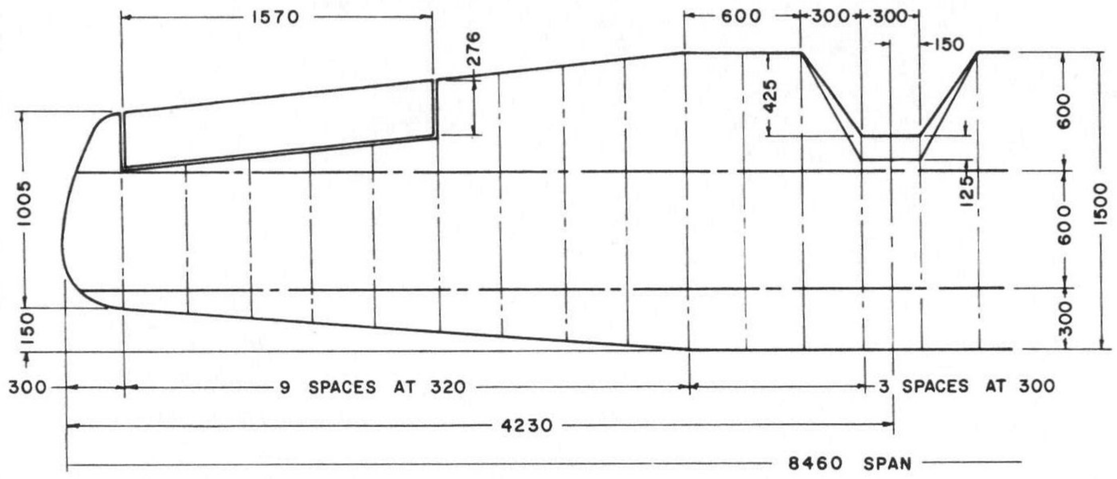
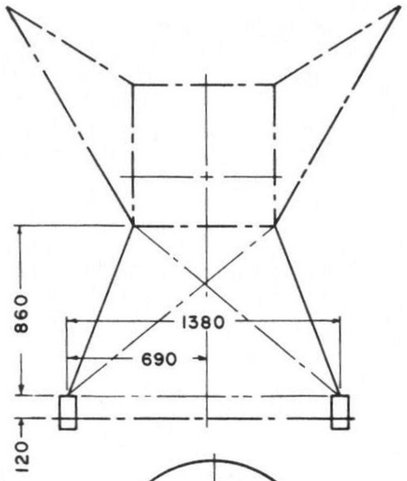
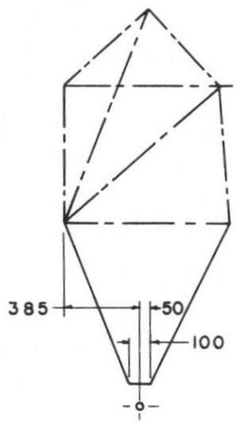
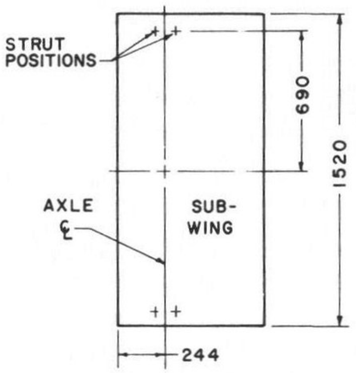
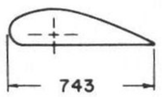
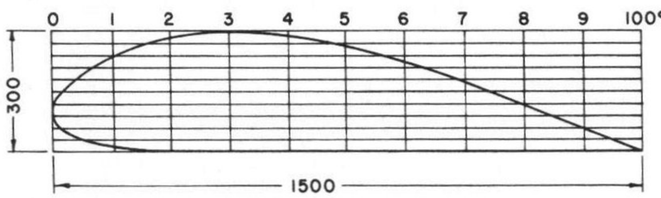




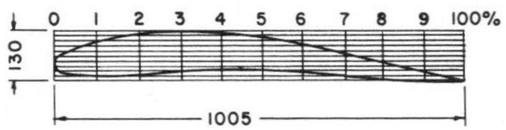




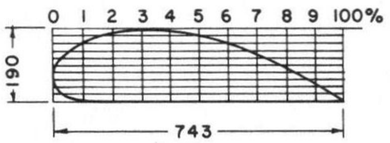




WING RIB AT STRUT ATTACHMENT POINTS



WING RIB AT TIP



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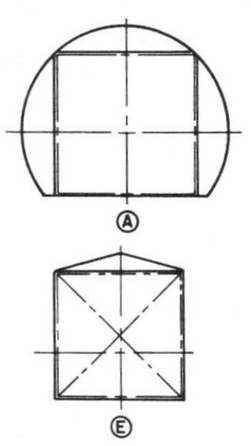
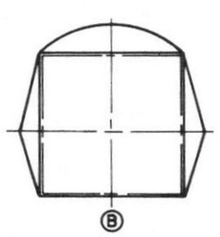
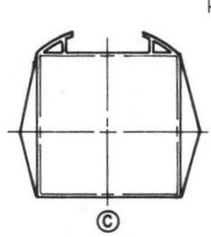
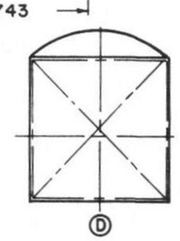
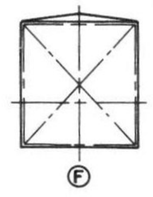
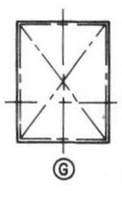


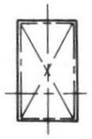


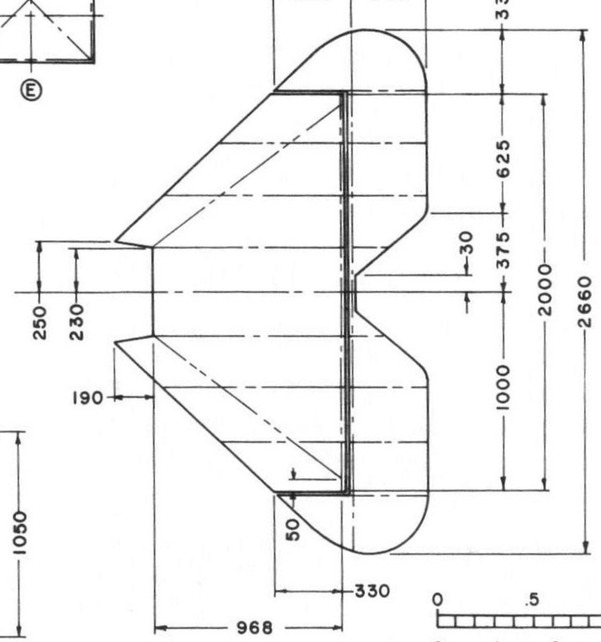


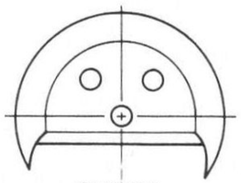


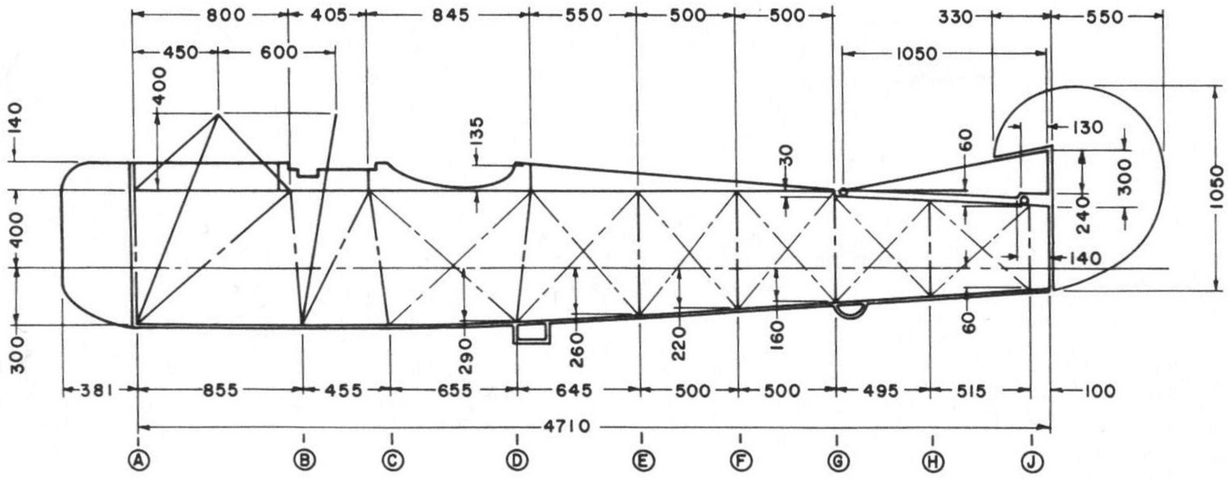


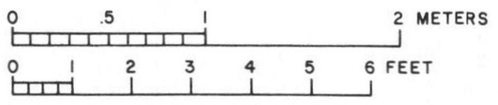












DRAWN BY: PHILLIP DREWS	1918 FOKKER EV/DVIII GENERAL LAYOUT
DATE: FEBRUARY 1973	

Hansa-Brandenburg C.I

drawings by WILLIS NYE

Having a top speed of a little over 100 mph, the C.I was still able to carry a heavy load but was vulnerable to Allied fighters. Photo courtesy of Leonard Opdycke, World War I Aeroplanes.

ERNST HEINKEL designed this big two-seater for the German Brandenburg firm, and it was built under license in Austria. Powered by a variety of engines of 160-230 hp, the C.I carried a heavy load with good performance, cruising at over 100 mph.

Willis Nye's drawing is mistitled Brandenburg LDD: this was a smaller Austrian two-seater, sometimes referred to as "The Little Brandenburg," to distinguish it from the C.I, "The Big Brandenburg."

There are none left. □

HANSA-BRANDENBURG "MODEL LDD"

STAGGER

7'-2" CHORD

5'-6" CHORD

1'-8"

5'-6" CHORD

LOWER WING AREA 17.90 SQ. METERS

THE INSTRUMENT PANEL CONTAINS:
- OIL TEMPERATURE INDICATOR
- WATER TEMPERATURE INDICATOR
- COMPASS
- ALTIMETER
- IGNITION SWITCH
- AIRSCOOP CONTROL
- ENGINE R.P.M. INDICATOR
- OIL PRESSURE GAUGE

FABRIC COVERED WOODEN WING STRUCTURE

TOP WING IS MADE IN TWO PANELS AND IS ATTACHED TO CENTER CABANE STRUTS WITH STEEL FITTINGS.

LAMINATED WALNUT PROPELLER

3'-5"

BRASS TIP

CABANE STRUT

ENGINE RADIATOR

3'-4"

9'-0"

39'-3"

SIX CYLINDER IN-LINE WATER COOLED ENGINE

PILOT SEAT BUILT INTO MAIN FUEL TANK

MAIN WING RIB

INSIGNIA ON TOP WING SAME LOCATION LOWER WING

LOWER WING OUTLINE

FABRIC COVERED WOODEN FRAME AILERON

CLEVIS TYPE AILERON HINGE

AILERON CONTROL HORN

FAIRLEAD

UPPER WING AREA 22.70 SQ. METERS

NO WASHOUT OR WASHIN OF WING TIPS OF TOP AND BOTTOM WINGS.

TAPED SEAMS OVER WING RIB LACING

26'-10" (OVERALL)

37'-6"

METAL COWLING

SLAT FLOOR

GUNNER'S SEAT

AFT GUN RING

PLYWOOD FAIRING

RUDDER CABLE

ELEVATOR CONTROL CABLE

CUT-OUT IN TOP WING

SCALLOPED TRAILING EDGE

MAIN WING RIB

STEEL RIB

WING RIB FABRIC SEAM

ELEVATOR RANGE OF MOVEMENT IS 40°

RUDDER RANGE OF MOVEMENT IS 60°

TOTAL STABILIZER AREA 3.84 SQ. METERS
TOTAL ELEVATOR AREA 1.65 SQ. METERS

FABRIC COVERED WOODEN WING STRUCTURE

9'-0"

1'-6"

RESPECTIVE WEIGHTS OF COMPONENTS OF AIRPLANE

AIRPLANE STRUCTURE, ENGINE, RADIATOR, RADIO, FUEL, OIL, GUNS, ETC.	614 KG.
WATER FOR RADIATOR	43
TAIL SURFACES (VERTICAL AND HORIZONTAL)	19
WINGS (TOP AND BOTTOM) INCLUDING CONTROLS	122
FIXED MACHINE GUN MOUNTED ON UPPER WING	30
ACCESSORIES (MISCELLANEOUS)	15
MOBILE MACHINE GUN AND AMMUNITION	30
INSTRUMENTS AND MOUNTING	5
RADIO EQUIPMENT, TRAILING ANTENNA	15
PILOT AND OBSERVER	150
FUEL (FUSELAGE TANK)	100
OIL (ENGINE CRANKCASE)	15
FUEL (EMERGENCY FUEL TANK UPPER WING)	70
INTERPLANE STRUTS	20
TOTAL AIRPLANE WEIGHT	1,248 KG.

THE FUEL SYSTEM CONSISTS OF THE MAIN FUSELAGE TANK AND AN EMERGENCY TANK MOUNTED ON UPPER WING. FUEL WAS SUPPLIED BY GRAVITY TO THE ENGINE. FUEL WAS PUMPED TO UPPER TANK BY PILOT OPERATING A FORCE PUMP IN SERIES WITH FUSELAGE TANK.

9'-3"

7'-4"

1'-11"

FABRIC COVERED STEEL TUBE FRAME ELEVATOR

FABRIC SEAM

STEEL STRAP ELEVATOR HINGE

FABRIC COVERED STEEL TUBE FRAME HORIZONTAL STABILIZER

FAIRLEAD

5'-6"

11'-0"

THIS AIRPLANE IS KNOWN AS THE HANSA-BRANDENBURG AND WAS THE AUSTRIAN VERSION OF THE GERMAN ALBATROSS TYPE. IT WAS INTENDED FOR AIR RECONNOISSANCE FUNCTIONS. THE AIRPLANE WAS FIRST DESIGNED IN 1914 AND FLOWN ON THE EASTERN FRONT. THE AIRPLANE WAS BUILT BY AN AIRCRAFT CONCERN THAT BUILT SEAPLANES FOR THE GERMAN NAVY.

THIS AIRPLANE WAS EASY PREY TO ALLIED FIGHTERS DUE TO ITS POOR PERFORMANCE, LOW ENGINE POWER, AND SLUGGISH MANEUVERABILITY.

VARIOUS TYPES OF WATERCOOLED ENGINES WERE INSTALLED INCLUDING 200 H.P. WARSKALOWSKI.

THE AIRPLANE LANDING GEAR COULD BE INTERCHANGED FOR SKIS FOR WINTER OPERATIONS.

THERE WERE SEVERAL VERSIONS OF THIS AIRPLANE ALL DIFFERING IN MINOR DETAILS OF CONSTRUCTION OR ENGINE INSTALLATION.

THE HIGH SPEED WAS 96 M.P.H. AND THE RANGE ABOUT 325 MILES IN STILL AIR.

AILERON CONTROL HORN

DIHEDRAL ANGLE 1.5°

ANGLE OF INCIDENCE 3°

MULTI-STRAND STEEL CABLES

WING RIB

FAIRED STEEL TUBE CABANE STRUCTURE

DRAG BRACE

BRASS TIP

CABLE BRACE

RUBBER SHOCK CORD BRAKING SPRAG

2'-6"

5'-8"
7'-7"

WALKWAY

TAIL PLANE

WATER FILLER
BRASS RADIATOR
200 H.P. WATER COOLED ENGINE

WING RIB

FAIRED STEEL TUBE SPREADER

SYNTHETIC RUBBER HIGH PRESSURE TIRE

(PLANE SHOWN IN HEAD-ON FLIGHT ATTITUDE)

FAIRED STEEL TUBE INTERPLANE STRUTS

FLYING CABLE BRACE

LANDING CABLE BRACE

SCALLOPED TRAILING EDGE

TIE

TURNBUCKLE

REMOVABLE ALUMINUM COWLING

WATER FILLER

MULTI-STRAND STAGGER CABLES

ALUMINUM COWLING

STEEL HUB

SEE DETAIL FOR FUEL SERVICE TANK AND FIXED MACHINE GUN

AILERON CONTROL HORN

WELDED STEEL TUBE FIXED GUN MOUNT. AIR COOLED MACHINE GUN IS MANUALLY ADJUSTABLE FOR HORIZONTAL OR VERTICAL TRAVERSE

AFT COCKPIT CONTAINED A WIRELESS TRANSMITTER, RECEIVER, FOLDING GUNNER'S SEAT, AMMUNITION RACK, ETC.

PLYWOOD TURTLE DECK

ADJUSTABLE AIR SCOOP

DRAG CABLE

ENGINE ACCESS PANEL

DRAG CABLE

WELDED STEEL FITTING

SPRAG ACTUATING CABLE

AIR VALVE

CANVAS COVERING OVER STEEL SPOKES

1'-5"

1'-3"

WHITE

BLACK

WOOD FILLED STREAMLINED STEEL TUBE LANDING GEAR STRUCTURE

WELDED STEEL FITTING

BRAKING SPRAG

HIGH PRESSURE TIRE

STEEL AXLE

STEP

GERMAN AIR FORCE IDENTIFICATION

ELEVATOR CONTROL CABLE

FAIRLEAD

RUDDER CONTROL CABLE

FABRIC COVERED STEEL TUBE FRAME RUDDER

AERODYNAMIC BALANCE

RIB STITCHING

STEEL STRAP HINGE VERTICAL STABILIZER FABRIC COVERING OVER STEEL TUBE FRAME

STEEL TUBE FRAME FABRIC COVERED HORIZONTAL STABILIZER

ADJUSTABLE ATTACHMENT FITTING

TIE DOWN RING

WOOD TAIL SKID

GROUND LINE

STEEL SHOE

PLYWOOD COVERED WOODEN FUSELAGE STRUCTURE

STREAMLINE STEEL TUBE BRACE

HORIZONTAL AND VERTICAL STABILIZERS ARE ADJUSTABLE ON THE GROUND.

FABRIC COVERED STEEL TUBE FRAME ELEVATOR

5'-6"

LANDING ANGLE 12°

(AIRPLANE SHOWN IN TAKE-OFF ATTITUDE)

(SCALE) 0. 1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 11. 12. 13. 14. 15. 16. 17. 18. 19.

WEIGHT SCALE 0. 1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 11.

(LENGTH SCALE) 0. 1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 11. 12. 13. 14. 15. 16. 17. 18. 19. 20. 21. 22. 23. 24. 25. 26. 10"

THE FABRIC WAS OF COTTON OF AVERAGE GRADE. IT WAS STITCHED TO EACH RIB WITH LINEN THREAD AND EACH LINE OF STITCHES WAS COVERED WITH DOPED TAPE.

WING RIBS WERE NAILED AND GLUED

TRAILING EDGE WAS FLEXIBLE

PLYWOOD LEADING EDGE TOP SURFACE ONLY
STEEL TUBE DRAG STRUT FITTING LOCATION
WING STRUT FITTING
WING RIB
ATTACHMENT FITTING
STEEL TUBE DRAG STRUT
AILERON CABLE
MULTI-STRAND CABLE BRACE
FABRIC COVERED WING STRUCTURE
WING STRUT FITTING
AILERON PULLEY BRACKET
STEEL TUBE WING TIP
FORWARD SPAR
SPAR CLIP
SOLID RIB
PLYWOOD COVERING
FUSELAGE LONGERON
AFT WING SPAR
STEEL CABLE TRAILING EDGE
DOUBLE WING RIB
STEEL CLIP
AILERON HINGE
FABRIC COVERED WOODEN AILERON
AILERON CONTROL HORN
SOLID AILERON SPAR

UPPER WING
(RIGHT SHOWN. LEFT SIMILAR)

WING RIB
STEEL TUBE DRAG STRUT
PLYWOOD LEADING EDGE TOP SURFACE ONLY
MULTI-STRAND CABLE BRACING
INTERPLANE STRUT FITTING
FORWARD WING SPAR FITTING
TIE
STEEL DRAG STRUT
AFT WING SPAR FITTING
SOLID WING RIB
FORWARD SPAR
STEEL TUBE WING TIP
AFT SPAR
INTERPLANE STRUT FITTING
DOUBLE RIB AT STRUT POINT
STEEL CABLE TRAILING EDGE
DOUBLE WING RIB AT STRUT POINT
PLYWOOD COVERING
FABRIC COVERED WING COVERING

LOWER WING
(RIGHT SHOWN. LEFT SIMILAR)

STEEL TUBE STABILIZER SPAR
STEEL STRAP HINGE
ELEVATOR CONTROL HORN
FABRIC COVERED WELDED STEEL TUBE STRUCTURE
RIB
ATTACHMENT FITTING

THIS TYPE AIRPLANE WAS CAMOUFLAGED IN A VARIGATED PATTERN OF RED, GREEN, BROWN AND PURPLE HEXAGONS ON THE WINGS AND FUSELAGE. THE TAIL SURFACES HAD AN ALTERNATED PATTERN OF DIAGONAL GRAY AND PURPLE STRIPES.

FABRIC COVERED WELDED STEEL TUBE STRUCTURE
STEEL STRAP HINGE
RUDDER CONTROL HORN
FITTING
STEEL TUBE ELEVATOR SPAR

HORIZONTAL STABILIZER AND ELEVATOR

VERTICAL STABILIZER AND RUDDER

STEEL TUBE LOWER WING CROSSBRACE
SLAT FLOOR
FUEL TANK
FAIRING FRAMEWORK
PLYWOOD COVERING
TAIL SKID SUPPORT
PILOT COMPARTMENT
GUNNER'S COCKPIT
STEEL FITTING
PLYWOOD DIAPHRAGMS CUT TO CLEAR ENGINE CRANKCASE
ENGINE BEARER
INSTRUMENT PANEL
PLYWOOD SEAT
FUEL TANK FILLER
FUEL TANK
STIFFENING BEAD
AFT GUN RING
FUSELAGE FAIRING FRAMEWORK
HORIZONTAL STABILIZER ATTACHMENT
PLYWOOD BULKHEAD
AMMUNITION COMPARTMENT
UPPER LONGERON
VERTICAL STRUT
TAIL POST
LOWER LONGERON
LOWER STRUT BRACING SAME AS THE TOP
TAIL SKID SUPPORT
PLYWOOD BULKHEAD
SLAT FLOOR
PLYWOOD COVERING
NAILED AND SCREWED JOINTS
STEEL TUBE CROSS BRACE
SHEET STEEL FIREWALL
STATION POINT
0. 14" 1. 17" 2. 8" 3. 13" 4. 6" 5. 27" 6. 16" 7. 16" 8. 23" 9. 23" 10. 24" 11. 17" 12. 20" 13. 17" 14. 17" 15. 24" 16.
23'-6"

TOP FUSELAGE TRUSS
(LOWER FUSELAGE TRUSS IS SIMILAR)

SIDE FUSELAGE TRUSS

CABANE

TYPICAL WING RIB

RIVETED AND WELDED CORNER BRACE AND WING FITTING
STEEL CLIP
FAIRING
FUSELAGE FITTING
WEB STIFFENER
AFT SPAR LOWER CAP STRIP
PLYWOOD WEB
FORWARD SPAR
SOLID LEADING EDGE
GUSSET
LOWER CAP STRIP
SPRUCE CAP STRIP
CUTOUT
PLYWOOD WEB STIFFENER
FUSELAGE FITTING

LANDING GEAR

FORE AND AFT BRACE CABLE
STEP
FAIRED STEEL STRUT
UPPER WING FITTING
FAIRED STEEL TUBE
FUSELAGE FITTING
SYNTHETIC RUBBER HIGH PRESSURE TIRE
FAIRED SPREADER TUBE
RUBBER SHOCK CORD
TIE WIRE SPOKE WHEEL FAIRED WITH FABRIC
CABANE
FOOT STEP
CABLE BRACE FITTING
FAIRED STEEL STRUT
M.G. MOUNT
UPPER WING

CONVENTIONAL WATER COOLED MACHINE GUN WAS MOUNTED ON UPPER WING. IT WAS FIRED BY A LANYARD OPERATED BY PILOT. IT WAS NOT SYNCHRONIZED. IT WAS MOUNTED ABOVE THE PROPELLER.

FIXED MACHINE GUN
(UPPER WING)

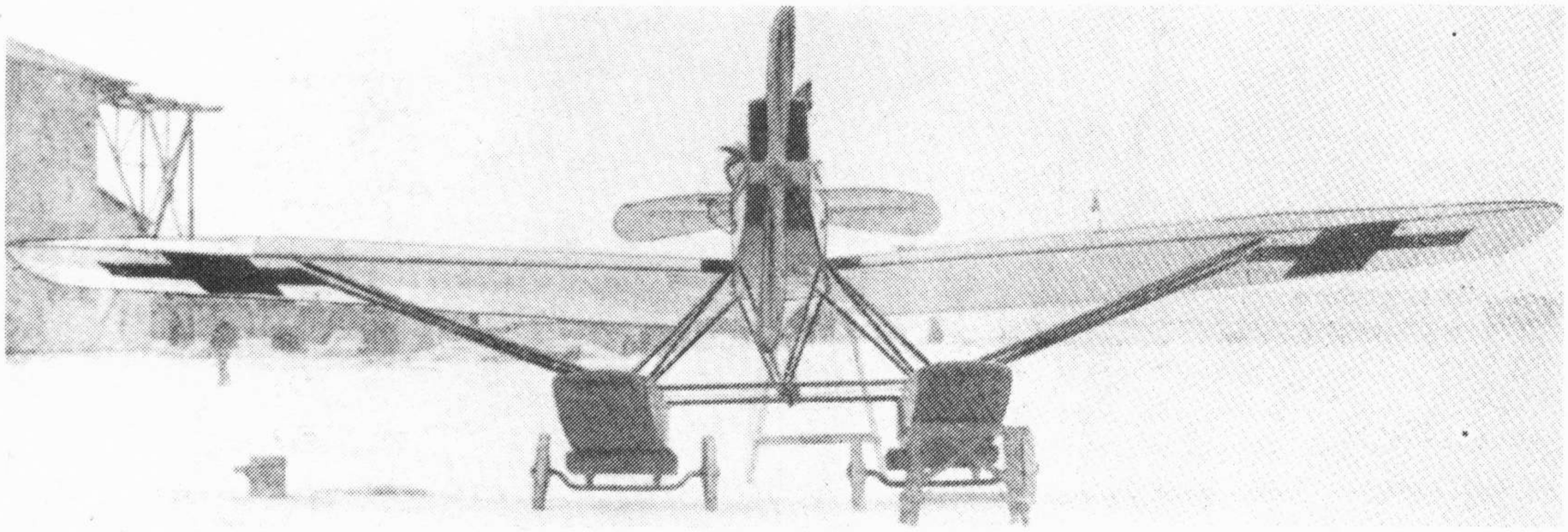
FRONT VIEW
WATER COOLED MACHINE GUN
MOUNTING QUADRANT
CARTRIDGE MAGAZINE
SERVICE FUEL TANK
AILERON HORN

Hansa-Brandenburg W.29

drawings by TAGE LARSEN

ERNST Heinkel designed the W.29 for the Brandenburg factory in 1918. It was used on the North Sea, its most famous pilot being Oberleutenant Christiensen. It was later built in Denmark and served several countries in modified forms almost until WW II.

One Brandenburg seaplane, the later W.33, is being restored in Finland. □



The Hansa-Brandenburg W.29 had several unique design features for its time. The structure was almost entirely from wood and explored the cantilever concept. "Jane's History of Aviation" photo.

30'-6"
9.350

EAR.
POW Y
A 6-CYL. BENZ
ENGINE.

BENZ ENGINES RATED AT 150, 185 AND 195 HP WERE USED IN GERMAN BRANDENBURGERS.

SHORT EXHAUST STUBS

LONG MANIFOLD

(A)

AUXILIARY FUEL TANK ON DANISH PLANES FROM 1925

FOOT STEPS

18'-7"
5.660

DANISH ROUNDELS ON UPPER WING SURFACES

(B)

MOVABLE 7.9 MM PARABELLUM GUN

TOP VIEW OF FLOAT

WATERTIGHT INSPECTION DOORS

(C)

2292

GERMAN W.29'S WERE DARK GREY ALL OVER EXCEPT FOR THE RUDDER, WHICH WAS WHITE. BLACK NUMERALS AND BLACK CROSSES OUTLINED IN WHITE. (MARKINGS VARIED CONSIDERABLY)

WING WALK (BOTH WINGS)

EMPTY WEIGHT	2.200 LBS	
" "	998 KG	
LOADED WEIGHT	3.285 LBS	
" "	1.490 KG	

(M)

TOP SPED	103 MPH	165 KM/H
CRUISING	87 "	140 "
LANDING	47 "	75 "
RANGE	326 MLS	525 KM

(D)

(O)

(N)

(N)

(E)

GERMAN MARKINGS IN SAME POSITION ABOVE AND BELOW WING.

(M)

(N)

Hansa-Brandenburg
W.29 (H.M.I)

Tage

29

DETACHABLE WIND SCREEN FOR OBSERVER'S SEAT INTRODUCED 1925.

ONE OF 15 W.29'S BUILT BY THE NAVAL DOCKYARD OF COPENHAGEN, DENMARK. ALSO THE 160 HP ENGINE WAS DESIGNED AND BUILT BY THE DOCKYARD (ORLOGS VAERFTET).

GERMAN AND EARLY DANISH W.29'S HAD SIX INDIVIDUAL EXHAUST STUBS. DANISH PLANES LATER CHANGED TO LONG MANIFOLDS.

FIXED ARMAMENT ON GERMAN W.29'S CONSISTED OF TWO 7.9 MM SPANDAU GUNS, ONE ON EACH SIDE OF THE FORWARD FUSELAGE. THE REAR SEAT GUNNER OPERATED A MOVABLE 7.9 MM PARABELLUM GUN.

DANISH W.29'S WERE ARMED WITH A FIXED SYNCHRONIZED 7.9 MM VICKERS GUN AND ONE OR TWO RING-MOUNTED DANISH DISA (MADSEN) GUNS IN THE REAR SEAT.

INSPECTION DOOR

WINDOW IN FLOOR UNDER OBSERVER / GUNNER'S COMPARTMENT.

FOOT STEPS

11'-11" 3.620

8'-11" 2.700

PERSISTANT STABILITY PROBLEMS WERE FINALLY OVERCOME BY INTRODUCING LARGER ELEVATORS IN 1925.

9'-4" 2.840

WOODEN O.V. PROPELLER WITH BRASS REINFORCED TIPS. BENZ ENGINE TURNED OPPOSITE WAY ROUND

DANISH PLANES WERE ORIGINALLY PAINTED DARK GREY ALL OVER WITH WHITE NUMBERS, BUT LATER CHANGED TO SILVER WITH BLACK NUMBERS. RED-WHITE FLAGS & ROUNDELS

VICKERS GUN
RADIATOR
WING WALK (CORRUGATED ALUMINUM)
MANIFOLD
FOOT STEP
AUX. TANK
PITOT TUBE

SPAN 44'-4" — 13.510

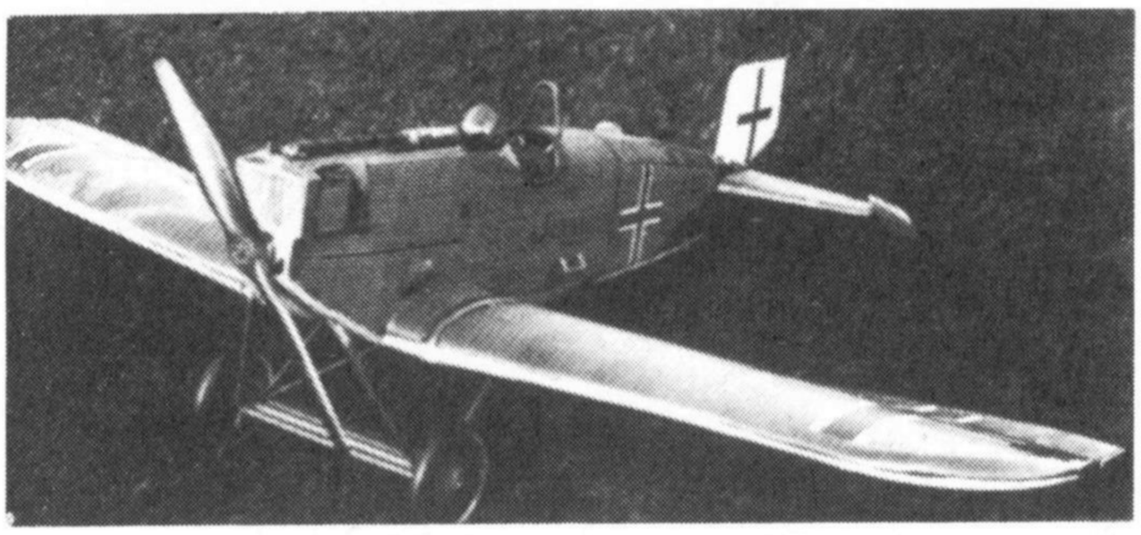
FEET 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14

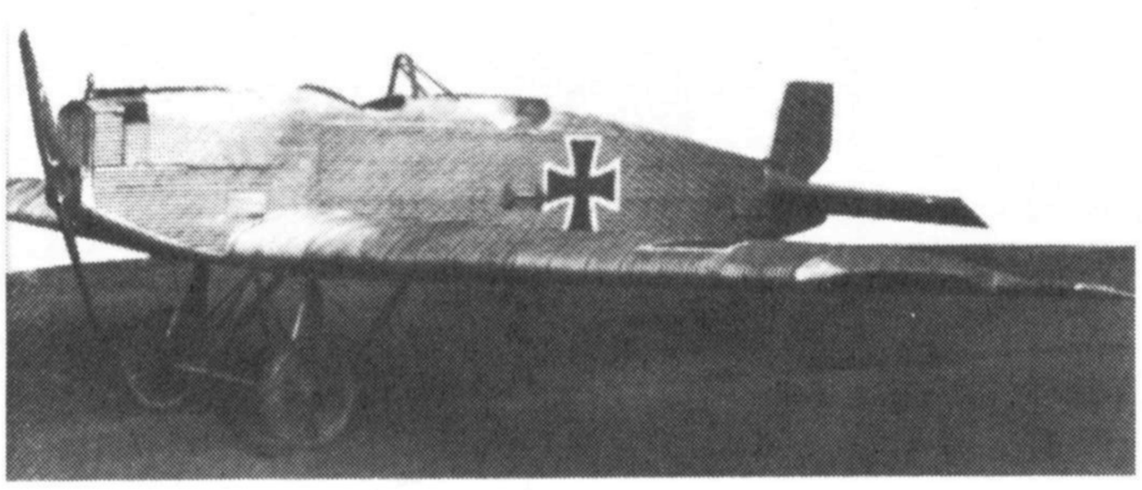
METRES 0 1 2 3

Junkers D.I

drawing by CHARLES GRAHAM

Junkers first design, the J 1, paved the way to success for the firm.





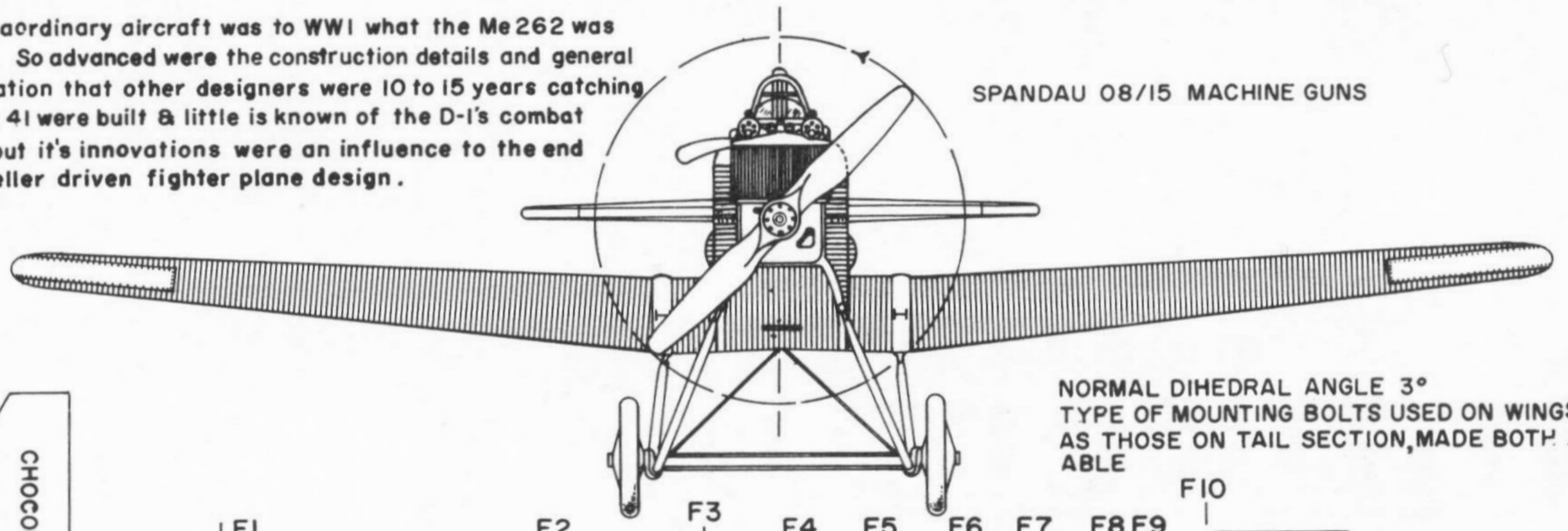
The Junkers D.1, above and below, was all-metal with full cantilever wings. "Jane's Encyclopedia of the World's Aircraft" photo.

THE FIRST JUNKERS factory design was the J 1 (Army designation E.I); it was known as The Tin Donkey, and only one was built. The 9th Junkers design, the J 9, appeared in October 1917, and with its 160 hp Mercedes was entered in the fighter competitions of 1918. The Army ordered it built as the D.I. Armament consisted of a pair of fixed, forward-firing Spandau guns ahead of the cockpit.

Because of lack of experience with the aircraft's then-unconventional metal construction, only forty-one D.1s were completed and delivered to the Front before the Armistice in November 1918. The aircraft featured a number of unique innovations, one of which was a full cantilever wing.

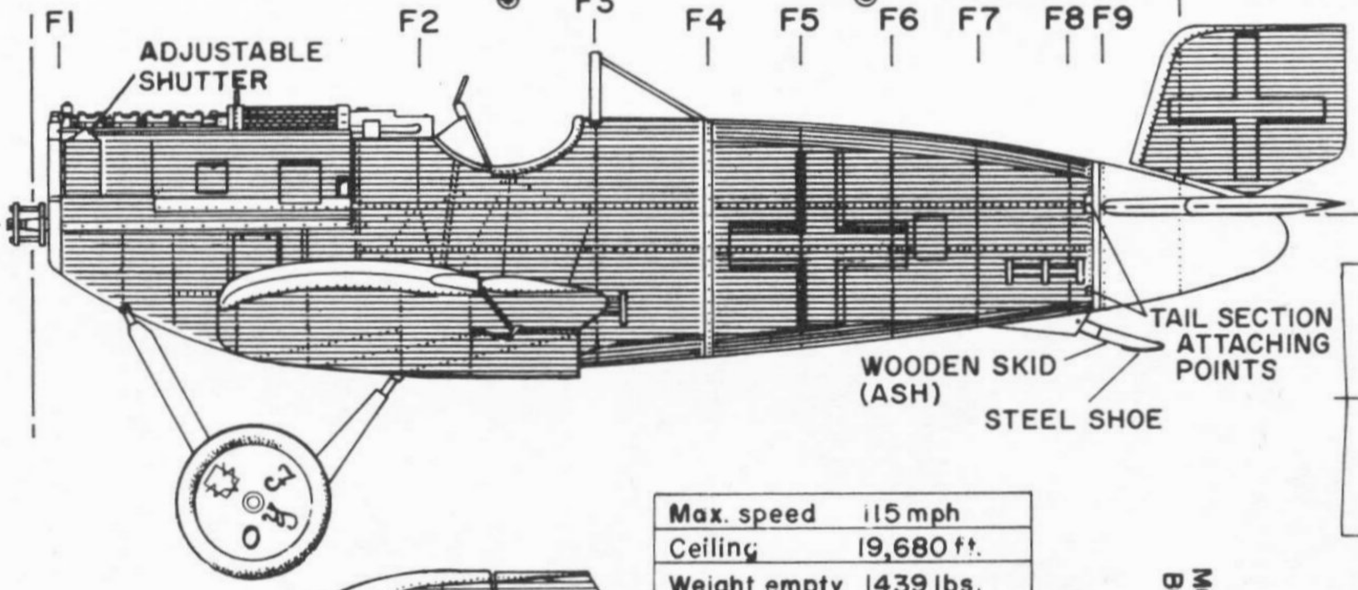
Four Junkers all-metal monoplanes of the WW I period survive in museums. □

This extraordinary aircraft was to WWI what the Me 262 was to WWII. So advanced were the construction details and general configuration that other designers were 10 to 15 years catching up. Only 41 were built & little is known of the D-1's combat record, but it's innovations were an influence to the end of propeller driven fighter plane design.



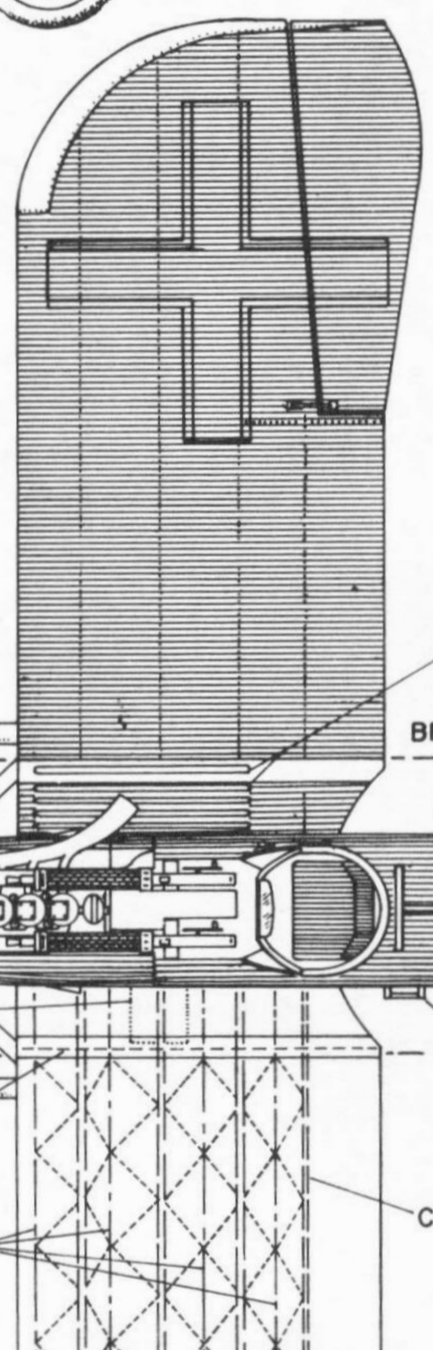
SPANDAU 08/15 MACHINE GUNS

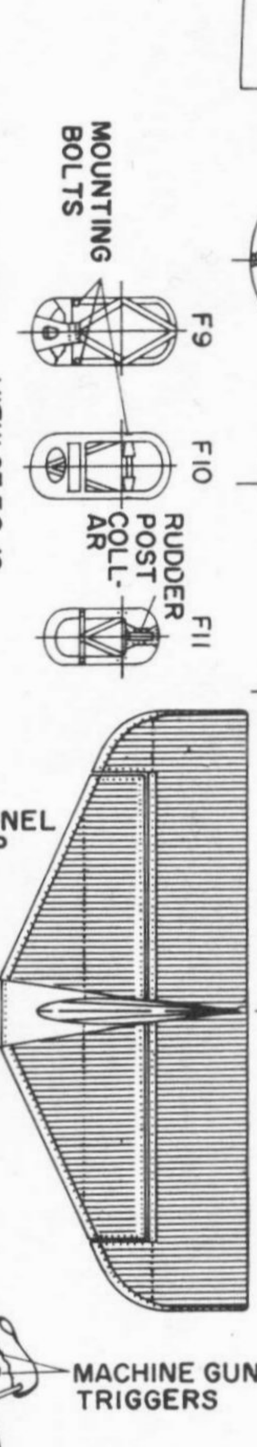
NORMAL DIHEDRAL ANGLE 3°
TYPE OF MOUNTING BOLTS USED ON WINGS, AS WELL AS THOSE ON TAIL SECTION, MADE BOTH ADJUSTABLE



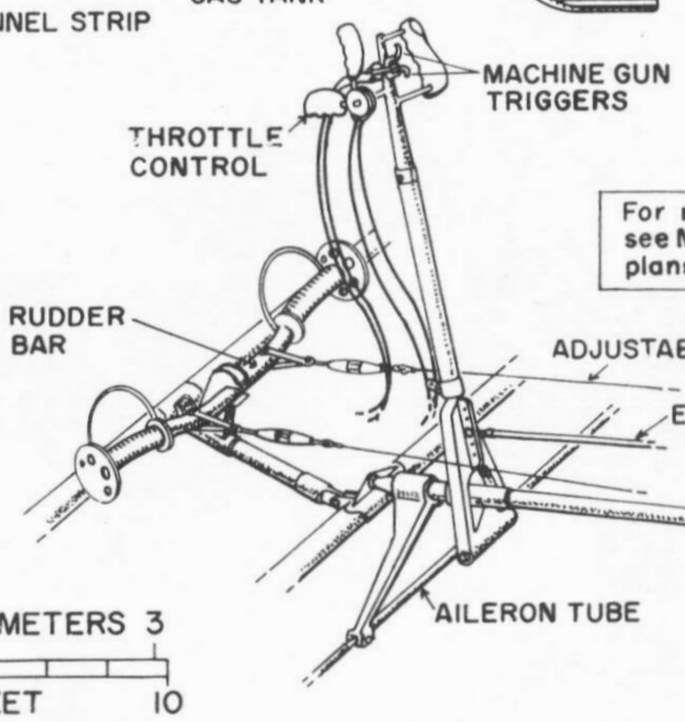
BASE COLOR IS PALE GREEN, IRREGULAR PATCHES: LIGHT MAUVE BLACK CROSS OUTLINED IN WHITE, SINCE UNDERSIDE IS WHITE, THE CROSS HAS NO OUTLINE

Max. speed	115 mph
Ceiling	19,680 ft.
Weight empty	1439 lbs.
" gross	1841 "
Time/Ht.	5.8/6500
	9.8/9800
	14.8/13,100
	22.17/16,400





CONSTRUCTION OF F5 THRU F8, IS SIMILAR TO F4



For more info on the engine see M.A.N. Aug. '48, for Wylam's plans of the Mecedes F-1466D3A

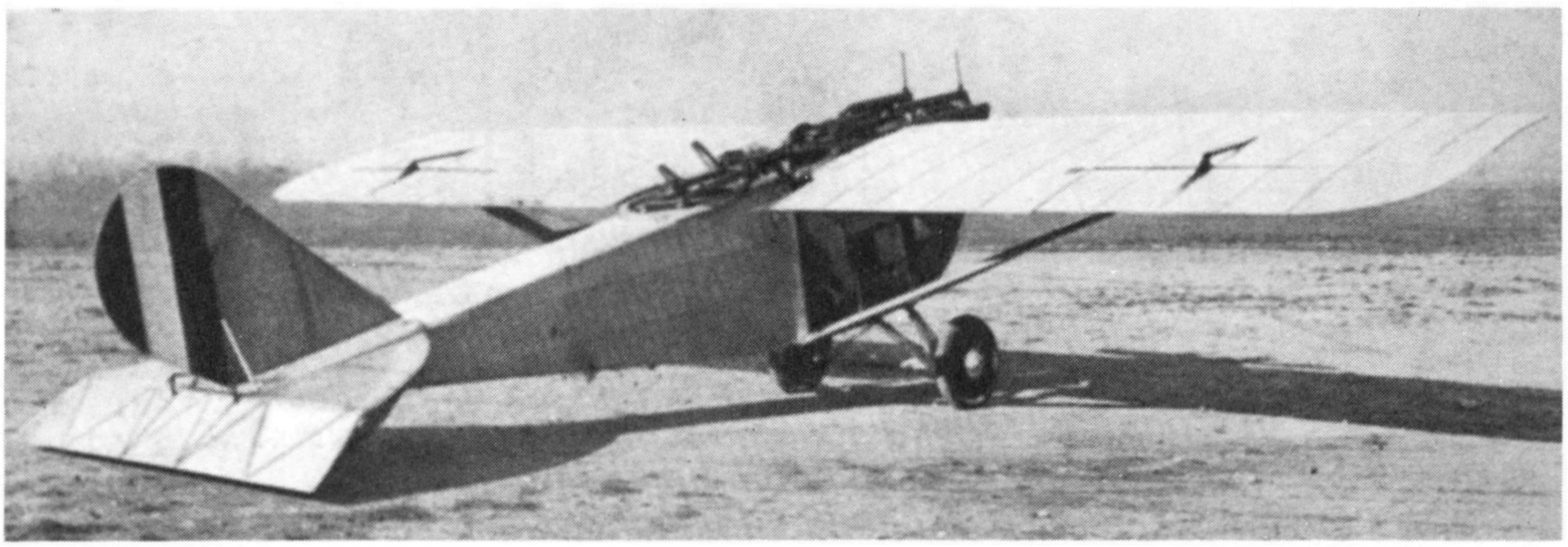
0 1 2 METERS 3
0 5 FEET 10

Junkers D-1. 1918

Drawn by C. Graham
Engine: 180 h.p. Mercedes
Designed by: Prof. Hugo Junkers

Loening M-8

drawings by TOM STARK



Although too late to see action in WW I, the Loening M-8 was to establish several world aviation records. "Jane's All the World's Aircraft" photo.

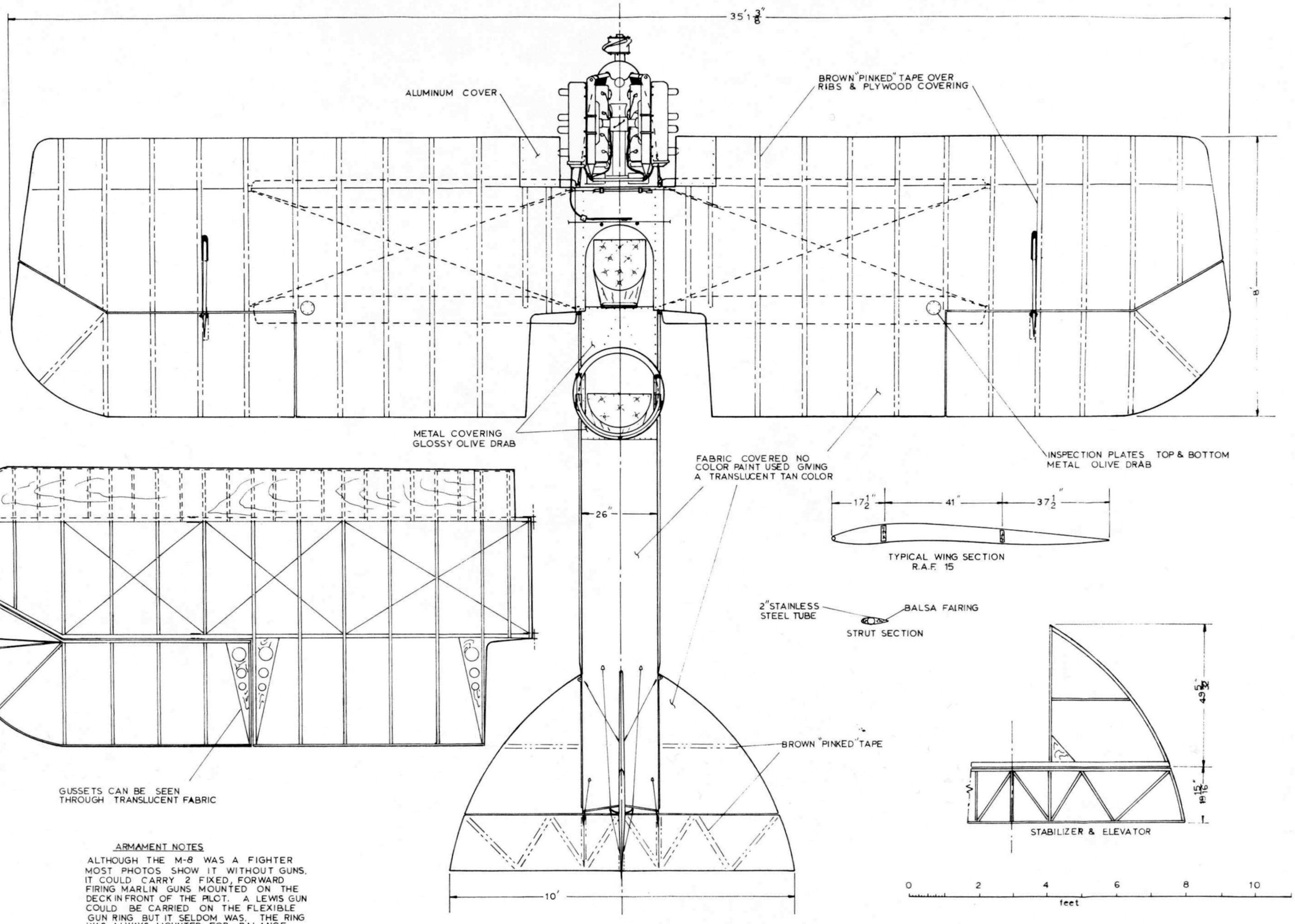
THE LOENING M-8 was described by Grover Loening as "nearer to being inspired than anything I ever did." While its pot-bellied appearance may be anything but inspired by modern standards, when it was designed it represented quite an advancement over the biplanes that dominated that era. It pioneered the strut-braced high-wing configuration and the use of lifting struts that characterized so many commercial airplanes a few years later, including Lindberg's Ryan NYP.

The M-8 was designed near the close of World War I and grew out of America's desire to contribute first line fighting airplanes to the war. The American aircraft industry had not been able to develop and build combat airplanes, and our pilots flew French and British designs in combat. The two-place Bristol Fighter served as the model for the M-8, but was a model in capability and characteristics only, since the M-8 had another requirement—ease of rapid manufacture. In this it succeeded very well, having only one-fifth the number of fittings and requiring only one-fourth the manufacturing time as the Bristol. In addition, it weighed 500 pounds less than the Bristol while carrying the same military load, but at a speed 30 mph faster.

Lifting strut wing braces designed for the M-8 were a breakthrough that has been carried over into lightplane designs of current manufacturing.

By the time the prototype was flying, the Armistice was signed and plans to build 5,000 M-8s were dropped. Only two were built for the Army and four for the Navy, and they served as engine testbeds, racing planes, and research vehicles. In December 1918, one broke the world's altitude record for carrying one and two passengers.

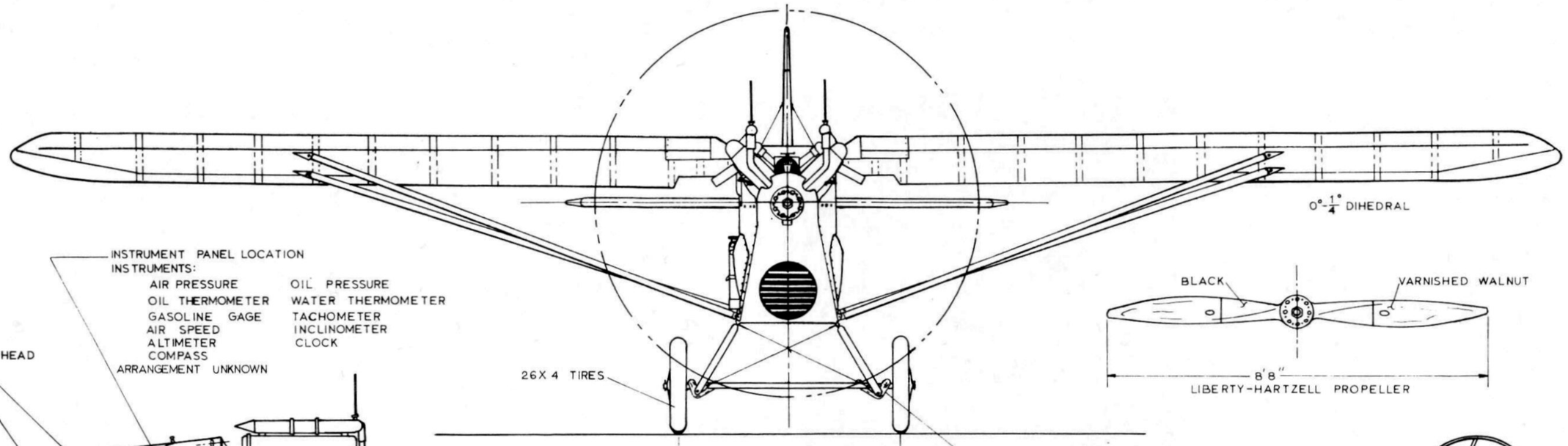
None survive. □

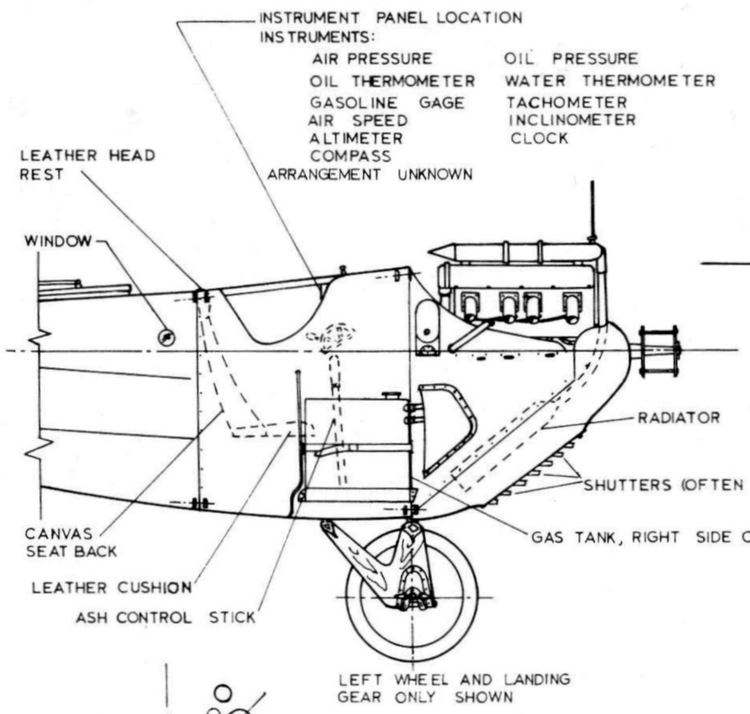


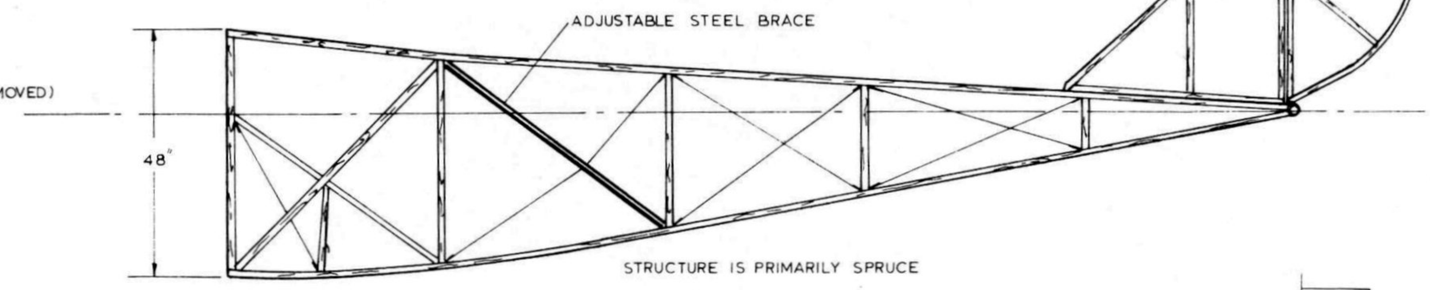
ARMAMENT NOTES

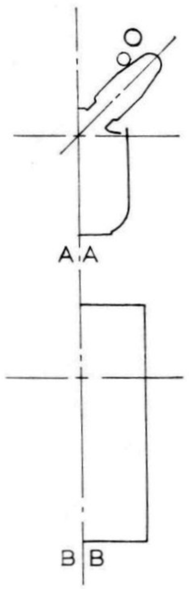
ALTHOUGH THE M-8 WAS A FIGHTER MOST PHOTOS SHOW IT WITHOUT GUNS. IT COULD CARRY 2 FIXED, FORWARD FIRING MARLIN GUNS MOUNTED ON THE DECK IN FRONT OF THE PILOT. A LEWIS GUN COULD BE CARRIED ON THE FLEXIBLE GUN RING BUT IT SELDOM WAS. THE RING WAS ALWAYS MOUNTED FOR BALANCE.

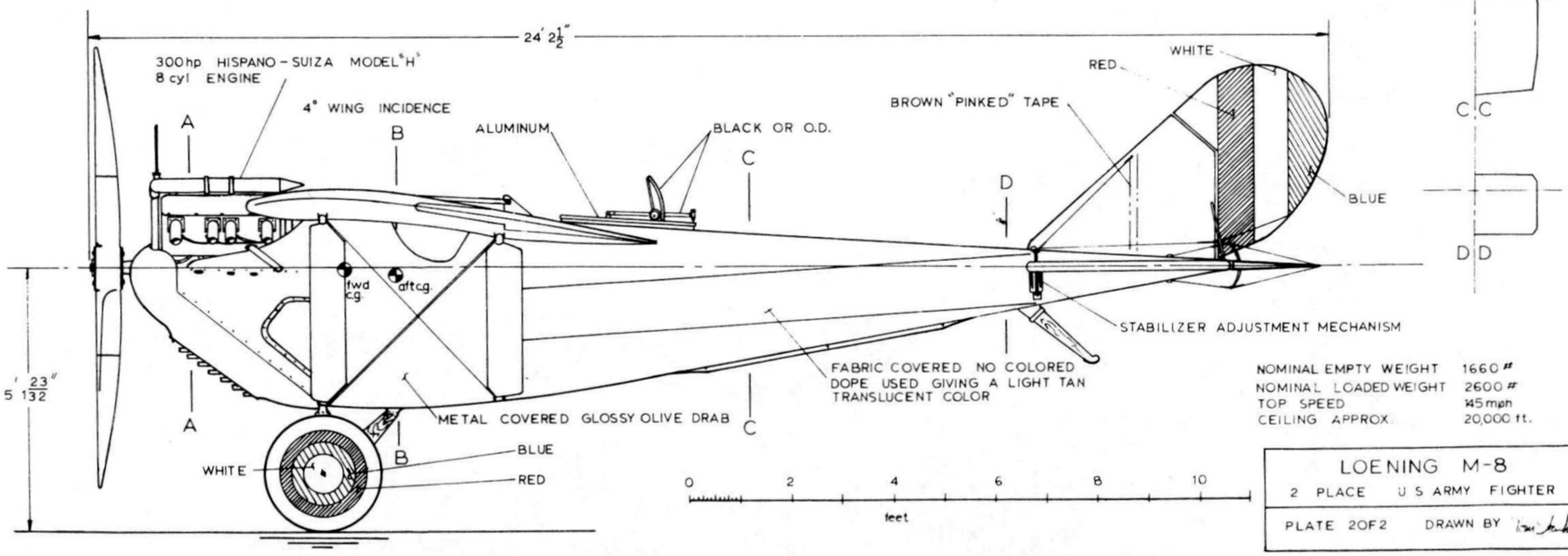
LOENING M-8's ALSO CALLED WRIGHT-MARTIN M-8's WERE BUILT IN LIMITED NUMBERS FOR THE ARMY AND NAVY. THERE WERE VARIATIONS BETWEEN INDIVIDUAL AIRPLANES AND AIRPLANES UNDERWENT MODIFICATIONS IN SERVICE. VISIBLE VARIATIONS WERE: WING TIP SHAPE, ROOT CUT-OUT, SPAN, CHORD, OVERALL COLOR SCHEME, WINDOWS, COWL DETAILS, AND CONTROL CABLE RUNS. DRAWING IS ARMY M-8 AS IT WAS WHEN PHOTOS USAF NEG. #'s 1777 THRU 1780 WERE TAKEN.











NOMINAL EMPTY WEIGHT	1660 #
NOMINAL LOADED WEIGHT	2600 #
TOP SPEED	145 mph
CEILING APPROX.	20,000 ft.

LOENING M-8

2 PLACE U S ARMY FIGHTER 1918

PLATE 2OF2 DRAWN BY [illegible] 28 DEC.69

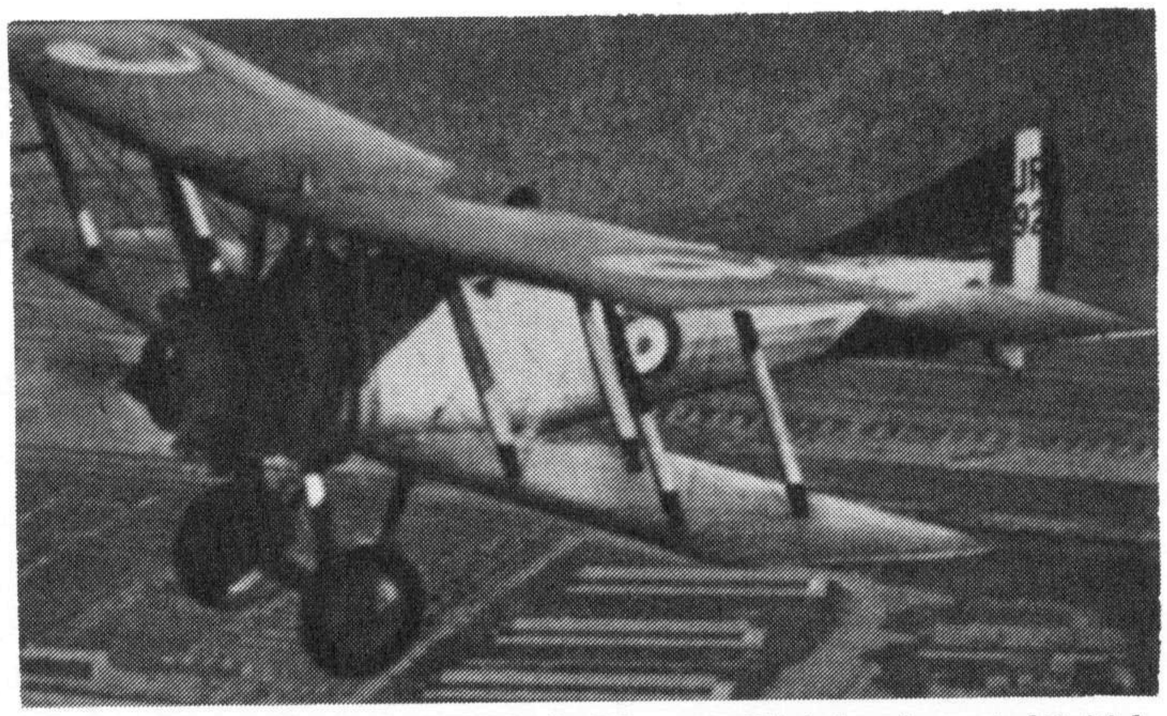
Nieuport Nighthawk

drawings by JOSEPH NIETO

THE BRITISH Nieuport Nighthawk was chosen for mass production by the Royal Air Force because of its remarkable performance and because it had been designed to use many S.E.5 parts. It also met the strength requirements as demonstrated by load tests throughout the entire machine. The general arrangements regarding position and accessibility of guns, instruments, etc., provided the facilities most suitable to combat conditions, aided by a minimum "blind" area. Intended for quick mass production of a "knock-out-punch" fighter to finish up the war, it was a bit late for front line service before the armistice. The Nighthawk was fully capable of carrying on for the RAF where the S.E.5 and Snipe had left off. As the RAF's first truly modern radial-powered production airplane, the Nighthawk was powered by a 9-cylinder 320-hp A.B.C. Dragonfly air-cooled engine, giving it a climb rate of 1,500 fpm and a top speed of 151 mph.

Built by Nieuport and the General Aircraft Co. Ltd. of Cricklewood, London, it was designed by H.P. Folland, formerly of the Royal Aircraft Factory.

The nearest thing to a surviving Nighthawk is one of the existing seven S.E.5a's. □



Too late to see service in WW I, the Nieuport Nighthawk carried British fighter pilots for nearly a decade, almost into WW II. "Aircraft of the Royal Air Force, 1918-1957" photo.

AIR AGE INC. 551 FIFTH AVE, NEW YORK, 17, N.Y.

SCALE: 1'-1'-0" } GENERAL ARRANGEMENTS & CONSTRUCTIONAL DETAILS.

FULL SIZE: 1'-1'-0" } BRITAIN'S 1918 R.A.F. NIEUPORT.

COPYRIGHT BY: Joseph Nieto.

Nighthawk.

B-B

C-C

A-A

— FUSELAGE SECTION OUTLINES —

LINEN TAPE, ½" WIDE WAS GLUED OVER ENDS OF RIBS & FLAP SPAR. APPLIED TO ALL RIBS ENDING AT FLAP SPAR.

FAIRING WAS FITTED AFTER FABRIC WAS PUT ON.

FAIRING STRIP TO BUTT UP AGAINST RIB AS SHOWN.

FAIRING STRIP GLUED & SCREWED TO SPAR.

SECTION ON LINE X, Y.

DRAIN EYELETS ON UNDER SURFACE ONLY, ALONG TRAILING EDGE, BOTH WINGS.

℄ OF WING PANEL HINGE.

AILERON CONTROL CABLE & SHAFT.

LOWER WING PANEL OUTLINE. (REF.)

11'-1 9/16"

AILERON HINGE ℄

4'-9.8"

(X)

(Y)

9.8" 13" 6.5" — 2'-11.8"

8.7" 8.7" 9.1" 7.2" 7.6" 9.0" 8.2" — 2'-9.25" — 2'-8.8"

9.8" 9.8" — 20.7"

9.8" 9.8" — 19.65"

5'-5.8" — 3'-3.35"

℄ OUTER STRUTS.

℄ INNER STRUTS.

SCARF JOINT, GLUED AND SCREWED, THEN WAS BOUND WITH CORD, AND VARNISHED.

CHORD LATHS WERE GLUED & SCREWED TO RIBS.

STRINGERS WERE GLUED AND BRADDED TO CHOCKS ON ALL RIBS.

SCARF — JOINT.

SECTION SHOWING JOINTS IN FLANGES OF RIBS BETWEEN JOINTS A, B, & C, D.

12" 11⅛" 11⅛" 12⅛" — ℄ SHIP. — VERTICAL FIN. (REF.)

6" 5⅛" 5⅛" 5⅛" 5⅛"

2'-6" — 3'-9"

DETAIL ③

DETAIL ②

℄ THRUST.

17.2" 12.75" 8.75"

3'-7.15" — 2'-9.95" — 7.2" — 11.35"

ALUMIN. — WOOD

STABILIZER. (REF.)

C — C

TOP, SIDE & BOTTOM STRINGERS NOT SHOWN, FOR CLARITY.

B — B

A — A

SHOCK CARDS.

19½" — STAGGER.

CHORD. 5'-3" (BOTH WINGS.)

LOWER WING PANEL. (REF.)

℄ UPPER & LOWER SPARS.

CENTER SECTION. (REF.)

FOREMOST POINT, SHIP. (REF.)

DETAIL ①

TAPE

FOREMOST POINT OF SHIP. (REF.)

DETAIL ⑤

PRESSED PLATE FITTING.

WASHER BRAZED TO RIVET D.

TAPE

DETAIL ④

ENDS OF D, BEADED THROUGH F.

OVERALL LENGTH. 18'-6"

7 GAL. GRAV. FUEL TANK IN C.C.

4 GAL. OIL TANK IN NOSE.

2'-9.5"

4'-6"

STABILIZER WAS ADJUSTABLE IN AIR.

BLUE — WHITE — RED

ONE INTAKE VALVE.

EXHAUST PORT ON EACH SIDE. "STACKS" NOT SHOWN.

TWO EXHAUST VALVES, OPERATED FROM ONE CAMSHAFT.

MAX. HEIGHT. 9'-3"

℄ ENGINE

GENERATOR.

TAPE.

26×4 TYRE.

13"

3'-1½"

13'-7.5"

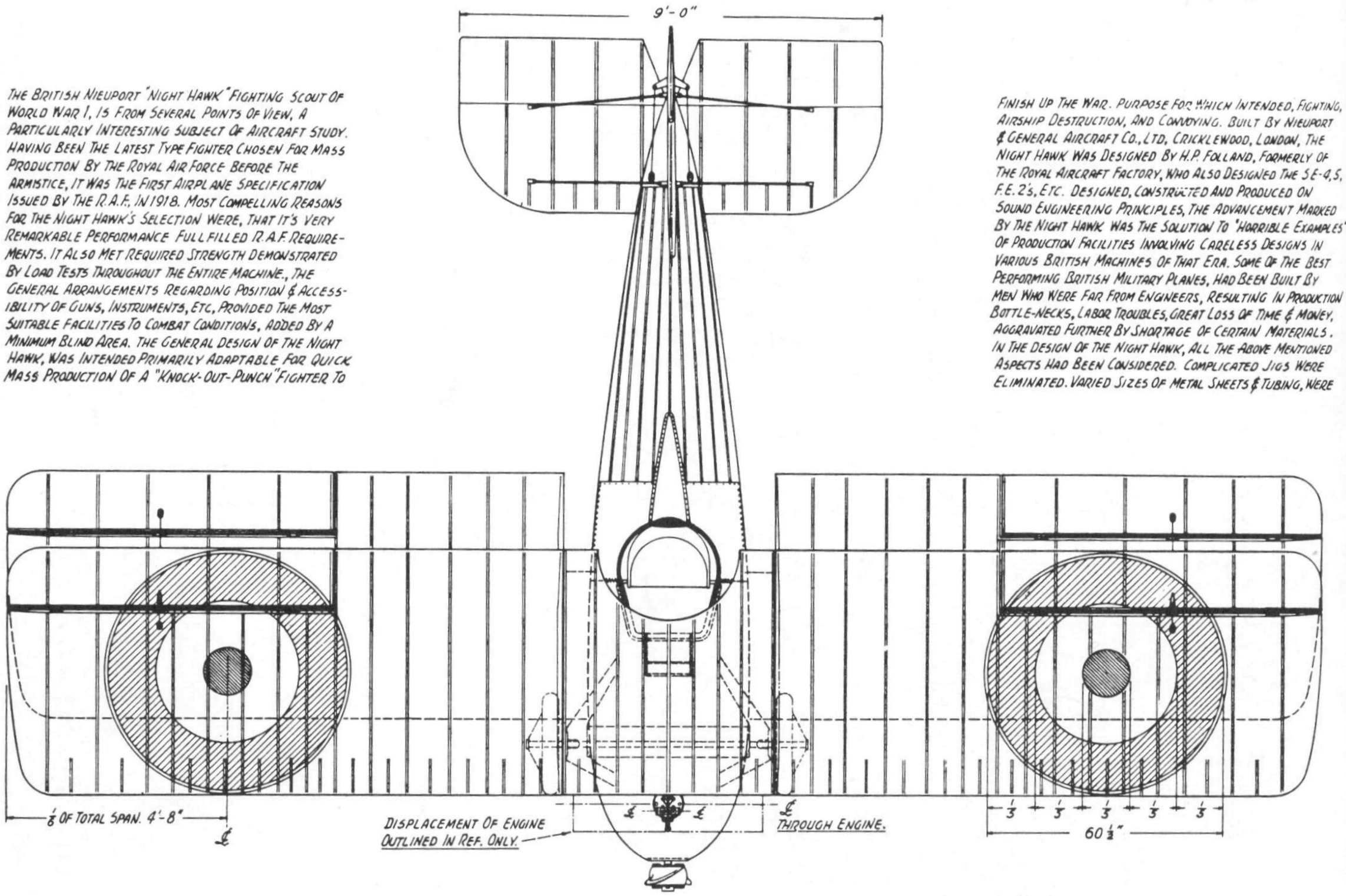
STEEL SHOE

MAIN PETROL, PORT SIDE, BETWEEN FUSELAGE FRAME & BODY SIDE, 16½ GALS. SIMILAR TANK, IN SAME POSITION ON STARBOARD SIDE, ALSO 16½ GALS.

THE COLOR SCHEME OF THE NIEUPORT NIGHTHAWK, APPEARS TO HAVE BEEN MUCH THE SAME AS THE SE-5, SOPWITH SNIPE, AND OTHER LAND-BASED BRITISH PURSUITS OF 1918. THE FUSELAGE, TAIL, LANDING GEAR & UPPER WING SURFACES & STRUTS, OLIVE-DRAB (KHAKI.) SURFACES BENEATH WINGS & TAIL, EITHER LIGHT-IVORY OR VERY LIGHT SKY BLUE. OTHER COLORS, AS NOTED.

ILLUSTRATED BY DETAILS 1 TO 5 AT RIGHT, IS THE UNIQUE METHOD CHARACTERIZING THE UNITING OF WOOD TO WOOD & METAL TO WOOD IN THE FUSELAGE OF THE NIEUP. NIGHTHAWK. USING A PRESSED PLATE FITTING WITH FIVE STAY-WIRE ANCHORAGES, A FLANGED TUBE D AND WASHER E, ARE BRAZED TO IT TO FACILITATE ASSEMBLY. LONGERON A, IS DRILLED TO RECEIVE TUBE D, THE END OF WHICH WHEN PASSED THRU' WASHER F, IS BEADED OVER AS AT G. CROSS-BAR C, IS HELD BETWEEN PRESSED FITTING & WASHER F BY TUBULAR RIVET J, STRUT B, IT'S END BOUND BY TAPE, IS FIXED IN POSITION BY HOLE DRILLED TO RECEIVE WOOD PEG H, DRIVEN DOWN THRU' BORE OF TUBE RIVET D.

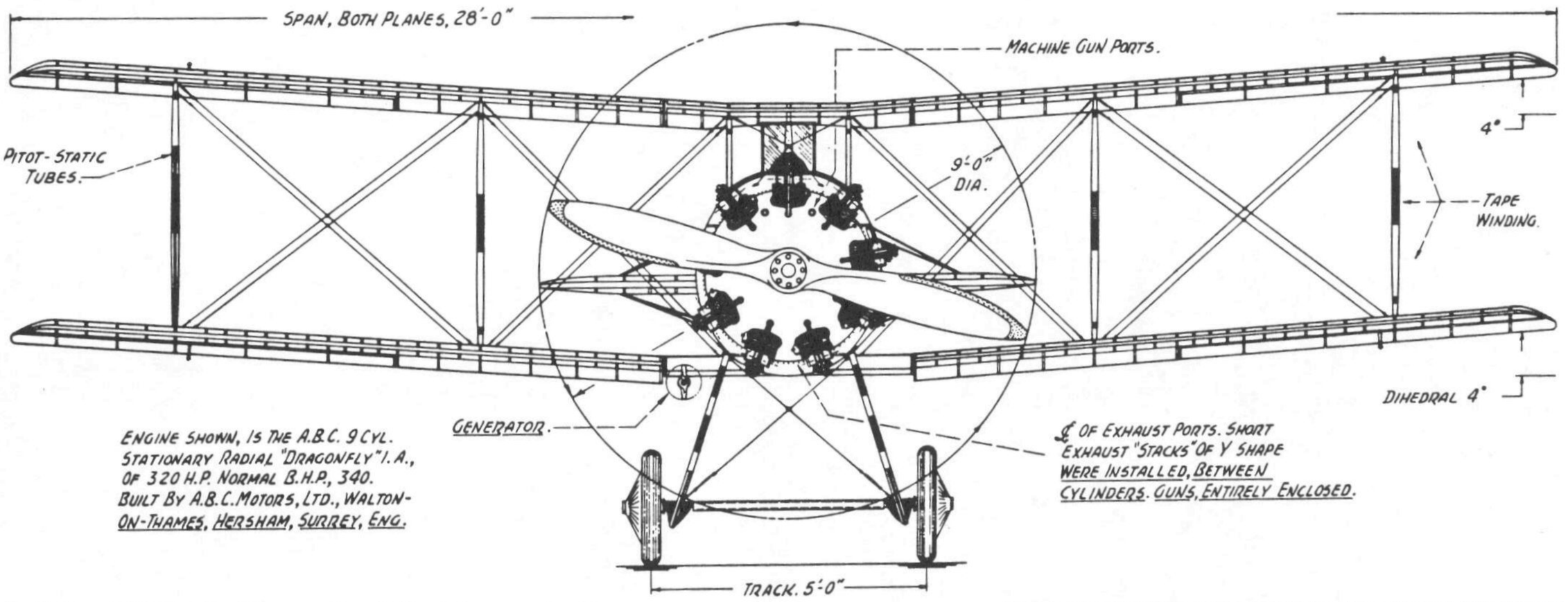
THE BRITISH NIEUPORT "NIGHT HAWK" FIGHTING SCOUT OF WORLD WAR 1, IS FROM SEVERAL POINTS OF VIEW, A PARTICULARLY INTERESTING SUBJECT OF AIRCRAFT STUDY. HAVING BEEN THE LATEST TYPE FIGHTER CHOSEN FOR MASS PRODUCTION BY THE ROYAL AIR FORCE BEFORE THE ARMISTICE, IT WAS THE FIRST AIRPLANE SPECIFICATION ISSUED BY THE R.A.F. IN 1918. MOST COMPELLING REASONS FOR THE NIGHT HAWK'S SELECTION WERE, THAT IT'S VERY REMARKABLE PERFORMANCE FULLFILLED R.A.F. REQUIREMENTS. IT ALSO MET REQUIRED STRENGTH DEMONSTRATED BY LOAD TESTS THROUGHOUT THE ENTIRE MACHINE., THE GENERAL ARRANGEMENTS REGARDING POSITION & ACCESSIBILITY OF GUNS, INSTRUMENTS, ETC, PROVIDED THE MOST SUITABLE FACILITIES TO COMBAT CONDITIONS, ADDED BY A MINIMUM BLIND AREA. THE GENERAL DESIGN OF THE NIGHT HAWK, WAS INTENDED PRIMARILY ADAPTABLE FOR QUICK MASS PRODUCTION OF A "KNOCK-OUT-PUNCH" FIGHTER TO



FINISH UP THE WAR. PURPOSE FOR WHICH INTENDED, FIGHTING, AIRSHIP DESTRUCTION, AND CONVOYING. BUILT BY NIEUPORT & GENERAL AIRCRAFT CO., LTD, CRICKLEWOOD, LONDON, THE NIGHT HAWK WAS DESIGNED BY H.P. FOLLAND, FORMERLY OF THE ROYAL AIRCRAFT FACTORY, WHO ALSO DESIGNED THE S.E-4,5, F.E. 2's, ETC. DESIGNED, CONSTRUCTED AND PRODUCED ON SOUND ENGINEERING PRINCIPLES, THE ADVANCEMENT MARKED BY THE NIGHT HAWK WAS THE SOLUTION TO "HORRIBLE EXAMPLES" OF PRODUCTION FACILITIES INVOLVING CARELESS DESIGNS IN VARIOUS BRITISH MACHINES OF THAT ERA. SOME OF THE BEST PERFORMING BRITISH MILITARY PLANES, HAD BEEN BUILT BY MEN WHO WERE FAR FROM ENGINEERS, RESULTING IN PRODUCTION BOTTLE-NECKS, LABOR TROUBLES, GREAT LOSS OF TIME & MONEY, AGGRAVATED FURTHER BY SHORTAGE OF CERTAIN MATERIALS. IN THE DESIGN OF THE NIGHT HAWK, ALL THE ABOVE MENTIONED ASPECTS HAD BEEN CONSIDERED. COMPLICATED JIGS WERE ELIMINATED. VARIED SIZES OF METAL SHEETS & TUBING, WERE

NO LONGER A PRODUCTION HINDRANCE. QUANTITIES OF PLENTIFUL, STOCK PARTS & FITTINGS USED IN S.E-5's, WENT INTO THE NEW DESIGN. SCRAP MATERIALS, RESIDUAL FROM WING CONSTRUCTION, WERE USED IN THE FUSELAGE & TAIL FRAMES. BRIEFLY, STANDARDIZATION, SIMPLICITY & FLEXIBILITY OF PRODUCTION FACILITY INCORPORATED IN THE NIGHT HAWK, WAS FURTHER GRATIFIED BY IT'S EXCELLENT AND SPECIFIC PERFORMANCE. A BIT LATE FOR FRONT LINE SERVICE BEFORE THE

ARMISTICE WAS SIGNED, THE NIGHT HAWK WAS FULLY CAPABLE OF CARRYING ON FOR THE R.A.F., WHERE THE S.E.-5 AND THE "SNIPE" (WHICH IT RESEMBLED) HAD LEFT OFF, AND WAS AFTER "THE BIG FUSS." PRODUCED IN CONSIDERABLE QUANTITY, FOR THE AIR FORCE'S PEACE PROGRAM. AS THE R.A.F'S FIRST TRULY MODERN, RADIAL POWERED PRODUCTION AIRPLANE, THE NIGHT HAWK WAS POWERED BY A 9 CYL. 320 H.P. "DRAGON-FLY" AIRCOOLED RADIAL ENGINE, GIVING IT A CLIMB OF APP. 1500 F.P.M.,



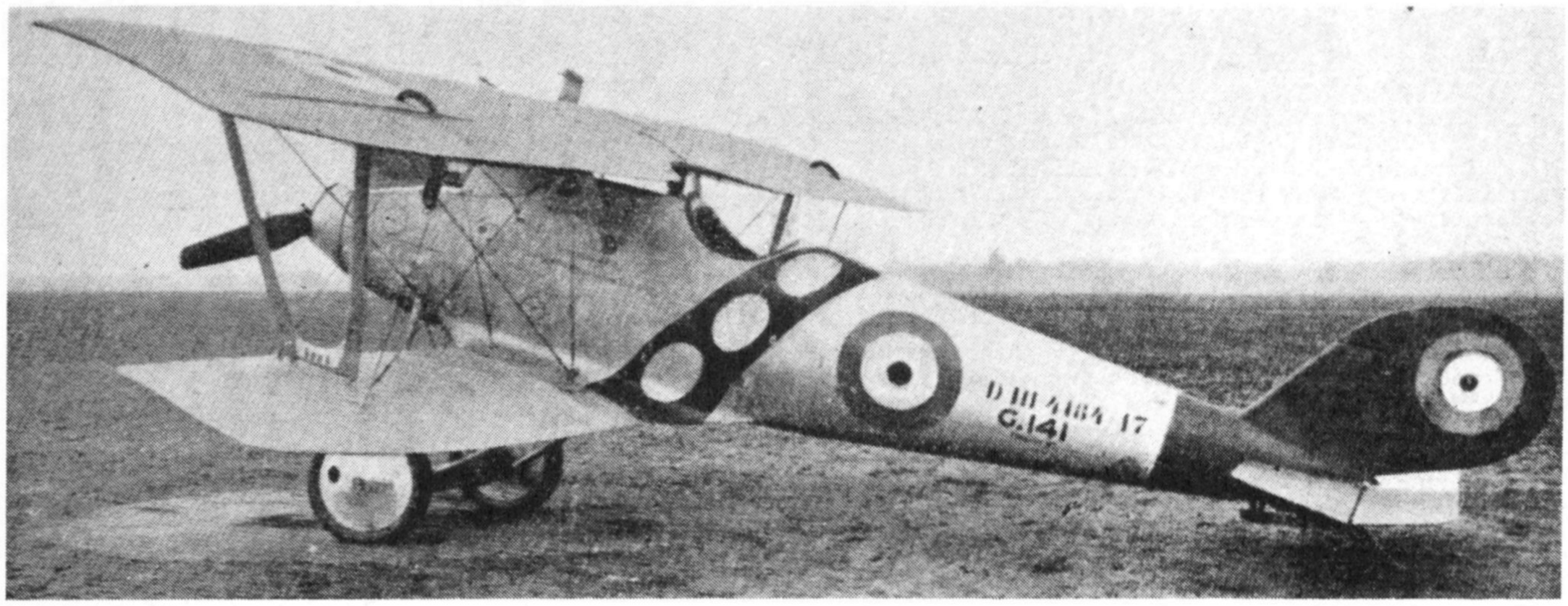
ENGINE SHOWN, IS THE A.B.C. 9 CYL. STATIONARY RADIAL "DRAGONFLY" I. A., OF 320 H.P. NORMAL B.H.P., 340. BUILT BY A.B.C. MOTORS, LTD., WALTON-ON-THAMES, HERSHAM, SURREY, ENG.

AND TOP SPEED OF 151 M.P.H. WITH ELECTRICAL CLOTHING HEATING EQUIPMENT, OXYGEN VAPORIZER FOR THE PILOT, THREE FUEL TANKS, ONE OIL, TWO AUTOMATIC GUNS, 2000 ROUNDS OF AMMO, & A MULTITUDE OF INSTRUMENTS, FITTINGS & FOUR 20 LB. BOMBS, SHE COULD CLIMB TO 28000 FEET IN 25 MIN. SPECIFICATIONS: SPAN, BOTH WINGS, 28'-0". O.A. LENGTH, 18'-6." MAX. HEIGHT, 9'-3" (LEV. FL. POS.) CHORD, BOTH, 63," INCIDENCE, 2½-3° DIHEDRAL, BOTH, 4° GAP. 4'-6". WEIGHTS: EMPTY, 1500 LBS, WT. PER H.P. 6.62 LBS.

GROSS, LOADED, 2120 LBS. FUEL CAP. 40 GALS, OIL, 4 GALS. (LASTING 3 HRS. @ 20000 FT.) PERFORMANCE: SPEED, AT SEA LEVEL, 151 M.P.H. AT 10000, 140 M.P.H. AT 20000, 121 M.P.H. LANDING, 58 M.P.H. CLIMB, TO 5000, 3 MINS., TO 10000, 7 MIN, TO 20000, 20 MINS. DISPOSABLE LOAD APART FROM FUEL, 400 LBS. TOTAL AREA OF WINGS, 270 □ TOTAL AREA OF TAIL, 28 □ (ADDITIONAL REFERENCE AVAILABLE IN "JANES ALL THE WORLD'S AIRCRAFT" FOR 1919.)

Pfalz D.III

drawings by WILLIAM WYLAM

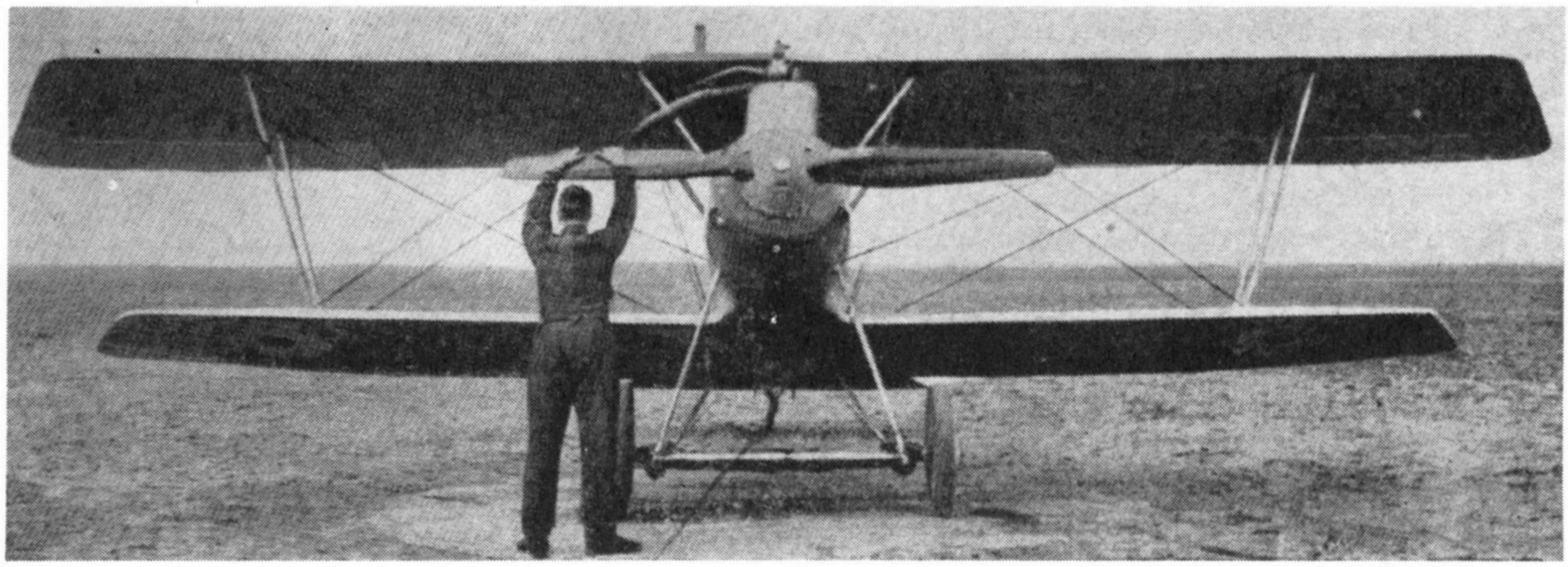


The Pfalz D.III was Germany's attempt to get an edge in the skies over Europe in WW I. Clean in design and very maneuverable, it was still outclassed by Allied aircraft of the era. "Jane's All the World's Aircraft" photos.

The Wylam drawings have been used by countless builders and by the producers of at least one D.III plastic kit. His forward fuselage line under the engine is too full, and the characteristic arrow-shaped profile of the original is lost.

AFTER A SERIES of monoplanes patterned after the French Morane-Saulniers, the D.III was Pfalz's first attempt at producing a modern, high-powered, single-seat fighter. It entered service in 1917 powered by a 160-hp Mercedes engine. Armament was comprised of the usual twin forward-firing Spandaus. Although useful for German units needing replacements, it was considered inferior to other types. Nonetheless, several hundred were built. For the last months of WW I the D.IIIa became available, which was basically a refined D.III with a more powerful (180-hp) engine. Clean in design, light in weight, and very maneuverable, it was one of the first attempts at streamlining by the Germans in order to develop a scout machine with good performance.

No D.III's still exist. □



D-3A FRONT VIEW SHOWN
LATE D-3 HAD ALMOST SAME
FRONT VIEW EXCEPT FOR FRONT
VIEW OF WINGS & EXHAUST
MANIFOLD

AILERON CONTROL CABLES

PROPELLERS:
WOLFF 8'-11" DIA.
LORENZEN 8'-11½" DIA. } D-3 ONLY
AXIAL 9'-4" DIA.
HEINE 9'-1½" DIA.
IMPERIAL 8'-10½" DIA. } D-3A ONLY

26'-7¾" WING SPAN - D-3 ONLY
25'-5" WING SPAN - D-3A ONLY
30'-10½" WING SPAN - BOTH D-3 & D-3A

WATER LINE TO PUMP
SHUTTER PUSH-PULL HANDLE
EXHAUST MANIFOLD
AIR INTAKE SCOOP
PRESSURE RELEASE LINE

FRONT BAY ONLY

TREAD 5'-7½"

PET COCK-GRAVITY FUEL LINE (TO CARBURETOR)
AUX. FUEL TANK - 9 GALLONS
AIR INTAKE - OIL COOLER
COOLING AIR OUTLET
ELASTIC SHOCKCORD
COMPRESSION TUBE
STEEL STRAP
FIXED SUB-WING

2'-6" DIA.

FUEL LINE (AUX. TANK)
WATER LINE (TO PUMP)
WATER LINE (TO RAD.)
WATER LINE (TO WING RADIATOR)
AIR INTAKE

PLAN VIEW
SIDE VIEW

EARLY D-3 EXHAUST MANIFOLD DETAILS

PLAN VIEW
SIDE VIEW

LATE D-3 EXHAUST MANIFOLD DETAILS

FORWARD

D-3A EXHAUST MANIFOLD DETAILS

RED - JAGDSTAFFEL 11 (1918)

NOTE:
ENTIRE LINE OF D-3 & D-3A WERE SPRAYED ALL ALUMINUM.

23'-2"

EARLY D-3 - 160 H.P. MERCEDES
6°20' INCIDENCE (BOTH WINGS) STRUT BRACED HORIZONTAL STABILIZER, UNCOWLED ENGINE, AIR INTAKE ON SPINNER. USED ON EASTERN AND WESTERN FRONTS DURING 1917.

WATER LINE (TO PUMP)
FUEL LINE - AUX. FUEL TANK
AILERON CONTROL CRANK
BEAD GUN SIGHTS
FIXED WINDSHIELD
SHUTTER PUSH-PULL HANDLE
LEATHER PADDING

WHITE TRIM
BLACK
BLACK STENCILED SERIAL
III 1370/17
GREEN - FROM HERE BACK
ALUMINUM - HORIZON STABILIZER
BLACK ON ALUMINUM BACKGROUND
RED - JAGDSTAFFEL 21

GREEN NOSE & TAIL WAS IDENTIFICATION MARK OF PILOT FOR NO. 1370.

GREEN (PILOT'S IDENTIFICATION)

23'-2"

LATE D-3 - 160 H.P. MERCEDES
6°20' UPPER; 3°45' LOWER (INCIDENCE) INVERTED AIRFOIL ON HORIZON. STABILIZER, COWLED ENGINE; AIR INTAKE AT TRAILING EDGE OF SPINNER. USED ON EASTERN, WESTERN & TURKEY FRONTS IN 1917.

EXPANSION RESERVOR
TANK COVER CAP
FLEXIBLE WINDSHIELD
EMPTY SHELL CASES ACCESS
CARTRIDGE BELT ACCESS
AILERON CONTROL CABLES

CARBURETOR ACCESS DOOR

4179/17

A&D
A,D,&E
C

BLACK - JAGDSTAFFEL 37
PILOT'S IDENTIFICATION COLOR WAS PAINTED BETWEEN RINGS, ON SPINNER, AND ON WHEEL HUBS.

STEEL PLATE
PIVOT POINT
ELASTIC SHOCKCORD
BLACK
WHITE

PLYWOOD FAIRING PANEL
LANDING GEAR STRUT SOCKET
COOLING AIR OUTLET

FRONT VIEW

LEADING EDGE - MACHINE GUNS

23'-2"

REMOVABLE BONNET

D-3A - 180 H.P. MERCEDES
3°45' UPPER; 3°0' LOWER (INCIDENCE)
RE-DESIGNED HORIZON. STABILIZER & LOWER WING PANELS; DECREASED GAP. USED ON WESTERN FRONT IN 1918.

FIXED SPANDAU M.G.
EMPTY BELT CHUTE
TURNBUCKLES
CABANE SOCKET PLATE

M
5897/18

RUDDER CONTROL CABLE
ELEVATOR CONTROL CABLES
TAIL LIFT HANDHOLE

HINGED COVER DOORS - FOOT STEPS
BLACK - PILOT'S IDENTIFICATION - "M" FOR MAIER
METAL PLATE
STEEL TUBING
PRESSURE RELEASE LINE - MAIN TANK

RE-WORKED NOSE

SAME LANDING GEAR ON D-3 AND D-3A

NOTE:
ENTIRE FUSELAGE WAS OF PLYWOOD MONOCOQUE; FINAL COVERING WAS FABRIC.

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SCALE: ¼" = 1'-0"
DATE:
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GENERAL ARRANGEMENTS
GERMAN "PFALZ" FIGHTER

D-3

REAR MOUNTING PLATE
STEEL TUBING
PLAN VIEW
7/8" DIA. COMPRESSION TUBES
2" DIA. AXLE SHAFT
EARLY D-3 STRUT
FABRIC
PLYWOOD
SECTION "A-A"
ON D-3, SUB-WING WAS BUTTED TO SIDE STRUTS
RUDDER HORN
ELEVATOR HORN
ELEVATOR HINGE
D-3
D-3A
AILERON CONTROL CABLE
AILERON BALANCE CABLE
PULLEYS
FALSE SPAR
D-3 TIPS
AIRPLANE
PLYWOOD CENTER PANEL
AUXILIARY SPAR
STIFFENER
LOWER WING PANEL - D-3A
(D-3 HAD SAME CONSTRUCTION)
WELDED STEEL AILERON
AILERON CRANK
STEEL STRAP
FRONT BAY ONLY
FRONT STRUT
D-3A SUB WING
FRONT
REAR STRUT
D-3 SUB-WING
SIDE-VIEW
AXLE SLOT
COMPRESSION TUBE
SHOCKCORD LOOP
LANDING GEAR DETAILS
NOTES:
1. JAGDSTAFFEL "11" ON D-3A'S SIDE-VIEW SHOULD READ JAGDSTAFFEL "44" ("RED BONNETS").
2. EXHAUST SHOWN (PLAIN-VIEW) WAS USED ON D-3A ONLY; FOR D-3 EXHAUST MANIFOLD DETAILS, SEE GENERAL ARRANGEMENT PAGE NO. 1.
3. PFALZ D-3 WERE NOT KNOWN TO BE FINISHED IN STANDARD HEXAGONAL CAMOUFLAGE.
COMPARTMENTS
D-3A WINDSHIELD
FIXED SPANDAU GUNS
AMMUNITION CHUTE
EMPTY BELT CHUTE
GRAVITY FUEL LINE
COMPRESSION TUBE
TURNBUCKLE & EYELET
CAPSTRIP-UPPER SURFACE ONLY
AILERON CRANK SLOT
REAR SPAR
FRONT SPAR-MAIN RIB
AILERON HINGE
OVERHANG WIRE (D-3A ONLY)
REAR MOUNTING PLATE
PRESSURE RELEASE LINE
PLYWOOD BUTT JOINT
SPAR ACCESS DOORS
WHITE TRIM (OPTIONAL)
D-3A ONLY
OVERHANG WIRE
WATER LINE TO PUMP
WATER LINE TO RADIATOR
WATER EXPANSION RESERVOIR
EXHAUST (D-3A ONLY)
LAMINATED WOOD
WING FUEL TANK
INTAKE MANIFOLD
UPRIGHT ENGINE COWL
AIR INTAKE SCOOP
METAL NOSE COWL
D-3A UPPER & LOWER WINGS
MAIN RIB'S CAPSTRIP
PLYWOOD PLATE (RIB'S)
PLYWOOD PLATE (SPAR)
UPRIGHT BLOCK
SHOCKCORD
FIXED SUB-WING
STEEL STRAP
COOLING AIR OUTLET
EXHAUST (D-3A)
D 3 UPPER & LOWER WINGS
LOWER WING SPAR & STRUT DETAILS
STARBOARD M.G.
PORT M.G.
WINTER COWL
WINTER PLUG
EARLY D-3 WITH BURIED SPANDAU GUNS
GUNS WERE RE-LOCATED ON EARLY D-3S AS SHOWN ON GENERAL ARRANGEMENT PAGE NO. 1.
PFALZ D 3 & D-3A SPAR & RIB DETAILS
BOTTOM VIEW

THANKS TO EVON P. JAMES, ERNEST W. ATKINS & CHARLES DONALD FOR PHOTOGRAPHS.

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SCALE: 1/4" = 1'0"
DATE:
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GENERAL ARRANGEMENTS
GERMAN PFALZ FIGHTER
D-3

SEAT SUPPORT RAILS
FIXED STABILIZER PANEL
ENGINE MOUNT RAILS
BONNET SUPPORT FRAME
METAL COWL
PLYWOOD WEBS
WELDED ALL STEEL RUDDER
RUDDER SUPPORT
FIXED WOODEN FORMS
HORIZONTAL STABILIZER WAS SLIDED INTO POSITION, BOLTED TO STERN; AND WAS FIXED TO PANEL BY METAL STRIPS & SCREWS.
D-3
D-3A
WOOD CONSTRUCTED ELEVATOR
FABRIC
PLYWOOD COVERED HORIZONTAL STABIL'R.
AIR PRESS. LINE TO TANK
FUEL LINE (TO CARBURETOR)
PRESS. GAUGE & VALVE
COMPASS
SWITCH PANEL
TACHOMETER
MAIN FUEL TANK
EMPTY SHELL BOX
PADDED RIDGE
M.G. CHARGING HANDLE
ALTIMETER
HAND PUMP
SWITCH PANEL
FRONT M.G. BRIDGE
EMPTY BELT CHUTE
EMPTY SHELL BOX
MAIN FUEL TANK
ACCESS DOORS
AMMUN. BOX
WATER TEMP.
AIRSPEED
HAND PUMP
SHOULDER STRAP
M.G. CONTROL
SUPPORT PULLEYS
ELEVATOR CONTROL CABLES
RUDDER CONTROL CABLES
PIVOTED ARM
COMPASS
SEAT RAIL
AILERON ROCKER ARM
FRONT SUPPORT BEARINGS
RUDDER CONTROL BAR
FLOORBOARD
FUEL LINE TO CARBURETOR
PRESSURE RELEASE LINE
FRONT M.G. BRIDGE
EMPTY SHELL BOX
PLYWOOD SHELF
TANK MOUNT BAND
FUEL TANK COVER CAP
SPAR PLATE
SPAR LUG
AMMUNITION BOX
EMPTY BELT CHUTE
FUEL GAGE
MAIN FUEL TANK
RUDDER BAR
FLOORBOARD
AILERON ROCKER ARM
AILERON CABLES
WING PULLEYS
HINGED ACCESS DOOR
FIXED WINDSHIELD
ALTIMETER
REAR M.G. BRIDGE
AIRSPEED
WATER TEMP. GAGE
HAND PUMP
AIR PRESS. GAGE
ENGINE THROTTLE
M.G. FIRING BUTTONS
PLYWOOD CUT-OUT
GUN SIGHT
M.G. ADJUSTMENT
TACHOMETER
SWITCH PANEL
PRESS. RELIEF VALVE
PIVOTED ARM
ELEVATOR LOCK
COMPASS
PADDED RIDGE
CUSHION
RAIL SUPPORT
AILERON CONTROL CABLE
AILERON BALANCE CABLE
AILERON ROCKER ARM
ELEVATOR CONTROL CABLES
RUDDER CONTROL CABLES
CONTROL COLUMN PULLEYS
CONTROL DIAGRAM
INLET
OUTLET
RADIATOR
MACHINE GUN FIRING BUTTONS
FLEXIBLE GUN CONTROL CABLES
REAR GUIDE SLOT
PUSH-PULL HANDLE
PIVOTED ARM
ELEVATOR LOCK (HAND SCREW)
BALL SOCKET JOINT
RUDDER BAR
OFF
ON
TWIST GRIP ENGINE THROTTLE
ADJUSTABLE LEATHER STRAP
PIVOTED FOOT PETALS
RUDDER CONTROL CABLE
WING RADIATOR-SHUTTER PANEL (BOTTOM VIEW)
PFALZ FLIGHT CONTROLS
RUDDER BAR SUPPORT
FLOORBOARD CUT-OUT
FRONT SUPPORT BEARINGS
AILERON CONTROL CABLES
AILERON BALANCE CABLE
ELEVATOR CONTROL CABLES
REAR SUPPORT BEARINGS

AIR AGE INC., 551 FIFTH AVE., NEW YORK 17, N.Y.

SCALE: 1/4 = 1'0"
DATE:
DRAWN BY ... W. A. WYLAM

FUSELAGE DETAILS
GERMAN "PFALZ" FIGHTER
D-3

D-3 LOWER WING

WING RADIATOR

REAR SPAR-LOWER ℄

REAR SPAR-UPPER ℄

FRONT SPAR-LOWER ℄

AUX. FUEL TANK

FRONT SPAR-UPPER ℄

AILERON HINGE

D-3A LOWER WING

D-3 AND D-3A UPPER WING

NO DIHEDRAL

HORIZONTAL THRUST ℄

1° DIHEDRAL (D-3 & D-3A)

WHEELS ℄

EARL. D-3 INCIDENCE -6°20'
LATE D-3 INCIDENCE 3°45'
D-3A INCIDENCE 3°0'

D-3 : 2°9½'
D-3A : 2°7⅛'

HORIZONTAL THRUST ℄

CABANE STAGGER

HEIGHT OF STRUTS VARIES ACCORDING TO INCIDENCE

OUTBOARD STRUTS

D-3 INCIDENCE -6°20'
D-3A INCIDENCE 3°45'

CABANE DETAILS

HEIGHT OF CABANE VARIES ACCORDING TO INCIDENCE

D-3 ONLY

LATE D-3 & D-3A

AIRPLANE ℄

ALMOST STRAIGHT FROM J TO P

D-3A ONLY

COWL PLATE ON EXHAUST SIDE-LATE D-3 & D-3A

SHEET METAL LINED M.G. CUTOUTS PARALLEL TO AIRPLANE ℄

SHEET METAL LINED CABLE OUTLETS STRAIGHT FROM H TO P

THRUST ℄

D-3A WITH REWORKED NOSE

STRAIGHT FROM J TO P

5" DIA. OPENING

1'6" DIA. SPINNER

LOWER WING AIRFOIL

STRAIGHT DECK ON D-3 & D-3A

EARLY D-3 HAD ONLY NOSE COWL

UPPER WING AIRFOIL

CABANE STRUT ATTACHMT PLATES

D-3 NOSE

AIR AGE INC., 551 FIFTH AVE., NEW YORK 17, N.Y.	
SCALE: ¼" = 1'0"	LAYOUT DATA & DETAILS GERMAN PFALZ FIGHTER
DATE:	
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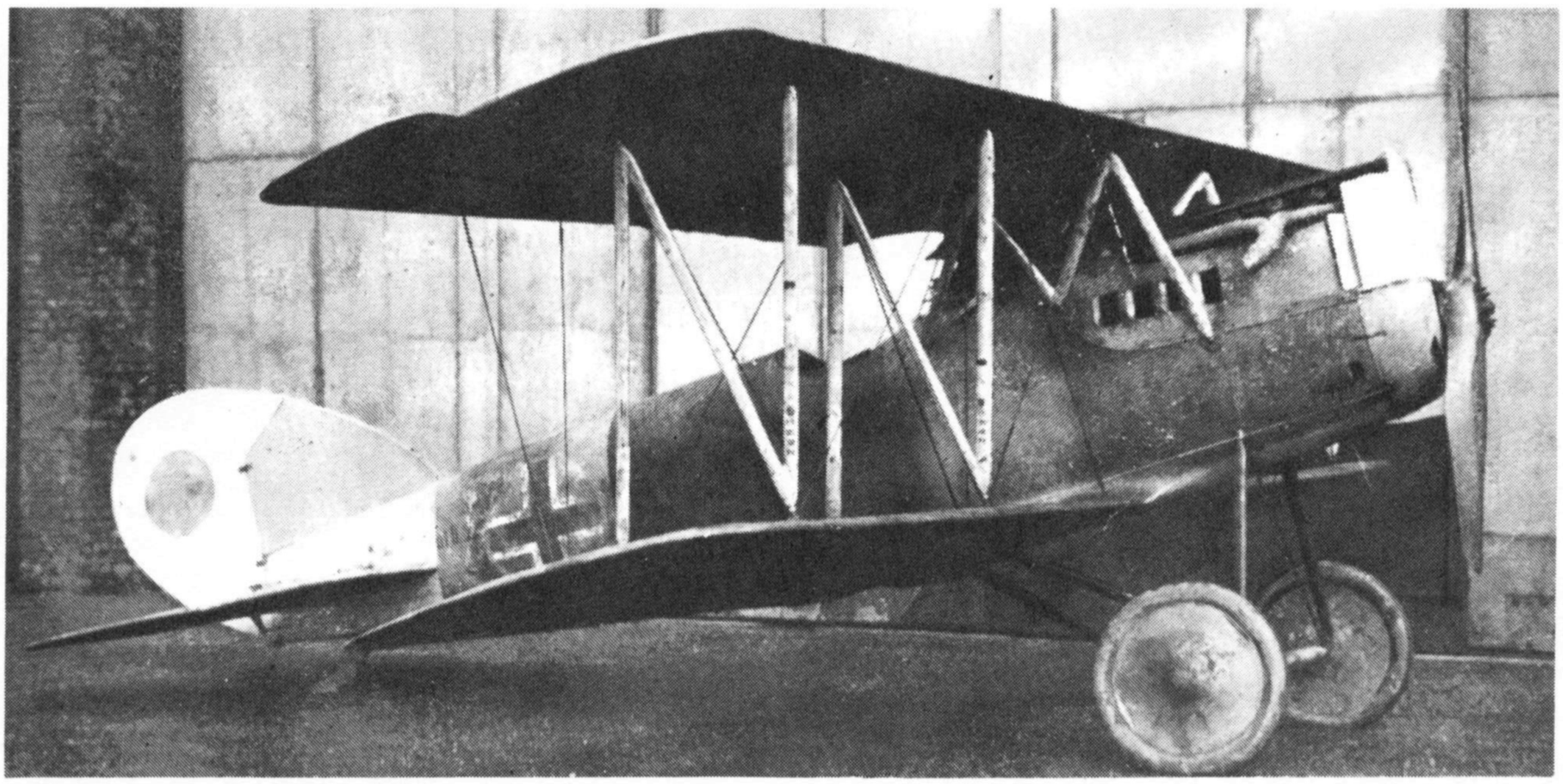
Pfalz D.XII

drawings by WILLIAM WYLAM



THE PFALZ D.XII was designed late in 1917 as a high-performance single-seat pursuit plane. Economy of construction was a prime prerequisite in view of Germany's increasing shortage of strategic materials, and the airplane was built largely of wood at a time when metal fabrication was coming into the picture. The fuselage utilized plywood skin.

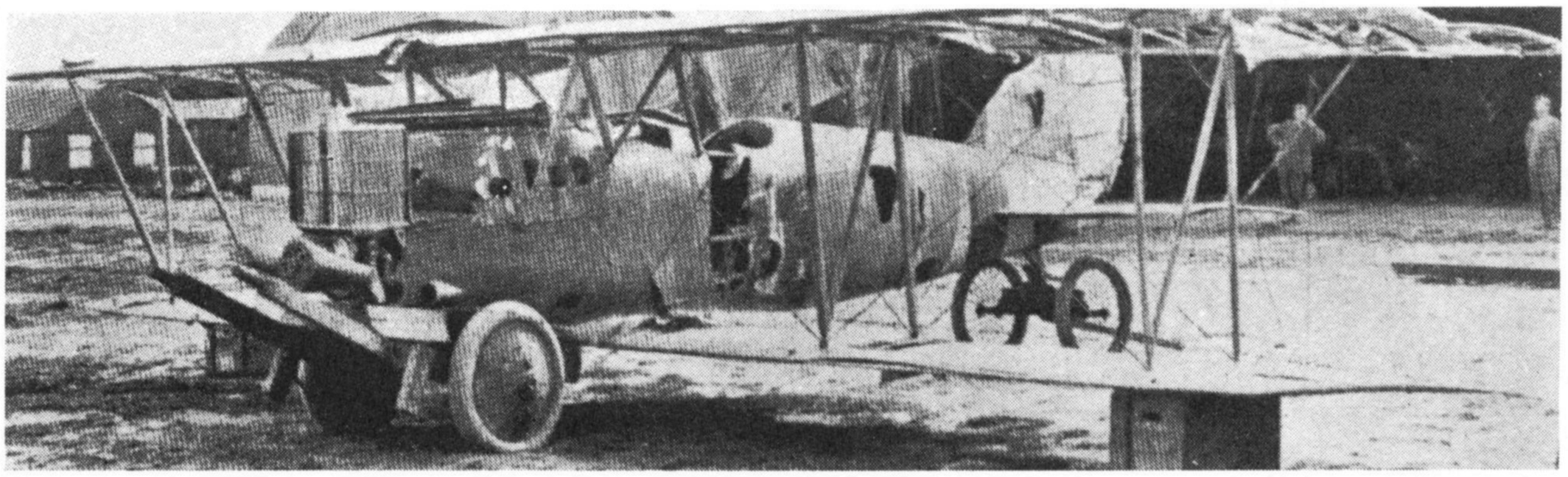
Pilots found the D.XII to be a stable airplane and easy to fly. It required little attention when cruising, although it was somewhat difficult to keep straight on the ground due to a sluggish rudder effect. But mechanics found its two-bay rigging difficult to keep in trim, especially when compared to the wire-less Fokker D.VII.

Beautiful in form, the D.XII was advanced for its time. Equipped with either a Mercedes 160- or 180-hp powerplant, depending on date of manufacture, the engine was cooled by a nose radiator located entirely above the propeller shaft. It had two fuel tanks located in the fuselage and worked under air pressure.

The D.XII reached the front too late in the war to make an imposing record for itself.

There are four left, all in museums. □

This Pfalz D.XII was a rugged design as seen in photo of wreckage below. "Jane's All the World's Aircraft" photos.



21'-5"

No.1 Cylinder
Steel Channel-Gun Mount Brace
Radiator Shutter Panel
Carburetor Access
Aileron Crank
M.G's Charging Handles
Fixed Windscreen
Aluminum Cowling
Pilot's Identification; Name Unknown
White With Red Trim
Fabric Covered-All White-Black Cross
White - 4th Army
Jagdstaffel 52
Jagdstaffel 51
White
Red
Hinge ℄
2'-3½"
3'-10½"
4
Fabric
10"
White
Black
Pfal D.XII 3216/18
Tail-Dolly Lug
Steel Tailskid Shoe
Aluminum Fairings
Wooden Tailskid-Ash
Water Line From Engine
Brass Tank
2'-0"
Baffle
Shutter Panel
Welded Channel
Water Line To Pump
Brass Oval Tubes
3'-3" Dia. Propeller (Heine)
9'-1½"
4'-1"
2'-2" ℄
3'-4¼"
2'-10¾"
1'-7" ℄
Plywood
Alum. Nose
Alum. Air Scoop
Drift Wire "D"
Fabric Disc
Black Propeller
Flying Position Of Wheels
14°
Cooling Air Outlets
Aluminum Cowl
Aileron Cables
Black Or Dark Green
Blue-Grey Disc
Pea Green - Fabric Covered
Plywood
5'-3"
4'-4¼" ℄
Bottom View
Elastic Shockcord
Access Panels-Spar's
Fabric Covered Fin
Aux. & Main Tank Relief
Brace Wires
Drift Wire
Oil Pump Access
Exhaust Manifold
Fixed Wooden Sub-Wing
Strut's Socket Plate
Cooling Air Outlets
Safety Harness
Airspeed Indicator
Empty Clips Chute
Aux. Fuel Tank Fill
Front Gun Mount & Brace
Pressed Dome
Starboard Side
Airspeed Indicator
Rear Gun Mount

Nose Details
Entire Radiator Assembly
Was Aluminum Lacquered

Thanks To: Ernest W. Aikens, Peter M. Bowers, Charles Donald & Evon P. James For Use Of Their Photos.

Hinge
1'-10¾" ℄
Aileron Crank Slot
Black & White Cross
A
B
C
D
Main Rib
Nose Cap Strip
Center Cap Strip
Ammunition
Aux. Fuel Tank Fill
Pressed Dome
Cooling Air Outlets
Radiator Shutter
Radiator Baffle
Channel-M.G. Brace
Radiator Water Fill
Fixed Windscreen
M.G. Charging Handles
Empty Clips Chute
180 H.P. Mercedes
Spandau Mach. Gun
1'-0"
6"

Upper & Lower Wing Details
(Minus Drag Wires & Tubes)

Threaded Extension (On Dome)
Turnbuckle Fitting
Welded Nut (To "N" Strut)
Compression Tube
Spar
3216
Ball Headed Bolts

Interplanes Strut Fittings

Wing's Color Scheme
Dark Green - Upper Surface
Blue-Grey - Lower Surface
White
White
White
Aileron Control Cables
Dark Green Haze
Blue-Grey Haze
Dark Purple (Base)
Pea Green (Base Color)
Dark Green & Pea Green

Semi-Standard Camouflage

Front Bay Only
Air Intake
4"
4¼"
2'-4" Dia.
5'-6" Tread
3216

Front Landing Gear
Strut Socket Details

AIR AGE INC., 551 FIFTH AVE., NEW YORK 17, N.Y.
SCALE: ¼" = 1'-0"
TYPE: Fighter

General Arrangements
German "Pfalz" Airplane

D-12

Built 1917-18 by Pfalz Flugzeugwerke G.m.b.H.

PADDED BACKREST
SHOULDER STRAP

AMMUNITION (EMPTY SHELL CASES & CLIPS) WERE DISCHARGED INTO THE AIR AFTER FIRING.- DEFLECTED BY METAL CHUTES.

STEEL SHOCKSPRINGS
FIXED STABILIZER
STEEL PLATE
PLYWOOD PANEL
ELEVATOR CABLE PASS THRU STABILIZER
STRINGER "Z"
STRINGER "Y"

AUX. FUEL TANK
AMMUNITION
MAIN FUEL TANK
ENGINE MOUNT

EMPTY CLIPS CHUTE
AMMUNITION
AUX. FUEL TANK
RUDDER BAR

AIRSPEED
IGNITION
ALTIMETER
THROTTLE
WATER TEMP.
AIR PUMP
AIR PRESS.
COMPASS (?)
PRESS. RELEASE VALVE
TACHOMETER
MACH. GUN FIRING CONTROL
FLOORBOARD
AILERON CRANKLEVER
DOUBLE ENCLOSED PULLEYS
WELDED ALL STEEL FIN (FABRIC COVERED)

AUX. FUEL TANK
AMMUNITION
AIRSPEED
THROTTLE CONTROL COLUMN
AIR PUMP
RADIATOR
180 H.P. MERCEDES
STRINGER "Y"
STRINGER "Z"
WATER LINE TO PUMP
FUEL LINES
OIL PUMP
WATER LINE TO ENGINE
CAT-STRIP- UPPER SURFACE ONLY
WELDED ALL STEEL
RUDDER BAR
MAIN FUEL TANK
PLYWOOD FLOORBOARD
RUDDER CABLES
ELEVATOR CABLES
REAR SUPPORT BEARINGS
DOUBLE AILERON PULLEYS
SHOCK SPRING
STEEL FITTINGS
PLYWOOD BOXED FRAME
AILERON CRANK
STEEL TUBING

SECTION "R-R"
PLYWOOD REINFORCED BOX

ELEVATOR WAS BUILT IN RIGHT & LEFT HAND UNITS OF WELDED STEEL TUBING.

ELEVATOR
SPAR (TUBING) WAS FLATTENED, HOLE DRILLED & 3/16" DIA. ROD INSERTED FOR HINGE AXLE. HINGE WERE EYELETS ON STABILIZER & ELEVATOR

WELDED-ALL STEEL RUDDER
RUDDER HORN (REF. ONLY)
RUDDER FITTING
PLYWOOD COVERED WING-WALK
STEEL WIRE (TRAILING EDGE)
DOUBLE AILERON PULLEYS
AILERON CONTROL CABLES

COMPRESSION TUBE (REF. ONLY)
CROWN LOCK NUT
BALL HEADED BOLT
THREADED EXTENSION (ON DOME)
SECTION "S-S"

MAC. GUN'S FIRING CONTROLS
PADDED HAND-GRIPS
FLEXIBLE GUN CONTROL CABLES
SAME RUDDER BAR AS D-3'S
FLOORBOARD

CONTROL COLUMN MOVEMENT TO LEFT PRODUCES THE CABLE MOVEMENTS AS SHOWN.

AILERON CABLE CONTROL SYSTEM

ELEVATOR CABLES
AILERON CRANK LEVER
AILERON CONTROL CABLES
DOUBLE PULLEYS-ALUM. HOUSING
CONTROL COLUMN SUPPORT SHAFT
SOCKET PLATE-STEEL
STREAMLINED STEEL TUBING
FIXED SPREADERS-STEEL TUBINGS
FIXED WOODEN SUB-WING

2" D.I.A. AXLE SHAFT
3/4" DIA. SPREADER
SECTION "T-T"

FLIGHT CONTROLS

ELASTIC SHOCKCORDS
FRONT
SHOCK STOP GUARD CORD

TRUE PLAN
AXLE
SHOCK STOP GUARD CORD
SHOCKCORD SLOT

NOTES ON PFALZ D-3 & D-12

1. TAPE & PLYWOOD LATTICE WORK ON EARLY D-3'S WERE REMOVED ON LATE D-3'S WINGS.
2. LATE D-3'S FUSELAGE STRUCTURE WAS CHANGED TO STIFFEN THE WEAK SPOTS; ALSO TO CONTROL WARPAGE. LATE D-3'S FUSELAGE DIFFERS IN CONSTRUCTION ONLY.
3. ORIGINAL SINGLE UNIT (ENCLOSED DOUBLE PULLEYS) AILERON CONTROL WAS CHANGED TO CRANK LEVER AS SHOWN IN D-3'S FLIGHT CONTROLS
4. EXHAUST MANIFOLD (D-123) VARIED DURING PRODUCTION.
5. INSTRUMENT LOCATIONS ALSO DIFFERS ON VARIOUS PRODUCTIONS.

AIR AGE INC., 551 FIFTH AVE., NEW YORK 17, N.Y.

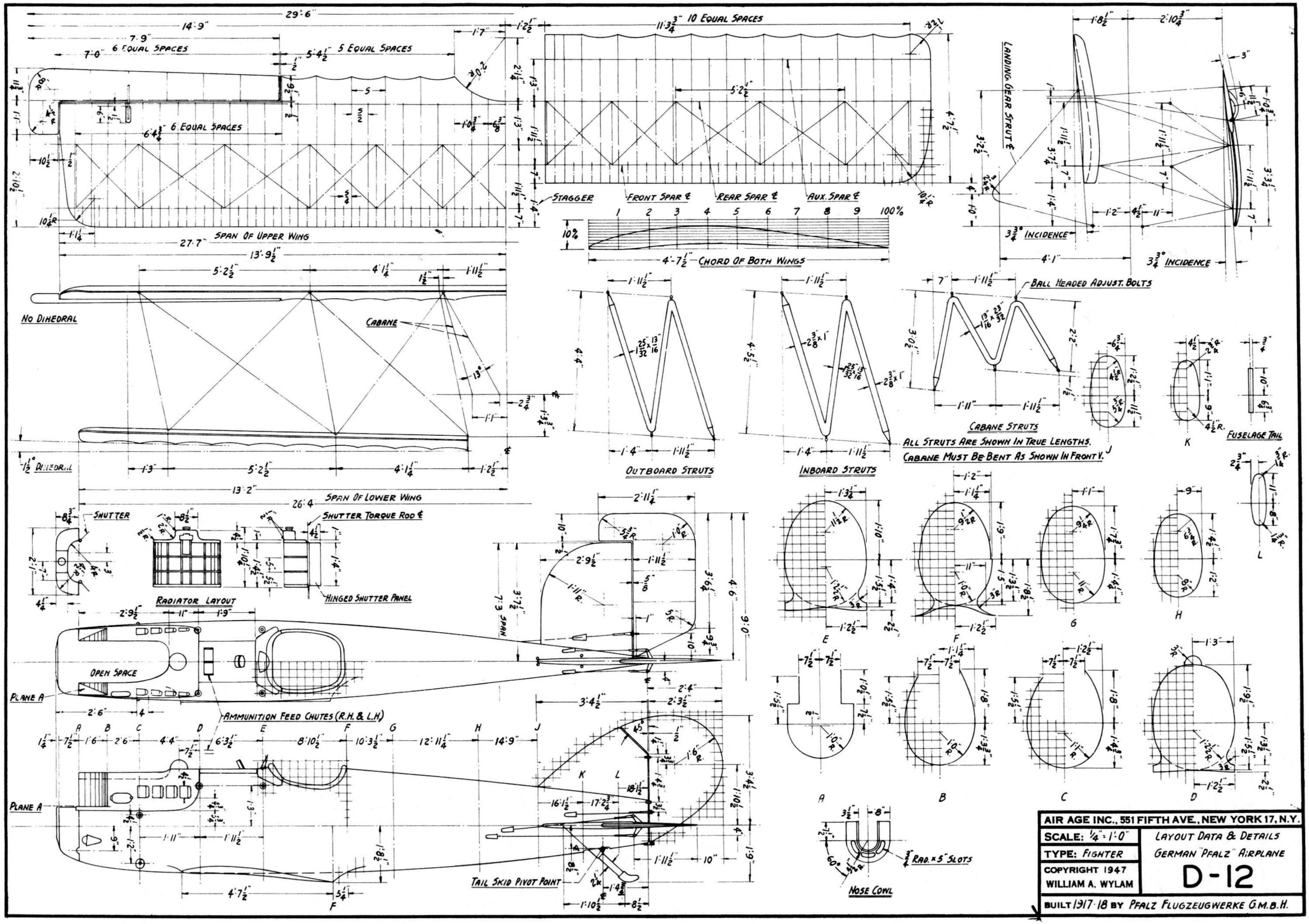
SCALE: 1/4 & 1/2 - 1'-0"

TYPE: FIGHTER

FUSELAGE DETAILS
GERMAN "PFALZ" AIRPLANE

D-12

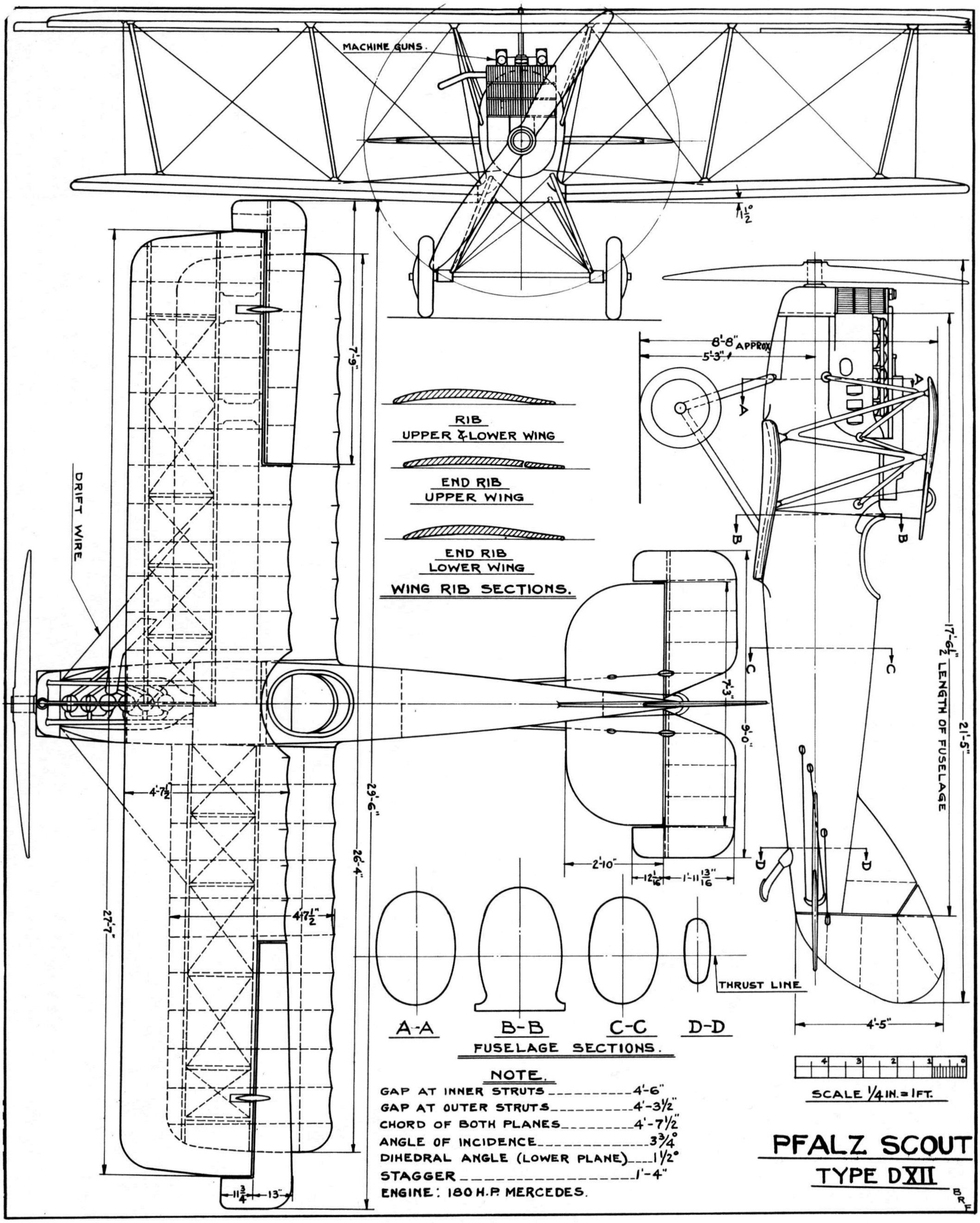
BUILT 1917-18 BY PFALZ FLUGZEUGWERKE G.M.B.H.



AIR AGE INC., 551 FIFTH AVE., NEW YORK 17, N.Y.

SCALE: ¼" = 1'-0"	LAYOUT DATA & DETAILS
TYPE: FIGHTER	GERMAN "PFALZ" AIRPLANE
COPYRIGHT 1947 WILLIAM A. WYLAM	D-12
BUILT 1917-18 BY PFALZ FLUGZEUGWERKE G.M.B.H.	

drawing by BARNETT FEINBERG



NOTE.

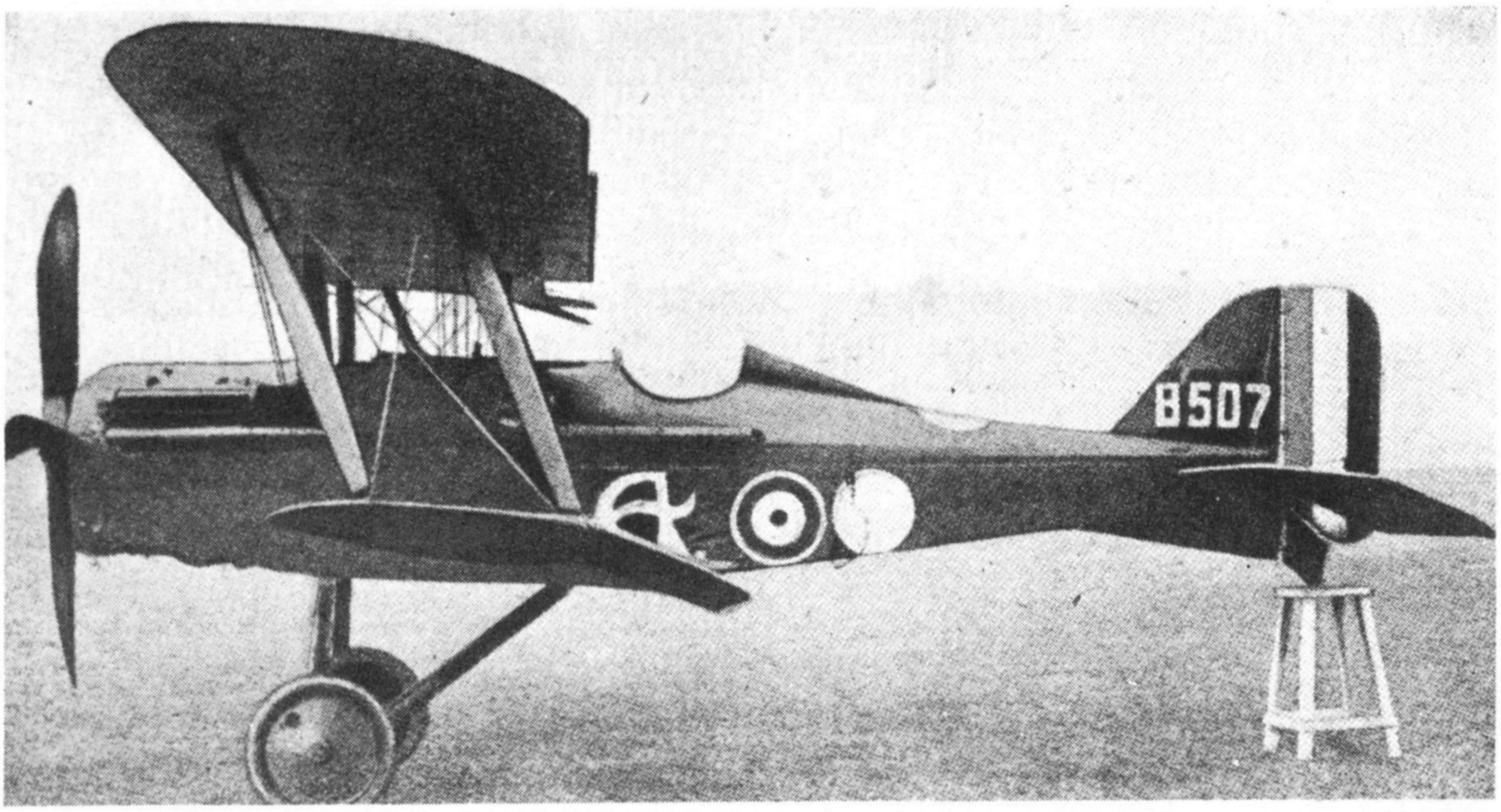
GAP AT INNER STRUTS	4'-6"
GAP AT OUTER STRUTS	4'-3½"
CHORD OF BOTH PLANES	4'-7½"
ANGLE OF INCIDENCE	3¾°
DIHEDRAL ANGLE (LOWER PLANE)	1½°
STAGGER	1'-4"
ENGINE: 180 H.P. MERCEDES.	

PFALZ SCOUT
TYPE DXII

BRF

RAF S.E.5a

drawings by WILLIAM WYLAM

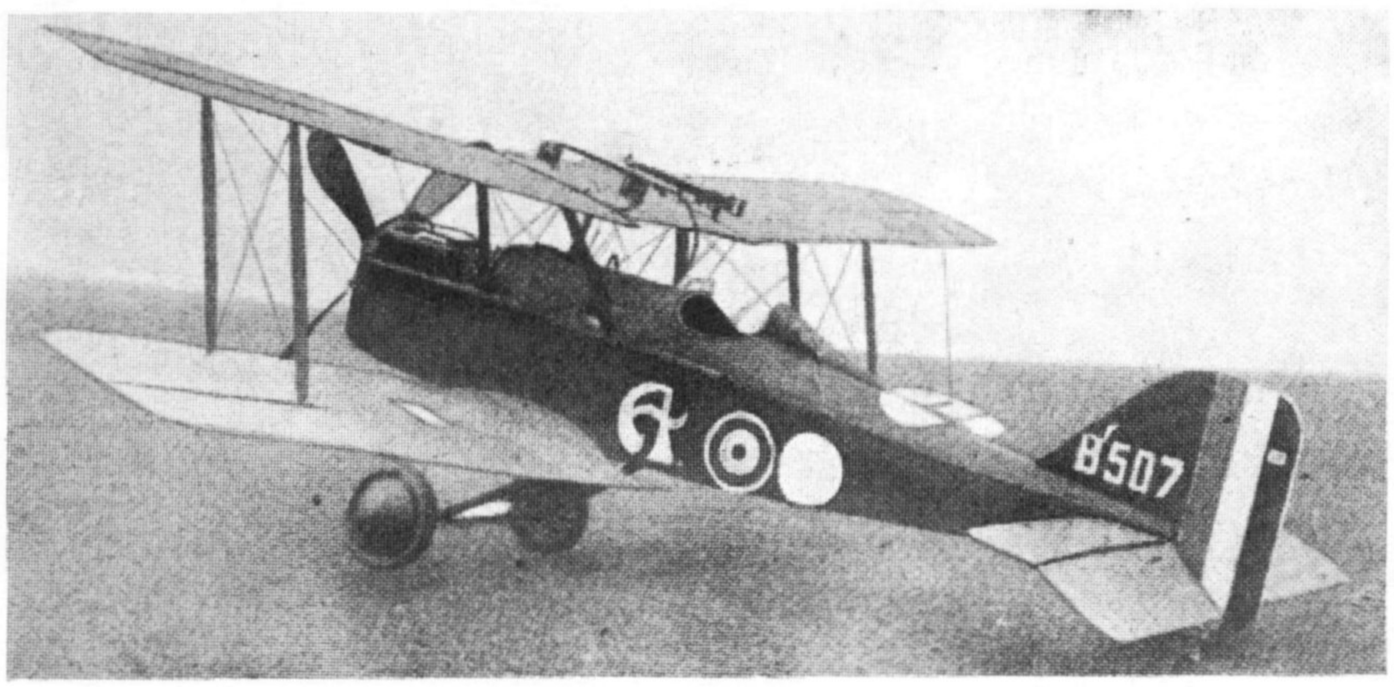


One of the most famous aircraft of WW I was the S.E.5a and it is credited with turning the tide in air supremacy over the Allied forces. "Jane's All the World's Aircraft" photos.

THE SCOUTING Experimental Number 5 was produced by the British Royal Aircraft Factory and appeared at the front during "bloody April" of 1917, the blackest month of the war in terms of casualties for the British RFC. Armed with either two Vickers guns or a Vickers and a Lewis gun, the Scout soon proved a match for the German Albatros, which up until that time had ruled the skies.

The S.E.5, and the later S.E.5a with a geared engine, was renowned for its ruggedness and proof of this fact came during a battle when a pilot actually flew an S.E.5 through the side of a house and emerged unhurt. It was also a favorite for fighter pilots of the Royal Flying Corps. Britain's leading Ace, Major Edward Mannock, scored 50 of his 73 victories while flying the S.E.5 Scout. William Bishop and Ray Collishaw also downed a majority of their credits in this aircraft.

A major contribution to the war effort, the 25th Aero Squadron was formed at Kelly Field in June 1917. The unit was made up of American pilots and ground personnel and their participation in the Great War has gone down in history as one of the turning points in favor of the Allies. The S.E.5 was a great aid to that end. In October 1918, no less than 16 units of the RFC were equipped with the S.E.5 and 5a. The speed of the airplane was reported to be 132 mph at 6,500 feet, with a climb of 765 fpm and a service ceiling of 20,000 feet. □



S.E.5A

Fuselage Details

AIR AGE INC., 551 FIFTH AVE., NEW YORK 17, N.Y.

SCALE: ¼" = 1'-0"

DATE: OCTOBER '44

DRAWN BY ... W.A.WYLAM