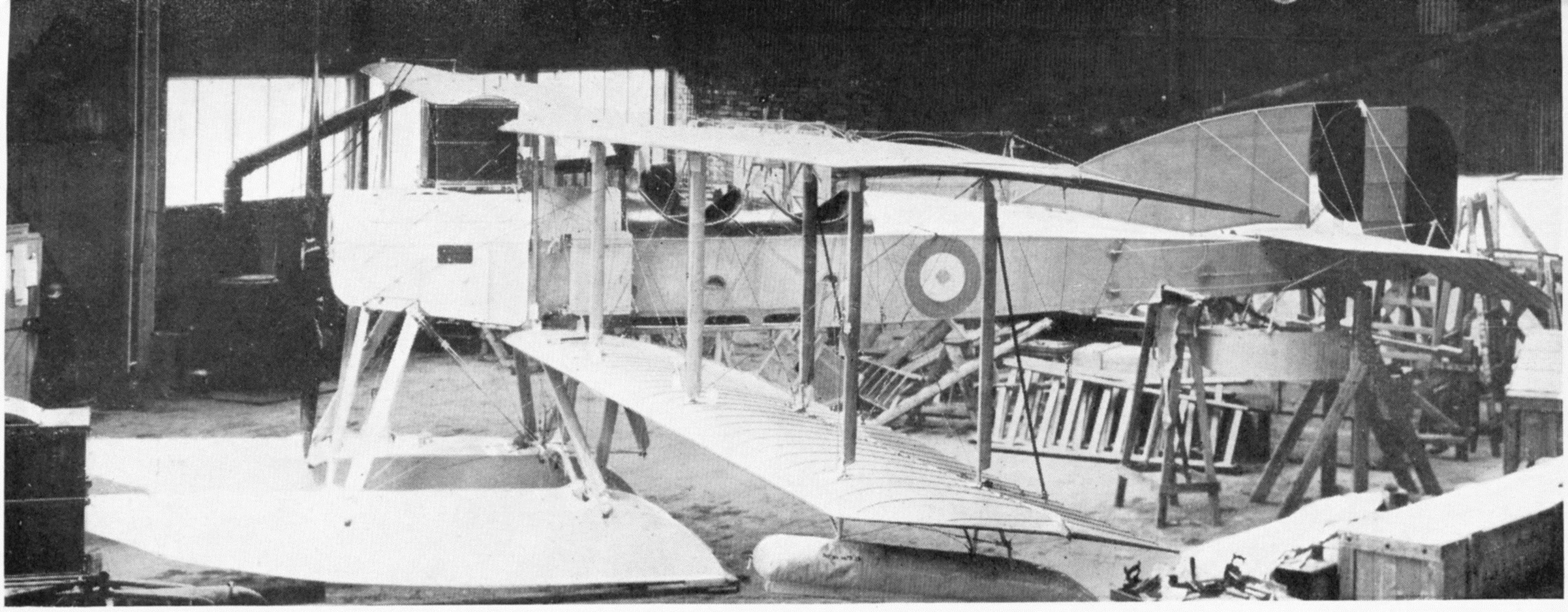
Chief Inspector	R. B. Brigham, M.I.P.E., A.F.R.Ae.S.	1929
Assistant Chief Inspector	E. J. Boulger	1927
Senior Service Engineer	R. Rostron	1936

SECRETARIAL AND ACCOUNTS DIVISION

Secretary	W. B. Hickman, A.C.A.	1935
Chief Accountant	T. A. Wright, A.C.A.	1938
Assistant Secretary	C. T. Jones, A.S.A.A.	1935
Cost Accountant	A. Peake	1938



Westland *have, in addition to orders for their own designs, received contracts from the Air Board (in the First World War), the Air Ministry and, latterly, The Ministry of Aircraft Production. The following pages deal with the types of aircraft which have been produced under these contracts, at Yeovil, during the years from* 1915 *to the present time,* 1944.



THE SHORT "225" SEAPLANE

The first type of aircraft to be built at Yeovil was the Short " 225 " Seaplane, construction of which was commenced in 1915, under direct order of the Admiralty. The completed machines were crated for despatch by rail, being reassembled by Messrs. Short Brothers and flight-tested by Mr. Ronald Kemp.

The Westland-built " 225 " had a high reputation for soundness of construction and general reliability, this fact being illustrated by a report, received at Yeovil some time after the end of hostilities in 1918, which reads as follows :

> " Short Seaplane No. 8359 with 225-h.p. Sunbeam engine on completion was appointed to H.M. Seaplane Carrier *Engadine* and allotted to Flt.-Lt. Graham Donald, R.N. She carried out a number of satisfactory flights and was apparently coveted by the whole Squadron.
>
> " On May 31st, 1916, the *Engadine* accompanied the First Battle Cruiser Squadron under Vice-Admiral Sir David Beatty to sea with pilots standing by their machines, and on the enemy being sighted, early in the afternoon, one Seaplane was ordered to carry out a reconnaissance. The Senior Officer of the Squadron, Flt.-Commander Rutland, R.N., naturally decided to carry this out himself and, dispensing with his own machine, ordered Lieutenant Donald's Westland machine to be hoisted out instead, no doubt on account of its greater efficiency. The Log states that a reconnaissance of three-quarters of an hour was carried out, the machine and engine being perfect the whole time.
>
> " Later on, a 240-h.p. Sunbeam engine was installed in this machine, in place of the 225, and even better results were accomplished."

SPECIFICATION

TYPE.—Two-seat torpedo-carrying float biplane.

POWER.—One 225-h.p. Sunbeam liquid-cooled engine.

CONSTRUCTION.—The fuselage and wings were of wire-braced wooden construction, fabric covered. The wings were hinged at the centre-section, on the rear spar line, to facilitate ship-board stowage. The flotation gear was a robust wood and ply structure, reinforced by the tubular steel torpedo cradle. Small additional floats were fitted beneath the outboard interplane struts.

EQUIPMENT.—One torpedo, slung on a cradle between the main floats, or an alternative load of four 100-lb. bombs. Radio equipment was also carried.

DIMENSIONS.—Span : 63 ft. 6 ins. (19.3 m.). Length : 40 ft. $7\frac{3}{4}$ ins. (14.3 m.). Height : 13 ft. 6 ins. (4.1 m.). Wing chord : 6 ft. (1.8 m.) top, 5 ft. (1.5 m.) bottom plane. Wing area : 688 sq. ft. (63.9 sq. m.). Dihedral : $1\frac{3}{4}$ deg. Incidence : 5 deg. Weight, loaded : 5,100 lbs. (2,313 kg.).

PERFORMANCE.—Speed : 75 m.p.h. (120.7 km./h.).

THE SHORT CANTON UNNE SEAPLANE

The second type of aircraft to be built at Westland, in 1916, was the Short seaplane fitted with the 200-h.p. Canton Unne engine, an unusual water-cooled radial motor of Swiss design.

These machines were delivered by rail to Hamble, where they were assembled and flight-tested by Mr. Sidney Pickles, of Short Brothers, before passing into service.

When the order for the Short Canton Unne was placed with Westland, finished drawings were not in existence and considerable staff work, between the Westland and Short technical organisations, was necessary before complete prints were available. This initial design work led, during the ensuing months, to the building up of the original Westland design team, under Mr. Bruce and Mr. Davenport.

Only a comparatively small number of the type was produced, owing to the rapid expansion of the Westland Works, and the acquisition of an aerodrome, for more urgent landplane construction during the closing stages of the First World War.

SPECIFICATION

TYPE.—Two-seat reconnaissance float biplane.

POWER.—One 200-h.p. Canton Unne (Swiss) liquid-cooled radial engine.

CONSTRUCTION.—The construction was similar to that of the Short " 225," the main differences being the slightly decreased span and sesquiplane arrangement of the wings, also the absence of the steel torpedo cradle tubing in the flotation gear.

EQUIPMENT.—The observer was armed with a Lewis gun, and three 112-lb. bombs were carried.

DIMENSIONS.—Span : 57 ft. 3 ins. (17.4 m.) upper, 42 ft. (12.8 m.) lower plane. Length : 40 ft. 7 ins. (12.3 m.). Height : 14 ft. $0\frac{3}{4}$ in. (4.2 m.). Wing chord : 6 ft. (1.8 m.). Wing area : 573 sq. ft. (53.2 sq. m.). Dihedral : nil. Incidence : 5 deg. Weight, loaded : 4,580 lbs. (2,077 kg.).

PERFORMANCE.—Speed : 60-65 m.p.h. approx.

THE SOPWITH ONE-AND-A-HALF STRUTTER

Both the single-seat and two-seat models of the Sopwith One-and-a-Half Strutter biplane were built by Westland during the First World War, the earlier machines being crated and delivered by rail before the aerodrome was completed at Yeovil, in the late spring of 1917, for their despatch by air.

The two-seat fighter-reconnaissance version, which was used by the Royal Flying Corps and the Royal Naval Air Service for long flights over enemy-occupied territory, replaced the " pusher " F.E.2b, which had proved much too slow and unwieldy against the Fokker. In its turn the One-and-a-Half Strutter suffered heavy losses in 1917, before the arrival of more powerful machines at the Front, but nevertheless it was the precursor of the small and handy two-seat fighter as later exemplified in the Hawker Demon. Much valuable experience was gained with the One-and-a-Half Strutters as shipboard fighters, catapulting them from temporary platforms built on the main gun turrets of battle-cruisers, and launching others from lighters towed by destroyers.

SPECIFICATION

TYPE.—(1) Single-seat day bomber biplane. (2) Two-seat fighter-reconnaissance biplane.

POWER.—One 130-h.p. Clerget air-cooled rotary engine.

CONSTRUCTION.—The standard wire-braced wooden structure system of the period was employed for both wings and fuselage. The single-seat bomber version differed from the two-seat fighter machine in having transparent panels in the main upper planes, above the pilot, and had increased range supplied by an extra twenty gallons of fuel.

EQUIPMENT.—Both types had a single Vickers gun, mounted on the top of the front fuselage and firing through the airscrew disc, operated by the pilot and with a Ross interrupter gear to prevent damage to the airscrew. The bomber version carried, in addition, a load of four 56-lb. bombs, while the fighter was equipped with a Scarff-mounted Lewis gun over the rear cockpit.

DIMENSIONS.—Span : 33 ft. 6 ins. (10.2 m.). Length : 25 ft. 3 ins. (7.6 m.). Height : 10 ft. 3 ins. (3.1 m.). Wing chord : 5 ft. 6 ins. (1.6 m.). Wing area : 350 sq. ft. (32.5 sq. m.). Stagger : 24 ins. (.609 m.). Dihedral : 2 deg. 23 min. Incidence : 2 deg. 45 min. Weight, loaded : Bomber, 2,350 lbs. (1,065 kg.). Fighter, 2,250 lbs. (1,020 kg.).

PERFORMANCE.—Speed : 100 m.p.h. (160.9 km./h.) at 6,500 feet (1,982 m.).
Service ceiling : 15,500 feet (4,727 m.).

THE DE HAVILLAND 4

One hundred and fifty De Havilland 4 biplanes were built at Yeovil during the First World War, these machines being the first Westland-built aircraft to be flown from the aerodrome constructed, on land adjoining the Works, in 1917.

The first D.H.4 to be produced at Yeovil was flight-tested in April, 1917, by the late B. C. Hucks, a well-known pilot of the early days of flying noted for his aerobatic displays, and was flown direct to France on the morning following its initial test. Many of these machines were later ferried from Yeovil to the Aircraft Pool at Dunkirk by Captain Leslie, R.F.C., who was occasionally accompanied by Mr. R. A. Bruce. An amusing story is told of one of these flights, during which Mr. Bruce lost his hat over the Channel and was obliged to replace it from a shop in Dunkirk, the startling specimen of headgear afterwards achieving fame as "Mr. Bruce's Dunkirk Hat."

The D.H.4, which was used mainly for reconnaissance duties, was finally fitted, in 1918, with the 360-h.p. Rolls Royce Eagle engine, which gave it a ceiling of 23,000 feet—a performance rendering it almost immune from attack.

SPECIFICATION

TYPE.—Two-seat reconnaissance biplane.

POWER.—One 200-h.p. B.H.P. liquid-cooled engine was fitted to the early machines, followed by the 250-h.p. Rolls Royce Falcon and the 360-h.p. Rolls Royce Eagle engines in the later models.

CONSTRUCTION.—The rear fuselage was constructed of wooden members, joined by steel plates and bolts, and braced by wires, the tension of the latter being adjusted by turnbuckles. The covering was doped fabric. The front fuselage was of ply and heavy spruce members spindled for lightness. The wings were of wood, with spindled wooden spars, and were wire-braced internally. The axle-type undercarriage was of simple design, sprung by rubber cords. The pilot's seat was well forward, directly below the centre-section, with the main fuel tank, in the fuselage behind, separating him from the rear gunner's cockpit.

ARMAMENT.—Two synchronised Vickers guns, operated by the pilot, were mounted on the top of the front fuselage, and one scarff-mounted Lewis gun was over the rear cockpit.

DIMENSIONS.—Span : 42 ft. 6 ins. (12.9 m.). Length : 30 ft. 3 ins. (9.2 m.). Height : 10 ft. 8 ins. (3.2 m.). Wing chord : 5 ft. 6 ins. (1.6 m.). Wing area : 435 sq. ft. (40.4 sq. m.). Stagger : 12 ins. (.304 m.). Dihedral : 3 deg. Incidence : 3 deg. Weight, loaded : 3,466 lbs. (1,572 kg.).

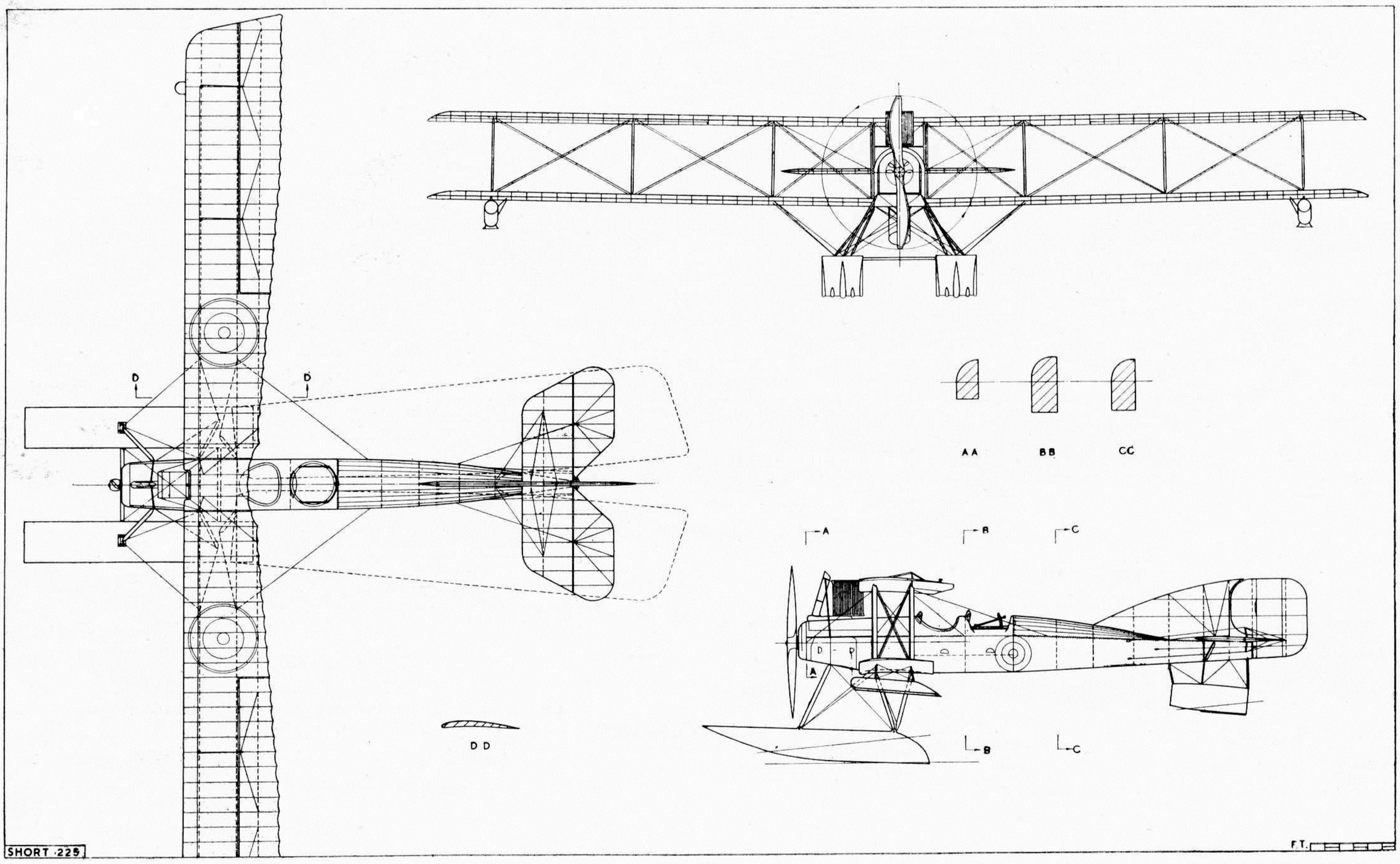
PERFORMANCE.—Speed : 117 m.p.h. (188.29 km./h.) at 6,500 feet (1,982 m.).

Ceiling : 18,000 feet (5,488 m.).

With 360-h.p. Rolls Royce Eagle engine :

Speed : 136 m.p.h. (218.87 km./h.) at 6,500 feet. (1,982 m.).

Ceiling : 23,000 feet. (7,014 m.).



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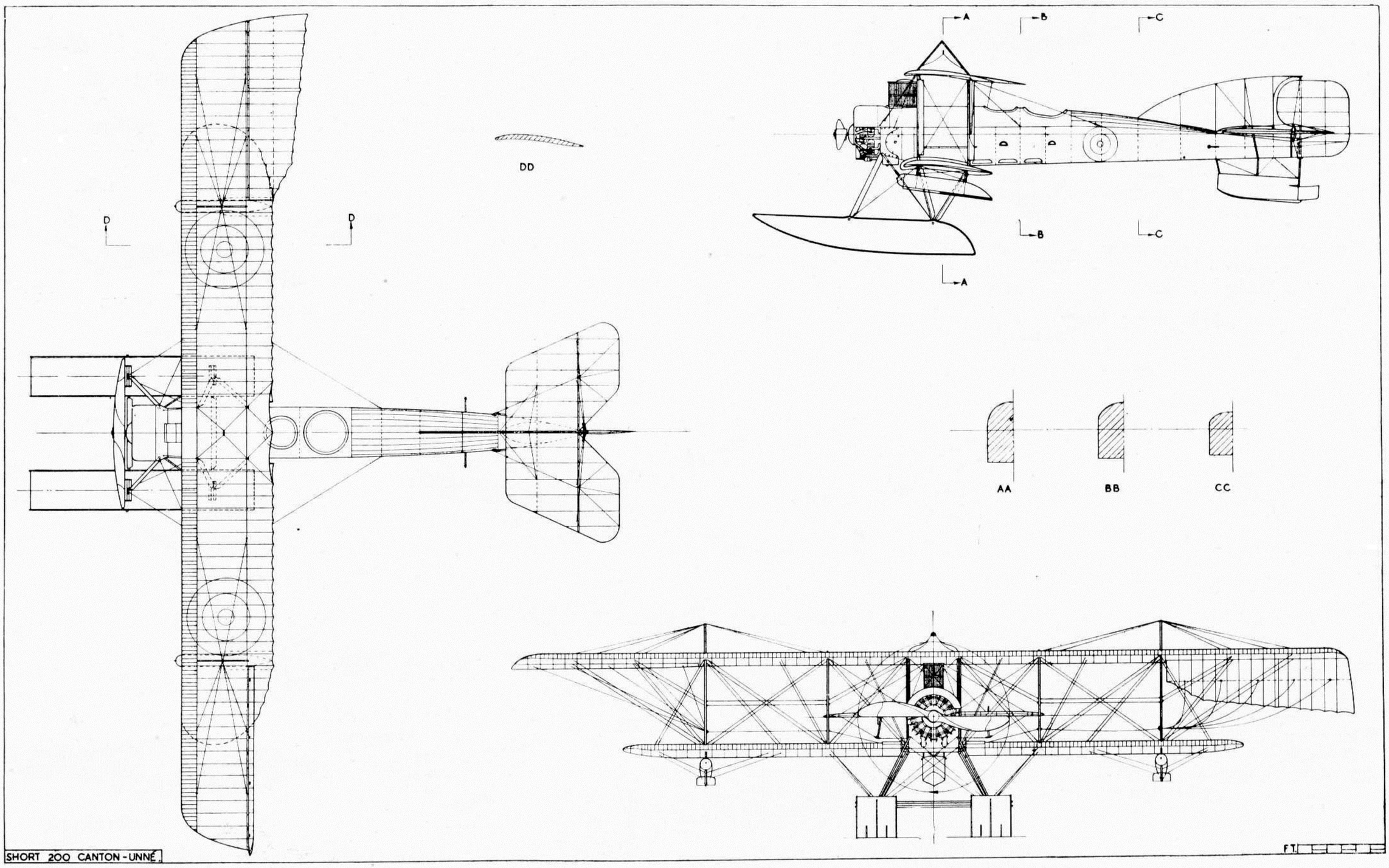

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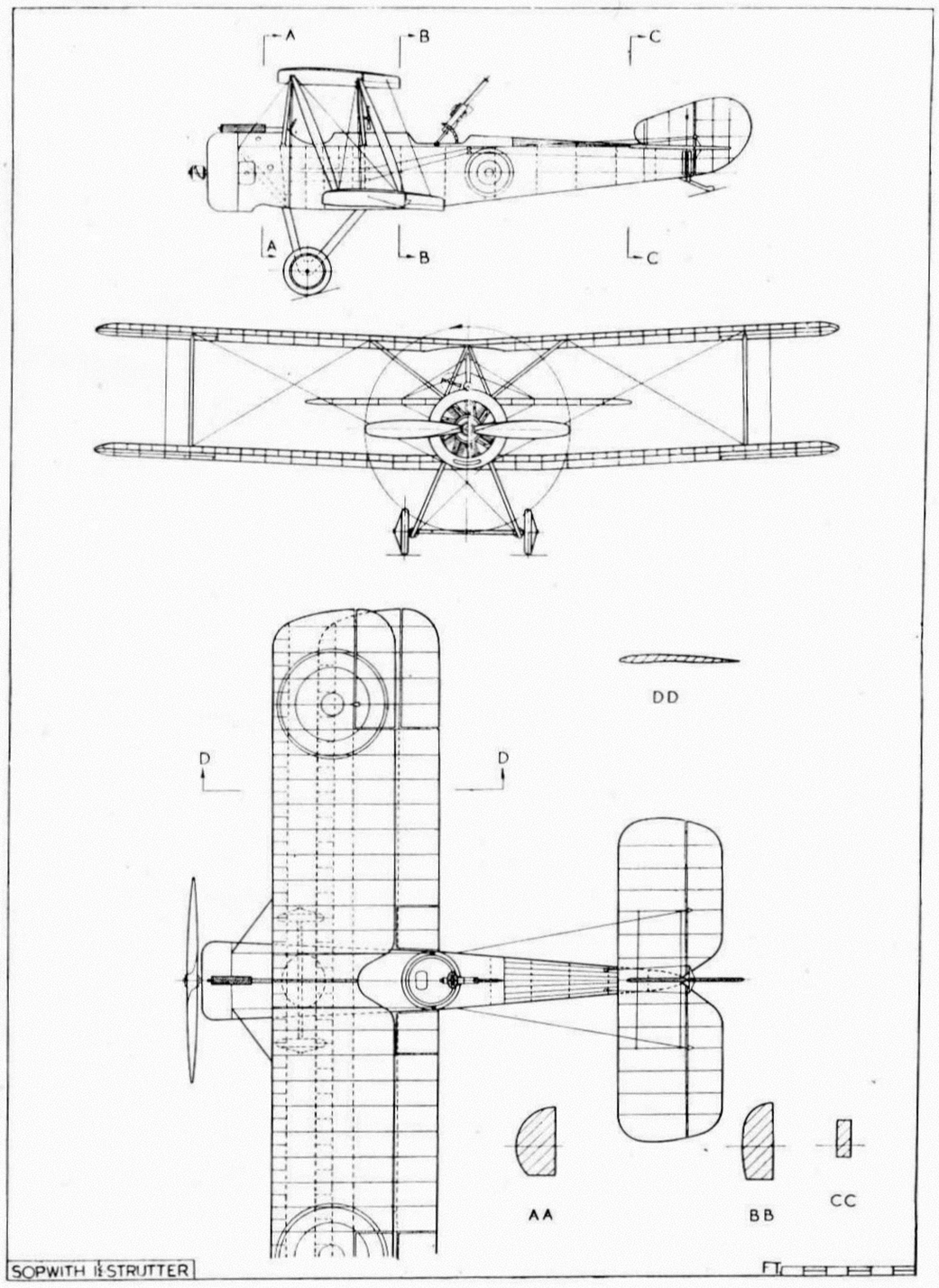

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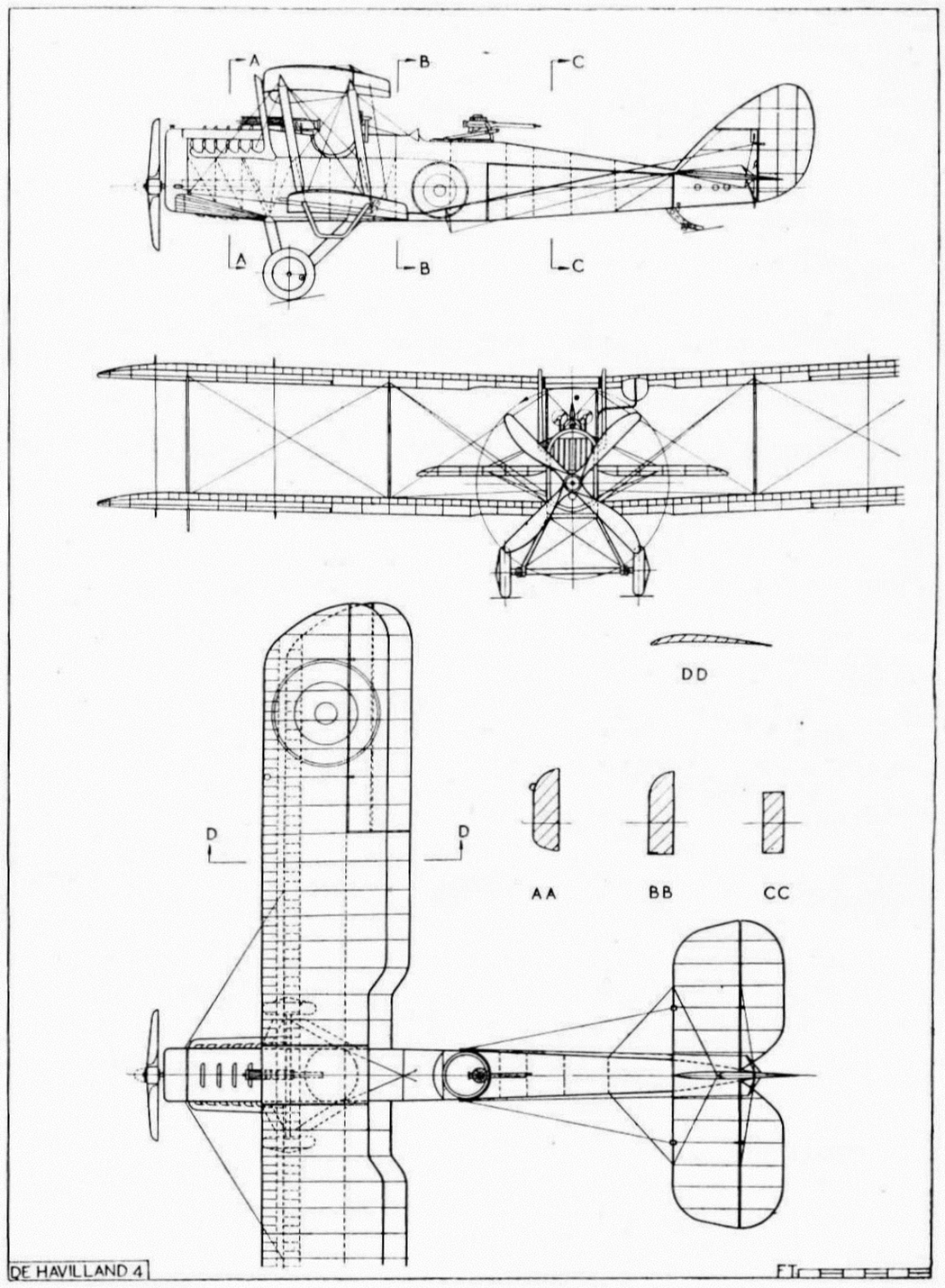

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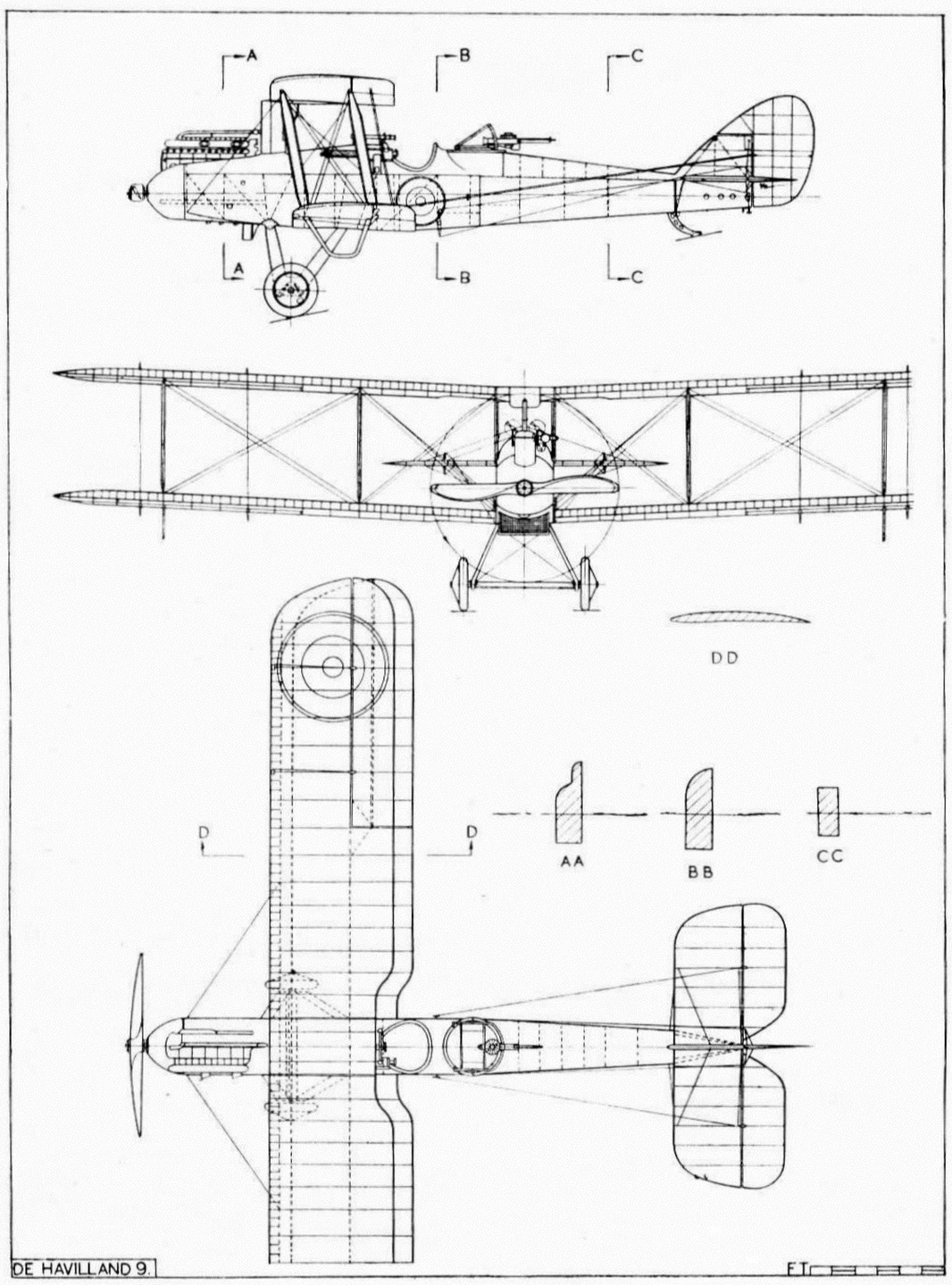

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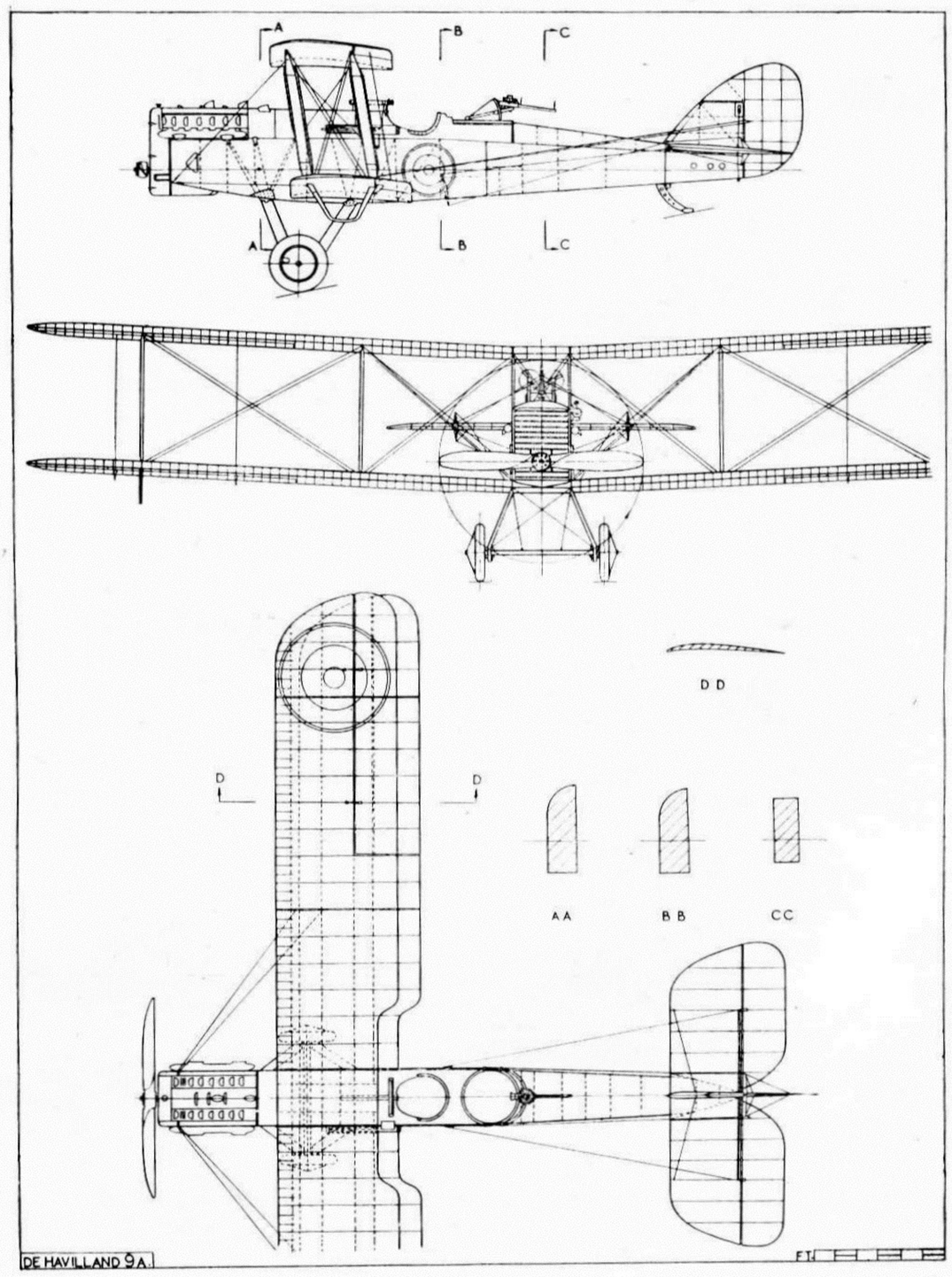

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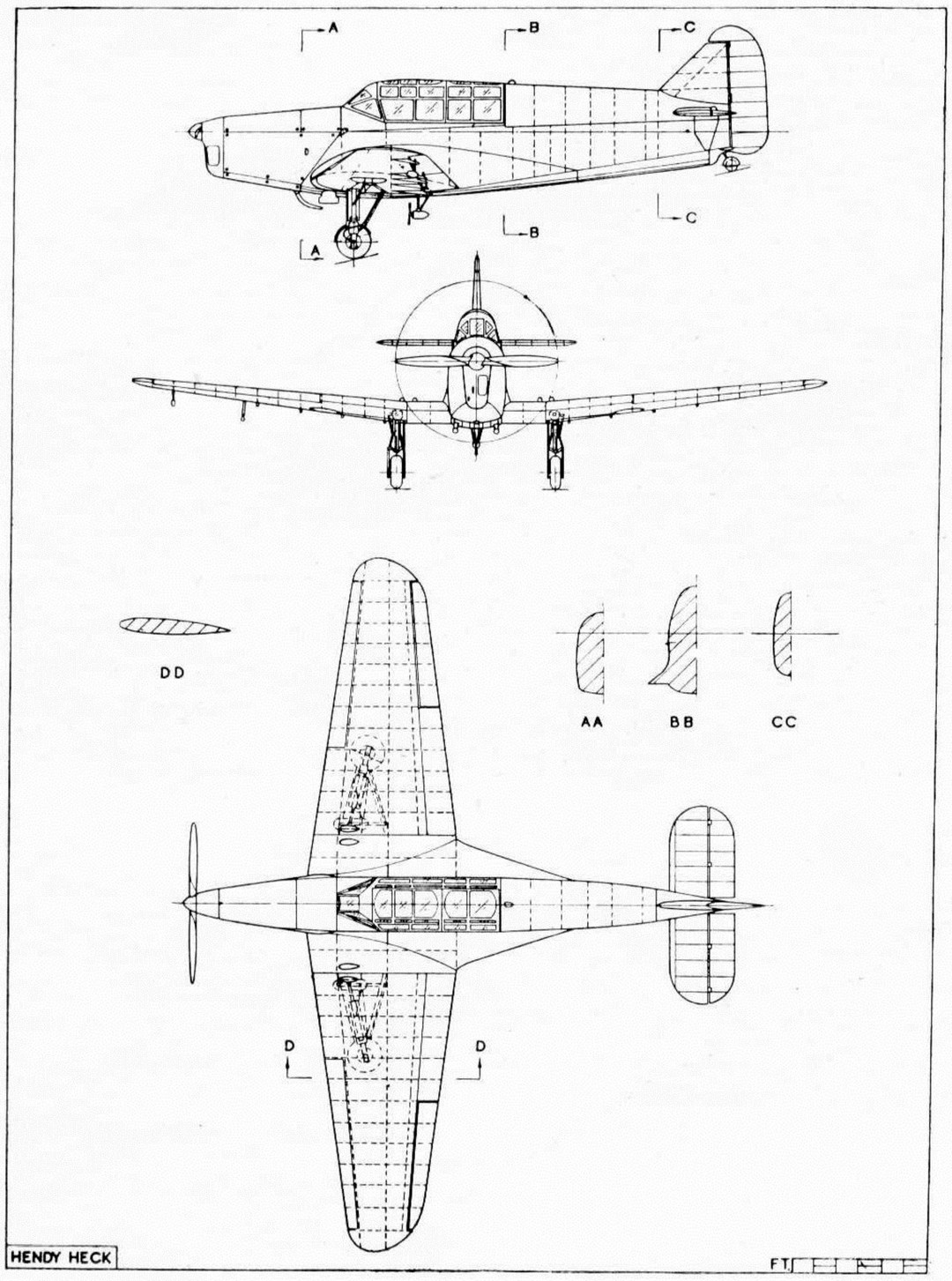

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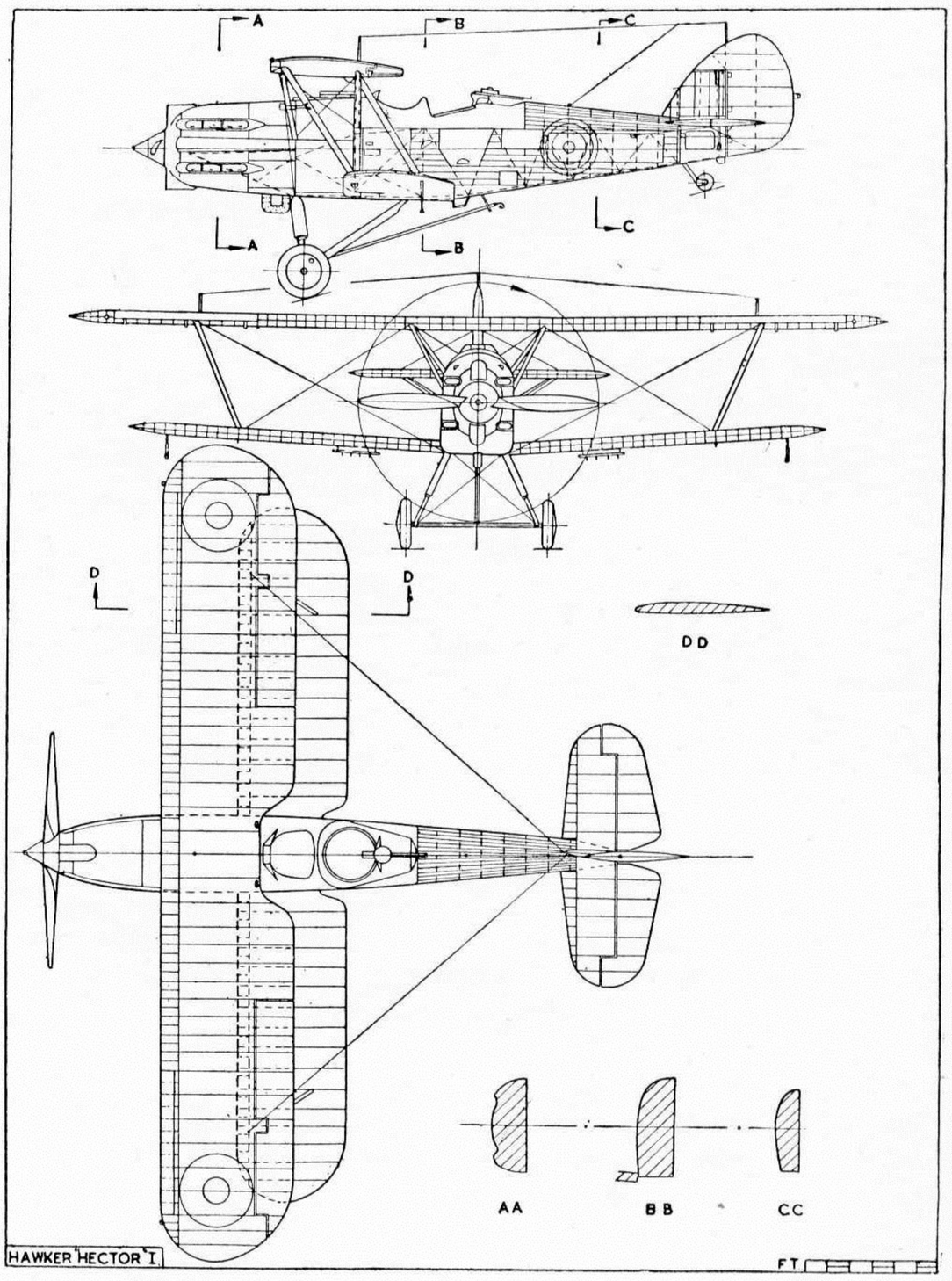

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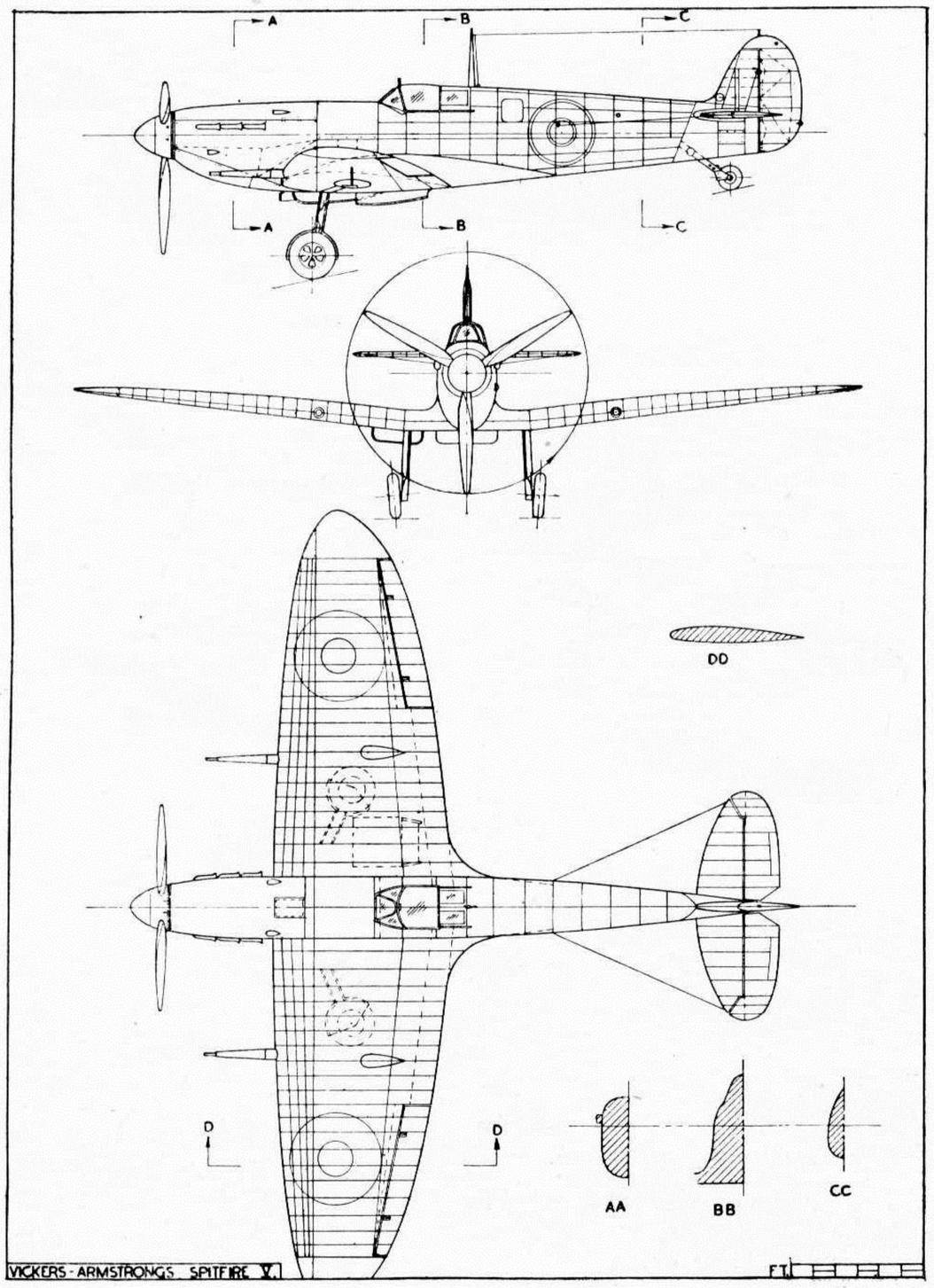


9

WESTLAND-BUILT AIRCRAFT

1 SHORT "225"

2 SHORT CANTON UNNE

3 SOPWORTH 1½ STRUTTER

4 DE HAVILLAND 4

5 DE HAVILLAND 9

6 DE HAVILLAND 9A

7 HENDY HECK

8 HAWKER HECTOR

9 SUPERMARINE SPITFIRE

10 VICKERS VIMY (*on p.* 89)

THE DE HAVILLAND 9

Designed to replace the D.H.4, and using the new mass-produced Puma engine, the D.H.9 was built by many aircraft firms, the total produced by Westland in 1917 and 1918 amounting to one hundred and fifty machines. It was used very effectively as a well-armed light bomber, but although its wartime performance was quite satisfactory, it was rather overshadowed by its famous development, the more powerful D.H.9A.

As a direct result of the success of the D.H.9A, which had been retained in service as the standard General Purpose aircraft after the conclusion of hostilities, large numbers of converted D.H.9s eventually became available for commercial use, and the type had a varied career as a " feeder " machine, air-taxi, and school aeroplane, as well as for several record-breaking attempts.

Until the mid-thirties this aeroplane was still used for instruction, but fitted with an oleo undercarriage and an Armstrong Siddeley Jaguar engine, when it was known as the 9J.

SPECIFICATION

TYPE.—Two-seat day bomber and reconnaissance biplane.

POWER.—One 240-h.p. B.H.P. six-cylinder in-line liquid-cooled engine.

CONSTRUCTION.—The construction was similar to that of the D.H.4, the main difference being that the pilot's seat was moved to aft of the wing trailing-edge line, while the fuel tank was positioned between the cockpits and the engine.

ARMAMENT.—One synchronised Vickers gun, operated by the pilot, was fitted on the port side of the front fuselage, and a Lewis gun on a Scarff mounting was fitted over the rear cockpit. Provision was made for a load of fourteen 20-lb. bombs.

DIMENSIONS.—Span : 42 ft. 6 ins. (12.9 m.). Length : 30 ft. 5 ins. (9.2 m.). Height : 11 ft. 4 ins. (3.4 m.). Wing chord : 5 ft. 6 ins. (1.6 m.). Wing area : 435 sq. ft. (40.4 sq. m.). Stagger : 12 ins. (.304 m.). Dihedral : 3 deg. Incidence : 3 deg. Weight, loaded : 3,300 lbs. (1,496 kg.).

PERFORMANCE.—Speed : 111 m.p.h. (178.63 k.m/h.) at 10,000 feet (3,050 m.).

Ceiling : 17,500 feet (5,236 m.).

THE DE HAVILLAND 9A

Of all the machines built at Yeovil during the First World War the D.H.9A biplane is undoubtedly the most important, and the story of its production is not a little thrilling.

It was realised, in late 1916 and early 1917, that the Allied aircraft then operating on the Western Front, while quite efficient, lacked that extra punch which could only be supplied by more powerful engines, and the Americans, who had entered the war in April, 1917, were asked to produce one.

As a result, the best U.S. engineers were called into conference at Washington and the design of a 400-h.p. motor, known as the Liberty, was initiated on May 19th, 1917, the first of the type being built by the following July 4th—in less than six weeks !

When the first Liberty engines began to arrive in this country it was decided to fit them to an airframe based on the D.H.9, suitably strengthened and increased in size. The Aircraft Manufacturing Company were, however, too preoccupied with the new D.H.10, and it was arranged that Westland should collaborate with the parent firm in producing the Design conversion.

It is now a matter of history that the D.H.9A, as the Liberty-engined D.H.9 was designated, was one of the most successful aeroplanes of its time, with a period of active service in the Allied and Royal Air Forces covering more than ten years.

The installation of the Liberty engines at Westland was under the supervision of Mr. Mumford, of the Packard Motor Car Company, and many of the machines were flight-tested by that great aviator Harry Hawker, who was in the habit of arriving at Yeovil, by train from London, about 3.30 p.m. and testing four machines, each to a height of 10,000 feet, before returning to Town by the evening train !

Drawings issued by Westland enabled the type to be produced in quantity at other manufacturing centres. In all, Westland built 390 D.H.9A's before the 1918 Armistice, and for many years afterwards reconditioned large numbers of them for the Royal Air Force, until the type was replaced in service by the Westland Wapiti.

SPECIFICATION

TYPE.—Two-seat general-purpose biplane.

POWER.—One 400-h.p. Liberty (U.S.) twelve-cylinder vee-type liquid-cooled engine. The 360-h.p. Rolls Royce Eagle VIII engine was also fitted to this type.

CONSTRUCTION.—The construction was similar to that of the D.H.4, with seating arrangements as in the D.H.9, the principal variation from the latter being the increased wing area.

ARMAMENT.—One synchronised Vickers gun, operated by the pilot, was mounted on the port side of the front fuselage, with a Scarff-mounted Lewis gun over the rear cockpit. A load of four 112-lb. bombs could also be carried.

DIMENSIONS.—Span : 45 ft. 10 ins. (13.9 m.). Length : 29 ft. 10 ins. (9.09 m.). Height : 11 ft. 8 ins. (3.5 m.). Wing chord : 5 ft. 9 ins. (1.7 m.). Wing area : 497 sq. ft. (46.1 sq. m.). Stagger : 16 ins. (.406 m.). Dihedral : 3 deg. Incidence : 3 deg. Weight, loaded : 4,000 lbs. (1,814 kg.).

PERFORMANCE.—Speed : 114 m.p.h. (183.46 km./h.) at 10,000 feet (3,050 m.).
Ceiling : 16,500 feet (5,032 m.).

THE VICKERS VIMY

In the closing stages of the First World War plans were made to subject Berlin to heavy air bombardment, as heavy, at least, as the aeronautical progress of those days permitted. To this end the four-engined Handley Page V/1500 and the twin-engined Vickers Vimy biplanes had been designed, and were in quantity production when the signing of the 1918 Armistice postponed this significant enterprise for a matter of twenty-five years.

As in the Second World War, construction of aircraft was dispersed among a number of manufacturers when particular types were required in large numbers, at short notice. Of these contractors, Westland built a batch of twenty-five Vickers Vimys in late 1918 and early 1919. These machines, which were assembled in a specially built erecting shop of large dimensions, were flight-tested by the late Squadron Leader Rollo de Haga Haig, A.F.C., who was at that time a Martlesham test-pilot. A notable incident in connection with these tests was that Squadron Leader Haig once looped a Vimy—no mean feat even by modern standards!

The type, of course, was too late to be of decisive military use, but achieved world fame in June, 1919, when, flown by the Vickers Test Pilot, Captain John Alcock, with Lieutenant Arthur Whitten Brown as navigator, a Vimy made the first direct non-stop flight across the North Atlantic, from west to east. This record was paralleled in the following October, when the brothers, Ross and Keith Smith, flew another Vimy on the first England-Australia flight, covering the 11,000 miles in 27 days and 20 hours.

SPECIFICATION

TYPE.—Three-seat twin-engined bomber biplane.

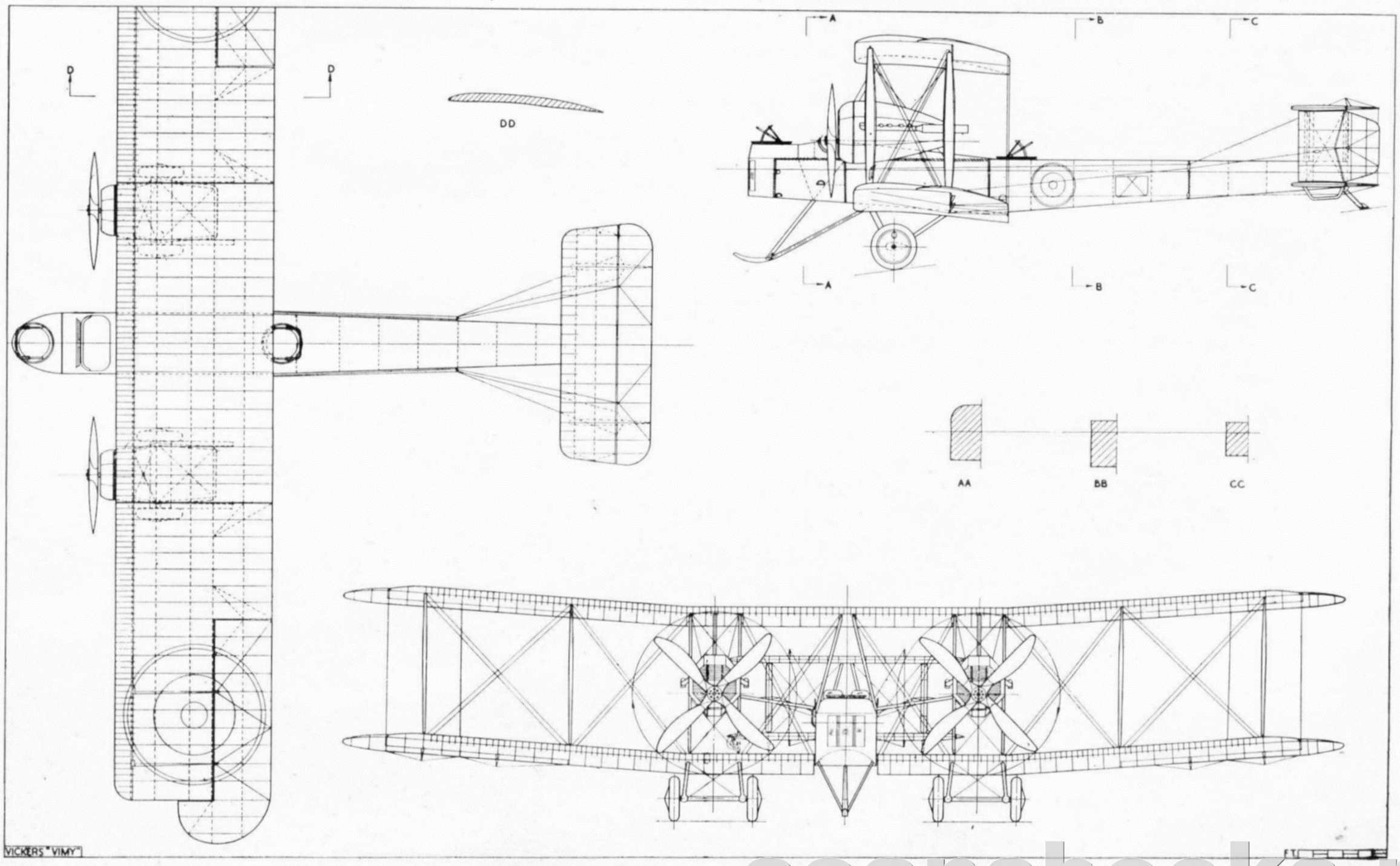
POWER.—Two 360-h.p. Rolls Royce Eagle VIII liquid-cooled engines.

CONSTRUCTION.—The fuselage and wing structures were of wire-braced wooden members, fabric covered.

EQUIPMENT.—Two Lewis guns, on a Scarff mounting, were fitted over the nose cockpit, with a similar set mounted over the midships cockpit. Provision was made for a load of eighteen 112-lb. and two 230-lb. bombs. Radio and navigational flares were also carried.

DIMENSIONS.—Span: 69 ft. 7 ins. (21.2 m.). Length: 43 ft. 6½ ins. (13.2 m.). Height: 15 ft. 7½ ins. (4.7 m.). Wing chord: 10 ft. 6 ins. (3.1 m.). Wing area: 1,318 sq. ft. (122.4 sq. m.). Dihedral: 3 deg. Incidence: 3½ deg. Weight, loaded: 10,884 lbs. (4,936 kg.).

PERFORMANCE.—Speed: 100 m.p.h. (160.9 km./h.).



THE HENDY HECK

It is not often that an aircraft manufacturer is asked to build a special machine for a private operator, but the Hendy Heck, built by Westland in 1934 for Mr. Whitney Straight, to the design of Mr. Basil Henderson, is an instance of this rare occurrence.

The Heck was a fast two-seat low-wing cabin monoplane in which the amenities and strength of contemporary cabin aircraft were combined with the performance of a racing machine. Among its unique features was the use of slats and slotted flaps, giving it the ability to take off and land in small spaces, despite a wing loading higher than that found in contemporary aircraft of similar power.

Westland Aircraft constructed the prototype Heck only, this machine having an outward retracting undercarriage. Later a batch of these monoplanes were manufactured by Parnall Aircraft Limited, but then were fitted with fixed undercarriages, while a further variation was built as a R.A.F. communication aircraft.

SPECIFICATION

TYPE.—Two-seat commercial low-wing cabin monoplane.

POWER.—One 200-h.p. De Havilland Gipsy-Six six-cylinder in-line inverted air-cooled engine.

CONSTRUCTION.—The fuselage was a ply-covered structure of spruce members, while the wing spars and ribs were of spruce and plywood, the whole being plywood covered. The tail unit was of wooden members, fabric covered. A Henderson retractable undercarriage was fitted to the prototype, but production models had fixed and spatted undercarriages.

DIMENSIONS.—Span : 31 ft. 6 ins. (9.5 m.). Length : 26 ft. 1½ ins. (7.9 m.). Height : 8 ft. 6 ins. (2.5 m.). Wheel track : 7 ft. 1 in. (2.1 m.). Wing area : 105.2 sq. ft. (9.75 sq. m.). Weight, empty : 1,811 lbs. (821 kg.). Weight, loaded : 2,600 lbs. (1,179 kg.).

PERFORMANCE.—Speed : 180 m.p.h. (289.68 km./h.). Landing speed : 40 m.p.h. (64.37 km./h.).

THE HAWKER HECTOR

For several years after the conclusion of the First World War the Air Staff favoured day-bombing aeroplanes of the single-engined two-seat biplane type, and the Hawker series, commencing with the Hart, was perhaps the best known. As ideas changed however, this class of aircraft gradually came to be identified with Army Co-operation duties, and continued in this capacity until finally replaced by monoplane types.

Westland Aircraft was concerned with one of the final editions of the Hawker series, the Hector, an Army Co-operation machine produced in considerable numbers for the air rearmament programme of the late 1930s. The Hector, which was similar in general arrangement to the Hart, Hind, Demon and Audax, was fitted with the twenty-four cylinder Napier Dagger engine, and apart from the prototype, the entire output of this version was handled by Westland, at Yeovil, the production flight-testing being carried out by Mr. H. J. Penrose.

A few Hectors remained in service until the second year of the present war, used principally for Army Co-operation Training and communication work.

SPECIFICATION

TYPE.—Two-seat Army Co-operation biplane.

POWER.—One 805-h.p. Napier Dagger IIIMS twenty-four cylinder H-type air-cooled engine.

CONSTRUCTION.—The fuselage was built up of round-section steel and duralumin tubing, with squared ends, joined by flat plates, tubular rivets and steel ferrules, and was fabric-covered aft of the cockpits. The wings and empennage were of steel and duralumin framework, fabric covered.

EQUIPMENT.—One synchronised Vickers gun, operated by the pilot, and a Lewis gun over the rear cockpit, on a patent Hawker mounting. Two-way radio and a message-hook were also carried.

DIMENSIONS.—Span : 36 ft. 11½ ins. (11.2 m.) upper, 31 ft. 4 ins. (9.5 m.) lower plane. Length : 29 ft. 9¾ ins. (9.08 m.). Height : 10 ft. 5 ins. (3.1 m.). Wing chord : 6 ft. 0½ in. (1.8 m.) upper, 5 ft. (1.5 m.) lower plane. Wing area : 348 sq. ft. (32.3 sq. m.). Incidence : 3 deg. 9 min. Dihedral : 1 deg. upper, 4 deg. lower plane. Wheel track : 6 ft. 4¼ ins. (1.9 m.).

PERFORMANCE.—Speed : 187 m.p.h. (300.9 km./h.) at 6,560 feet (2,000 m.).

Climb : To 9,840 ft. (3,000 m.) in 5½ minutes.
To 19,680 ft. (6,000 m.) in 17.2 minutes.

Service ceiling : 24,000 feet (7,321 m.).

British Official Photo

THE SUPERMARINE SPITFIRE

The years between the two world upheavals saw a revival of the races for the Schneider Trophy, an international speed event for seaplanes, the prize being eventually won outright for Britain by the brilliant series of Supermarine seaplanes designed by the late Reginald Mitchell.

Many people, at the time of these contests, questioned the wisdom of spending time and money on special aircraft for such purposes, but history has given an answer, for a direct descendant of the Supermarine racing seaplanes, the Spitfire fighter, not only played a great part in saving Britain from invasion in 1940, but is still regarded as the finest fighter in the world.

In 1942 Sir Archibald Sinclair, Secretary of State for Air, declared that production of the Spitfire—as our primary single-seat fighter—would continue until the end of hostilities. Even at that time a vast building programme had been embarked on, and of the various firms contributing to them, Westland devoted a large section of their plant to Spitfire production.

SPECIFICATION

TYPE.—Single-seat fighter low-wing monoplane.

POWER.—One Rolls Royce Merlin liquid-cooled vee-type engine. The engine mark number and horse-power varied with the different machine models.

CONSTRUCTION.—The fuselage was an all-metal "stressed-skin" monocoque structure of four main longerons, frames and stringers, covered by flush-riveted dural sheet. The empennage was a detachable unit, joined to the fuselage immediately forward of the tailplane leading-edge. The wings were all-metal light alloy structures, with a single main spar. The heavy-gauge leading-edge, forward of the spar, formed a D-type torsion box. The undercarriage was of the outward retracting type.

EQUIPMENT.—Early Spitfires were fitted with eight .303 Browning machine-guns—four firing from ports in the leading-edge of each wing, but later versions carried two 20 mm Hispano shell-guns in place of the four inboard machine-guns. Two-way radio and oxygen equipment were also carried.

DIMENSIONS.—Span : 36 ft. 10 ins. (11.2 m.). Length : 29 ft. 11 ins. (9.1 m.). Height : 11 ft. 5 ins. (3.4 m.).

Note : The above particulars refer to Spitfire V.

British Official Photo