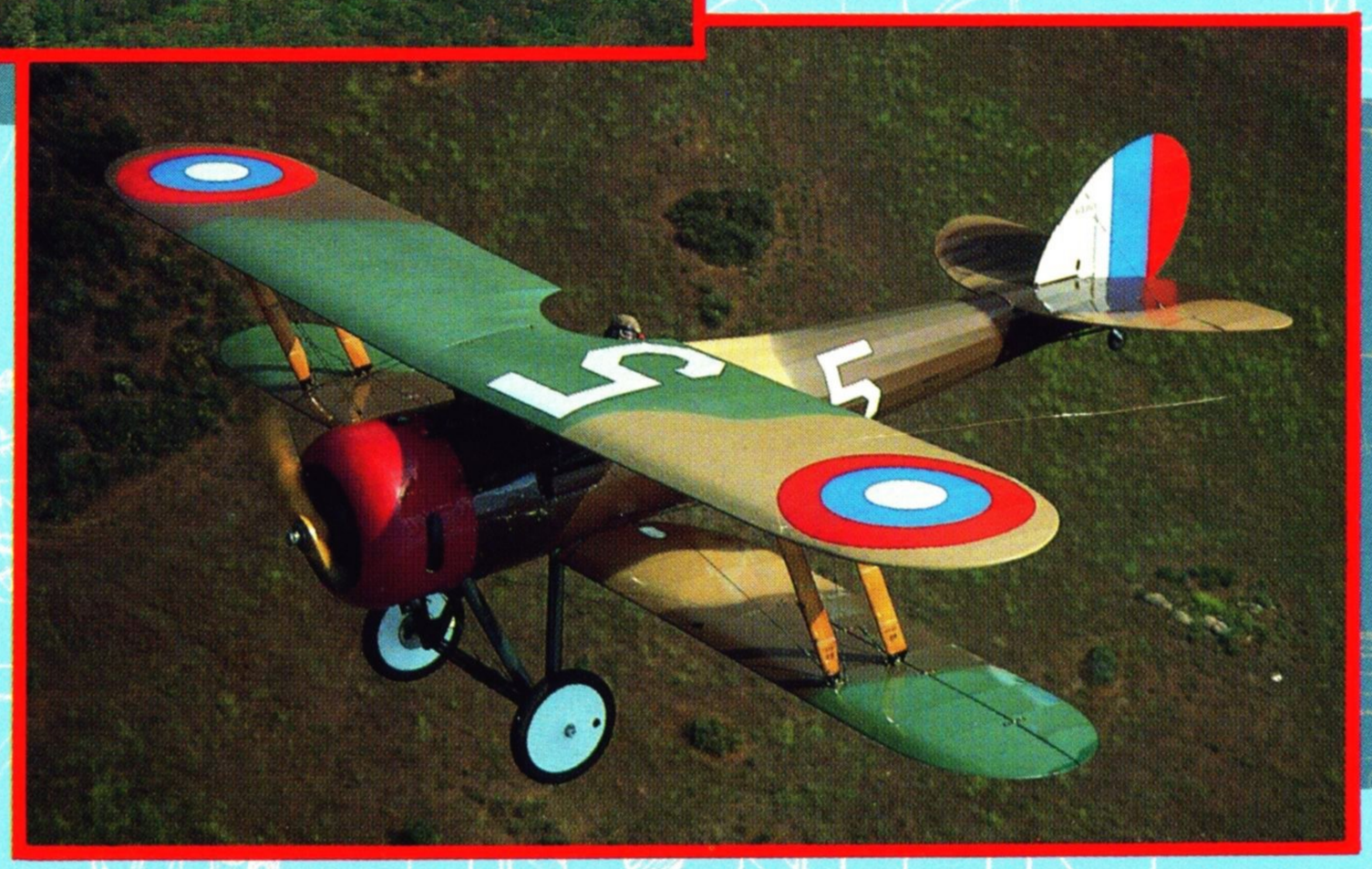
An Air Age Publication

From the Publishers of Model Airplane News

Scale Aircraft Drawings

Volume I—World War I

Scale Drawings, Rare Photos, and Historical Data on Popular WW I Aircraft.



Scale Aircraft Drawings

Volume 1—World War I

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ISBN: 0-911295-02-X

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Published by Air Age, Inc.
632 Danbury Road
Wilton, CT 06897

Manufactured in the United States of America
This book was designed by Alan J. Palermo.

Publishers: Dr. Louis V. DeFrancesco, Yvonne M. Micik, and Louis V. DeFrancesco, Jr.
Editor: Dan Santich
Managing Editor: Mary Hennessy
Editorial Assistant: Karen Lindsay
Cover photos by Budd Davisson.

ACKNOWLEDGEMENT: The publishers wish to express their sincere gratitude to the following: *Jane's All the World's Aircraft; Jane's Encyclopedia of Aviation;* The American Aviation Historical Society; The Smithsonian Institute; Leonard Opdycke, WW I Aeroplanes, Inc.; Acme Photo Service; Garden City Press; Arco Publishing Co. Inc.; The Society of World War I Aero Historians; The Wright Bros. Historical Foundation; Silver Hill Aviation Museum; Air Force Museum; Naval Air Museum; Boeing Aircraft Corp.; The Curtiss-Wright Aircraft Corp. and Curtiss Museum; Paris Air and Space Museum.

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INTRODUCTION

by DAN SANTICH

The time-scale of this book represents the period in history when aviation was born. There were no rules. In many cases pilots were self-taught and their airplanes were handmade creations of fabric, wood, and dreams. Pilot comfort was not a pressing issue, and airports to operate from were a long time in coming.

Most of the aircraft presented in this book are only memories: scraps of fabric and wire that one time filled the sky with ambition and heroics. The photographs are all authentic; they represent a relatively new idea for the era—aviation photography.

A scale model is only as good as the effort that went into the research of it. There is, in absolute terms for scale modelers, no substitute for a dimension. A measurement of a given dimension of a given part of an aircraft is one of the most valuable aids to a scale project. With that dimension, a conversion to inches is a simple matter of mathematics. If it isn't given, it's only a guess.

These drawings are of both historical and artistic interest, and are what are generally referred to as Master Drawings.

This book is dedicated to the doer and the dreamer, the armchair pilot and the Captain of tomorrow's spaceship. It's history in black and white. The drawings presented herein are the works of master illustrators, such as Wylam, Nye, Larsen, Karlstrom, and others. It was a massive effort, and the drawings reflect countless hours of research and digging through the halls of history. In some cases, measurements were taken from the actual aircraft. In many cases there were no remaining examples of the aircraft. Obtaining the accurate dimensions of these aircraft was difficult, if not impossible. Where factory drawings and sketches were available, many differences in dimensions were found. To resolve this dilemma, a best-guess approach was used. But it was an educated guess.

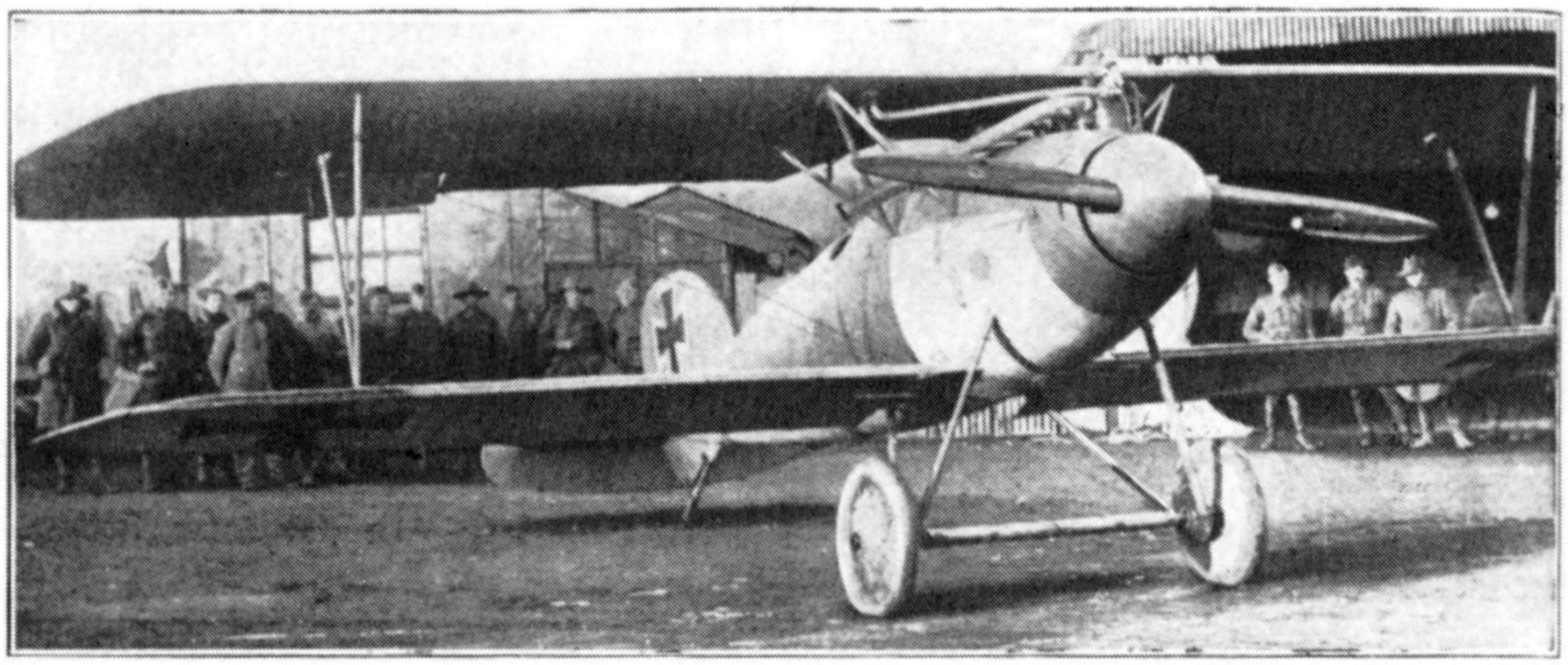
Some errors, a few major and some minor, are noted in the text. Modelers and enthusiasts should check them carefully against available photographs before undertaking major projects. A lot of technical material has been uncovered in the last 30 years that was not available to these draftsmen.

It should be noted that the scale reference given in the title block of each drawing does not reflect the scale size of that drawing. All of the drawings in this book have been reduced for presentation and are available from us in their full-size to the appropriate scale. These Master Drawings were rendered in varying scales.

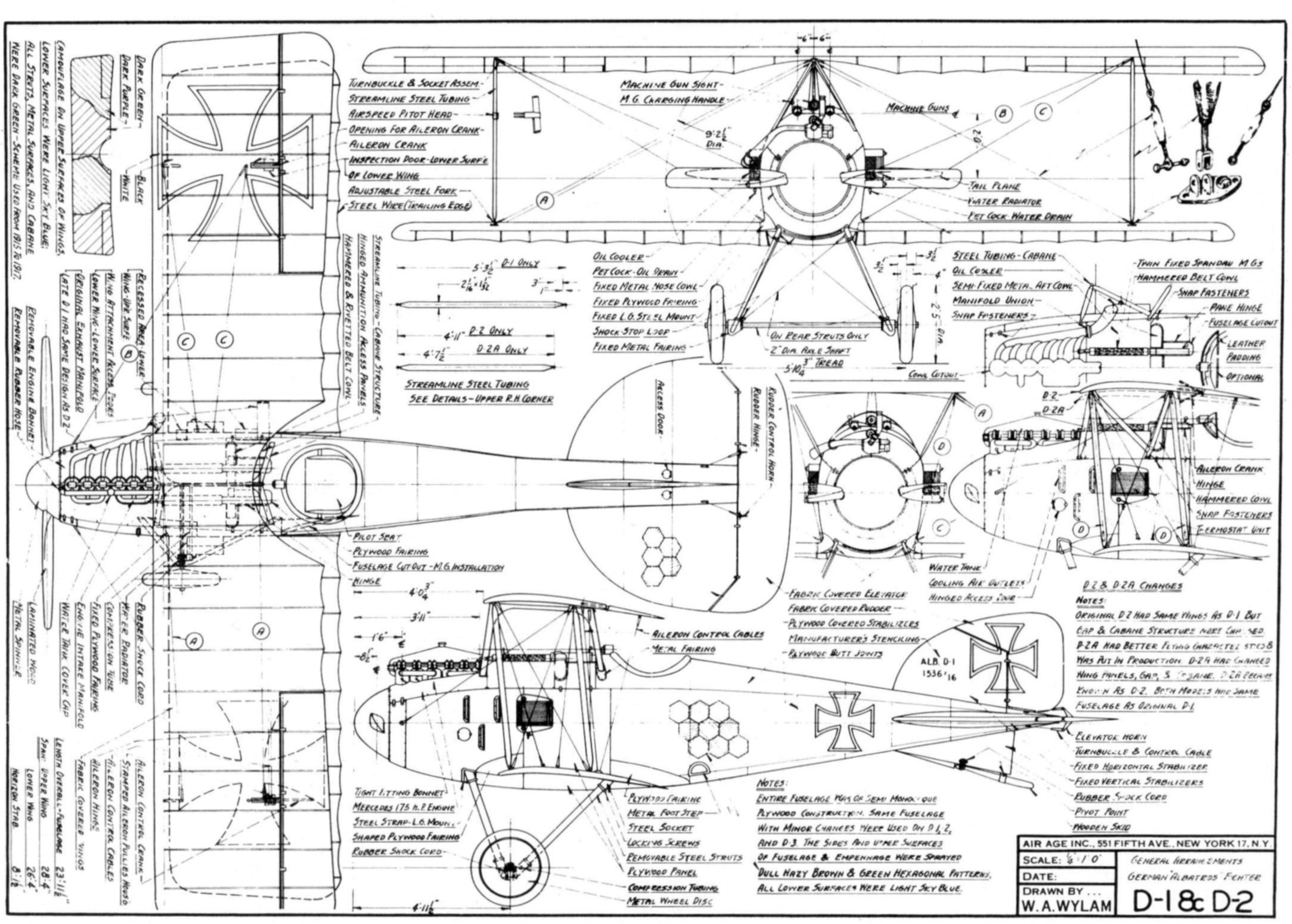
For the scale modeler, this book is invaluable. For the historian, it's a collector's dream. For the aviation-minded, modeler or not, it's a fascinating collection of winged history. We hope you enjoy it.

Albatros D.I to D.VI

drawings by WILLIAM WYLAM



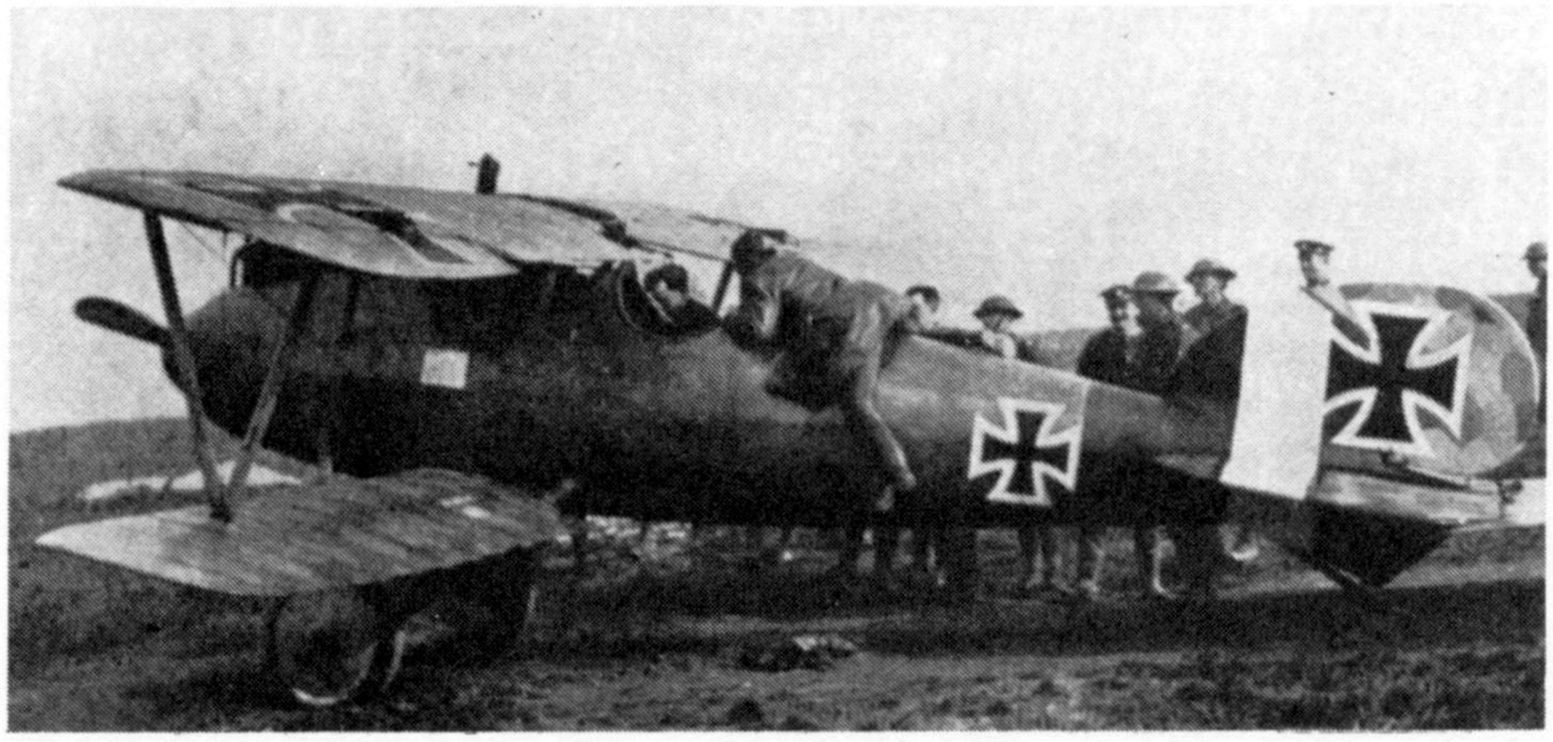
Front view of the Albatros D.V. "Jane's All the World's Aircraft" photo.

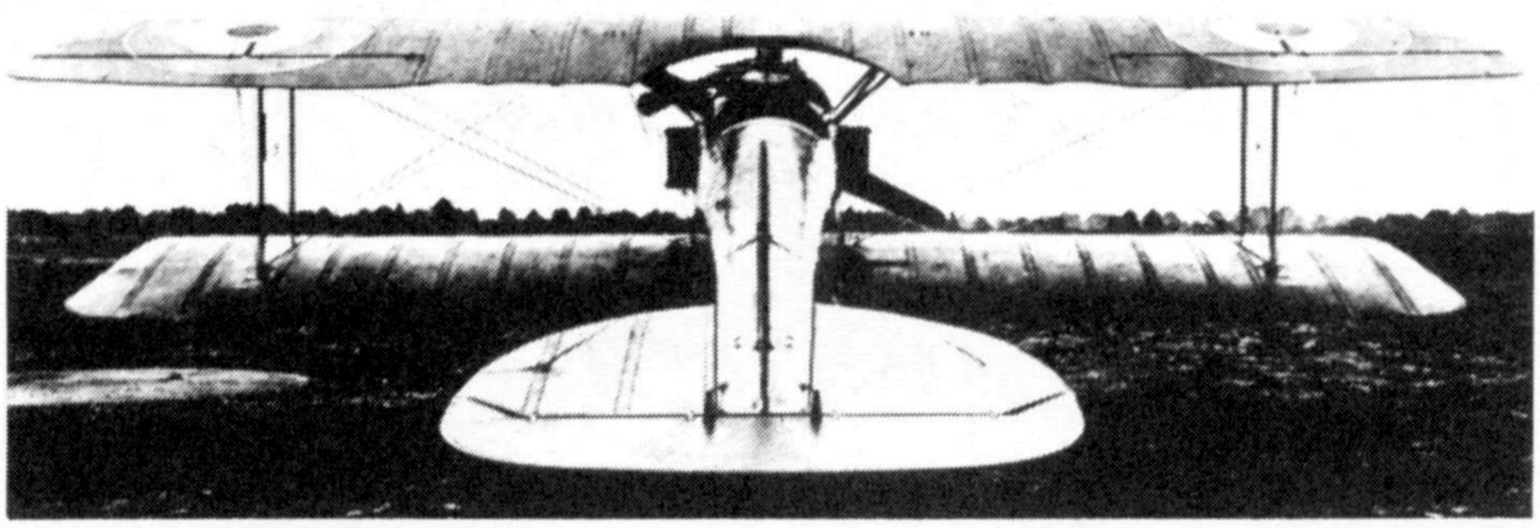


Albatros D.I to D.VI

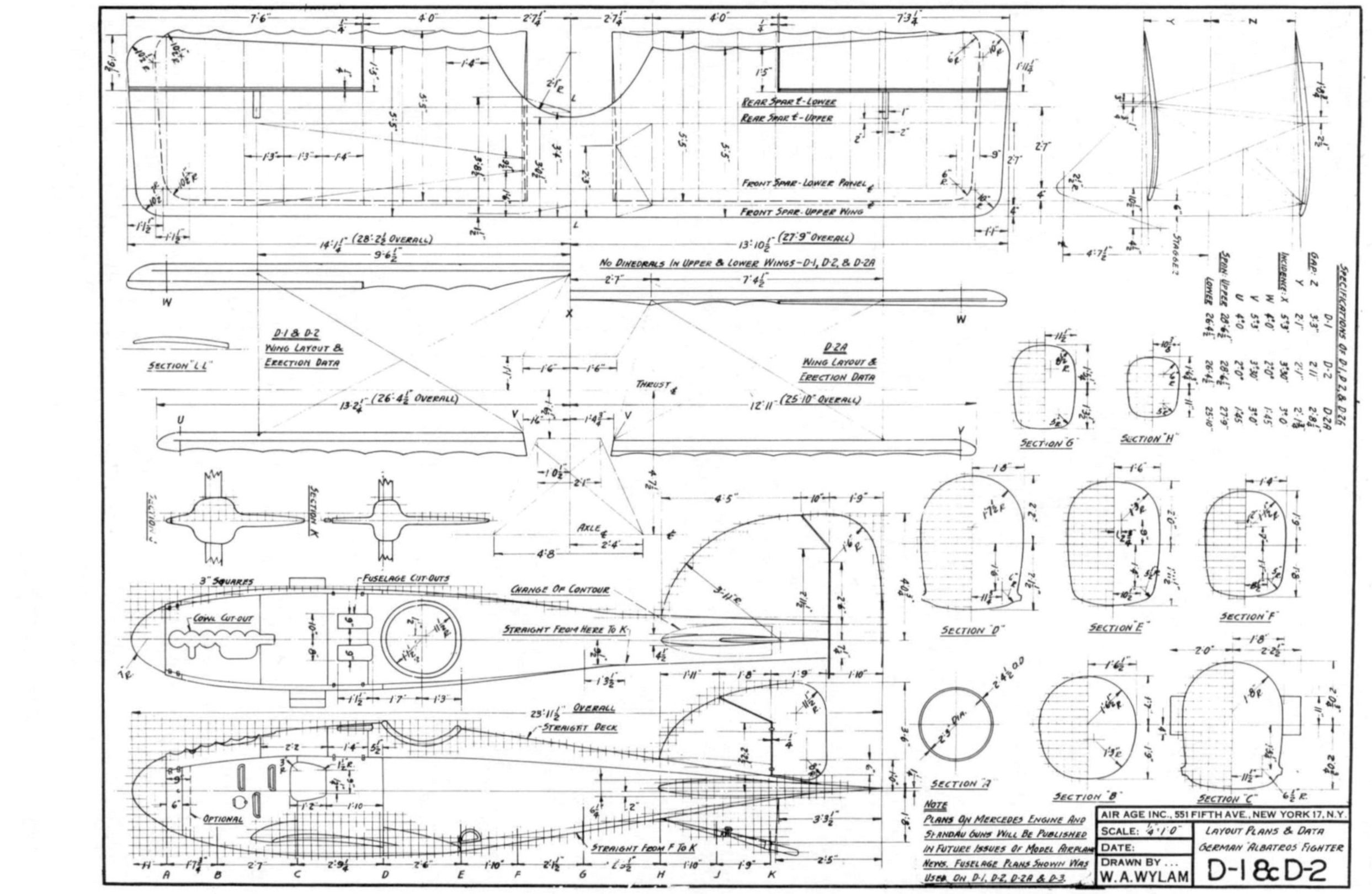
THE ALBATROS was introduced in April 1916 by the Albatros Werke, a manufacturing plant and civil flying school with excellent aero credentials, in the town of Johannisthal near Berlin. The Albatros was the mainstay of German airpower during the entire first world war, although it was outclassed by faster British and French aircraft later in the war. The Albatros D.I made its combat debut on September 17, 1916, against an ill-fated flight of seven British F.E.2b pushers, resulting in the loss of five of the pushers and no loss to the Germans.

The D.1 immediately made every other fighter aircraft at the front obsolete. Development continued, however, which ended with the D.XII. The combat career of the Albatros did not end with the closing of WW I, but went into Polish and Czechoslovakian units. Two survive, both D.Va's; one at the National Air & Space Museum, the other in Australia. □





Above: A D.Va. The Albatros was a departure from the typical WW I fabric-and-stick fuselage and utilized advanced streamlining techniques for the times. "Jane's All the World's Aircraft" photo. Below: A captured Albatros D.III bearing RAF markings is another example of German streamlining attempts. Squadron/Signal Publications photo.



COLOR SCHEME NOTES:
UPPER SURFACE OF WINGS WERE SPRAYED GREEN & PURPLE AS DESIRED. ALL LOWER SURFACES WERE LIGHT SKY BLUE. ALL SIDES & TOP VIEW OF FUSELAGE & TAIL CAMOUFLAGE WERE COVERED WITH EITHER REGULAR OR IRREGULAR BLURRED HEXAGONS.

SPUN ALUMINUM SPINNER
ENGINE COOLANT RAD.
EXPANSION RESERVOIR
WATER LINE TO PUMP
WATER LINE FROM ENGINE
EXHAUST MANIFOLD
SNAP FASTENERS
REMOVABLE LIGHT FUSELAGE BONNET
GUNTER SYNCHRONIZED PROPELLER
HINGED AMMUNITION DOOR
HAMMERED BELT COWL
AUX. FUEL TANK
GRAVITY FUEL FEED LINE
COWL CUT-OUT
INTAKE MANIFOLD
FABRIC COVERED WINGS
STRUT'S ANCHOR PLATE
ACCESS DOOR - LOWER WING
HAMMERED PULLEYS HOUSING
TURNBUCKLES JUNCTION
CIRCULAR SECTION WIRES

STRUT'S ANCHOR PLATE
AIR INTAKE OPENING
3'0" 2'7"
AILERON CONTROL CABLES

NOTES:
ORIGINAL D-3 HAD WING RADIATOR MOUNTED AT CENTER OF SPAN; IT HAD NO AUX. FUEL TANK. THE ORIGINAL CABANE WAS LOCATED AT "AZ". LATE D-3 HAD REDESIGNED AILERONS - SAME AS D-4's. NO HEADREST WAS USED ON D-3.

MACHINE GUNS
"AZ"
2'0"
HAMMERED PULLEYS HOUSING

D-4 FUSELAGE SECTIONS
H J K L
D-3 & D-4 MANIFOLD
HORIZONTAL STABILIZER
OIL COOLER INTAKE
9'3" DIA. LAMINATED PROP'R.
SAME WHEELS AS D-1's
JUNCTION - WIRES "C" & "D"
PLYWOOD FAIRING PANEL
STEEL STRAP - L.G. MOUNT
ENGINE COOLANT RADIATOR
ON REAR STRUTS ONLY
HAMMERED HOUSING
5'10 3/4"
FIXED TWIN SPANDAU M.G.s
CARBURETOR ACCESS
INTAKE MANIFOLD
THERMOSTATIC UNIT
RELIEF VALVE - WATER EXPANSION
EXPANSION RESERVOIR TANK
TANK COVER CAP
1" WATER LINE TO WING RADIATOR
1" WATER LINE TO ENGINE PUMP
LEATHER PADDED COCKPIT
OPTIONAL WINDSHIELD
OPTICAL GUN SIGHT
GUN CHARGING HANDLE

D-4 CHANGE - STRAIGHT FROM "E" TO ELEVATOR
E F G H J K L
FABRIC COVERED ELEVATOR
D-4 HEADREST
CHANGE OF CONTOUR
PLYWOOD PANELS
CABANE REINF'MT.
PEEP SIGHT
1" WATER LINE TO ENGINE PUMP
EXPANSION RESERVOIR
1" WATER LINE TO RADIATOR
4'0 3/4"
3'11" M.G.
1'6"
10"
D-4 CHANGES
OIL COOLER

OIL COOLER
ON D-4 ONLY
MANUFACTURER'S MARK'G
PLYWOOD BUTT JOINT
PLYWOOD D.1990/16
FABRIC
1'3"
D-4's VERT. STAB.
D-4's TAIL SKID SAME AS D-3's
BOTTOM VIEW - D-3 VERT. STAB.
BLACK
WHITE
RED
PRINTED CAMOUFLAGE FABRIC DOPED ONTO PLYWOOD SURFACE

NOTES:
D-4 HAD D-3's UPPER WING WITH MINOR CHANGES; THE LOWER PANELS WERE SAME AS D-3. THE LANDING GEAR WAS SAME AS G.I. THE SIDE VIEW (D-4's) WAS SAME AS D-3; PLAN VIEW WAS CHANGED AT SECTION "E" TO ELEVATOR. THE D-13 HORIZONTAL & VERTICAL STABILIZERS (LOWER VERT. STAB. CHANGED) WAS ON D-4.
D-4 FUSELAGE SECTIONS
E F G

METAL COWL & SPINNER
OIL TANK ACCESS DOOR
METAL COOLING AIR OUTLETS
PLYWOOD FAIRING PANEL
AILERON CONTROL CRANK
VALVE ACCESS DOOR
AILERON HINGE
OPENING FOR AILERON CRANK
STEEL L.G. SOCKET
PULLEYS INSPEC. DOOR
STRUT'S ANCHOR PLATE
STEEL TUBING
HINGE
ACCESS DOORS - WING ATTACHMENTS
REAR LAND. GEAR STRUT SOCKET
LOWER WING PANEL
BUTTED PLYWOOD FAIRING PANEL
FUEL TANK VENT
ACCESS DOORS
ACCESS DOOR - ENGINE DRAIN
STEEL STRAP - L.G. MOUNT
OIL TANK VENT
D-3 & D-4 BOTTOM VIEW
PILOT IDENTIFICATION STRIPES & MARKINGS WERE PAINTED OVER CAMOUFLAGED BACKGROUND; USED BY SPECIAL SCOUT SQUADRONS.
COMPRESSION STRUT
RUBBER SHOCK-CORD
SHOCK-CORD HOUSING
LANDING GEAR STRUT SOCKET

AIR AGE INC., 551 FIFTH AVE., NEW YORK 17, N.Y.
SCALE: 1/4" = 1'0"
DATE:
DRAWN BY ... W.A.WYLAM
GENERAL ARRANGEMENTS
GERMAN "ALBATROS" FIGHTER
D-3 & D-4

29'6" SPAN - D-5A & D-5B
D-5A & D-5B AILERONS
14'9"
4'5"
2'7½"
7'0½"
12'4"
13 EQUAL SPACES = 14 RIBS
EARLY D-3 ONLY
2'10½"
REAR SPAR
FRONT SPAR
FALSE SPAR - D-3 & D-5
MAIN SPAR - D-3 & D-5
CHORD
2'6"
14'10"
29'8" SPAN - D-3 & D-4
10'0" D-3, D-4, D-5 SERIES

AILERON CONTROL CABLES
FIXED STAGGER - ALL MODELS

NOTES:
D-3, D-4B & D-5 USED SAME WINGS WITH MINOR CHANGES. D-5A & D-5B's UPPER WING HAD MINOR CHANGES; LOWER WING WAS RE-DESIGNED.

LATE D-3 & D-4
EARLY D-3
NO DIHEDRAL ON LEADING EDGES - THE TRAILING EDGE AT "N" WAS RAISED TO CHANGE THE INCIDENCE. SAME SYSTEM WAS USED ON BOTH WINGS OF D-1 & D-2.
HORIZONTAL THRUST

WING SETTING SPECIFICATIONS

	D-3	D-4
GAP: Z	3'2"	2'9"
" Y	1'9½"	1'9½"
INCIDENCE: X	3°	3°
" - W	1°45"	1°45"
" - V	2°30"	2°30"
" - U	2°30"	2°30"

UPPER WING ATTACH'T. LUG
SLOTTED CENTER FOR LUG
STAGGER ADJUSTM'T. HOLES
1⅛" = 2⅝"
ADJUSTABLE EYES
STEEL TUBING
STEEL PLATE - BRACE WIRES ATTACH.
STREAM'D. STEEL
D-1 CABANE STRUCTURE DETAILS

1½" DIHEDRAL
14'4½"
28'9" SPAN - D-3 & D-4
SLANTED TO FIT BODY CONTOUR
1'4"
1'2½"
D-5 SERIES
14'3"
28'6 SPAN - D-5 & D-6
CABANE REINFORCEMENT TUBING
STREAMLINED STEEL TUBING
ADJUSTABLE FORK
2'9½" D-3 & D-4
2'7 D-3
2'2" D-2 & D-4
2'8 D-2
1½" x 2½"

WELDED STEEL AILERONS
AILERON CRANK
AUXILIARY SPAR
STEEL WIRE - TRAILING EDGE
LATE D-5's SERIES

FALSE SPAR (NOT ANCHORED) D-3 & D-5
STEEL COMPRESSION TUBE D-5A & 5B
STEEL DRAG WIRE - D-5A & D-5B
AILERON CONTROL CABLES
PULLEYS FRAME - HOUSING & DOOR
DOUBLE PULLEYS
3'10" D-5 ONLY
3'7¼" D-5A & D-5B
2'2"
MAIN SPAR D-3 & D-5
RADIATOR COMPARTMENT
D-5A & 5B
REAR SPAR
FRONT SPAR
CAT STRIPS - UPPER SURFACE ONLY
SPRUCE RIBS
HOLLOWED WOODEN LEADING EDGE
STEEL TUBING
AUXILIARY SPAR
SLANTED RIB
AILERON CONTROL CABLES
DOUBLE PULLEYS

TYPICAL ALBATROS D-2, -3 & -4 CABANE
MAIN CHANGES ON LOWER WING ARE: D-3 & D-5 HAD SINGLE MAIN SPAR & UNANCHORED FALSE SPAR; ON D-5A & D-5B, DOUBLE ANCHORED MAIN SPARS WITH INTERNAL WIRE TRUSS.

TYPICAL ALBATROS CONSTRUCTED RIB
10% 20 30 40 50 60 70 80 90 100
8%
% OF CHORD
TYPICAL ALBATROS AIRFOIL - 1915 TO 1917

LATE D-3, D-4, D-5 SERIES
UPPER & LOWER WING DETAILS
REINFORCED FRAME
WOOD HINGE BLOCK
STEEL STRAP - HINGE
D-1 & D-2 UPPER & LOWER WING DETAILS

NOTES:
"V" STRUTS ON D-3 TO D-5's WERE MOUNTED TO MAIN SPARS; ON D-5A & D-5B, "V" STRUTS WERE MOUNTED ON COMPRESSION TUBES IN LOWER WING PANELS.

AIR AGE INC., 551 FIFTH AVE., NEW YORK 17, N.Y.
SCALE: 1/4 & 1/2" = 1'0"
DATE:
DRAWN BY ... W.A.WYLAM
WING LAYOUTS & DETAILS
GERMAN "ALBATROS" FIGHTER
D-1 TO D-5

THESE TWO GUNS WERE 6" FORWARD

D-5B & D-6 OPTIONAL MACHINE GUNS INSTALLATION

TANK FILLER CAP
EXPANSION RESERVOIR
COOLING AIR INTAKE
EXHAUST MANIFOLD

OPENING FOR AILERON CRANK
AILERON BELL CRANK
ANCHOR PLATES

THERMOSTATIC SHUTTER PANEL
4 SQ. RADIATOR HONEYCOMBING
CABANE REINFORCEMENT

D-5's & EARLY D-5A AILERON CONTROL

EXPANSION RESERVOIR TANK
AIR INTAKE - WING RADIATOR
EXHAUST MANIFOLD
THERMOSTATIC SHUTTER PANEL

EARLY D-5A BRACING

REAR VIEW MIRROR
THERMOSTAT - OIL COOLER
INTAKE MANIFOLD

M.G.'s

9'-2" DIA. "XIAL" LAMINATED WOOD PROPELLER
ANTI-FLUTTER BRACE WIRE
ANTI-FLUTTER STRUT

JUNCTION-WIRES "F" & "G"
PLYWOOD FAIRING PANEL
AIR INTAKE - OIL COOLER
METAL COWL & SPINNER
SAME WHEELS AS D-1's
HAMMERED HOUSING
SPIRAL SHOCK-SPRINGS
FIXED SUB-WING PANEL ON LATE D-5A & ALL D-6's
CABANE STRUTS
HAMMERED HOUSING
ANCHOR PLATE

THE LANDING GEAR'S SUB-WING WAS BUILT IN TWO HALVES; FRONT & REAR HALVES. THE FRONT HALF IS FIXED TO THE AXLE WHILE THE REAR HALF WAS FIXED TO THE COMPRESSION TUBE.

BOTTOM VIEW

OIL TANK VENT
ACCESS PANEL - OIL DRAIN
ACCESS PANELS - WING ATTACHT.
SPIRAL SHOCKSPRINGS
PUSH PULL ELEVATOR TUBE

D-3's RUDDER & FIN

D-5's FUSELAGE
D-4's VERTICAL STABILIZER
D-3's CONTROL HORNS
D-4's TAIL SKID

D-5's REAR DETAILS

CABANE DETAILS

5'-7½" TREAD

2" DIA AXLE
ELASTIC SHOCKCORD - D-5 ONLY
ELEVATOR HINGE
FABRIC COVERED ELEVATOR
D-6's HORIZONTAL STABILIZER
PLYWOOD PANELS
ELEVATOR CONTROL HORN
PUSH PULL ELEVATOR CONTROL TUBE
ON LATE D-5A & ALL D-6's
INSPECTION DOORS
CHANGE OF CONTOUR LINES
LATE D-5A & D-6's AILERON HORN
TRANSPARENT WIND BREAK
LEATHER COVERED PADDING
PLYWOOD HEADRESS (OPTIONAL)
PLYWOOD BUTT JOINTS
WHITE
BLACK

D5176

PLYWOOD
D5029
FABRIC

CHANGE OF CONTOUR
ELASTIC SHOCKCORD
HICKORY TAIL SKID
CONICAL CROSS SECTION
PIVOT POINT

REAR VIEW MIRROR
JUNCTION WIRE "F" & "G"
2 OR 3 M.G.'S
EXTRA 2 M.G.'S
SIGHT

RELIEF VALVE
EXPANSION RESERVOIR
1" WATER LINE TO RADIATOR
1" WATER LINE TO PUMP
CABANE REINFORCEMENT

ACCESS DOORS
METAL COOLING AIR OUTLETS
ANTI-FLUTTER STRUT
PLYWOOD FAIRING PANEL
LATE D-5A'S HORN
REAR SPAR E
ACCESS DOOR - TIRE VALVE
D-5A'S SUB-WING

SPRAYDAY MACHINE GUNS
HAMMERED BELT COWL
FIXED PLYWOOD DECK
SEMI-FIXED METAL COWL
REMOVABLE ENGINE BONNETS
JUNCTION-WIRES "F" & "G"
STREAMLINE STEEL TUBING

D-5A

D-5B & D-6 STANDARD MACHINE GUNS INSTALLATION

MACHINE GUN TROUGH
OPTIONAL SPINNER

NOTES:
D-5B IS SAME AS D-5A WITH CHANGES MADE ON THE ARMAMENTS & ENGINES. D-6 IS SAME AS D-5B WITH CHANGES MADE ON HORIZONTAL STABILIZER AS SHOWN IN PLAN VIEW. D-6A IS SAME AS D-6 EXCEPT IT HAD TWO MACHINE GUNS, SAME ENGINES AS D-5A; & IT WAS A TRIPLANE.

AIR AGE INC., 551 FIFTH AVE., NEW YORK 17, N.Y.	
SCALE: ¼" = 1'-0"	GENERAL ARRANGEMENTS
DATE:	GERMAN "ALBATROS" FIGHTER
DRAWN BY ... W. A. WYLAM	D-5 & D-6

FRONT LANDING GEAR STRUT'S STEEL STRAP FUSELAGE MOUNT & SOCKETS (ON D-1 TO D-4 ONLY)

1¼" DIA COMPRES. TUBE

STEEL STRAP
STRUT SOCKET
SCREW LOCK
DETACHABLE STRUT

TYPICAL SHOCK CORD DETAILS (ON D-1 TO D-5)

SHOCK-STOP LOOP
SHOCK CORD COMPRESSION TUBE
2" DIA AXLE

REAR STRUT SOCKET (ON D-1 TO D-6A)

ANCHOR PLATE
STRUT SOCKET
BALL SOCKET
LIGHTENING HOLES
FRONT STRUT SOCKET ON D-5 & D-6's SERIES
SAME WITHOUT TURNBUCKLE

WING SETTINGS & SPECIFICATIONS (REFER TO MAY 46 M.A.N. PAGE 29)

		D-5	D-5A	D-5B	D-6	D-6A (TRIPLANE MODEL DR.1)
GAP:	Z	2'-9"	2'-7½"	2'-6½"	2'-6½"	
	Y	2'-1½"	2'-1½"	2'-1½"	2'-1½"	
INCIDENCE:	X	3°	3°	3°	3°	
	W	1°-45"	1°-45"	1°-45"	1°-45"	
	V	2°-30"	2°-30"	2°-30"	2°-30"	
	U	2°-30"	2°-30"	2°-30"	2°-30"	
CHORD	UPPER WING	4'-10"	4'-10"	4'-10"	4'-10"	
	LOWER WING	3'-7¼"	3'-7¼"	3'-7¼"	3'-7¼"	
MACHINE GUNS		2	2	3 OR 5	3 OR 5	2
MERCEDES ENGINE		160 H.P.	220 H.P.	220 H.P.	260 H.P.	220 H.P.
BENZ ENGINE			200 H.P.	200 H.P.	200 H.P.	200 H.P.

NOTE
LOWER WING CHORD OF LATE D-3, D-4 TO D-6 WAS 3'-7¼". THE CHORD 3'-10" WAS ON EARLY D-3's AND SOME LATE D-3's.

SECTION A-A (BUILT-UP PANEL & FITTED TO NON-ROTATING AXLE)

FRONT HALF
REAR HALF

STEEL STRAP L.G. MOUNT (FRONT STRUTS ONLY)

TURNBUCKLE ASSEM. REAR STRUTS ONLY

D-1 TO D-4 LANDING GEAR LAYOUT

D-5 TO D-6A LANDING GEAR LAYOUT

WELDED & FLARED END PLATE (SLOTTED TO HOLD SHOCKCORD)

HORIZONTAL THRUST
VERTICAL THRUST
WHEELS

D-5 TO D-6A LANDING GEAR LAYOUT

2½" × 1½" STREAMLINED STEEL TUBING

SHOCK-STOP LOOP
SHOCKCORD SLOT

D-1 TO D-4 LANDING GEAR LAYOUT

BEARINGS
SPOKES
SHOCKCORD GUARD (ON D-1 TO D-5)

ON D-5A TO D-6A (DR.1)
SAME WHEELS AS D-1's.

D-3's & D-4's WHEELS IN SAME POSITION AS D-1, D-5 SERIES & D-6 SERIES' WHEELS IN SAME POSITION AS D-5A's.

D-5 & D-6A (DR.1) HORIZONTAL STABILIZER LAYOUT

SAME ELEVATOR ON D-5 SERIES & D-6

TIGHT FITTING ENGINE COWL CUT OUT - REMOVABLE IN 2 SECTIONS

FUSELAGE CUT OUT

NOTES
D-5 SERIES & D-6 SERIES USED SAME FUSELAGE SHOWN HERE — THE ONLY CHANGE IS THE HORIZONTAL STABILIZER ON THE D-6's

D-5 SERIES HORIZONTAL STAB. LAYOUT

ALL SQUARES ARE 3"

23'-11½" OVERALL LENGTH

NOTE:
REFER TO MAY 1946 MODEL AIRPLANE NEWS FOR LAYOUT & DETAILS ON THE WINGS.

AIR AGE INC., 551 FIFTH AVE., NEW YORK 17, N.Y.	
SCALE: ¼" = 1'-0"	LAYOUT PLANS & DATA
DATE:	GERMAN "ALBATROS" FIGHTER
DRAWN BY ... W. A. WYLAM	D-5 & D-6

(A)

Connection From Thermostat
Rudder Control Cable
Empty Shell Box
Ammunition Box
Empty Belt Box
Pullies "H"
Pullies "G"
Elevator Control Cables
Compass
Adjustment Holes - Seat
Support Bar - Seat
Push-Pull Cable Control System
Pullies "K"
D-1 To D-5 Elevator
Rudder Horn
Pullies "J"
Oil Line To Pump
Oil Tank Vent
Oil Line From Cooler
Thermostat Housing
2 Stage Air Pump
Oil Line To Oil Cooler
Oil Cooler
Flexible Gun Control
Engine Throttle
Pet Cocks - Fuel Lines
Aileron Control Cables
Control Column Tube
Rudder Bar
Rudder Control Cable
Elevator Control Cables
Strap
Hinge Block
Typical Albatros Hinge Detail
Ammunition & Empty Belt Boxes
Empty Shell Box
Plywood Panel
Altimeter
Oil Cooler
Oil Tank Vent
Pressure Release Lines
Rear Spar - Upper Wing
Empty Belt Box
Ammunitio Box
Pullies "G"
Pullies "H"
Elevator Crank
Pullies "A"
Pullies "C"
Pullies "D"
Push-Pull Tube
Bell Crank
Empty Shell Chutes
Cover Cap - Tank
Pullies "B"
Pullies "C"
Cable Hole
Altimeter
Hand Grips - Control Column
Throttle
Cover Cap - Aux. Fuel Tank
Wood Seat Mount
Plywood Support Panel
Aux. Fuel Tank (Optional)
Compass
Pressure Release Lines
Push-Pull Tube - Elevator
Push-Pull Tube - Rudder
Plan View - Aileron Horn
Aileron Horn
Push-Pull Tubes Control System
Late D-5 & D-5A To D-6 Rudder
D-5A To D-6 Rudder
Pullies "G"
Pullies "H"
Push-Pull Tube - Rudder
Push-Pull Tube - Elevator
Welded Steel Structure
Hinge Block - Wood
Auxilliary Fuel Tank
Cover Cap - Tank
Fuel Air Line
Main Fuel Tank
Elevator Horn
Empty Shell Chutes
Ammun. Box
Access Door
Main Fuel Tank
Elevator Horn
Fuselage Bulkheads Omitted For Clarity
Empty Belt Box
Ammunition Box
Empty Shell Box
Plywood Panel
Airspeed
Pullies "F"
Aileron Cables
Empty Belt Box
Leather Band
Alum. Foot Plate
Tank Mount
Empty Shell Bay
Charging Handle - Machine Gun
Altimeter
Pressure Gauge - Fuel Tanks
Pet Cock - Fuel Tank Pressure Release
Tachometer
Flexible Gun Control
Elevator Lock
Rudder Bar
Pivot Point
Pullies "A"
Pullies "B"
Cover Cap
Pullies "C"
Pullies "D"
Bearing Block
Pullies "E"
Ball Joint
Aux. Fuel Tank (Optional)
Pullies "A"
Leading Edge
Aileron Control Cables In Lower Wing
Control Column
Pullies "E"
Engine Controls
Safety Straps
Compass
Fuselage Longeron
Seat Bolts
Plywood Panel
Support Band
Pullies
Aileron Control Cables In Upper Wing
Pullies "D"
Leather Padded Grips
Polished Steel Tubing
Welded Pivot Rod Plates
Rudder Control Cables
Alum. Foot Plate
Rudder Bar
Machine Gun Controls
Sliding Collar
Pivot Point (All 4 Corners)
Elevator Lock
Elevator Crank
Double Pullies "E"
Control Column Pivot
Elevator Cables
Rudder Cable
Support Bearings
Control Column Cable Diagram
Collar Slides Up & Down When Unlocked
Screw Type Hand Elevator Lock
Aileron Cables
Pivot Point
Double Pullies "E"
Steel Tubing
Albatros Control System (Minor Changes On Push-Pull Tube Control System)

AIR AGE INC., 551 FIFTH AVE., NEW YORK 17, N.Y.
SCALE: 1/4" = 1'-0"
DATE:
DRAWN BY ... W.A.WYLAM
Fuselage Interior Details
German "Albatros" Fighter
D-1 TO D-6

On D-1 To D-3, Sections "K" & "L" Forms The Fuselage And Vertical Stabilizer Bulkheads. The Horizontal Stabilizer Was In 2 Panels; Left And Right Hand Units.

Longeron "X"
Plywood Covering
Seat Support Rail
Engine Mounting Rails
Longeron "Z"
Longeron "Y"
Cockpit Cut-Out
Longeron "Z"
Longeron "Y"
Longeron "X"
Plywood Covering
Typical Albatros Longeron (Routed Out Between Bulkheads)
Plywood Fairing
On D-5 Series, Sections "J" & "K" Forms The Fuselage, Horizontal And Vertical Stabilizer Bulkheads.
Engine Mounting Rails
Seat Support Rails

Note:
Mr. Robert Campbell Is Correct On Single Spar Details Of Lower Wing Panel; It Believed That The Spar Centers Shown Were The Location Of Auxiliary Spars. Any Other Errors Pedopted Will Be Appreciated - W.A.Wylam.

AIR AGE INC., 551 FIFTH AVE., NEW YORK 17, N.Y.
SCALE: 1/4" = 1'-0"
DATE:
DRAWN BY ... W.A.WYLAM
Fuselage Structure Details
German "Albatros" Fighter
D-1 TO D-6

Ansaldo SVA-1

drawing by WILLIS NYE

Ansaldo SVA-4 was nearly identical to SVA-1. Note extra strut in center section bracing. Robert Hare photos from Air Age file.

ALTHOUGH little has been written of Italy's contributions during the first world war, the record is an amazing one. Italy's aerodynamicists were numbered among the world's finest, her factories were efficient, and Italian designs were definitely first class.

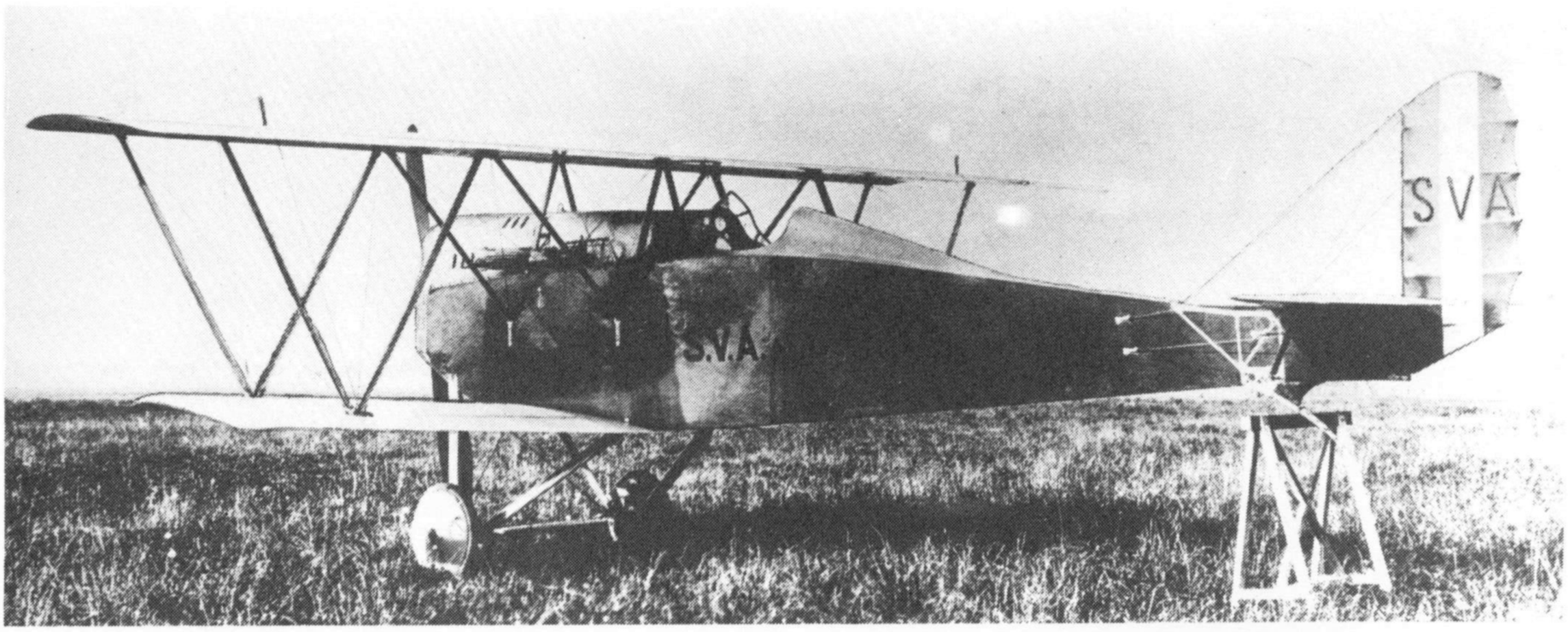
One of the largest companies was a firm known as "Societa Gio Ansaldo" of Genoa. To guarantee consistent quality, the firm established a testing program virtually unheard of during that period. In-plant testing and inspections were more critical than any contemporary manufacturer had even thought of. From these facilities came the famous S.V.A. series of fighter and bomber aircraft.

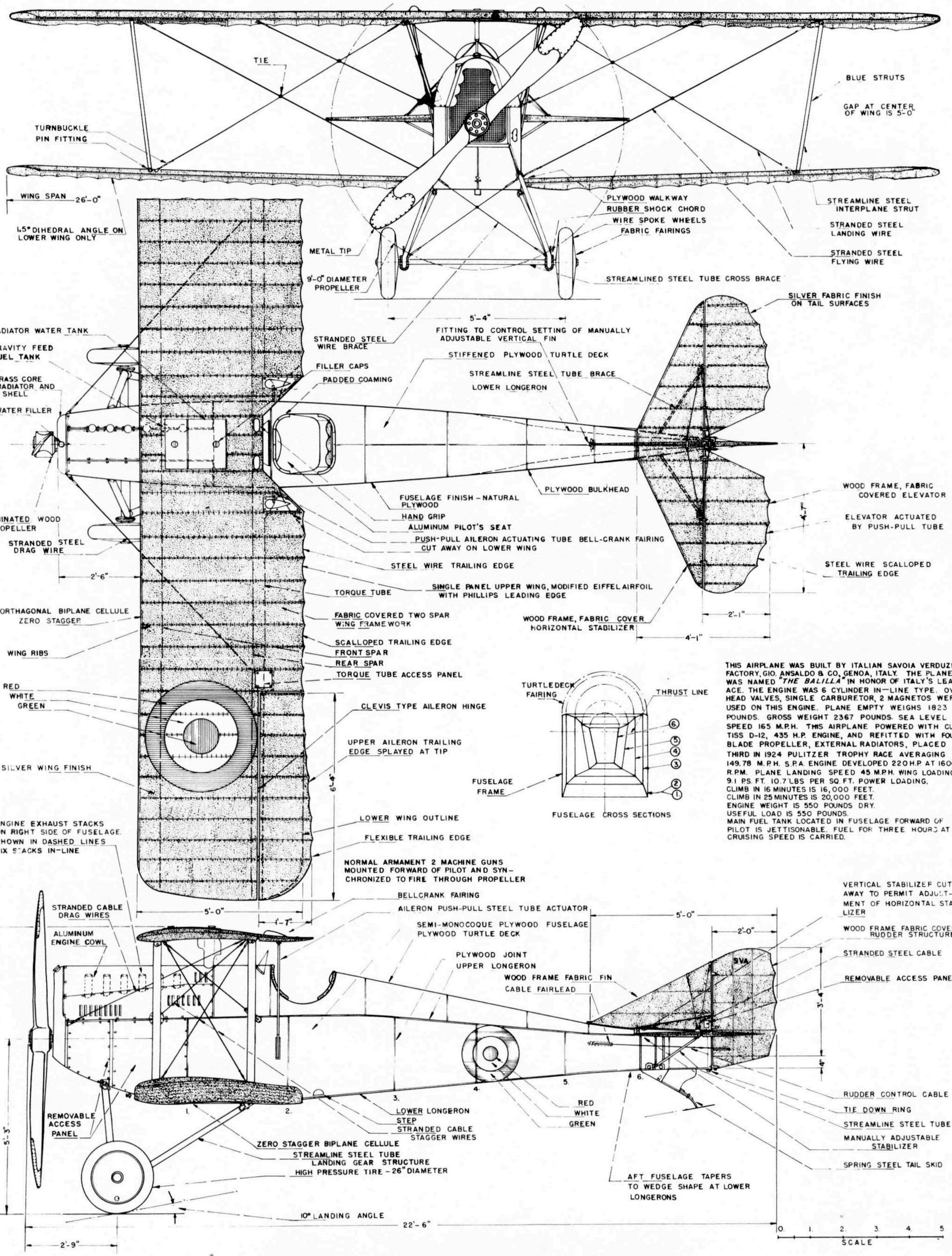
Fitted with a six-cylinder, water-cooled vertical-type engine that developed 225 hp at 1,700 rpm, the aircraft was suited to roles of both fighter and bomber. Altogether six models of the basic S.V.A. design are known to have been built, and of these three were exclusively single-seat fighters, two were listed as "escort" types, and one was fitted out as a single-seat bomber. Only the S.V.A.-4 and -5 reached true production status.

Operationally, the S.V.A.-4 and -5 were a distinct success. Nearly all Italian pursuit squadrons were fitted with the fighter version toward the war's end, while four bomber squadrons were entirely -4 equipped. They regularly took on missions of up to 700 miles round trip, which were completed in less than seven hours. Because of their versatility, the -5 fighters were often fitted with bombs for shorter range work and with extra fuel to escort the bombers.

A curious feature of Ansaldo aircraft, as well as other Italian aircraft up through WW II, was that the left-hand wings were *longer* than the right-hand wings to help overcome torque. Most drawings, including Nye's, do not show this.

The S.V.A. team was a formidable weapon deserving of an everlasting place in aviation's Hall of Fame. Seven survive, five in Italy and two in the U.S. □





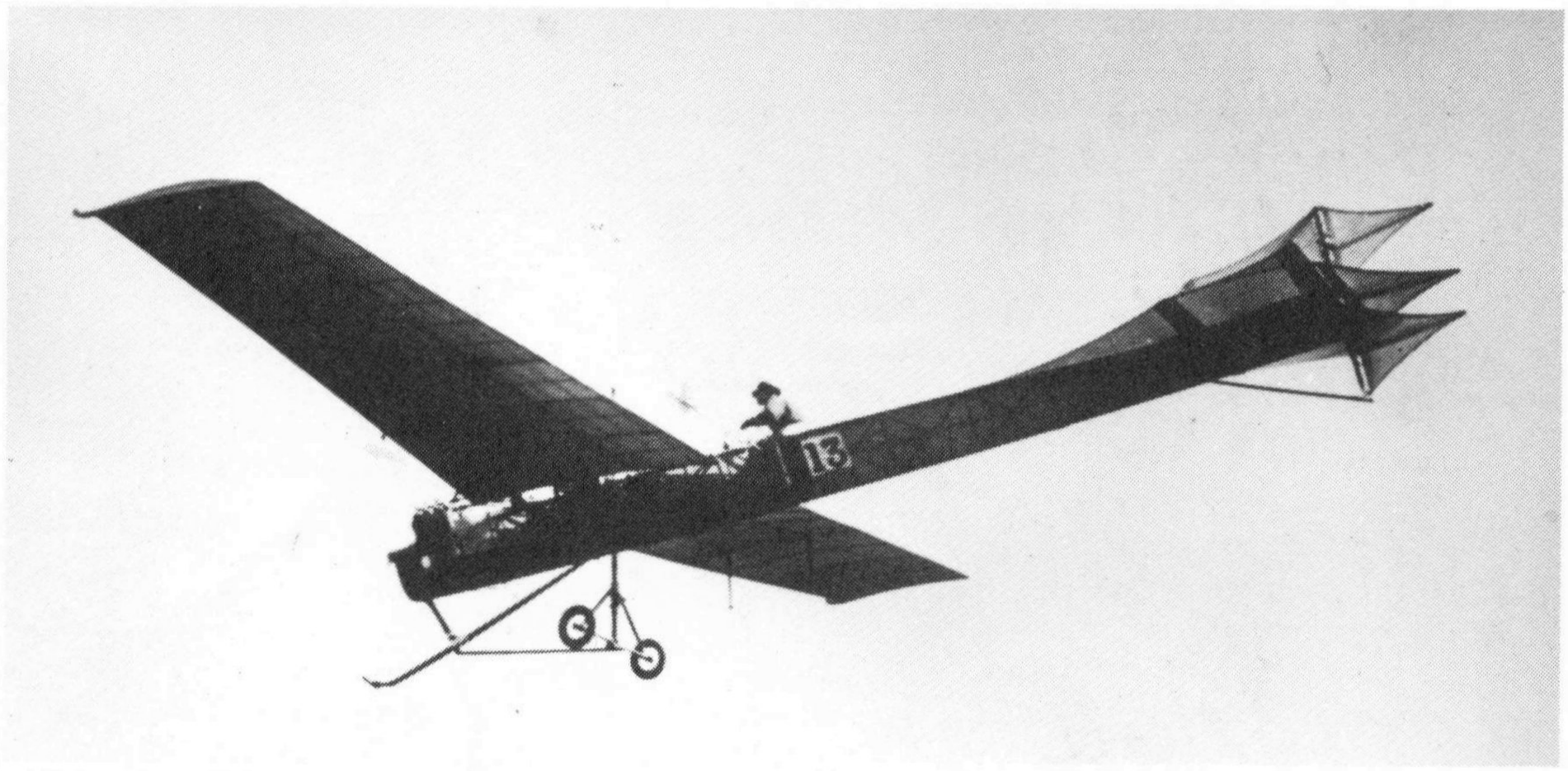
THIS AIRPLANE WAS BUILT BY ITALIAN SAVOIA VERDUZIO FACTORY, GIO. ANSALDO & CO, GENOA, ITALY. THE PLANE WAS NAMED *"THE BALILLA"* IN HONOR OF ITALY'S LEAD-ACE. THE ENGINE WAS 6 CYLINDER IN-LINE TYPE. OVER-HEAD VALVES, SINGLE CARBURETOR, 2 MAGNETOS WERE USED ON THIS ENGINE. PLANE EMPTY WEIGHS 1823 POUNDS. GROSS WEIGHT 2367 POUNDS. SEA LEVEL SPEED 165 M.P.H. THIS AIRPLANE POWERED WITH CUR-TISS D-12, 435 H.P. ENGINE, AND REFITTED WITH FOUR BLADE PROPELLER, EXTERNAL RADIATORS, PLACED THIRD IN 1924 PULITZER TROPHY RACE AVERAGING 149.78 M.P.H. S.P.A. ENGINE DEVELOPED 220 H.P. AT 1600 R.P.M. PLANE LANDING SPEED 45 M.P.H. WING LOADING 9.1 PS. FT. 10.7 LBS PER SQ. FT. POWER LOADING.
CLIMB IN 16 MINUTES IS 16,000 FEET.
CLIMB IN 25 MINUTES IS 20,000 FEET.
ENGINE WEIGHT IS 550 POUNDS DRY.
USEFUL LOAD IS 550 POUNDS.
MAIN FUEL TANK LOCATED IN FUSELAGE FORWARD OF PILOT IS JETTISONABLE. FUEL FOR THREE HOURS AT CRUISING SPEED IS CARRIED.

THE ANSALDO SVA-1

W.L. NYE

Antoinette VII

drawing by WILLIS NYE



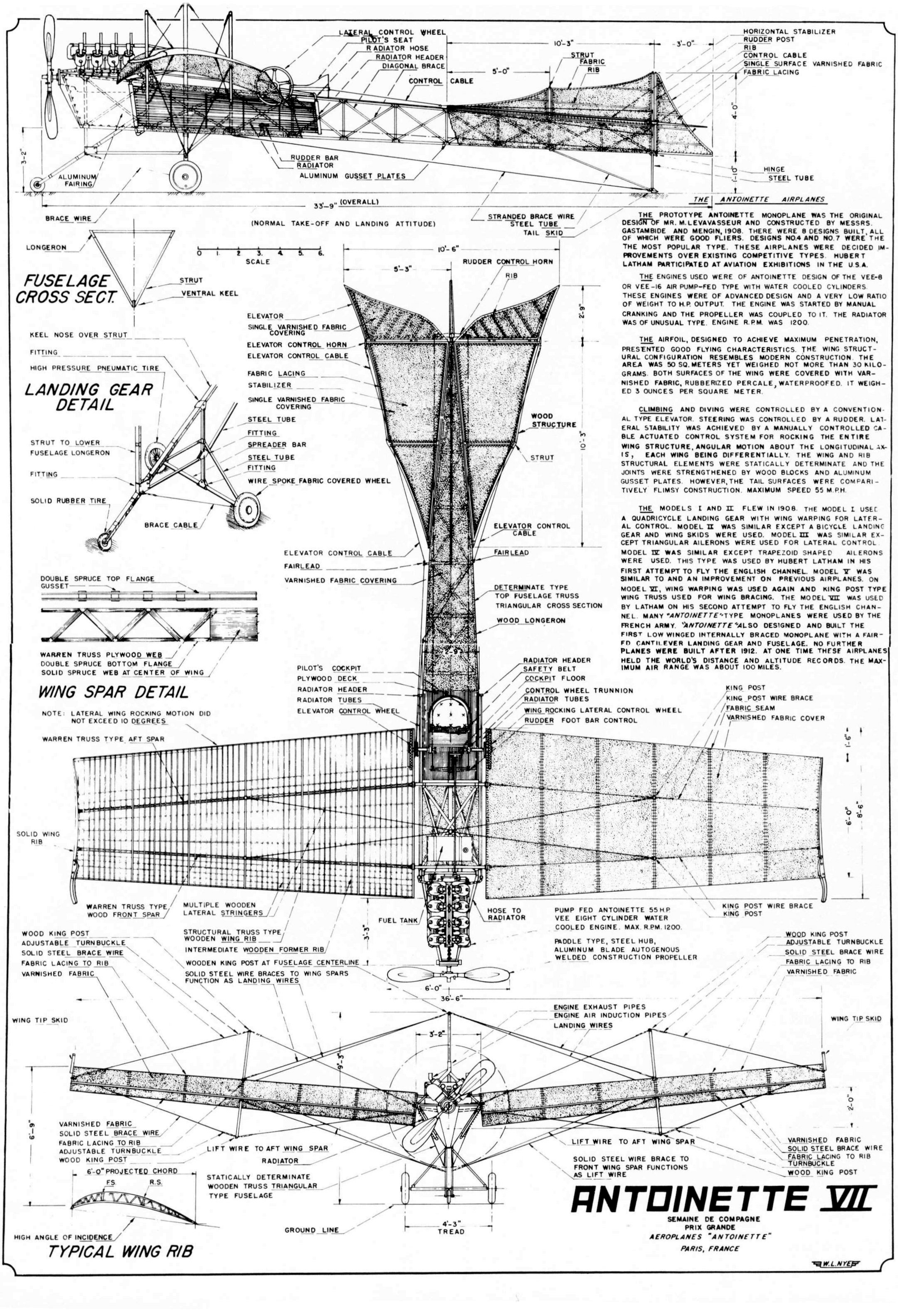
FROM their motorboat engine factory, Leon Levavasseur and Jules Gastambide began building airplanes in 1903; the first successful design, Model IV, flew in 1908. Herbert Latham used it, much modified, in his first cross-Channel attempt, and the Model VII on his second: both efforts ended in the water. Most of the Antoinette designs were heavily modified: the two photographs on this page, and Nye's drawing, are all of the same machine.

The designs were fast and stable: Latham later flew his Model VII, repaired and dried out, over the Golden Gate Bridge in San Francisco in 1911. He was observed on the occasion by Willis L. Nye, our draftsman.

The firm also built the Monobloc, the first internally-braced low-wing monoplane, in 1910: it was too heavy to fly. Three Model VIIs were lent to the U.S. Navy by Harry Harkness, and two of them appear in photographs of the Curtiss training school at North Island, in California.

Three Antoinettes are left, one in London, one in Paris, and one in Krakow, in Poland. □

The advancement in aircraft design exhibited here in 1908 was quite revolutionary. Note rudder and elevator control surfaces. The entire wing panels were moved for lateral control. Photos courtesy of Leonard Opdycke, WW I Aeroplanes.



THE ANTOINETTE AIRPLANES

THE PROTOTYPE ANTOINETTE MONOPLANE WAS THE ORIGINAL DESIGN OF MR. M. LEVAVASSEUR AND CONSTRUCTED BY MESSRS. GASTAMBIDE AND MENGIN, 1908. THERE WERE 8 DESIGNS BUILT, ALL OF WHICH WERE GOOD FLIERS. DESIGNS NO.4 AND NO.7 WERE THE THE MOST POPULAR TYPE. THESE AIRPLANES WERE DECIDED IMPROVEMENTS OVER EXISTING COMPETITIVE TYPES. HUBERT LATHAM PARTICIPATED AT AVIATION EXHIBITIONS IN THE U.S.A.

THE ENGINES USED WERE OF ANTOINETTE DESIGN OF THE VEE-8 OR VEE-16 AIR PUMP-FED TYPE WITH WATER COOLED CYLINDERS. THESE ENGINES WERE OF ADVANCED DESIGN AND A VERY LOW RATIO OF WEIGHT TO H.P. OUTPUT. THE ENGINE WAS STARTED BY MANUAL CRANKING AND THE PROPELLER WAS COUPLED TO IT. THE RADIATOR WAS OF UNUSUAL TYPE. ENGINE R.P.M. WAS 1200.

THE AIRFOIL, DESIGNED TO ACHIEVE MAXIMUM PENETRATION, PRESENTED GOOD FLYING CHARACTERISTICS. THE WING STRUCTURAL CONFIGURATION RESEMBLES MODERN CONSTRUCTION. THE AREA WAS 50 SQ. METERS YET WEIGHED NOT MORE THAN 30 KILOGRAMS. BOTH SURFACES OF THE WING WERE COVERED WITH VARNISHED FABRIC, RUBBERIZED PERCALE, WATERPROOFED. IT WEIGHED 3 OUNCES PER SQUARE METER.

CLIMBING AND DIVING WERE CONTROLLED BY A CONVENTIONAL TYPE ELEVATOR. STEERING WAS CONTROLLED BY A RUDDER. LATERAL STABILITY WAS ACHIEVED BY A MANUALLY CONTROLLED CABLE ACTUATED CONTROL SYSTEM FOR ROCKING THE ENTIRE WING STRUCTURE, ANGULAR MOTION ABOUT THE LONGITUDINAL AXIS, EACH WING BEING DIFFERENTIALLY. THE WING AND RIB STRUCTURAL ELEMENTS WERE STATICALLY DETERMINATE AND THE JOINTS WERE STRENGTHENED BY WOOD BLOCKS AND ALUMINUM GUSSET PLATES. HOWEVER, THE TAIL SURFACES WERE COMPARITIVELY FLIMSY CONSTRUCTION. MAXIMUM SPEED 55 M.P.H.

THE MODELS I AND II FLEW IN 1908. THE MODEL I USED A QUADRICYCLE LANDING GEAR WITH WING WARPING FOR LATERAL CONTROL. MODEL II WAS SIMILAR EXCEPT A BICYCLE LANDING GEAR AND WING SKIDS WERE USED. MODEL III WAS SIMILAR EXCEPT TRIANGULAR AILERONS WERE USED FOR LATERAL CONTROL. MODEL IV WAS SIMILAR EXCEPT TRAPEZOID SHAPED AILERONS WERE USED. THIS TYPE WAS USED BY HUBERT LATHAM IN HIS FIRST ATTEMPT TO FLY THE ENGLISH CHANNEL. MODEL V WAS SIMILAR TO AND AN IMPROVEMENT ON PREVIOUS AIRPLANES. ON MODEL VI, WING WARPING WAS USED AGAIN AND KING POST TYPE WING TRUSS USED FOR WING BRACING. THE MODEL VII WAS USED BY LATHAM ON HIS SECOND ATTEMPT TO FLY THE ENGLISH CHANNEL. MANY "ANTOINETTE"-TYPE MONOPLANES WERE USED BY THE FRENCH ARMY. "ANTOINETTE" ALSO DESIGNED AND BUILT THE FIRST LOW WINGED INTERNALLY BRACED MONOPLANE WITH A FAIRED CANTILEVER LANDING GEAR AND FUSELAGE. NO FURTHER PLANES WERE BUILT AFTER 1912. AT ONE TIME THESE AIRPLANES HELD THE WORLD'S DISTANCE AND ALTITUDE RECORDS. THE MAXIMUM AIR RANGE WAS ABOUT 100 MILES.

ANTOINETTE VII

SEMAINE DE COMPAGNE
PRIX GRANDE
AEROPLANES "ANTOINETTE"
PARIS, FRANCE

W.L.NYE

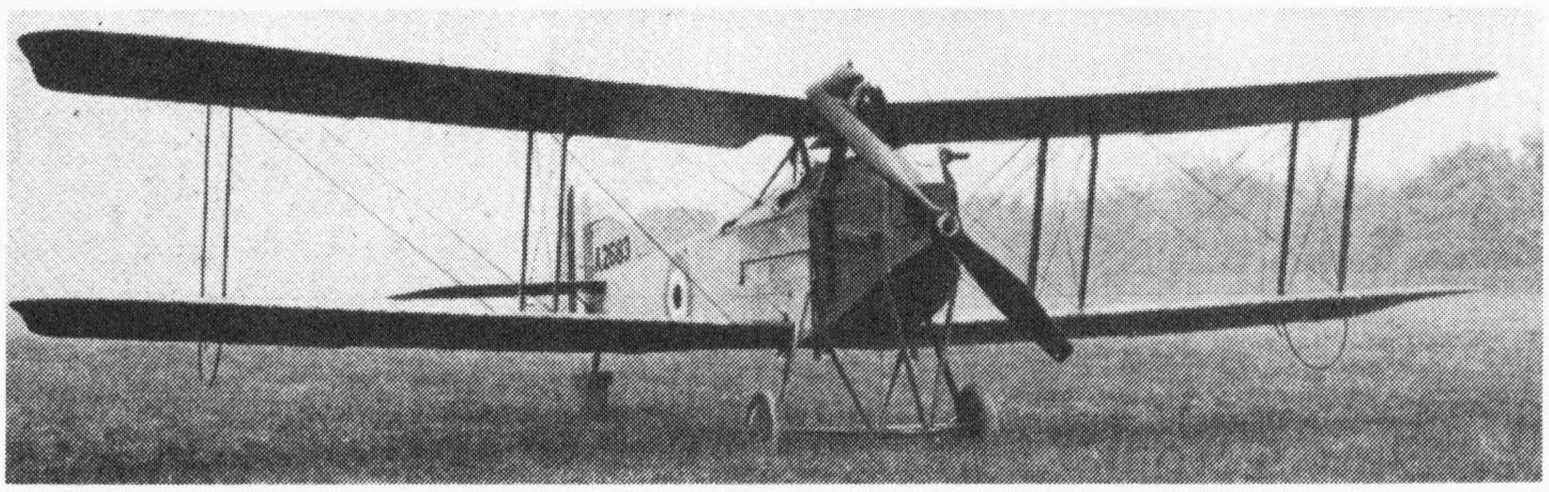
Armstrong-Whitw

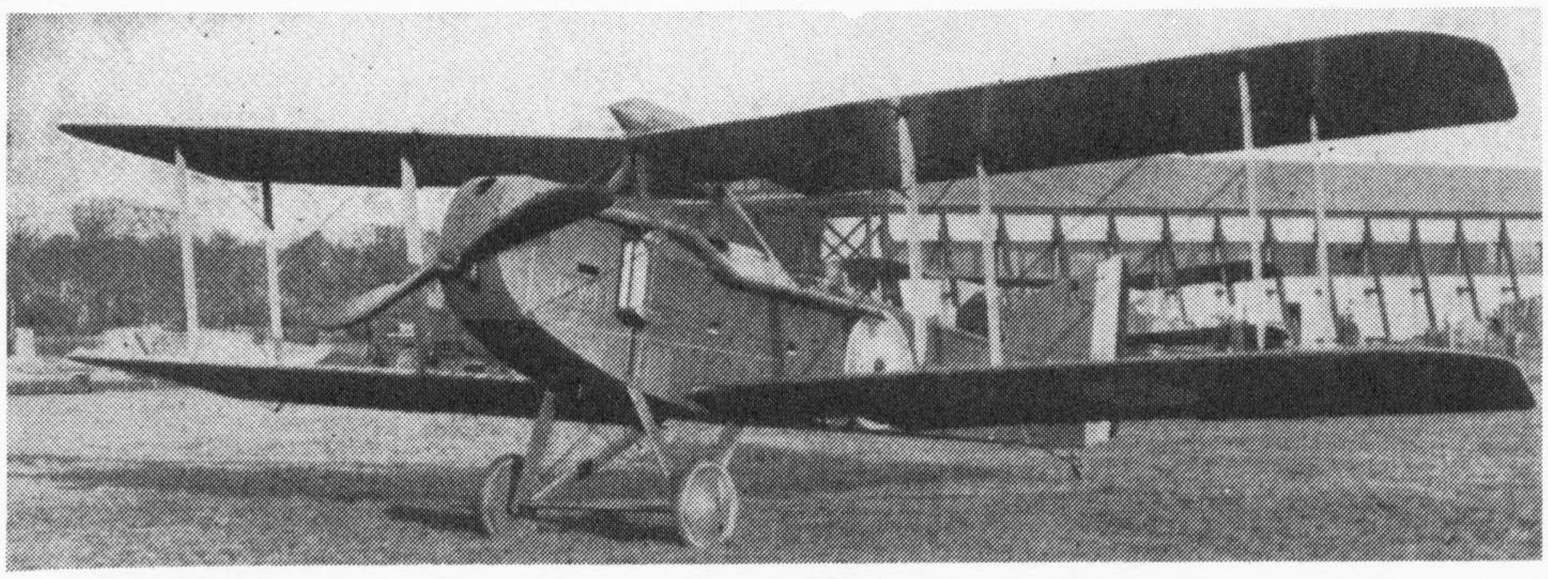
drawing by BJORN KARLSTROM

THE Armstrong-Whitworth F.K.8, designed by Mr. Frederick Koolhoven, was a heavier and an improved version of the F.K.3. It had a deeper fuselage, a slimmer type of undercarriage except that the central skid was cut short in front of the front V, and a 160-hp Beardmore engine. This machine was used to a large extent on various fronts of WW I for contact patrols, artillery spotting, light bombing, photography, and reconnaisance work up to the signing of the Armistice.

About halfway through its active service life, the F.K.8 was slightly modified by having a V-type undercarriage fitted (at first from Bristol fighters, and when the stock ran low, from B.E.2c's, finally from Armstrong-Whitworth), and smaller radiators of improved efficiency installed. A long exhaust pipe was also added to carry the exhaust fumes well clear of the crew.

None survive. □

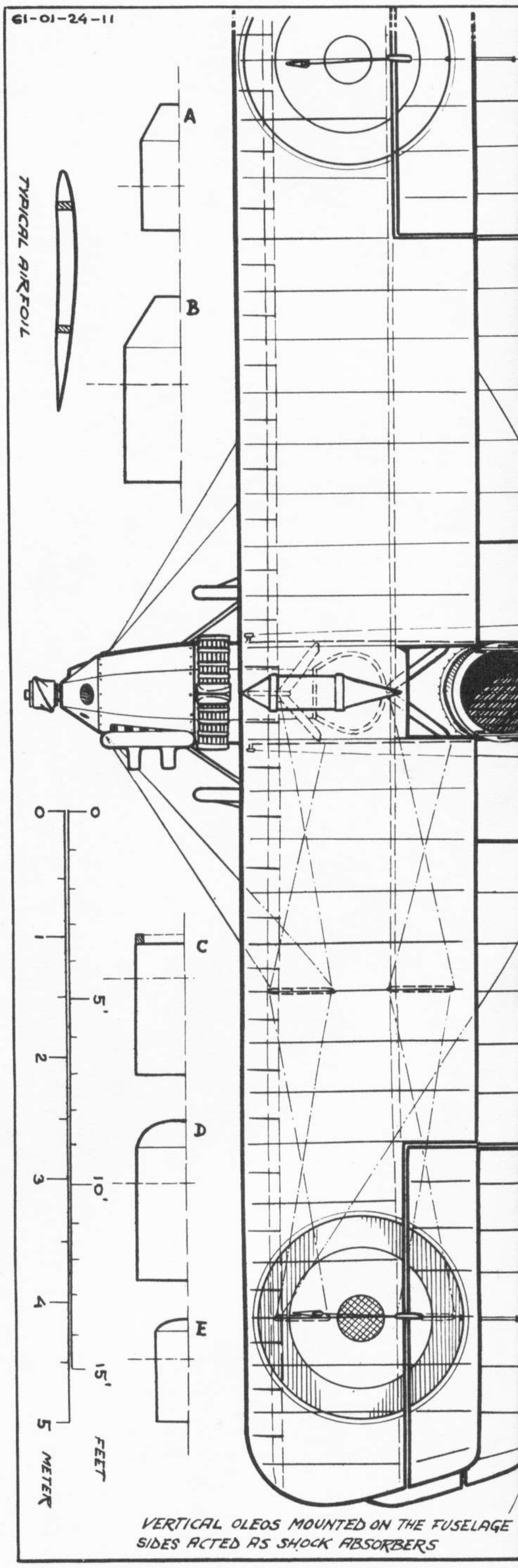




With 120-hp Beardmore engine, the F.K.8 had a top speed of 85 mph. Developed by the British, this aircraft served notably throughout WW I. "Jane's All the World's Aircraft" photos.

Specification.

Type of machine	.. .. ..	**Two-seater Biplane.**
Name or type No. of machine	..	**Armstrong-Whitworth F.K.3.**
Purpose for which intended	..	**Sport and Training.**
Span	.. ..	**40 ft.**
Overall length	.. .. ..	**28 ft. 8 in.**
Maximum height	.. .. ..	**10 ft. 2½ in.**
Engine type and h.p.	.. ..	**90 h.p. R.A.F.**
Weight of machine empty	..	**1,900 lbs.**
Tank capacity in hours	.. ..	**3½ hours.**
Performance.		
Speed at 1,000 feet	.. ..	85 m.p.h.
Landing speed	.. .. ..	38 m.p.h.
Climb.		
To 10,000 feet in minutes	..	23 minutes.



orth F.K.8

PITOT
(SEE SIDE VIEW)

POWER PLANT:

ONE 120-HP BEARDMORE,
6-CYL. WATERCOOLED VERTICAL
IN-LINE ENGINE.
LATER AIRCRAFTS HAD A VARIETY
OF ENGINE INSTALLATIONS, BUT THE
160-HP BEARDMORE (ENLARGED MODEL
OF THE 120-HP) GAVE BEST ALL-ROUND
PRESTANDA.

L.G LEG
OLEO
"RUNNERS"
NOT TO SCALE
SCARFF RING FOR LEWIS M.G.

DETAIL OF THE 160-HP VERSION. RADIATORS, EXHAUST AND LANDING GEAR AS ON VERY LATE MODELS. THE 160-HP MODEL COULD LOOK AS THE MAIN DRAWING EXCEPT THE NEW COWLING.

ELEVATOR CABLES

COLORSCHEME:

FUSELAGE ALL KHAKI-GREEN
MOTOR COWL AND TOP DECKING AFT
TO REAR COCKPIT BLACK.
WINGS AND TAILPLANE KHAKI-GREEN
ON UPPER SIDES -- UNDERSIDES CLEAR
DOPED LINEN FABRIC (A PALE CREAM SHADE).
ALL STRUTS KHAKI-GREEN OR FRENCH GREY.

EXHAUST COLLECTOR WITH TWO STUBS.

RIGGING AS ON MAIN DRAWING

TOP VIEW OF RADIATOR

GRAVITY TANK
AW HAMMERED ON COWL.
PITOT HEAD
RADIATOR
LEWIS M.G.
WHITE FIGURES
A-2725
LIFT HERE
SHOCK TRAVEL
BLUE WHITE RED
WHITE SQUADRON AND "LIFT HERE" MARKINGS
(Nº 2 SQ - JUNE 1917 MAR. 1918)
BLUE WHITE RED
A B C D E

W.W. - 1
ARMSTRONG WHITWORTH F.K.8 1916 1918
SCALE: 1:72
DRAWN BY: BJÖRN KARLSTRÖM

Bleriot XI

drawing by WILLIAM WYLAM

ONE of the epic flights of aviation history, probably equal in importance and impact to Lindbergh's flight, was Louis Bleriot's 22-mile flight across the English Channel in 1909. With this amazing feat, the French pioneer created a worldwide sensation and focused the attention of all civilization on the potential use of the airplane as a transportation vehicle.

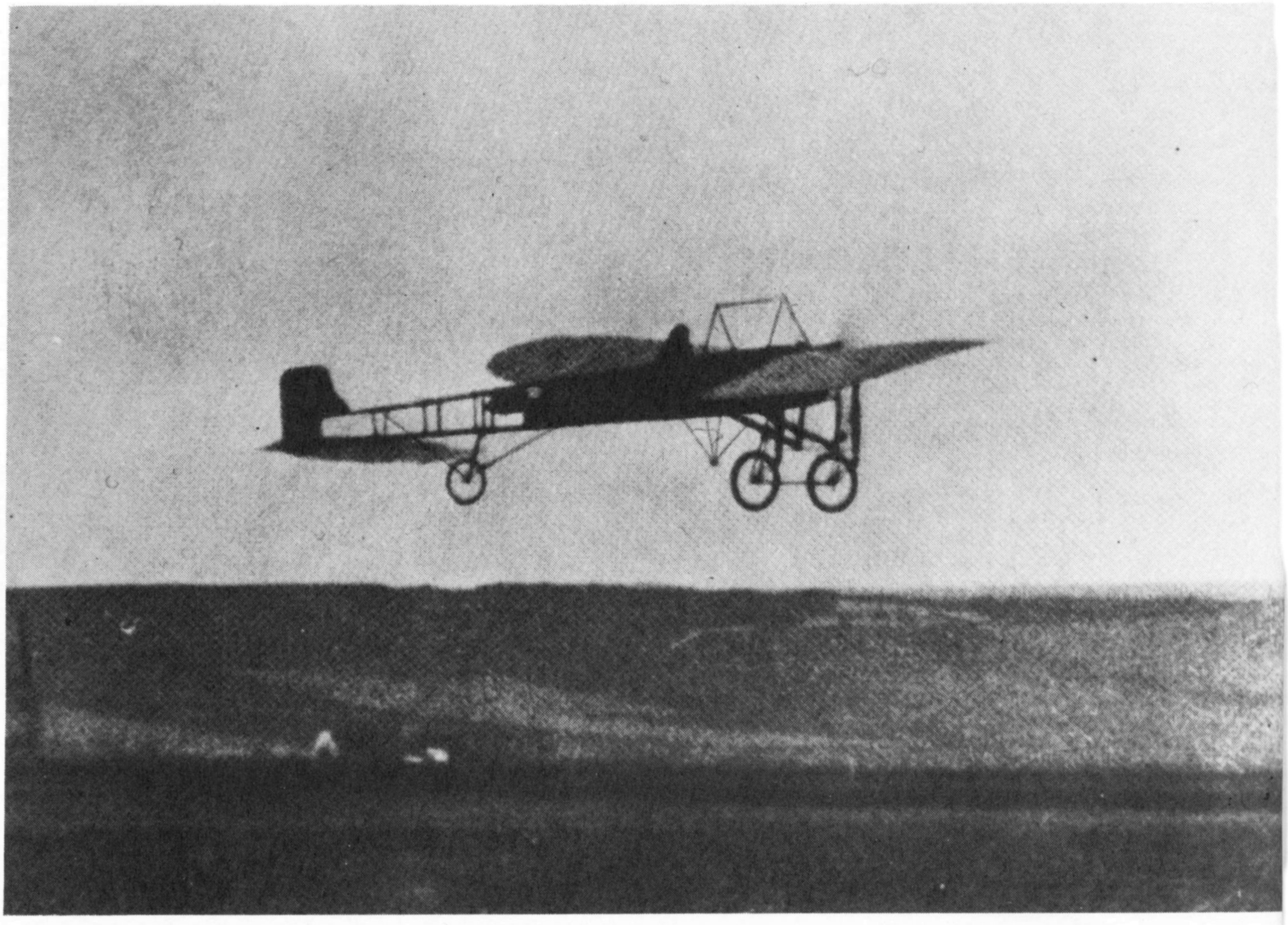
The Bleriot XI was small and weighed only 660 pounds. Power was a three-cylinder Y-type Anzani air-cooled engine that developed about 20 hp. The airframe was wood, with rubberized fabric covering. Lateral control was attained by warping the wings.

Sparked by an award of $5,000 by the *London Daily Mail* for the first flight across the Channel, Bleriot was challenged for the award by Hubert Latham, a famous record-smashing pilot of that period. On Sunday, July 25, 1909, Louis Bleriot landed his plane near Dover Castle, England, after crossing the Channel in less than one hour, a feat which garnered him over $15,000 in prize money.

Many variants of the XI design were built by the Bleriot firm, including parasols and two-seaters. The photograph and Wylam's drawing show the aircraft Bleriot used to fly the Channel. Note the inflated bladder inside the fuselage.

Many Bleriot XIs are still around, in museums or privately owned. □

An extremely rare photograph, this shot taken as Bleriot commenced his journey into history crossing the English Channel on Sunday, July 25, 1909. Air Age file photo.



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

SCALE: 1/4" = 1'-0"

DATE:

DRAWN BY ... W. A. WYLAM

General Arrangement
Bleriot "Channel Crosser" 1909

V

MAIN FUEL TANK

DOUBLE PULLEYS "W"

WARPING WIRES

FIXED SEAT SUPPORT

FUEL LINE

RUDDER CONTROL CABLES

ELEVATOR CONTROL CABLES

FIXED TAIL WHEEL FORKS

AUX. FUEL TANK (OPTIONAL)

FABRIC

STRUT "X"

CLAMP "Y"

DOUBLE PULLEYS "Z"

ELEVATOR

FIXED STABILIZER

STABILIZER ADJUSTMENT

20" DIA. × 2" TAIL WHEEL

28" DIA. × 2" WHEEL

FIXED HANDWHEEL

DOUBLE "CLOCHE" (BELLS)

ELEVATOR TORQUE TUBE

TORQUE TUBE HOUSING

FRONT VIEW

SIDE VIEW

PIVOT

ELEVATOR CONTROL CABLES

THE HANDWHEEL DID NOT TURN; IT WAS FIXED TO THE SHAFT. HANDWHEEL WAS PUSHED FORWARDS; PULLED BACKWARDS; OR SIDEWARDS FOR FLIGHT CONTROL.

PULLEYS "Z"

WARPING WIRES

RUDDER

ELEVATOR

PULLEYS "W"

REAR SPAR HINGE

WARPING BALANCE WIRES

WARPING WIRES

FLEXIBLE REAR SPAR

RUDDER BAR

PULLEYS "Z"

FLIGHT CONTROL DETAILS

FROM AIRPLANE ℄ TO OUTER SURFACE

THE TAILWHEEL WAS STEERABLE; BUT WITH THE ADDITION OF AUX. FUEL TANK, THE WHEEL FORK WAS BRACED.

PULLEYS "W"

STEEL TUBING

REAR SPAR (HINGE POST)

STEEL TUBE (FRONT SPAR)

STEEL TUBING

STRUT "X"

SHOCK TRAVEL

STEEL TUBING

FIXED CLAMP

SLIDING COLLAR

FIXED CLAMP

TYPICAL BLERIOT DETAILS

ELEVATOR CONTROL CABLES

RUDDER CONTROL CABLES

WARPING WIRES CONNECTIONS

STRINGER

FLEXIBLE REAR SPAR

STRINGER

STRINGER

RIGID FRONT SPAR

FLEXIBLE COMPRESSION TUBE

METAL SHEET

UNIVERSAL JOINT

CLAMP "Y"

RIB SPACINGS

REAR SPAR HINGE

FLEXIBLE STRUT JOINTS

ANZANI "FAN TYPE" AIR COOLED THREE CYLINDERS - 24.5 H.P. WAS USED ON THE CHANNEL FLIGHT.

STEEL TUBE - FRONT SPAR MOUNT

ANTI-SH'MMY SHOCKSPRING

NATURAL VARNISH FINISH

WARPING BALANCE WIRES

WARPING WIRES

RIGID FRONT SPAR BRACING ($\frac{1}{8}$" × $\frac{3}{4}$" STEEL TAPE)

DIHEDRAL

LEADING EDGE

TRUE CHORD

SHOCKSPRING

CLAMP "Y"

UNIVERSAL JOINT

TREAD

TYPICAL BLERIOT AIRFOIL

PROJECTED CHORD

INCIDENCE

HORIZONTAL THRUST

TYPICAL BLERIOT* RIB

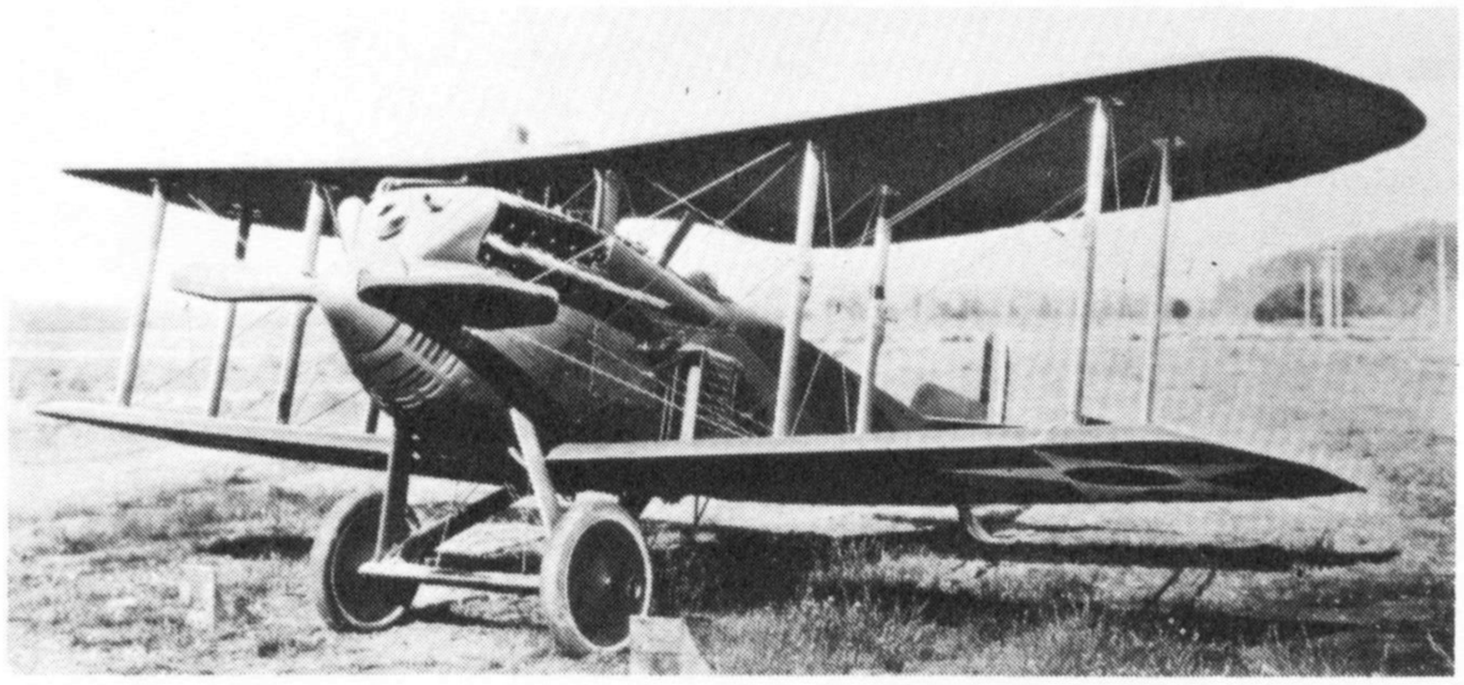
* PRONOUNCED BLÄ'RYŌ'

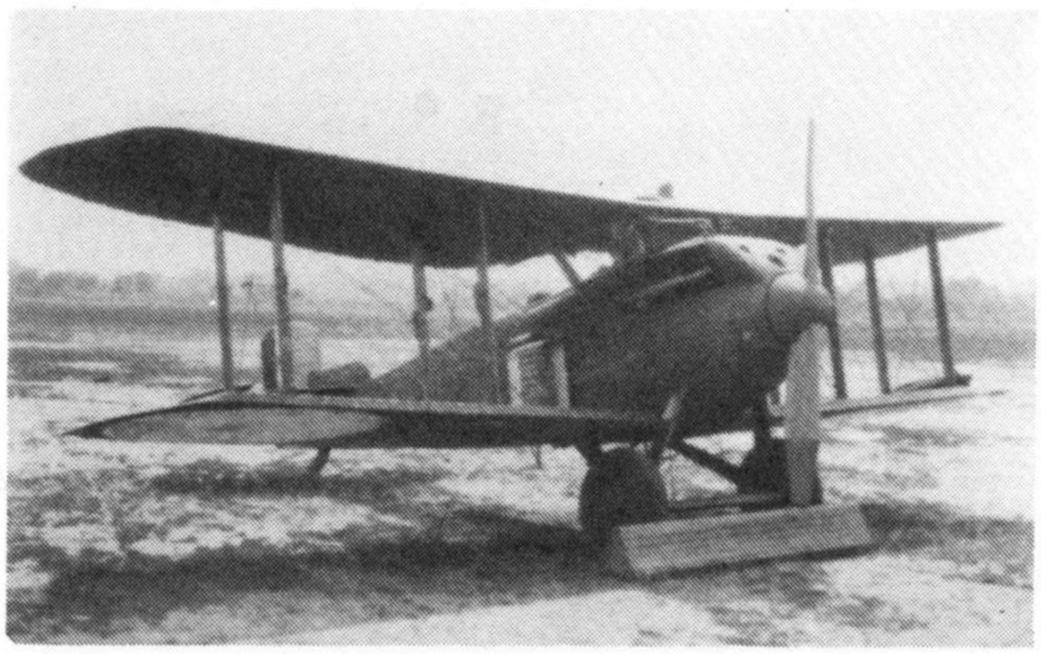
Boeing MB-3A

drawing by JOSEPH NIETO

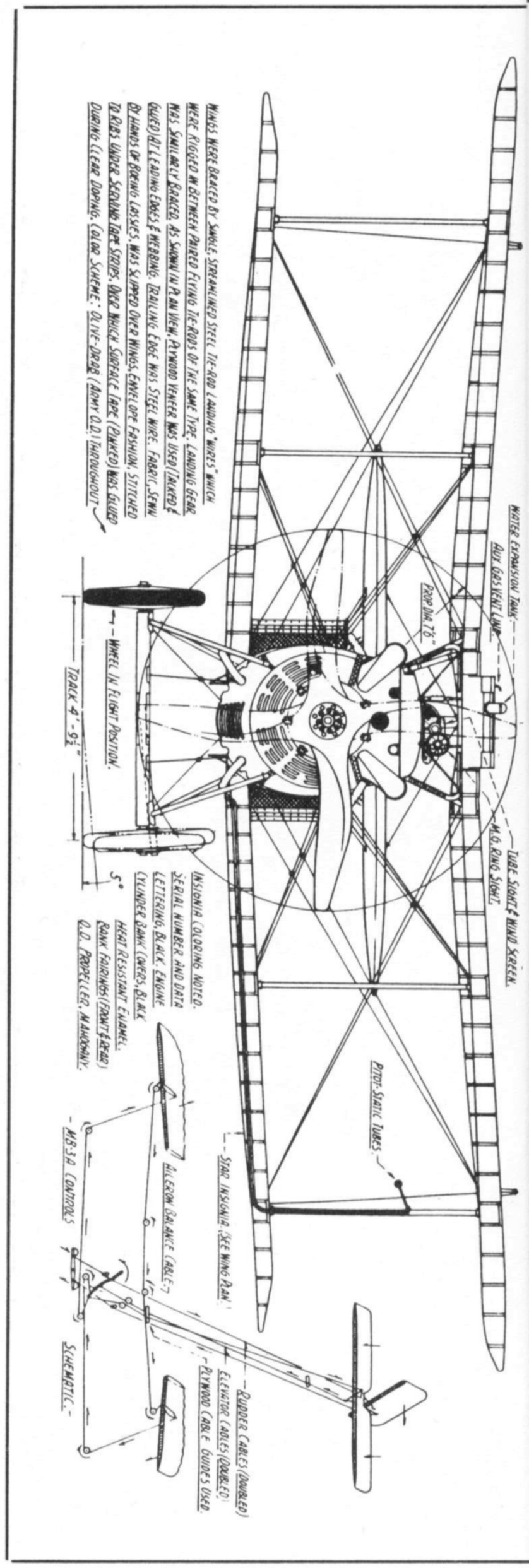
"IF THE WAR had lasted..." That was a common speculation among aircraft engineers and enthusiasts following the Armistice of WW I. Of course, no sane person of the period was genuinely in favor of continuing the European holocaust, but there was, after the fracas was all over, a somewhat nostalgic—and disappointed—feeling that swept over the American aircraft industry. The Thomas Morse Aircraft Co. had but one thing in mind with the MB-3: to equal, and possibly outperform any European plane of the same type. Designed in 1918, and not flown until February 1919, it was too late to see service in the war.

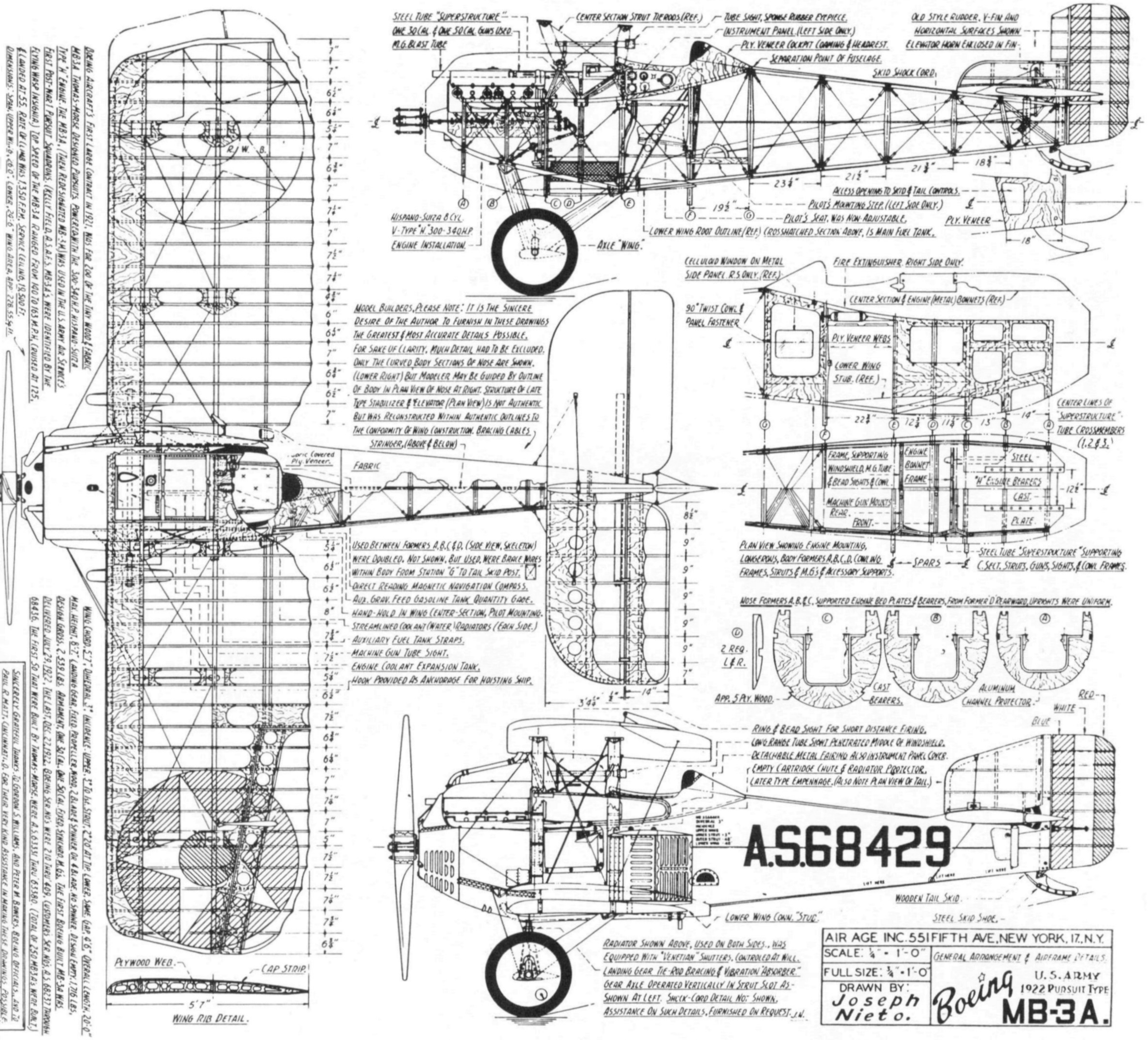
Boeing was contracted, along with Thomas Morse, to build the Thomas Morse design and the versions produced by Boeing were the MB-3A, which featured modifications to the control surfaces and empennage, among other changes to cowling and engine. The result was an airplane that, in its time, was equal to or better than anything in the air. Serving up until 1929, the MB-3A established Boeing as a quality craft builder at a time when the aviation business was really tough. □





Top photo, "Pedigree of Champions, Boeing Since 1916." Left photo, "Chronicle of Aviation History in America."





BOEING AIRCRAFT'S FIRST LARGE CONTRACT IN 1921, WAS FOR 200 OF THE TINY WOOD & FABRIC MB3A THOMAS-MORSE DESIGNED PURSUITS POWERED WITH THE 300-340 H.P. HISPANO-SUIZA TYPE "H" ENGINE. THE MB3A, (THEN REDESIGNATED MB-3M) WAS USED IN THE U.S. ARMY AIR SERVICE'S FIRST POST-WAR I PURSUIT SQUADRONS, (KELLY FIELD, R.S.A.F.S. MB-3A'S WERE IDENTIFIED BY THE FLYING WASP INSIGNIA.) TOP SPEED OF THE MB-3A RANGED FROM 140 TO 163 M.P.H. (CRUISED AT 125.) LANDED AT 55. RATE OF CLIMB WAS 1,350 F.P.M. SERVICE CEILING 19,500 FT.

DIMENSIONS: SPAN, UPPER WING, 30'-0". LOWER, 22'-0". WING AREA, APP. 278.55 SQ. FT.

WING CHORD 5'-7". QUINCE RAIL 3". INCIDENCE: UPPER, 3° TO 1½. STRUT, 2°20' AT TIP. LOWER, SAME. GAP 6'-8". OVERALL LENGTH, 20'-0". MAX. HEIGHT, 8'-2". LANDING GEAR, FIXED. PROPELLER, WOOD, 2 BLADE & SPINNER OR 4 BLADE, NO SPINNER. (SHOWN EMPTY) 1,716 LBS. DESIGN GROSS, 2,539 LBS. ARMAMENT, ONE 30 CAL. GUN SYNCHRO M.G.'S. ONE 50 CAL. FIXED SYNCHRO M.G.'S. THE FIRST BOEING BUILT MB-3A WAS DELIVERED JULY 29, 1922. THE LAST, DEC. 27, 1922. BOEING SER. NOS. WERE 210 THRU 409, CUSTOMERS SER. NOS. A.S. 68237 THROUGH 68416. THE FIRST 50 THAT WERE BUILT BY THOMAS-MORSE, WERE A.S. 63351 THRU 63580. (TOTAL OF 250 MB3A'S WERE BUILT.)

SINCERELY GRATEFUL THANKS TO GORDON S. WILLIAMS, AND PETER M. BOWERS, BOEING OFFICIALS, AND TO PAUL R. MATT, CINCINNATI, O. FOR THEIR VERY KIND ASSISTANCE IN MAKING THESE DRAWINGS POSSIBLE.

MODEL BUILDERS, PLEASE NOTE: IT IS THE SINCERE DESIRE OF THE AUTHOR TO FURNISH IN THESE DRAWINGS THE GREATEST & MOST ACCURATE DETAILS POSSIBLE. FOR SAKE OF CLARITY, MUCH DETAIL HAD TO BE EXCLUDED. ONLY THE CURVED BODY SECTIONS OF NOSE ARE SHOWN. (LOWER RIGHT) BUT MODELER MAY BE GUIDED BY OUTLINE OF BODY IN PLAN VIEW OF NOSE AT RIGHT. STRUCTURE OF LATE TYPE STABILIZER & ELEVATOR (PLAN VIEW) IS NOT AUTHENTIC BUT WAS RECONSTRUCTED WITHIN AUTHENTIC OUTLINES TO THE CONFORMITY OF WING CONSTRUCTION. BRACING CABLES, STRINGER, (ABOVE & BELOW)

FABRIC

USED BETWEEN FORMERS A.B.C & D. (SIDE VIEW, SKELETON) WERE DOUBLED. NOT SHOWN, BUT USED, WERE BRACE WIRES WITHIN BODY FROM STATION "G" TO TAIL SKID POST.

DIRECT READING MAGNETIC NAVIGATION COMPASS.

AUX. GRAV. FEED GASOLINE TANK QUANTITY GAGE.

HAND-HOLD IN WING (CENTER-SECTION, PILOT MOUNTING.

STREAMLINED COOLANT (WATER) RADIATORS (EACH SIDE.)

AUXILIARY FUEL TANK STRAPS.

MACHINE GUN TUBE SIGHT.

ENGINE COOLANT EXPANSION TANK.

HOOK PROVIDED AS ANCHORAGE FOR HOISTING SHIP.

Fabric Covered Ply. Veneer.

PLYWOOD WEB.

CAP STRIP.

5'-7"

WING RIB DETAIL.

Bristol F.2B

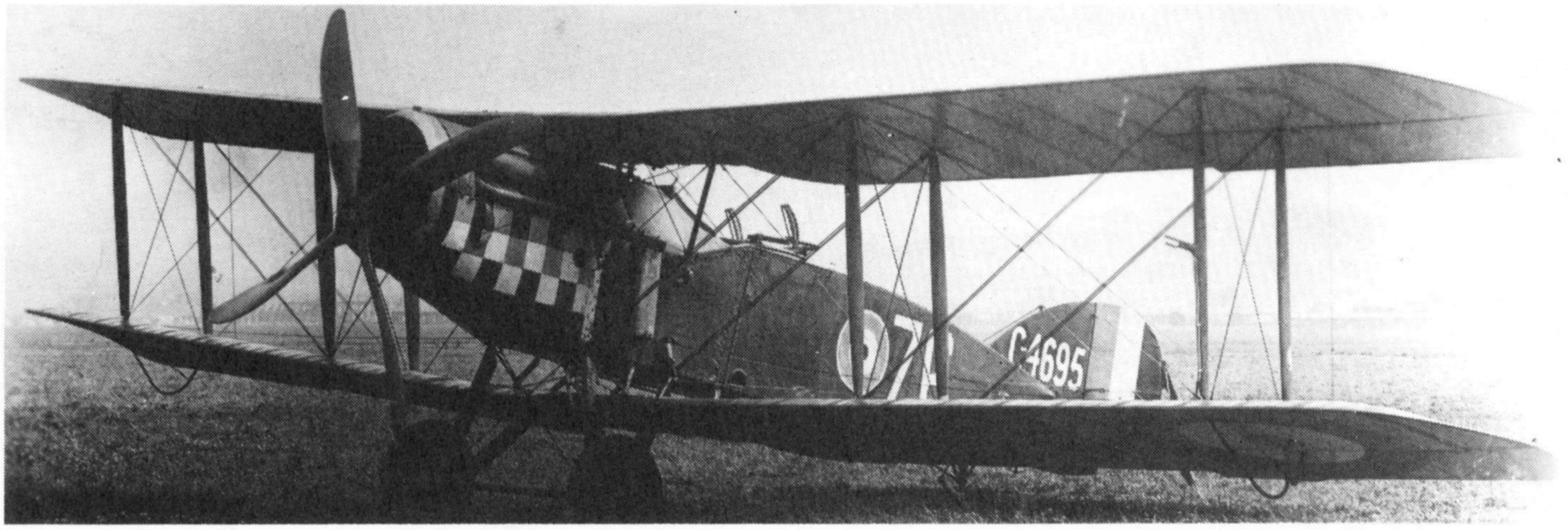
drawings by WILLIAM WYLAM

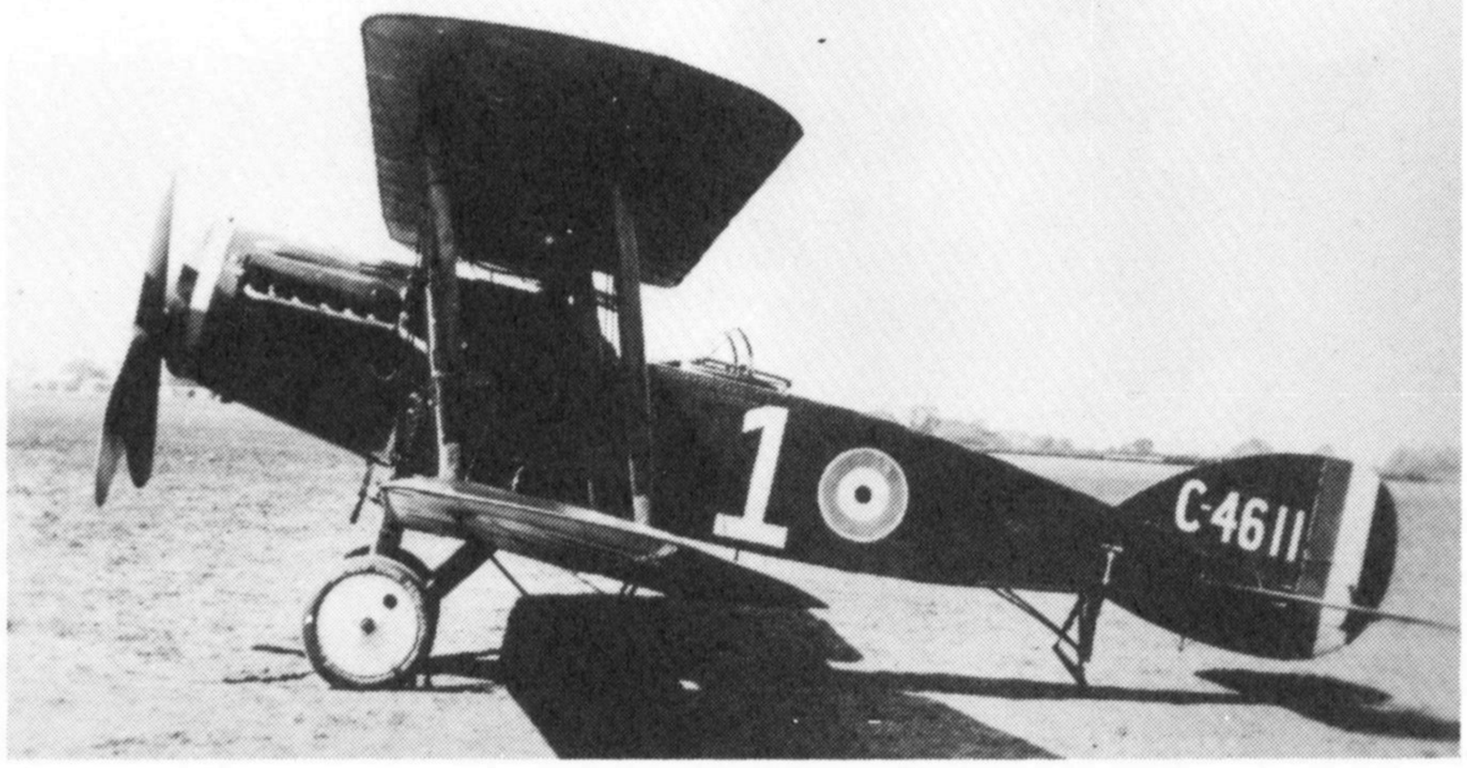
AN OUTSTANDING success in every role it was to play in WW I, the Bristol fighter, affectionately known as the "Brisfit," was described as a "pilot's airplane" by all accounts on file with the British Air Ministry. But its first appearance over the Front—six F.2A's—ended with four of them shot down, because their pilots had not yet learned to fly them like fighters instead of observation planes. When they did learn, in the middle of 1917, the Fighter began to replace the then-staged S.E.5. It didn't take long for stories about the F.2B's fighting ability to get around. A two-place airplane, the F.2B was a departure from pilots' prior experience and the acceptance of it was initially slow. The training methods, however, stressed the remarkable features of the airplane itself and the pilot-observer teamwork necessary to obtain the greatest possible effect. The result was to fulfill a specific function—fighting in the air.

The engine selection varied from 190 to 280 hp, depending on the job expected of the plane and its date of manufacture. Radiators were fitted accordingly and differed in shape and size. The F-2B was probably the only two-seater built during WW I that handled like a single-seater. It was maneuverable and as fast as the Fokker D.VII. These features made it possible for pilots such as Capt. Andrew McKeever to gain 23 of his 30 victories. And McKeever had only one eye!

As many as ten F.2B's survive, all in England; two of them in museums, the rest fragments being restored.

Wylam's drawings of the F.2B are among his most beautiful and least accurate. Modelers should check especially carefully against good photographs the shape of the oval radiator, the tapering rear fuselage, vertical tail, and underline of engine cowling. □





The highly successful British Bristol Brisfit was very maneuverable and as fast as the Fokker D.VII. Air Age file photos.

NOTE: "F-2A" AND EARLY "F-2B" MODELS WING SPAN WERE 39'-5". THIS WAS DUE TO DECREASE OF GAPS AT POINT "Z".

39'-4"

19'-8"

17'-6½"

4'-3"

2'-1½"

1'-8⅜"

BRASS RADIATOR SHELL
SHUTTER CONTROL HOUSING
STEEL CONTROLABLE SHUTTERS
AIR INTAKE - OIL COOLER

FLUTED CHANNEL - WATER TUBING CLEARANCE
RIVETED HEAD COWL

+3° DIHEDRAL

SINGLE LANDING WIRES

GUN SIGHT ℄

M.G. ℄

7¾"

1'-10½"

5'-5" GAP

DOUBLE FLYING WIRES

+3° DIHEDRAL

"Z"

"Z"

6½"

8"

2'-6" DIA.

5'-8" TREAD

9'-8" DIA. - 4 BLADED PROPELLER

FALSE RIB
NOSE SPAR
ALUMINUM CAP
AIRSPEED HEAD
¼" BRASS TUBING

BRASS SHEATHED LEADING EDGES
MAHOGANY LAMINATED PROPELLER
EXHAUST MANIFOLD
SHOCK CORD LOOP
RUBBER SHOCK CORD
FIXED SIDE STRUTS
FIXED SPREADERS - 1" O.D. STEEL TUBING
STREAMLINE HOUSING - AXLE

2" TO 4"

WING SKID - 1" O.D. STEEL TUB
AILERON CONTROL HORN

COLOR SCHEME:

FUSELAGE & VERTICAL FINS	KHAKI
WINGS & HORIZON'L. STABILIZERS	BUFF
ENGINE & FUSELAGE COWLS	SILVER OR KHAKI
LANDING GEAR, PROPELLER, STRUTS	DULL BLACK
WING STRUTS, FUSELAGE FRAME W'K.	NATURAL VARNISH

MODEL "F-2B" WITH HISPANO-SUIZA-200 H.P. MODEL "E" ENGINE →

M.G. ℄

1'-10½"

1'-8¼"

¾"

AIR INTAKE

ENGINE MOUNT

"F-2A" 12" "F-2B" (H.S.)

HEADER TANK

BLAST TUBE - 2¼" O.D.

25-9"

3½"

2"

10"

WATER VALVE ACCESS

VICKERS MACHINE GUN - 30 CAL

AMMUNITION TRAY

EMPTY SHELL CHUTE

COWL FASTENERS

CUTOUT FOR STRUTS

SNAP FASTENERS

EXHAUST STACK

TUBULAR ENGINE MOUNT

OIL DRAIN

WATER DRAIN

BOTTOM VIEW (F2B WITH H.S.)

MODEL "F-2B" WITH ROLLS-ROYCE "FALCON III" ENGINE

25'-9" ALSO 26'-2" (HIGH ALTITUDE MODEL)

5½"

3½"

3'-9½" ALSO 4'-2½"

HAMMERED AIR INTAKE
EMPTY SHELL CHUTE

FLUTED CHANNEL
RIVETED COWL
SNAP FASTENERS

1'-7½"

7"

AILERON CONTROL HORN
FLEXIBLE WINDSHIELD
LEATHER CRASH PAD
TELESCOPING FOOT STEP
LACING

BEAD & RING SIGHT (OPTIONAL)
AMMUNITION DRUM
SINGLE OR TWIN LEWIS M.G.
GUN ADAPTER CLAMPS

RED
WHITE
BLUE
YELLOW

DOUBLE RUDDER CONTROL CABLES
DOUBLE ELEVATOR CONTROL CABLES
ADJUSTING GUY-WIRE POST
BLACK REGISTRATION NUMBERS

4'-1½"

2'-0"

5"

1'-11½"

J 8586

3'-1"

1'-3½"

OPTIONAL CUTOUTS

CARBURETOR AIR INTAKE
ROLLS-ROYCE "FALCON III"

EMPTY SHELL CHUTE

MODEL "F-2A" WITH ROLLS-ROYCE "FALCON I"

RECESSED AREA

FUEL TANK ACCESS

6"

TUBULAR ENGINE MOUNT (ENDS)
UNCOVERED CENTER SECTION
EXHAUST MANIFOLD UNION
WATER DRAIN VALVES ACCESS
OIL DRAIN VALVE ACCESS

STEEL TUBING

AIR INTAKE - OIL COOLER
STAMPED COOLING LOUVERS
FUEL TANK ACCESS HOLE
OPTIONAL COOLING AIR OUTLETS

5'-6"

ROTATABLE SCARFF RING
ADJUSTABLE GUN MOUNT
EXHAUST MANIFOLD - 3⅝" O.D. TUBING
FOOT PLATE
AILERON GAP WIRE
EXHAUST MANIFOLD SUPPORT
AILERON HORN BRACE WIRE
ELEVATOR CONTROL HORN
AILERON CONTROL CABLE
WING SKID
STEEL TUBING - ¾" O. DIA.
TAIL SKID - HICKORY
TAIL SKID SHOE - STEEL PLATE
STEEL TUBING, WOOD FAIRED

2'-6¾"

FIXED BRACE WIRES
STABILIZER ADJUSTOR'S BELL CRANK
WHITE REGISTRATION NUMBERS

6'-0½"

3"

SHOCK TRAVEL

10°

8" PROP'R. CLEARANCE

5'-10½"

WOODEN FAIRING - FABRIC COVERED
STEEL TUBING - 1½" O.D.A.
STREAMLINE HOUSING
SHOCK CORD LOOP
GROUND LINE - FULLY EXTENDED

2" DIA. HELICAL SPRING

(REAR VIEW)

BOTTOM VIEW

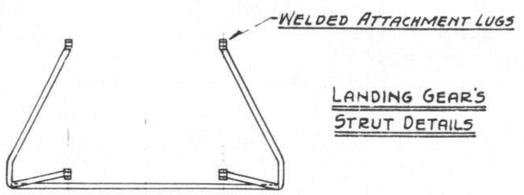
"F-2B" (R.R) SUMP COWL IS SIMILAR TO "F-2A" WITH CHANGES ON OIL COOLER'S AIR INTAKE & FUEL TANK'S ACCESS HOLES. ALL SUMP COWLS ARE REMOVABLE BY REMOVING MACHINE SCREWS ON INTERIOR.

AIR INTAKE
STAMPED COOLING LOUVERS
LANDING GEAR & FLYING WIRE LUGS

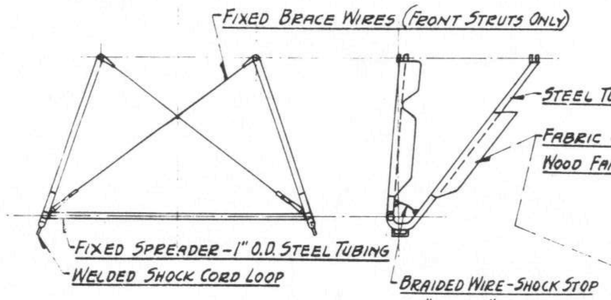
LOWER WING'S OUTER PANEL

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

SCALE: ¼" = 1'-0"	GENERAL ARRANGEMENTS
DATE:	BRISTOL "BRISFIT" FIGHTER
DRAWN BY ... W. A. WYLAM	F-2B



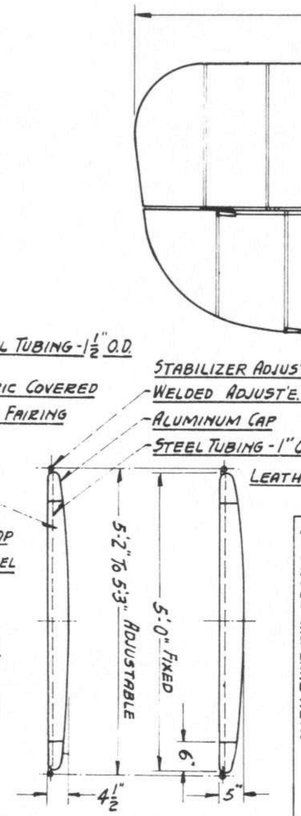
LANDING GEAR'S STRUT DETAILS



SECTION "A-A"

WHEEL & AXLE ASSEMBLY

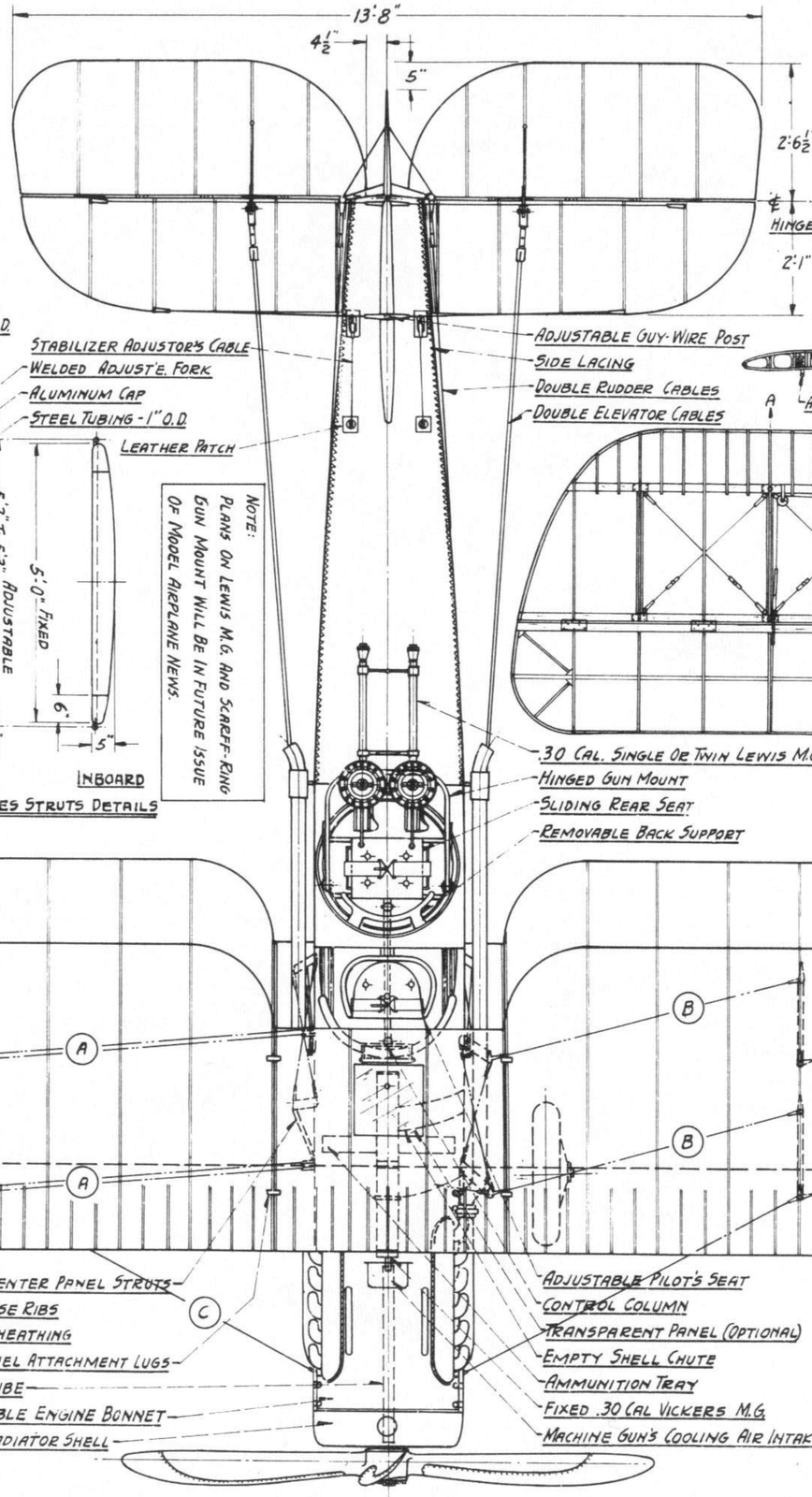
ENTIRE LANDING GEAR CHASSIS ASSEMBLY IS RIGIDLY ATTACHED TO FUSELAGE'S STRUCTURE. WHEEL & AXLE ASSEMBLY IS HELD TO CHASSIS BY RUBBER SHOCK CORD.

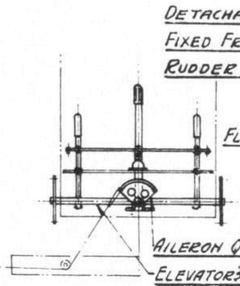


OUTBOARD INBOARD

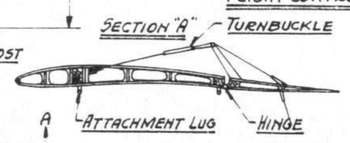
INTERPLANES STRUTS DETAILS

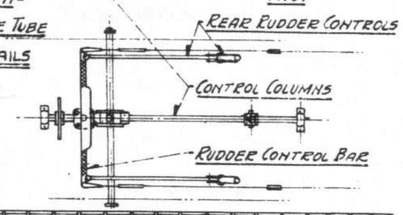
NOTE: PLANS ON LEWIS M.G. AND SCARFF-RING GUN MOUNT WILL BE IN FUTURE ISSUE OF MODEL AIRPLANE NEWS.

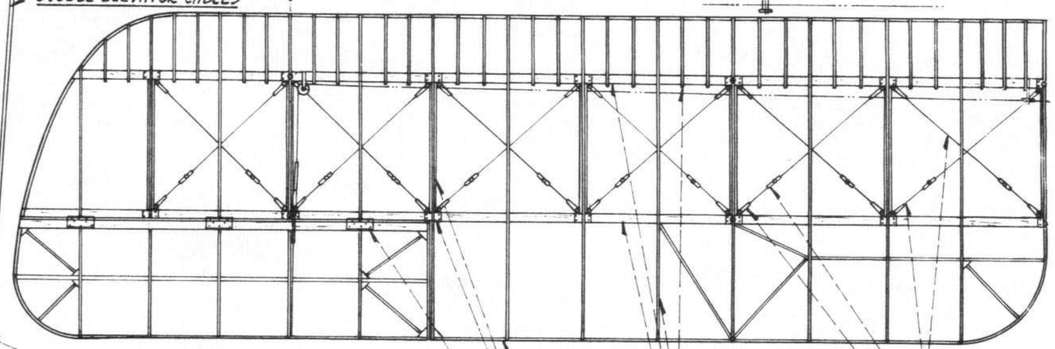


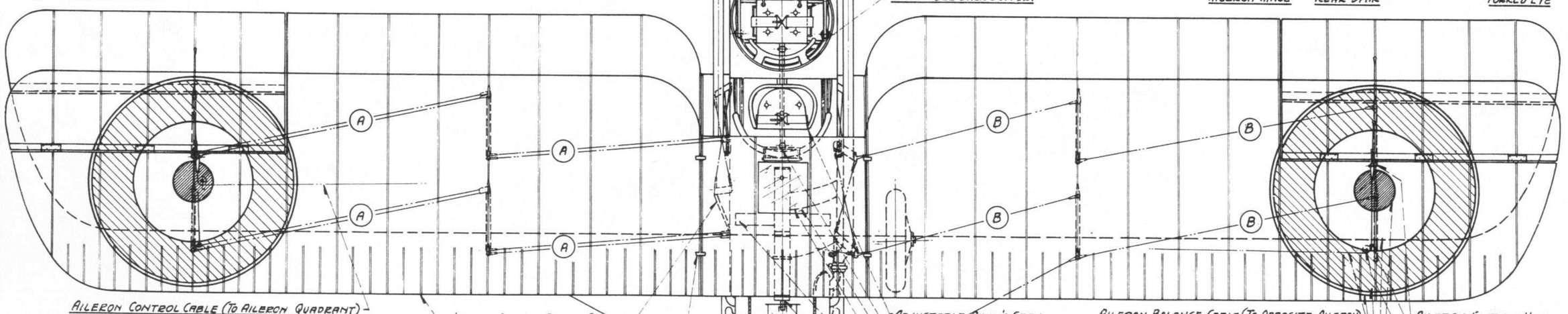


FLIGHT CONTROL DETAILS

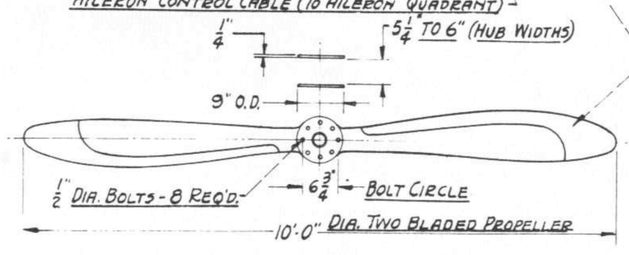








AILERON CONTROL CABLE (TO AILERON QUADRANT)



AILERON BALANCE CABLE (TO OPPOSITE AILERON)

YELLOW
BLUE
WHITE
RED

AILERON CONTROL HORN
AILERON BALANCE CABLE
AILERON CABLE PULLEY

AIR AGE INC., 551 FIFTH AVE., NEW YORK 17, N.Y.	
SCALE: ¼" = 1'-0"	GENERAL ARRANGEMENTS
DATE:	BRISTOL "BRISFIT" FIGHTER
DRAWN BY ... W. A. WYLAM	F-2B

F-2B

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

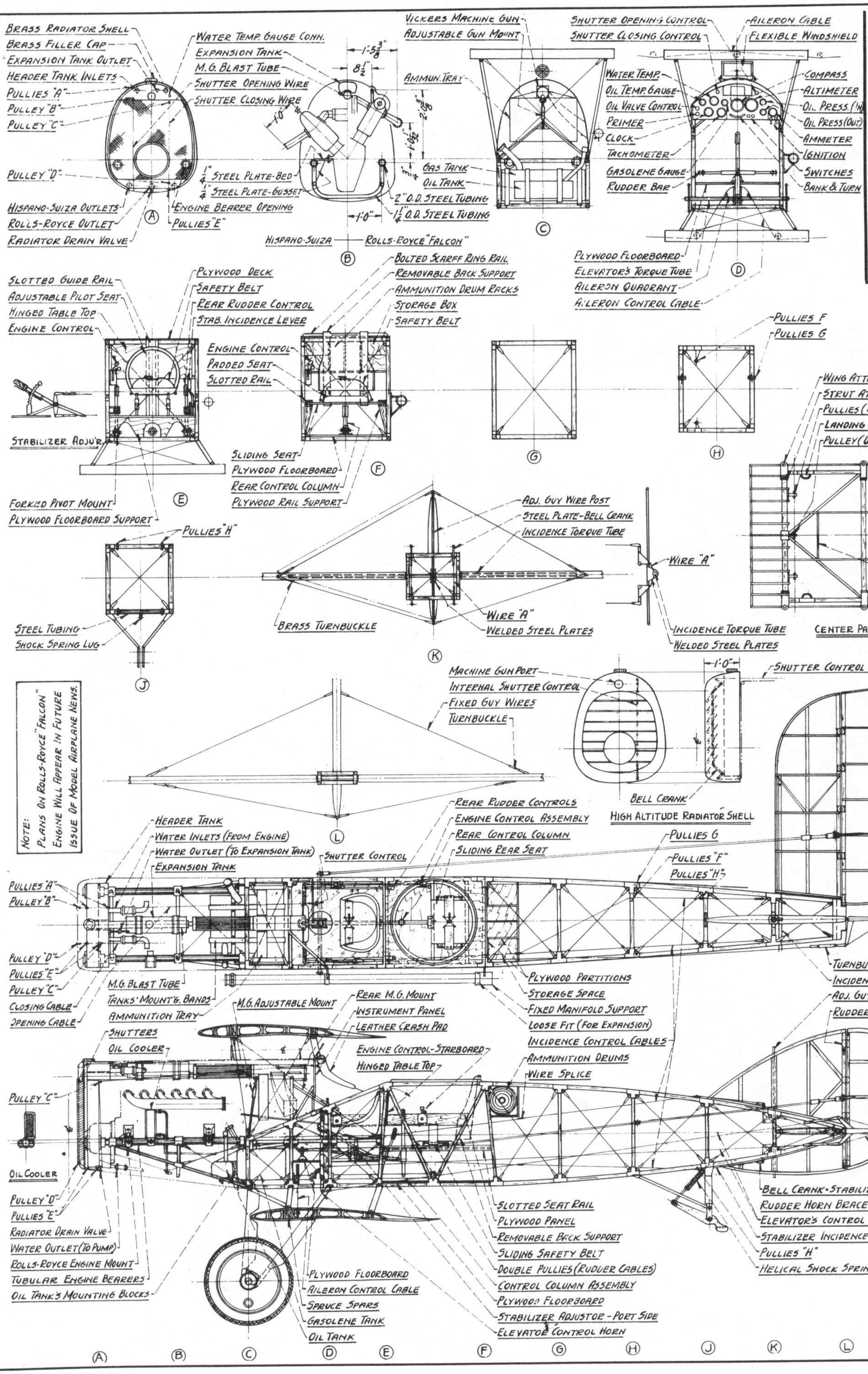
SCALE: 1/4" = 1'-0"

DATE:

DRAWN BY ... W. A. WYLAM

FUSELAGE DETAILS

BRISTOL "BRISFIT" FIGHTER



NOTE:
"F-2C" MODEL EMPLOYS 300 H.P. HISPANA-SUIZA MODEL "H." LENGTH OVERALL WAS 26'2" (HIGH ALTITUDE MODEL).

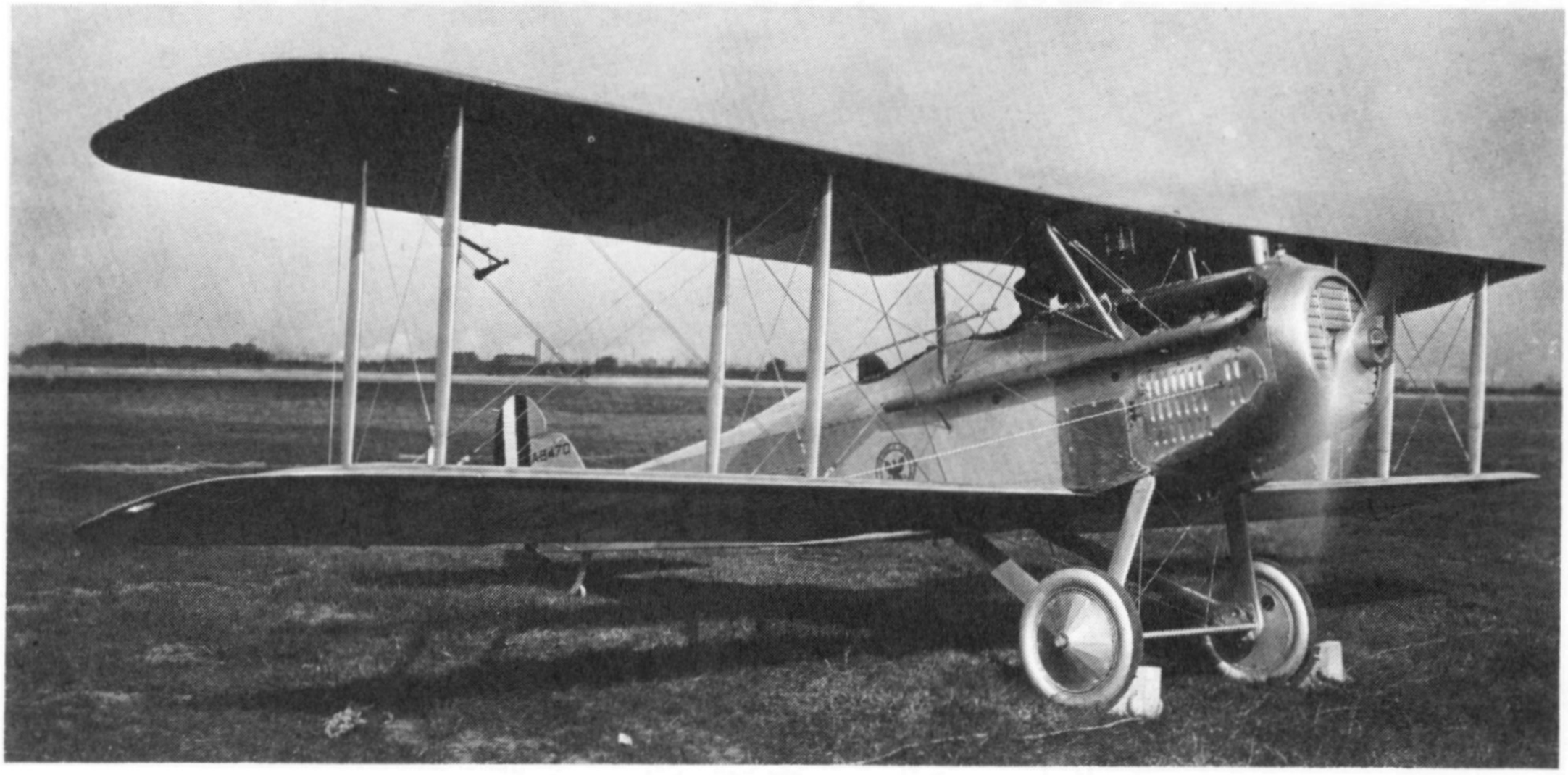
FUSELAGE STRUCTURE ℄
REAR SPAR ℄
FRONT SPAR ℄
EQUALLY SPACED FALSE RIBS
7 EQUALLY SPACED RIBS
DIHEDRAL
HORIZONTAL THRUST ℄
⅛" DIA. WIRES
WING CENTER STRUTS ℄
5'5" GAP
½" RAD. (TIP)
+1" INCIDENCE
STAGGER
"F-2A" IS 13'10" SPAN
"F-2A" IS 2'0" WIDTH
± 5° STABILIZER ADJUSTMENTS
HORIZONTAL STABILIZER PLAN
EXHAUST MANIFOLD "F-2C"
TUBULAR ENGINE MOUNT ℄
ENGINE BONNET LINE
TOP SIDE - FUSELAGE STRUCTURE
BOTTOM SIDE - FUSELAGE STRUCTURE
R.A.F. # 8 AIRFOIL ½" = 1'0"
PARALLEL WITH THRUST ℄
3" SQUARES
OPTIONAL TAIL SKID "F-2B" & "F-2C"
SECTION "A-A"
SECTION "B-B"
SECTION "C-C"
SECTION "D-D"
SECTION "E-E"
SECTION "F-F"

AIR AGE INC., 551 FIFTH AVE., NEW YORK 17, N.Y.	
SCALE: ¼" = 1'0"	GENERAL LAYOUT DATA
DATE:	BRISTOL "BRISFIT" FIGHTER
DRAWN BY ... W. A. WYLAM	F-2B

Chance Vought

drawings by WILLIS NYE

VE-7, VE-9, & UO-1



THE CHANCE-Vought VE-7 was designed as an entrant in the U.S. Army advanced trainer competition held in 1917, and the first experimental airplane was submitted for testing to Army authorities in 1918. The VE-7 won the competition and was ordered into production by the parent company and two licensees, the Springfield Aircraft Co. and the B.F. Sturtevant Co. Twenty VE-7's were delivered by the end of WW I, and in 1922 to 1923 twenty-seven VE-9 airplanes were procured by the U.S. Army Air Service.

The VE-9 was an improved version of the VE-7, and was the first American-designed ship-board airplane that could be launched from a catapult. The service time of this version was one of the longest of that era, spanning over 10 years, which gave credibility to the company that was to remain a main provider of aircraft for the U.S. armed forces for many years. □

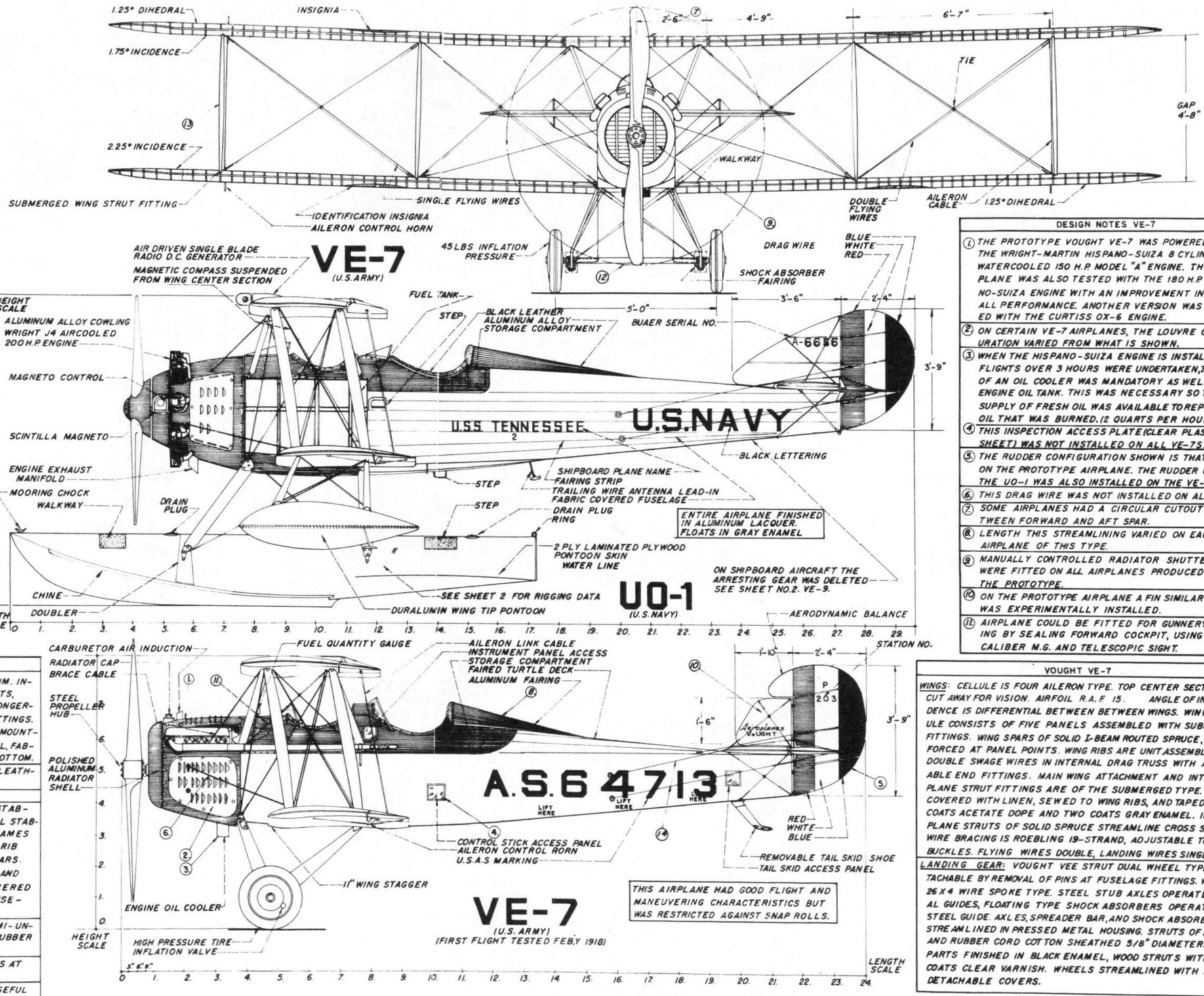
Their association with Naval aircraft design is legendary. Air Age file photos of VE-7.

VOUGHT VE-7
ENGINE INSTALLATION: WRIGHT-MARTIN HISPANO-SUIZA, MODEL "A," 150 H.P. WATERCOOLED ENGINE.
PROPELLER: LIBERTY, 2-BLADE, 8'-4" DIAMETER OF LAMINATED WALNUT. PITCH 5'-5½".
ENGINE EXHAUST MANIFOLD: TUBULAR WELDED SHEET SUPPORTED ON FORGED BRACKETS.
ENGINE STARTING: PILOT'S COCKPIT PROVIDED WITH BOOSTER MAGNETO AND LUNKENHEIMER FUEL PRIMER. ENGINE WAS HAND CRANKED.
ENGINE CONTROLS: EACH COCKPIT PROVIDED WITH THROTTLE, SPARK, AND FUEL MIXTURE LEVERS ON LEFT SIDE.
ENGINE RADIATOR: HONEYCOMB TYPE, 9½ GALLONS WATER SYSTEM CIRCULATION CAPACITY. DISTANCE TYPE TEMPERATURE INDICATOR. SHUTTERS MANUALLY CONTROLLABLE.
FUEL SYSTEM: TWO FUEL TANKS, MAIN UNDER REAR SEAT, AUXILIARY UNDER COWL BETWEEN ENGINE AND INSTRUMENT PANEL. FUEL CAPACITY 32 GALLONS. FUEL PUMPED TO CARBURETOR BY AN ENGINE-DRIVEN FUEL PUMP. HAND AIR PUMP FOR STARTING IN PILOT'S COCKPIT. FUEL SHUT-OFF VALVES IN EACH COCKPIT.
FLIGHT CONTROLS: DUAL JOYSTICKS AND RUDDER BARS IN EACH COCKPIT. CONTROLS ASSEMBLED AS A UNIT AND QUICKLY REMOVABLE.
INSTRUMENTS: CONSIST OF ALTIMETER, AIRSPEED INDICATOR, CLOCK, TACHOMETER, FUEL PRESSURE GAUGE, OIL PRESSURE GAUGE, WATER TEMPERATURE GAUGE, ETC.

DESIGN NOTES VE-7
(12) VARIOUS MAKES AND TYPES OF LAMINATED PROPELLERS WERE USED WITH VARIATIONS IN PITCH.
(13) INTERPLANE STRUTS OF CONSTANT OR VARIED STREAMLINE CROSS SECTION WERE USED.
(14) ENTIRE FLIGHT CONTROLS ARE CABLE ACTUATED. ALL CABLES ARE DOUBLE, FLEXIBLE TYPE.

THE AMERICAN VERSION OF THE HISPANO-SUIZA ENGINE WAS MANUFACTURED UNDER FOREIGN LICENSE BY THE SIMPLEX AUTOMOBILE COMPANY. THIS COMPANY WAS LATER ABSORBED BY THE WRIGHT-MARTIN AIRCRAFT COMPANY OF NEW BRUNSWICK, N.J., THE PARENT COMPANY OF THE PRESENT CURTISS-WRIGHT CORPORATION.

VOUGHT VE-7
FUSELAGE: ENGINE COWLS ARE PRESSED SHEET ALUMINUM. INSPECTION PLATES PROVIDED FOR ACCESS TO INSTRUMENTS, FLIGHT CONTROLS AND TAIL SKID. FRAME HAS SPRUCE LONGERONS AND STRUTS, STEEL CABLE BRACING, AND STEEL FITTINGS. RECTANGULAR CROSS SECTION. ENGINE SECTION IS DEMOUNTABLE AS A UNIT. ENGINE COWLINGS LIGHT BLUE ENAMEL, FABRIC GRAY ENAMEL. FUSELAGE TRUSS FAIRED TOP AND BOTTOM.
SEATING: EACH COCKPIT UPHOLSTERED WITH IMITATION LEATHER. PLYWOOD SEATS. LEATHER COCKPIT COAMING.
WINDSHIELDS: CLEAR REINFORCED PLASTIC SHEET.
EMPENNAGE: FIXED DOUBLE CAMBERED HORIZONTAL STABILIZER. ELEVATORS DUAL CONNECTED. FIXED VERTICAL STABILIZER. AERODYNAMICALLY BALANCED RUDDER. ALL FRAMES OF STEEL TUBES WELDED OR BRAZED TOGETHER, WOOD RIB FILLED OVER TUBULAR STEEL AND ROUTED SPRUCE SPARS. STRUCTURE INTERNALLY BRACED WITH SWAGED CABLES AND ADJUSTABLE STEEL FITTINGS. ENTIRE EMPENNAGE COVERED WITH APPROVED COTTON FABRIC, FINISHED TO MATCH FUSELAGE COVERING.
TAIL SKID: PATENTED VOUGHT DESIGN, FLOATING TYPE, SEMI-UNIVERSAL AND SELF-ALIGNING IN ACTION. FITTED WITH RUBBER SHOCK ABSORBERS AND RENEWABLE METAL SHOE.
FACTOR OF SAFETY: UNIFORM FACTOR OF SAFETY OF 9 PLUS AT HIGH INCIDENCE CONDITION IN STATIC TESTS.
WEIGHT (GROSS): 2,000 POUNDS INCLUDING 525 POUNDS USEFUL LOAD AND 78 POUNDS ENGINE COOLING WATER.



DESIGN NOTES VE-7
(1) THE PROTOTYPE VOUGHT VE-7 WAS POWERED WITH THE WRIGHT-MARTIN HISPANO-SUIZA 8 CYLINDER WATERCOOLED 150 H.P. MODEL "A" ENGINE. THE AIRPLANE WAS ALSO TESTED WITH THE 180 H.P. HISPANO-SUIZA ENGINE WITH AN IMPROVEMENT IN OVERALL PERFORMANCE. ANOTHER VERSION WAS POWERED WITH THE CURTISS OX-6 ENGINE.
(2) ON CERTAIN VE-7 AIRPLANES, THE LOUVRE CONFIGURATION VARIED FROM WHAT IS SHOWN.
(3) WHEN THE HISPANO-SUIZA ENGINE IS INSTALLED, IF FLIGHTS OVER 3 HOURS WERE UNDERTAKEN, THE USE OF AN OIL COOLER WAS MANDATORY AS WELL AS AN ENGINE OIL TANK. THIS WAS NECESSARY SO THAT A SUPPLY OF FRESH OIL WAS AVAILABLE TO REPLENISH OIL THAT WAS BURNED. (2 QUARTS PER HOUR)
(4) THIS INSPECTION ACCESS PLATE (CLEAR PLASTIC SHEET) WAS NOT INSTALLED ON ALL VE-7S.
(5) THE RUDDER CONFIGURATION SHOWN IS THAT USED ON THE PROTOTYPE AIRPLANE. THE RUDDER USED ON THE UO-1 WAS ALSO INSTALLED ON THE VE-7.
(6) THIS DRAG WIRE WAS NOT INSTALLED ON ALL VE-7S.
(7) SOME AIRPLANES HAD A CIRCULAR CUTOUT BETWEEN FORWARD AND AFT SPAR.
(8) LENGTH THIS STREAMLINING VARIED ON EACH AIRPLANE OF THIS TYPE.
(9) MANUALLY CONTROLLED RADIATOR SHUTTERS WERE FITTED ON ALL AIRPLANES PRODUCED AFTER THE PROTOTYPE.
(10) ON THE PROTOTYPE AIRPLANE A FIN SIMILAR TO UO-1 WAS EXPERIMENTALLY INSTALLED.
(11) AIRPLANE COULD BE FITTED FOR GUNNERY TRAINING BY SEALING FORWARD COCKPIT, USING A 30-CALIBER M.G. AND TELESCOPIC SIGHT.

VOUGHT VE-7
WINGS: CELLULE IS FOUR AILERON TYPE. TOP CENTER SECTION CUT AWAY FOR VISION. AIRFOIL R.A.F. 15. ANGLE OF INCIDENCE IS DIFFERENTIAL BETWEEN BETWEEN WINGS. WING CELLULE CONSISTS OF FIVE PANELS ASSEMBLED WITH SUBMERGED FITTINGS. WING SPARS OF SOLID I-BEAM ROUTED SPRUCE, REINFORCED AT PANEL POINTS. WING RIBS ARE UNIT ASSEMBLY TYPE. DOUBLE SWAGE WIRES IN INTERNAL DRAG TRUSS WITH ADJUSTABLE END FITTINGS. MAIN WING ATTACHMENT AND INTERPLANE STRUT FITTINGS ARE OF THE SUBMERGED TYPE. WINGS COVERED WITH LINEN, SEWED TO WING RIBS, AND TAPED. FIVE COATS ACETATE DOPE AND TWO COATS GRAY ENAMEL. INTERPLANE STRUTS OF SOLID SPRUCE STREAMLINE CROSS SECTION. WIRE BRACING IS ROEBLING 19-STRAND, ADJUSTABLE TURNBUCKLES. FLYING WIRES DOUBLE, LANDING WIRES SINGLE.
LANDING GEAR: VOUGHT VEE STRUT DUAL WHEEL TYPE. DETACHABLE BY REMOVAL OF PINS AT FUSELAGE FITTINGS. WHEELS 26 X 4 WIRE SPOKE TYPE. STEEL STUB AXLES OPERATE IN METAL GUIDES, FLOATING TYPE SHOCK ABSORBERS OPERATE IN STEEL GUIDE. AXLES, SPREADER BAR, AND SHOCK ABSORBERS STREAMLINED IN PRESSED METAL HOUSING. STRUTS OF ASH AND RUBBER CORD COTTON SHEATHED 5/8" DIAMETER. METAL PARTS FINISHED IN BLACK ENAMEL, WOOD STRUTS WITH THREE COATS CLEAR VARNISH. WHEELS STREAMLINED WITH FABRIC, DETACHABLE COVERS.

CHANCE VOUGHT VE-7 & UO-1

(SHEET NO.1)

(DRAWN FOR MODEL AIRPLANE NEWS BY WILLIS L. NYE)

VOUGHT VE-7

THE CHANCE VOUGHT VE-7 WAS DESIGNED AS AN ENTRANT IN THE U.S.ARMY ADVANCED TRAINER COMPETITION HELD IN 1917. THE FIRST EXPERIMENTAL AIRPLANE WAS SUBMITTED FOR TESTING BY ARMY AUTHORITIES IN 1918. THE VE-7 WON THE COMPETITION AND WAS ORDERED INTO PRODUCTION BY THE PARENT COMPANY AND TWO LICENSEES, THE SPRINGFIELD AIRCRAFT CO. AND THE B.F.STURTEVANT COMPANY. TWENTY VE-7 PLANES WERE DELIVERED BY THE END OF WORLD WAR I. IN 1922-23 YEARS 27 VE-9 AIRPLANES WERE PROCURED BY THE U.S.ARMY AIR SERVICE.

THE AIRPLANE WAS FINISHED IN SILVER PIGMENTED LACQUER. SHADED AREAS GRAY. ENGINE AND TIRES IN BLACK.

NAVY VOUGHT VE-9

THIS AIRPLANE WAS AN IMPROVED VERSION OF THE VE-7 MODEL BUILT FOR THE U.S.ARMY. THE VE-9 WAS ADAPTED FOR LAND OR WATER OPERATION. THE VE-9 WAS THE FIRST AMERICAN DESIGNED SHIPBOARD AIRPLANE THAT COULD BE LAUNCHED FROM A CATAPAULT. THE FUSELAGE WAS STRENGTHENED FOR ROUGH WATER LANDING AS WELL AS THE IMPACT OF CATAPAULT LAUNCHING. TWO AIRPLANES OF THIS TYPE WERE ASSIGNED TO EACH BATTLESHIP FOR SCOUTING AND GUNFIRE SPOTTING.

ENGINE INSTALLATION:	WATER COOLED, AEROMARINE MANUFACTURE, 250 H.P. MODEL U-873.
FUSELAGE:	STRENGTHENED SPRUCE LONGERONS AND STRUTS AND STEEL CABLES AND FITTINGS.
SEATING:	SAME AS VE-7.
WINDSHIELDS:	SAME AS VE-7.
EMPENNAGE:	SAME AS VE-7, EXCEPT INCREASED VERTICAL STABILIZER AREA.
FACTOR OF SAFETY:	SAME AS VE-7.
WEIGHT:	IN EXCESS OF VE-7.
WING CELLULE:	IDENTICAL TO VE-7. CENTER SECTION OF UPPER WING REINFORCED FOR HOISTING PURPOSES.
FLIGHT CONTROLS:	SAME AS VE-7.
FUEL SYSTEM:	IMPROVED OVER VE-7.

DESIGN NOTES VOUGHT VE-9

1. AEROMARINE TYPE ENGINE VEE CYLINDER BLOCK. WAS NOT SUCCESSFUL AS AN ENGINE TYPE.
2. PROPELLER 8'-4" DIAMETER LAMINATED TYPE.
3. WING TIP FLOAT TYPE USED ALSO ON EARLY MODELS OF UO-1. (ALUMINUM ALLOY STRUCTURE)
4. FIN INCREASED IN AREA AS REQUIRED WHEN PONTOONS ARE INSTALLED. (ADJUSTABLE SETTING)
5. PONTOON CONSISTS OF SPRUCE FRAMES AND LONGITUDINAL MEMBERS AND LAMINATED MAHOGANY PLYWOOD (2 LAYERS) AT 90° DIRECTION OF GRAIN TO EACH OTHER.
6. WIND-DRIVEN GENERATOR FOR RADIO TRANSMITTER WITH LOW AND HIGH VOLTAGE OUTPUT.
7. ARRESTING HOOK OMITTED ON SEAPLANES.
8. THIS BRACE CABLE USED ON VE-9 ONLY, AND EARLY PRODUCTION UO-1 AIRPLANES.
9. THIS BRACE CABLE USED ON VE-9 SEAPLANES ONLY.
10. THIS TYPE OF FLOAT STERN USED ON VE-9 SEAPLANES ONLY.
11. STREAMLINE SPRUCE STRUTS.
12. REAR COCKPIT WAS ADAPTABLE FOR GUNNERY.
13. ORIGINAL IDENTIFICATION MARKS WERE RED, WHITE AND BLUE ROUNDELS. (1918).

BRACE WIRES ARE IN PLANE OF FRONT AND REAR WING SPARS
MAGNETIC COMPASS
WING CELLULE AND STRUCTURAL CONFIGURATION SAME FOR VE-7, VE-9 AND UO-1 SERIES
BRASS PROPELLER TIP
WIND-DRIVEN DUAL VOLTAGE RADIO GENERATOR
WRIGHT J-4 RADIAL AIRCOOLED ENGINE
INSIGNIA
1.25° DIHEDRAL
TIE
WING TIP PONTOON BRACING
AILERON LINK CABLE
1.25° DIHEDRAL
STREAMLINE STRUTS
LANDING WIRES
SEE FLOAT INSTALLATION SHEET NO.1.
WALKWAY
DRAG WIRE
FLYING WIRES-DOUBLE
SPRUCE STRUTS
ANNULAR ENGINE EXHAUST MANIFOLD
ORIGINAL FLOAT INSTALLATION

UO-1
(U.S.NAVY SHIP PLANE)

FLOAT INSTALLATION ON LATE PRODUCTION PLANES
SAME STRUT CONFIGURATION ON VE-9
SAME PONTOON CROSS SECTION ON FU-1
STERN SECTION VE-9 ONLY
SAME AREA AND HORIZONTAL TAIL USED ON VE-7, VE-9, AND UO-1, AND FU-1.
LIFT TYPE HORIZONTAL STABILIZER
FAIRLEAD
ELEVATOR CONTROL CABLES (2)
RUDDER CONTROL CABLE
WING FITTING
RUDDER 30° RIGHT-LEFT
FABRIC COVERING
ELEVATORS - 20° UP-DOWN
FIXED SURFACE -1.25° ANGLE OF INCIDENCE TO THRUST LINE
U.S.NAVY SERIAL NO.
A-6698 U.S.NAVY
RED WHITE BLUE

PROCURED IN QUANTITY IN 1918 FOR U.S.ARMY AIR SERVICE. (MODEL VE-7)
LIMITED PROCUREMENT IN 1920 FOR U.S.NAVY (MODEL VE-9).
LIMITED PROCUREMENT IN 1921 FOR U.S.MARINES (VE-9 HISPANO-SUIZA)

FUEL QUANTITY GAUGE
POWER AIR PUMP INDUCTION MANIFOLD
FILLER CAP
FUEL SHUT-OFF VALVE
AIR PRESSURE INDICATOR
HAND AIR PUMP
FUEL PRIMER
THROTTLE
PILOT
PET COCK
FUEL TANK
13 GALS.
15 GALS.
NO.26 TERNE PLATE
FUEL SHUT-OFF VALVE
FUEL STRAINER
CARBURETOR
FUEL DRAIN
AIR RELIEF VALVE

FUEL SYSTEM
(GRAVITY-AIR PRESSURE TYPE-VE-7 & VE-9)

VE-7
(U.S.ARMY TRAINER)

MAGNETIC COMPASS
BRACE CABLE
CARBURETOR AIR INDUCTION
RADIATOR CAP
FUEL FILLER
AILERON LINK CABLE
INSTRUMENT PANEL ACCESS
STORAGE COMPARTMENT
FAIRED TURTLEDECK
ALUMINUM ALLOY FAIRING
STEEL PROPELLER HUB
WRIGHT E-2 180 H.P. ENGINE
TRAILING RADIO ANTENNA WEIGHT
POLISHED ALUMINUM ALLOY RADIATOR SHELL
WALNUT PROPELLER
DRAIN PLUG
MOORING BIT
U.S.S. OKLAHOMA 2
STEP
CONTROL STICK ACCESS PANEL
AILERON CONTROL HORN
U.S.NAVY SQUADRON MARKING
DRAIN PLUG
RING
ARRESTING HOOK
RED WHITE BLUE

8/2

MODEL VE-9 FITTED WITH A LANDING GEAR AND EQUIPPED WITH ARRESTING DEVICES WAS THE FIRST NAVAL SERVICE TYPE TO LAND ON THE U.S.S LANGLEY, THE U.S.NAVY'S FIRST AIRCRAFT CARRIER UNDER WAY AT SEA.

CHINE
WALKWAY
DOUBLER
FOR CARRIER OPERATIONS A VE-7 LANDING GEAR WAS INSTALLED
LOAD WATERLINE

VE-9
(U.S.NAVY SHIP PLANE)
(PROCURED IN 1921)

(LENGTH SCALE)
(HEIGHT SCALE)

THE FLOAT BRACING IS RIGGED IN SUCH A WAY THAT WHEN THE AIRPLANE IS FLYING, THE LONGITUDINAL CENTERLINE OF THE FLOAT IS 6° INCIDENCE TO THE THRUST LINE.
MAIN PONTOON COVERED WITH 2-PLY PLYWOOD. PLIES AT 45° TO EACH OTHER.

WASHED OUT WING TIP
SAME WING PLANFORM ON VE-7, VE-9 AND UO-1
FORMER RIBS
RED WHITE BLUE
DRAG WIRE
HISPANO-SUIZA MODEL "A" AND "E" WERE INTERCHANGEABLE
HISPANO-SUIZA WATERCOOLED ENGINE MODEL "A" 150 H.P.

HISPANO-SUIZA TYPE "E"	
RATED H.P.	180
RATED R.P.M.	1800
BORE	4.72"
STROKE	5.11"
DRY WEIGHT	476"
COMPRESSION	5.33

VE-7 DESCRIPTION	
WING AIRFOIL	R.A.F.15
WING AREA (2)	285 SQ.FT.
STAB. AREA	18 SQ.FT.
ELEV. AREA (2)	17 SQ.FT.
AIL'N AREA (4)	39 SQ.FT.
FIN AREA	23 SQ.FT.
RUDDER	8.4 SQ.FT.
WT. EMPTY	1560 LBS.
WT. LOADED	2100 LBS.
WT. SQ.FT.	7.4 LBS.
WT. H.P.	11.6 LBS.
CLIMB 6500'	9.25 MIN.
CLIMB 10,000'	17.00 MIN.
SERV. CEILING	16,000'
DURATION	2.33 HRS.
MAX. SPEED 5,000'	111 M.P.H.
MAX. SPEED 10,000'	100 M.P.H.
LANDING SPEED	40 M.P.H.

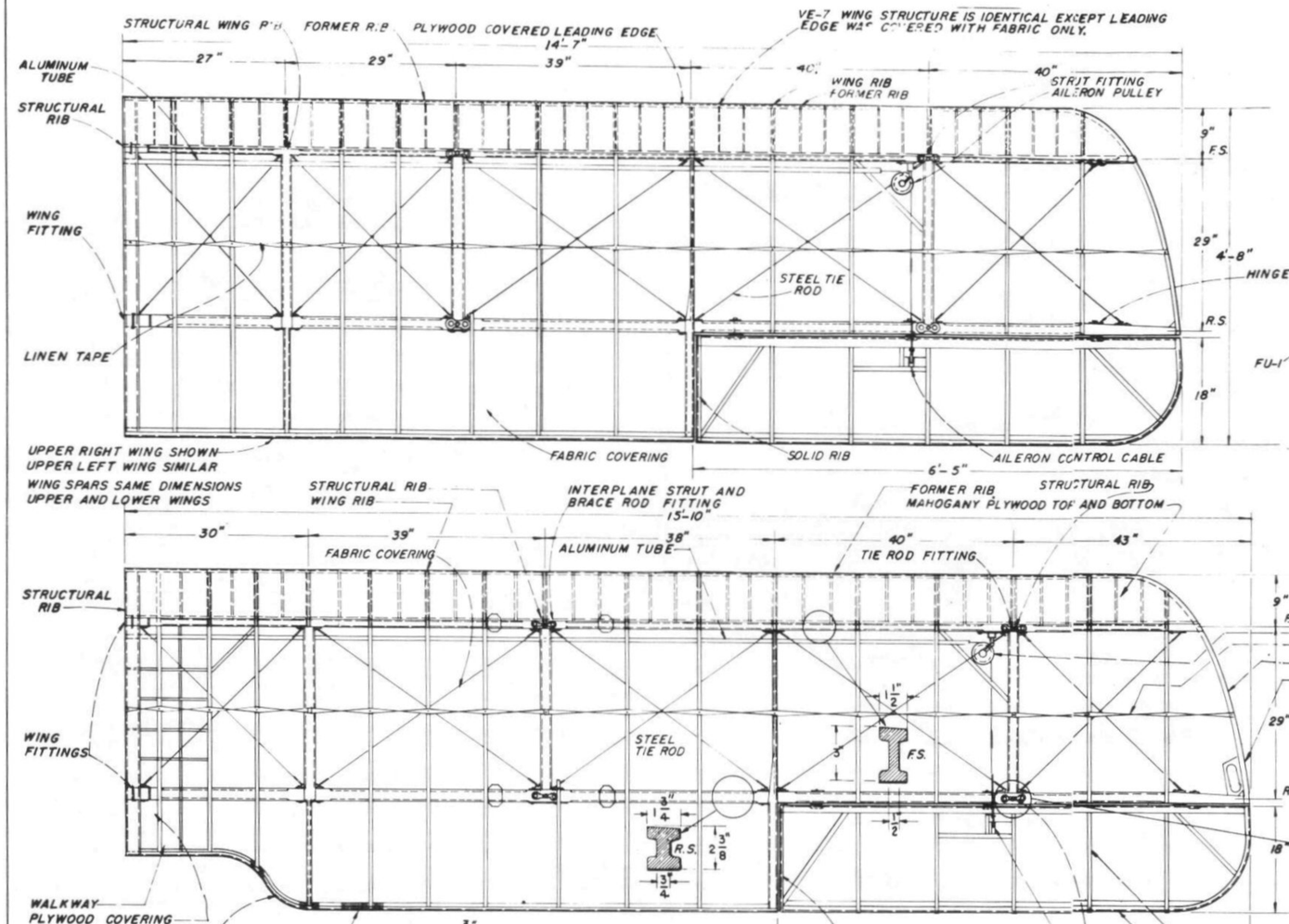
ANGLE OF INCIDENCE TOP WING 1.75°
ANGLE OF INCIDENCE BOTTOM WING 2.25°
AILERON MOVEMENT UP-DOWN 20°

THANKS IS EXTENDED TO THOSE THAT ASSISTED TO MAKE THIS PRESENTATION POSSIBLE:
WILLIAM LARKINS, SECRETARY, AMERICAN AVIATION HISTORICAL SOCIETY.
ESTHER B. MUELLER, AIR FORCE CENTRAL MUSEUM, TECHNICAL SERVICES DIVISION, REFERENCE BRANCH.
RANDOLPH BRANDT-PHOTO COLLECTION.
ARTHUR SCHOENI, CHANCE VOUGHT AIRCRAFT.
WILLIAM MIER, CHANCE VOUGHT AIRCRAFT.
F.E.DALLY, CAP'T. U.S.N., TECHNICAL DATA DIVISION, BUREAU OF AERONAUTICS, U.S.NAVY.

(DRAWN FOR MODEL AIRPLANE NEWS BY WILLIS L. NYE)

CHANCE VOUGHT

(SHEET NO. 2)



WINGS
UO-1 OR VE-7 (SEE NOTE)

VERTICAL TAIL
FU-1 OR UO-1

STRUT FITTING

WING RIB

CENTER SECTION
UO, FU, VE

HORIZONTAL TAIL SURFACES
UO OR FU-1

FUSELAGE
VE-7

CHANCE VOUGHT

(SHEET NO. 3)

(DRAWN BY WILLIS L. NYE FOR MODEL AIRPLANE NEWS)

CHANCE VOUGHT

VE-7

(DRAWN FROM PHOTO) 1918 PROTOTYPE)

WATER FILLER
CARBURETOR AIR INDUCTION
EXPANSION TANK
HAND AIR PUMP
INSTRUMENT PANEL
THROTTLE
BOOSTER MAGNETO
ALUMINUM ALLOY HEAD STREAMLINING
SPLICE
PLYWOOD
SPRUCE STRINGERS AND PLYWOOD FORMERS
TAPERED SPRUCE LONGERONS
STEEL TUBE RUDDER AND VERTICAL STABILIZER STRUCTURE-BRAZED JOINTS AND FABRIC COVERING
DIAGONAL TRANSVERSE STEEL TIE RODS
CONTROL CABLE FAIRLEAD
150 H.P. ENGINE WATERCOOLED
FUEL TANK
OBSERVER
PILOT
SEAT
SEAT
MAIN FUEL TANK
CLEVIS HINGE
RUBBER SHOCK CORD
STEEL TIE ROD
FABRIC COVERING
CENTERING SPRING
ASH TAIL SKID
CONTROL CABLES
PULLEY
ROUTED STRUT
BOLTED FITTING
SPLICE
JOY STICK(DUAL)
QUADRANT
AILERON TORQUE TUBE
RUDDER BAR(DUAL)
FIRE EXTINGUISHER(DUAL)
BOLTED FITTING
TERNE PLATE FIREWALL
DOUBLE TIE RODS
BOLTED FITTING
ASH STRUT
STEEL FITTING
LANDING GEAR SPREADERS
PIVOT TUBES
FAIRING
AXLE

THIS TYPE LANDING GEAR USED INTERCHANGEABLY ON MODELS UO-1 AND FU-1. THE LANDING GEAR ON THESE MODELS WAS EQUIPPED WITH ARRESTING DEVICES.

DESIGN NOTES- VOUGHT AIRPLANES

THE BASIC STRUCTURAL AND AERODYNAMIC DESIGN EMBODIED IN THE VENERABLE MODEL VE-7 WAS THE CRITERION OF DESIGN FOR THE LATER VE-9, UO-1,2,3, AND THE FU-1. EACH OF THESE AIRPLANES EMPLOYED SAME GENERAL WING, FUSELAGE, TAIL SURFACES, AND LANDING GEAR ASVE-7. HOWEVER, IMPROVEMENTS IN MATERIALS AND IN DETAIL DESIGN PLUS MORE POWERFUL AIRCOOLED ENGINES IMPROVED THE OVERALL PERFORMANCE. VOUGHT SEAPLANES SERVED WITH BATTLESHIPS AND CRUISERS OF THE U.S. NAVY ALL OVER THE WORLD. OTHER PLANES OF THE TYPE SERVED WITH U.S. COAST GUARD AND CUBAN AIR FORCE.

VE-7 INSTRUMENTS

(PILOT'S COCKPIT)

BANK INDICATOR
AIR PRESSURE
AIR PUMP
AIR SPEED
ALTIMETER
OIL PRESSURE
ENGINE R.P.M.
THROTTLE
MAGNETO SWITCH
FUEL PRIMER
WATER TEMPERATURE
BOOSTER MAGNETO CRANK
BOOSTER SWITCH

VE-7 TAIL

ELEVATOR HORN
STEEL TUBE
SPRUCE RIBS
BRAZED JOINTS
STEEL TUBE TRAILING EDGE
STEEL TUBE ELEVATOR SPAR
SPRUCE RIBS
SPRUCE SPAR
SPRUCE FORMER RIB
STEEL TUBE FRAME

2-F-11

ALUMINUM ALLOY COVERING
GUN PORT
WRIGHT WHIRLWIND J-5 SUPERCHARGED AIRCOOLED ENGINE 225 H.P.
WOOD PROPELLER
MAGNETO
ALUMINUM ALLOY SPINNER
THRUST LINE
REMOVABLE PANEL
SUPERCHARGER AIR DUCT
STREAMLINE SPRUCE STRUT
CLEAT
MOORING RING
STEP
DRAIN PLUG
CHINE
WALKWAY
ALUMINUM ALLOY FUEL TANK
STEP
STREAMLINE SPRUCE STRUT
ALUMINUM ALLOY BRACE STRUT
ALUMINUM ALLOY PONTOON
WALKWAY
TWO-PLY PLYWOOD PONTOON COVERING
LOAD WATERLINE
DRAIN PLUG
STEP
9°
31°
6°
7'-6"
4'-3"
4"
1'-5"
2'-4"
12"
12"
1'-5"
10'-10"
8'-2"
(SCALE)
0. 1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 11. 12. 13. 14. 15. 16. 17. 18. 19. 20. 21.

4'-1"
2'-2"
1'-11"
10'-0"
ELEVATOR MOVEMENT 20° UP-DOWN
RUDDER MOVEMENT 30° RIGHT-LEFT
RESTRICTED ANGLE OF VISION
AILERON INTERCONNECTING CABLE
TELESCOPIC GUN SIGHT
FUEL TANK FILLER
N-9 AIRFOIL
SPRUCE STRUT
RUDDER CONTROL CABLE
ELEVATOR CONTROL CABLE
FAIRLEAD
LIFT TYPE HORIZONTAL STABILIZER-FABRIC COVERING - NON-ADJUSTABLE
ELEVATOR CONTROL HORN
HINGED ACCESS TO INSTRUMENTS
5'-0"
2'-7"
2'-5"
ALUMINUM ALLOY HEAD REST
NAVY SERIAL NO.
A-7363
U.S. NAVY
NAVAL PLANE MARKING
FABRIC COVERING
FAIRING STRIP
2'-7"
ACCESS PANEL
CONTROL CABLES
FABRIC COVERED VERTICAL STABILIZER AND RUDDER
RED
WHITE
BLUE
4'-0"
6'-5"
34'-2"
1'-6"
4'-8"
(SCALE)

DESIGN NOTES FU-1

(1) BRACE WIRES DIFFER FROM UO-1.
(2) FUSELAGE STRUCTURE ON FU-1 SAME AS UO-1, REINFORCED FOR CATAPAULT LAUNCHING.
(3) TWO TYPES OF WING TIP FLOATS WERE SUPPLIED BY NAVAL AIRCRAFT FACTORY, I.E. TYPE SHOWN AND FLOAT SHOWN ON VE-9 BUT BRACED AS SHOWN AT LEFT WING OF MODEL UO-1 FRONT VIEW.
(4) FUSELAGE FAIRED TO ELLIPTICAL CROSS SECTION.

FU-1

(20 PLANES OF THIS TYPE PROCURED BY U.S. NAVY)

THE AIRPLANE WAS FINISHED IN SILVER PIGMENTED LACQUER. SHADED AREAS WERE LIGHT GRAY. TIRES AND ENGINE IN BLACK.

WING FITTING
REINFORCEMENT TO PERMIT HOISTING OF AIRPLANE ON BOARD SHIP
MULTI-VOLTAGE WIND-DRIVEN SINGLE BLADE RADIO GENERATOR
FABRIC COVERING
BRASS TIPPED PROPELLER
WRIGHT 200 H.P. WHIRLWIND J-4 ENGINE
WALKWAY
MAGNETO
FLYING WIRES
RED
WHITE
BLUE

UO-1

(FU-1 IS SIMILAR)

VOUGHT FU-1

THE MODEL FU-1 WAS USED AS A TRAINER FOR FIGHTER PILOTS. IT WAS ADAPTABLE FOR CARRIER OPERATIONS BY THE INSTALLATION OF A LANDING GEAR SIMILAR TO THAT OF VE-7 EXCEPT BEING EQUIPPED WITH BRAKES AND ARRESTING HOOK.

THIS WAS FIRST NAVAL AIRPLANE WITH AN AIRCOOLED ENGINE TO HAVE A SUPERCHARGER. ENGINE HAS AN ELECTRIC AS WELL AS AN INERTIA STARTER. (MANUAL OPERATION).

ARMAMENT CONSISTED OF 2 30-CALIBER MACHINE GUNS SYNCHRONIZED TO FIRE THROUGH THE PROPELLER AND BOMB RACKS ON THE UNDERSIDE OF LOWER WINGS. THE GUNS WERE MANUALLY CHARGED. THE HIGH SPEED AT 20,000 FEET WAS 150 M.P.H. SERVICE CEILING IS 28,000 FEET. SEA LEVEL HIGH SPEED WAS 130 M.P.H. THIS AIRPLANE WAS A DEVELOPEMENT OF THE "UO" TYPE.

(SHEET NO. 4)

(DRAWN FOR MODEL AIRPLANE NEWS BY WILLIS L. NYE)

Curtiss Jenny JN-4—JN-6H.

drawings by JOSEPH NIETO

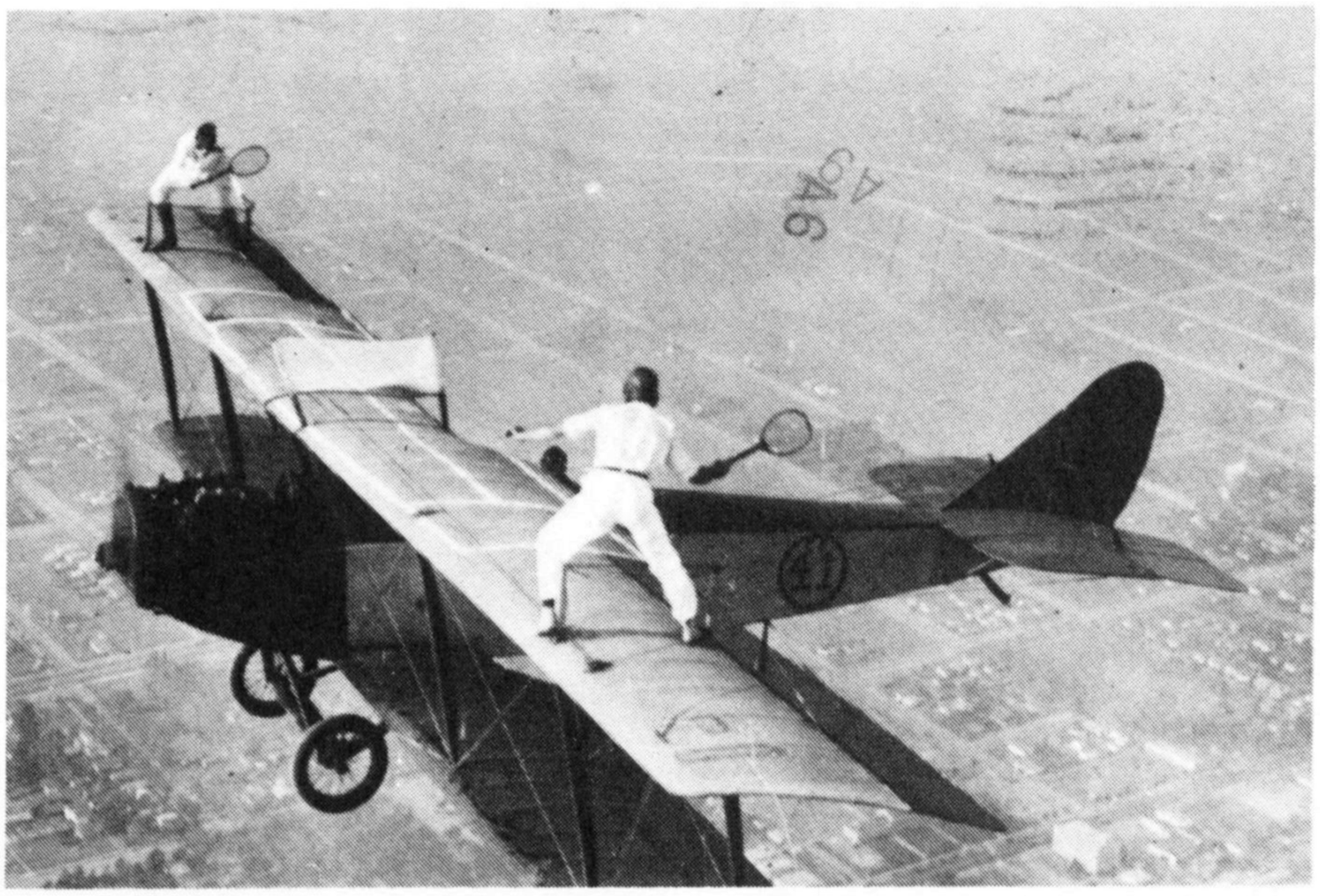
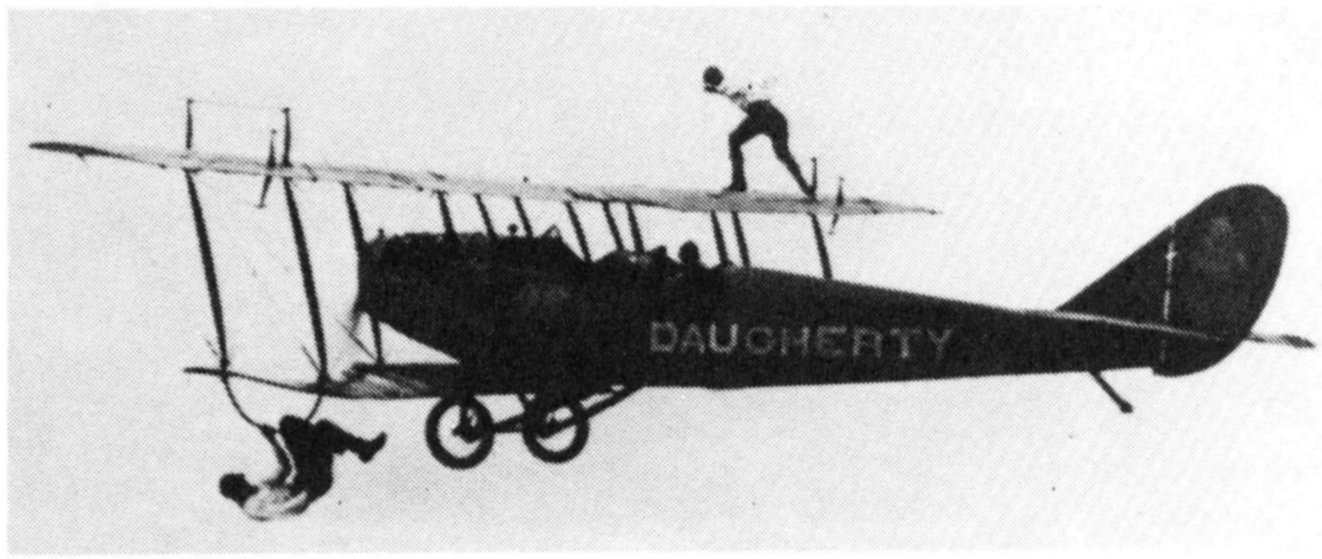


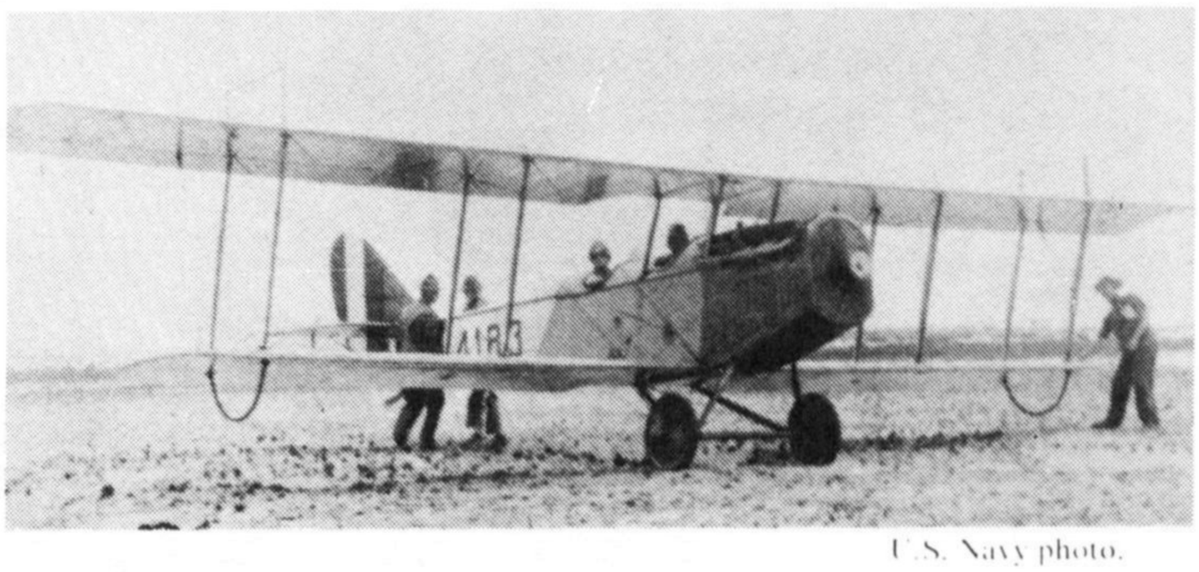
Photo courtesy of UPI.



"Flying the World's Great Aircraft" photo.

The Curtiss Jenny served as a trainer, a barn stormer, a mailplane, and was used extensively in early Hollywood films.

"U.S. Airmail Service" photo.



U.S. Navy photo.

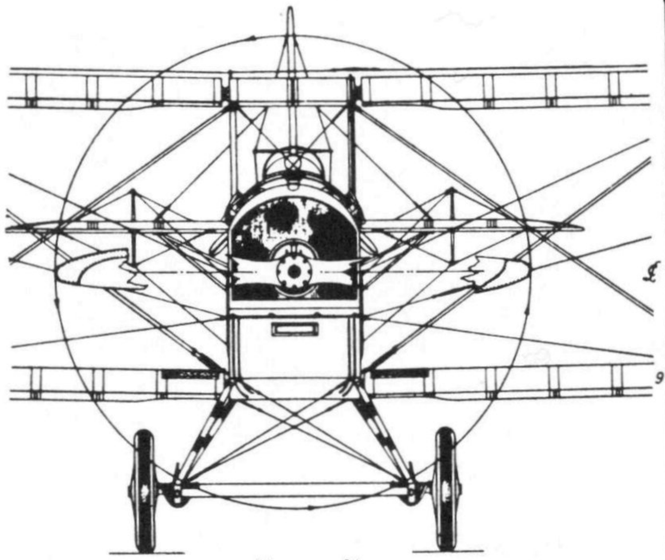
The Jenny was purely American. Produced in great quantities (over 4,500) for that period, Curtiss was helped in the effort by many subcontractors in Canada and the British Empire.

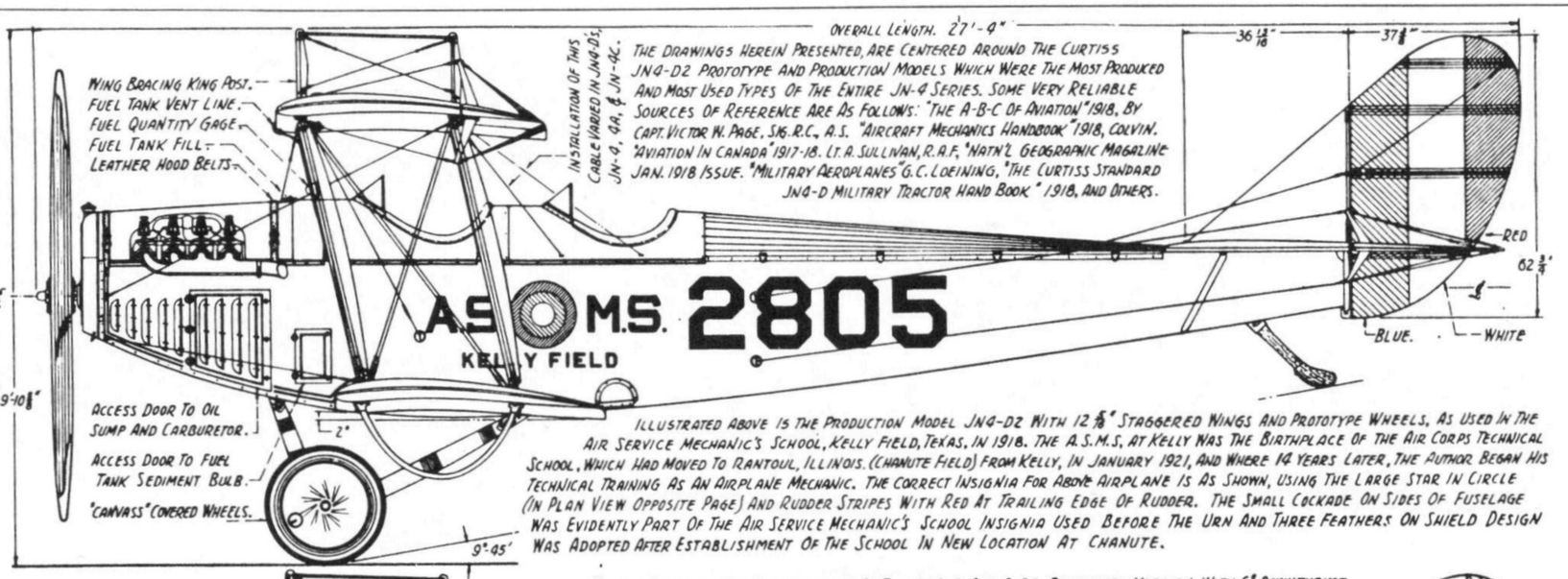
There used to be a saying, "If you can fly a Jenny, you can fly anything." She had her shortcomings, yet she would give novice pilots more than an even break. She was designed to teach men to fly and nothing more was ever expected of her.

However clear-cut the Jenny's wartime purpose may have been, her greatest fame actually came in the post-war years of the 1920s. By sheer numbers she invaded—and took over—the initial phases of American aviation. She flew the first regular airmail schedule and became the first readily available private plane.

To those who teethed on a Jenny there is something magical in recalling the feel of air pressure on her elevators or rudder, of the throbbing of her OX-5 engine pulling her out of a dirt field, of every rib, strut, and wire vibrating in unison, of fabric dancing to the same beat as she bored her way to history. There is no pilot who has put in time in a Jenny who will not admit, "Verily, *there* was an airplane!"

Many survive—several are still flying.□

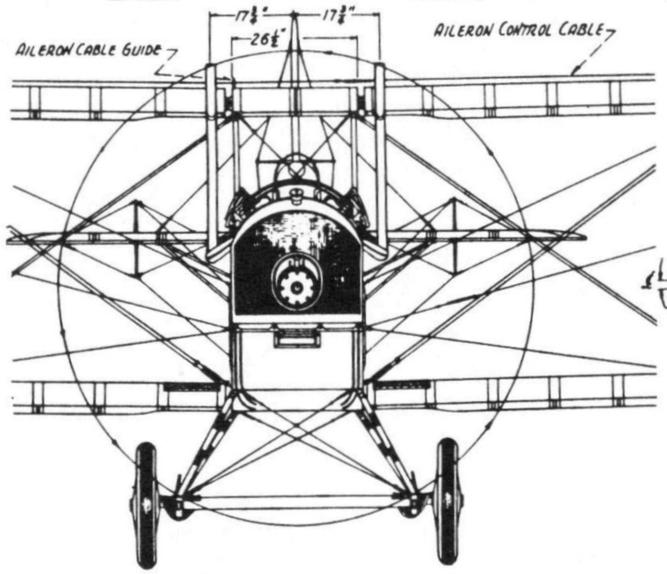


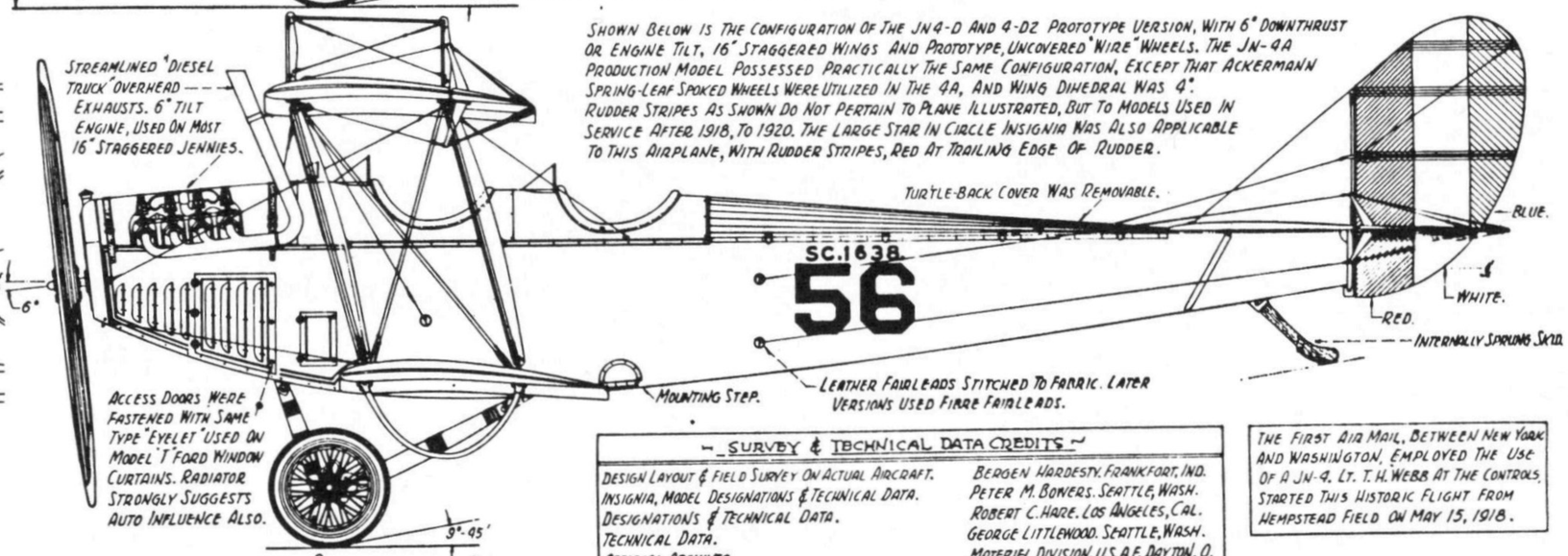


THE DRAWINGS HEREIN PRESENTED, ARE CENTERED AROUND THE CURTISS JN4-D2 PROTOTYPE AND PRODUCTION MODELS WHICH WERE THE MOST PRODUCED AND MOST USED TYPES OF THE ENTIRE JN-4 SERIES. SOME VERY RELIABLE SOURCES OF REFERENCE ARE AS FOLLOWS: "THE A-B-C OF AVIATION" 1918, BY CAPT. VICTOR W. PAGE, S.M.S.R.C., A.S. "AIRCRAFT MECHANICS HANDBOOK" 1918, COLVIN. "AVIATION IN CANADA" 1917-18. LT. A. SULLIVAN, R.A.F. "NATN'L GEOGRAPHIC MAGAZINE JAN. 1918 ISSUE. "MILITARY AEROPLANES" G.C. LOEHING, "THE CURTISS STANDARD JN4-D MILITARY TRACTOR HAND BOOK" 1918, AND OTHERS.

A.S.M.S. 2805
KELLY FIELD

ILLUSTRATED ABOVE IS THE PRODUCTION MODEL JN4-D2 WITH 12 6/16" STAGGERED WINGS AND PROTOTYPE WHEELS, AS USED IN THE AIR SERVICE MECHANIC'S SCHOOL, KELLY FIELD, TEXAS, IN 1918. THE A.S.M.S. AT KELLY WAS THE BIRTHPLACE OF THE AIR CORPS TECHNICAL SCHOOL, WHICH HAD MOVED TO RANTOUL, ILLINOIS. (CHANUTE FIELD) FROM KELLY, IN JANUARY 1921, AND WHERE 14 YEARS LATER, THE AUTHOR BEGAN HIS TECHNICAL TRAINING AS AN AIRPLANE MECHANIC. THE CORRECT INSIGNIA FOR ABOVE AIRPLANE IS AS SHOWN, USING THE LARGE STAR IN CIRCLE (IN PLAN VIEW OPPOSITE PAGE) AND RUDDER STRIPES WITH RED AT TRAILING EDGE OF RUDDER. THE SMALL COCKADE ON SIDES OF FUSELAGE WAS EVIDENTLY PART OF THE AIR SERVICE MECHANIC'S SCHOOL INSIGNIA USED BEFORE THE URN AND THREE FEATHERS ON SHIELD DESIGN WAS ADOPTED AFTER ESTABLISHMENT OF THE SCHOOL IN NEW LOCATION AT CHANUTE.





SHOWN BELOW IS THE CONFIGURATION OF THE JN4-D AND 4-D2 PROTOTYPE VERSION, WITH 6° DOWNTHRUST OR ENGINE TILT, 16" STAGGERED WINGS AND PROTOTYPE, UNCOVERED "WIRE" WHEELS. THE JN-4A PRODUCTION MODEL POSSESSED PRACTICALLY THE SAME CONFIGURATION, EXCEPT THAT ACKERMANN SPRING-LEAF SPOKED WHEELS WERE UTILIZED IN THE 4A, AND WING DIHEDRAL WAS 4°. RUDDER STRIPES AS SHOWN DO NOT PERTAIN TO PLANE ILLUSTRATED, BUT TO MODELS USED IN SERVICE AFTER 1918, TO 1920. THE LARGE STAR IN CIRCLE INSIGNIA WAS ALSO APPLICABLE TO THIS AIRPLANE, WITH RUDDER STRIPES, RED AT TRAILING EDGE OF RUDDER.

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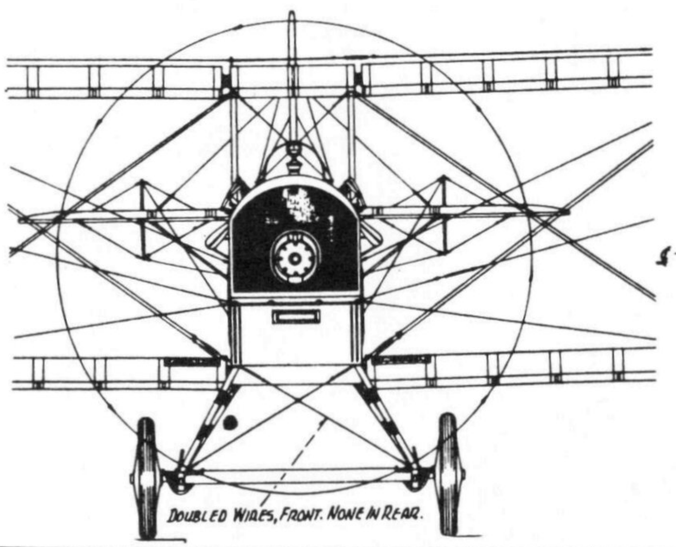
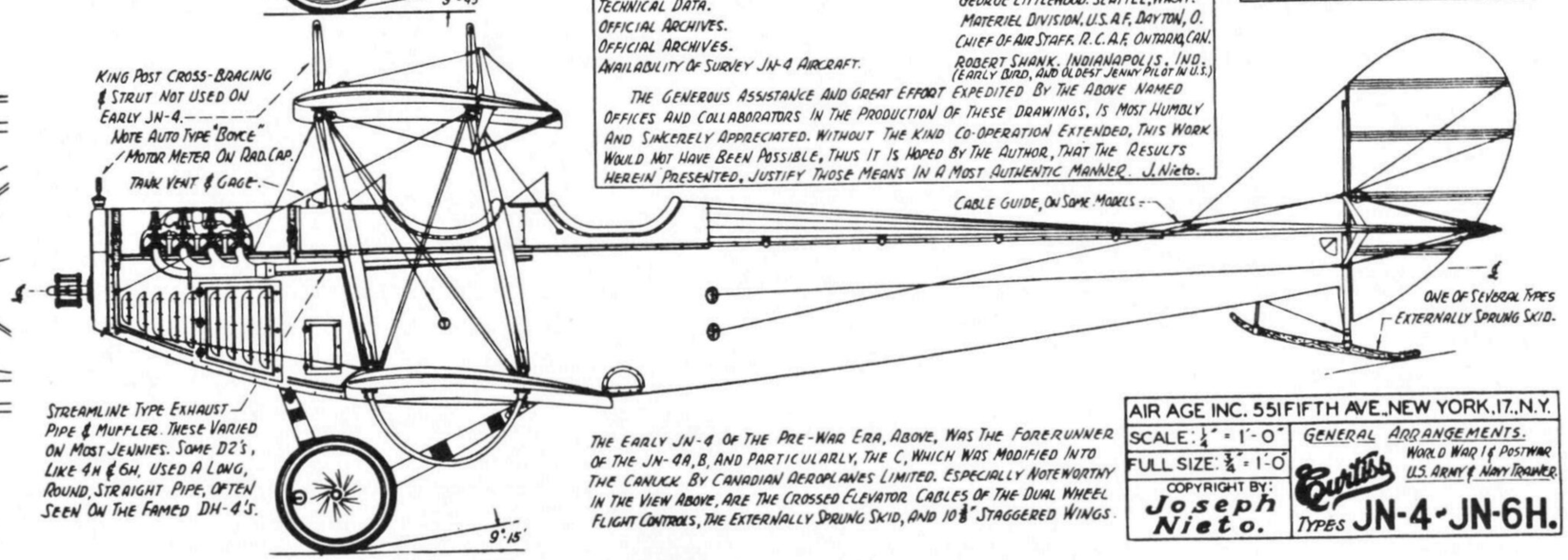




SURVEY & TECHNICAL DATA CREDITS

DESIGN LAYOUT & FIELD SURVEY ON ACTUAL AIRCRAFT. — BERGEN HARDESTY. FRANKFORT, IND.
INSIGNIA, MODEL DESIGNATIONS & TECHNICAL DATA. — PETER M. BOWERS. SEATTLE, WASH.
DESIGNATIONS & TECHNICAL DATA. — ROBERT C. HARE. LOS ANGELES, CAL.
TECHNICAL DATA. — GEORGE LITTLEWOOD. SEATTLE, WASH.
OFFICIAL ARCHIVES. — MATERIEL DIVISION, U.S.A.F. DAYTON, O.
OFFICIAL ARCHIVES. — CHIEF OF AIR STAFF. R.C.A.F. ONTARIO, CAN.
AVAILABILITY OF SURVEY JN-4 AIRCRAFT. — ROBERT SHANK. INDIANAPOLIS, IND. (EARLY BIRD, AND OLDEST JENNY PILOT IN U.S.)

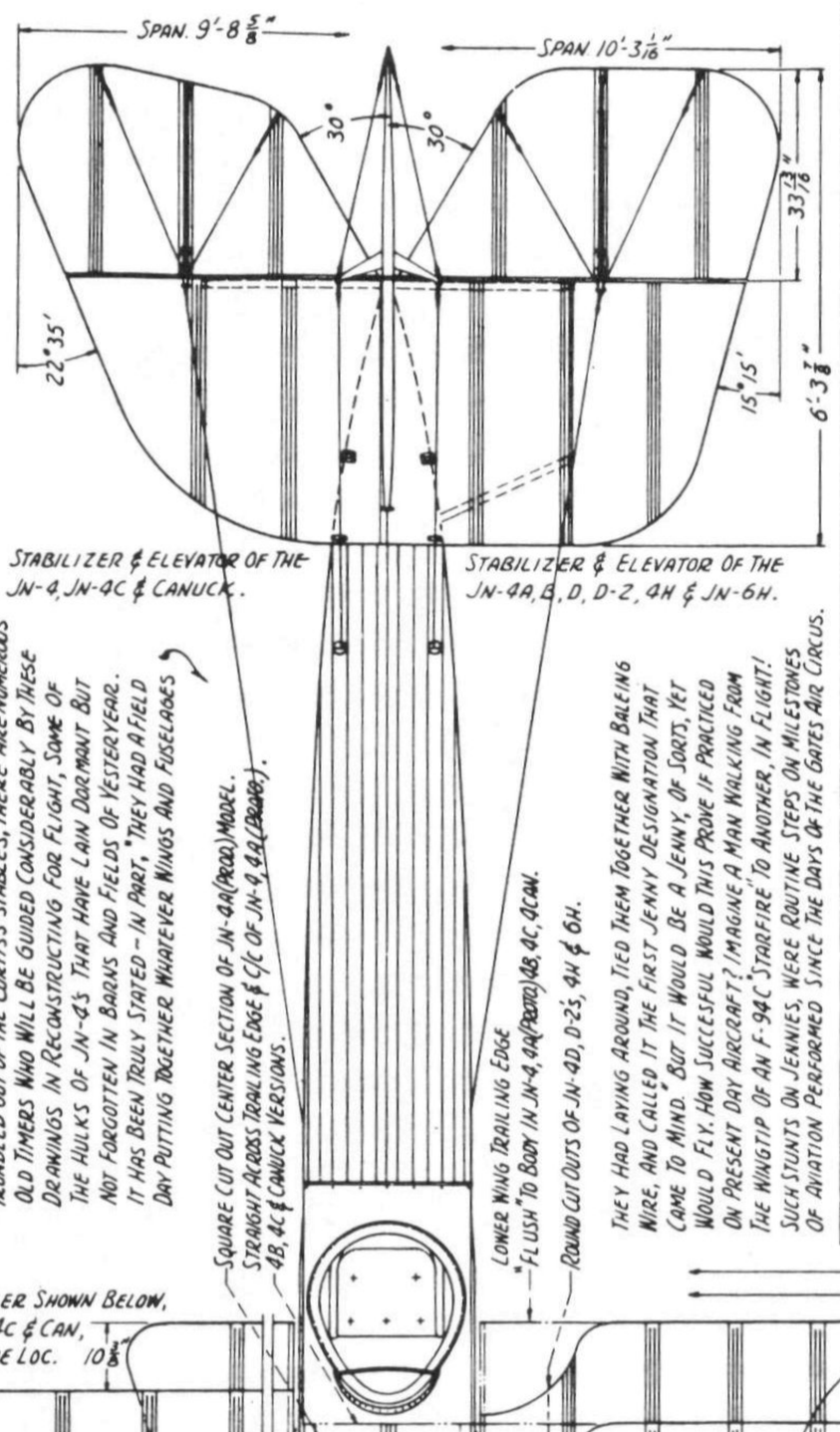
THE GENEROUS ASSISTANCE AND GREAT EFFORT EXPEDITED BY THE ABOVE NAMED OFFICES AND COLLABORATORS IN THE PRODUCTION OF THESE DRAWINGS, IS MOST HUMBLY AND SINCERELY APPRECIATED. WITHOUT THE KIND CO-OPERATION EXTENDED, THIS WORK WOULD NOT HAVE BEEN POSSIBLE, THUS IT IS HOPED BY THE AUTHOR, THAT THE RESULTS HEREIN PRESENTED, JUSTIFY THOSE MEANS IN A MOST AUTHENTIC MANNER. J. Nieto.

THE FIRST AIR MAIL, BETWEEN NEW YORK AND WASHINGTON, EMPLOYED THE USE OF A JN-4. LT. T. H. WEBB AT THE CONTROLS, STARTED THIS HISTORIC FLIGHT FROM HEMPSTEAD FIELD ON MAY 15, 1918.

THE EARLY JN-4 OF THE PRE-WAR ERA, ABOVE, WAS THE FORERUNNER OF THE JN-4A, B, AND PARTICULARLY, THE C, WHICH WAS MODIFIED INTO THE CANUCK BY CANADIAN AEROPLANES LIMITED. ESPECIALLY NOTEWORTHY IN THE VIEW ABOVE, ARE THE CROSSED ELEVATOR CABLES OF THE DUAL WHEEL FLIGHT CONTROLS, THE EXTERNALLY SPRUNG SKID, AND 10⅛" STAGGERED WINGS.

AIR AGE INC. 551 FIFTH AVE., NEW YORK, 17., N.Y.
SCALE: ¼" = 1'-0"
FULL SIZE: ¾" = 1'-0"
GENERAL ARRANGEMENTS.
WORLD WAR I & POST WAR U.S. ARMY & NAVY TRAINER.
COPYRIGHT BY: Joseph Nieto.
Curtiss
TYPES JN-4-JN-6H.

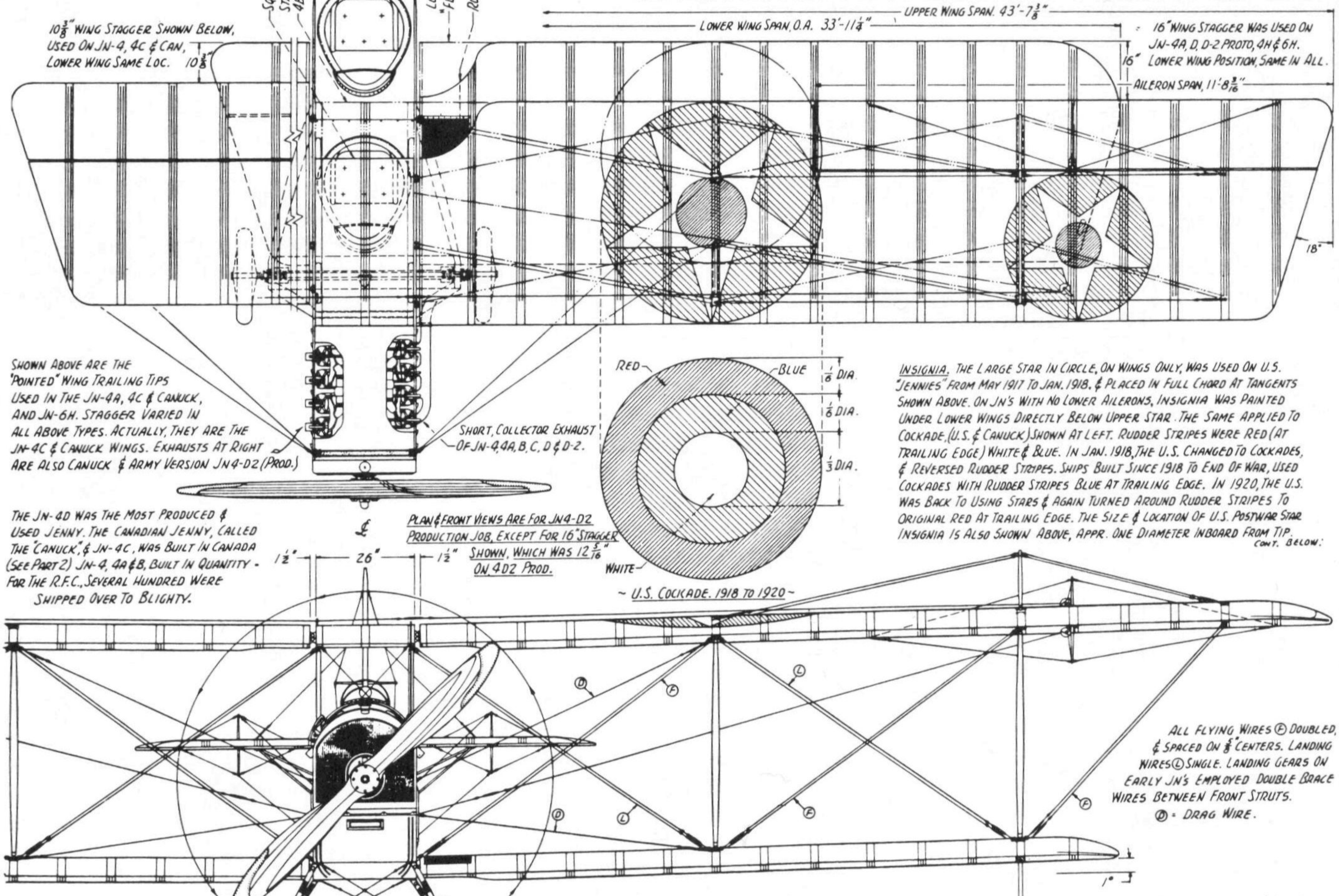
FROM THE AUTHOR'S POINT OF VIEW, NO OTHER AIRPLANE IN U.S. AVIATION HISTORY HAS DONE MORE TO PIONEER AVIATION IN GENERAL, THAN THE CURTISS JN-4, "FIRST LOVE" OF WORLD WAR I PILOTS, AND MANY OF THE AVIATION GREATS OF TODAY. THE FAMED JENNY, THE DEPENDABLE WORK-HORSE OF THE "GOOD OLD DAYS", HAS BEEN SEEN PLODDING ALONG AVIATION TRAILS IN MANY ODD AND VARIED GARBS, PERFORMING DUTIFULLY TO ALL THE UNLIMITED TASKS TO WHICH SHE WAS HARNESSED TO PULL, FROM HAULING WOUNDED, TO HAULING MAIL, FROM TRAINING PILOTS TO SURVEYING THE U.S. FOR MANY OF OUR PRESENT AIR TERMINALS, FROM AN ACTUAL FRONT-LINE AIR BATTLE OR TWO IN WORLD WAR I, TO MAKING PEOPLE'S HAIR STAND ON END AT BARNSTORMING AIR CIRCUSES AS LATE AS 1950! AND YET TODAY, OVER THIRTY FIVE YEARS SINCE THE JENNY FIRST ROUNDED OUT OF THE CURTISS STABLES, THERE ARE NUMEROUS OLD TIMERS WHO WILL BE GUIDED CONSIDERABLY BY THESE DRAWINGS IN RECONSTRUCTING FOR FLIGHT, SOME OF THE HULKS OF JN-4'S THAT HAVE LAIN DORMANT BUT NOT FORGOTTEN IN BARNS AND FIELDS OF YESTERYEAR. IT HAS BEEN TRULY STATED - IN PART, "THEY HAD A FIELD DAY PUTTING TOGETHER WHATEVER WINGS AND FUSELAGES HAPPENED TO BE AVAILABLE AT THE TIME."



~ TABLE OF VARIATIONS. CURTISS BIPLANES TYPE JN-4 THROUGH JN-6H ~

ITEM.	JN-4 (PRE-WAR)	JN-4A PROTOTYPE.	JN-4A PRODUCTION.	JN-4B.	JN-4C.	JN-4 (CAN.) (CANUCK.)	JN-4D.	JN4-D2. PROTOTYPE.	JN4-D2. PRODUCTION	JN-4H.	JN-6H.
WING SPAN. UPPER.	43'-7 3/8"	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
WING SPAN. LOWER.	33'-11 1/4"	34'-8 1/2"	34'-8 1/2"	33'-11 1/4"	34'-8 5/16"	34'-8 5/16"	33'-11 1/4"	✓	✓	✓	✓
OVERALL * LENGTH.	27'-3"	27'-3"	27'-3"	27'-3"	27'-3"	27'-3"	27'-9"	27'-4"	27'-4"	27'-0 1/2"	26'-11"
HEIGHT, O.A. *	9'-10 11/32"	10'-6"	10'-6"	9'-10 1/2"	9'-10 3/8"	9'-10 3/8"	9'-10 3/8"	9'-10 3/8"	9'-10 3/8"	9'-10 3/8"	9'-10 3/8"
CHORD.	59 1/2"	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
GAP.	61 1/2"	✓	✓	62 3/16"	61 1/2"	✓	60 1/2"	61 1/2"	12 5/16"	16"	✓
STAGGER.	10 3/8"	16"	✓	12 5/16"	10 3/8"	✓	16"	✓	✓	✓	✓
INCIDENCE.	2°	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
DIHEDRAL.	1°	4°	✓	1°	✓	✓	✓	✓	✓	✓	✓
TYPE ENGINE	CURTISS OX5 90 H/P	✓	✓	OX-2. 90	OXX-3. 90.	OX-5 - 90.	✓	✓	✓	WISP SUZA 150 H.P.	✓
ANGLE OF THRUST.	0°	8° DOWN-THRUST.	✓	0°	✓	✓	6° DOWN.	✓	0°	✓	✓
* ENGINE EXHAUSTS:	SHORT COLL-ECTOR TYPE.	SH. COLL. & D'HEAD STKS.	SHORT COLLECTOR.	✓	✓	SAME. ALSO SHORT PIPES	SHORT, STR. COLLECTOR.	SAME. ALSO D'HEAD STACKS.	SAME AS CANUCK	LONG "AUTO" STR. PIPES	SAME. ALSO SHORT PIPES
FLIGHT CONTROLS	DEP. WHEEL & EL. CABLES	✓	✓	✓	MODIFIED TO STICK CONTR.	✓	STICKS.	REVISED TO ✱ STICKS.	STICKS.	✓	✓
STABILIZER SETTING.	0°	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
* AILERON INTERCONN'S	NONE.	SINGLE STAUT.	STEEL CABLE.	NONE.	VERTICAL ✱ DIAG STRUTS	✓	NONE.	✓	✓	✓	SINGLE VERT. STRUT
AIR FOIL.	EIFFEL 36	✓	✓	✓	R.A.F. 6. EXPERIM'L.	✓	EIFFEL 36	✓	✓	✓	✓
WING C/C OUTLINE.	NO CUT OUT. STR ACROSS	✓	SQUARE-CUT-OUT.	SAME AS JN-4.	✓	CURVED UNL CUT-OUTS	CURVED UNL CUT-OUTS	✓	✓	✓	✓
WING TIP OUTLINE TOP	"POINTED" REAR	POINTED	✓	POINTED	POINTED	POINTED	POINTED	✓	✓	✓	✓
TIP OUTLINE LOWER.	ROUNDED REAR.	POINTED	✓	ROUNDED	POINTED.	✓	ROUNDED	✓	✓	✓	✓
STABILIZER OUTLINE	ROUNDED LEAD. EDGE	PARALLELLE WITH TR EDGE	✓	✓	SAME AS EARLY JN-4	SAME AS JN-4A.	SAME AS JN-4A.	✓	✓	✓	✓
ELEVATOR OUTLINE.	TR. EDGE'S SWEPT BACK	PARALLEL. NO SWEEP.	✓	✓	SAME AS EARLY JN-4	SAME AS JN-4A.	SAME AS JN-4A.	✓	✓	✓	✓
RUDDER OUTLINE.	GEMINA, EXT. BELOW BODY.	"CONVENTION" (SEE DWGS.)	✓	✓	✓	SAME AS 4A, B, C, D-2.	SHORT, ROUND	✓	✓	✓	✓
TYPE TAIL SKID	EXTERNAL SPRUNG.	INTERNAL SPRUNG.	✓	✓	✓	✓	✓	✓	✓	✓	✓
WING TIP SKIDS.	"U" SHAPE WOOD	✓	✓	NONE.	VERTICAL ✱ DIAG STRUTS	✓	✓	✓	✓	✓	✓
TYPE L.G. WHEELS	40 SPOKE STANDARD.	✓	ACKERMANN SPRING STEEL	40 SPOKE STANDARD	✓	✓	✓	✓	✓	✓	✓
NO. OF AILERONS.	UPPERS ONLY (2)	UPPERS ONLY (2)	UPPERS ✱ LOWER (4)	UPPERS ONLY (2)	UPPERS ✱ LOWERS (4)	✓	UPPERS ✱ LOWERS (4)	✓	✓	✓	UPPERS ✱ LOWERS.

REMARKS: ✱1. O.A. LENGTH: INASMUCH AS THE FUSELAGES OF ALL JN MODELS APPEAR TO HAVE BEEN BASICALLY THE SAME, AND THE REPORTED LENGTHS VARIED SO LITTLE, DIFFERENCES IN AIRPLANE O.A.L. IS BELIEVED DUE TO RUDDER SHAPE ✱ TILT OR NO-TILT OF ENGINE.
2. HEIGHT: MEASURED FROM TOPMOST WING KING POST TO GR. LEVEL. DIFFERENCES DUE TO INCREASED DIHEDRAL ✱ EXTERNAL SKID IF MEASURED AT OES DIFFERED ALSO. SOME UTILIZED HEAT FOR CARBURETOR AIR HEATING
3. ENGINE EXHAUSTS. THESE ALSO VARIED CONSIDERABLY. L ✱ R SIDES DIFFERED MOST CANUCKS ✱ JN-6H. 4. FLIGHT CONTROLS OF JN4-D2 STRENGTHENED THE JN4-D2 PROD. ARMY MODEL USED SHORT STRAIGHT STACKS LIKE OVER 4D DESIGN. 5. AILERON INTERCONNECTIONS: ON MODELS A, C, H ✱ 6 VARIED. A ✱ H, VARIOUSLY WIRE ✱ STRUT: 6H, STRUT ONLY.



SHOWN ABOVE ARE THE "POINTED" WING TRAILING TIPS USED IN THE JN-4A, 4C & CANUCK, AND JN-6H. STAGGER VARIED IN ALL ABOVE TYPES. ACTUALLY, THEY ARE THE JN-4C & CANUCK WINGS. EXHAUSTS AT RIGHT ARE ALSO CANUCK & ARMY VERSION JN4-D2 (PROD.)

SHORT, COLLECTOR EXHAUST OF JN-4, 4A, B, C, D & D-2.

~ U.S. COCKADE. 1918 TO 1920 ~

INSIGNIA. THE LARGE STAR IN CIRCLE, ON WINGS ONLY, WAS USED ON U.S. "JENNIES" FROM MAY 1917 TO JAN. 1918. & PLACED IN FULL CHORD AT TANGENTS SHOWN ABOVE. ON JN'S WITH NO LOWER AILERONS, INSIGNIA WAS PAINTED UNDER LOWER WINGS DIRECTLY BELOW UPPER STAR. THE SAME APPLIED TO COCKADE. (U.S. & CANUCK) SHOWN AT LEFT. RUDDER STRIPES WERE RED (AT TRAILING EDGE) WHITE & BLUE. IN JAN. 1918, THE U.S. CHANGED TO COCKADES, & REVERSED RUDDER STRIPES. SHIPS BUILT SINCE 1918 TO END OF WAR, USED COCKADES WITH RUDDER STRIPES BLUE AT TRAILING EDGE. IN 1920, THE U.S. WAS BACK TO USING STARS & AGAIN TURNED AROUND RUDDER STRIPES TO ORIGINAL RED AT TRAILING EDGE. THE SIZE & LOCATION OF U.S. POSTWAR STAR INSIGNIA IS ALSO SHOWN ABOVE, APPR. ONE DIAMETER INBOARD FROM TIP.

CONT. BELOW:

THE JN-4D WAS THE MOST PRODUCED & USED JENNY. THE CANADIAN JENNY, CALLED THE "CANUCK", & JN-4C, WAS BUILT IN CANADA (SEE PART 2) JN-4, 4A & B, BUILT IN QUANTITY - FOR THE R.F.C., SEVERAL HUNDRED WERE SHIPPED OVER TO BLIGHTY.

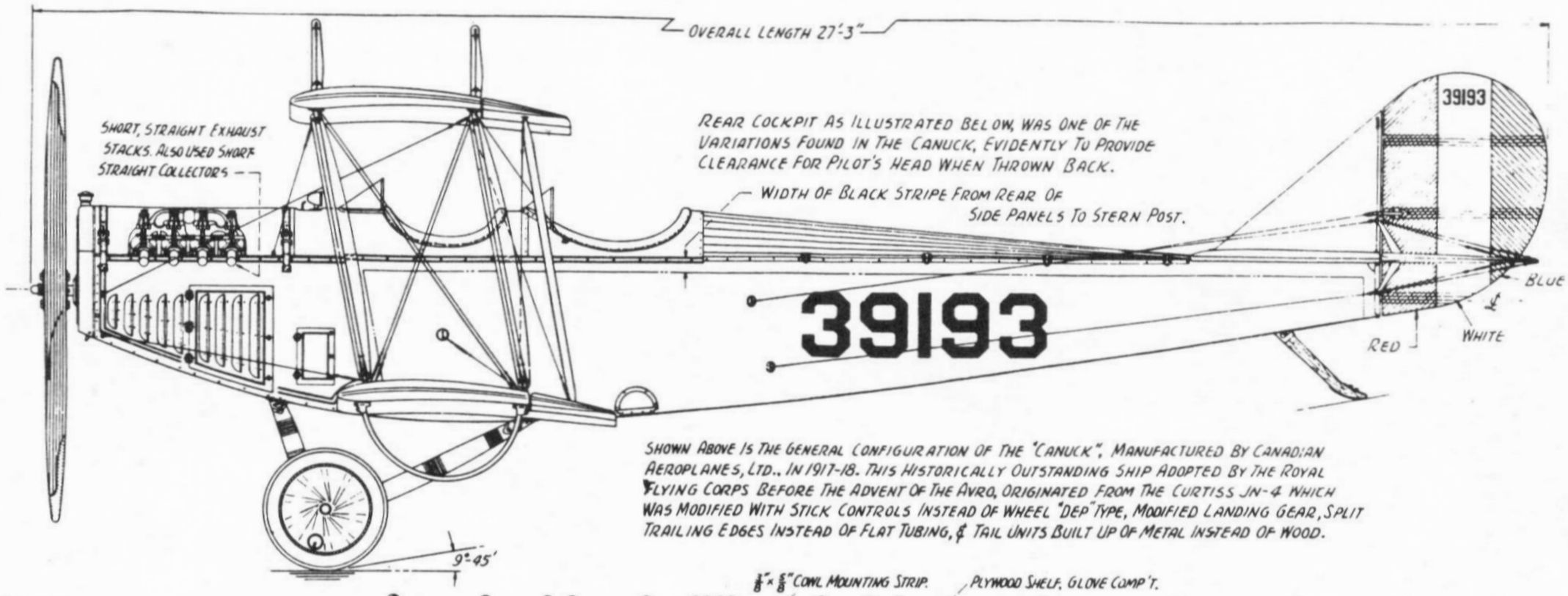
PLAN & FRONT VIEWS ARE FOR JN4-D2 PRODUCTION JOB, EXCEPT FOR 16" STAGGER SHOWN, WHICH WAS 12 5/16" ON 4D2 PROD.

PROPELLER WAS AN 8'-4" DIA. WHITE OAK AIR SCREW MADE BY FLOTTORP MFG. CO, CHICAGO, U.S.A. SIX LAMINATIONS, BUILT UP TO 4 1/4" THICKNESS AT HUB, 7 1/2" DIA. ACROSS BLADES, 6 3/4" AT THE WIDEST POINT.

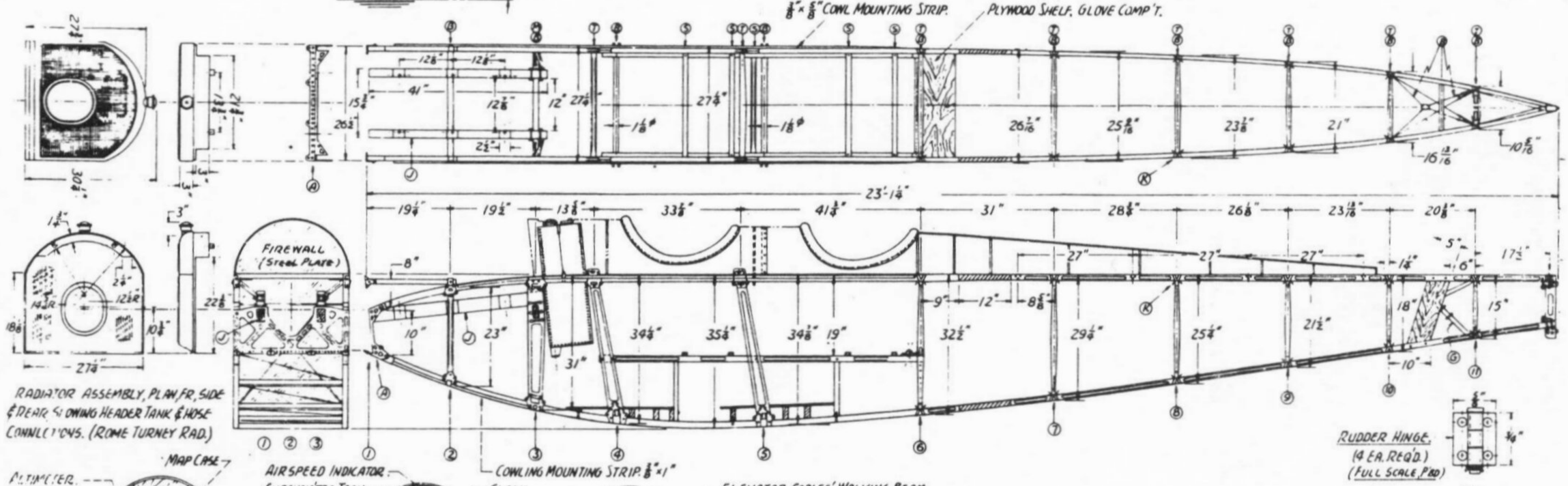
AFTER THE 1918 CHANGE TO COCKADES, MANY WINGS IN SERVICE WERE LEFT UNCHANGED. WING MAY HAVE HAD ONE INSIGNIA AND THE SHIP ANOTHER. COLOR SCHEMES & MARKINGS: DURING WORLD WAR I, JENNIES SPORTED CLEAR DOPED FABRIC, ALTHOUGH SOME LATE ONES WERE PAINTED ALL (TRAINER) YELLOW. U.S. NAVY POST WAR JN'S WERE SILVER, WITH YELLOW ON UPPER SURFACES OF TOP WING & HORIZONTAL TAIL PLANE. SOME ARMY JOBS WERE TRAINER YELLOW, OTHERS ALL OLIVE DRAB. (PRIMARY YELLOW, ADVANCED, O.D.?) COWLING MATCHED PAINT. ON CLEAR DOPED JOBS, COWLS WERE GENERALLY O.D, OR LEFT PLAIN METAL. JN'S USED FROM TWO TO FIVE DIGIT SERIAL NUMBERS ON FUSELAGE SIDES. SOMETIMES SMALL SERIAL NUMBERS WERE LOCATED AT TOP OF WHITE RUDDER STRIPE, PRECEDED BY LETTERS "SC" FOR SIGNAL CORPS. OTHERS USED THE "SC" & SER. NO., SMALL, JUST UNDER UPPER LONGERON, WITH LARGE TRAINER NUMBER BELOW.

SOME SHIPS EVEN FLEW WITH MIXED INSIGNIA. A SPARE

PLYWOOD VENEER (TOP ONLY)
SOLID SPRUCE L.E.
FUEL TANK FILLER CAP. 21 GALS.
2"x 3" ASH MOTOR BEAMS.
FILLER STRIP.
SPRUCE SPAR.
CAP STRIP
PINE WEB PLATES, WERE SOLID AT COMPRESSION RIB STATIONS.
INSTR. PANEL & MAP CASE.
TRAIL END OF C/C.
INSTR. PANEL.
COWLING BLOCKS.
SEAT STRAP.
SCARFED, SAW-TOOTH SPLICE, FORWARD TO NOSE SECTION, LONGERONS WERE MANUFACTURED OF 1⅝"x1⅜" ASH MATERIAL, WHILE TO THE REAR TO STERNPOST, MATERIAL WAS SPRUCE, 1½" SQ. REMOVABLE FAIRING, SPRUCE, FABRIC COVERED.
FOREMOST POINT AT PROP. HUB.
STRANDED STEEL CABLE TRUSSES WERE PAIRED TO UPRIGHT AT REAR COCKPIT (STA. #6) BUT WERE SINGLE, CROSSED CABLES TO TAIL POST.
FUEL TANK SEDIMENT VIAL.
THROTTLE LINKAGE TO CARBURETOR.
RUDDER BAR, FRONT.
AILERON CONTROL CABLE.
LINEN CORD.
STEP.
SEAT RAIL.
DETAIL G TAIL SKID FIXTURE. CROSS-MEMBER AT TOP WAS STEEL BOX, ALSO USED TO SECURE FIXTURE BELOW.
STEEL CROSS MEMBER (2 EA.) USED AT STATION 11.
SHOCK CORD RETAINERS.
ACTUATING POINT.
ELEVATOR CABLES' WALKING BEAM. DETAIL F
AILERON CONTROL CABLE & PULLEYS
FR. FLOOR B'D
REAR FLOOR B'D
GLUE BLOCKS AT STRUT ATTACHMENT.
⅞" DIA. STEEL TUBE.
¼"x⅜" CAP STRIPS.
PLYWOOD SHELF. (GLOVE COMPARTMENT.)
SEAT CUSHION.
SEE FUSELAGE PLAN GENERAL ARR. (PART I.) FOR OUTLINE OF COCKPITS.
CENTER SECTION WING PANEL REMOVED FOR SAKE OF CLARITY.
DRAG WIRES.
STRINGERS TOP & BOTTOM
PLY. VENEER L.E. TOP ONLY.
NOSE WEB.
⅝"x 2¼" SPAR.
16'-9⅝"x⅜" F.S.C. SPEC. 271. LENGTH TAKEN FROM BEARING POINT ON SHACKLE, TO BEARING POINT OF LOOP THAT IS PINNED TO THE FOOT BAR.
12'-11⅛"x 5/32" EX. FLEX. CABLE.
12'-0⅝"x 5/32" EX. FLEX. CABLE.
5/32" EX. FLEX. CABLE.
14'-0" CUTTING LENGTH
SPLICE ON ASSEMBLY.
2'-6⅜"x 5/32" EX. FLEX CABLE.
Ⓕ ELEVATOR WALKING BEAM.
Ⓗ LINKAGE TO W.B. CONTROL SHAFT.
Ⓘ AILERON CONTROL CABLE QUADRANT.
1⅛"x⅜" STIFFENER
HINGE SPARS "A-A." FULL SIZE. (¾ F.S. WHEN PUBLISHED)
½"x⅛" CRIMPED STEEL TRAILING EDGE.
TRAILING EDGE, RUDDER & ELEVATOR. DETAIL E SCALE: FULL SIZE.
ELEVATOR & STABILIZER OF THE JN-3, JN-4C AND CANUCK.
- SCHEMATIC DIAGRAM OF JN- STICK CONTROLS -
ILLUSTRATED ABOVE, IS THE DUAL "JOY STICK" CONTROL SYSTEM MOST GENERALLY USED IN THE FAMED JENNY. THE JN-4, CANUCK AND 4-D2 PROTOTYPE MODELS WERE MODIFIED FROM "DEP" (DEPERDUSSIN) TYPE STEERING-WHEELS TO "STICKS," LIKEWISE FOUND IN THE JN4-D2 PRODUCTION MODEL, JN-4H & 6H. CANUCK CONTROLS WERE MODIFIED AT DALLAS AND KELLY FIELD, TEXAS. ILLUSTRATIONS & DIAGRAMS OF THE EARLY JENNY "DEP." CONTROL SYSTEM, WILL BE FOUND ON PAGE 182, "A.B.C. OF AVIATION," BY CAPT. VICTOR W. PAGE.
OTHER, PERHAPS NOTEWORTHY ODDITIES ABOUT THE JENNY, I.E., CANUCKS, SERVING IN THE R.F.C., TRAINING PROGRAM AT FORT WORTH, TEXAS, (SEPT. 1917, APRIL 1918) WERE IDENTIFIED BY RUDDER STRIPES PAINTED DIAGONALLY INSTEAD OF CONVENTIONALLY VERTICAL. THESE CANUCKS, ALONG WITH JN-4A PROTO'S, WERE USED FOR PILOT TRAINING AND AERIAL GUNNERY, TOWING TARGETS, COMBAT TACTICS, ETC.
THE JN-4 WITH JAMES V. MARTIN AERODYNAMIC CONTROL, WITH AUXILIARY LATERAL & VERTICAL CONTROL SURFACES ON EACH UPPER WING TIP.
IN MEMORY OF ROBERT "BOB" HAUSLER, A DEAR OLD FRIEND OF THE AUTHOR, WHO MOUNTED MANY A JENNY IN THE "GOOD OLD DAYS" AND WHOM I NEVER SAW WITHOUT HIS GRAND OLD LEATHERY SMILE. J. Nieto.
TO MR. PAUL EDWARD GARBER, HEAD CURATOR, & MR. ROBERT C. STROBELL, ASSOCIATE CURATOR, NATIONAL AIR MUSEUM, WASHINGTON, D.C., MANY SINCERE THANKS FOR ASSISTANCE IN THE TECHNICAL DETAILS & FOR HISTORICAL MATERIAL USED IN THE PRODUCTION OF THESE DRAWINGS. J. Nieto. A COMPLETE CURTISS JN-4D AIRPLANE, IS NOW ON PERMANENT EXHIBITION AT THE NATIONAL AIR MUSEUM.
- REAR SPAR - FRONT SPAR. SCALE: 1"=1'-0"
- WING ATTACHMENT FITTING - DETAIL B
DETAIL C FITTING OF LOWER END, INTERPLANE STRUT.
DOUBLE FLYING CABLE TO OVERHANG.
COPPER TIP.
REINFORCEMENT PATCH.
INCIDENCE CABLE.
LANDING CABLE.
AILERON PULLEY ATTACHMENT. DETAIL D
- REAR INTERPLANE STRUTS -
- FRONT INTERPLANE STRUTS -
- FRONT CENTER-SECTION STRUTS -
REAR CENTER-SECTION STRUTS
- CURTISS JN-4D RIB SECTION -
COMPRESSION RIBS (INDICATED IN PLAN- Ⓒ Ⓡ) WERE WEBBED IN WITH SOLID PLYWOOD SHEET BETWEEN FRONT & REAR MAIN SPARS. WING & TAIL SURFACES WERE COVERED WITH COTTON FABRIC OF 80 LBS. TO 1" TENSILE STRENGTH, & WEIGHT, NOT TO EXCEED 4½ OZ. PER SQ. YD, THEN WERE CLEAR DOPED. CANUCKS, FIRST USED IMPORTED IRISH LINEN BUT LATER SUBSTITUTED WABASSO COTTON FABRIC.
FIN BRACE, HARD WIRE.
⅝" BOLTS, NUT & SPLIT PINS.
HARD WIRE FERRULES.
EXTRA FLEXIBLE ELEVATOR CONTROL CABLE. 5/32" TO 7/32"
HARD WIRE.
⅜" BOLTS
- ELEVATOR CONTROL PYLON & FITTINGS. - DETAIL M
VERTICAL FIN BRACE WIRE
⅜" BOLT, NUT & SPLIT PIN.
DOUBLED RUDDER CABLES
No 12 HARD WIRE BRACE
⅜" SHACKLE.
No 16 HARD WIRE BRACE.
- RUDDER CONTROL PYLON & FITTINGS - DETAIL N
LOWER LEFT WING PANEL. (JN-4, 4B, 4D, D2's, 4H, 6H)
PLYWOOD VENEER.
HAND HOLD.
AIR AGE INC. 551 FIFTH AVE. NEW YORK, 17, N.Y.
SCALE: ¼" - 1'-0"
FULL SIZE: ¾" - 1'-0"
CONSTRUCTIONAL DETAILS. WORLD WAR I & POSTWAR U.S. ARMY & NAVY ENGINES
COPYRIGHT BY: Joseph Nieto.
Curtiss TYPES JN-4 - JN-6H.



SHOWN ABOVE IS THE GENERAL CONFIGURATION OF THE "CANUCK", MANUFACTURED BY CANADIAN AEROPLANES, LTD., IN 1917-18. THIS HISTORICALLY OUTSTANDING SHIP ADOPTED BY THE ROYAL FLYING CORPS BEFORE THE ADVENT OF THE AVRO, ORIGINATED FROM THE CURTISS JN-4 WHICH WAS MODIFIED WITH STICK CONTROLS INSTEAD OF WHEEL "DEP" TYPE, MODIFIED LANDING GEAR, SPLIT TRAILING EDGES INSTEAD OF FLAT TUBING, & TAIL UNITS BUILT UP OF METAL INSTEAD OF WOOD.

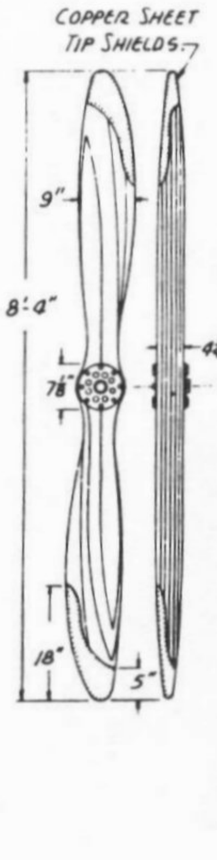


SHOWN ABOVE, IS THE USUAL & APPROXIMATE ARRANGEMENT OF THE ENGINE AND NAVIGATION INSTRUMENTS IN THE JN-4D2 FRONT & REAR COCKPITS: THESE VARIED HOWEVER. SOME JN'S HAVING NAVIGATIONAL INSTRUMENTS MOUNTED ON HORIZONTAL AUXILIARY BOARDS, LOW IN FRONT & ON EITHER SIDE OF THE PILOT. STANDARD EQUIPMENT CALLED FOR: AN AIRSPEED, BALL LEVEL IND., ALTIMETER, TACHOMETER, CLOCK, OIL PRESSURE GAUGE, FUEL PRESS. (IN STARTING SYSTEM) FUEL AIR PRESSURE IN FEED SYSTEM, MAGNETIC COMPASS, THROTTLE & IGNITION CONTROL LEVERS AND SWITCHES & FUEL CUT OFF VALVE IN REAR OR INSTRUCTOR'S COCKPIT. STUDENT'S (FRONT) COCKPIT WAS EQUIPPED WITH ONLY THE MOST PERTINENT INSTRUMENTS WITH REGARD TO AIRCRAFT ALTITUDE, SPEED & POSITION. SPARK & THROTTLE CONTROLS ON THE JN-4D2 WERE CHANGED TO LEFT SIDE OF COCKPITS AS SHOWN ON OPPOSITE PAGE.

~ SPECIFICATIONS. ADDITIONAL TO PART 1. ~

AREAS:	
UPPER PLANES.	167.92 ☐
LOWER PLANES.	149.42 "
AILERONS. (EACH 17.6 ☐)	35.20 "
HORIZONTAL STABILIZER.	28.70 "
VERTICAL STABILIZER.	3.80 "
ELEVATORS (EACH 11.00 ☐)	22.00 "
RUDDER.	12.00 "
TOTAL SUPPORTING SURFACE.	352.56 "
WEIGHTS:	
NET WEIGHT, EMPTY.	1430 LBS.
GROSS WEIGHT, LOADED.	1920 "
USEFUL LOAD.	490 "
WEIGHT OF FUEL (21 U.S. GALS.)	130 "
" " OIL (4 " ") IN CRANKCASE.	30 "
" " PILOT & PASSENGER (165 LBS. EA.)	330 "
PERFORMANCE:	
MAXIMUM, HORIZONTAL SPEED.	75 M.P.H.
MINIMUM " "	45 "
CLIMB IN 10 MINUTES.	2000 FEET.
ENGINE: CURTISS OX-5, 90 HP, V-8 (STAGGERED CYL'S) WATER COOL'D	

RATED AT 1400 R.P.M. WEIGHT PER R.H.P. - 4.33 LBS. BORE & STROKE - 4" × 5"
FUEL CONSUMPTION - 9 GALS. PER HR. FOREGOING DATA, FROM THE CURTISS STANDARD JN-4D MILITARY TRACTOR HAND BOOK, 1918. (NOTE: DETAILED SCALE DRAWINGS OF THE CURTISS OX-5 90 H.P. ENGINE ARE IN COURSE OF PREPARATION AT THIS WRITING, IN ¾" TO 1'-0" SCALE, BUT WERE NOT AVAILABLE IN TIME FOR THIS ISSUE. J. Nieto.)



SHOWN ABOVE, IS ONE TYPE (FLOTTORP) PROPELLER USED ON JENNIES, WHEREIN VARIOUS DESIGNS AND SIZES WERE USED. ABOVE, IS THE 8'-4", 6 LAMINATIONS WHITE OAK PROPELLER CANADIAN AEROPLANES LTD., MANUFACTURED A 9FT., FIVE PLY, WHITE OAK PROPELLER ON MACHINES THAT WERE ALMOST HUMAN, ORIGINATING FROM A LATHE DESIGNED BY PETER THE GREAT FOR MAKING GUN-STOCKS. C.A.L.'S MACHINE TURNED OUT PROPS., FOUR AT A TIME, TO ½" OF FINISHED FORM. FINAL TOUCHES AND BALANCING, COMPLETED BY HAND.

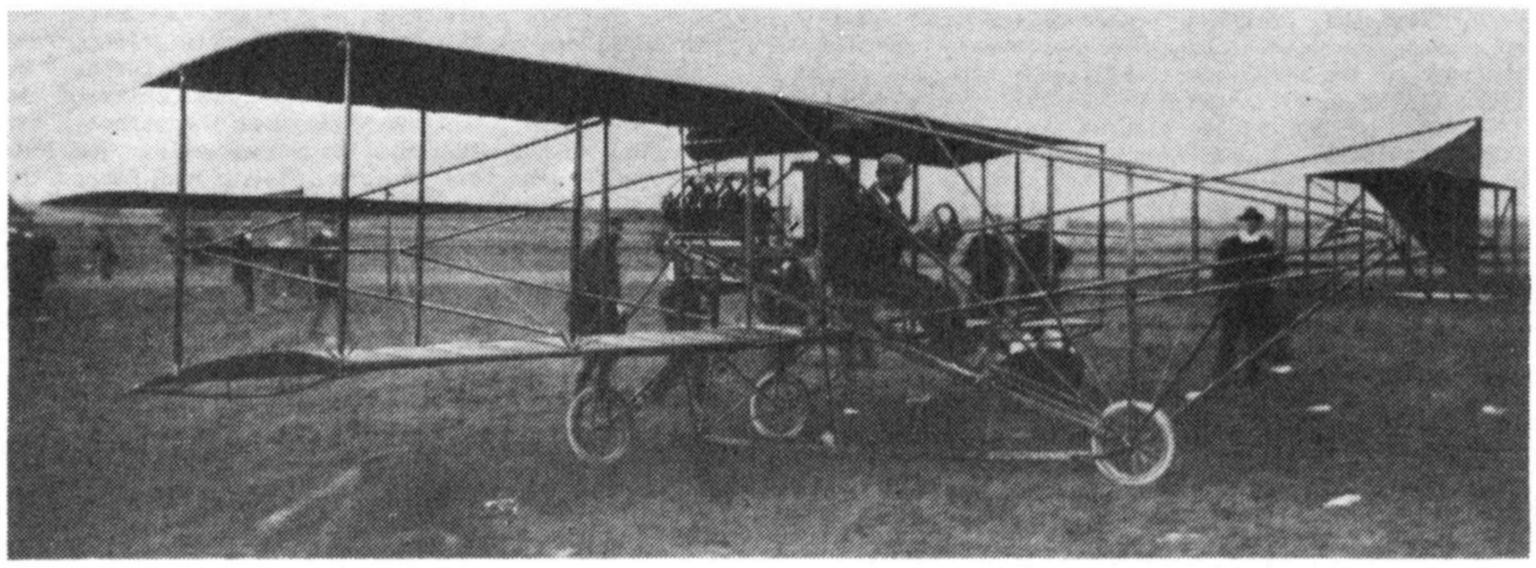
Curtiss Model D

drawing by WILLIAM WYLAM

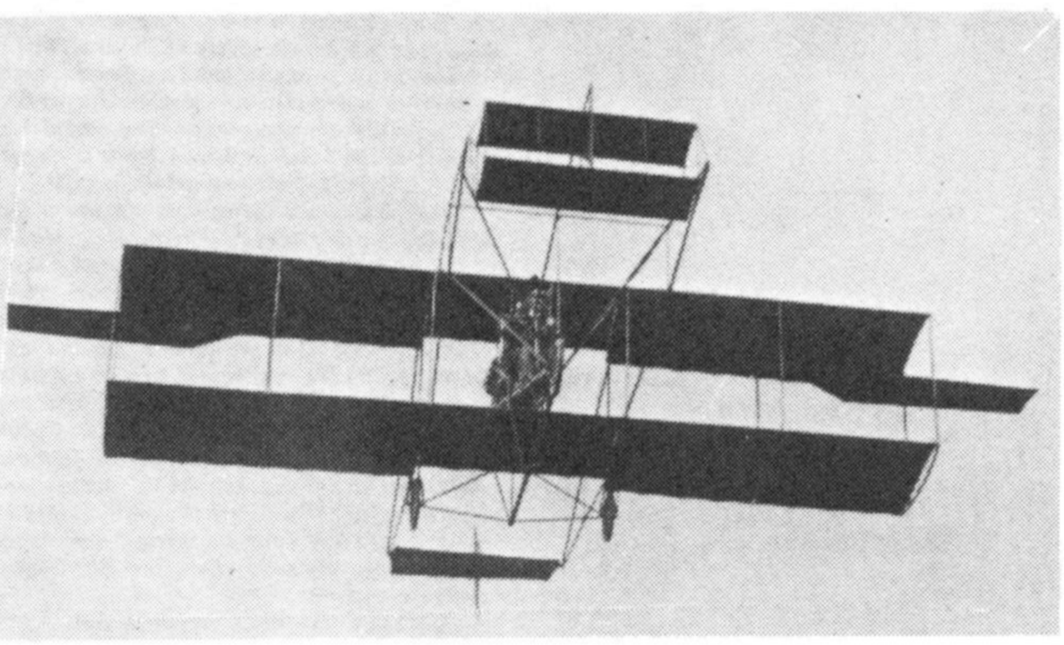
THIS AIRCRAFT was the result of U.S. Signal Corps authorization by Congress to appropriate aircraft for the Army. After a 5-year struggle to prove the practicality of the airplane, the Wright Brothers' flight demonstration had opened the eyes of Army brass to a new spectrum of weaponry. In 1911 Congress approved the first allotment specifically for aeronautics, and the Wright Brothers and Glenn Curtiss received the first two such contracts.

Designated "Signal Corps" sequence numbers, S.C. 1, the first military aircraft of the Wright Brothers was retired to the Air Force Museum that year, and Curtiss' S.C. 2 was the second aircraft to enter testing at Fort Sam Houston in April 1911. G.E.M. Kelly flew the trials on the morning of April 10. He took it up and shortly came in for a landing, hit the ground hard, and bounced back in the air. Climbing slowly, Kelly banked the airplane away from the tent area, suddenly lost control, and plummeted to his death. The S.C. 2 was repaired, however, and was used as a trainer. It was removed from service on February 24, 1914.

Seven Pushers survive, and many reproductions. □



The Curtiss S.C. 2 was the second aircraft to enter the military inventory. "A.A.H.S." Journal photo.



Glen Curtiss at the controls of his June Bug was determined to prove the utility of the airplane to the military. "A.A.H.S. Journal" photo.

MODEL A

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

SCALE: 1/4" = 1'-0"

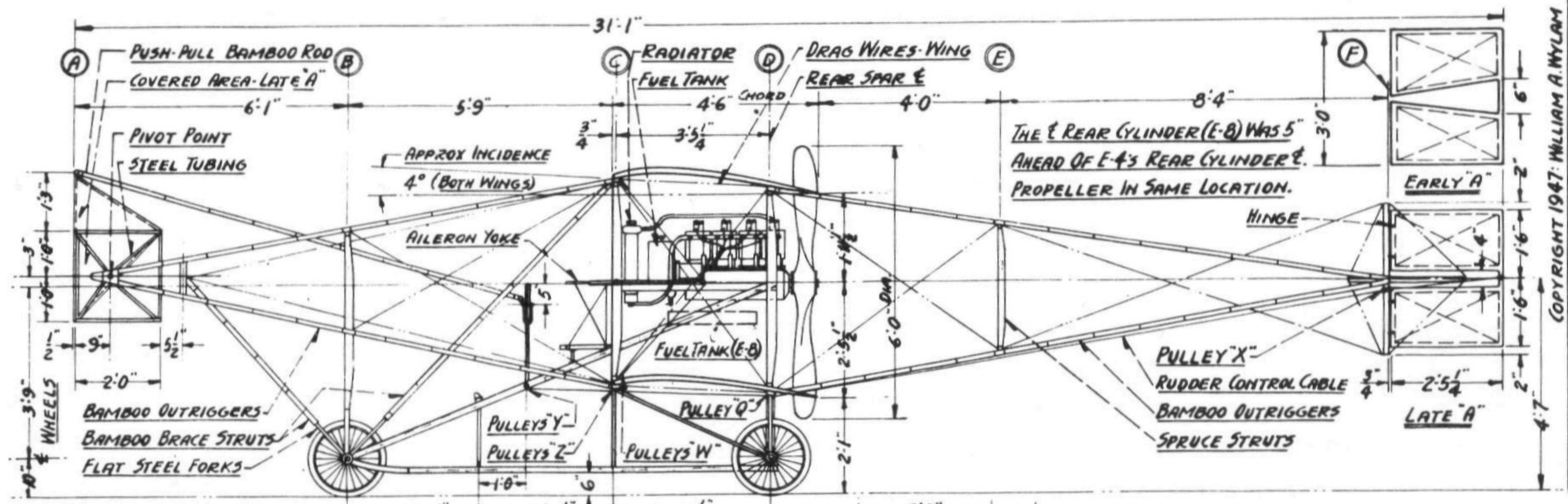
DATE:

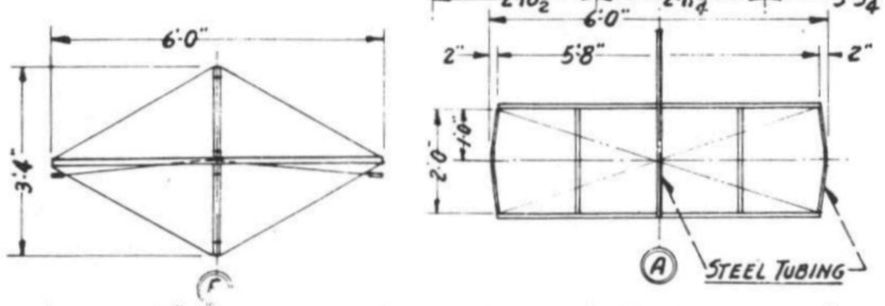
DRAWN BY ... W.A.WYLAM

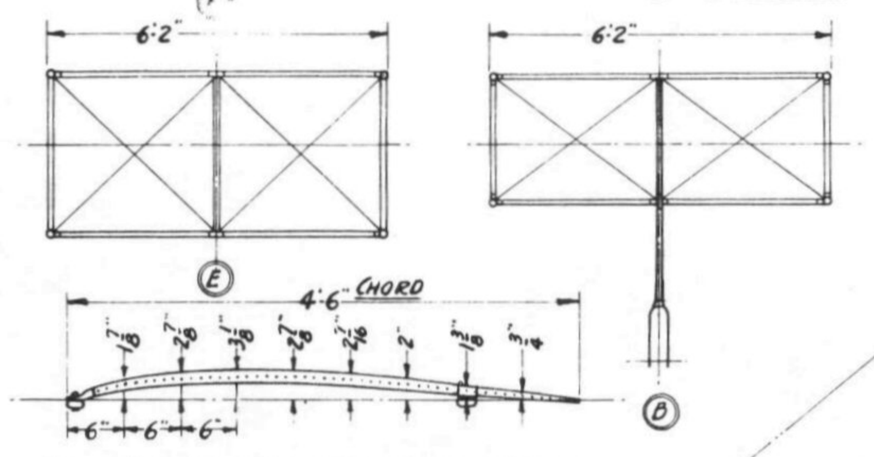
GENERAL ARRANGEMENTS

CURTISS 1909 BIPLANE PUSHER

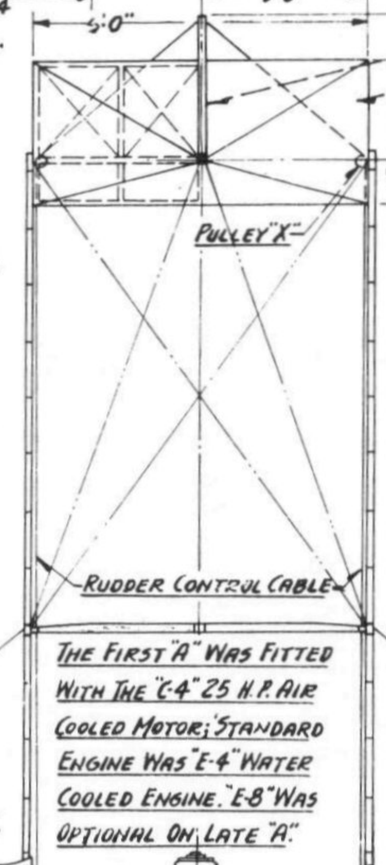
COPYRIGHT 1947: WILLIAM A. WYLAM

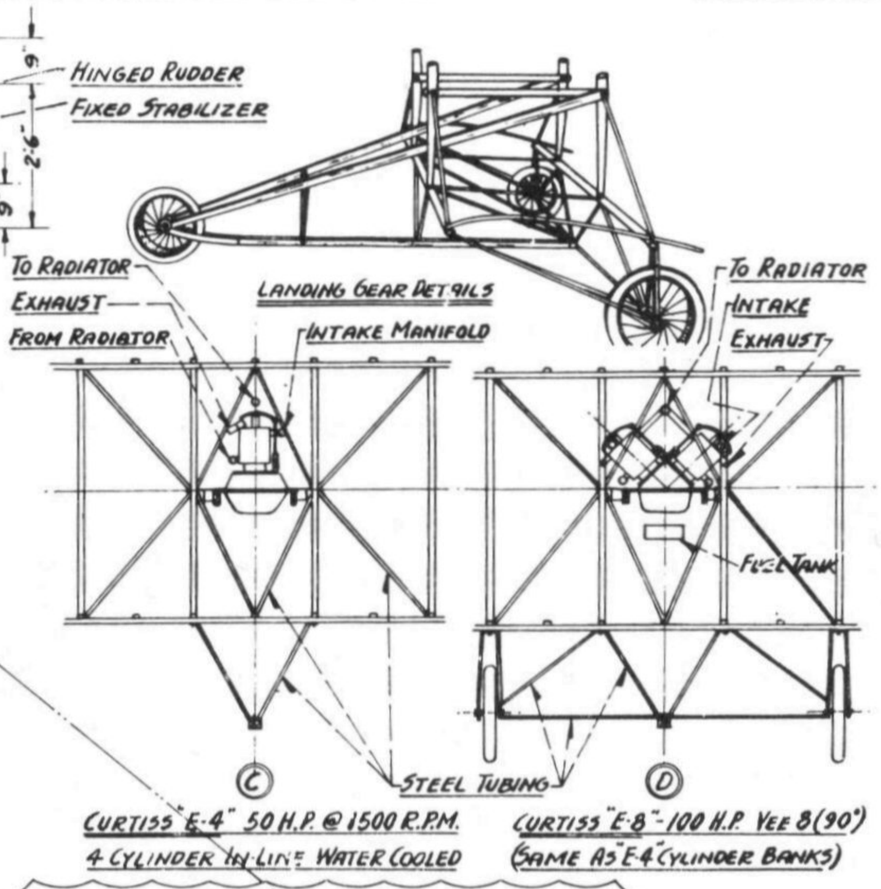






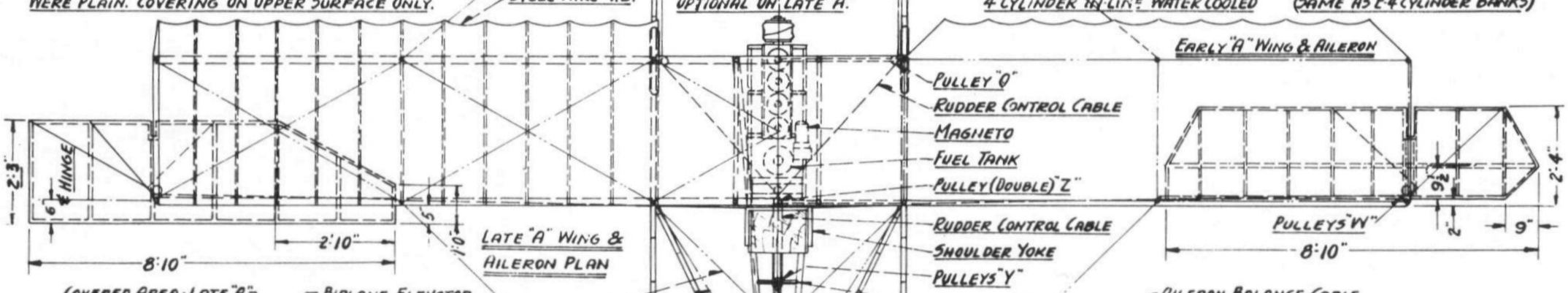
RIBS AT VERTICAL STRUTS WERE PROVIDED WITH LACING HOLES FOR LACING CANVAS TO RIBS; ALL OTHER RIBS WERE PLAIN. COVERING ON UPPER SURFACE ONLY.

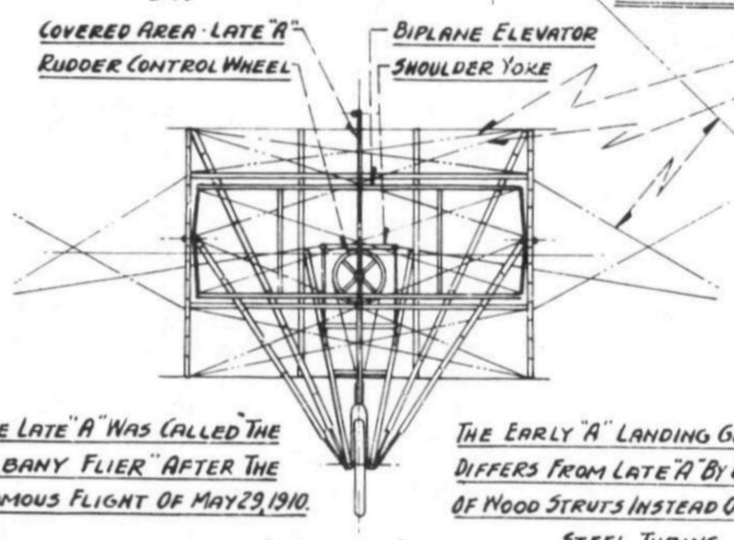




CURTISS "E-4" 50 H.P. @ 1500 R.P.M. 4 CYLINDER IN LINE WATER COOLED

CURTISS "E-8" - 100 H.P. VEE 8 (90°) (SAME AS "E-4" CYLINDER BANKS)

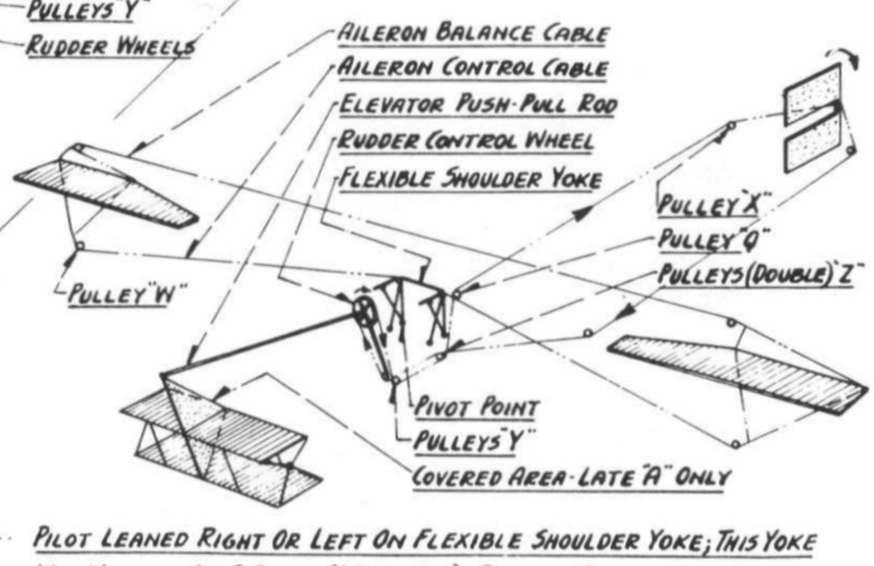


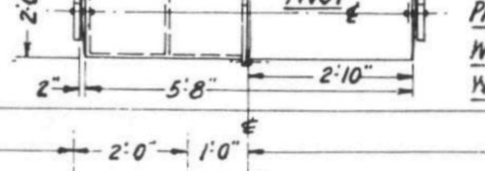


THE LATE "A" WAS CALLED "THE ALBANY FLIER" AFTER THE FAMOUS FLIGHT OF MAY 29, 1910.

OUTRIGGER FRONT VIEW

THE EARLY "A" LANDING GEAR DIFFERS FROM LATE "A" BY USE OF WOOD STRUTS INSTEAD OF STEEL TUBING.



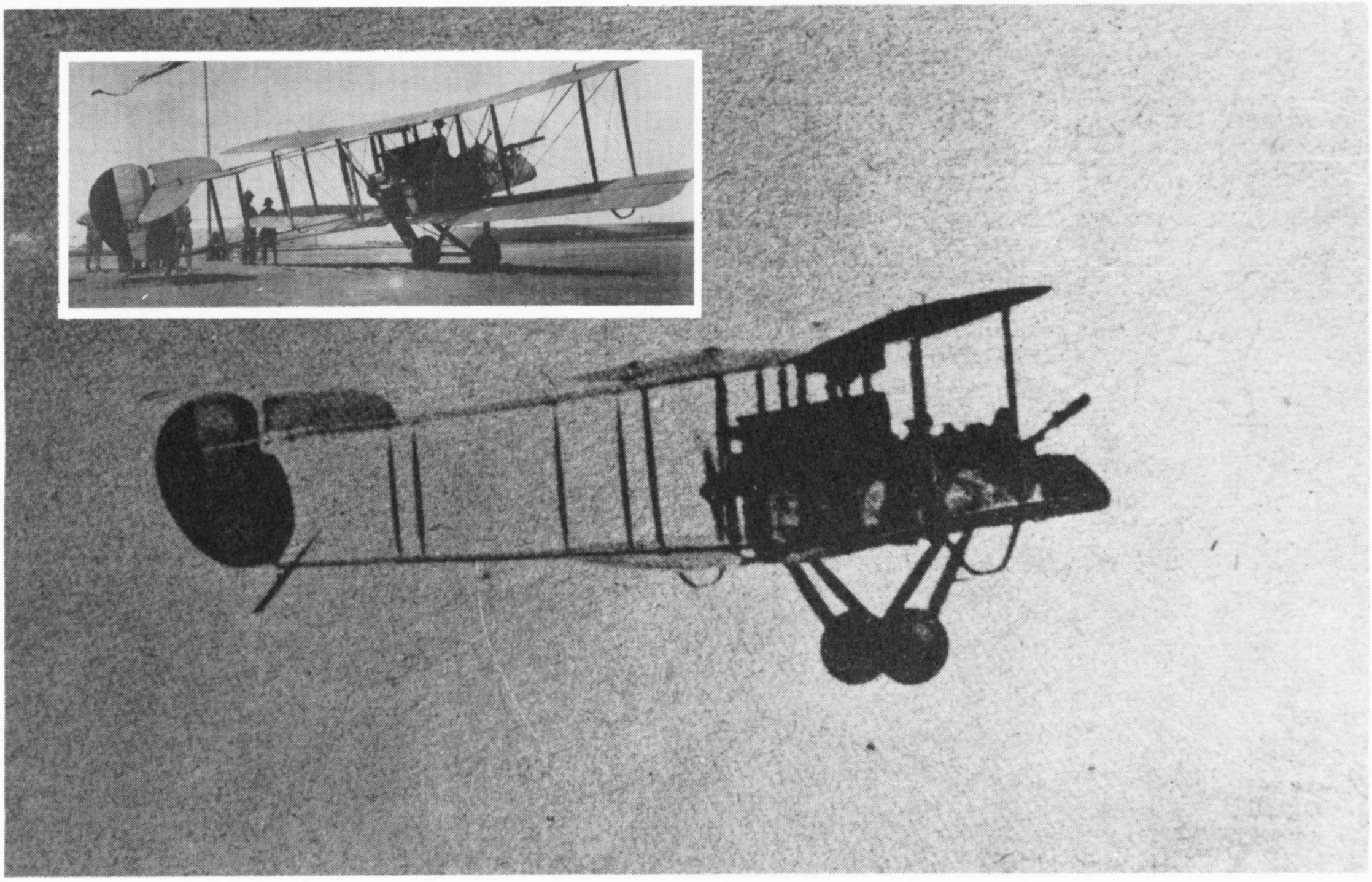


PILOT LEANED RIGHT OR LEFT ON FLEXIBLE SHOULDER YOKE; THIS YOKE WAS MOUNTED ON 8 PIVOTS (4 EACH SIDE). RUDDER TURNED SHIP TO LEFT WHEN THE WHEEL WAS TURNED CLOCKWISE.

ENTIRE AIRPLANE WAS OF NATURAL VARNISH FINISH. ALL METAL FITTINGS & TUBINGS WERE PAINTED ALUMINUM.

DeHavilland D.H.1

drawings by WILLIAM WYLAM

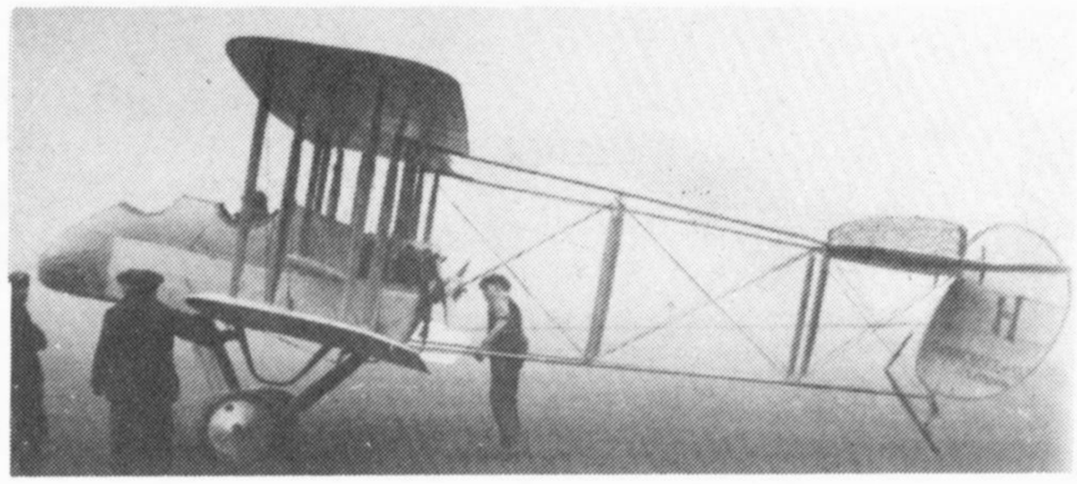


THE deHavilland D.H.1 was a two-bay pusher biplane designed by Geoffrey deHavilland in 1915 while he was with the Aircraft Manufacturing Company, producers of the plane. As simple as they were in those days, aircraft could be designed, built, and test-flown in a matter of just a few months. The D.H.1 was an immediate success and garnered much of that success from the 70-hp Renault V-type air-cooled engine. Its top speed at sea level was 78 mph, and its rate of climb was estimated at something less than 500 fpm.

DeHavilland himself did all the preliminary flight testing on the D.H.1. The lessons he had learned in the application of inherent stability theories to full-size aircraft were incorporated in his new pusher. He demonstrated these qualities very impressively by flying hands off during tests and on low passes.

Although the D.H.1 was never produced in quantity, it was a very good airplane both performance-wise and structurally.

With a good airplane on their hands but no orders, the makers decided to develop the D.H.1 into a more serviceable military design, thus the D.H.1A evolved, which did reach limited production. There are none left. □

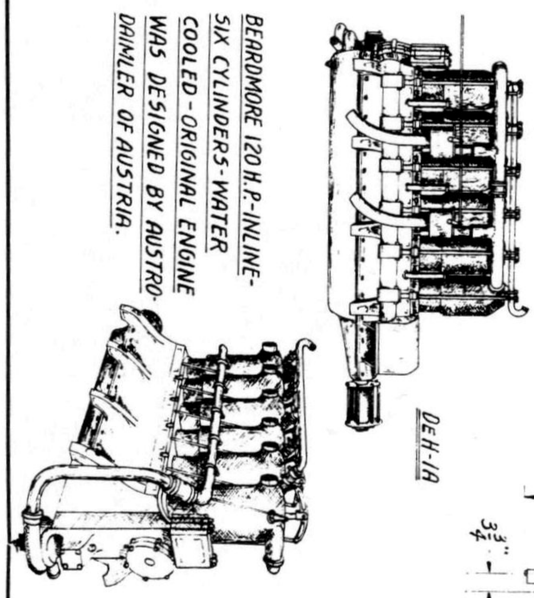


Springboard for the deHavilland aircraft manufacturing firm, the D.H.1 was considered a fine aircraft in its time. Air Age file photos.

41'-0" SPAN

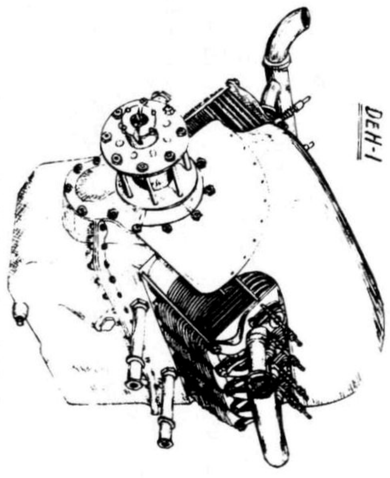
AILERON HORN
AILERON PULLEY HOUSING
FAIRLEAD
MAIN FUEL TANK
AILERON BALANCE CABLE
3° DIHEDRAL
AILERON GAP WIRE
COLOR SCHEME
ALL FABRIC SURFACES WERE CLEAR DOPED TO A CREAM TINT; ALL WOOD & METAL SURFACES WERE PAINTED LIGHT GREY.
DOUBLE ELEVATOR PULLEYS "K"
ELEVATOR CONTROL CABLES
GRAVITY FUEL LINE
PITOT HEAD (AIRSPEED)
RUDDER CONTROL CABLE
SINGLE LANDING WIRES
DOUBLE FLYING WIRES
AILERON CONTROL CABLE
PULLEY "J"
WIRES "B" & "C" WERE STEEL TAPES
3° DIHEDRAL
LATE DeH-1A'S RUDDER & TAIL-SKID
(TAIL-SKID WAS STANDARD ON ALL DeH-1A'S)
DeH-1A
DeH-1
DeH-1 AND EARLY DeH-1A'S RUDDER
(TAIL-SKID WAS STANDARD ON ONLY DeH-1'S)
SAME WINGS AND TAIL BOOMS ON BOTH
DeH-1 & DeH-1A.
4563
4501
BLUE
RED
AMC 3175
AMC 3027
28'-11⅝" DeH-1 & EARLY DeH-1A OVERALL
12'-11½" NACELLE-DeH-1A
5'-6" CHORD
ELEVATOR PULLEYS "K"
GAS FILL-MAIN FUEL TANK
WATER FILL-RADIATOR
FLEXIBLE WINDSCREEN
PLYWOOD COWLING
LEWIS MACHINE GUN
OPTIONAL WINDSCREEN
BOTH WINGS
4½° INCIDENCE
OPTIONAL COWL
EXHAUST
ELEVATOR CABLES
RUDDER CABLE
5'-7" GAP
METAL NOSE
FABRIC & LACING
METAL STEP
ELEVATOR HORN
AILERON CABLE OUTLET
RUDDER CABLE OUTLET
AILERON PULLEY HOUSING
PLYWOOD PANEL
CARBURETOR AIR INTAKE
ENGINE MOUNT
AILERON HORN
WING SKID
COOLING AIR INTAKE
ASH TAIL BOOMS-1½" DIA.
SPRUCE STRUTS
TURNBUCKLE ASSEMBLY
10°
7'-6¼"

BEARDMORE 120 H.P. INLINE-SIX CYLINDERS-WATER COOLED-ORIGINAL ENGINE WAS DESIGNED BY AUSTRO-DAIMLER OF AUSTRIA.



DeH-1A

RENAULT 80 H.P. V-8-AIR COOLED



DeH-1

DeH-1A SHOWN — BEARDMORE 120 H.P. ENGINE

THANKS TO E.W. ATKINS, W.J. BAIRD, P.M. BOWERS, M.J. DRAVERS, R.L.G. MAHON, O.G. THETFORD & HELMUTH ZIEBE.

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

SCALE: ¼" = 1'-0"

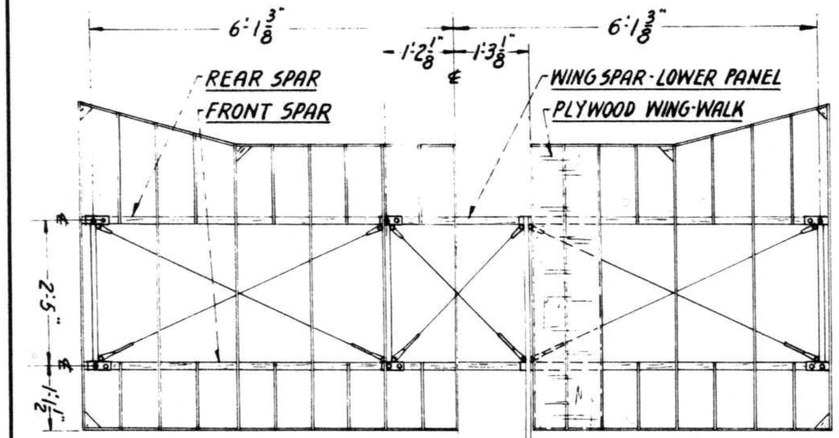
TYPE: PUSHER

COPYRIGHT 1948 WILLIAM A. WYLAM

GENERAL ARRANGEMENT
ENGLISH'S DeHAVILLAND

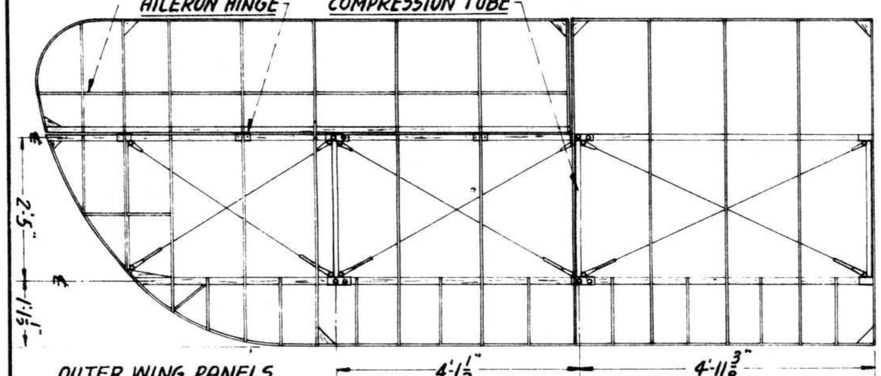
DeH-1

BUILT 1915-'16 BY THE AIRCRAFT MANUFACTURING CO., LTD.

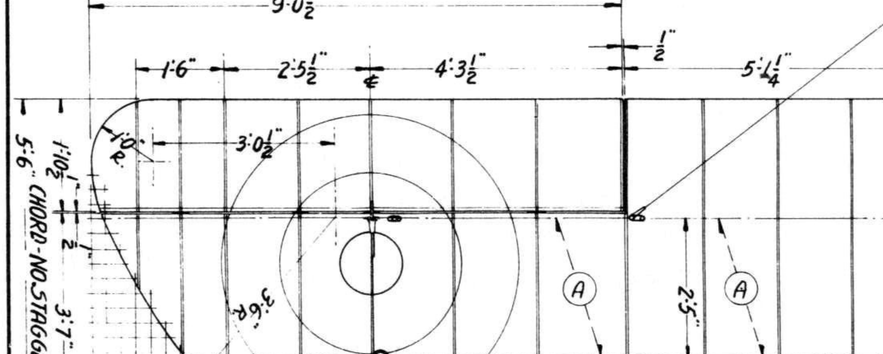


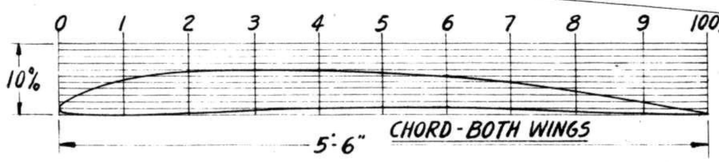
UPPER CENTER WING PANEL
(ONE CONTINUOUS UNIT)

LOWER CENTER WING PANEL
(R.H. & L.H. UNITS ON SAM
FRONT & REAR SPARS)

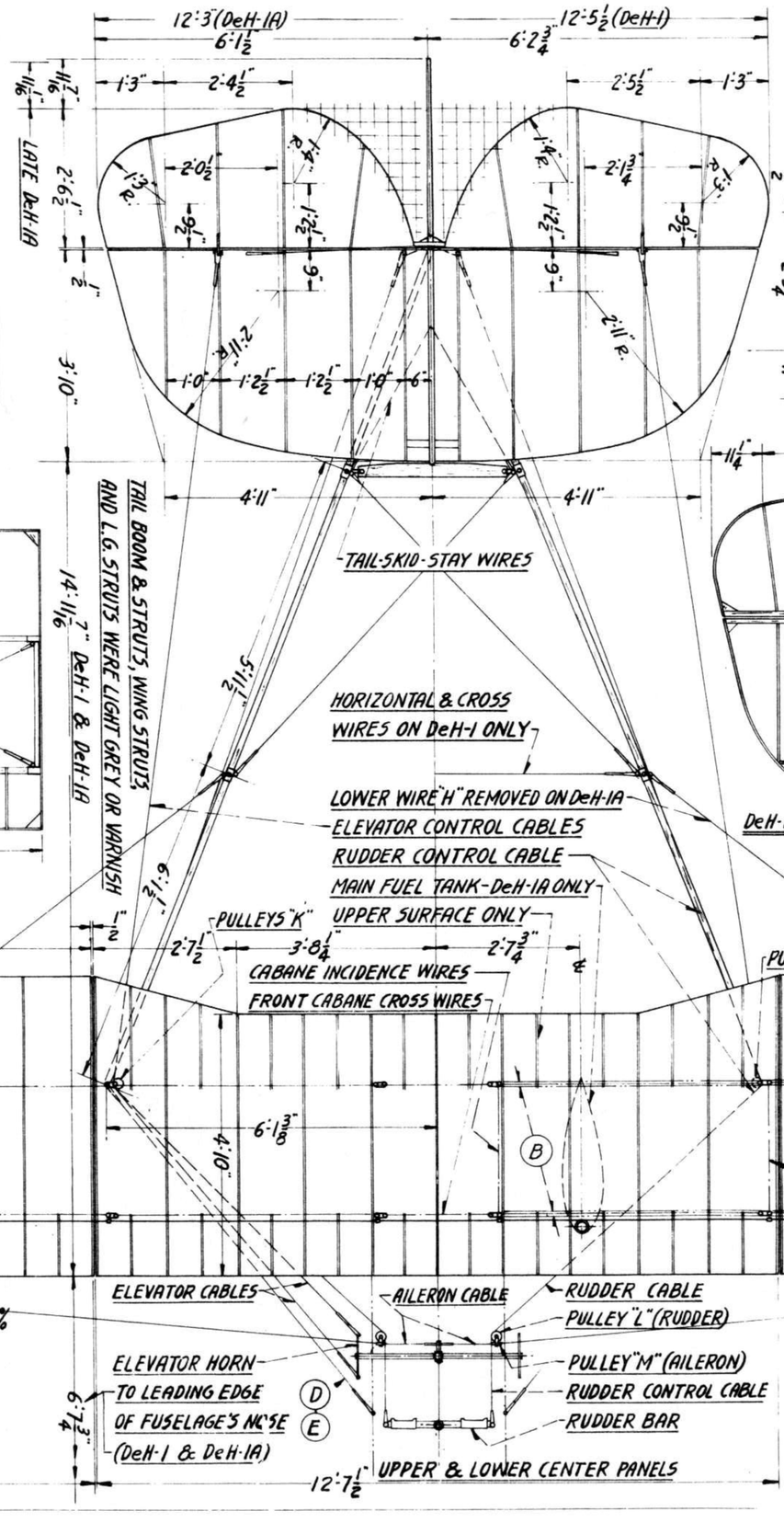


OUTER WING PANELS

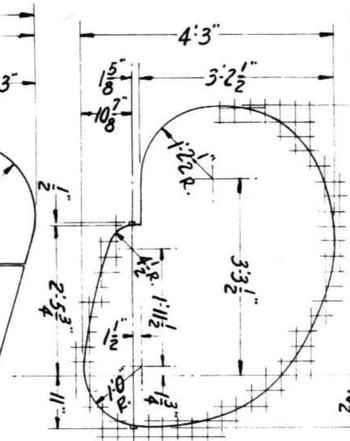




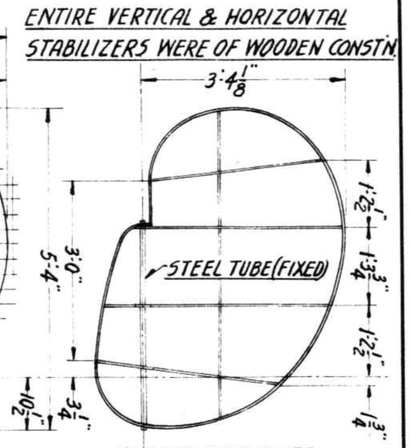
14'-1¾" OUTER PANELS (DeH-1 & DeH-1A)
41'-0" SPAN



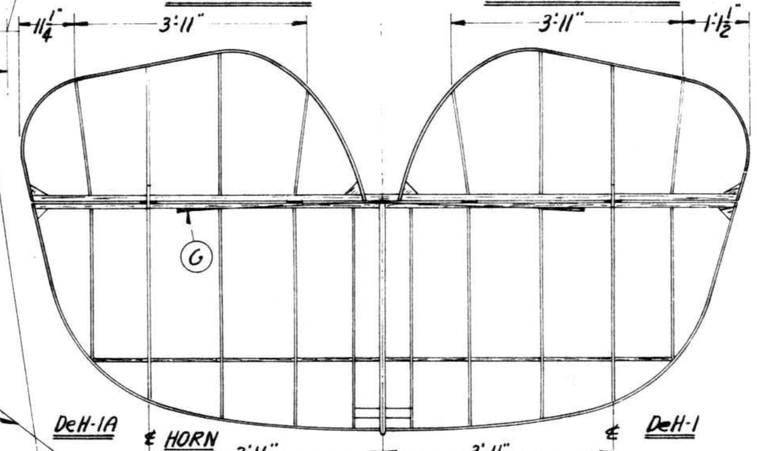
ENTIRE VERTICAL & HORIZONTAL
STABILIZERS WERE OF WOODEN CONSTN



RUDDER LAYOUT



RUDDER STRUCTURE



DeH-1A ℄ HORN DeH-1

HORIZONTAL STABILIZER & ELEVATOR

AIR AGE INC., 551 FIFTH AVE., NEW YORK 17, N.Y.	
SCALE: ¼"=1'-0"	PLAN-VIEW LAYOUT & DETAILS
TYPE: PUSHER	ENGLISH DeHAVILLAND
COPYRIGHT 1948 WILLIAM A. WYLAM	DeH-1
BUILT 1915-16 BY THE AIRCRAFT MANUFACTURING Co. LTD	

TYPICAL DeH-1 & DeH-1A RIB DETAILS

CLOCKWISE

BEARDMORE PROPELLER

9'-0" DIA.

PLYWOOD PLATFORM

ELEVATOR HORN

AILERON TORQUE TUBE

DeH-1A

DeH-1

RADIATOR HOUSING

AIR INTAKE (COOLING)

MAIN FUEL TANK

BEARDMORE 120 H.P.

RENAULT 80 H.P.

ALL STRUTS WERE STREAMLINED

INBOARD STRUTS

FIN STRUCTURE

1½" DIA. BOOMS

STEEL ROD WAS RUDDER PIVOT & TAIL BOOM'S UPRIGHT STRUT

APPROX.

APPROX

DUAL CONTROLS ON DeH-1 ONLY

ELEVATOR CONTROL CABLES

NACELLE LENGTH - DeH-1

PULLEYS "K" (INBOARD STRUTS)

DeH-1 WITH RENAULT 80 H.P. AIR COOLED V-8. USED FOR TRAINING & HOME DEFENSE

PLYWOOD

METAL

FABRIC

WIRE REINFORCEMENT

WOODEN L.G. STRUTS

FOOT STIRRUP

TO RUDDER

TO AILERON

ELEVATOR

PULLEY "J" (INBOARD STRUTS)

COUNTER-CLOCKWISE (FROM FRONT VIEW)

ALTIMETER

IGNITION

CLOCK

COMPASS

TACHOMETER

PRIMER

AILERON QUADRANT

RENAULT PROPELLER

ELEVATOR HORN

PULLEYS "M"

ALL SQUARES = 3"

FUSELAGE LAYOUT

INSTRUMENT PANEL

FRONT SEAT

THROTTLE

CONTROL COLUMN

RUDDER BAR

ELEVATOR PUSH-PULL ROD

AILERON TORQUE ROD

FUSELAGE DETAILS

PILOT SEAT

PLYW'D. SUPPORT

RUDDER CONTROL CABLE

REAR RUDDER BAR

ELEVATOR CONTROL HORN

SUPPORT BEARINGS

AILERON QUADRANT

PULLEYS "L" (RUDDER'S)

PULLEYS "M" (AILERON'S)

	A	B	C
DeH-1	2'-2½"	3'-11½"	2'-0"
DeH-1A	2'-6"	3'-8"	2'-4½"

3'-4½" DeH-1 (TRUE)

3'-6½" DeH-1A

SHOCKCORD SLOT

REAR SPREADER TUBE

STRUT LAYOUT

LANDING GEAR

7'-2¾"

BUILT-UP SUB-WING (DETAILS ARE UNKNOWN)

FRONT & REAR L.G. BRACE WIRES

OPEN SPACE

FRONT & REAR SPARS (LOWER CENTER PANEL)

DeH-1A ONLY

PLYWOOD

DeH-1 & DeH-1A BOTTOM VIEW

AILERON GAP WIRE

INCIDENCE WIRES

OUTBOARD STRUTS

THANKS, ALSO, TO CHARLES DONALD & CASIMIR PAWLAK

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

SCALE: ¼" = 1'-0"

TYPE: PUSHER

COPYRIGHT 1948 WILLIAM A. WYLAM

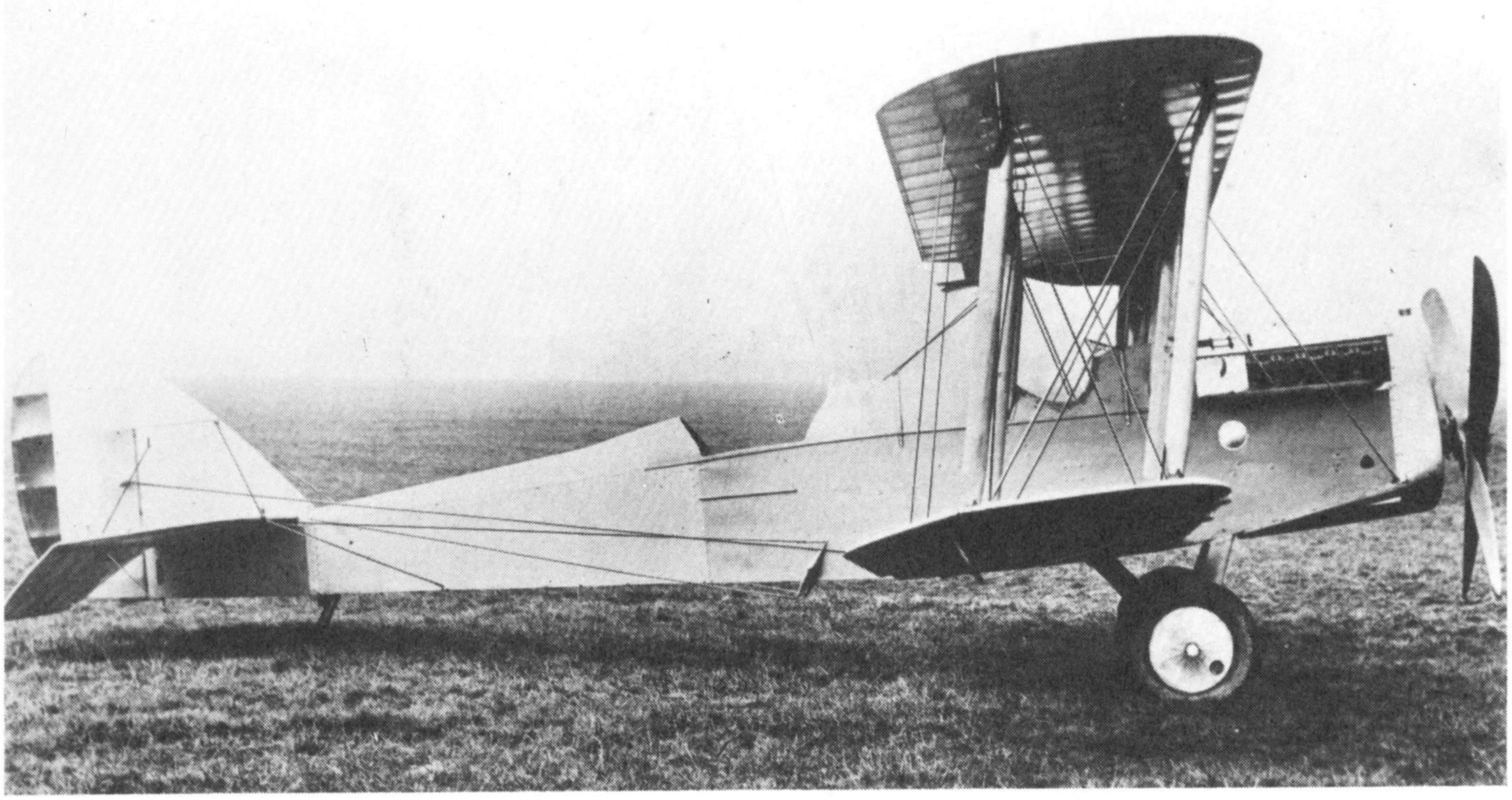
FUSELAGE LAYOUT & DETAILS ENGLISH'S DeHAVILLAND

DeH-1

BUILT 1915-16 BY THE AIRCRAFT MANUFACTURING Co., Ltd.

DeHavilland D.H.4

drawings by WILLIAM WYLAM



Entered into service in 1916, the D.H.4 had a long and productive life despite its reputation as a "flying death trap." "Model Airplane News" photo.

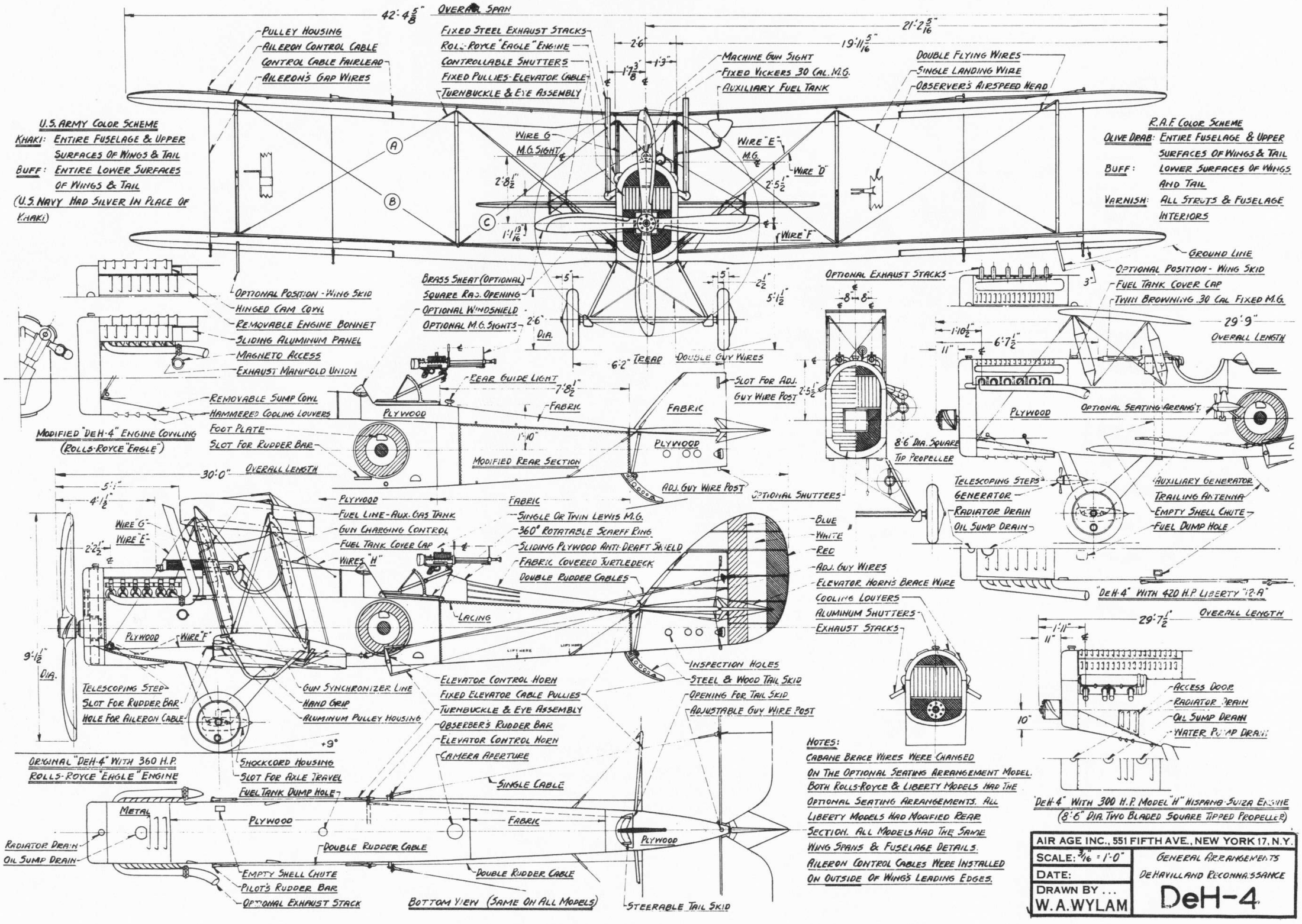
THE BRITISH firm known as the Aircraft Manufacturing Company was founded by G. Holt Thomas in 1912, and among its talented designers was Geoffrey deHavilland. Credited with many successful designs, deHavilland was prolific. In June 1916 mechanics rolled out the prototype of the now famous D.H.4 biplane, which was later to be both condemned and praised for its characteristics and fighting abilities. The ship was big and beautiful, yet in some respects ungainly and unsafe.

The first production models to go into service in 1916 were fitted with a variety of engines from 200-260 hp. The completely enclosed fuselage with its occupants sitting in tandem was not new, but the fact that the gunner member of the crew sat in the rear seat was. The greatest influence in the change of crew positions was the advent of the synchronized gun on the cowling.

Later versions of the D.H.4 made use of the Rolls-Royce Falcon engine and later still the Eagle engine, which produced 375 hp.

Throughout the history of aviation, airplanes have been given nicknames, most of them of a complimentary nature, and which were supposed to describe the plane's most outstanding characteristics. "Flaming Coffin" was attached to the D.H.4 early in its career, because the fuel tank was positioned between the cockpits. Its excellent handling qualities and large speed range encouraged development, and in the DH-4B (American designation) the pilot was moved back and the tank forward.

Six D.H.4's are left, in various models in various conditions. □



NOTES:
CABANE BRACE WIRES WERE CHANGED ON THE OPTIONAL SEATING ARRANGEMENT MODEL. BOTH ROLLS-ROYCE & LIBERTY MODELS HAD THE OPTIONAL SEATING ARRANGEMENTS. ALL LIBERTY MODELS HAD MODIFIED REAR SECTION. ALL MODELS HAD THE SAME WING SPANS & FUSELAGE DETAILS. AILERON CONTROL CABLES WERE INSTALLED ON OUTSIDE OF WING'S LEADING EDGES.

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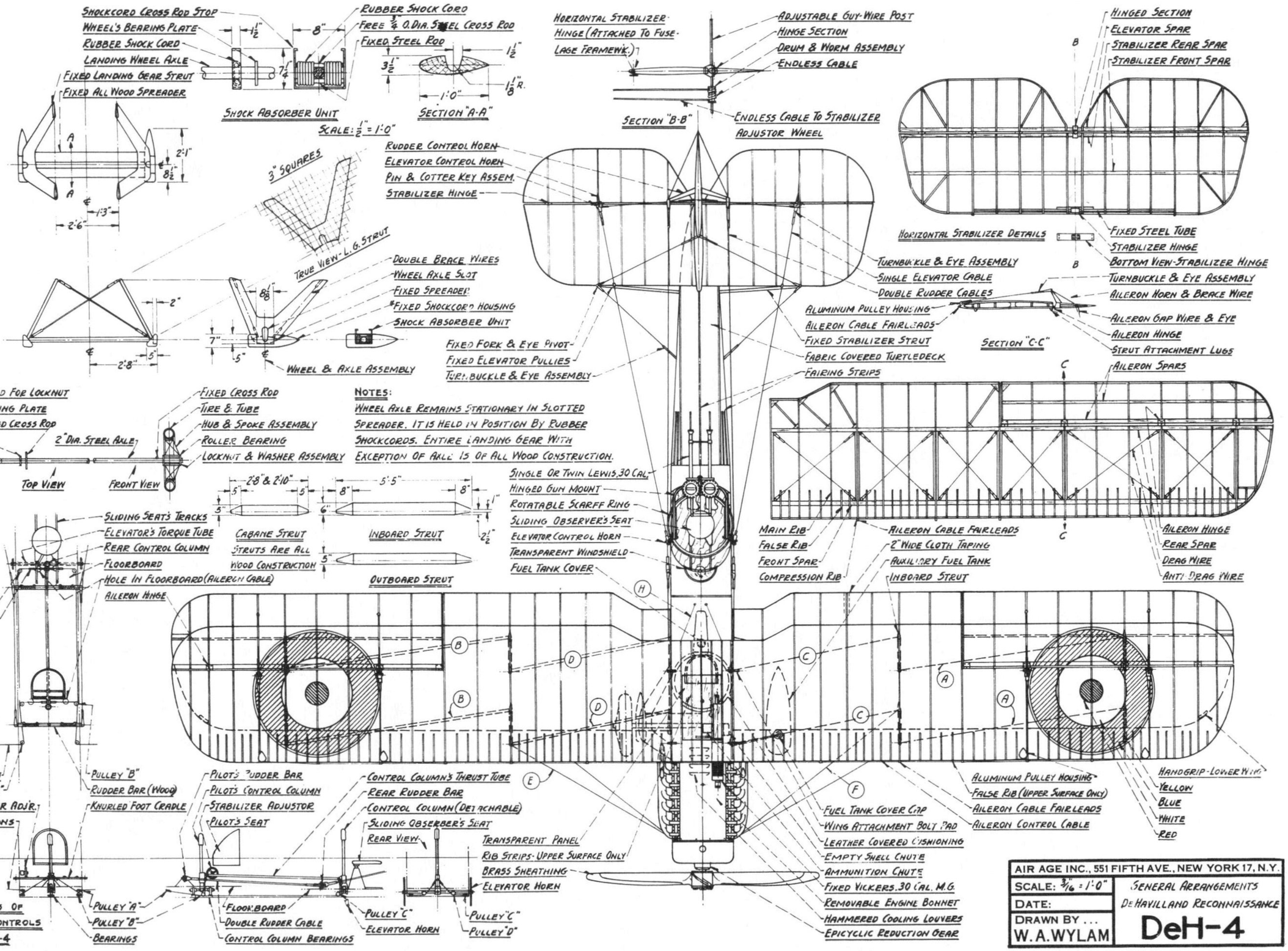
SCALE: 3/16" = 1'-0"	GENERAL ARRANGEMENTS
DATE:	DE HAVILLAND RECONNAISSANCE
DRAWN BY ... W. A. WYLAM	DeH-4



AIR AGE INC., 551 FIFTH AVE., NEW YORK 17, N.Y.	
SCALE: 3/16" = 1'0"	General Arrangements
DATE:	DeHavilland Reconnaissance
DRAWN BY ... W.A.WYLAM	DeH-4

AIR AGE INC., 551 FIFTH AVE., NEW YORK 17, N.Y.
SCALE: 3/16" = 1'-0"
DATE:
DRAWN BY ... W.A.WYLAM
FUSELAGE & SCARFF RING DETAILS
DEHAVILLAND RECONNAISSANCE
DeH-4

MOUNTING BOLT HOLES WERE LOCATED TO SUIT AIRPLANE STRUCTURE. BELOW IS TYPICAL FOR INSTALLATION ON PLYWOOD DECK.

SCARFF RING RAIL
MACHINED BRASS CASTING

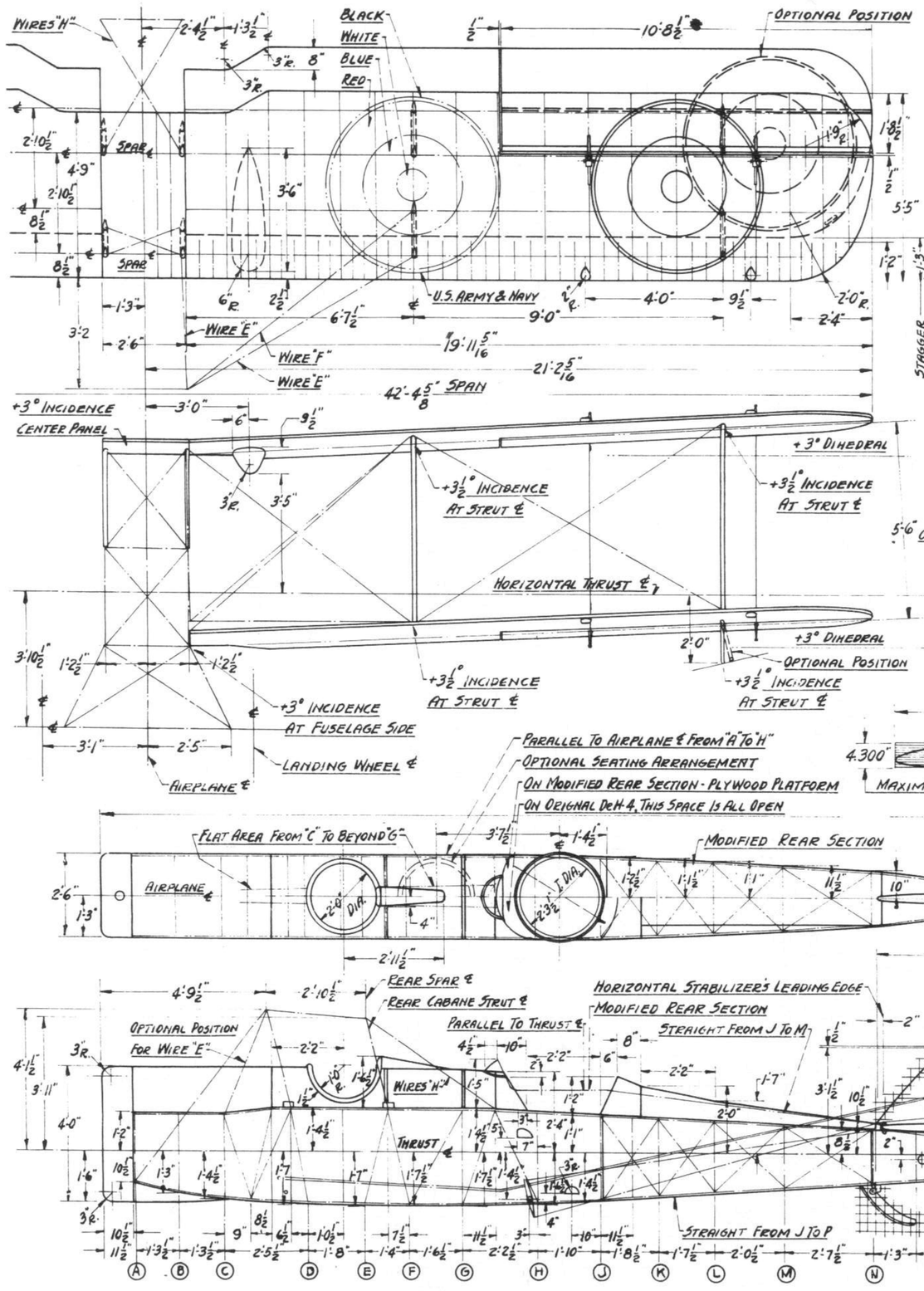
DOUBLE GUN YOKE

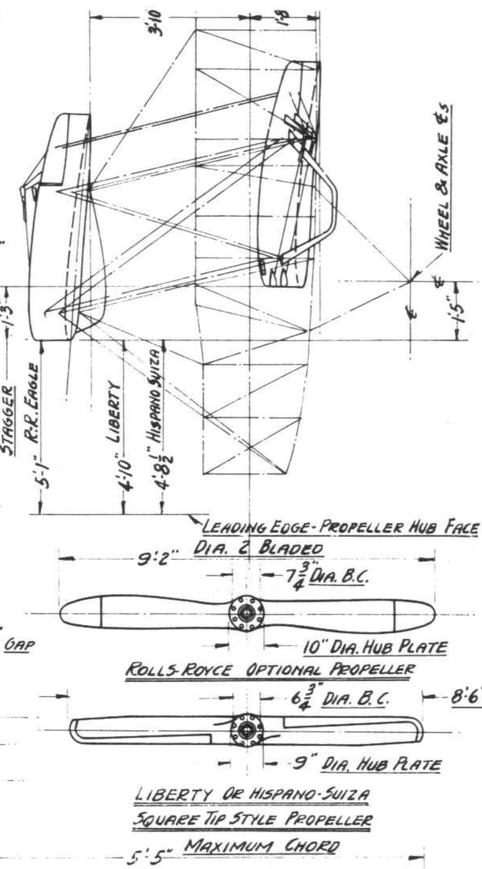
SINGLE LEWIS GUN YOKE

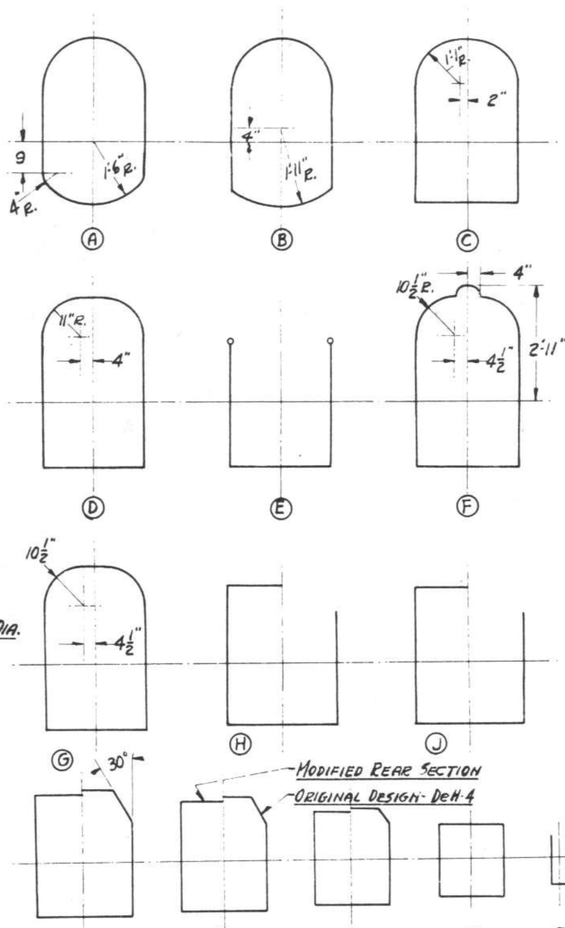
NOTES:
SPLIT SCARFF RING UNIT IS SLIPPED ONTO RING RAIL; CLASP PART IS ATTACHED MAKING TWO INTREGAL ROTATABLE UNIT. OIL IS USED FOR LUBRICANT BETWEEN FINISHED MACHINED SURFACES. GUN MOUNT ASSEMBLY WAS ATTACHED AFTER SCARFF RING WAS MOUNTED ONTO AIRPLANE DECK. GUN YOKE WAS REMOVED BY PRESSING SPRING LATCH & REMOVING LOCK KEY.

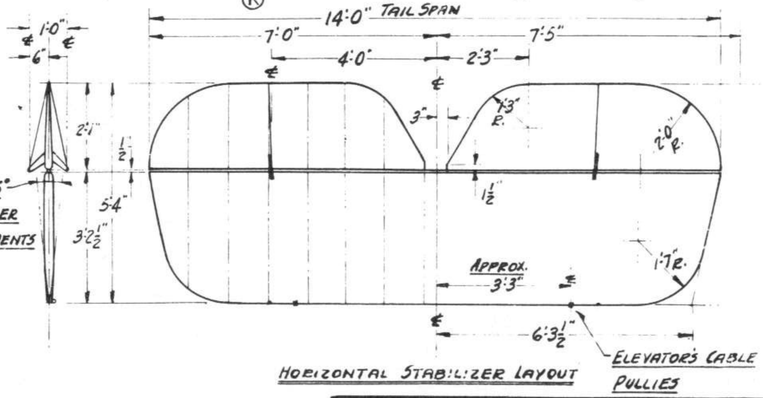
GUN MOUNT ASSEMBLY
ALL ALUMINUM

SPLIT SCARFF RING UNIT







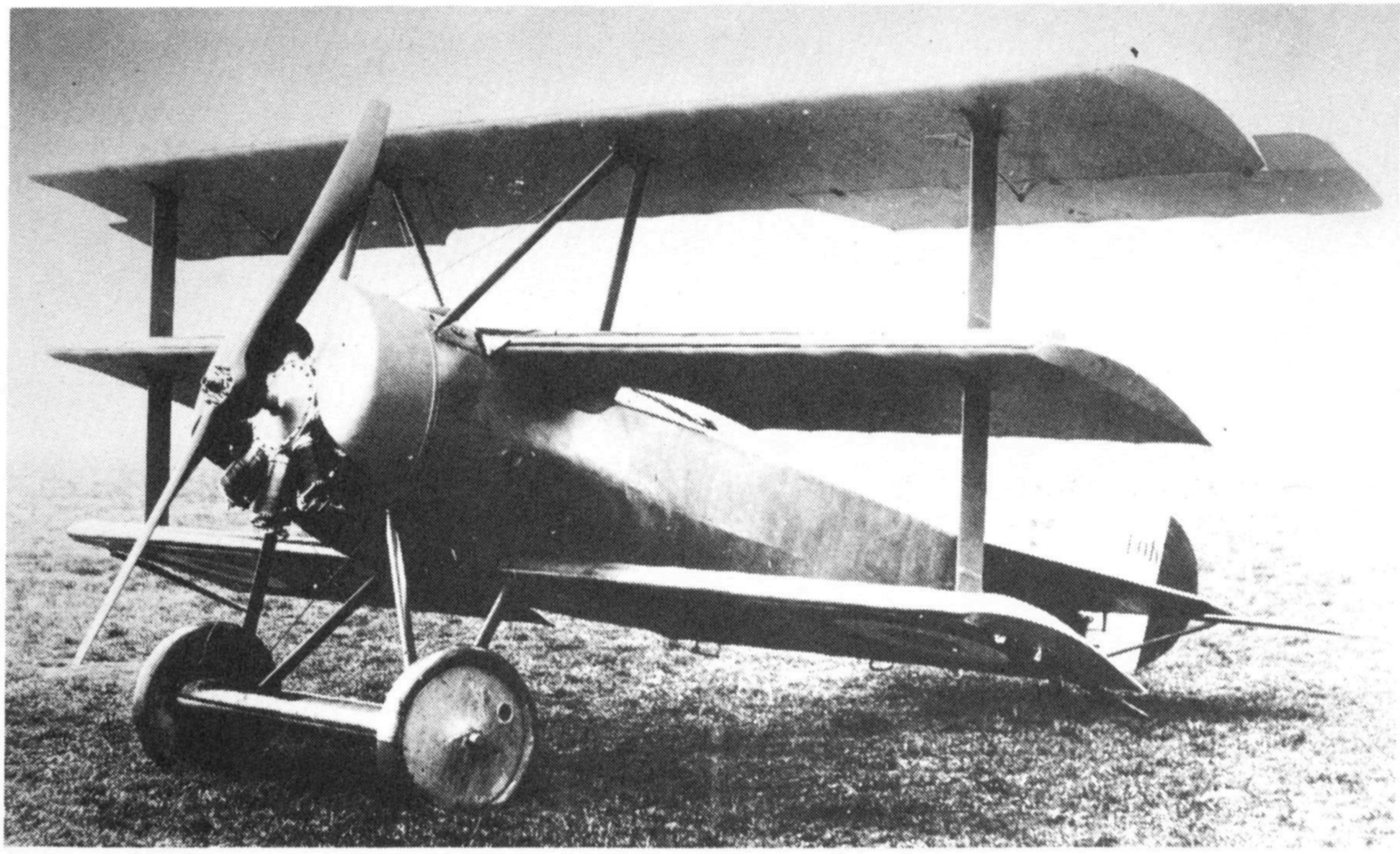


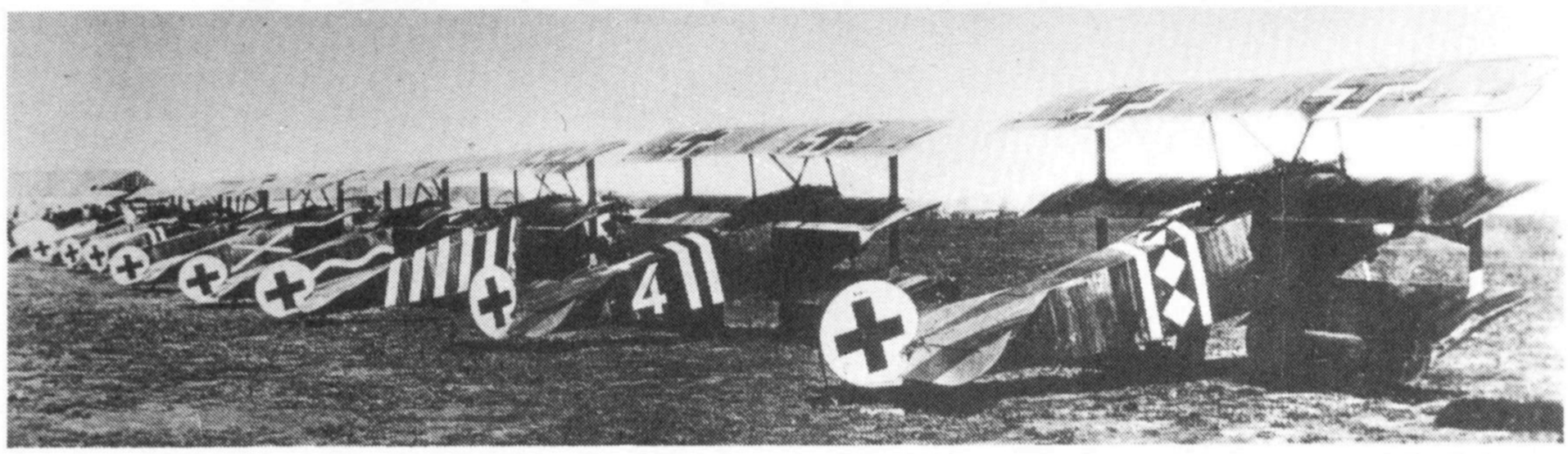
HORIZONTAL STABILIZER LAYOUT

AIR AGE INC., 551 FIFTH AVE., NEW YORK 17, N.Y.	
SCALE: 3/16 = 1'-0"	GENERAL LAYOUT DATA
DATE:	DeHAVILLAND RECONNAISANCE
DRAWN BY ... W. A. WYLAM	DeH-4

Fokker Dr.1

drawings by JOSEPH NIETO





An airplane without flying wires, particularly a fighter, was unheard of in 1915. Anthony Fokker proved that self-supporting flying surfaces were not only practical but advantageous in his triplane. Air Age file photos.

ONE OF the most unusual fighters of WW I, the Fokker Triplane was also the most agile fighting machine during that period. Designed for dog fighting, the ship was unequaled in its ability to out-maneuver anything in the air. It quickly became apparent to German fighter pilots that the Dr.1 was the ship to fly when Manfred von Richthofen scored a victory on his first time out with the new design. The second time out he scored another. It also became apparent to British pilots that the Germans had something to reckon with.

One of the most unusual aspects of this design, other than its being a triplane, was that it had no wires. Today this seems academic, but in 1915 design engineers fully expected the wings to fold on any airplane that had non-supported flying surfaces. This airplane proved that a cantilever wing was not only possible, but practical.

Powered by the Oberursel rotary engine rated at 110 hp, the triplane had a top speed of 97 mph and a ceiling of 18,000 feet. The rate of climb was nearly 2,000 fpm and the landing speed in zero wind was only 30 mph. It was feather light on the controls and could literally turn on a dime, causing a near blackout to the pilot at the controls.

Von Richthofen was shot down in one.

Although the service period of the triplane was only seven months, it remains one of the most remembered aircraft of WW I. No original Triplane survived the war. □

DR-1 CONTROL SYSTEM SHOWN IN PLAN VIEW.

BOARD

FLOOR

SPAN. 18'9"

LOWER WING PLAN. INSIGNIA, LOWER SURFACE ONLY.

LOWER WING WAS ASSEMBLED OF ONE PIECE SPAR. IT WAS INSTALLED BY BOLTS TO RECESS UNDER BODY, LIKE D-VII. ALUMINUM SHEET COVERED ATTACH AREA.

WHITE AREA 9'-1"

SPAN. 20'-6"

MIDDLE WING PLAN. ONE SIDE OF TOP WING STRUT IS SHOWN.

CENTER LINE M. GUNS.

FUEL GUAGE ROD.

MIDDLE WING, LIKE LOWER, WAS INSTALLED BY FOUR BOLTS TO UPPER BODY LONGERONS. AFTER WING WAS FIXED, THE ONE-PIECE TYPE COWLING AS SHOWN ABOVE WAS PLACED & SECURED BY USE OF

WING NUTS (SAME AS D-VII) UPPER WING STRUTS WERE THEN BOLTED ON, AND GUNS INSTALLED, INSERTING CLIP TUBES THROUGH HOLES IN COWLING. SEVERAL VERSIONS OF THIS CENTER-SECTION COWLING WERE USED.

FOKKER DR-1 WING SECTION. 3/4" = 3"

CHORD - 3'3 3/8"

(SCALE WHEN PUBLISHED 1/12TH. SIZE.)

ABOVE IS MASKED COWL USED BY WERNER VOSS. BELOW, TWO-PIECE COWL VERSION POPULARLY USED.

WEBS 3/8" 3 PLY.

SECTION OF SPAR.

INTERPLANE TIE DETAIL.

TAPE.

15MM STEEL TUBE

BUILT-UP RIBS

WHITE AREA 4'-1"

SPAN. 23'-7"

SPAN. 21'-6"

SPAN. 18'-9"

DIA. 8'6"

CENTER SECTION. 7'-1 7/8"

MAIN SPARS OF WINGS CONSISTED OF TWO BOX SPARS OF 3/4" DEEP SPRUCE FLANGES & TWO 3/8" 3 PLY WEBS, CONNECTED AT TOP & BOTTOM BY LAYERS OF 3/32" PLY. RANGE WIDTHS TAPERED FROM 2.8" @ E TO 10 3/8" @ CENTER SECTION.

CONT: "...TAIN CROSSES WHICH WAS COMPA... ...HIS N...HE, MEANING WHITE IN ENGLISH. LT. HANS KIRCHSTEIN, STA. #5, OF RICHTHOFEN JAGDGESCHWADER 1, HAD HIS DR-1 PAINTED ALL

SPAN. 4'-9"

TRACK. 5'-3"

WITH 27 ALLIED PLANES, HE'S KILLED IN JULY OF 1918, WHILE BEING STRAFED FROM A GERMAN AIRCRAFT. PILOT IN THE REAR COCKPIT OF A TWO SEATER PLANE. FRITZ LOERZER, BRUNO'S BROTHER, FLEW AN ALL BLACK & WHITE CHECKERED DR-1 FOR ... SD. 26. E.A. SCORES: WEISS, 16. FRITZ LOERZER, 11.

OVER WITH BLACK & WHITE DIAGONAL STRIPES, WORKS THIS EFFECT WOULD CONFUSE ENEMY AIRMEN. THE STRIPED DR-1 WAS PROMPTLY DUBBED BY FELLOW PILOTS, THE OPTICAL ILLUSION. KIRCHSTEIN, CREDITED

SKETCH SHOWING GROOVED CONE CONFIGURATION AT JOINTS & CURVATURE OF

THANK YOU ALSO, PETER L. GRAY, OF LUTON, BEDS, ENGLAND, & ANGELO RUSSO, MT. VERNON, N.Y. FOR YOUR KIND HELP. JN.

AFTER RICHTHOFEN'S DEATH, JAGDSTAFFEL 11 DISCONTINUED THE ALL-SCARLET COLOR SCHEME USED ON MANY OF IT'S PLANES. THE STAFFEL WAS LED FOR A SHORT TIME BY LT. HANS WEISS (SHOT DOWN BY A SOPWITH CAMEL, MAY 2, 1918.) WHO ADOPTED AN ALL WHITE FOK. DR-1 WITH (CONT.)

SERIAL Nº 2009/17. WITH STRAIGHT CROSS.

WHITE AREA NOT USED ON DR-1

8 1/2" + 8 1/2"

24 1/2"

26"

8"

10 1/2"

10 1/2"

INDIVIDUAL GUN TRIPS

AUXILIARY THROTTLE

BOTH GUNS AT ONCE.

AILERON LEVER

~ AUTHOR'S NOTE ~

IT IS MOST SINCERELY HOPED THAT THE SCALE DRAWINGS AND DATA COMPILED HEREIN, HAS RESULTED IN THE MOST ACCURATE AND AUTHENTIC DESCRIPTION OF THE FOKKER TRIPLANE AND RICHTHOFEN'S DEATH PLANE, BROUGHT TO LIGHT TO THIS TIME. MATERIAL COLLECTED SINCE 1930, IN ADDITION TO ALL POSSIBLE SOURCES, WAS CHECKED AND COMPARED, TO ACHIEVE THIS DESIREABLE PURPOSE.

J. Nieto.

CONTROL SYSTEM OF FOKKER DR-1, WAS SIMILAR TO D-VII. VARIATIONS EXISTED,

PULLEY & CONTROL CABLE INSPECTION OPENINGS, AT UPPER & LOWER SURFACES.

VERY-PISTOL SIGNALING CARTRIDGE HOLDER.

CARDAN TYPE MAGNETIC NAVIGATION COMPASS.

BLACK & WHITE SQUARES, NOT USED ON ANY OF RICHTHOFEN DR-1'S.

PARTLY SHOWN BELOW, IS THE EFFECT USED BY ERICH LOWENHARDT, 9'-10"

BLACK & WHITE STRIPED TAIL & FLOWN, WHEN BORROWED, BY RICHTHOFEN.

FAIRING DETAIL. USED ON BACK & SIDES AT FRONT OF BODY.

TAIL DETAIL.

"BUSINESS OFFICE" OF THE FOKKER DR-1.

AND WAS FITTED WITH A 160 H.P. SIEMENS-HALSKE SH-3 ENGINE AND A CLOSED AXIAL PROPELLER. NOTE WINDSHIELD, AND ABSENCE OF GUNS AND AUXILIARY AILE PLANE. IT IS WONDERED, WHAT THIS PLANE MAY HAVE DONE IN RICHTHOFEN'S HANDS.

③ ANOTHER COWL VERSION, NOT OFTEN USED. ④ COWL USED AS AN EXPERIMENTAL FOR BETTER COOLING

ILLUSTRATED AT RIGHT IS A FOKKER DR-1 EXPERIMENTAL TYPE, (WING TIPS & STRUTS NOT SHOWN) WHICH WAS BEING TESTED AT THE JOHANNISTHAL AIRDROME (BERLIN) IN 1918.

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

SCALE: 1/4" = 1'-0"

FULL SIZE: 1/8" = 1'-0"

GENERAL ARRANGEMENTS AND DETAILS 1918 GERMAN IMPERIAL AIR SERVICE.

KAMPF EINSITZER DRIDECKER.

Fokker DR.I

COPYRIGHT BY: Joseph Nieto.

ILLUSTRATED BELOW, IS THE PLANE FLOWN BY BARON MANFRED FR. von RICHTHOFEN AS LATE AS APRIL 20, 1918. ON THAT DAY, HIS COMBAT REPORTS STATE HE SHOT DOWN TWO ALLIED PLANES WITH THIS MACHINE. THIS PLANE WAS PURE RED, (LESS SQUARES & RUDDER Nº 1729 SHOWN HERE ONLY FOR ADDED ILLUSTRATION PURPOSES) WHILE THE STRAIGHT (LATIN) CROSSES, ADOPTED APRIL 1, 1918, WERE BLACK, WITH A VERY THIN WHITE OUTLINE AGAINST THE RED BACKGROUND. (NOTE: VARIOUS SOURCES DIFFER AS TO DATE OF CHANGE OF PATEE TO LATIN CROSSES. VARIATIONS FROM JAN. 1, APRIL 1, TO JUNE. 1, 1918.)

WHITE

1729

STATIC GR. LINE.

STAT. FLYING LINE.

RED

Fokker DR I. 425/17

VERY CARTRIDGE HOLDER.

16½"

2"

8½" 8½"

25"

33½"

17"

14"

14"

ENGINE ACCESS.

ANOTHER POPULAR, BUT ERRING BELIEF WAS THAT RICHTHOFEN MADE A NORMAL THREE-POINT LANDING WHEN SHOT DOWN BY A. ROY BROWN.

RICHTHOFEN'S TRIPLANE, WAS ACTUALLY CRASHED. THE PLANE WAS DEMOLISHED BEYOND THE COCKPIT. THE SOUVENIR-MINDED AUSY SOLDIERS DID THE REST.

9'-9½" MAX.

RICHTHOFEN WAS KILLED IN A PURE RED FOKKER DR-1 WITH STRAIGHT (LATIN) CROSSES, WITH VERY NARROW, IF ANY WHITE OUTLINES. THIS WAS A NEW DR-1, FROM THE FACTORY AT OBERURSEL, NEAR FRANKFORT AM MAIN. THE SERIAL NUMBER WAS 2009/17., REF: "DEUTSCHLANDS ZUKUNFT LIEGT IN DER LUFT" Pp. 21, & "JAGD IN FLANDERNS HIMMEL". (NOTE: THE ALBATROS D-3 USED BY RICHTHOFEN, WAS ALSO ALL RED, WITH BLACK CROSSES & NO WHITE OUTLINE)

(VON RICHTHOFEN ALSO TOTED OUT THE PFALZ DR-1 TRIPLANE.)

OVERALL LENGTH. 19'-0"

2"

3"45'

ALUMINUM COWL, SCROLLED, LEFT "NATURAL".

CLIP COLLECTOR TUBE TO FRONT TANK.

Leergewicht. —— 376 kg.
Nutzlast. —— 195 ..
Gessamml. Gewicht. - 571 ..

CARBURETOR AIR INTAKE.

WHITE

17°

Fok.FI 102/17

WHITE FIELD.

USUAL LOCATION OF PATEE OR MALTESE CROSS.

WHITE

1729

COLORED RED.

BLACK NUMERALS.

PATEE CROSS LOCATION ON RICHTHOFEN'S DR-1 Nº 102/17.

SHOWN BELOW, IS THE FIRST FOKKER DR-1 TRIPLANE POSSESSED AND FLOWN IN COMBAT BY BARON MANFRED FREIHERR VON RICHTHOFEN, GERMANY'S GREATEST WORLD WAR I ACE, COMMANDER OF JAGDSTAFFEL 11, WITH 80 OFFICIAL AND 126 UNOFFICIAL VICTORIES TO HIS CREDIT BEFORE HE WAS SHOT DOWN NEAR SAILLY LE SEC, NORTH OF VAUX SUR SOMME, ON APRIL 21, 1918, BY CAPTAIN A. ROY BROWN, D.S.C., OF Nº 209 SQUADRON, ROYAL AIR FORCE.

IT HAS BEEN GENERALLY PUBLICIZED THROUGHOUT THE PAST, THAT VON RICHTHOFEN WAS SHOT DOWN IN A FOKKER DR-1, SERIAL Nº FI. 102/17. THIS WAS DEFINITELY NOT TRUE. VON RICHTHOFEN, LIKE RAOUL LUFBERY, EDDIE RICKENBACKER, AND MANY OTHER FAMOUS ACES OF THAT TIME, DID NOT CONFINE THEIR COMBAT FLYING TO THE USE OF ONE SAME, PERSONAL PLANE CONTINUOUSLY. RICKENBACKER, USED TWO IDENTICAL SPAD "Nº 1's", IMMELMANN ALSO USED THIS TRICK. WITH 'E' TYPE FOKKERS. LIKEWISE, RICHTHOFEN FLEW FOUR OR MORE DR-1's INTERMITTENTLY, BUT RESERVED HIS 102/17 FOR OFFICIAL VISITS TO THE OTHER STAFFELS UNDER HIS WING, AND OCCASIONAL TRIPS TO THE FOKKER FACTORY. AT LEFT, IS SHOWN ANOTHER OF THE FOUR DR-1's MANFRED USED, AND THE FOURTH, IDENTIFIED AS THE ONE IN WHICH THE FAMED RED KNIGHT OF GERMANY MET HIS DEATH. MANFRED'S SECOND TRIPLANE WAS Fok 1.152/17.

GENERAL CHARACTERISTICAL DATA: WEIGHT EMPTY, 376 Kg. (829 LBS.) USEFUL LOAD, 195 Kg. (430 LB.) TOTAL WEIGHT, 571 Kg. (1260 LB.) TOTAL SPANS, 23'7", 20'6", 18'9". O.A. LENGTH, 19'0" MAX. HEIGHT: 9'9½". CHORD OF MAIN PLANES, 3'3⅛". GAP BETWEEN PLANES AS SHOWN. ANGLE OF STAGGER OF ALL THREE PLANES, 14°0'. ANGLE OF INCIDENCE. UPPER, 2°@ C.C. 3°45'@ AILERONS, MIDDLE & LOWER WINGS, 1°30' INCIDENCE OF TAIL PLANE, 5° POS. TAIL PLANE SPAN, 9'10". ENGINE, 110 HP. LE RHONE (FR.) OR OBERURSEL. (GER. COPY.) CONT: LOWER LEFT.

Ply. veneer Fairing.
Cardan Compass.
Ammeter.
Sight Feed Lubricator.
Tachometer.
Fuel Pressure.
Seat & Rails.
Control Cable Pulleys.

SECTION "D" AT LEFT SHOWS DIRECTION OF FEED & DISPOSAL OF SHELLS & CLIPS. USED SHELLS WERE DEFLECTED OUT RIGHT SIDE OF GUNS TO EARTH.

MID-WING MOUNTING.

UPPER WING MOUNTING.

FRONT & REAR GUN MOUNTINGS.

MACHINE GUN DETAILS ON MY FOKKER D-VII DRAWINGS ARE IN ERROR. CORRECT SYSTEM SHOWN HERE, FITS D-VII. LIVE AMMO ENTERS GUN FROM RIGHT SIDE & REAR TANK. CLIPS DISCHARGED THRU' TUBE AT LEFT, EACH GUN, TO FRONT TANK. USED SHELLS DISCHARGED OUT RIGHT OF GUNS INTO THE AIR.

FRONT M.G. SIGHT.
REAR, FOLDING SIGHT.
LINE OF SIGHTING.

PLY VENEER. SAME ON FRONT AT SIDES.
TAIL SKID CONTROLED BY SHOCK CORDS & STOP CABLE.

SWIVEL POINT.
STEEL SHOE.
WOOD SKID.
TUBE HANDLE. (2 REQ.)
STEEL TUBE STEP. (2 REQ.)
ASH WING SKID. NOT USED ON RICHTHOFEN'S DR-1. 102/17.

SEAT (METAL) & ADJUSTMENT DETAIL.

HATS OFF WITH THANKS TO: ROBERT E. ZOOK, PITTSBURGH, PA. AND TO CAPTAIN KIMBROUGH S. BROWN, U.S.A.F. SURREY, ENG., FOR ASSISTS ON THESE DRAWINGS. J.N.

SEE DRAWINGS OF FOKKER D-VII, AUG. & SEPT. 1957, MODEL AIRPLANE NEWS FOR DETAILS VERY SIMILAR, USED ON DR-1 NOT SHOWN HERE.

OIL PUMP.
BOSCH MAG.
"TAMPIER" CARB.

ENGINE SHOWN ABOVE IS THE 110 HP. LE RHONE. RICHTHOFEN WAS SUPPOSED TO HAVE USED SUCH A CAPTURED ENGINE IN HIS SHIP. THE GERMAN "OBERURSEL" WAS COPIED FROM THE 110 LE RHONE. WHEELS WERE 36 SPOKED, 18 SPOKES ON EACH WHEEL SIDE.

SHOCK ABSORBER CORDS.
OIL TANK FILL (4 GALS.)
ENGINE COWL FASTENER.

HAND TYPE, INITIAL FUEL PRESS. PUMP
CARDAN MAGNETIC "KOMPASS".
PROTECTIVE CRASH PAD, REAR GUN BUTTS. PLYWOOD VENEER FAIRING.

ALUMINUM COWL.
FUEL QUAN. GUAGE.
COWL FASTENER.
FUEL TANK FILL (16GAL.) (SUF. FOR 2½ HRS.)
FABRIC COVERED WIRE WHEELS
PLAN VIEW TOP WING STRUTS.
ALERON STRAP HINGE.

OUTER EDGE OF ENTIRE TAIL, 15M.M. STEEL TUBE.
STABILIZER FRAME TRIANGLE WAS 31MM. TUBE.
STABILIZER RIBS, & ELEVATOR, BUILT UP OF 10MM. TUBE.
AERODYNAMICALLY BALANCED ELEVATOR.

THANKS ALSO, TO DAVE WILLIAMS, IOWA CITY, IOWA, BERGEN HARDESTY, FRANKFORT, IND. FOR THEIR KIND COLLABORATION. J.N.

(A) SHOWS THE ENGINE SUPPORT AT REAR, (B) FRONT, PLATE MOUNTING TO FIREWALL.

ENGINE MOUNTED BY ONLY FOUR BOLTS.

ENGINE FRONT MOUNTING IS HOW PLATE, THEN BOLTED TO FRAME.

R.21"

(E) STARTER (OIL TANK (LEFT)

FUEL (BENZINE) QUAN. GUAGE.

ENGINE CONTROLS.

VENEER.

2'-10½"

2'-4"

-LOWER WING MOUNTING.-

SHOCK ABSORBER DETAIL ENCLOSED IN AUXILIARY "WING."

(B) BOTTOM CROSS PIECE.
(A) BOTTOM X PIECE.
(T) TOP CROSS PC. FR. M.G. (B)-A1 PULLEYS.
(A) (T) (B) FL. B.D. (B) (T)
(T) (A) TOP & BOTTOM, REARWARD.

FRONT MACHINE GUN SUPPORT.
REAR M.G. SUPPORT A PIECE.

GEN. DATA. CONT: ENGINE, ALSO SIEMENS-HALSKE SH-3, 160 H.P. WITH 4 BLADED PROP. PROP. DIA, 8'-6" AXIAL. FUEL CAP. 16 GALS, 4 GALS. OIL. FOR DURATION OF 2½ HRS @ 10000 FT. ARMAMENT, TWIN SPANDAU (MAXIM) 8MM. M.G.'S SYNCHRO'D TO FIRE SINGLY OR SIMOULTANEOUSLY THRU' PROP. INSTRUMENTS. CARDAN COMPASS, TACHOMETER, FUEL QUANTITY & PRESS, OIL SIGHT FEED VIAL, AMMETER, ETC. TOP SPEED, 120-30 MPH. CLIMB, 15000 FT., IN 17 MINUTES.

LOCATION OF STATIONS. BODY FORMERS, ENGINE MOUNT PLATE "A" TO TAIL POST.

END, TAIL POST.

Fokker D.VII

drawings by JOSEPH NIETO

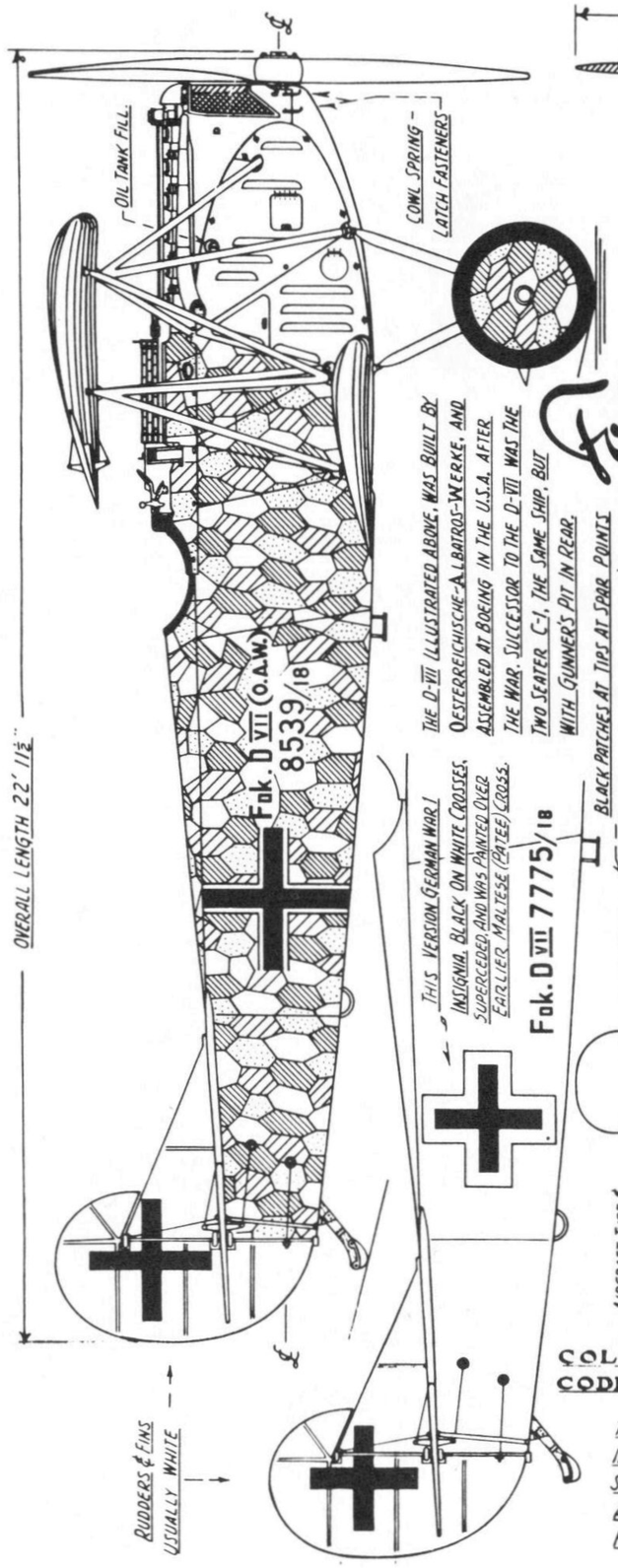
Probably the most famous of German WW I aircraft was the Fokker D.VII. Ernst Udet, shown below, was an advocate of the design, although he preferred the D.VIII. Air Age file photos.

EARLY in May 1918, pilots assigned to the French sector began to meet increasing numbers of a strange new German pursuit plane. They observed it flying with squadrons of Albatros and Pfalz single-seaters, perhaps two or three to a flight. The new ships stayed pretty well back and very seldom engaged in a dog fight, but they impressed Allied pilots by their ability to bound around in the air like a rubber ball. This new plane, the D.VII, was the shot in the arm the Germans were looking for.

Among modelers and WW I aviation enthusiasts, the question always arises as to which was the best plane of that period. The Fokker D.VII certainly will have its supporters in any such discussion. Simplicity was the keynote of the design. The fuselage was of wire-braced welded steel tubing (the Germans did not trust welds in tension); the tail was all-steel. The wings were each built on two massive wooden box-spars, and there was no wire rigging. Most examples of the aircraft were powered by the Mercedes D.III engine, rated at 160 hp; however, later models were fitted with Daimler and B.M.W. engines for high altitude.

Two Spandau machine guns were mounted directly in front of the pilot, and the combination of pilot, machine, and firepower added up to a formidable weapon for the Germans. From a historical standpoint, the Fokker D.VII will always hold a special significance as one of the most interesting airplanes ever built: it was the only German airplane by name to be mentioned in the Treaty of Versailles.

Seven original D.VIIs are in museums all over the world. □



Fokker

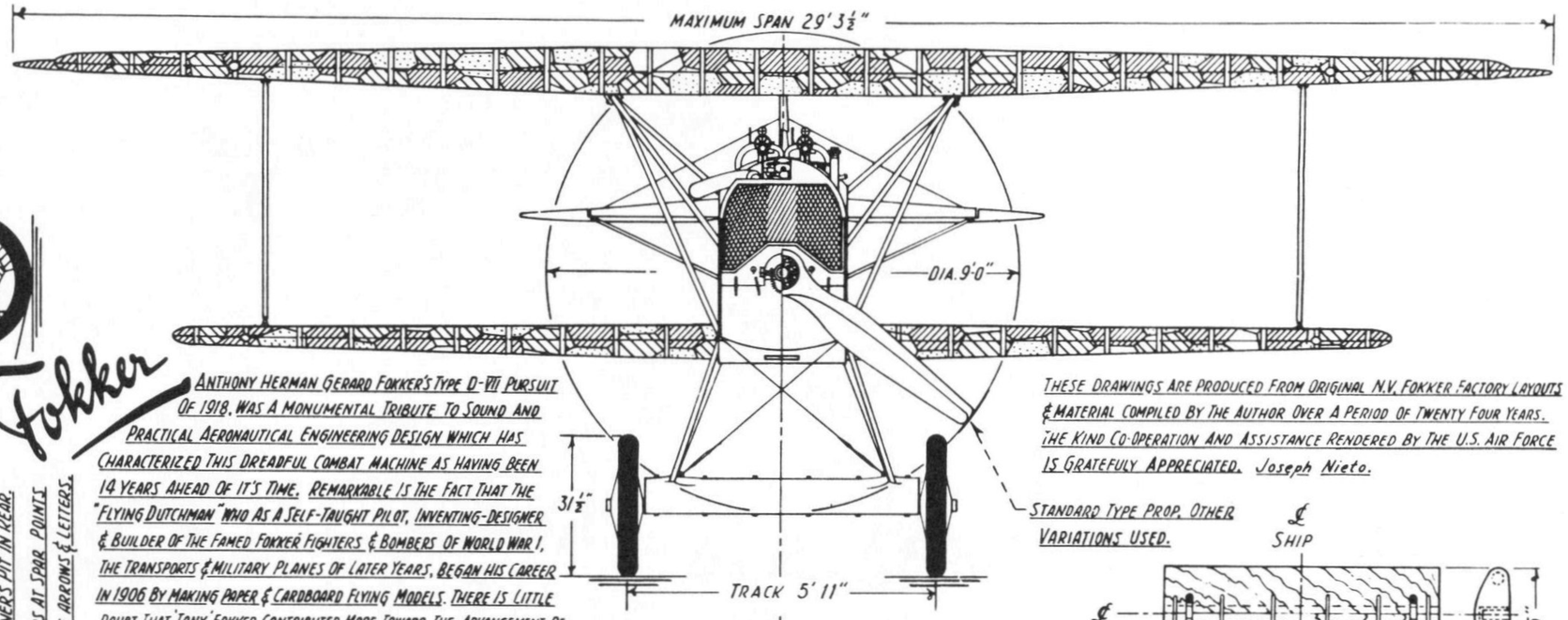
THE D-VII ILLUSTRATED ABOVE, WAS BUILT BY OESTERREICHISCHE-ALBATROS-WERKE, AND ASSEMBLED AT BOEING IN THE U.S.A. AFTER THE WAR. SUCCESSOR TO THE D-VIII WAS THE TWO SEATER C-I, THE SAME SHIP, BUT WITH GUNNER'S PIT IN REAR.

THIS VERSION GERMAN WAR I INSIGNIA, BLACK ON WHITE CROSSES, SUPERCEDED, AND WAS PAINTED OVER EARLIER MALTESE (PATEE) CROSS.

Fok. D VII 7775/18

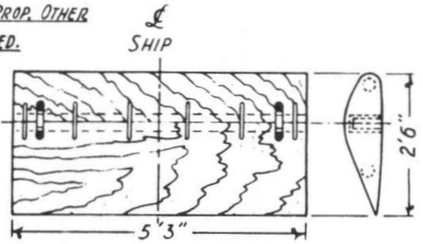
BLACK PATCHES AT TIPS AT SPAR POINTS INDICATED WITH WHITE ARROWS & LETTERS.

ANTHONY HERMAN GERARD FOKKER'S TYPE D-VII PURSUIT OF 1918, WAS A MONUMENTAL TRIBUTE TO SOUND AND PRACTICAL AERONAUTICAL ENGINEERING DESIGN WHICH HAS CHARACTERIZED THIS DREADFUL COMBAT MACHINE AS HAVING BEEN 14 YEARS AHEAD OF IT'S TIME. REMARKABLE IS THE FACT THAT THE "FLYING DUTCHMAN" WHO AS A SELF-TAUGHT PILOT, INVENTING-DESIGNER & BUILDER OF THE FAMED FOKKER FIGHTERS & BOMBERS OF WORLD WAR I, THE TRANSPORTS & MILITARY PLANES OF LATER YEARS, BEGAN HIS CAREER IN 1906 BY MAKING PAPER & CARDBOARD FLYING MODELS. THERE IS LITTLE DOUBT THAT 'TONY' FOKKER CONTRIBUTED MORE TOWARD THE ADVANCEMENT OF THE AIRPLANE THAN ANY OTHER DESIGNER OF HIS TIME, ALBEIT THE ABILITY & PROMOTIONAL TACTICS HE EMPLOYED AS A SALESMAN ARE AS PROMINENTLY RECORDED IN THE ANNALS OF AVIATION HISTORY. NAMES OF WORLD WAR I & 2 GERMAN AIR SERVICE PILOTS BECAME OF FAME WITH THE FOKKER. RICHTHOFEN, UDET, GOERING, BOELCKE, IMMELMANN, VOSS & MANY OTHERS, EVEN FOKKER ---
(CONT. BELOW)



THESE DRAWINGS ARE PRODUCED FROM ORIGINAL N.V. FOKKER FACTORY LAYOUTS & MATERIAL COMPILED BY THE AUTHOR OVER A PERIOD OF TWENTY FOUR YEARS. THE KIND CO-OPERATION AND ASSISTANCE RENDERED BY THE U.S. AIR FORCE IS GRATEFULY APPRECIATED. Joseph Nieto.

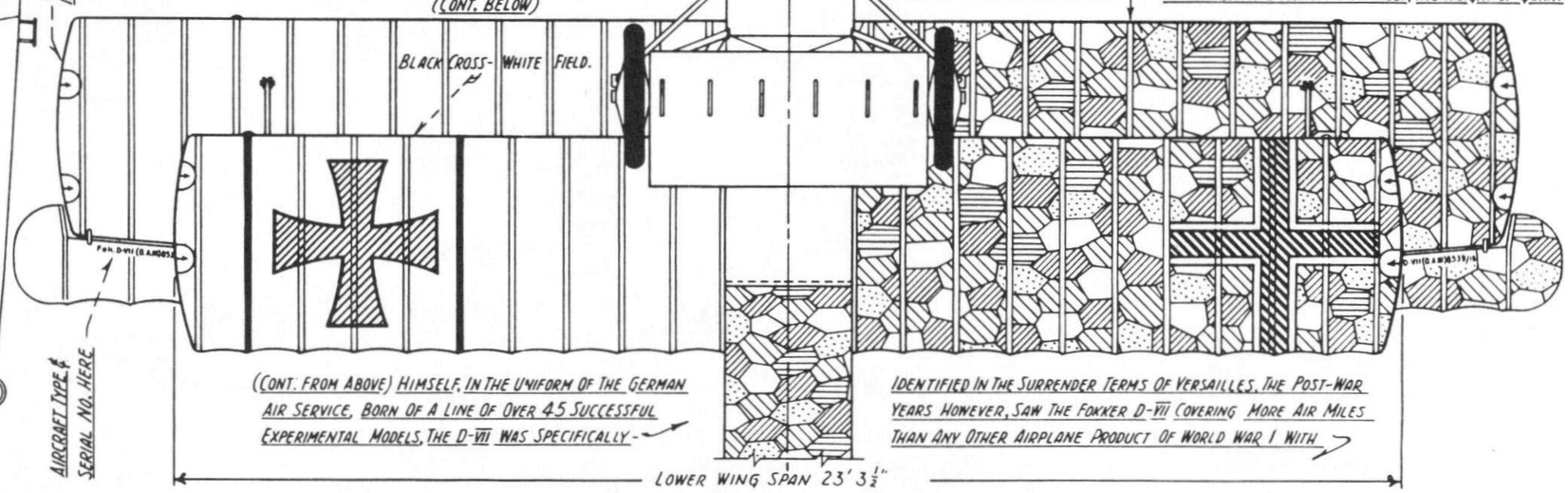
STANDARD TYPE PROP. OTHER VARIATIONS USED.



PLAN & END VIEWS OF AUXILIARY PLANE SUPPOSED TO COMPENSATE AERODYNAMICALLY, THE WEIGHT OF GEAR.

THANKS TO PETER M. BOWERS FOR DATA ON AUTHENTIC CROSS INSIGNIA.

SURFACE TAPE WAS LIGHT BLUE



(CONT. FROM ABOVE) HIMSELF, IN THE UNIFORM OF THE GERMAN AIR SERVICE, BORN OF A LINE OF OVER 45 SUCCESSFUL EXPERIMENTAL MODELS, THE D-VII WAS SPECIFICALLY - IDENTIFIED IN THE SURRENDER TERMS OF VERSAILLES. THE POST-WAR YEARS HOWEVER, SAW THE FOKKER D-VII COVERING MORE AIR MILES THAN ANY OTHER AIRPLANE PRODUCT OF WORLD WAR I WITH

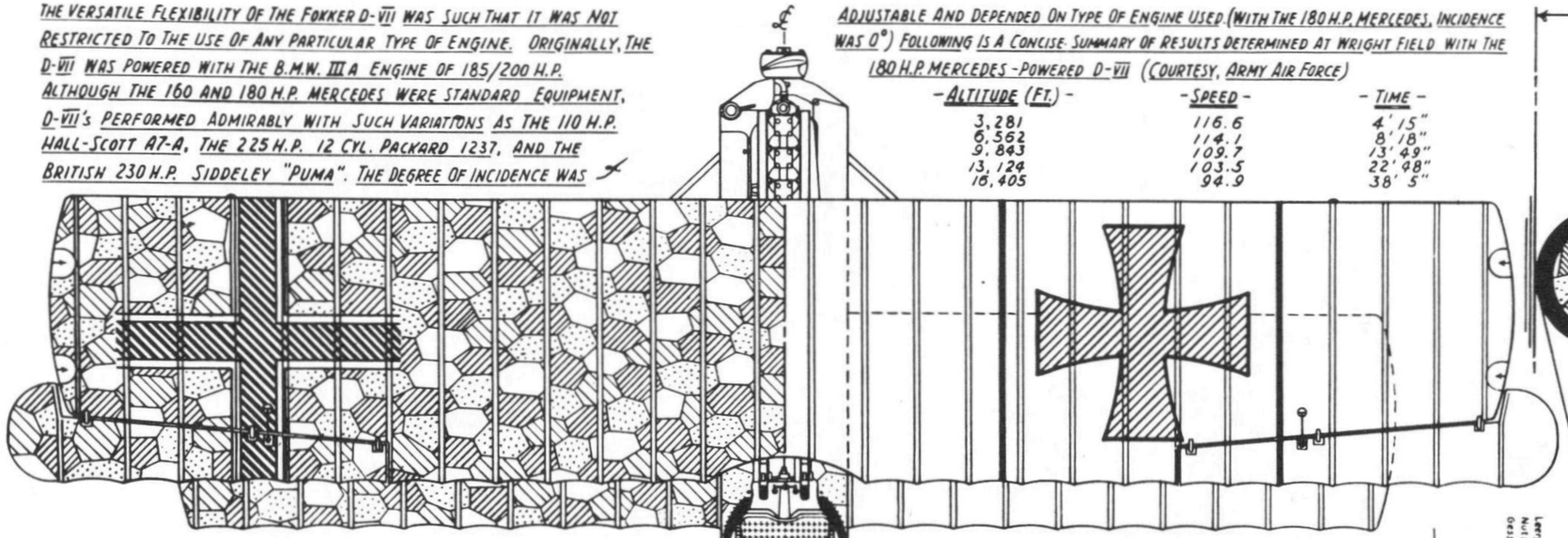
COLOR CODING — DARK GREEN. LIGHT GREEN. MAUVE. PINK. ROSE BEIGE OR FAWN.

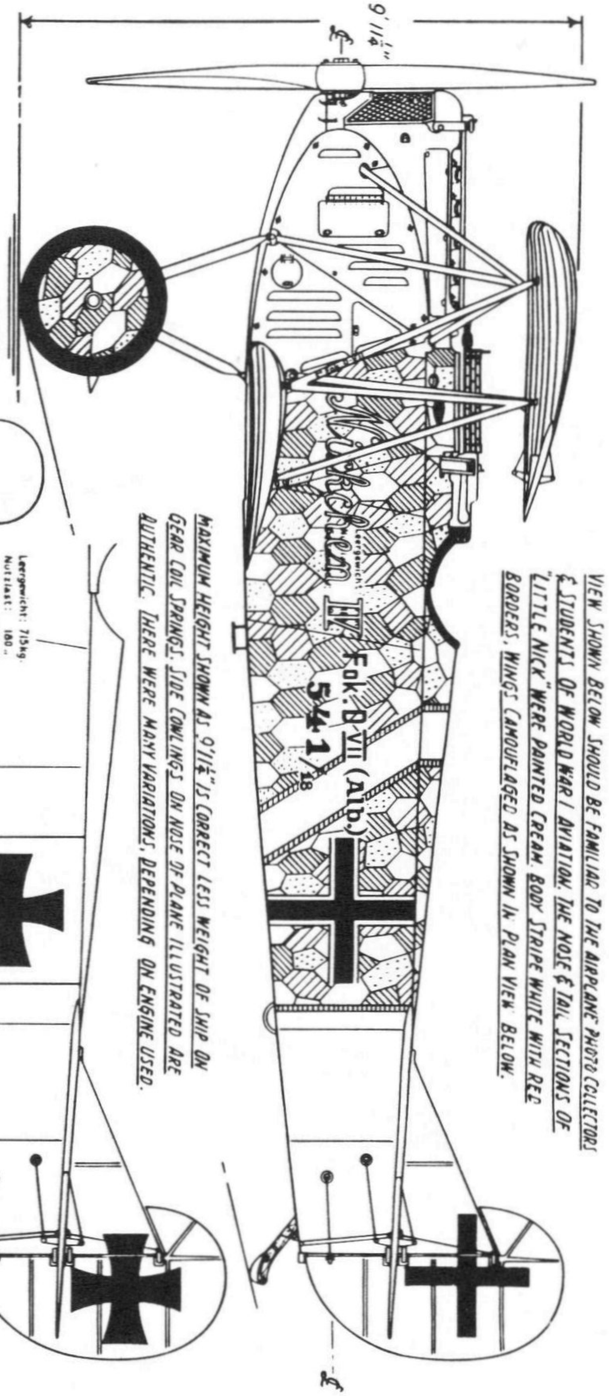
THE MILITARY AIR SERVICES OF POLAND, RUSSIA, RUMANIA, THE DUTCH, AND MANY OTHERS, NOT ONLY AS A SINGLE SEAT FIGHTER, BUT ALSO AS AN IDEAL WEATHER SHIP IN METEOROLOGICAL SERVICE, AS LATE AS 1933-34. (WITH OR WITHOUT SNOW SKIIS, THE D-VIII COULD CLIMB TO 23000 FEET AND EASILY WITHSTOOD STRUCTURAL STRAIN OF TEMPERATURE CHANGES UP TO 50°C.) FOKKERS WERE FIRST BUILT AT "FOKKER FLUGZEUGWERKE," SCHWERIN-GORRIES, MECKLENBURG, THEN AT JOHANNISTHAL AERODROME, BERLIN. (FOKKER AEROPLANBAU, G m.b.H.) AND LATER IN AMSTERDAM, HOLLAND. (N.V. NEDERLANDSCHE VLIEGTUIGEN-FABRIEK, ROKIN, 87.) ALSO BUILT BY AUSTRIAN BRANCH, ALBATROS WORKS, O.A.W. (OESTERREICHISCHE-ALBATROS-WERKE, G.m.b.H.) VIENNA.

AIR AGE INC. 551 FIFTH AVE, NEW YORK, 17, N.Y.	
SCALE: ¼" = 1'-0"	GENERAL ARRANGEMENTS. 1918 GERMAN PURSUIT KAMPF-DOPPELDECKER
FULL SIZE: ¾" = 1'-0"	Fok. D VII
COPYRIGHT BY Joseph Nieto.	

THE VERSATILE FLEXIBILITY OF THE FOKKER D-VII WAS SUCH THAT IT WAS NOT RESTRICTED TO THE USE OF ANY PARTICULAR TYPE OF ENGINE. ORIGINALLY, THE D-VII WAS POWERED WITH THE B.M.W. IIIA ENGINE OF 185/200 H.P. ALTHOUGH THE 160 AND 180 H.P. MERCEDES WERE STANDARD EQUIPMENT, D-VII's PERFORMED ADMIRABLY WITH SUCH VARIATIONS AS THE 110 H.P. HALL-SCOTT A7-A, THE 225 H.P. 12 CYL. PACKARD 1237, AND THE BRITISH 230 H.P. SIDDELEY "PUMA". THE DEGREE OF INCIDENCE WAS ADJUSTABLE AND DEPENDED ON TYPE OF ENGINE USED. (WITH THE 180 H.P. MERCEDES, INCIDENCE WAS 0°) FOLLOWING IS A CONCISE SUMMARY OF RESULTS DETERMINED AT WRIGHT FIELD WITH THE 180 H.P. MERCEDES-POWERED D-VII (COURTESY, ARMY AIR FORCE)

- ALTITUDE (FT.) -	- SPEED -	- TIME -
3,281	116.6	4' 15"
6,562	114.1	8' 18"
9,843	109.7	13' 49"
13,124	103.5	22' 48"
16,405	94.9	38' 5"

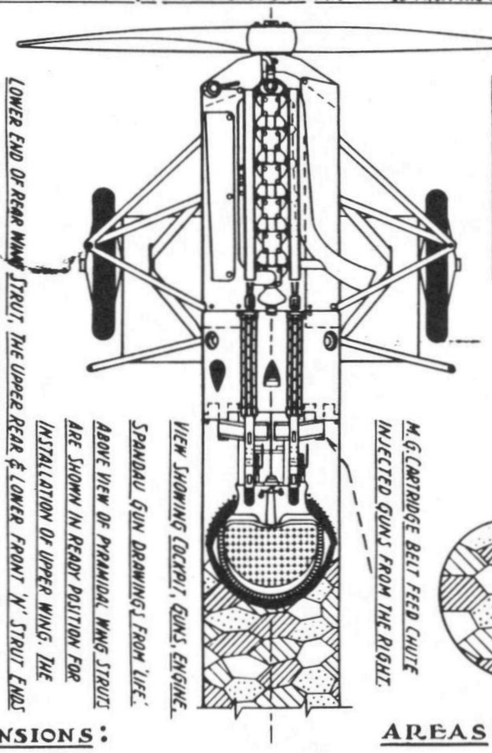




VIEW SHOWN BELOW SHOULD BE FAMILIAR TO THE AIRPLANE PHOTO COLLECTORS & STUDENTS OF WORLD WAR I AVIATION. THE NOSE & TAIL SECTIONS OF "LITTLE NICK" WERE PAINTED CREAM, BODY STRIPE WHITE WITH RED BORDERS. WINGS CAMOUFLAGED AS SHOWN IN PLAN VIEW BELOW.

MAXIMUM HEIGHT SHOWN AS 9'11¼" IS CORRECT LESS WEIGHT OF SKID ON GEAR COIL SPRINGS. SIDE COWLINGS ON NOSE OF PLANE ILLUSTRATED ARE AUTHENTIC. THERE WERE MANY VARIATIONS, DEPENDING ON ENGINE USED.

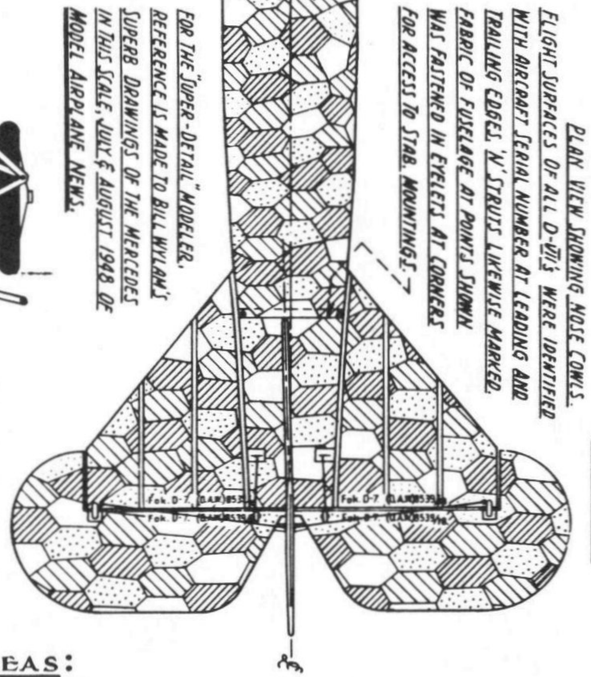
GENERALLY, THE FOKKER D-VII WAS DECORATED WITH ALL THE COLORS SUITED TO FANCIFUL TASTE. SHOWN IN PART IS THE CHARACTERISTIC STYLE OF GERMAN CAMOUFLAGE WITH COLOR CODE ON OPPOSITE PAGE. ONE CAPTURED D-VII WAS PAINTED FROM THE NOSE TO PILOT'S SEAT IN BRIGHT RED, FROM THAT POINT TO THE TAIL, WHITE. THE UPPER WING TOP SURFACE, CABANE, UNDERCARRIAGE & 'N' STRUTS, RED, WHILE BOTTOM OF UPPER WING & ENTIRE LOWER WING CAMOUFLAGED WITH VARIOUS DULL COLORS. MALTESE CROSS (ABOVE) ON WHITE FIELD.



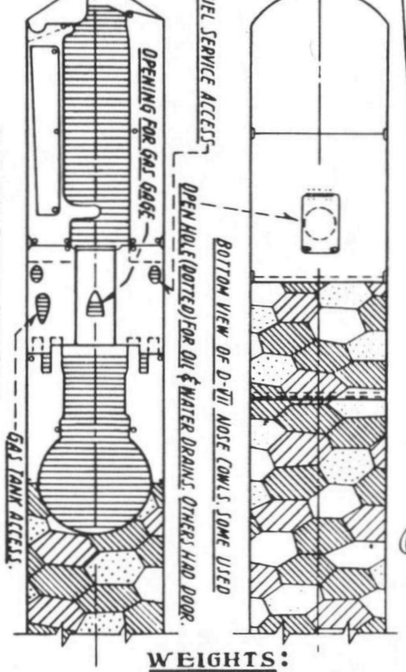
LOWER END OF REAR WING STRUT; THE UPPER REAR & LOWER FRONT 'N' STRUT ENDS ATTACHED TO WING SPAR FITTINGS BY ADJUSTABLE BALL-SOCKET THREADED "EYE BOLTS" WHICH PROVIDED MEANS TO ADJUST ANGLE OF INCIDENCE. SEVERAL VARIATIONS OF ENGINE EXHAUST STACKS WERE USED. SHOWN IS THE TYPE MOST CONVENTIONAL WITH 180 H.P. MERCEDES.

VIEW SHOWING COCKPIT, GUNS, ENGINE, SPANDAU GUN DRAWINGS FROM 'LIFE.' ABOVE VIEW OF PYRAMIDAL WING STRUTS ARE SHOWN IN READY POSITION FOR INSTALLATION OF UPPER WING. THE M.G. CARTRIDGE BELT FEED CHUTE INJECTED GUNS FROM THE RIGHT.

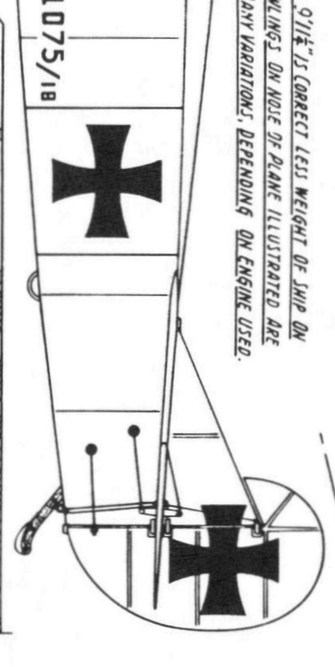
FOR THE "SUPER-DETAIL" MODELER, REFERENCE IS MADE TO BILL WYLAM'S SUPERB DRAWINGS OF THE MERCEDES IN THIS SCALE, JULY & AUGUST 1938 OF MODEL AIRPLANE NEWS.



PLAN VIEW SHOWING NOSE COWLS. FLIGHT SURFACES OF ALL D-VII's WERE IDENTIFIED WITH AIRCRAFT SERIAL NUMBER AT LEADING AND TRAILING EDGES. 'N' STRUTS LIKEWISE MARKED. FABRIC OF FUSELAGE AT POINTS SHOWN WAS FASTENED IN EYELETS AT CORNERS FOR ACCESS TO STAB. MOUNTINGS.



BOTTOM VIEW OF D-VII NOSE COWLS. SOME USED



DIMENSIONS:

WINGSPAN, UPPER PLANE.	29' 3½"
" " LOWER "	23' 3½"
CHORD, UPPER PLANE.	5' 3"
" LOWER "	4' 0"
OVERALL LENGTH.	22' 11½"
GAP BETWEEN PLANES (AT BODY SIDE).	4' 3¾"

AREAS:

UPPER PLANE INCLUDING AILERONS.	140.7 SQ. FT.	BALANCED PART OF ELEVATORS.	1.1 SQ. FT.
LOWER PLANE.	78.3 " "	VERTICAL FIN.	2.8 " "
AILERONS (TOTAL OF TWO).	11.4 " "	RUDDER.	5.9 " "
BALANCED PART OF AILERONS.	.5 " "	HORIZONTAL AREA OF BODY.	35.6 " "
STABILIZER.	21.1 " "	VERTICAL " " "	58.6 " "
ELEVATORS (TOTAL OF TWO).	15.2 " "	PLANE BETWEEN WHEELS.	12.4 " "

WEIGHTS:

FUSELAGE (COMPLETE WITH ENGINE, ETC.)	1,322.2 LBS.
UPPER WING, WITH AILERONS.	167.2 "
LOWER WING.	99.0 "
TAIL SURFACES (COMPLETE).	34.1 "
TOTAL WEIGHT (EMPTY).	1,622.5 "
USEFUL LOAD (APPROXIMATELY)	395.0 "

THE THIN, STRAIGHT, BLACK CROSS INSIGNIA AS SHOWN IN SIDE VIEW DIRECTLY ABOVE, WAS THE LATEST TYPE USED BY GERMANY IN 1918. NARROW WHITE BORDER TRIM.

Fok. D VII

AIR AGE INC. 551 FIFTH AVE. NEW YORK, 17. N.Y.
SCALE: 1/4" = 1'-0"
FULL SIZE 3/4" = 1'-0"
AIRFRAME CONSTRUCTION & GENERAL DETAILS. 1918 GERMAN PURSUIT TYPE
COPYRIGHT BY Joseph Nieto.

STIRNKUHLER (RADIATOR)
RADIATOR FILL PIPE
OBERER FLUGEL (UPPER WING)
QUERRUDDER (AILERON)
SPANNTURM (WING SUPPORT STRUTS)
VERGASER (CARB.)
AILERON CONTROL CABLES BRANCHED FROM BODY IN PAIRS.
EMPTY M.G. BELT CHUTE (LEFT) TO TANK (PATRONENKASTEN) LIVE AMMO, FROM RIGHT.
PATRONENKASTEN (LIVE M.G. AMMO SUPPLY TANK.)
SCHALTBRETT (INSTRUMENT PANEL) STARTING MAGNETO SHOWN.
STEUERGRIFF (FLIGHT CONTROL GRIP)
AUXILIARY THROTTLE CONTROL (CONNECTED TO MAIN BY BOWDEN CABLES.
MAIN THROTTLE ADJUSTABLE AT CONN. TO ROD. (VERGASERHEBEL.)
AUTOLOCHEBEL (MAGNETO ADVANCE & RET. CONTROL)
RUCKENFLOSSE (V. FIN)
SEITENRUDER (RUDDER)
HOHENFLOSSE (HOR. STAB.)
HOHENRUDER (ELEVATOR)
STREBE FUR HOHENFLOSSE (STAB. STRUT.)
SCHWANZKUFE (SKID)
BENZINE & OIL TANKS. (21 GALS. & 4½ GALS.)
FAHRGESTELL (LANDING GEAR)
FAHRGESTELLFLUKE (L. GEAR WING.)
LAUFRAD (TIRE)
SITZBEFESTIGUNG (SEAT MOUNTING.)
SITZ (SEAT) ADJUSTABLE. (FIG. 5.)
KOMPAS (MAGNETIC (COMPASS)
FUSSBODEN (FLOORBOARD) PLY.
LUFTPUMPE (HAND PUMP FOR INITIAL AIR PRESSURE.)
STEUERKNUPPEL (FLIGHT CONTROL COLUMN.)
STEUGWELTE. (AILERON BAR.)
AUFSTIEG (MOUNTING STEP)
ZUNDGESKTANGE (MAG.) CONTROL LINKAGE.)
ZEITENRUDER FUSHEBEL (RUDDER PEDAL.)
PATRONEN LEER GURTKASTEN. (STORAGE TANK FOR SPENT SHELLS)
AILERON CONTROL CABLES (CROSSED ABOVE HORNS.)
TUBE FOR FUEL GAUGE. (BETWEEN GUNS.) BENZINUHR.
UNTERER FLUGEL (LOWER WING)
ENGINE BEARERS WERE 14 GAUGE 34MM DIA. STEEL TUBES WELDED TO FUSELAGE FRAME.
FIGURE ⑧ TAIL SKID.
COIL SPRINGS.
BALANCE POINT.
STEEL SHOE.
SHOCK STOP CABLES.
M.G. SYNCHRONIZER OP. BY CAMSHAFT INDIVIDUAL CABLES TO EACH GUN.
FUEL GAUGE LOCATED BETWEEN M.G.'s.
HAND OPERATED AIR PUMP TO FUEL TANKS.
MAGNETIC NAVIGATION COMPASS.
CHRONOMETRIC TACHOMETER.
FLIGHT CONTROL GRIP.
CONTROL CABLES DOUBLED.
THREE-PLY FAIRING COVERED BY PRINTED FLAX FABRIC. (REF. FIG. 6)
FIGURE ② MERCEDES 180 H.P. ENGINE MOUNTING.
FIGURE ① STRUTS A-B-C, WELDED JOINTS. STRUT D, REMOVABLE. (REF. FIGS. 3 & 4.)
VERTICAL FIN WAS SET AT 2° ANGLE TO PORT OF SHIP CENTER LINE.
FIG. ⑨ TAIL SECTION.
℄ SHIP
HORIZONTAL STABILIZER SET AT 3½° INCID. ADJUSTED BY USE OF LONGER BOLTS & WASHERS TO VARY INC. AT FRONT ATTACHMENTS.
AUX. THROTTLE CONTROL.
STARTING MAGNETO.
ENG. DRIV. MAG. CONTR.
MAIN THROTTLE. (REF. FIG. 14.)
4TH. RIB FROM BODY (REF.)
4TH. RIB FROM ℄ SHIP. (REF.)
MAXIM "SPANDAU" 8MM. M.G.'s (08/15 TYPE) WERE FIRED BY EITHER OR BOTH TRIGGER-LEVERS (ON CONTROL STICK) ACTUATING M.G. INTERRUPTORS.
FIG. ⑤ ALUM. "BUCKET" SEAT & ADJUST. MOUNTING DETAIL.
FIG. ⑥ FAIRING DETAIL OF FUSELAGE TOP.
ELEVATOR LEADING EDGE STEEL TUBE, FLATTENED & WELDED AT TIP.
VERTICAL STAB. 2° PORT INCID. AGAINST TORQUE.
FIGURE ③ LOWER WING SPAR ATTACHMENT TO FUSELAGE FRAME. (SEE FIG. 4 ALSO)
FRONT M.G. MOUNT
REAR M.G. MOUNT.
℄ THRUST
FIG. ④ REAR WING STRUT ATTACHMENT.
SECTION OF TUBING WAS REMOVABLE FOR REPLACEMENT OF LOWER WING.
FIG. ⑦ TAIL-LIFT HANDLE.
PLYWOOD VENEER
LOWER WING PLAN ASSEMBLED TO FUSELAGE IN ONE PIECE.
THE FABRIC OF THE D-VII FUSELAGE WAS COARSE FLAX AND PRINTED (PROBABLY BY MACHINE) WITH THE USUAL IRREGULAR VARI-COLORED POLYGONS OF CAMOUFLAGE. THE FABRIC WAS NOT ATTACHED TO THE FUSELAGE LONGERONS BUT WAS SIMPLY CARRIED OVER THE FRAMEWORK AND LACED UNDERNEATH ALONG THE CENTER LINE. A CROSS PIECE WAS LACED ACROSS & BEHIND COCKPIT.
FITTING HORIZ. STAB.
FUEL TANK STRAPS
PLAN VIEW ABOVE PRESENTS D-VII FUSELAGE TOP-SIDE LONGITUDINALS AND CROSSMEMBERS & RIGGING OF SAME. PLYWOOD VENEER FLOORBOARD, (SHADED AREA) FRONT & REAR M.G. MOUNTS & MERCEDES 180 H.P. F-1466D-3A ENGINE BASE MOUNTED IN NOSE SECTION. REAR ATTACHMENT FOR HORIZONTAL STAB. AT REAR TIP.
SECTIONS OF FRONT, REAR L.W. SPARS AT BODY SIDES. FLANGES TOP & BELOW OF SCOTS PINE. BIRCH WEBS.
LAMINATED PINE FLANGES. BIRCH WEB.
SCALE: 1½" = 1'-0"
VIEW ABOVE PRESENTS FUSELAGE BOTTOM-SIDE LONGITUDINALS, CROSSMEMBERS & RIGGING. BETWEEN A & B, TUBING WAS REMOVABLE ALLOWING PASSAGE OF LOWER WING SPARS UPON INITIAL INSTALLATION OR REPLACEMENT. TUBING WAS THEN REPLACED AND ALUMINUM COWL-PLATE FASTENED. COWLING WAS ALUMINUM, COVERING FUSELAGE ON ALL FOUR SIDES, ABOVE TO COCKPIT, BELOW, BEYOND MAIN SPARS COWLS FASTENED BY NUTS & BOLTS. NUTS HAD 1" HANDLES PROVIDING RAPID REMOVAL WITHOUT TOOLS.
L.W. SPAR SECTIONS AT THE TIPS. SCALE: 1½" = 1'-0"
FIG. ⑩ BALL-SOCKET JOINT "N" STRUT FITTING TO FRONT L.W. MAIN SPAR.

RADIATOR FACE — FUSELAGE SECTIONS LEGEND — A B C D E

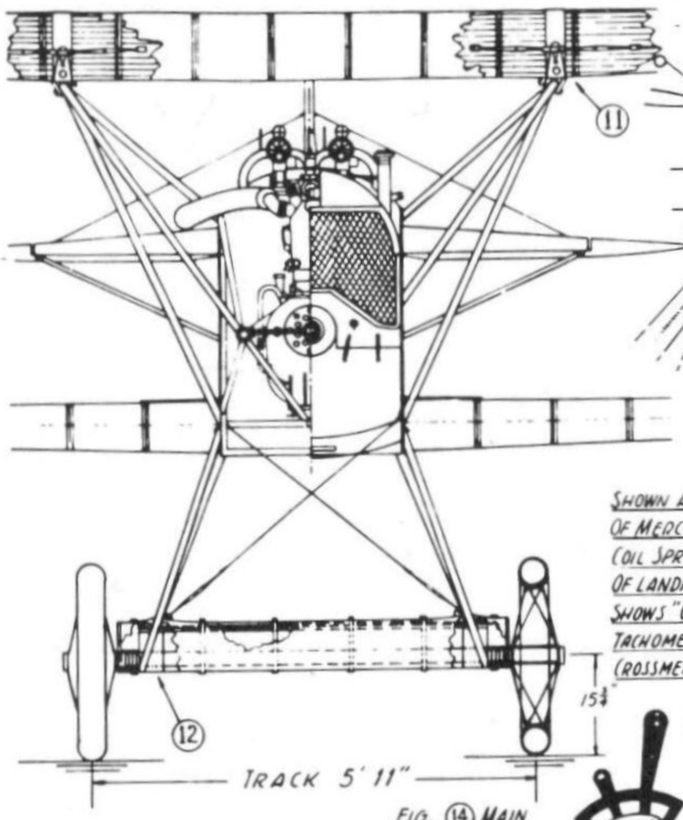
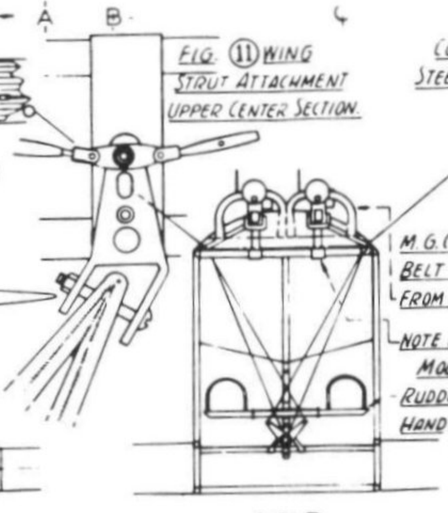


FIG. (11) WING STRUT ATTACHMENT UPPER CENTER SECTION.



CONTROL CABLES FROM STEERING COL. TO AILERON.

M. G. CARTRIDGE BELT CHUTES TO & FROM AMMO. TANKS.

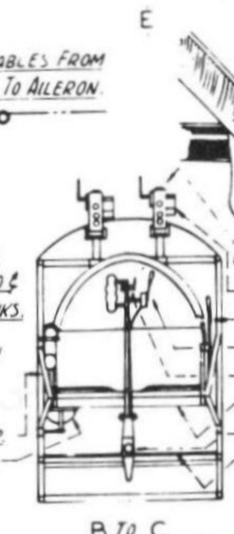
NOTE REAR GUN MOUNTINGS.

RUDDER BAR.

HAND (AIR) PUMP.

COMPASS.

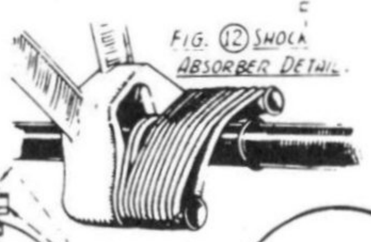
A TO B

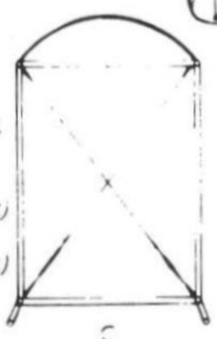


B TO C

M.G. MECH. BOXES.
SPRING CASE.
THROTTLE & SPARK.
AUX. THROTTLE.
M. G. TRIGGERS.
SEAT BOTTOM (PLY.)
AILERON SHAFT.
FLOOR BOARD (PLY.)

FIG. (12) SHOCK ABSORBER DETAIL.





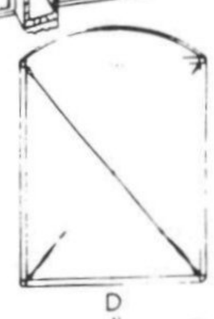
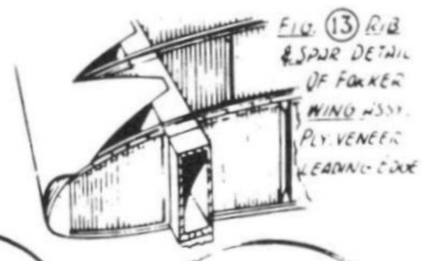


FIG. (13) RIB & SPAR DETAIL OF FOKKER WING ASSY. PLY VENEER LEADING EDGE



C

D

ELN

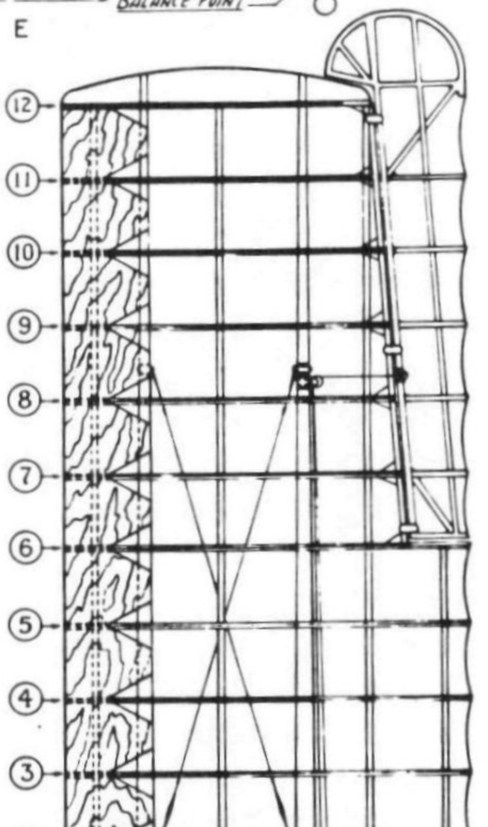
STAB

SECTION "F" SHOWS TAIL SKID & SPRING SHOCKS INST.

F

BALANCE POINT

E



SHOWN AT LEFT IS SECTION OF MERCEDES INSTALLATION & COIL SPRING SHOCK ABSORBER SYSTEM OF LANDING GEAR. SKETCH AT RIGHT SHOWS "OFFICE" OF THE D-VIII. ENGINE TACHOMETER MOUNTED ON SAME CROSSMEMBER OF REAR M. G. MOUNTS. LOCATIONS OF ALTIMETER & CLOCK VARIED IN ARRANGEMENT.

MAIN TANK FUEL PRESS. — TACH. — AUX. TANK FUEL PRESS.

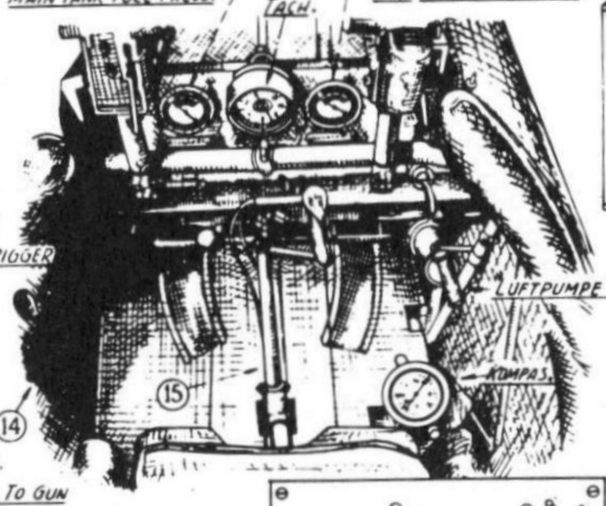


FIG. (14) MAIN THROTTLE & IGNITION CONTROL SEEN FROM OUTSIDE BODY. NOTE BOWDEN CABLES.

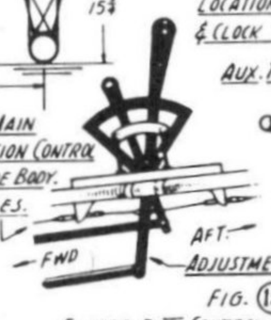


FIG. (15) FOKKER D-VIII CONTROL SYSTEM. BUT FOR GRIP, SAME AS THAT OF FOK. DR-I. HEEL PLATES, METAL.

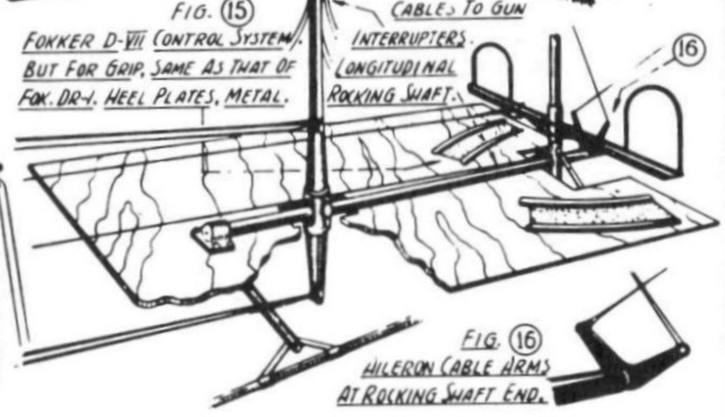


FIG. (16) AILERON CABLE ARMS AT ROCKING SHAFT END.

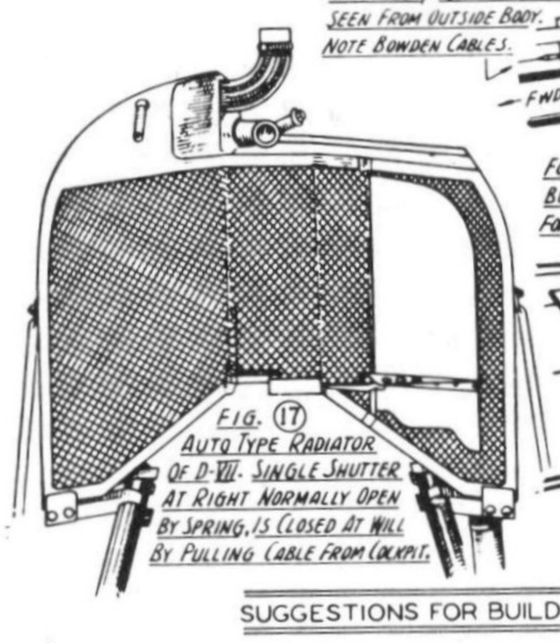


FIG. (17) AUTO TYPE RADIATOR OF D-VIII. SINGLE SHUTTER AT RIGHT NORMALLY OPEN BY SPRING, IS CLOSED AT WILL BY PULLING CABLE FROM COCKPIT.

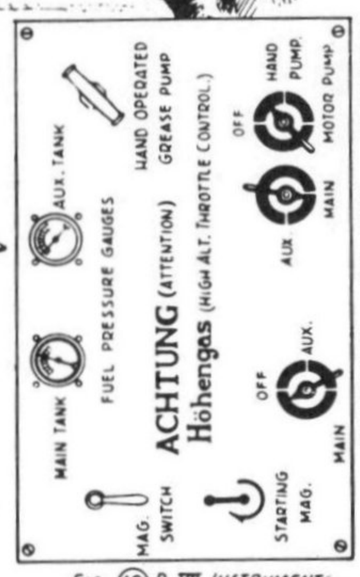
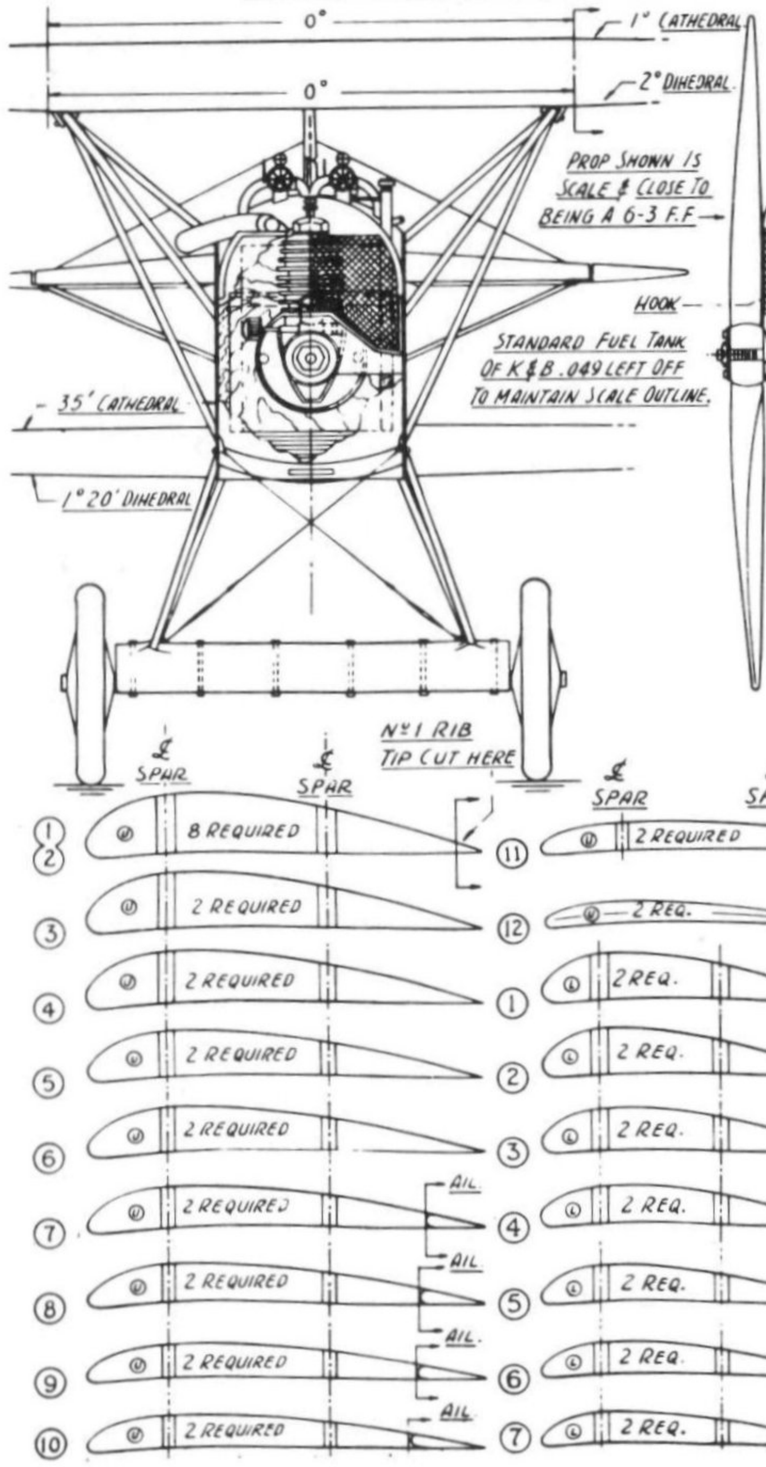
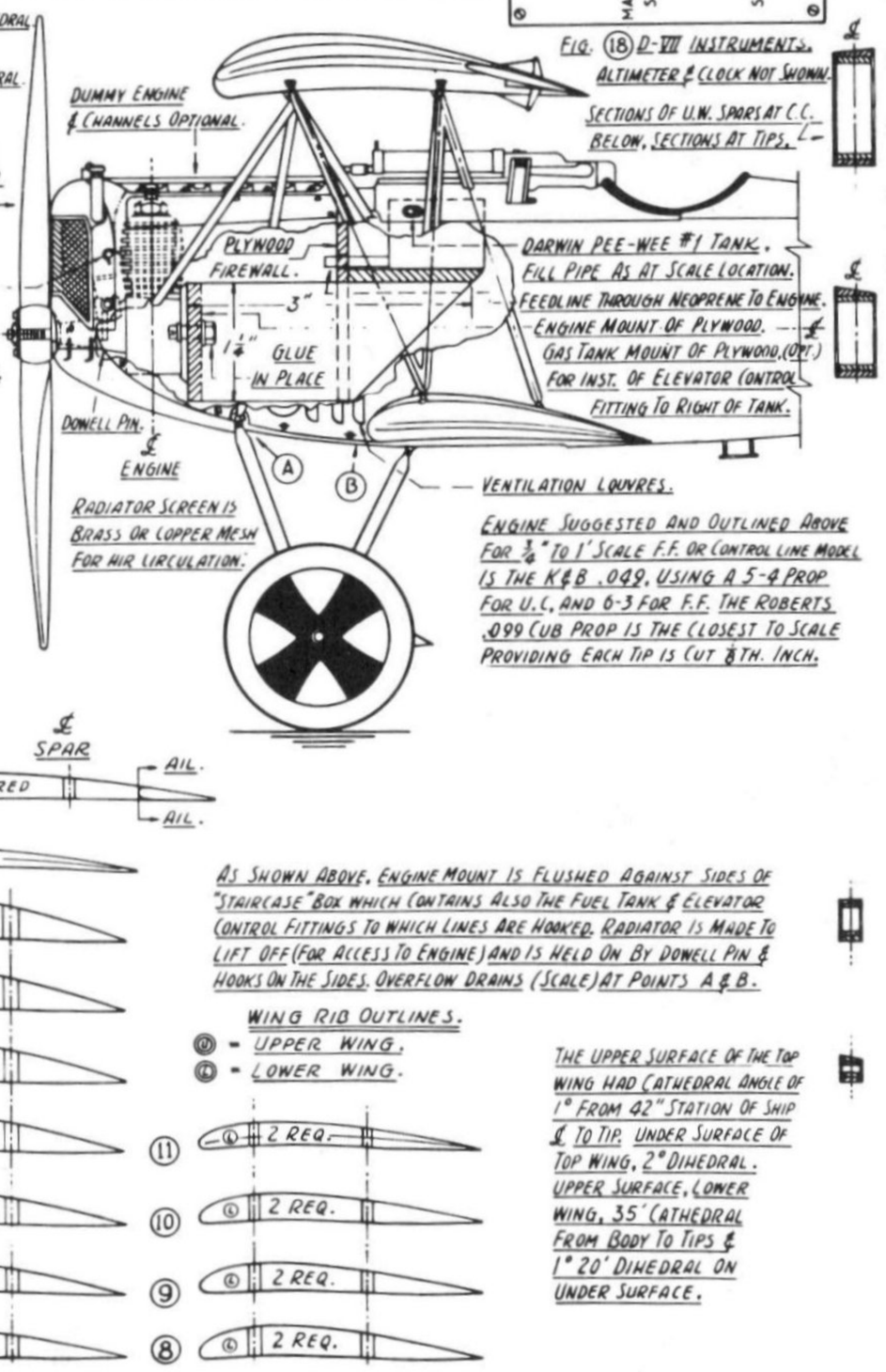


FIG. (18) D-VIII INSTRUMENTS. ALTIMETER & CLOCK NOT SHOWN.

SUGGESTIONS FOR BUILDING A CONTROL-LINE MODEL OF THE FOKKER D-VII.





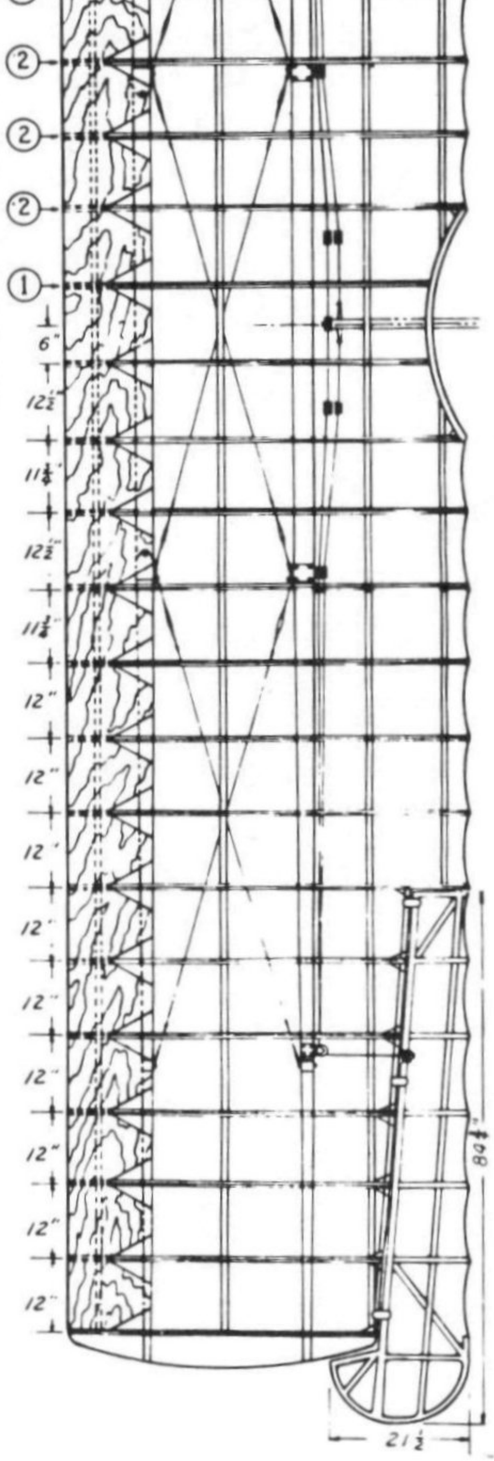
RADIATOR SCREEN IS BRASS OR COPPER MESH FOR AIR CIRCULATION.

ENGINE SUGGESTED AND OUTLINED ABOVE FOR ¾" TO 1' SCALE F.F. OR CONTROL LINE MODEL IS THE K&B .049. USING A 5-4 PROP FOR U.C. AND 6-3 FOR F.F. THE ROBERTS .099 CUB PROP IS THE CLOSEST TO SCALE PROVIDING EACH TIP IS CUT ⅛TH. INCH.

AS SHOWN ABOVE, ENGINE MOUNT IS FLUSHED AGAINST SIDES OF "STAIRCASE" BOX WHICH CONTAINS ALSO THE FUEL TANK & ELEVATOR CONTROL FITTINGS TO WHICH LINES ARE HOOKED. RADIATOR IS MADE TO LIFT OFF (FOR ACCESS TO ENGINE) AND IS HELD ON BY DOWELL PIN & HOOKS ON THE SIDES. OVERFLOW DRAINS (SCALE) AT POINTS A & B.

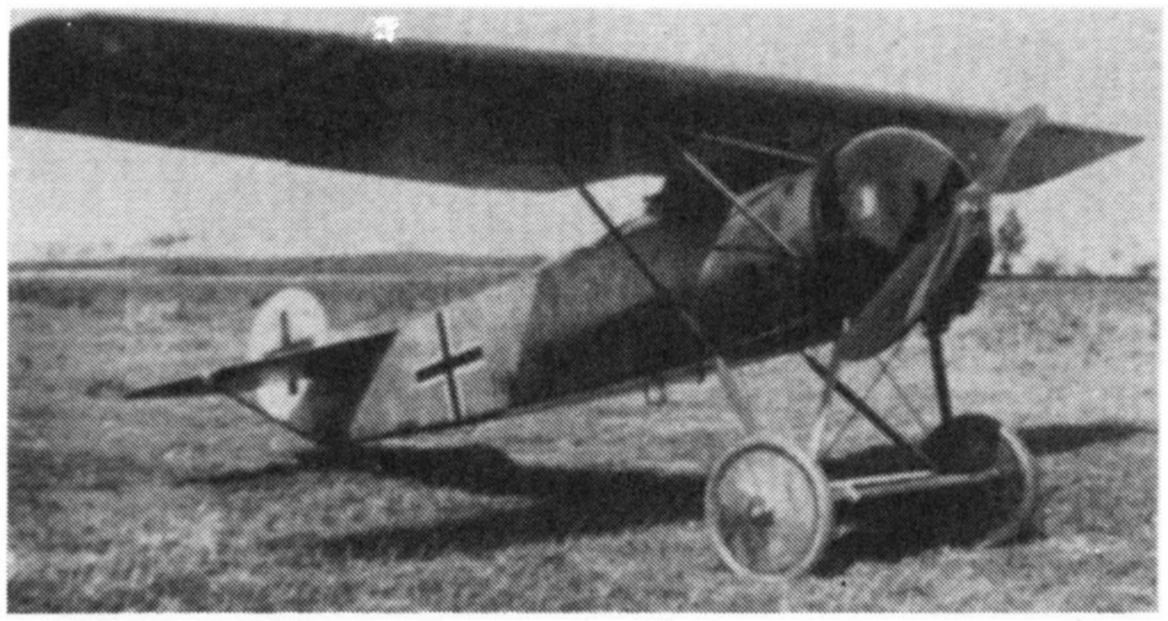
WING RIB OUTLINES.
Ⓤ - UPPER WING.
Ⓛ - LOWER WING.

THE UPPER SURFACE OF THE TOP WING HAD CATHEDRAL ANGLE OF 1° FROM 42" STATION OF SHIP ℄ TO TIP. UNDER SURFACE OF TOP WING, 2° DIHEDRAL. UPPER SURFACE, LOWER WING, 3.5° CATHEDRAL FROM BODY TO TIPS & 1° 20' DIHEDRAL ON UNDER SURFACE.

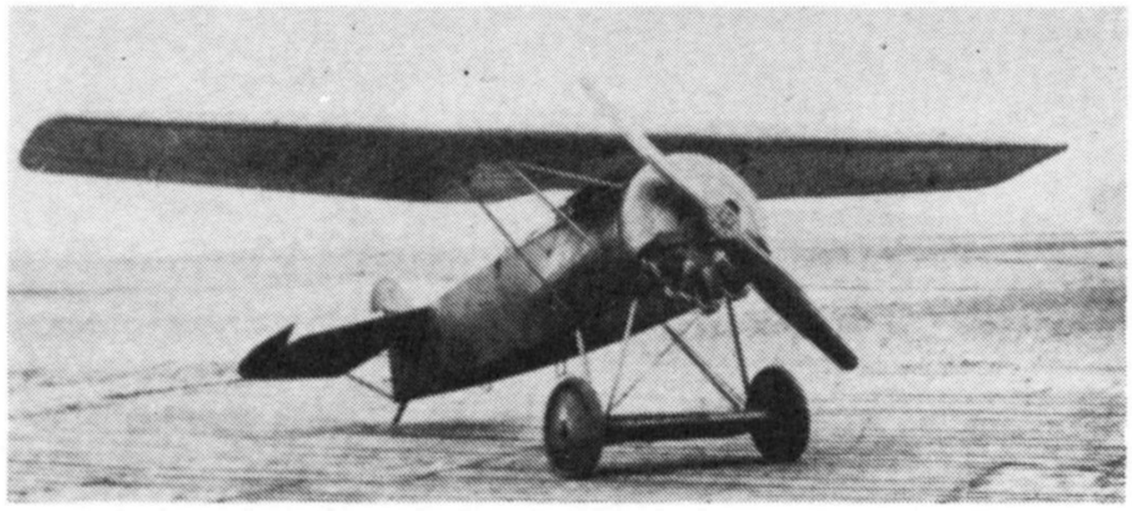


Fokker E.V/D.VIII

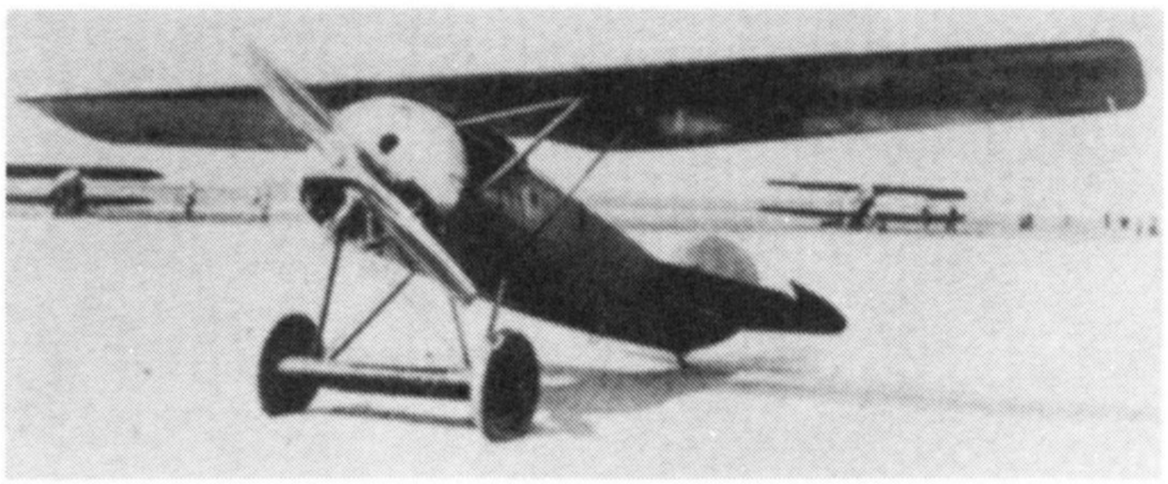
drawings by PHILLIP DREWS



The Fokker D.VIII was unique in several respects. Full cantilever wing, no struts and good performance gave its pilots a tremendous advantage over their foes. Photo courtesy of "Fokker, the Man and the Aircraft."



The 110-hp Oberursel rotary, Siemens-Halske, Goebel, and Le Rhone engines were used on various versions of the D.VIII.



An extremely clean design for WW I, the Fokker D.VIII was a formidable weapon in the hands of German pilots.

DURING the closing weeks of WW I, there appeared over the front lines a nimble little monoplane that is generally credited as being the finest fighter of its day. This was the famous Fokker D.VIII of the German Imperial Air Force.

Powered by a rotary Oberursel engine of 110 hp, the D.VIII had a speed of 127 mph. It climbed at a rate of 1,500 fpm and could ascend over 4 miles high. In its ability to maneuver and dive it was unequaled. The first production E.V's (called D.VIII) were so badly built by the Fokker factory that several crashes resulted, and the type was grounded until the defects could be located and remedied. By the time proper construction procedures were established at the factory, the War was almost over; the D.VIII saw almost no service.

Also known as the Fokker E.V and the "Flying Razor," it gained much of its reputation in the hands of the famous German pilot Ernst Udet. Even after the war Udet toured small German towns giving mock demonstrations of aerial dog fights. Strangely, these illegal performances were not detected by the Allied Occupation authorities.

Of the many designs credited to Anthony Fokker, the D.VIII or E.V was probably one of the best—and most controversial.

Note: recent research has shown that the two spars in each wing were not parallel, as in Drews' drawing, but tapered together toward each tip—and each spar was made in one piece.

One D.VIII survives, now on exhibition in Italy. □

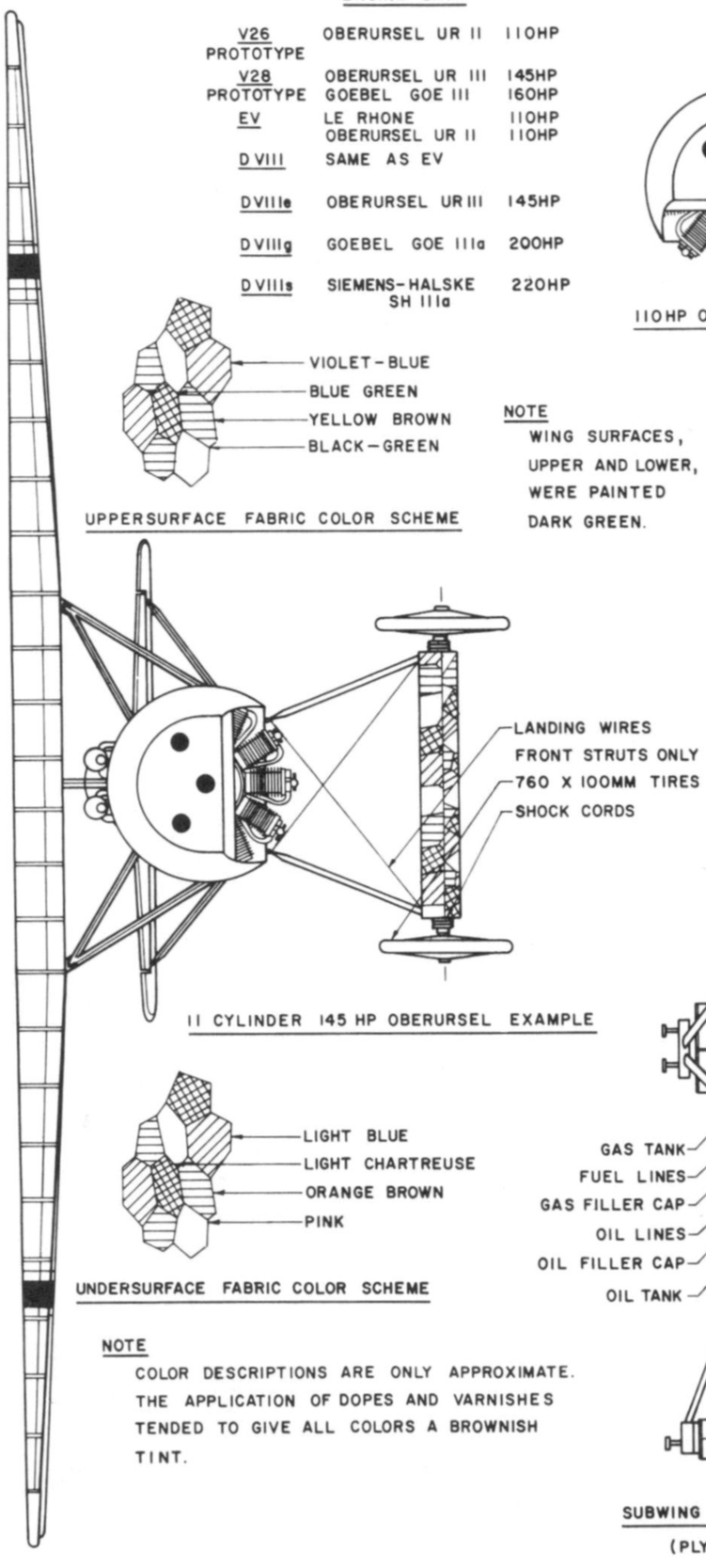
ENGINE DATA

V26 PROTOTYPE	OBERURSEL UR II	110HP
V28 PROTOTYPE	OBERURSEL UR III	145HP
	GOEBEL GOE III	160HP
EV	LE RHONE	110HP
	OBERURSEL UR II	110HP
D VIII	SAME AS EV	
D VIIIe	OBERURSEL UR III	145HP
D VIIIg	GOEBEL GOE IIIa	200HP
D VIIIs	SIEMENS-HALSKE SH IIIa	220HP

UPPERSURFACE FABRIC COLOR SCHEME

NOTE

WING SURFACES, UPPER AND LOWER, WERE PAINTED DARK GREEN.

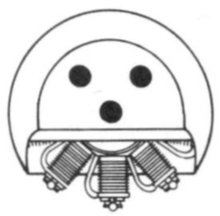


11 CYLINDER 145 HP OBERURSEL EXAMPLE

UNDERSURFACE FABRIC COLOR SCHEME

NOTE

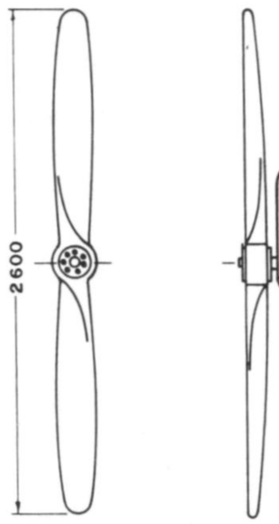
COLOR DESCRIPTIONS ARE ONLY APPROXIMATE. THE APPLICATION OF DOPES AND VARNISHES TENDED TO GIVE ALL COLORS A BROWNISH TINT.

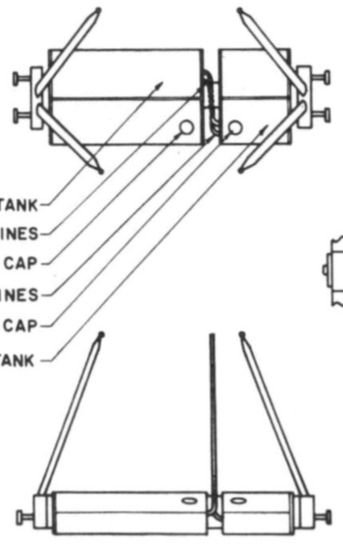


110HP OBERURSEL EXAMPLE

NOTE

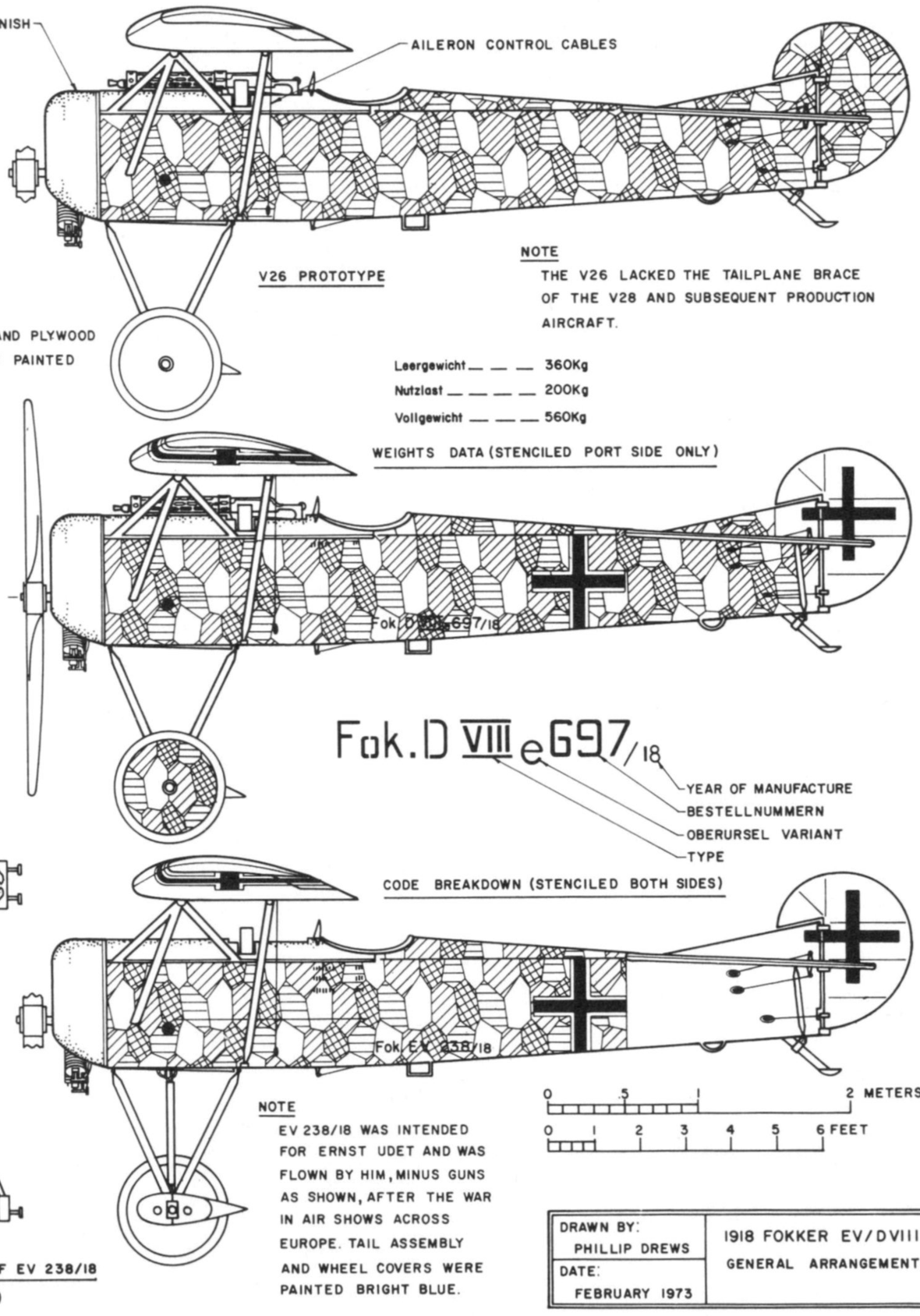
ALL STRUTS AND PLYWOOD PANELS WERE PAINTED DARK GREEN.





SUBWING TANK INSTALLATION OF EV 238/18

(PLYWOOD SKIN REMOVED)



V26 PROTOTYPE

NOTE

THE V26 LACKED THE TAILPLANE BRACE OF THE V28 AND SUBSEQUENT PRODUCTION AIRCRAFT.

Leergewicht _ _ _ 360Kg
Nutzlast _ _ _ _ 200Kg
Vollgewicht _ _ _ 560Kg

WEIGHTS DATA (STENCILED PORT SIDE ONLY)

Fok.D VIII e697/18

- YEAR OF MANUFACTURE
- BESTELLNUMMERN
- OBERURSEL VARIANT
- TYPE

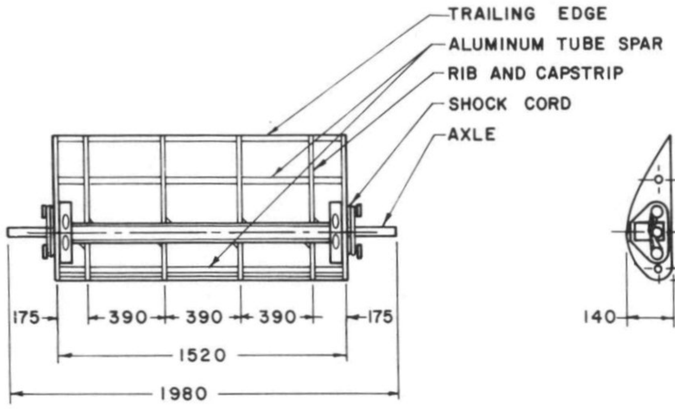
CODE BREAKDOWN (STENCILED BOTH SIDES)

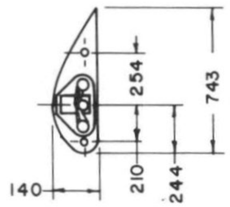
NOTE

EV 238/18 WAS INTENDED FOR ERNST UDET AND WAS FLOWN BY HIM, MINUS GUNS AS SHOWN, AFTER THE WAR IN AIR SHOWS ACROSS EUROPE. TAIL ASSEMBLY AND WHEEL COVERS WERE PAINTED BRIGHT BLUE.

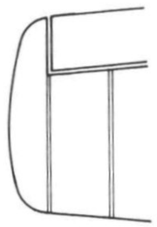
0 .5 1 2 METERS
0 1 2 3 4 5 6 FEET

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

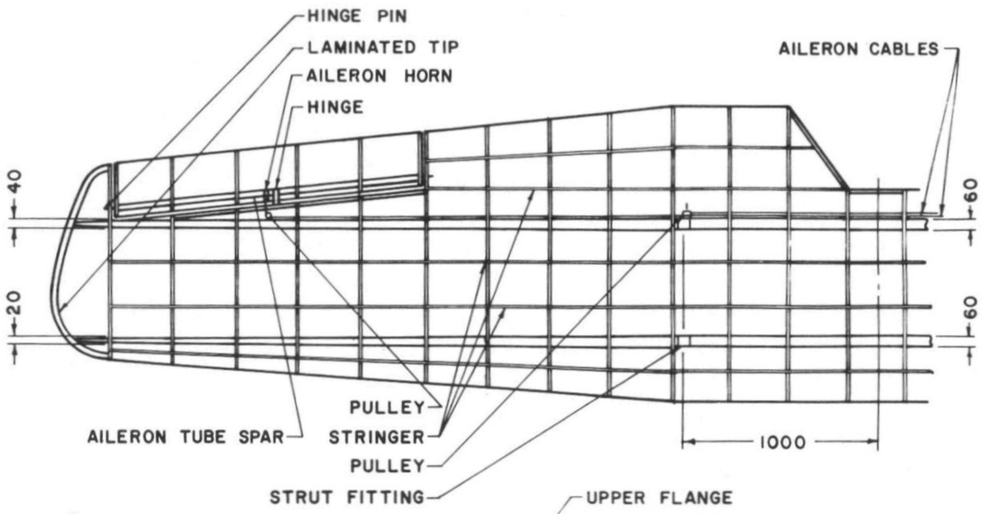


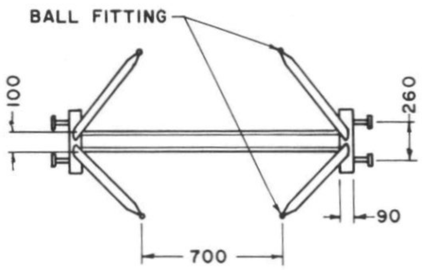


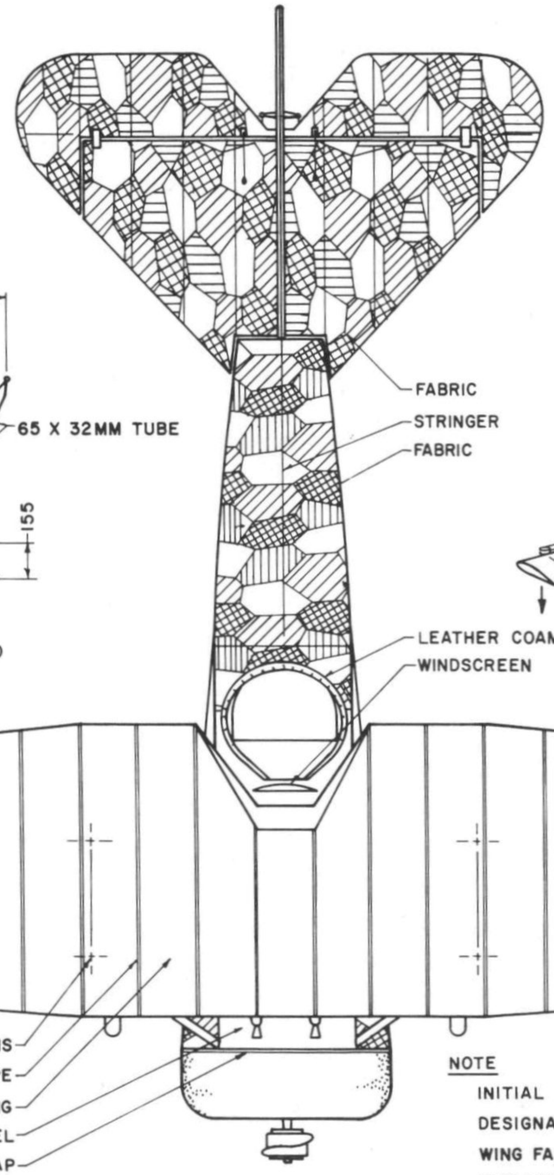
SUBWING LAYOUT

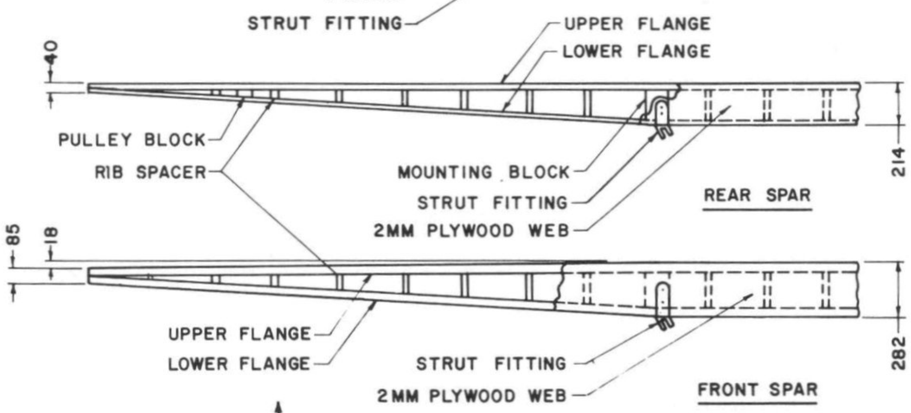


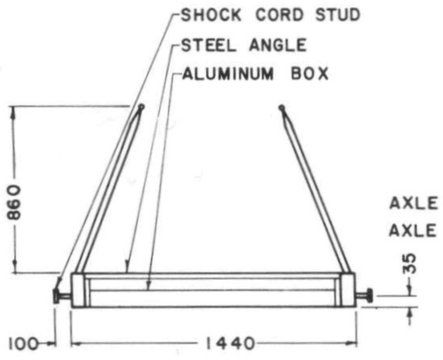
PROTOTYPE WINGTIP

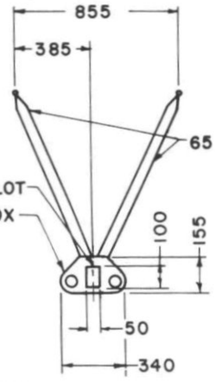




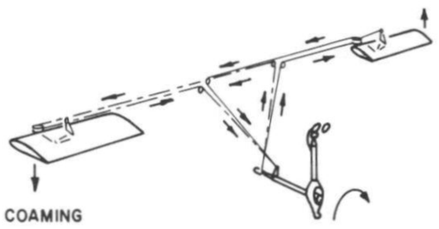




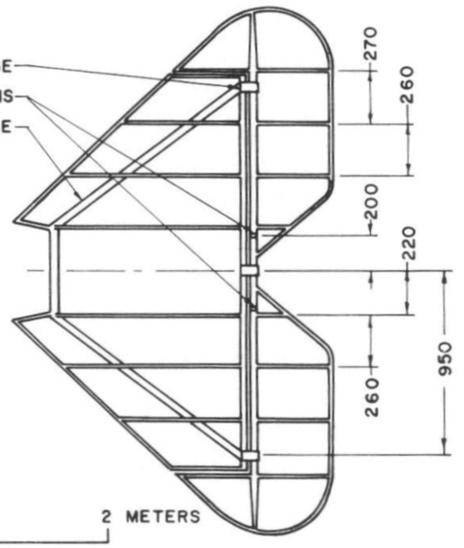


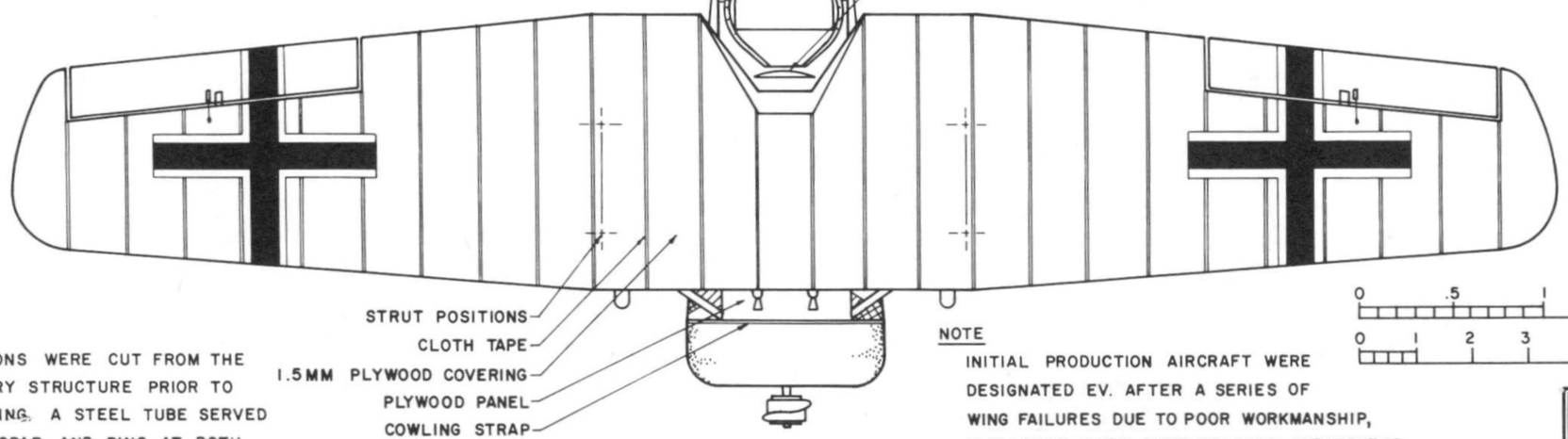


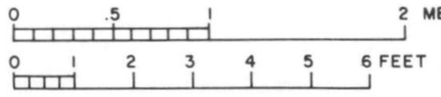
LANDING GEAR LAYOUT



AILERON CONTROL DIAGRAM







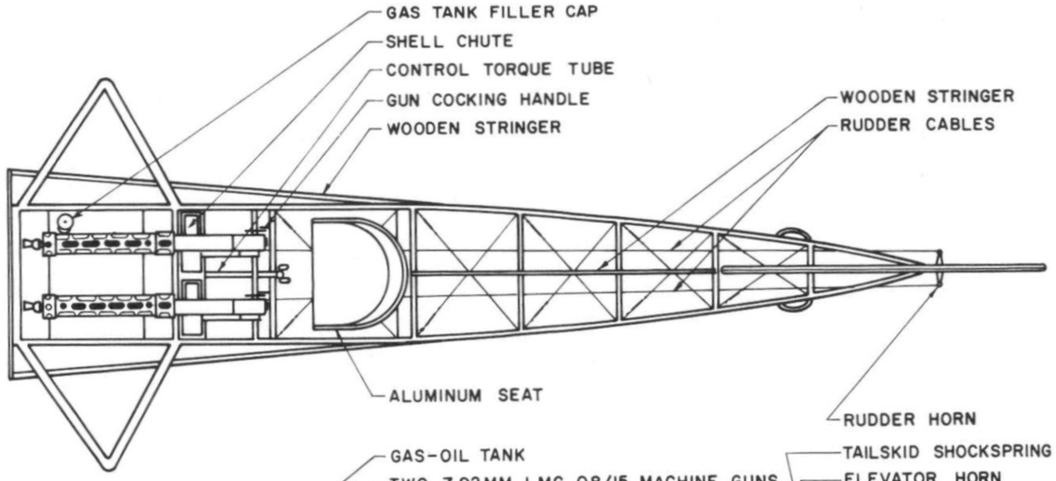
NOTE

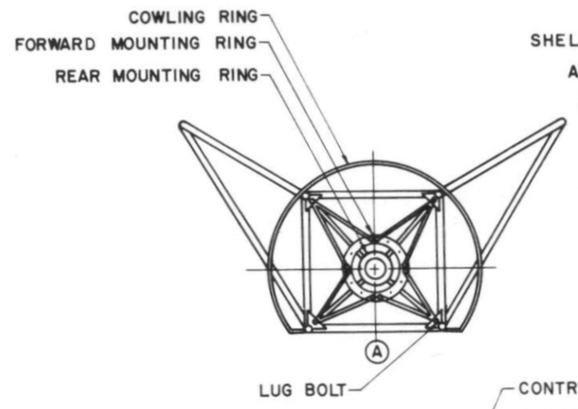
AILERONS WERE CUT FROM THE PRIMARY STRUCTURE PRIOR TO COVERING. A STEEL TUBE SERVED AS A SPAR AND PINS AT BOTH ENDS HINGED THEM TO THE MAINPLANE.

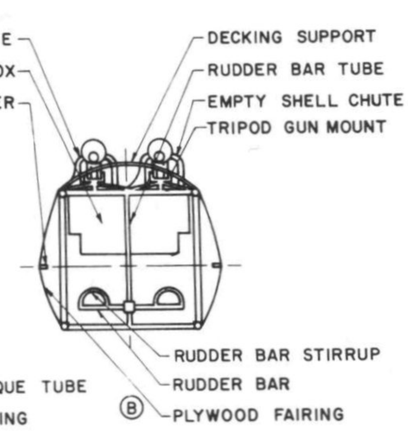
NOTE

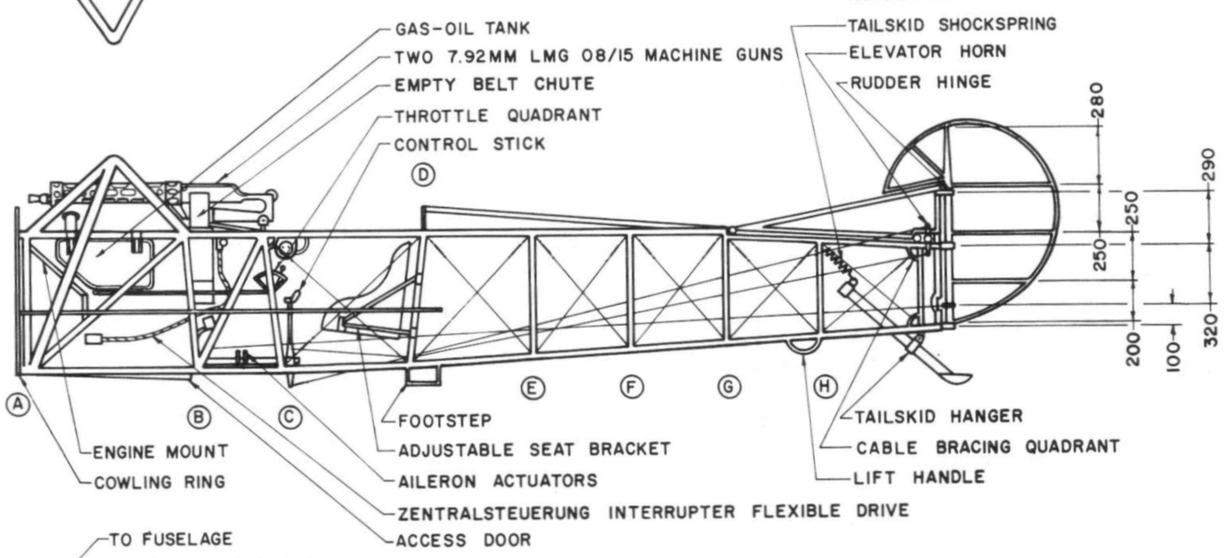
INITIAL PRODUCTION AIRCRAFT WERE DESIGNATED EV. AFTER A SERIES OF WING FAILURES DUE TO POOR WORKMANSHIP, THE SPARS WERE STRENGTHENED. SUBSEQUENT AIRCRAFT AND THOSE REFITTED WITH THE MODIFIED WINGS WERE DESIGNATED D VIII.

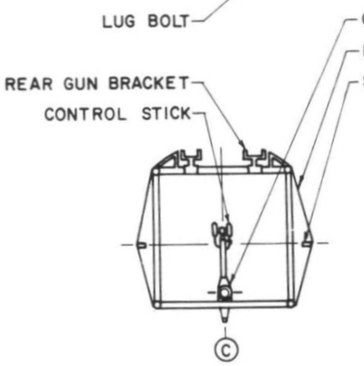
DRAWN BY PHILLIP DREWS	1918 FOKKER EV/DVIII WING AND LANDING GEAR DETAILS
DATE: FEBRUARY 1973	





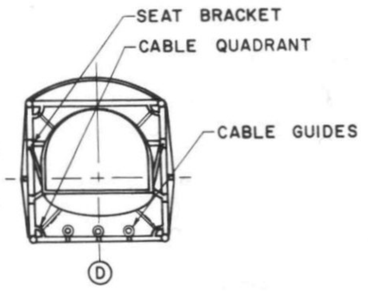


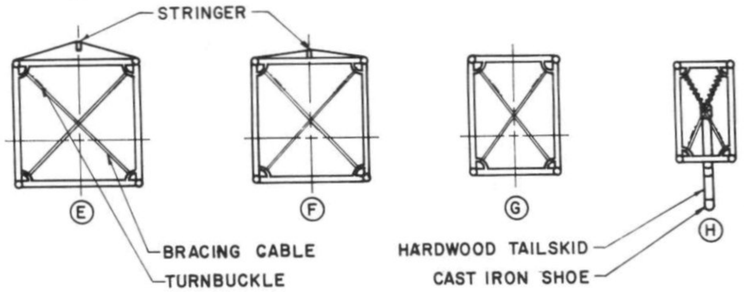




NOTE

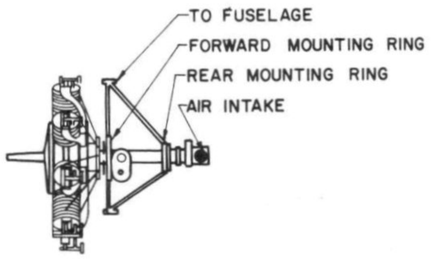
SLIP-TUBES ON FUSELAGE FRAME GIVES SEAT ADJUSTMENT.





NOTE

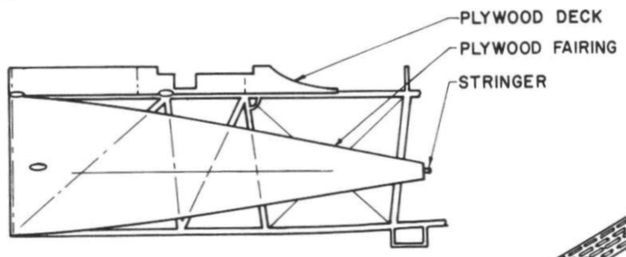
SINGLE CABLE WAS LOOPED THROUGH CORRESPONDING QUADRANTS AND MATED TO A SINGLE TURNBUCKLE. NO ANCHORING CLEVIS WAS NEEDED.



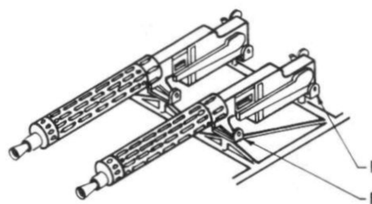
ENGINE INSTALLATION

NOTE

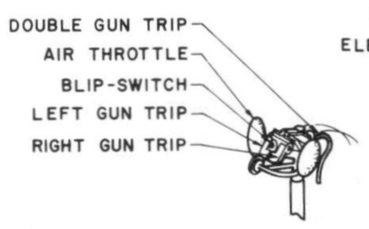
ENGINE AND MOUNT WERE REMOVABLE AS A SINGLE UNIT



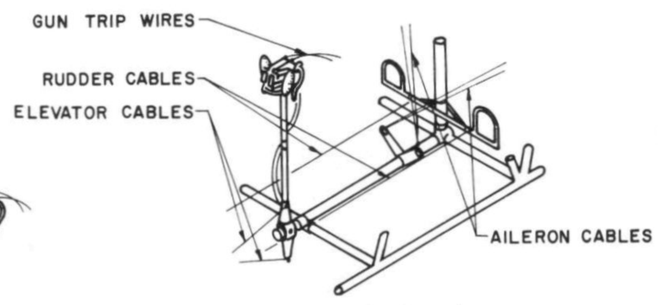
FAIRING DETAIL



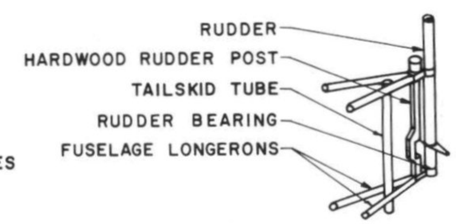
MACHINE GUN DETAIL



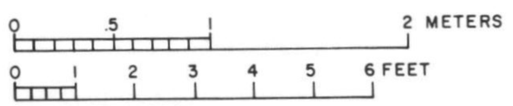
GRIP DETAIL



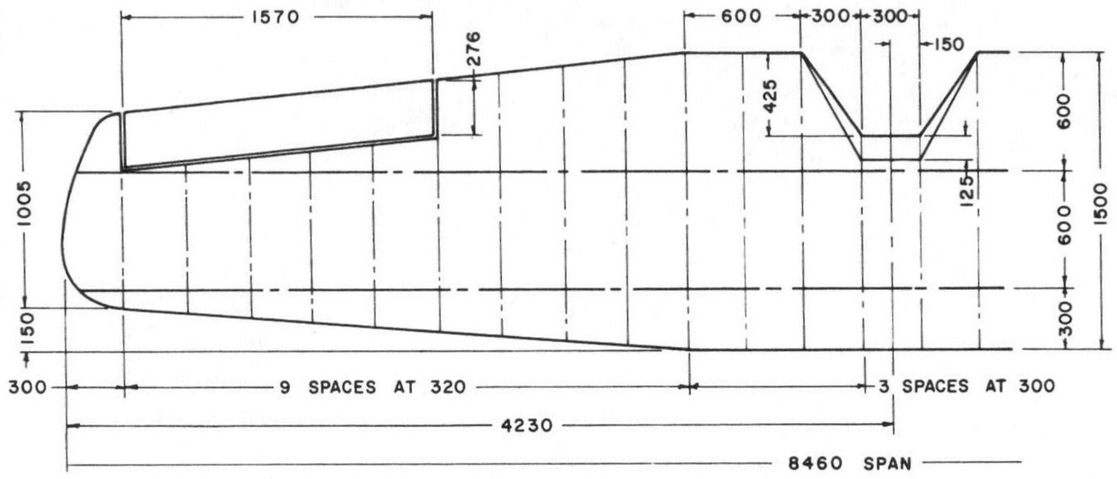
FLIGHT CONTROL DETAIL

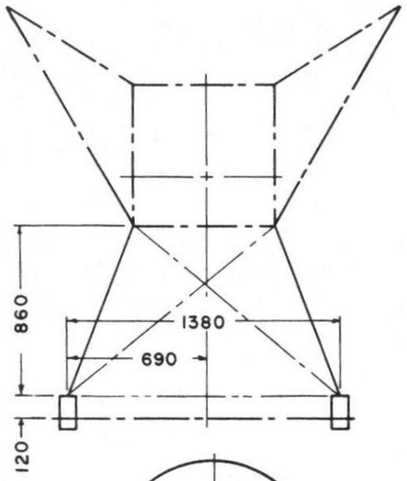


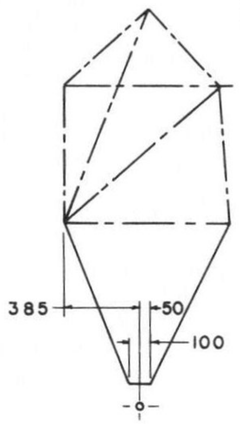
TAIL SECTION DETAIL

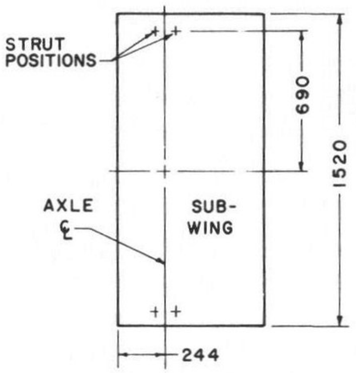


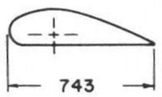
DRAWN BY PHILLIP DREWS	1918 FOKKER EV/DVIII FUSELAGE DETAILS
DATE: FEBRUARY 1973	

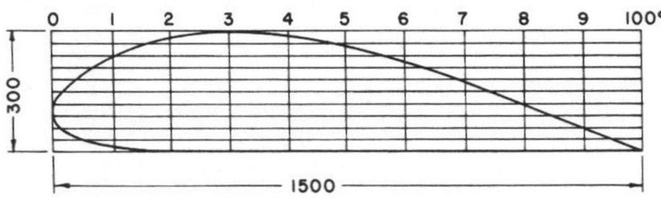




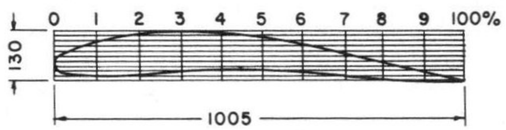




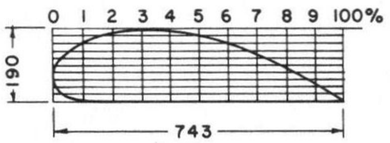




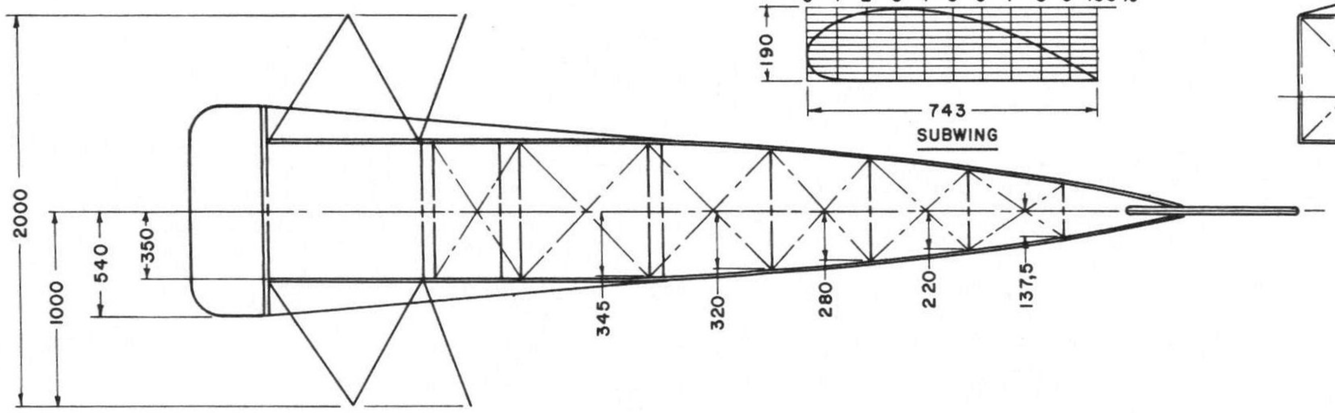
WING RIB AT STRUT ATTACHMENT POINTS

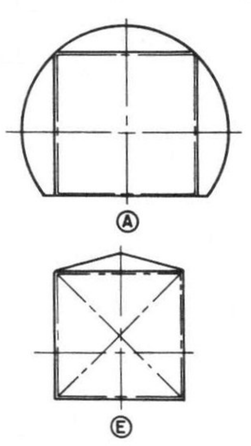


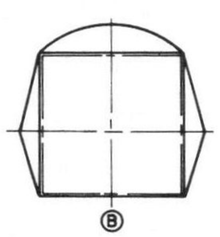
WING RIB AT TIP

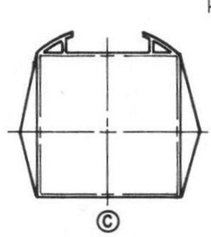


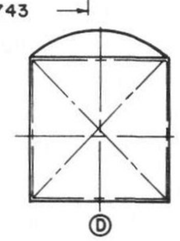
SUBWING

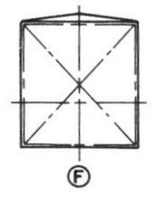


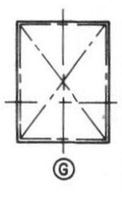


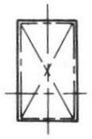


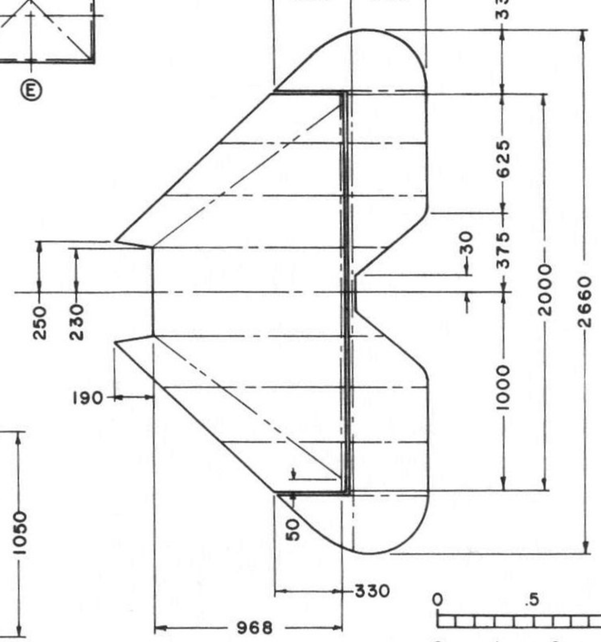


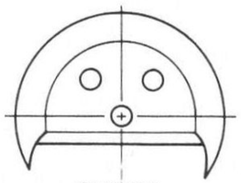


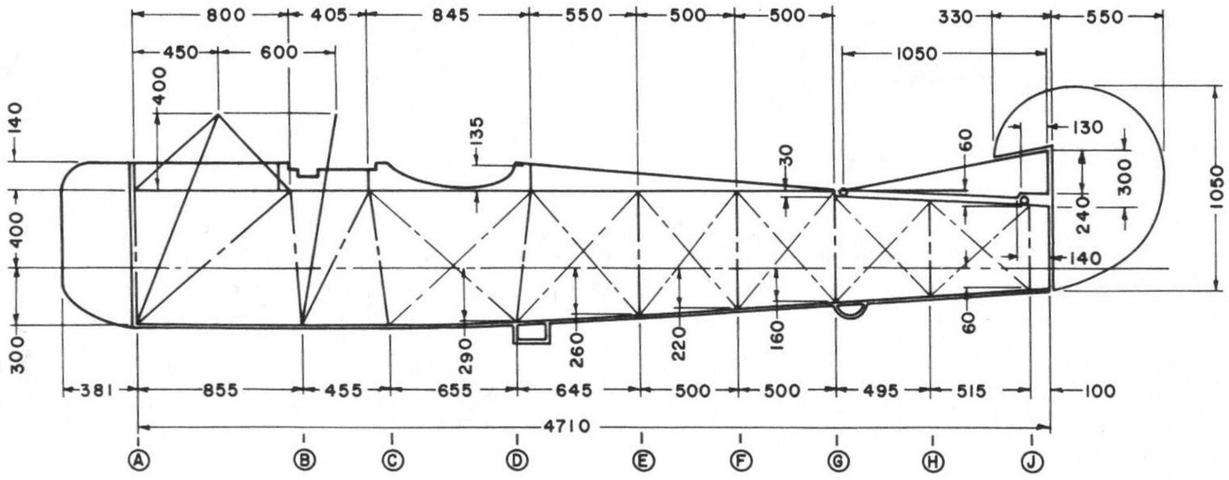


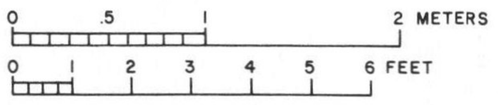












DRAWN BY: PHILLIP DREWS	1918 FOKKER EV/DVIII GENERAL LAYOUT
DATE: FEBRUARY 1973	

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)

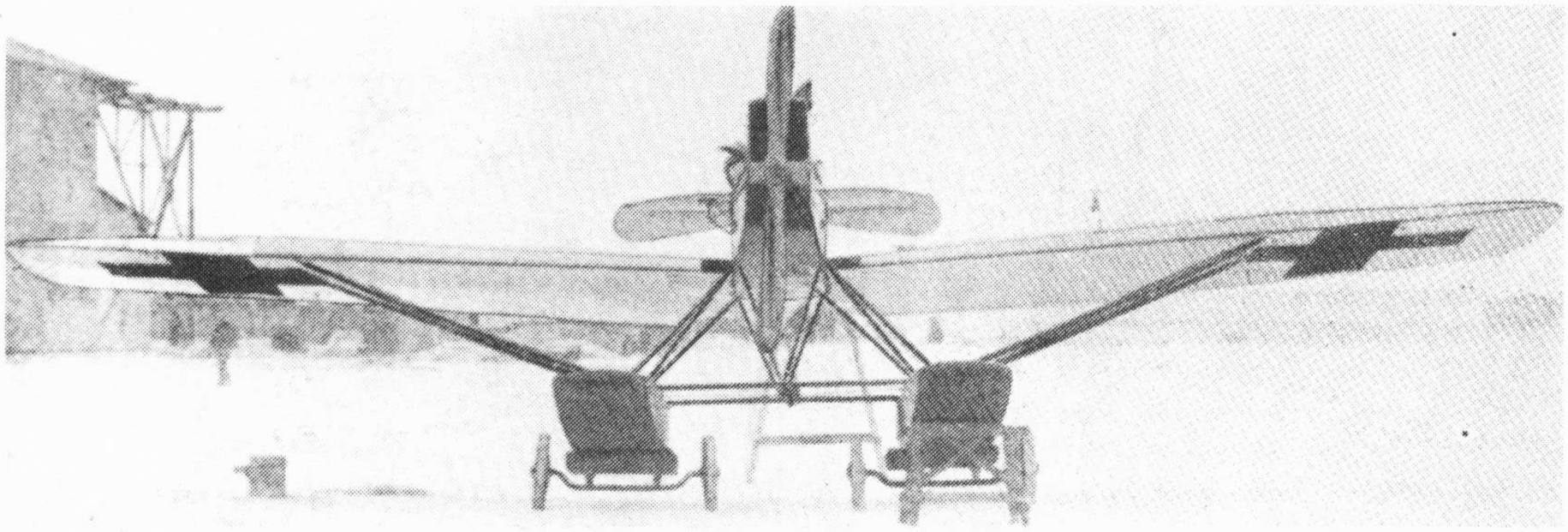
FRONT VIEW
WATER COOLED MACHINE GUN
MOUNTING QUADRANT
CARTRIDGE MAGAZINE
SERVICE FUEL TANK
AILERON HORN

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

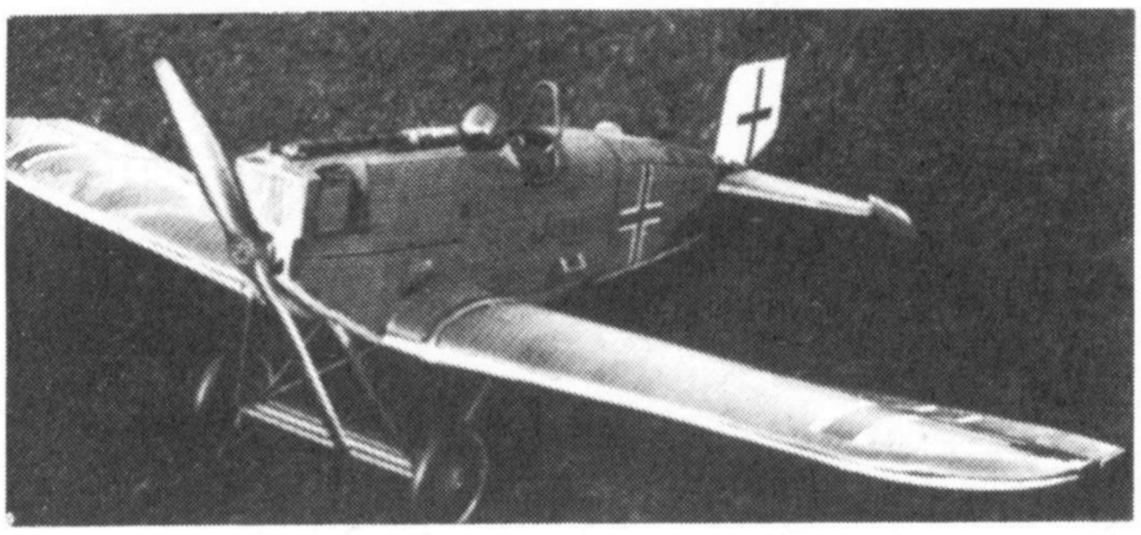
FEET 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14

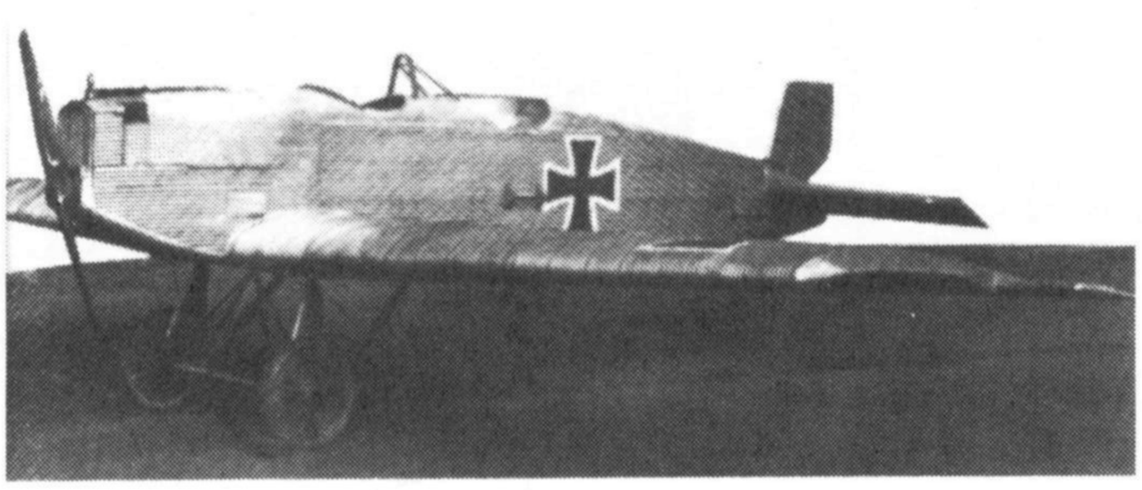
METRES 0 1 2 3

Junkers D.I

drawing by CHARLES GRAHAM

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





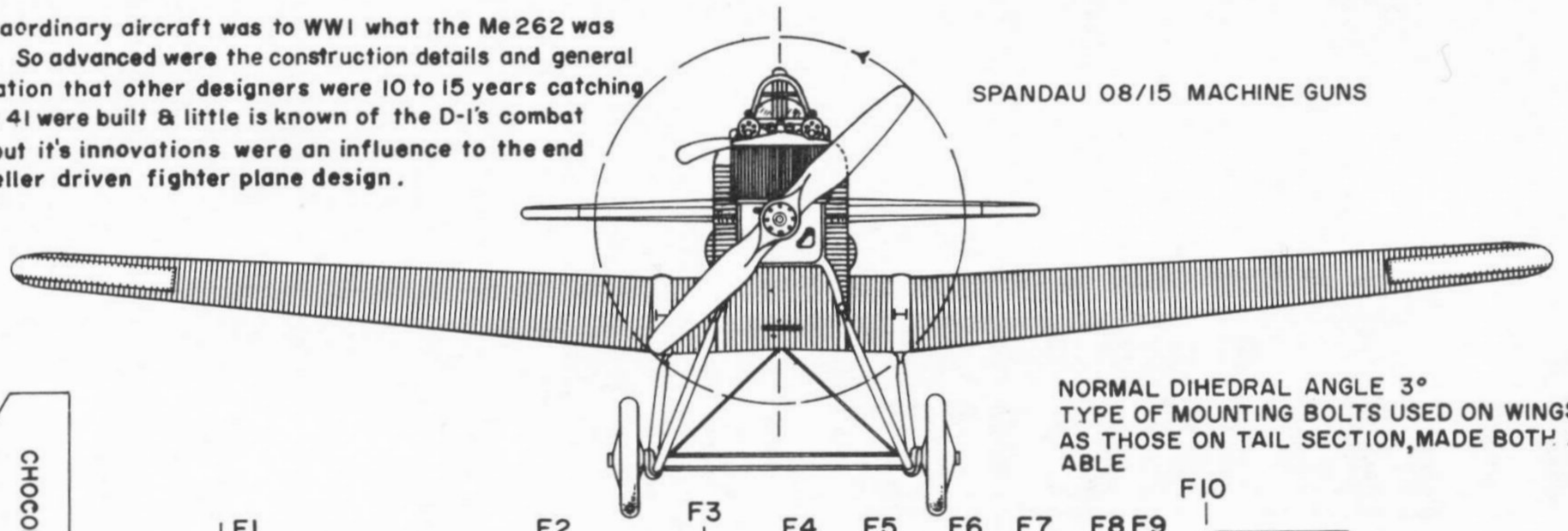
The Junkers D.1, above and below, was all-metal with full cantilever wings. "Jane's Encyclopedia of the World's Aircraft" photo.

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.

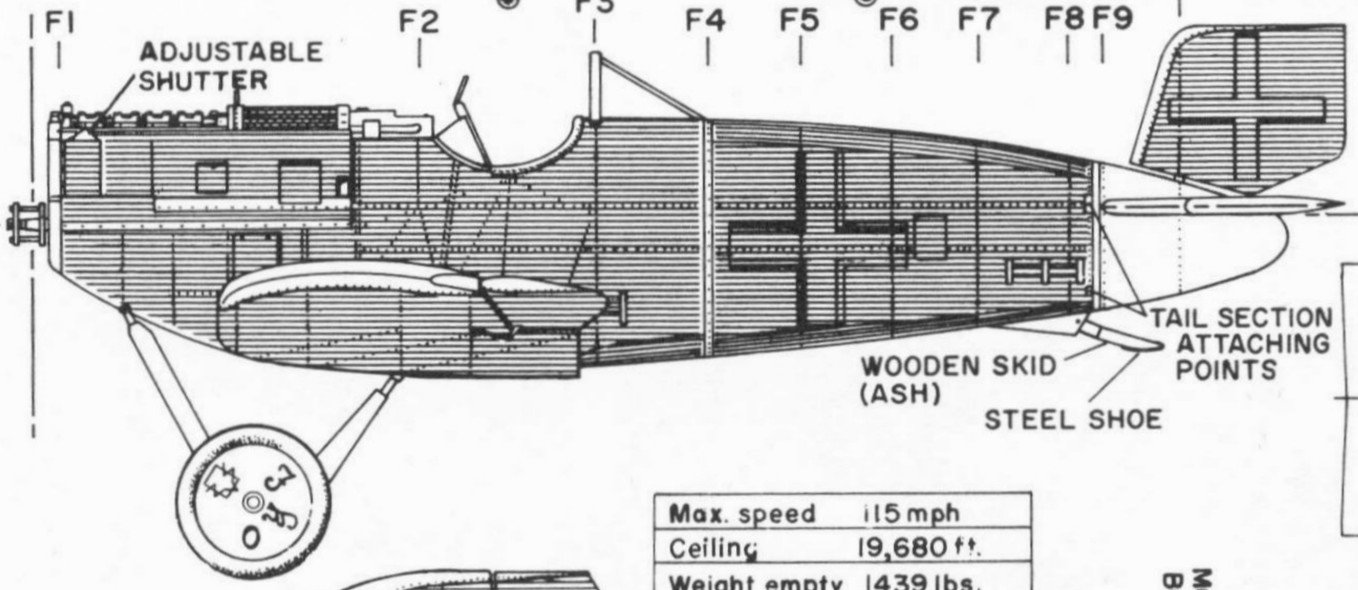
Four Junkers all-metal monoplanes of the WW I period survive in museums. □

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.



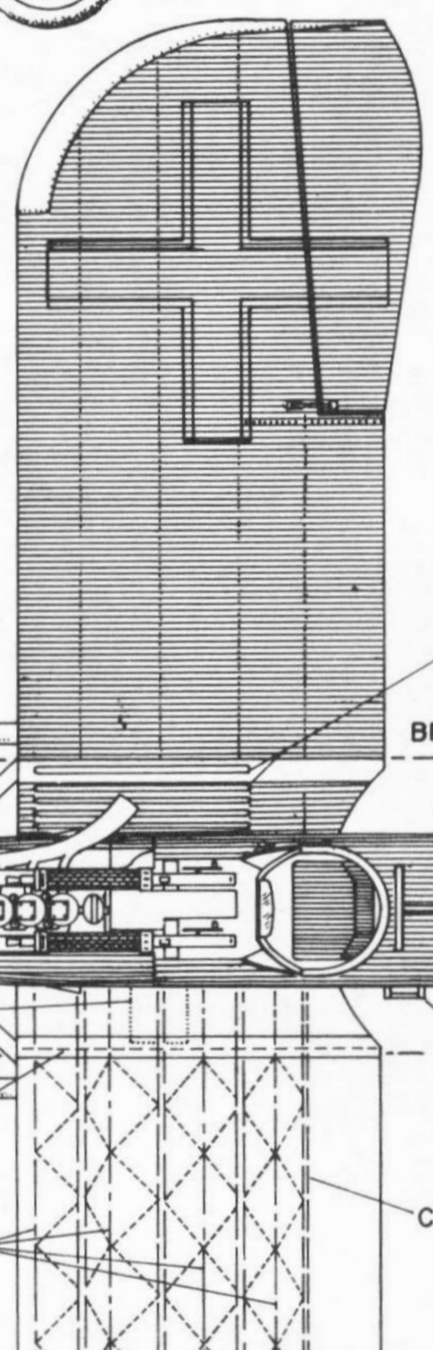
SPANDAU 08/15 MACHINE GUNS

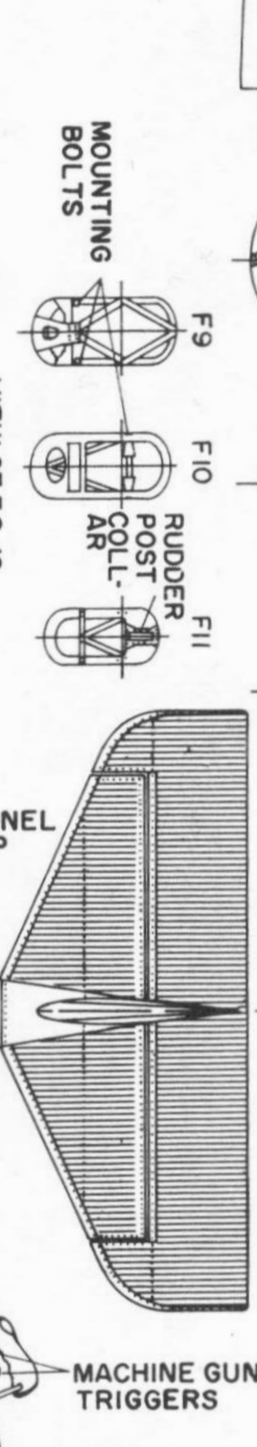
NORMAL DIHEDRAL ANGLE 3°
TYPE OF MOUNTING BOLTS USED ON WINGS, AS WELL AS THOSE ON TAIL SECTION, MADE BOTH ADJUSTABLE



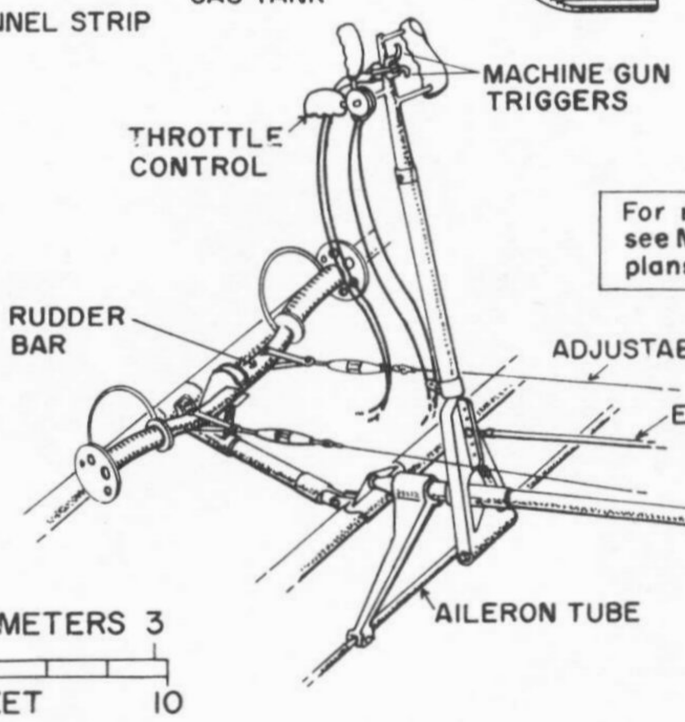
BASE COLOR IS PALE GREEN, IRREGULAR PATCHES: LIGHT MAUVE BLACK CROSS OUTLINED IN WHITE, SINCE UNDERSIDE IS WHITE, THE CROSS HAS NO OUTLINE

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

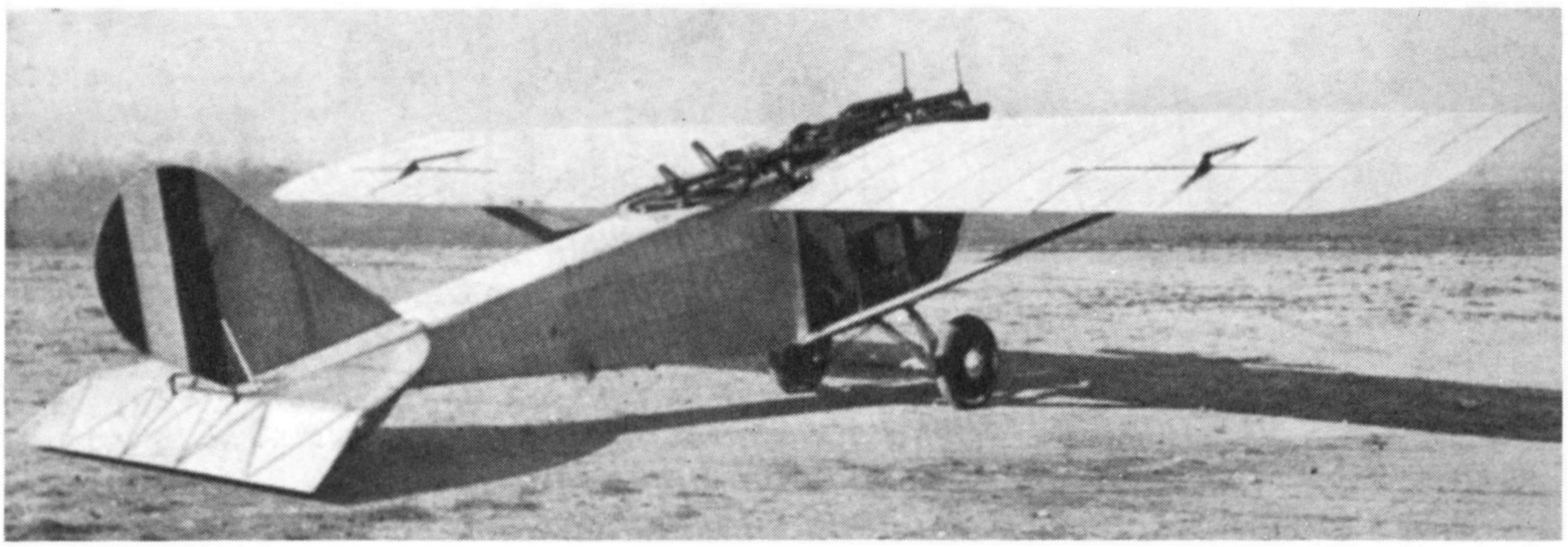
0 1 2 METERS 3
0 5 FEET 10

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.

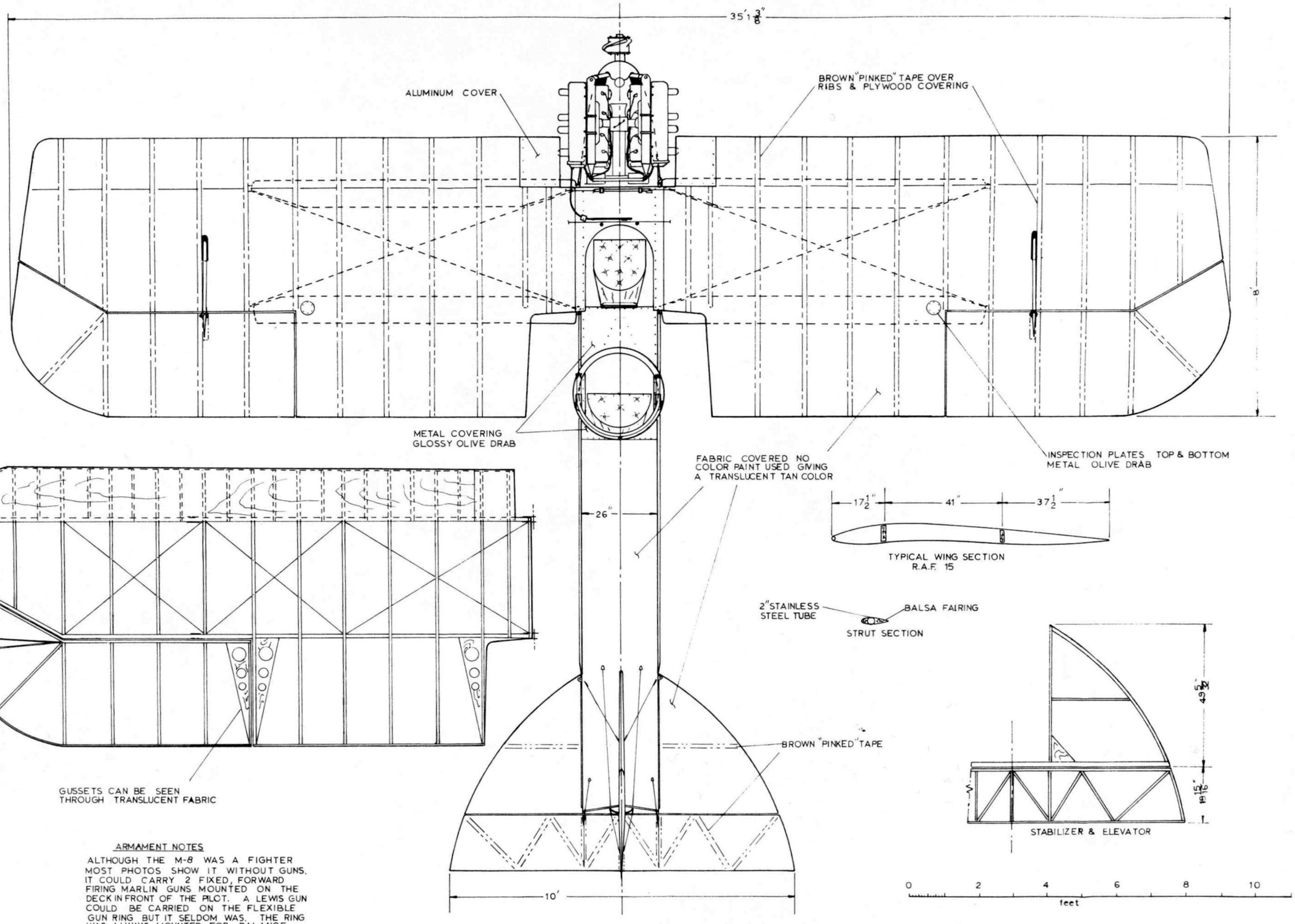
THE LOENING M-8 was described by Grover Loening as "nearer to being inspired than anything I ever did." While its pot-bellied appearance may be anything but inspired by modern standards, when it was designed it represented quite an advancement over the biplanes that dominated that era. It pioneered the 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.

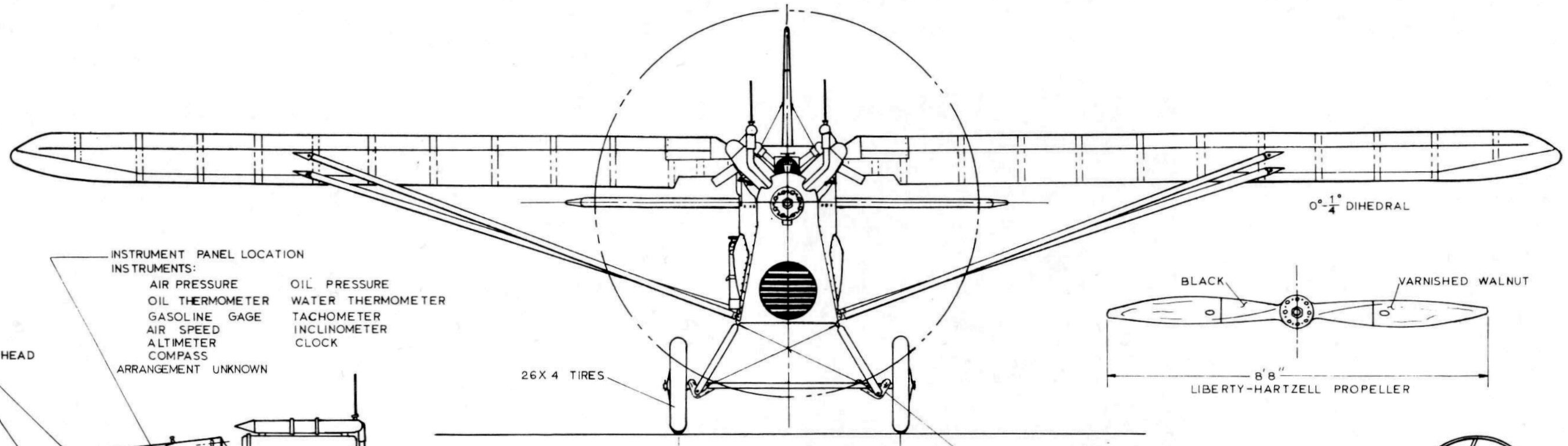
None survive. □

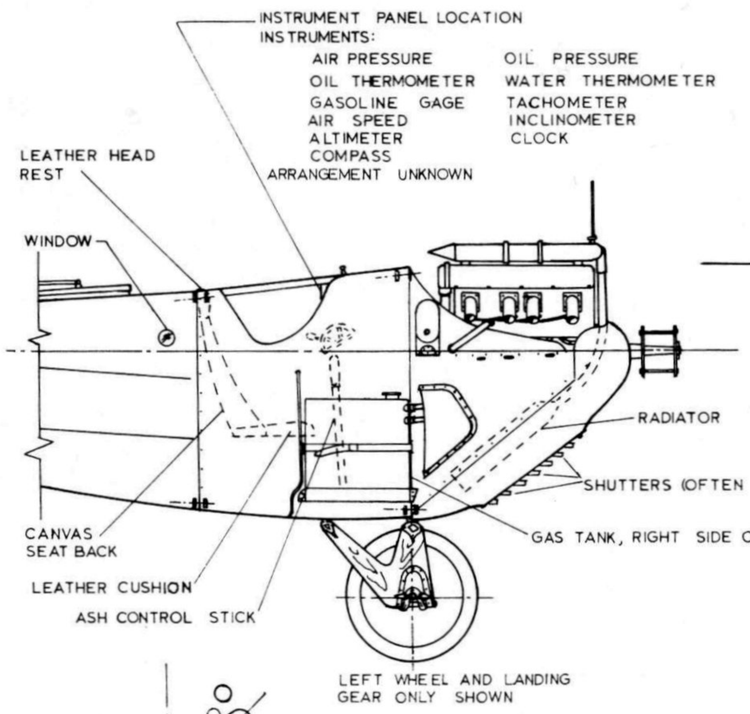


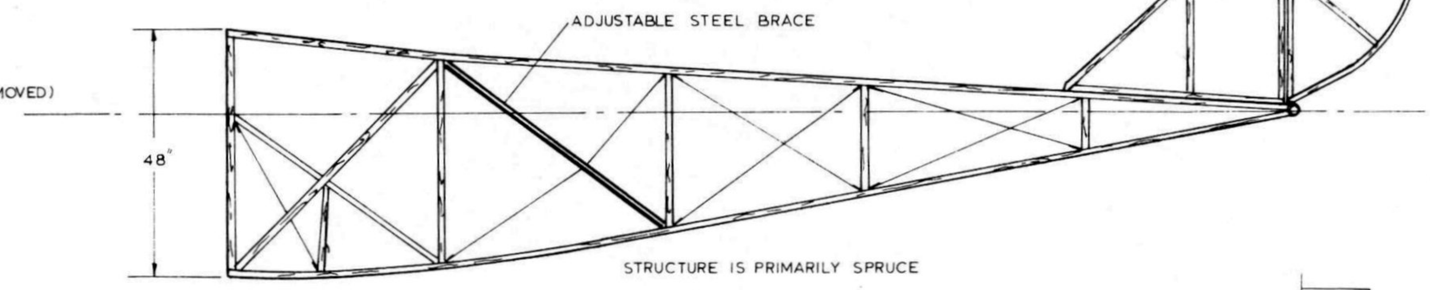
ARMAMENT NOTES

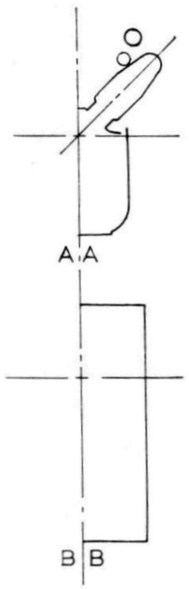
ALTHOUGH THE M-8 WAS A FIGHTER MOST PHOTOS SHOW IT WITHOUT GUNS. IT COULD CARRY 2 FIXED, FORWARD FIRING MARLIN GUNS MOUNTED ON THE DECK IN FRONT OF THE PILOT. A LEWIS GUN COULD BE CARRIED ON THE FLEXIBLE GUN RING BUT IT SELDOM WAS. THE RING WAS ALWAYS MOUNTED FOR BALANCE.

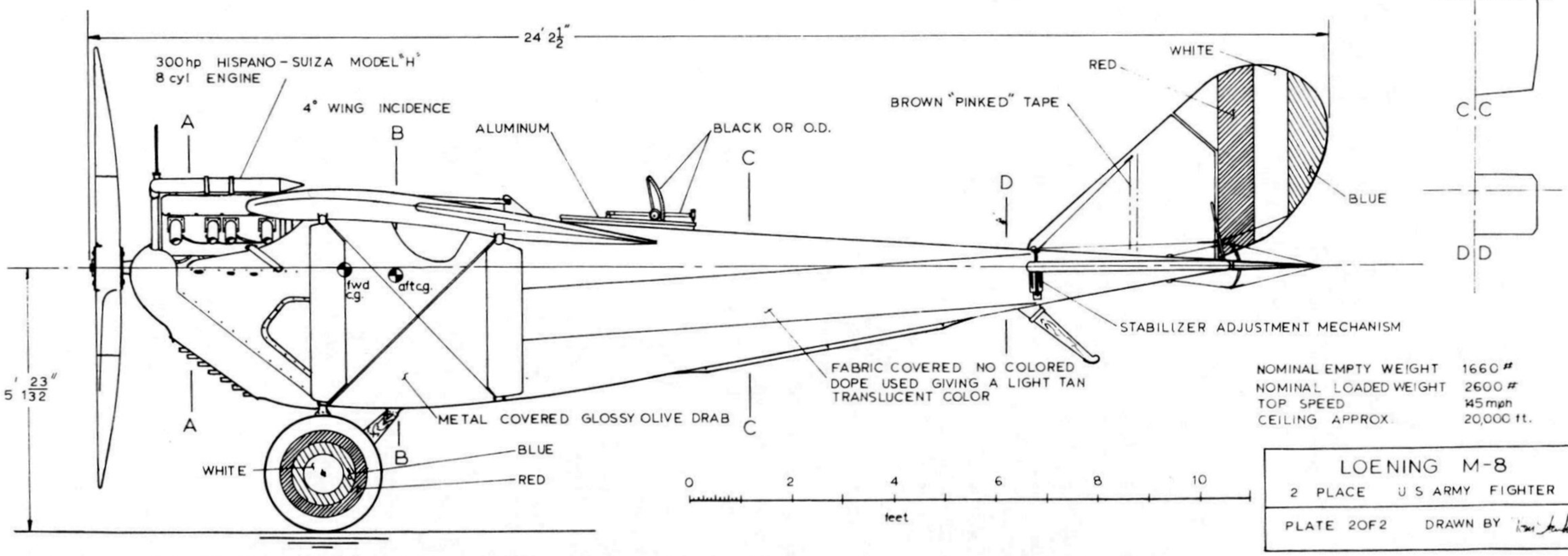
LOENING M-8's ALSO CALLED WRIGHT-MARTIN M-8's WERE BUILT IN LIMITED NUMBERS FOR THE ARMY AND NAVY. THERE WERE VARIATIONS BETWEEN INDIVIDUAL AIRPLANES AND AIRPLANES UNDERWENT MODIFICATIONS IN SERVICE. VISIBLE VARIATIONS WERE: WING TIP SHAPE, ROOT CUT-OUT, SPAN, CHORD, OVERALL COLOR SCHEME, WINDOWS, COWL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

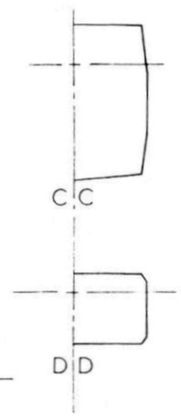












NOMINAL EMPTY WEIGHT	1660 #
NOMINAL LOADED WEIGHT	2600 #
TOP SPEED	145 mph
CEILING APPROX.	20,000 ft.

LOENING M-8

2 PLACE U S ARMY FIGHTER 1918

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

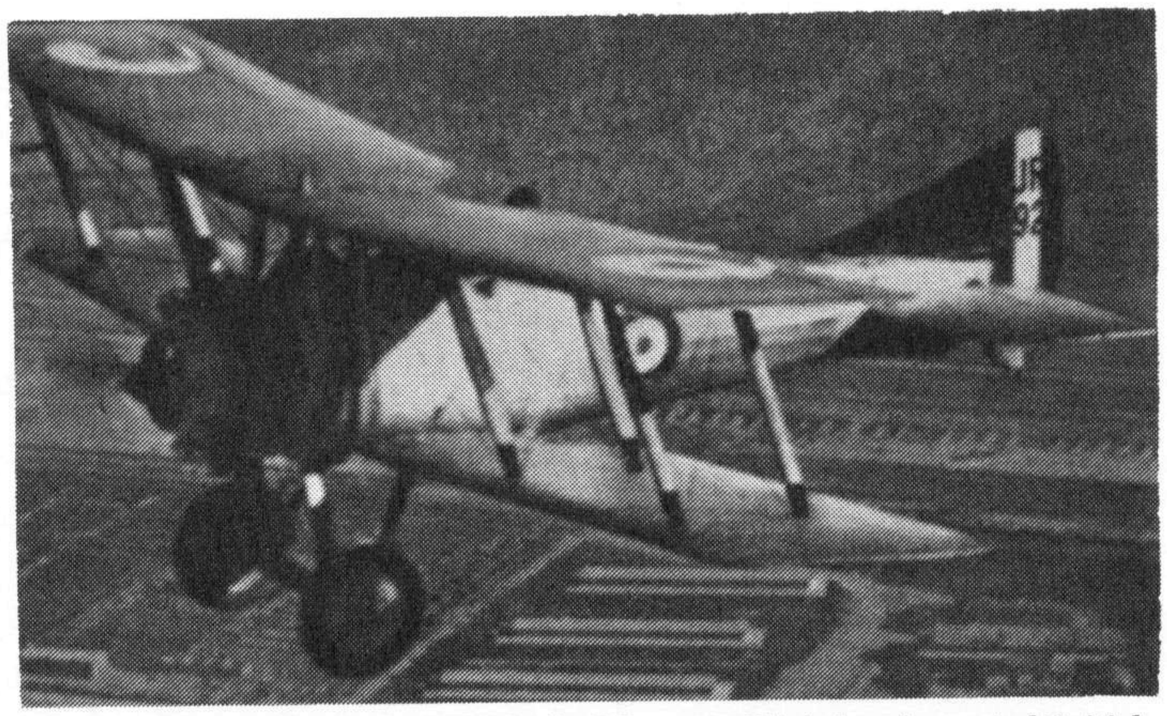
Nieuport Nighthawk

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"

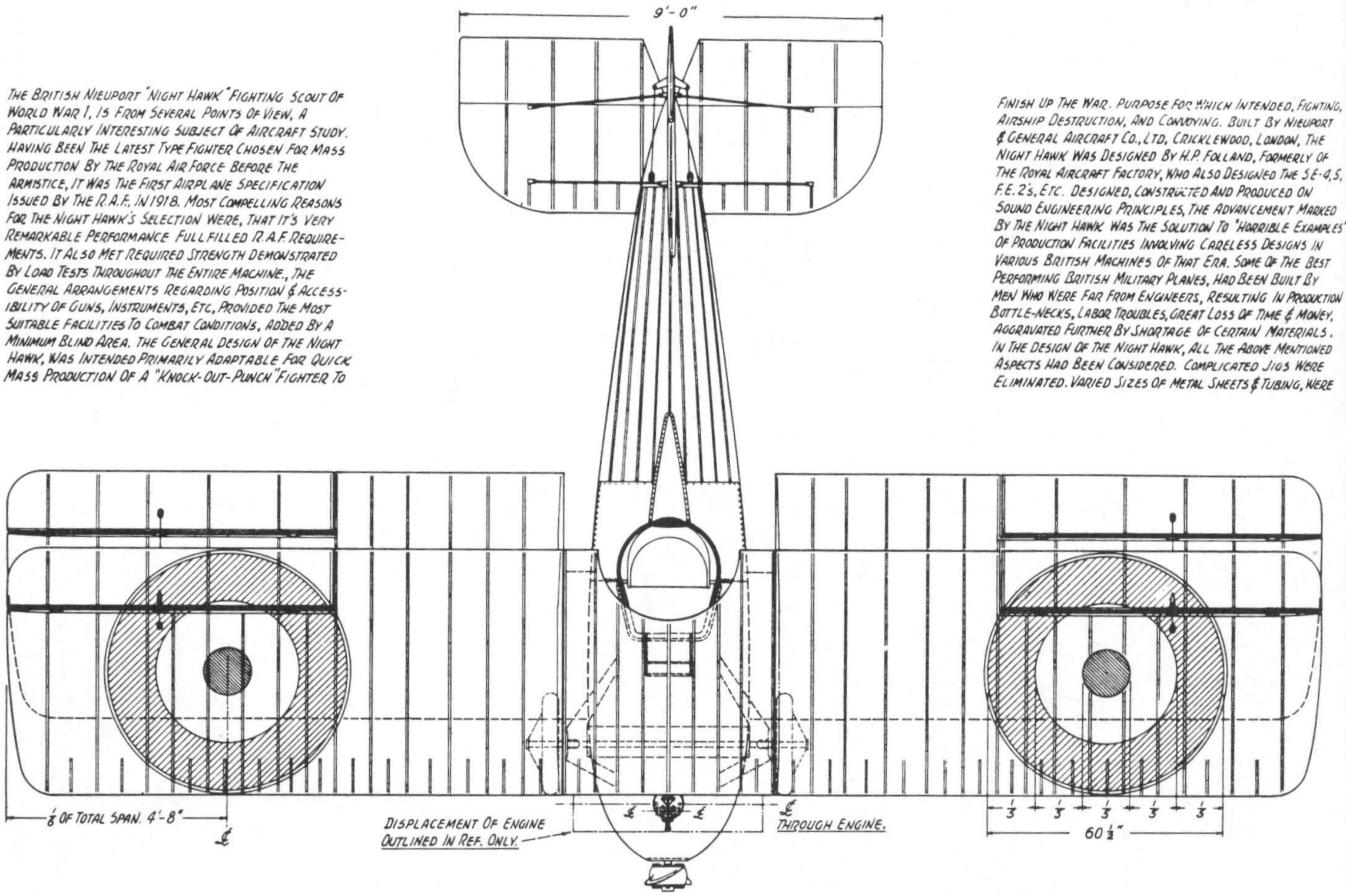
STEEL SHOE

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.

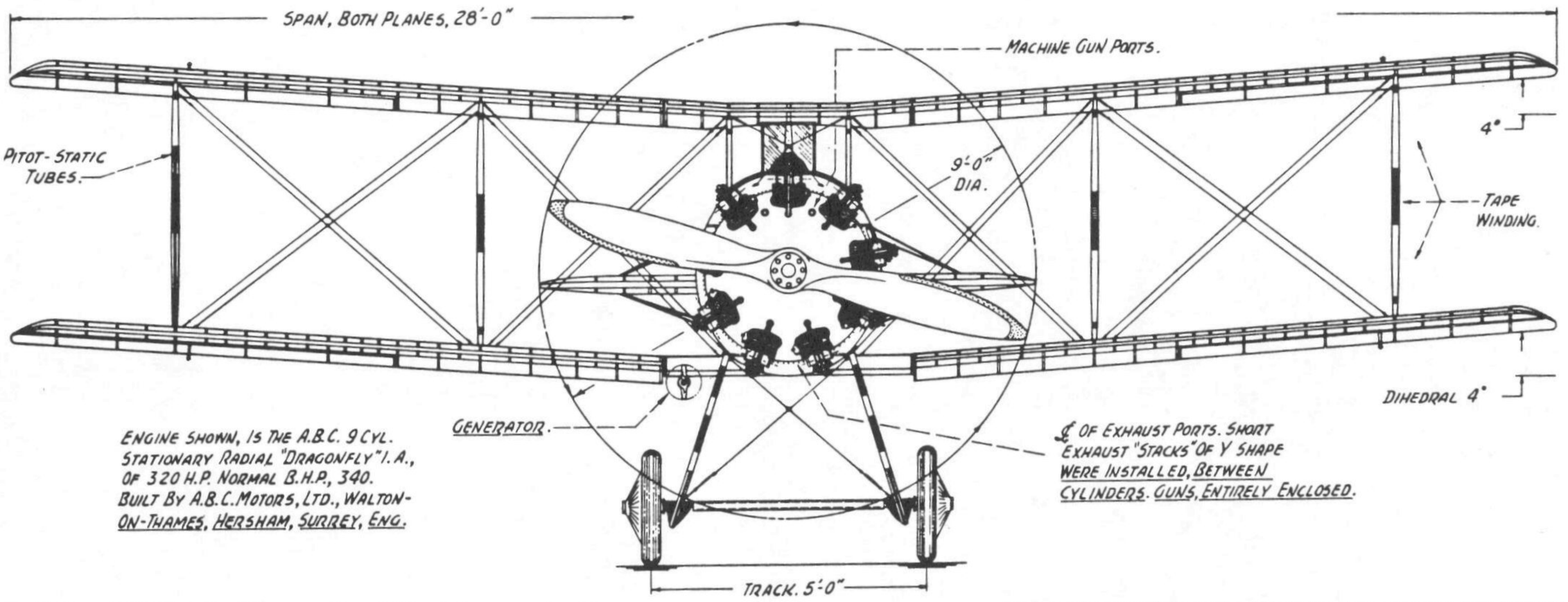
THE BRITISH NIEUPORT "NIGHT HAWK" FIGHTING SCOUT OF WORLD WAR 1, IS FROM SEVERAL POINTS OF VIEW, A PARTICULARLY INTERESTING SUBJECT OF AIRCRAFT STUDY. HAVING BEEN THE LATEST TYPE FIGHTER CHOSEN FOR MASS PRODUCTION BY THE ROYAL AIR FORCE BEFORE THE ARMISTICE, IT WAS THE FIRST AIRPLANE SPECIFICATION ISSUED 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.,



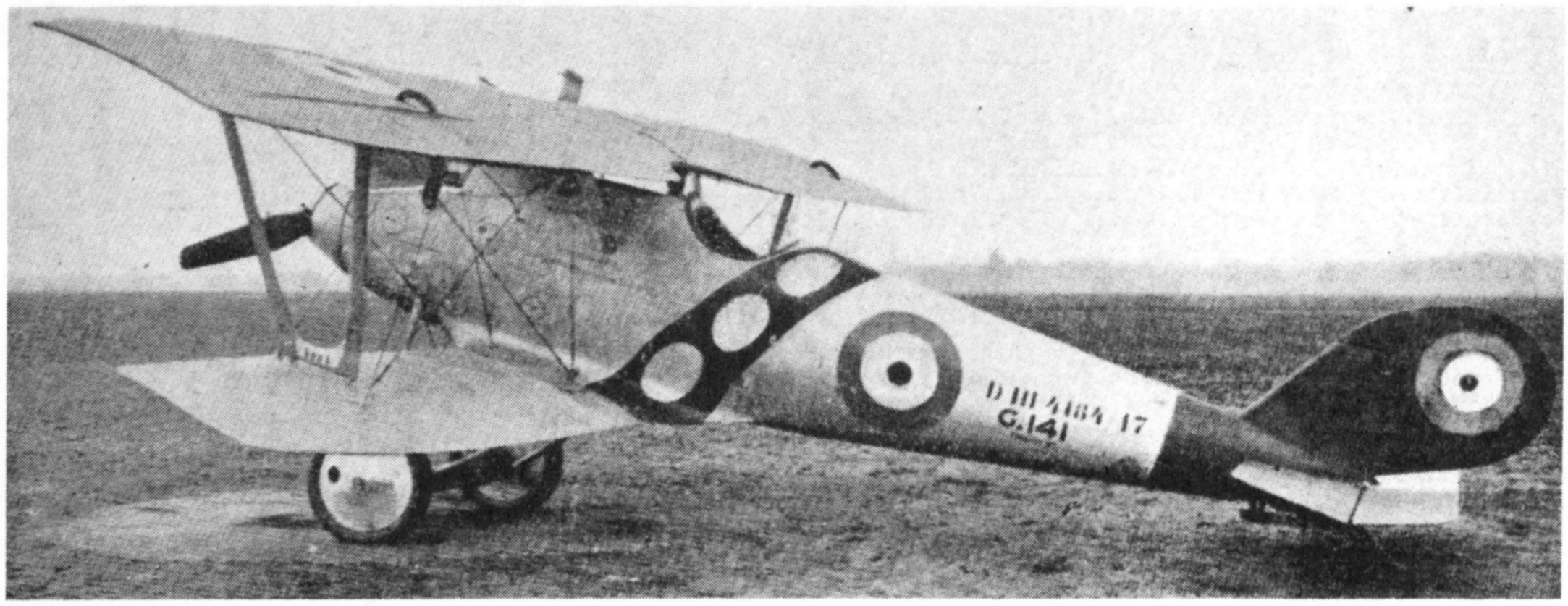
ENGINE SHOWN, IS THE A.B.C. 9 CYL. STATIONARY RADIAL "DRAGONFLY" I. A., OF 320 H.P. NORMAL B.H.P., 340. BUILT BY A.B.C. MOTORS, LTD., WALTON-ON-THAMES, HERSHAM, SURREY, ENG.

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

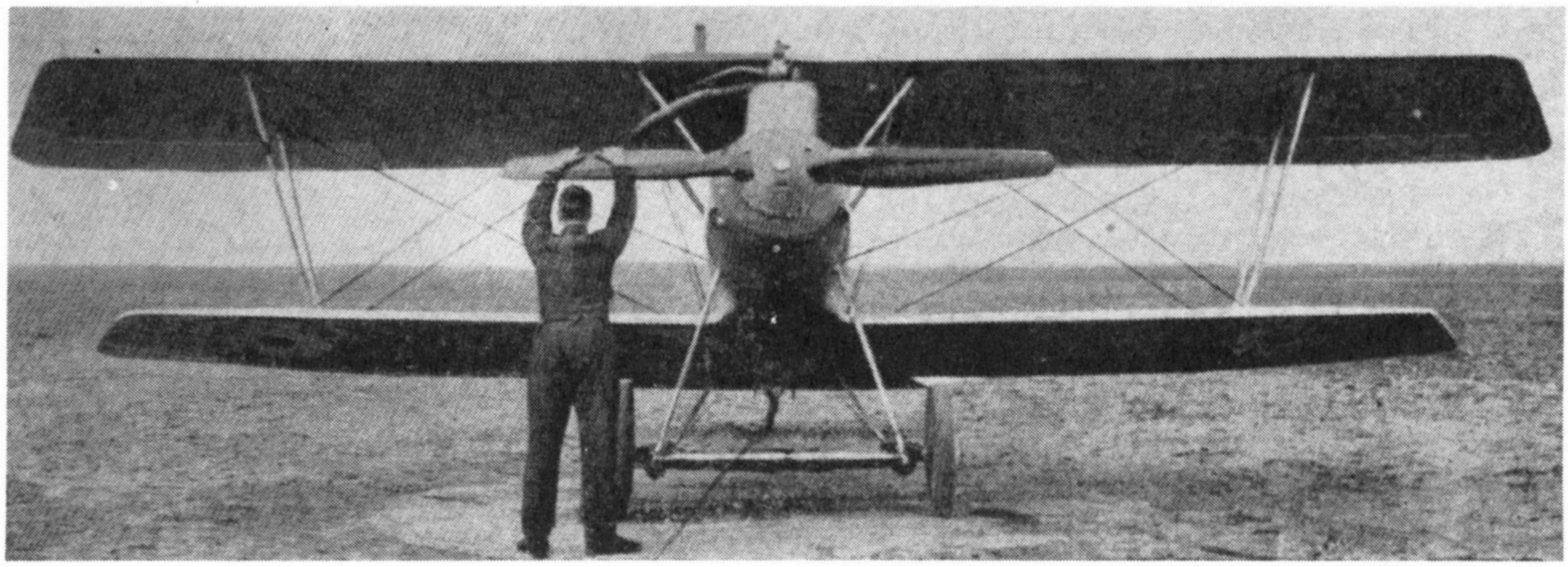


The Pfalz D.III was Germany's attempt to get an edge in the skies over Europe in WW I. Clean in design and very maneuverable, it was still outclassed by Allied aircraft of the era. "Jane's All the World's Aircraft" photos.

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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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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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

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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

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SCALE: ¼" = 1'0"	LAYOUT DATA & DETAILS GERMAN PFALZ FIGHTER
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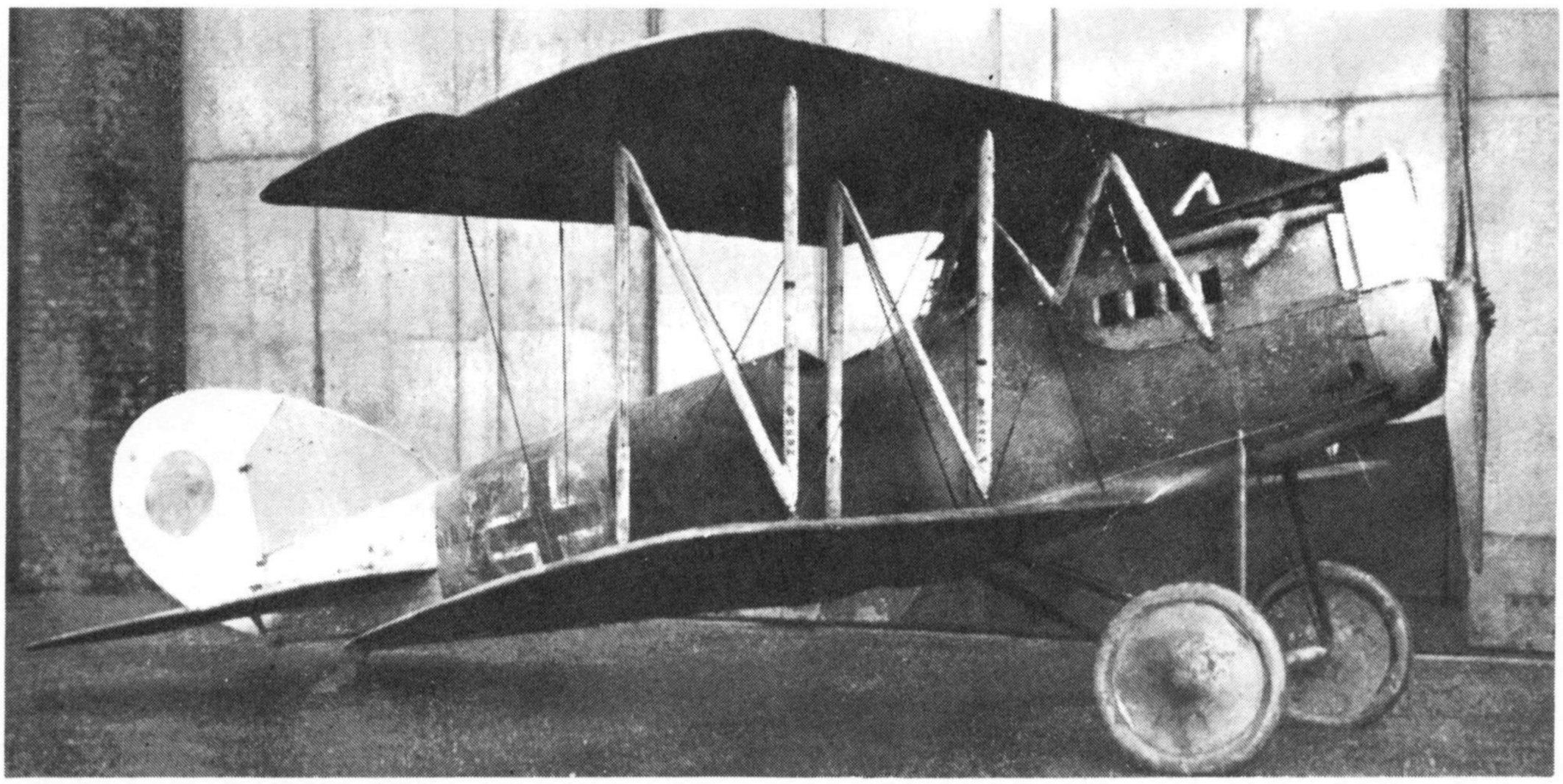
Pfalz D.XII

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.

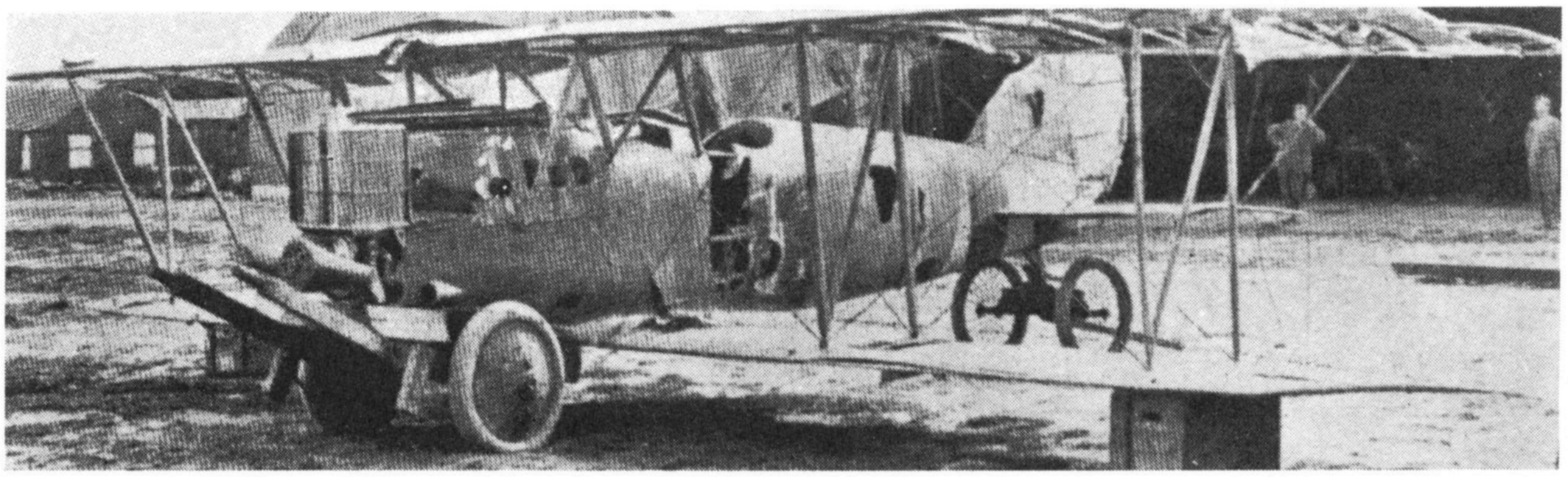
Pilots found the D.XII to be a stable airplane and easy to fly. It required little attention when cruising, although it was somewhat difficult to keep straight on the ground due to a sluggish rudder effect. But mechanics found its two-bay rigging difficult to keep in trim, especially when compared to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

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SCALE: ¼" = 1'-0"
TYPE: Fighter
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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.

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

TYPE: FIGHTER

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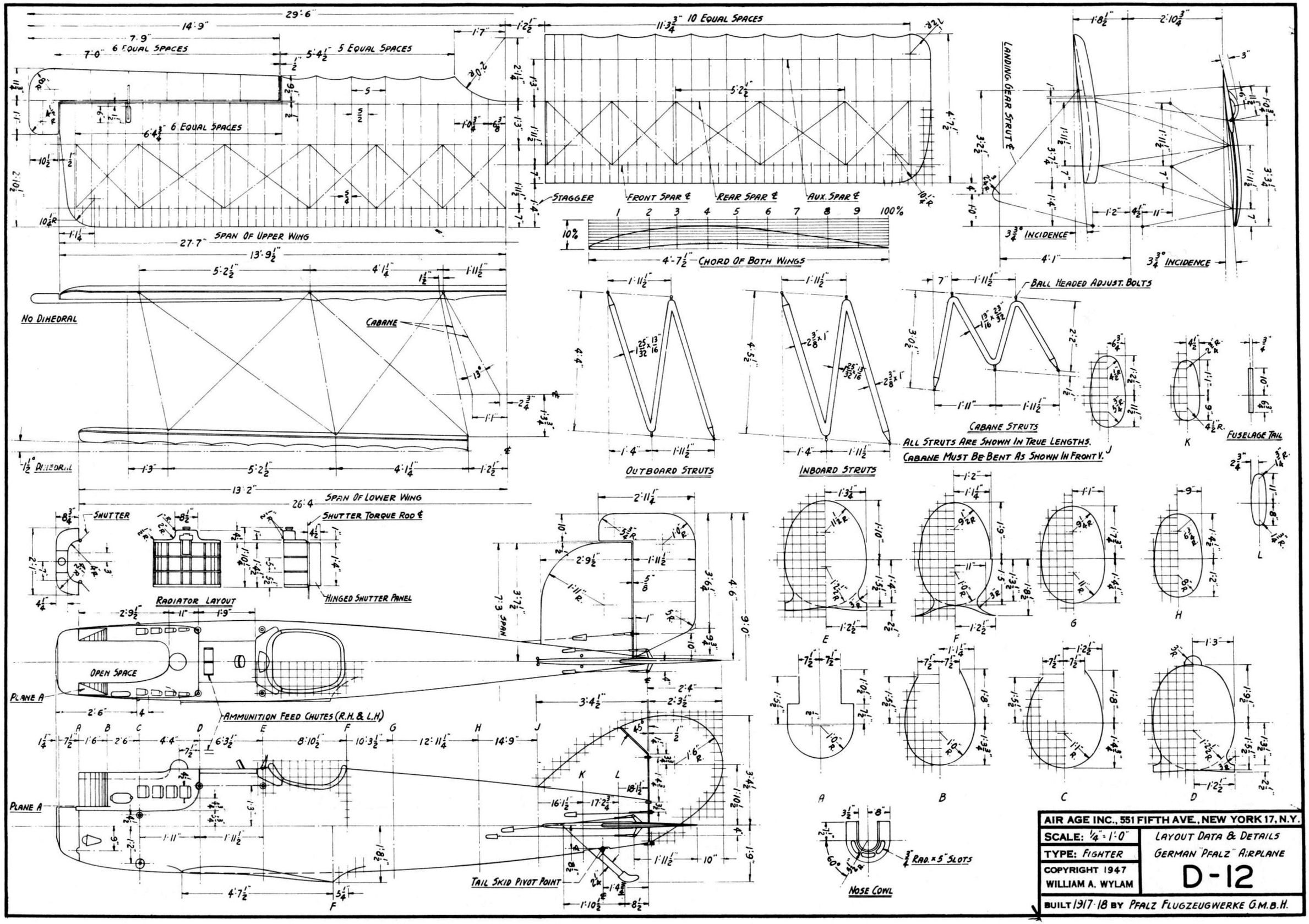
FUSELAGE DETAILS
GERMAN "PFALZ" AIRPLANE

D-12

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



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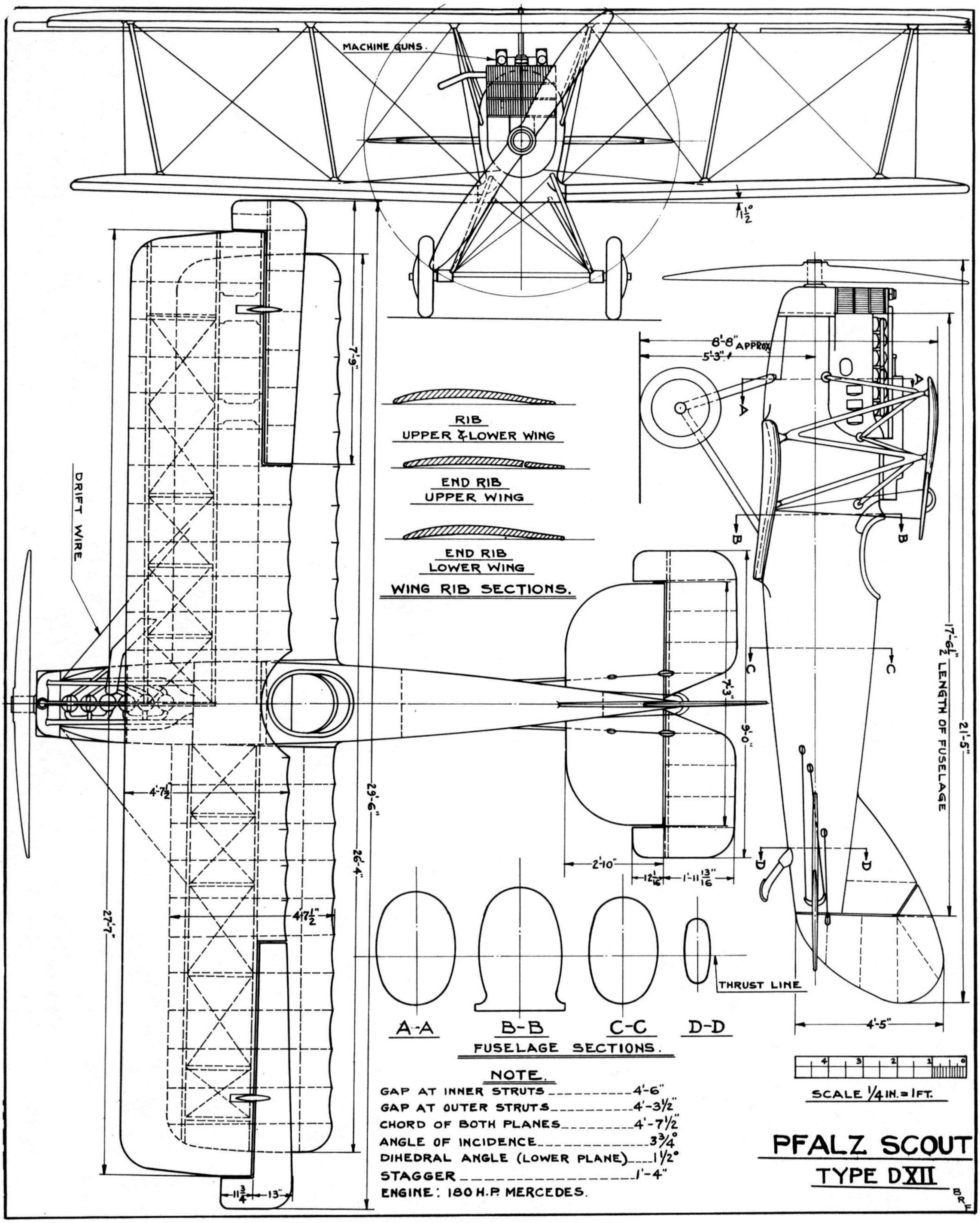
SCALE: ¼" = 1'-0"	LAYOUT DATA & DETAILS
TYPE: FIGHTER	GERMAN "PFALZ" AIRPLANE
COPYRIGHT 1947 WILLIAM A. WYLAM	D-12
BUILT 1917-18 BY PFALZ FLUGZEUGWERKE G.M.B.H.	

drawing by BARNETT FEINBERG



NOTE.

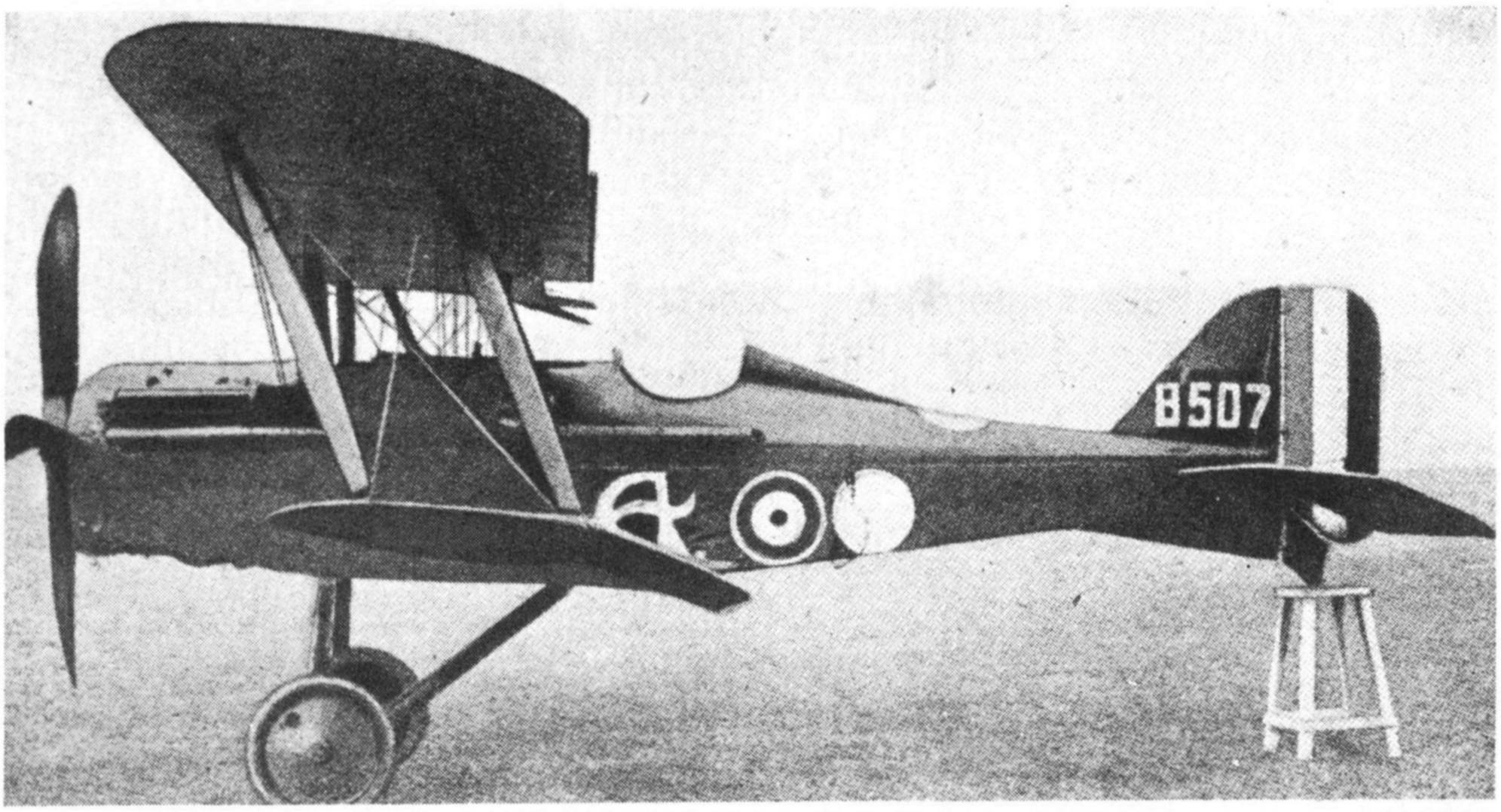
GAP AT INNER STRUTS	4'-6"
GAP AT OUTER STRUTS	4'-3½"
CHORD OF BOTH PLANES	4'-7½"
ANGLE OF INCIDENCE	3¾°
DIHEDRAL ANGLE (LOWER PLANE)	1½°
STAGGER	1'-4"
ENGINE: 180 H.P. MERCEDES.	

PFALZ SCOUT
TYPE DXII

BRF

RAF S.E.5a

drawings by WILLIAM WYLAM

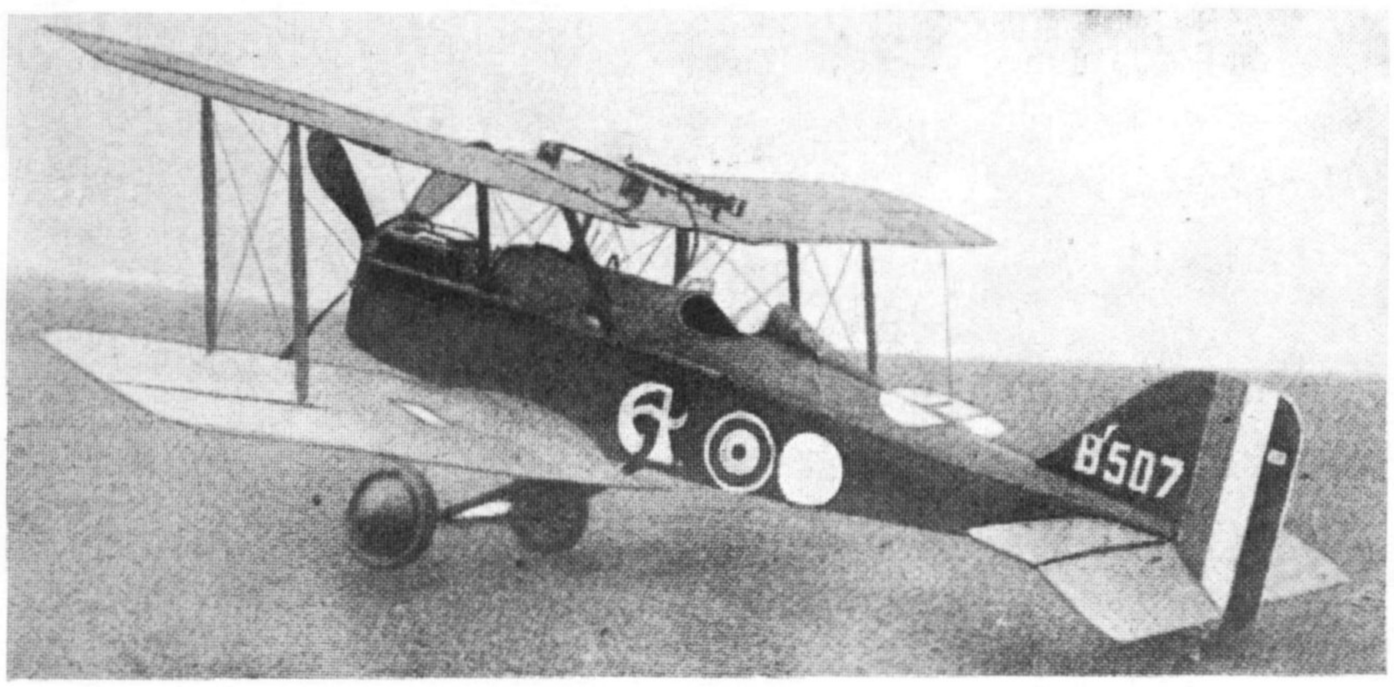


One of the most famous aircraft of WW I was the S.E.5a and it is credited with turning the tide in air supremacy over the Allied forces. "Jane's All the World's Aircraft" photos.

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