MODEL AIRPLANE NEWS presents

the BEST of WYLAM

PRICE
$2.00

WORLD WAR 1

ENGINES

BEECH FAMILY

OLD FAVORITES

GUNS

BOOK 1

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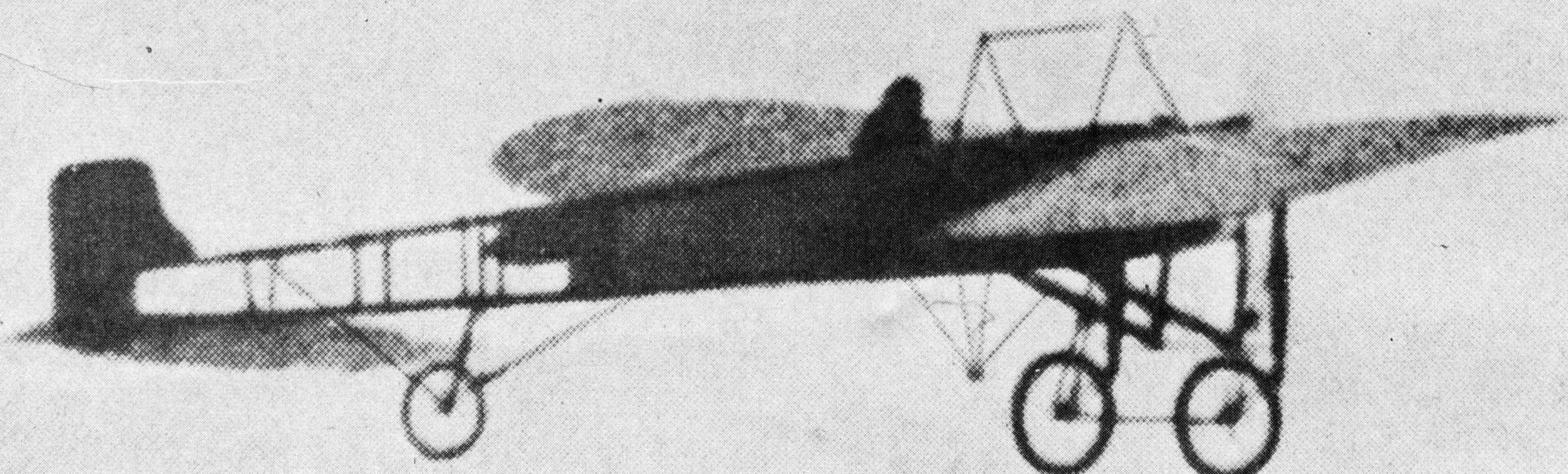


FOREWORD

What can one possibly say about the Wylam drawings—or their creator—that does them justice? It was in the mid-thirties that Bill Wylam inauspiciously launched in Model Airplane News what was to become a unique 30-year (so far) author-magazine relationship which by far outdates perhaps all aeronautical series-published material. In fact, his work pre-dates most aviation magazines! Other people have prepared excellent scale drawings, but for sustained quality, details and sheer numbers, the aptly named Master-plans are in a class by themselves. Considering the many hundreds—individual plates run into four figures—of subjects, Wylam's work, covering well over a quarter century of research and drawing, runs into man-year's of time. And over the full range of this entire output, probably only his first subject—an air-cooled-engined Polish fighter, we believe done at what must have been a tender age—might be termed crude by Wylam's quickly established and assiduously maintained standards. In this fantastic output, a nitpicking critic might find a very occasional mathematical (not drafting) error in an accumulation of many measurements, but this is mentioned, and should be mentioned, only to reassure ourselves that the man is human. As the exception proves the rule, so does such a hard-to-find instance verify the awe-inspiring values of what is a comprehensive history of the airplane, "written" with a drawing pen.

No book can be called "the Wylam book." It can be called **a** Wylam book. Many books such as this would be required to present the complete Wylam—and a volume that could be accurately designated "the complete Wylam" would be a treasure we probably never will find. In compiling a Wylam book, therefore, one is faced with a monumental selection problem. Wylam's SE-5's—if you include the sheets on markings—would permit only four such-sized subjects (not sections!) in a book of this size, hardly typical of Wylam's far-ranging coverage. The tour de force that is his Stinson family, would fill more than half a book.

So what we have done is to pick out some of "the best of Wylam." That word "some" means only representative. You will find convenient sections, each section, again, including only some of the numerous, typical subjects in the few categories compacted between these covers. Covering the sweep of aircraft types and vintages, you will find a rewarding collection of World War I types, of World War II, and interesting types from between the wars. Hardly anyone realizes, we suppose, that Wylam turned out many valuable drawings of aeronautical history's famous engines—their being collected here no doubt will delight the collector and the historian, as well as any modeler who takes seriously his scale jobs. And there are other surprises!

Wylam Number 1—for we hope that a Number 2, and a Number 3, and . . . will be demanded—is, even only hot off the press, a rare volume in that there is nothing quite like it in the world. It is with a sense of humility that we presume to collect this small bit of Wylam and to call it "The Best of Wylam."

In reality, there is no best of Wylam. The priceless file of Wylam originals is proof that, what we could not include in this volume, is every bit as good as the fine items we did select. We take comfort from the fact, however, that there is nothing better than the collection of plates in this book, by Wylam—or anyone else!

—BILL WINTER

The Bristol Fighter .....WORLD

WAR I. . . . The Sopwith Dolphin

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"

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

2" TO 4"

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

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

6"

8"

2'-6" DIA.

5'-8" TREAD

9'-8" DIA. - 4 BLADED PROPELLER

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 FRAMEW'K.	NATURAL VARNISH

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

HEADER TANK
BLAST TUBE - 2¼" O.D.
25-9"
VICKERS MACHINE GUN - 30 CAL
AMMUNITION TRAY
EMPTY SHELL CHUTE
WATER VALVE ACCESS
COWL FASTENERS
CUTOUT FOR STRUTS
SNAP FASTENERS
EXHAUST STACK
TUBULAR ENGINE MOUNT
AIR INTAKE
OIL DRAIN
WATER DRAIN
BOTTOM VIEW (F2B WITH H.S.)

M.G. ℄
M.G. ℄
1'-10½"
1'-8½"
5½"
2"
3½"
10"
¾"

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

MODEL "F-2B" WITH ROLLS-ROYCE "FALCON III" ENGINE
25'-9" ALSO 26'-2" (HIGH ALTITUDE MODEL)

HAMMERED AIR INTAKE
EMPTY SHELL CHUTE
FLUTED CHANNEL
RIVETED COWL
SNAP FASTENERS
5½"
3½"
3'-9½" ALSO 4'-2½"
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"
E
F
J 8586
3'-1"
1'-3¼"

OPTIONAL CUTOUTS
3½"
1'-7½"
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 - STAMPED COOLING LOUVERS
LANDING GEAR & FLYING WIRE LUGS
LOWER WING'S OUTER PANEL

AIR INTAKE - OIL COOLER
STAMPED COOLING LOUVERS
FUEL TANK ACCESS HOLE
OPTIONAL COOLING AIR OUTLETS
5'-6"
3"
SHOCK TRAVEL
10°
8" PROP'R. CLEARANCE
5'-10½"

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

2'-6¾"
LIFT HERE
FIXED BRACE WIRES
STABILIZER ADJUSTOR'S BELL CRANK
WHITE REGISTRATION NUMBERS
6'-0½"
2" DIA. HELICAL SPRING
(REAR VIEW)

BOTTOM VIEW

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

"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 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

WELDED ATTACHMENT LUGS

LANDING GEAR'S STRUT DETAILS

FIXED BRACE WIRES (FRONT STRUTS ONLY)

STEEL TUBING - 1½" O.D.

FABRIC COVERED WOOD FAIRING

FIXED SPREADER - 1" O.D. STEEL TUBING

WELDED SHOCK CORD LOOP

BRAIDED WIRE-SHOCK STOP

30" O.D. × 6" TIRE & WHEEL

TIRE & TUBE

TIRE RIM

SPOKES & DISC COVER

ROLLER BEARINGS

WASHER PLATE & LOCK

AXLE - 1¾" O.D. STEEL

WOOD FAIRING

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.

13'-8"

4½"

5"

2'-6½"

HINGE

2'-1"

STABILIZER ADJUSTOR'S CABLE

WELDED ADJUST'E. FORK

ALUMINUM CAP

STEEL TUBING - 1" O.D.

LEATHER PATCH

5'-2" TO 5'-3" ADJUSTABLE

5'-0" FIXED

6"

4½"

5"

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.

ADJUSTABLE GUY-WIRE POST

SIDE LACING

DOUBLE RUDDER CABLES

DOUBLE ELEVATOR CABLES

.30 CAL. SINGLE OR TWIN LEWIS M.G.

HINGED GUN MOUNT

SLIDING REAR SEAT

REMOVABLE BACK SUPPORT

DETACHABLE REAR CONTROL COLUMN

FIXED FRONT CONTROL COLUMN

RUDDER CONTROL BAR

FLOORBOARD

DOUBLE PULLIES

BEARINGS

PIVOT

AILERON QUADRANT

ELEVATOR'S TORQUE TUBE

FLIGHT CONTROL DETAILS

SECTION "A"

TURNBUCKLE

ATTACHMENT LUG

HINGE

REAR RUDDER CONTROLS

CONTROL COLUMNS

RUDDER CONTROL BAR

STEEL ROD

COMPRESSION RIB

STEEL FITTINGS

AILERON HINGE

FALSE RIB

RIB

FRONT SPAR

REAR SPAR

DRAG WIRE

ANTI-DRAG WIRE

TURNBUCKLE

FORKED EYE

AILERON CONTROL CABLE (TO AILERON QUADRANT)

¼" — 5¼" TO 6" (HUB WIDTHS)

9" O.D.

½" DIA. BOLTS - 8 REQ'D. — 6¾" — BOLT CIRCLE

10'-0" DIA. TWO BLADED PROPELLER

LOWER CENTER PANEL STRUTS

FALSE NOSE RIBS

BRASS SHEATHING

WING PANEL ATTACHMENT LUGS

BLAST TUBE

REMOVABLE ENGINE BONNET

BRASS RADIATOR SHELL

ADJUSTABLE PILOT'S SEAT

CONTROL COLUMN

TRANSPARENT PANEL (OPTIONAL)

EMPTY SHELL CHUTE

AMMUNITION TRAY

FIXED .30 CAL VICKERS M.G.

MACHINE GUN'S COOLING AIR INTAKE

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.

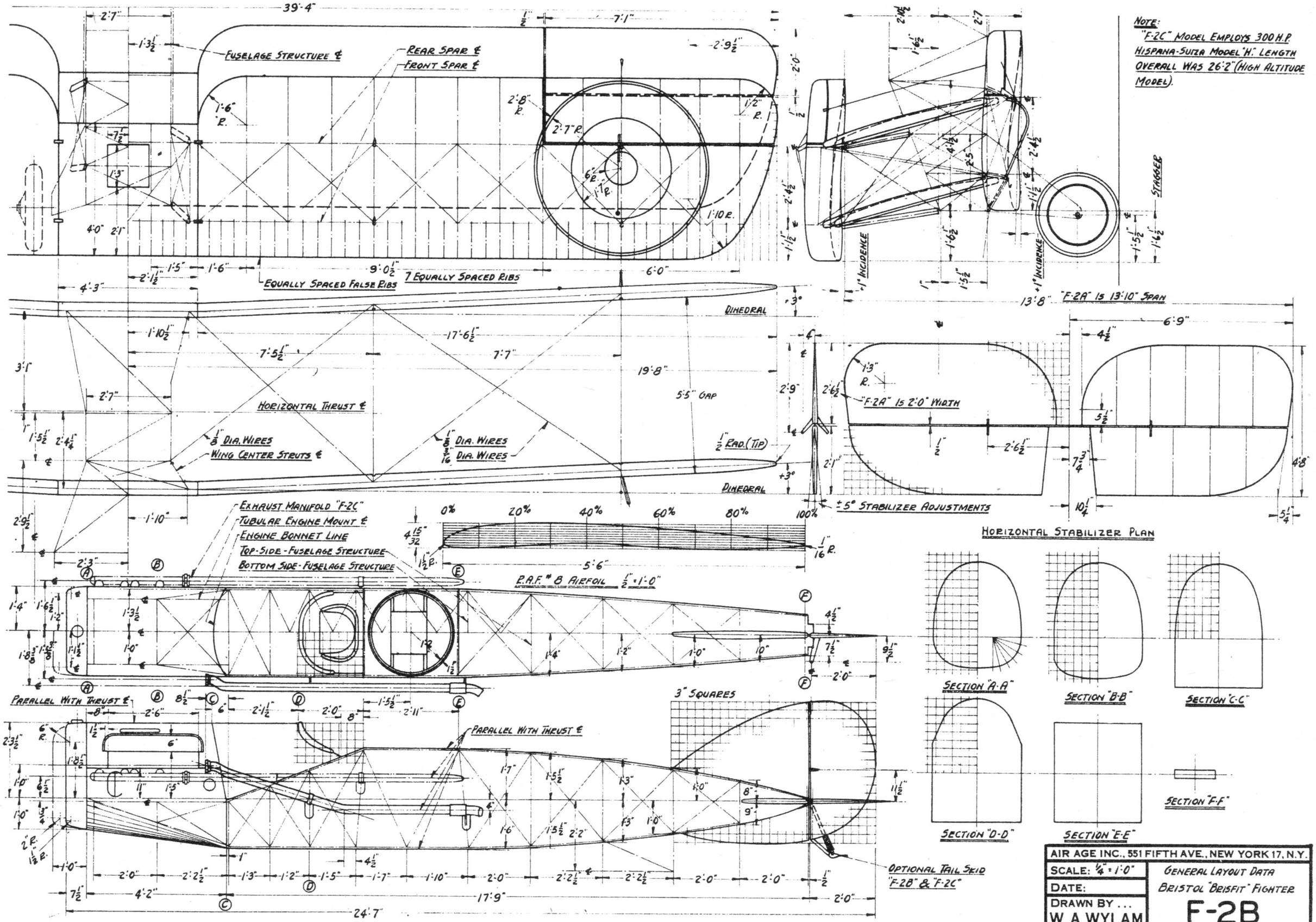
SCALE: ¼" = 1'-0"

DATE:

DRAWN BY ... W. A. WYLAM

GENERAL ARRANGEMENTS BRISTOL "BRISFIT" FIGHTER

F-2B



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SCALE: ¼" = 1'-0"	GENERAL LAYOUT DATA
DATE:	BRISTOL "BRISFIT" FIGHTER
DRAWN BY ... W. A. WYLAM	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

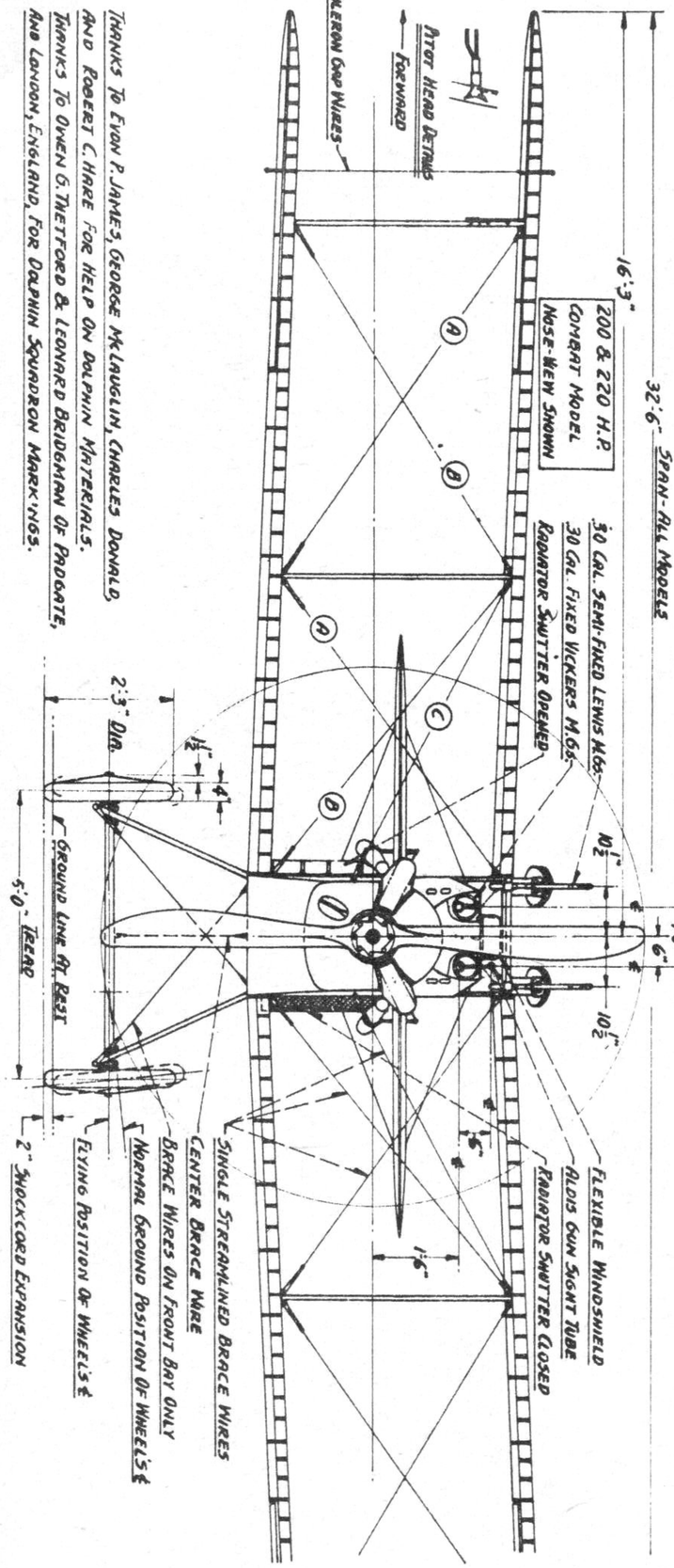
F-2B

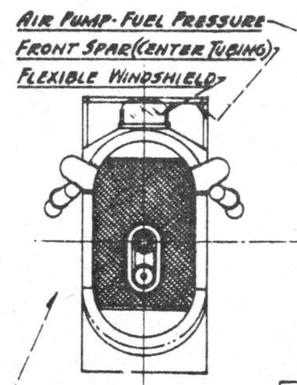
BRASS RADIATOR SHELL
BRASS FILLER CAP
EXPANSION TANK OUTLET
HEADER TANK INLETS
PULLIES "A"
PULLEY "B"
PULLEY "C"
PULLEY "D"
HISPANO-SUIZA OUTLETS
ROLLS-ROYCE OUTLET
RADIATOR DRAIN VALVE
WATER TEMP. GAUGE CONN.
EXPANSION TANK
M.G. BLAST TUBE
SHUTTER OPENING WIRE
SHUTTER CLOSING WIRE
1" STEEL PLATE-BED
1" STEEL PLATE-GUSSET
ENGINE BEARER OPENING
PULLIES "E"
1'-5 3/8"
8 1/2"
1'-0"
2'-6 1/2"
1'-0 1/2"
3/4"
1'-0"
2" O.D. STEEL TUBING
1 1/4" O.D. STEEL TUBING
VICKERS MACHINE GUN
ADJUSTABLE GUN MOUNT
AMMUN. TRAY
GAS TANK
OIL TANK
HISPANO-SUIZA — ROLLS-ROYCE "FALCON"
(A) (B) (C)
SHUTTER OPENING CONTROL
SHUTTER CLOSING CONTROL
AILERON CABLE
FLEXIBLE WINDSHIELD
WATER TEMP.
OIL TEMP. GAUGE
OIL VALVE CONTROL
PRIMER
CLOCK
TACHOMETER
GASOLENE GAUGE
RUDDER BAR
COMPASS
ALTIMETER
OIL PRESS. (IN)
OIL PRESS (OUT)
AMMETER
IGNITION
SWITCHES
BANK & TURN
(D)
PLYWOOD FLOORBOARD
ELEVATOR'S TORQUE TUBE
AILERON QUADRANT
AILERON CONTROL CABLE
SLOTTED GUIDE RAIL
ADJUSTABLE PILOT SEAT
HINGED TABLE TOP
ENGINE CONTROL
PLYWOOD DECK
SAFETY BELT
REAR RUDDER CONTROL
STAB. INCIDENCE LEVER
STABILIZER ADJU'R
FORKED PIVOT MOUNT
PLYWOOD FLOORBOARD SUPPORT
(E)
BOLTED SCARFF RING RAIL
REMOVABLE BACK SUPPORT
AMMUNITION DRUM RACKS
STORAGE BOX
SAFETY BELT
ENGINE CONTROL
PADDED SEAT
SLOTTED RAIL
SLIDING SEAT
PLYWOOD FLOORBOARD
REAR CONTROL COLUMN
PLYWOOD RAIL SUPPORT
(F)
(G)
PULLIES F
PULLIES G
(H)
WING ATTACHMENT LUG
STRUT ATTACHM'T. LUG
PULLIES (LOWER PANEL)
LANDING GEAR BRACE
PULLEY (UPPER PANEL)
UPPER PANEL ONLY
CENTER PANEL DETAILS
PULLIES "H"
STEEL TUBING
SHOCK SPRING LUG
(J)
ADJ. GUY WIRE POST
STEEL PLATE-BELL CRANK
INCIDENCE TORQUE TUBE
WIRE "A"
BRASS TURNBUCKLE
WELDED STEEL PLATES
(K)
INCIDENCE TORQUE TUBE
WELDED STEEL PLATES
MACHINE GUN PORT
INTERNAL SHUTTER CONTROL
FIXED GUY WIRES
TURNBUCKLE
(L)
1'-0"
SHUTTER CONTROL WIRES
BELL CRANK
HIGH ALTITUDE RADIATOR SHELL

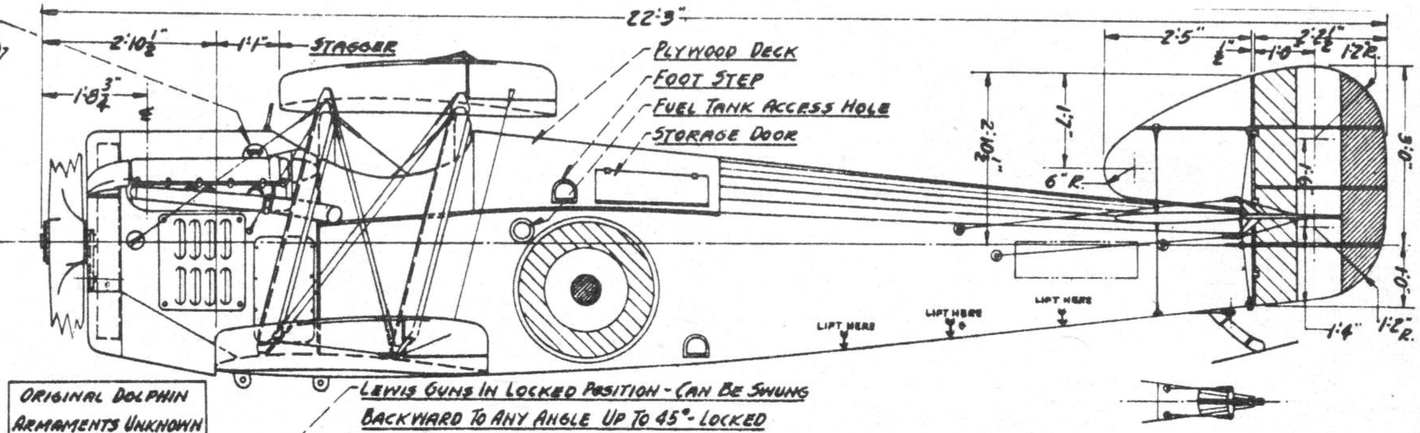
NOTE: PLANS ON ROLLS-ROYCE "FALCON" ENGINE WILL APPEAR IN FUTURE ISSUE OF MODEL AIRPLANE NEWS.

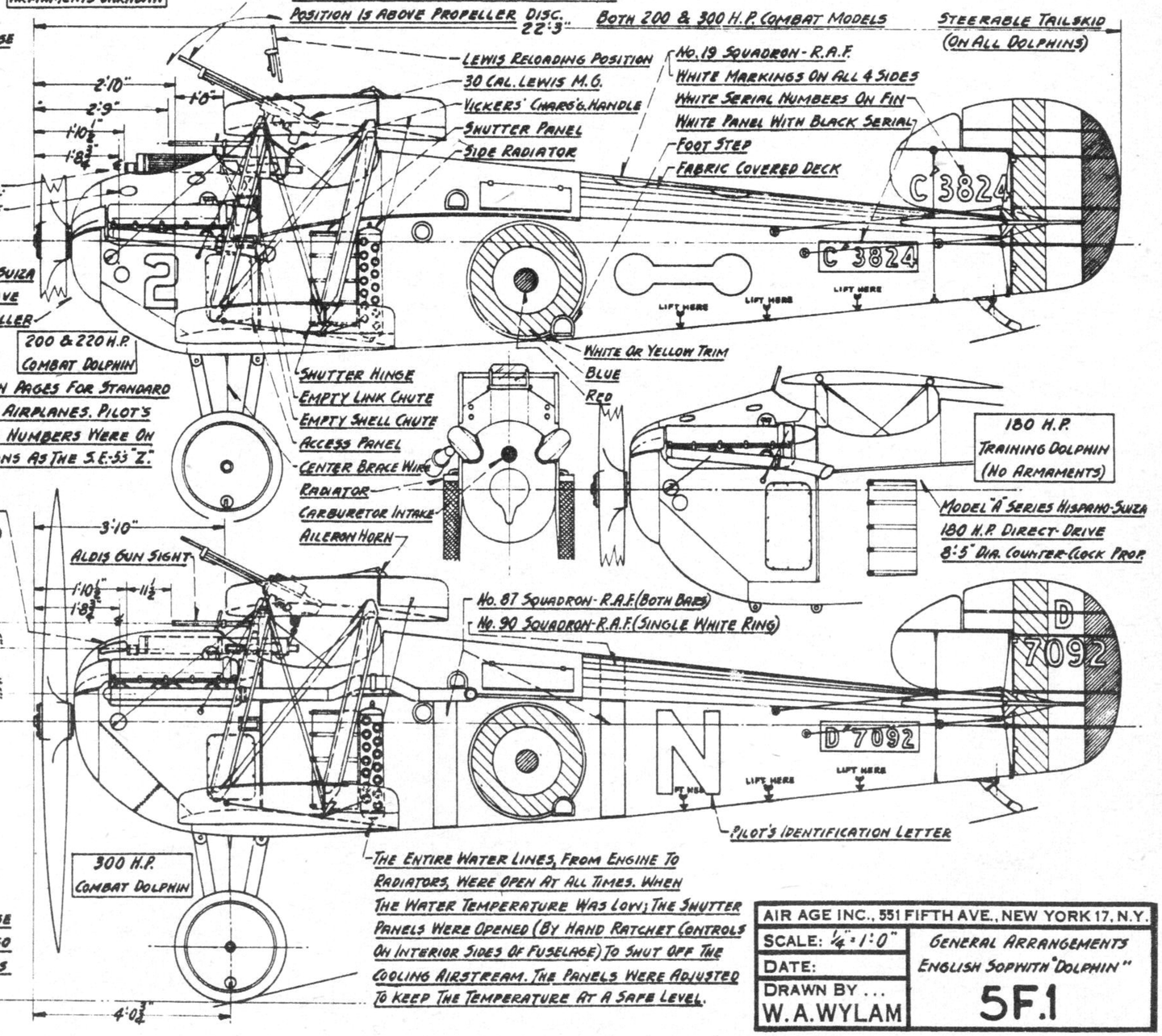
HEADER TANK
WATER INLETS (FROM ENGINE)
WATER OUTLET (TO EXPANSION TANK)
EXPANSION TANK
SHUTTER CONTROL
REAR RUDDER CONTROLS
ENGINE CONTROL ASSEMBLY
REAR CONTROL COLUMN
SLIDING REAR SEAT
PULLIES G
PULLIES "F"
PULLIES "H"
PULLIES "A"
PULLEY "B"
PULLEY "D"
PULLIES "E"
PULLEY "C"
CLOSING CABLE
OPENING CABLE
M.G. BLAST TUBE
TANKS' MOUNT'G. BANDS
AMMUNITION TRAY
SHUTTERS
OIL COOLER
M.G. ADJUSTABLE MOUNT
REAR M.G. MOUNT
INSTRUMENT PANEL
LEATHER CRASH PAD
ENGINE CONTROL-STARBOARD
HINGED TABLE TOP
PLYWOOD PARTITIONS
STORAGE SPACE
FIXED MANIFOLD SUPPORT
LOOSE FIT (FOR EXPANSION)
INCIDENCE CONTROL CABLES
AMMUNITION DRUMS
WIRE SPLICE
TURNBUCKLE
INCIDENCE TORQUE TUBE
ADJ. GUY WIRE POST
RUDDER HINGE
PULLEY "C"
OIL COOLER
PULLEY "D"
PULLIES "E"
RADIATOR DRAIN VALVE
WATER OUTLET (TO PUMP)
ROLLS-ROYCE ENGINE MOUNT
TUBULAR ENGINE BEARERS
OIL TANK'S MOUNTING BLOCKS
PLYWOOD FLOORBOARD
AILERON CONTROL CABLE
SPRUCE SPARS
GASOLENE TANK
OIL TANK
SLOTTED SEAT RAIL
PLYWOOD PANEL
REMOVABLE BACK SUPPORT
SLIDING SAFETY BELT
DOUBLE PULLIES (RUDDER CABLES)
CONTROL COLUMN ASSEMBLY
PLYWOOD FLOORBOARD
STABILIZER ADJUSTOR - PORT SIDE
ELEVATOR CONTROL HORN
BELL CRANK-STABILIZER ADJ.
RUDDER HORN BRACE WIRE
ELEVATOR'S CONTROL CABLES
STABILIZER INCIDENCE CONTROL WIRE
PULLIES "H"
HELICAL SHOCK SPRING
(A) (B) (C) (D) (E) (F) (G) (H) (J) (K) (L)

THANKS TO EVON P. JAMES, GEORGE MCLAUGLIN, CHARLES DONALD, AND ROBERT C. HARE FOR HELP ON DOLPHIN MATERIALS.
THANKS TO OWEN G. THETFORD & LEONARD BRIDGMAN OF PROGATE, AND LONDON, ENGLAND, FOR DOLPHIN SQUADRON MARKINGS.

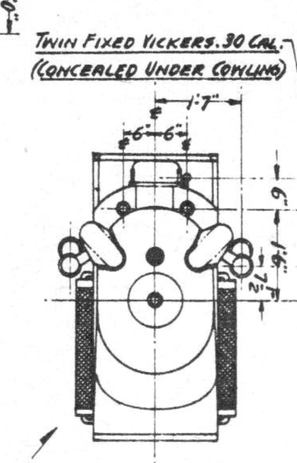








NOTES:
REFER TO S.E.-5's SQUADRON PAGES FOR STANDARD COLOR SCHEMES OF R.A.F.'s AIRPLANES. PILOT'S IDENTIFICATION LETTER & NUMBERS WERE ON THE WINGS IN SAME POSITIONS AS THE S.E.-5's "Z".



AIR AGE INC., 551 FIFTH AVE., NEW YORK 17, N.Y.	
SCALE: ¼" = 1'-0"	GENERAL ARRANGEMENTS ENGLISH SOPWITH "DOLPHIN"
DATE:	
DRAWN BY ... W. A. WYLAM	5F.1

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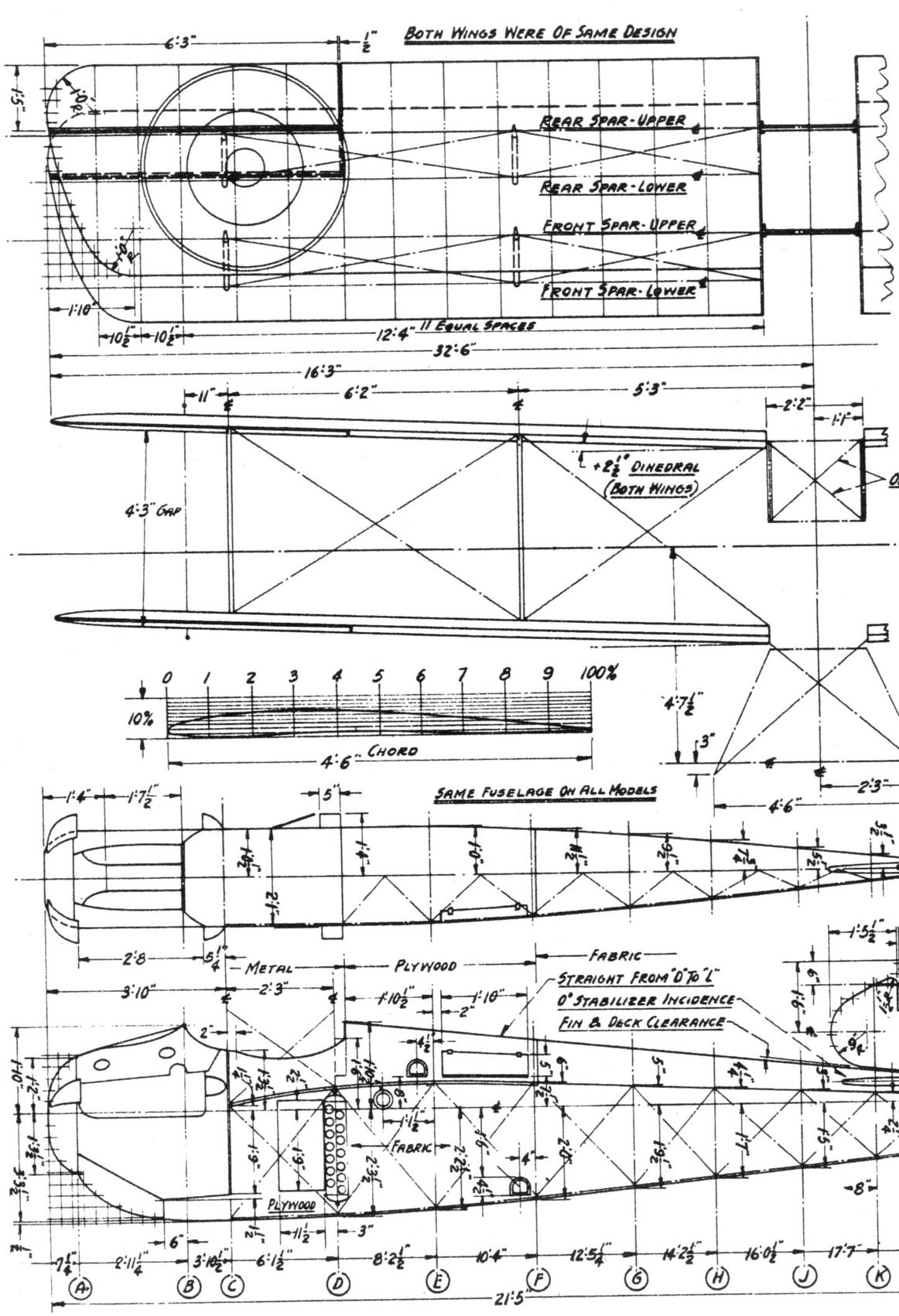

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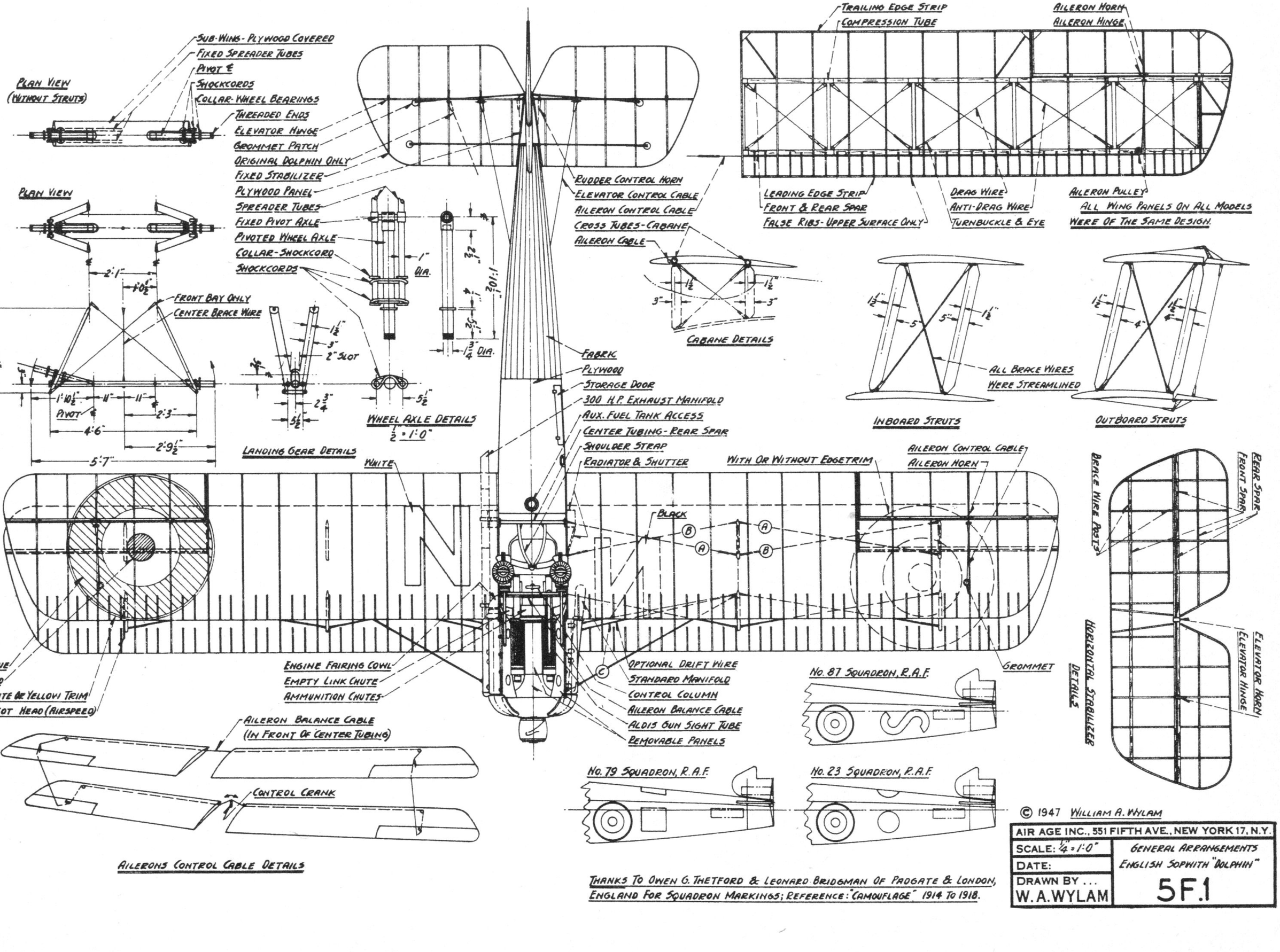
SCALE: ¼" = 1'0"	GENERAL LAYOUT & DETAILS ENGLISH SOPWITH "DOLPHIN"
DATE:	
DRAWN BY ... W. A. WYLAM	5F.1



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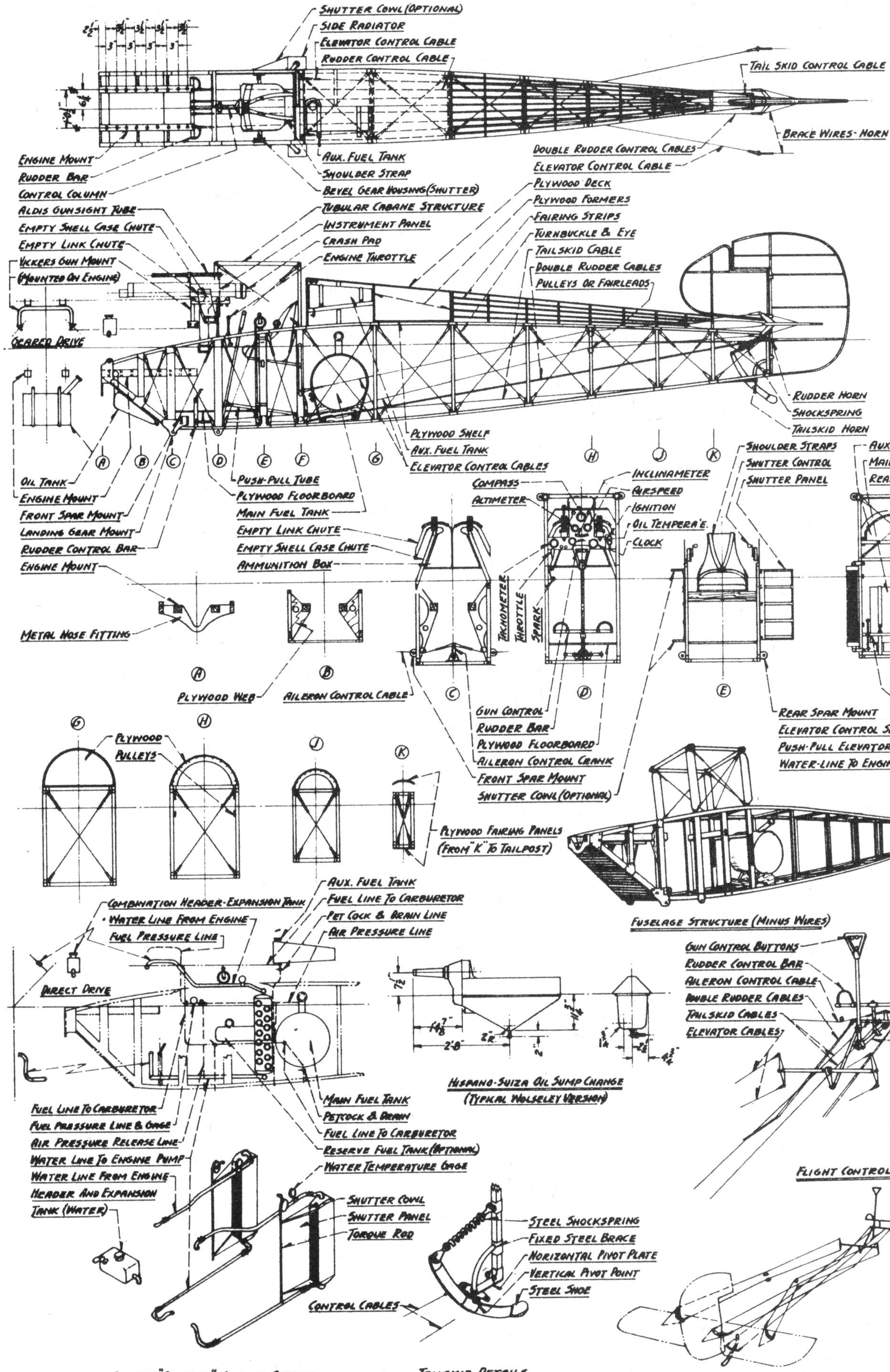
SCALE: ¼" = 1'-0"	General Arrangements English Sopwith "Dolphin"
DATE:	
DRAWN BY ... W.A.WYLAM	5F.1

Thanks To Owen G. Thetford & Leonard Bridgman Of Frodgate & London, England For Squadron Markings; Reference: "Camouflage" 1914 To 1918.



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

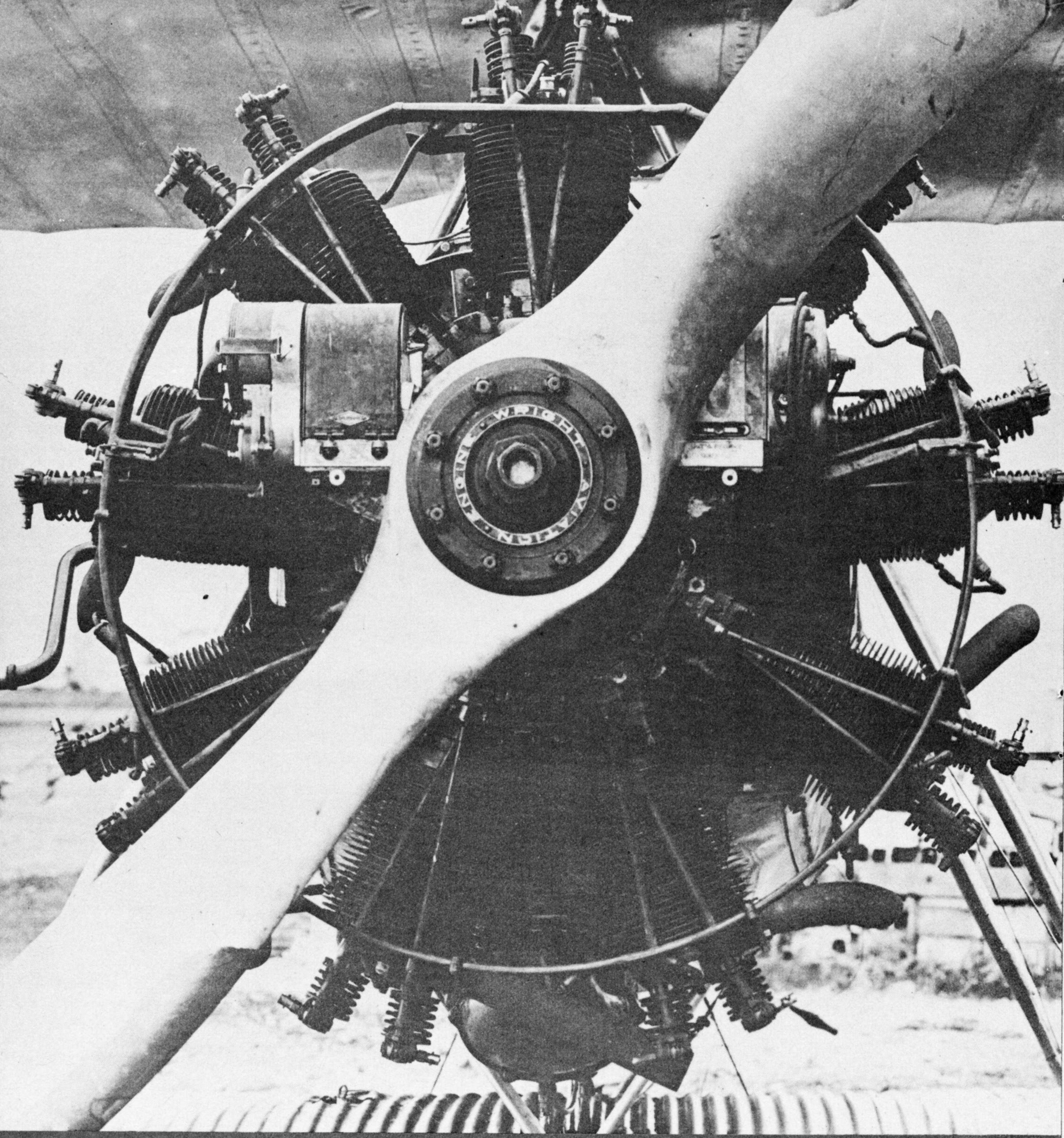
SCALE: ¼" = 1'-0"

DATE:

DRAWN BY .... W.A.WYLAM

FUSELAGE DETAILS
ENGLISH SOPWITH "DOLPHIN"

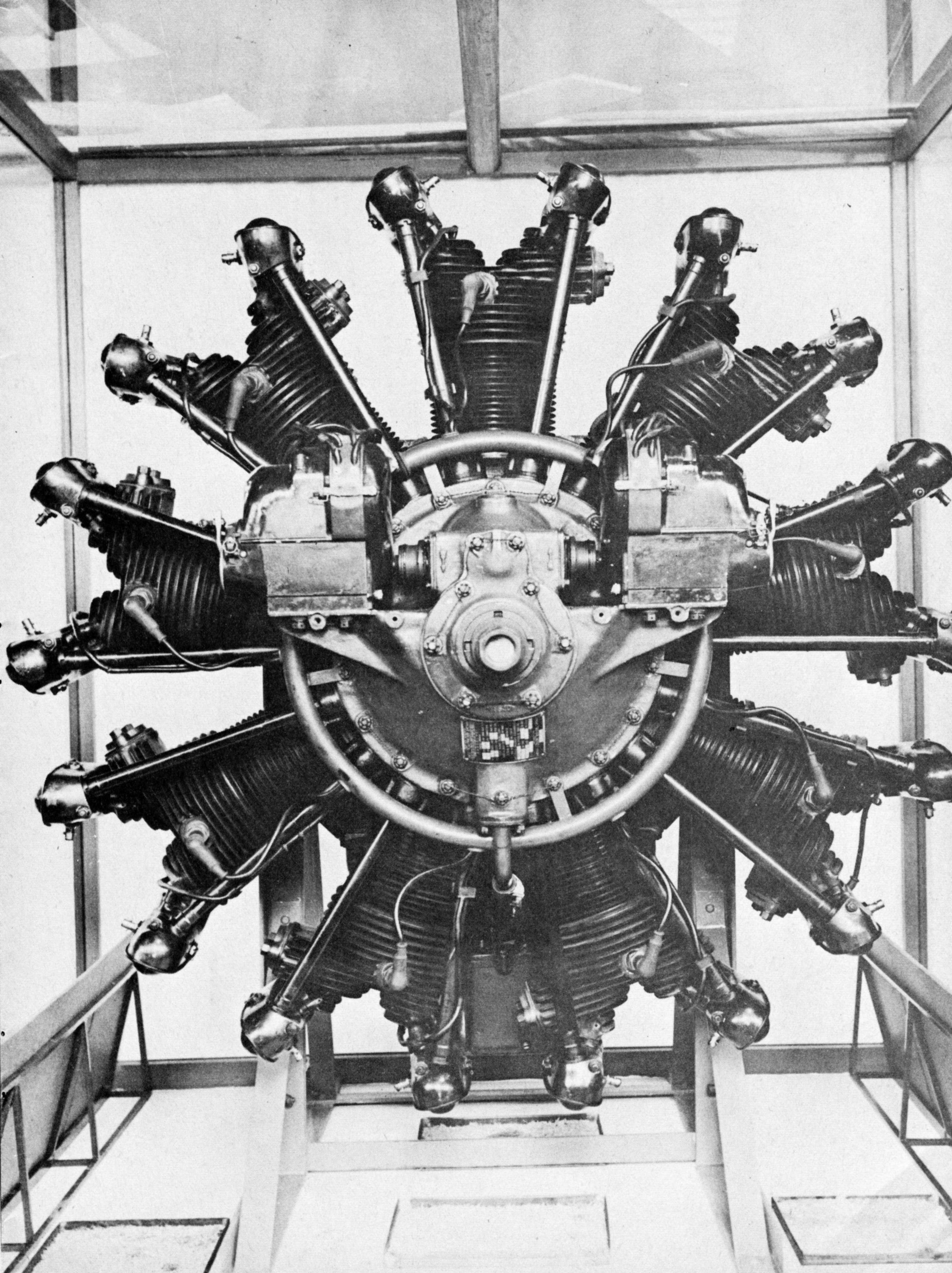
5F.1



ENGINES THAT HAVE MADE HISTORY

• Cyclone • Whirlwind • Twin Wasp

• Clerget • Mercedes • Hisso



CYLINDER DESIGN

MODEL "F-50" CYCLONE | DIRECT DRIVE; 8·5 HYDRO RED'N. GEAR; 16 11 HYDRO RED'N. GEAR

SCALE DOUBLE SIZE | 11-17-'36 | M-1

DRAWN BY.. WILLIAM A. WYLAM

HOT-AIR INTAKE
CARBURATOR AIR SCOOP
MAGNETO
SHEATED WIRES FROM HARNESS to MAGNETO
FUEL PUMP
LUBRICATION CONTROL VALVE
GUN SYNCHR'R. MECH'N.
CONTROLABLE PROPELLOR VALVE
24 31/32"
53 3/4" MAX. ENG. DIAM.
LEATHER IS CUT TO SUIT COWL
SPECIFICATION'S NAMEPLATES
INTER-CYLINDER BAFFLE
CYLINDER HEAD BAFFLE
52 15/16" MAX. ENG. HT.
RADIO SHIELD
OIL STRAINER
WIRING HARNESS

ENTIRE CYLINDER IS JET BLACK EXCEPT FOR SPRINGS, SPARK PLUG'S CENTERS and OIL LINE'S BOLTS are CHROMIUM PLATED.

MINUS SPRINGS & BOLTS for CLEARNESS
1 11/32"
FRONT VIEW

WRIGHT CYCLONE
FRONT
REAR

OIL LINE'S OPENING
5 11/32"
2 1/16"
MOUNTING BOSS FOR ANTI-DRAG & N.A.C.A COWLS
EXTERNAL WALL of COMPRESSION CHAMBER
20 9/64" RAD.
18 25/64" RAD
COOLING FLANGE
CENTER of MOTOR
RIGHT SIDE VIEW

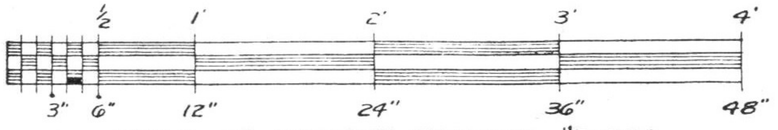
3/8" O.D. BRASS TUB'G.
EXHAUST
INTAKE
MOUNTING FOR REAR BAFFLE
22 13/32" RAD.
REAR VIEW

51 1/4" OVERALL
℄ CYLINDERS
CARBURATOR AIR SCOOP
12 9/16"
16 SPLINES
OIL PASSAGE LINE
OIL PASSAGE
MAGNETO
OIL GAUGE MECH'N
SUPERCHARGER CHAMBER
INTAKE PIPE

WRIGHT CYCLONE
LEFT SIDE VIEW
BOTTOM VIEW

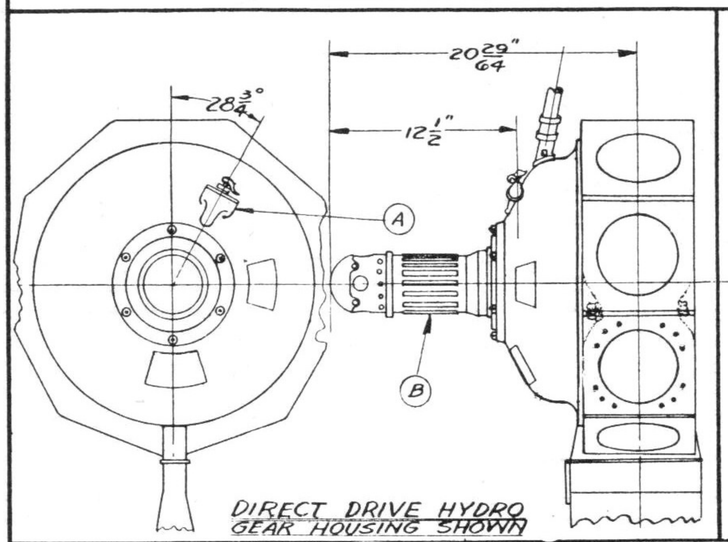
CYCLONE "F-50"
REDUCTION GEAR 16:11
HYDRO MODEL SHOWN

1

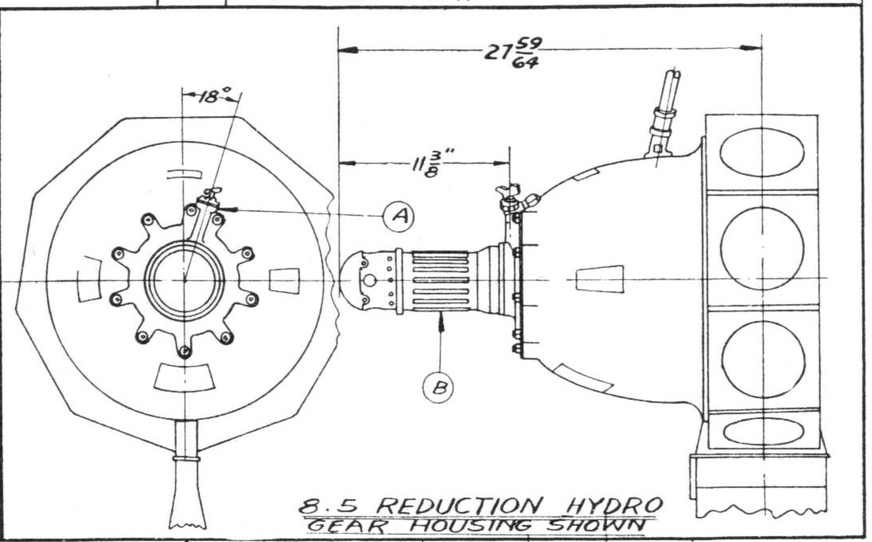


SCALE of WRIGHT CYCLONE "F-50"

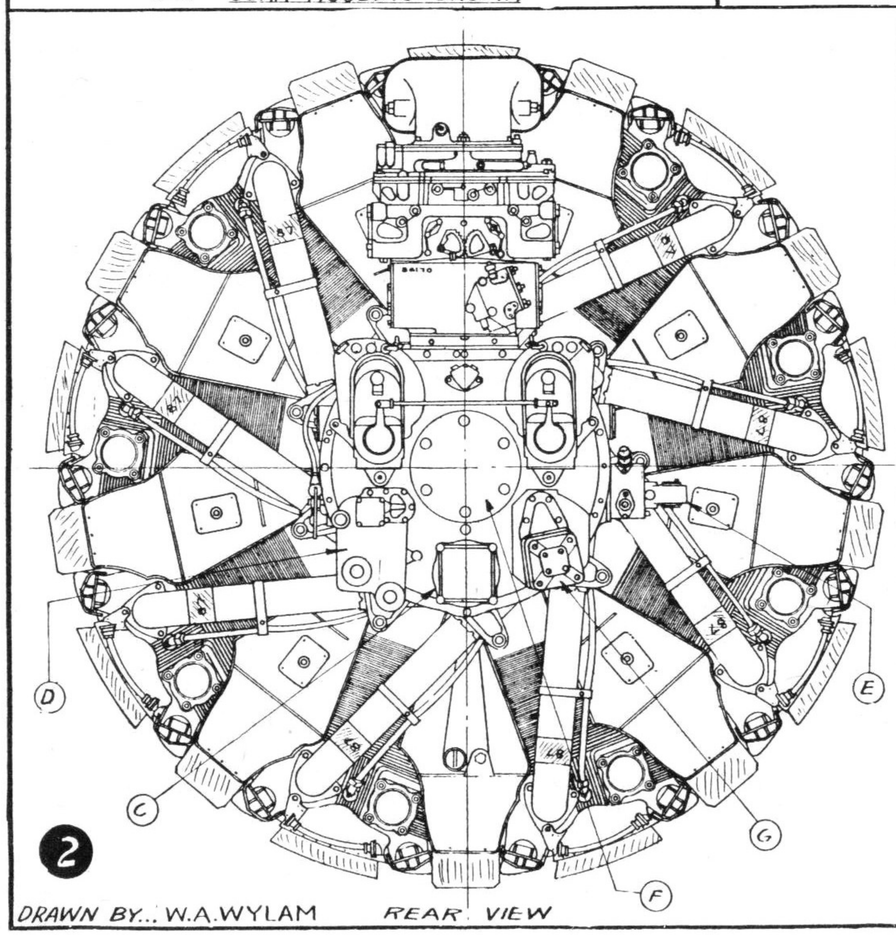
A	CONTROLLABLE PROPELLOR VALVE
B	16 SPLINES
C	GENERATOR'S STATION
D	OIL GAUGE MECHANISM
E	FUEL PUMP
F	SPARE DRIVE SHAFT
G	VACUUM PUMP



DIRECT DRIVE HYDRO
GEAR HOUSING SHOWN



8.5 REDUCTION HYDRO
GEAR HOUSING SHOWN



DRAWN BY.. W.A.WYLAM REAR VIEW

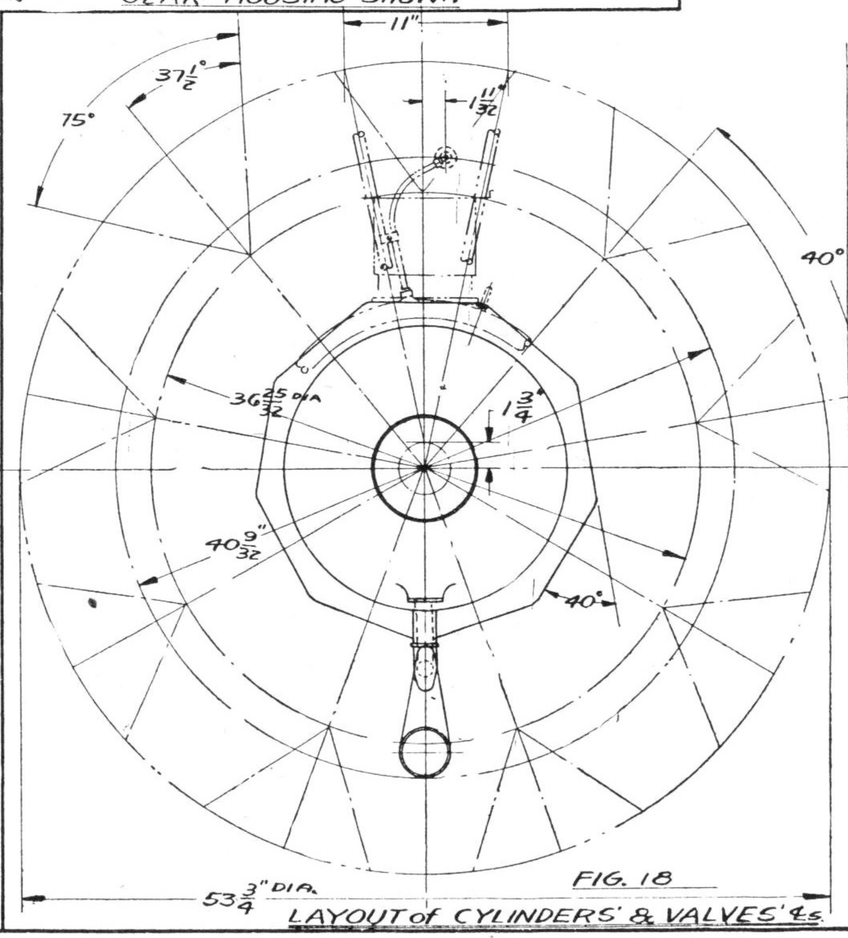
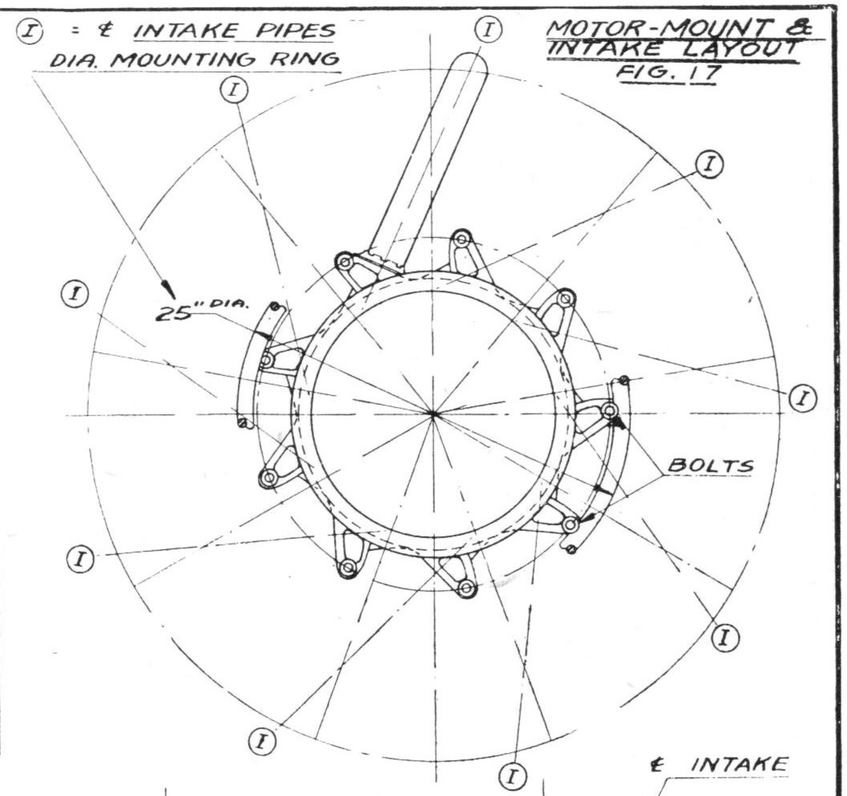


FIG. 18
LAYOUT of CYLINDERS' & VALVES' ℄s



MOTOR-MOUNT & INTAKE LAYOUT
FIG. 17

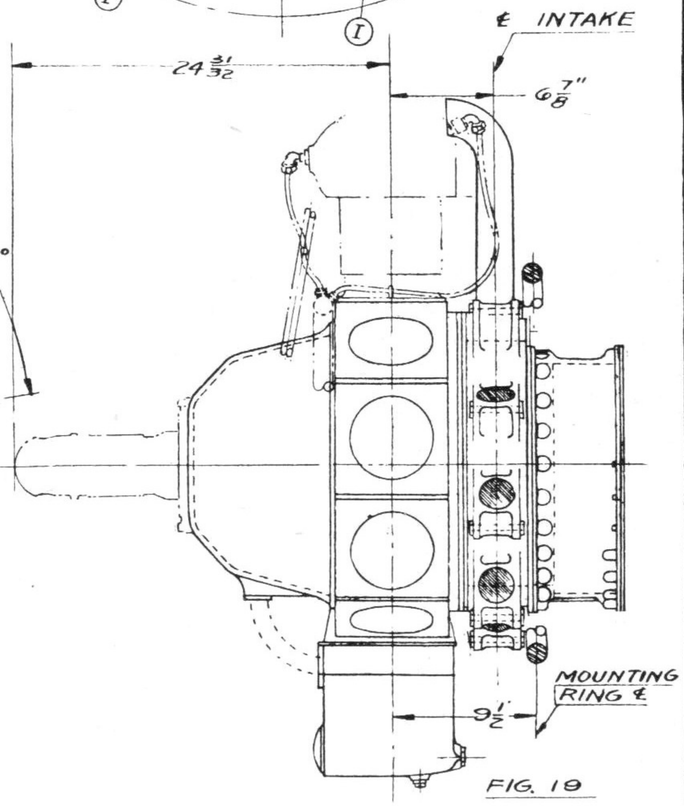


FIG. 19

16.11 GEAR HOUSING
MOTOR BLOCK and END
CONTRUCTION

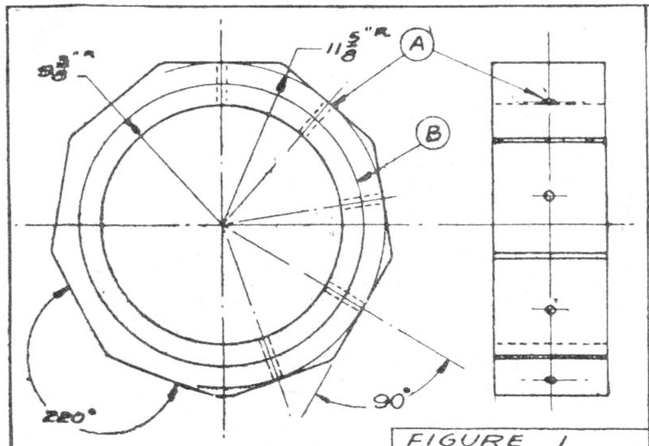


FIGURE 1

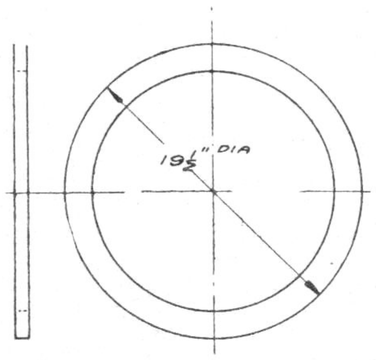


FIGURE 2

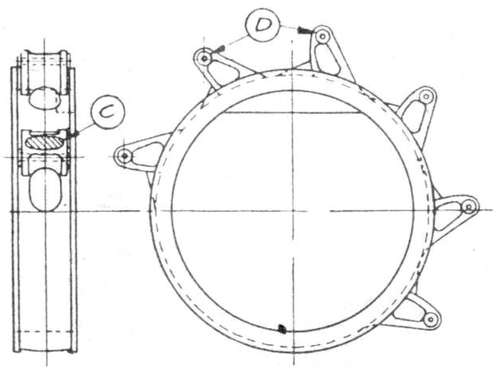


FIGURE 3

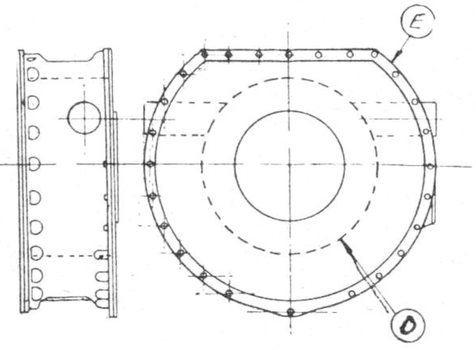


FIGURE 4

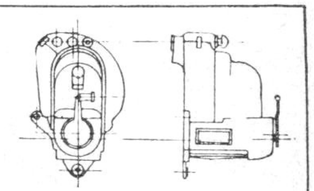
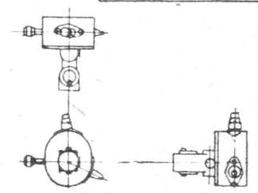


FIGURE 8

FIGURE 9



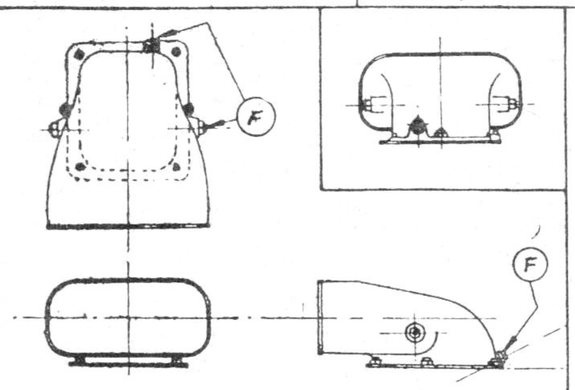


FIGURE 5

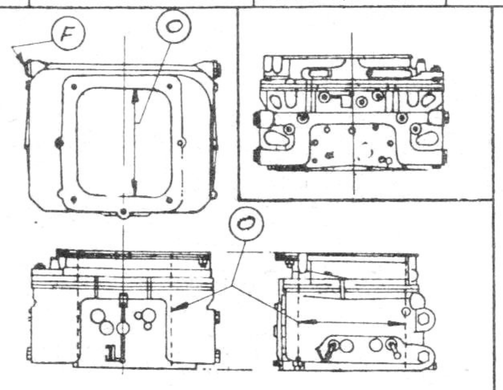


FIGURE 6

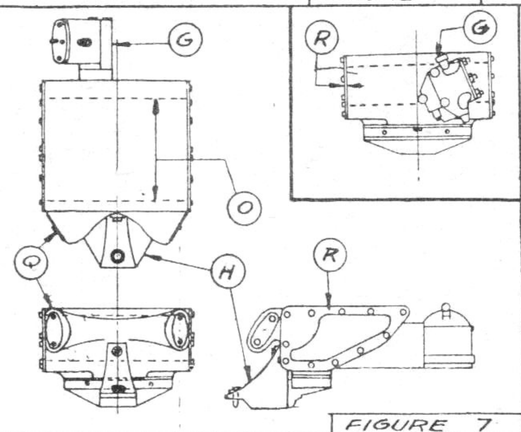


FIGURE 7

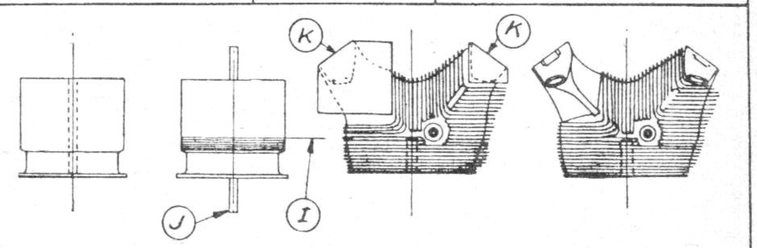
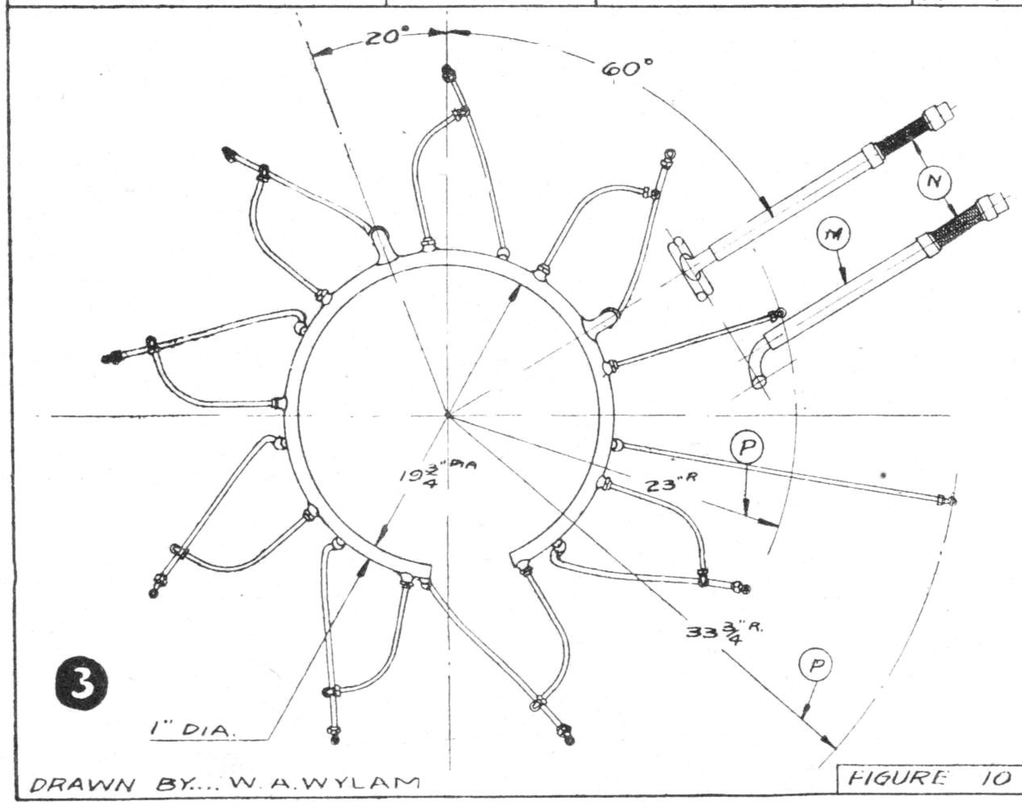


FIGURE 11

A SUGGESTIVE METHOD of MAKING UP EACH CYLINDER — 2 PEICES for 1 UNIT

SEVERAL THREE-VIEW DRAWINGS ON THIS PAGE ARE MINUS A FEW FIXTURES for CLEARNESS — LOOK TO ENGINE'S FOUR-VIEW DRAWING for the MISSING DETAILS.

R	GRID PLATE (SCREEN MISSING).
Q	EXHAUST CONNECTIONS for HOT-AIR PASSAGE
P	MINIMUM RADUS
O	HOLLOW SPACE
N	BRAIDED WIRES' COVERING
M	METAL SLIEVE (BEND TO CONTOUR of BLOCK)
K	WOOD BLOCK (CARVE TO SHAPE of VALVE HOUS'G.)
J	GLUED DOWEL
I	THREAD
H	MOUNTING POST
G	HOT-AIR EXHAUST
F	ADJUSTMENT BOLTS
E	REINFORCEMENT RING
D	BUSHINGS
C	INTAKE PORT
B	GUIDE LINE for GEAR HOUSING
A	DOWEL HOLES (DRILLED TO SUIT DOWELS)



DRAWN BY... W. A. WYLAM

FIGURE 10

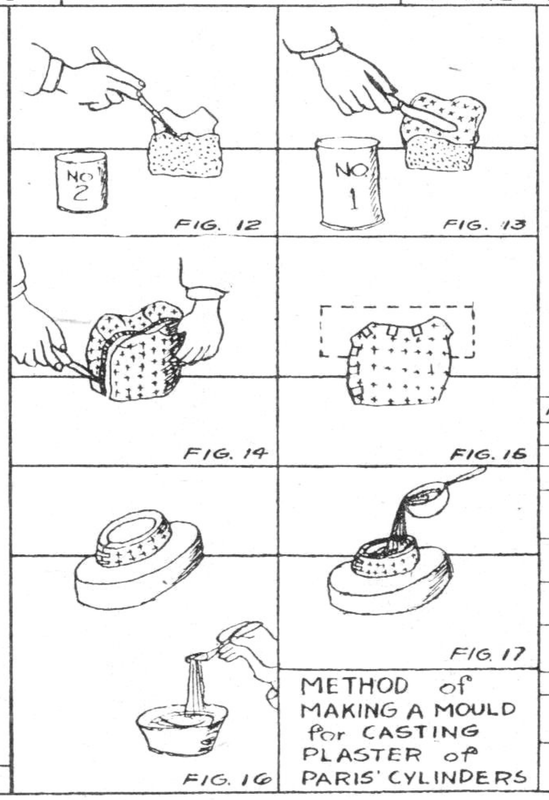


FIG. 12

FIG. 13

FIG. 14

FIG. 15

FIG. 16

FIG. 17

METHOD of MAKING A MOULD for CASTING PLASTER of PARIS' CYLINDERS

FIGURES	NAME	COLOR	MISCELLANEOUS
1	MOTOR BLOCK	BLUE-GRAY	
2	SPACER	BLUE-GRAY	
3	ENGINE MOUNT	BLUE-GRAY	
4	SUPERCHARGER CHAMBER	BLUE-GRAY	
5	CARBURATOR AIR SCOOP	SHINEY BLACK	
6	CARBURATOR MIXING CHAMBER	SHINEY BLACK	CHROM. PL'D. FIXTURES
7	CARBURATOR ADAPTER	SHINEY BLACK	CHROM. PL'D. SIDES CHROM. PL'D. FIXTURES
8	MAGNETO	SHINEY BROWN	CHROM. PL'D. FIXTURES
9	FUEL PUMP UNIT	ALL STEEL	
10	WIRING HARNESS	ALUMIMUN SHIELD RING	GOLD S.P. WIRES CHROM. PL'D. FIXTURES

WRIGHT "WHIRLWIND" 420 H.P.

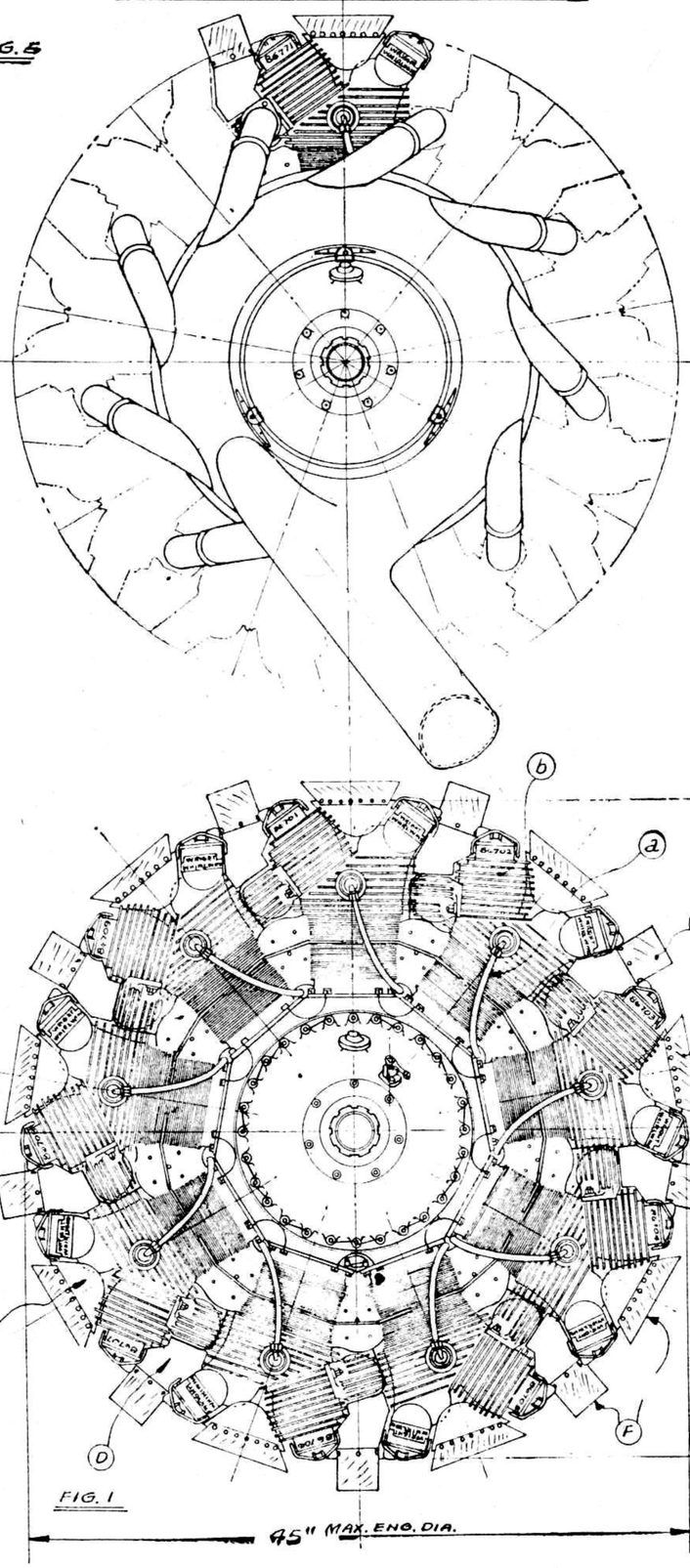
621 | SCALE: 1/16 = 1"-0 | DRAWN BY... WILLIAM A. WYLAM

Y	OIL PRESSURE GAUGE CONN.	A	OIL LUBRICATION LINE
Z	OIL SUMP ENTRANCE	B	EXHAUST PORTS
A°	FELT PADS	C	WIRE HARNESS
B°	CASTLE NUTS	D	INTER-CYLINDER BAFFLE
C°	PROP. HUB RETAINER NUT	E	CYLINDER-HEAD BAFFLE
D°	PROP. HUB FRONT CONE	F	LEATHER STRIPS
E°	PROP. HUB TAPER RING	G	GENERATOR DRIVE CONN.
	..COLORS..	H	STARTER CONN.
a	GOLD	I	OIL ENTRANCE CONN.
b	DULL BLACK	J	OIL EXIT CONN.
c	DULL BROWN	K	OIL PRESSURE ADJ. CONN.
d	DULL BLUE GREEN	L	OIL THERMOCOUPE CONN.
e	RED ORANGE	M	FUEL PRESSURE CONN.
f	SHINEY BROWN	N	GUN SYNCHRONIZER CONN.
g	SHINEY BLACK	O	VENT TO OIL
h	ALUMINUM	P	MAGNETO
i	COPPER	Q	CARBURATOR
		R	THROTTLE CONN.
		S	INTAKE PIPE
		T	CONTRO'E. PROP. VALVE
		U	S.A.E. "30 SPLINE
		V	MOUNTING BOLT HOLES
		W	BRAIDED WIRE SHIELD
		X	CARBURATOR HEATER

WHEN COLLECTOR RING IS INSTALLED, REVERSE THE EXIT (TOWARD THE PROPELLOR HUB).

FRONT VIEW of COLLECTOR RING

FIG. 5



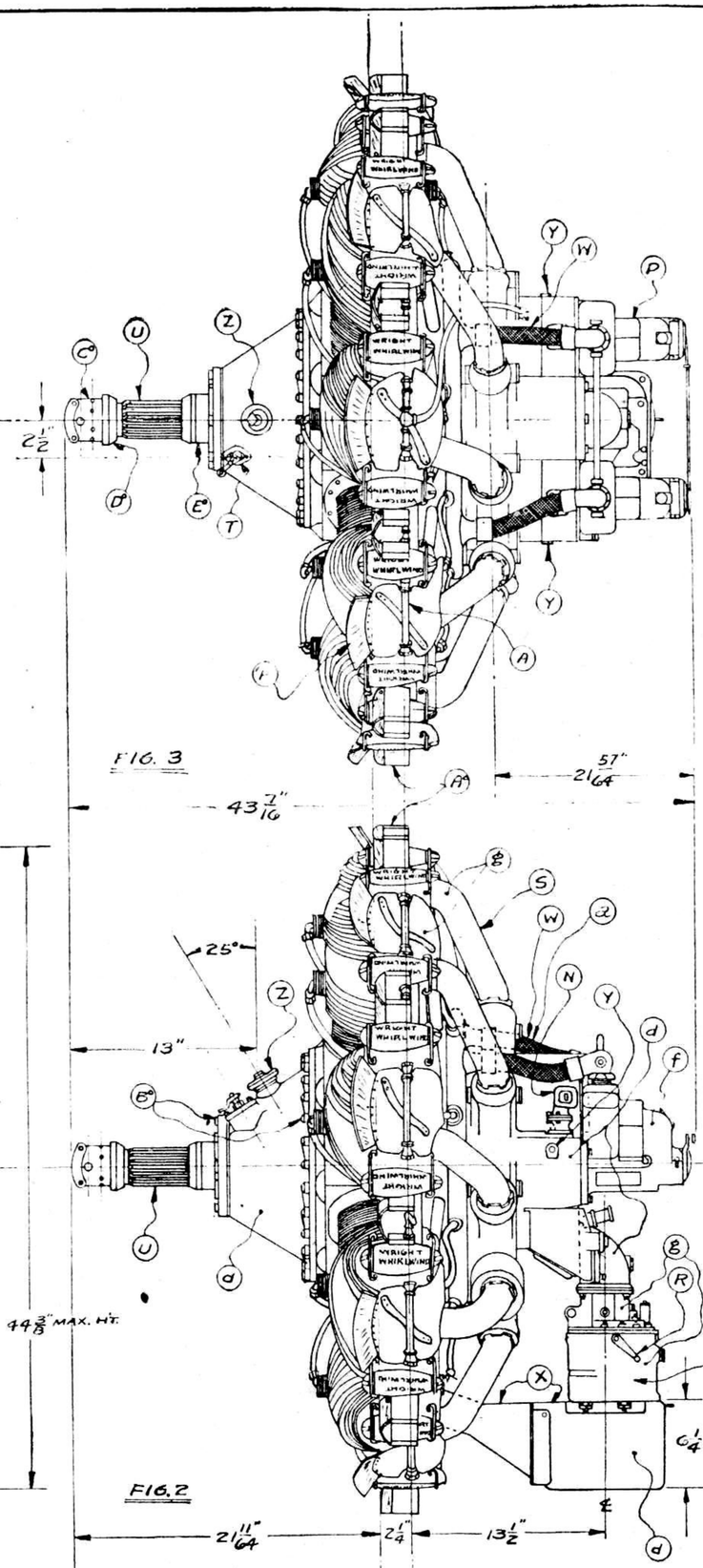


FIG. 3

FIG. 2

FIG. 1

45" MAX. ENG. DIA.

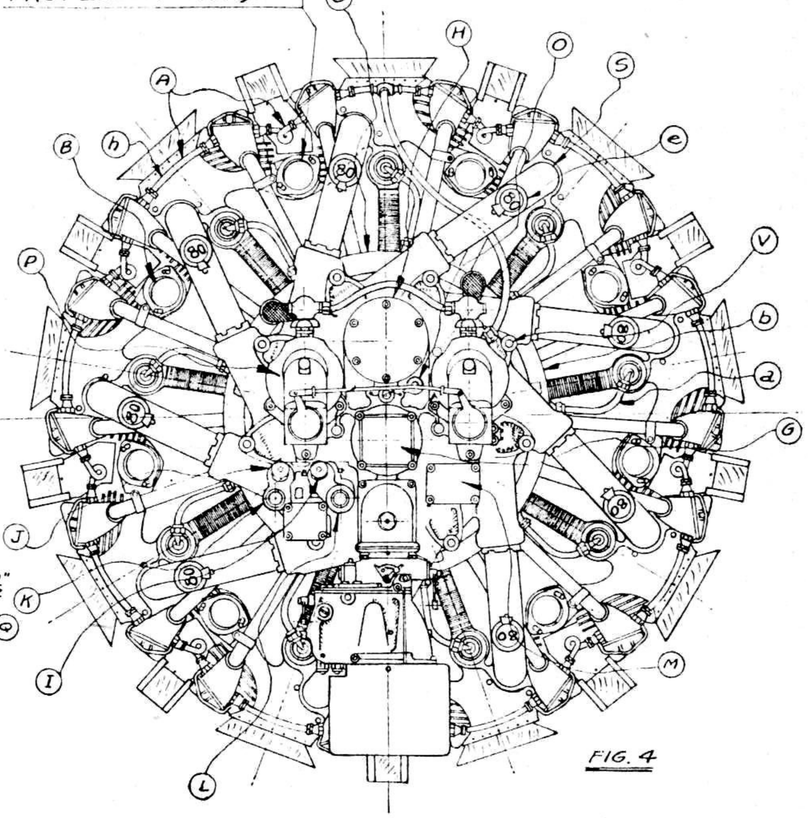


FIG. 4

W. A. WYLAM

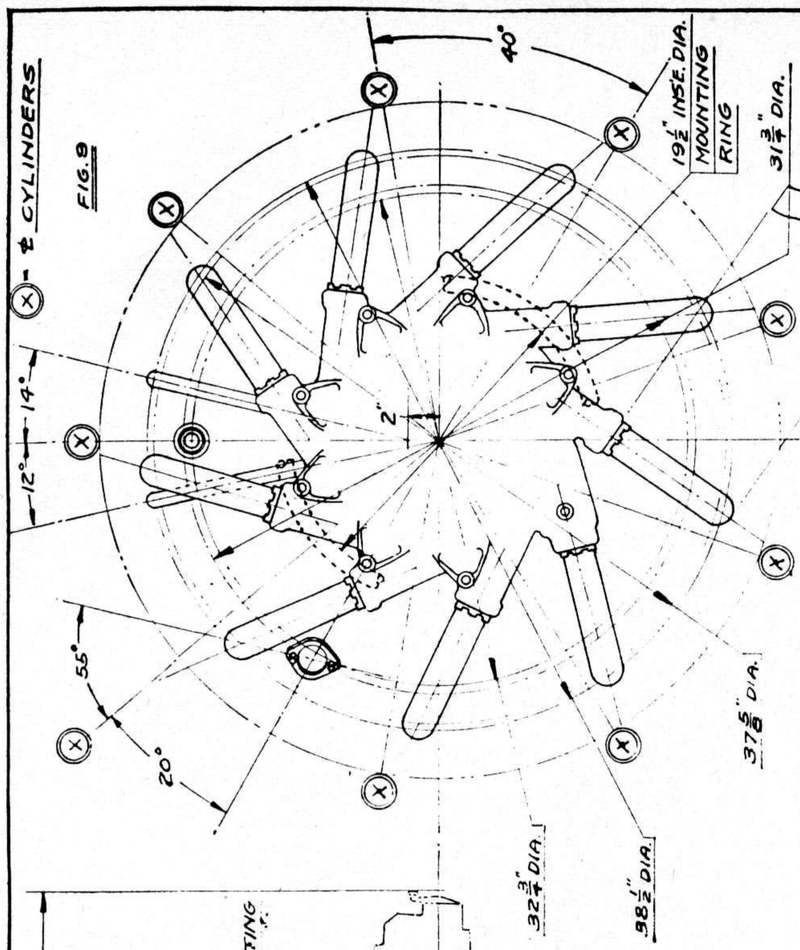


FIG. 9 — 4 CYLINDERS

REAR VIEW of LAYOUT PLAN

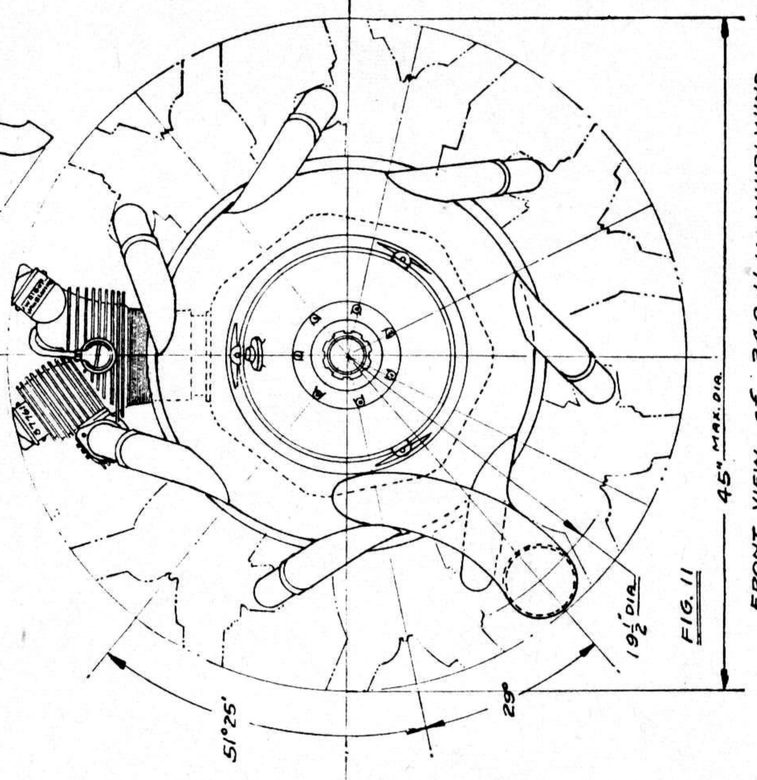


FIG. 11

FRONT VIEW of 340 H.P. WHIRLWIND
W.A. WYLAM

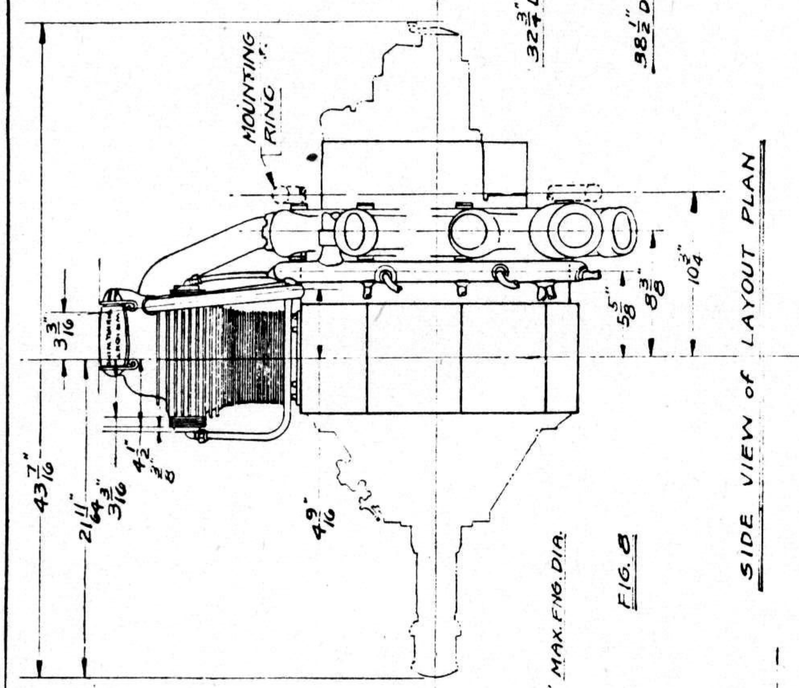


FIG. 8

SIDE VIEW of LAYOUT PLAN

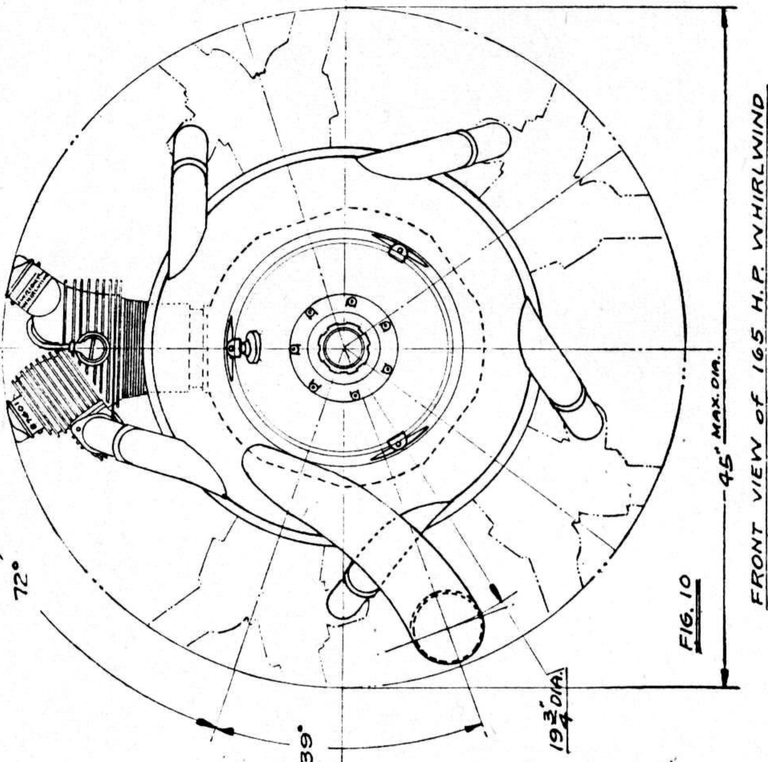


FIG. 10

FRONT VIEW of 165 H.P. WHIRLWIND

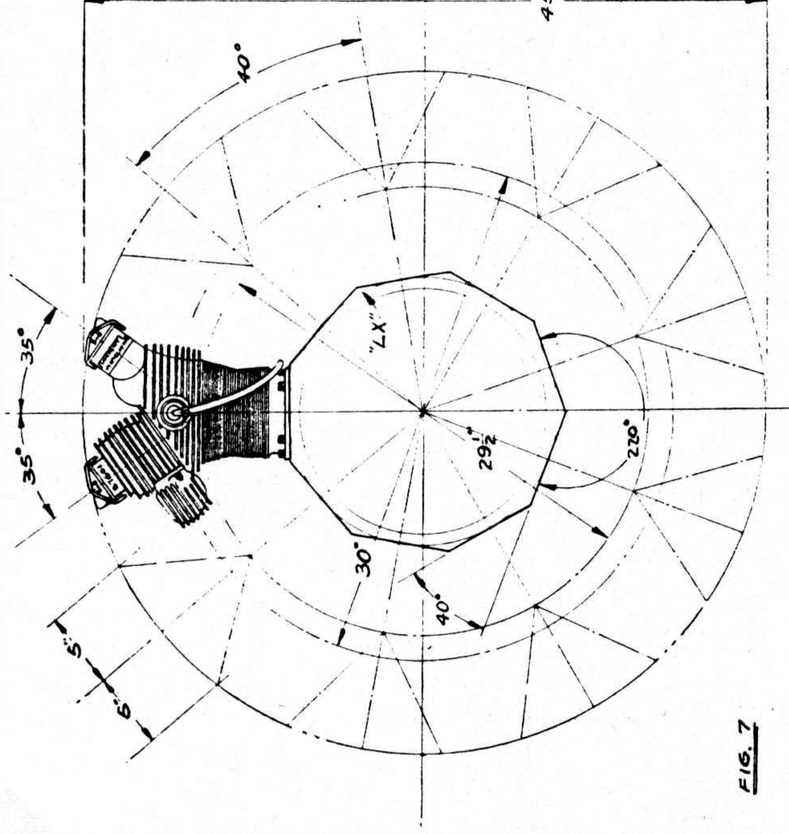


FIG. 7

FRONT VIEW of LAYOUT PLAN

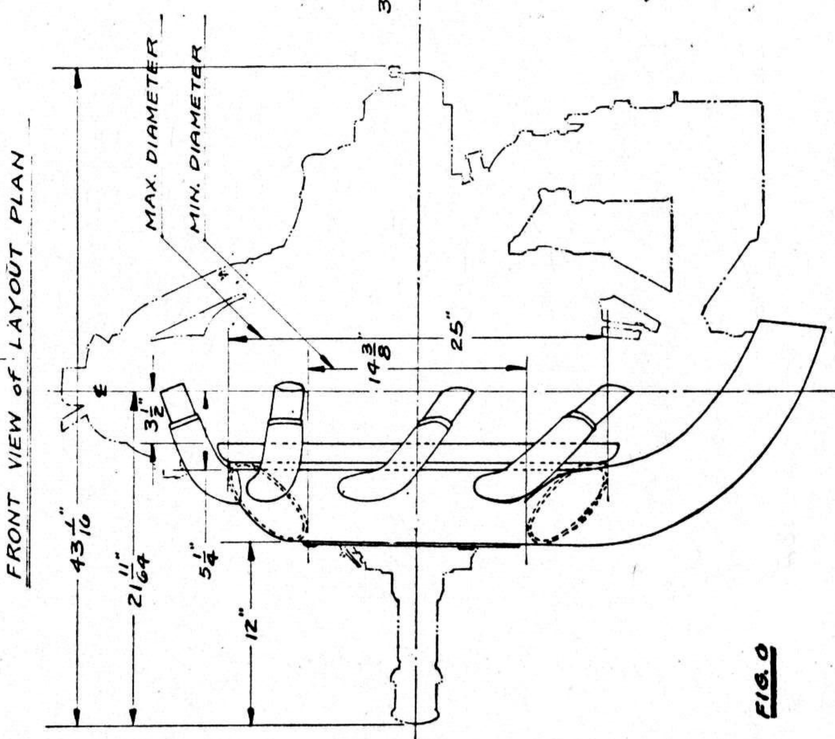
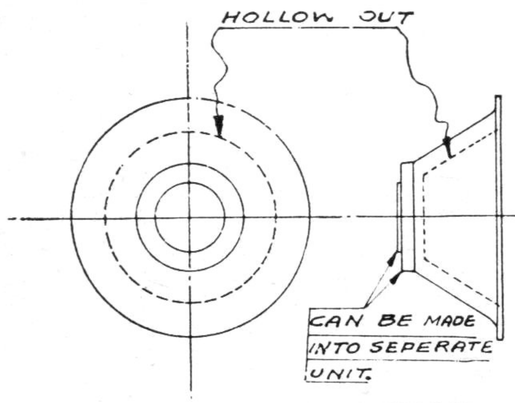


FIG. 6

SIDE VIEW of COLLECTOR RING (REF. FIG.)

FIG. 12



WHIRLWIND GEAR HOUSING

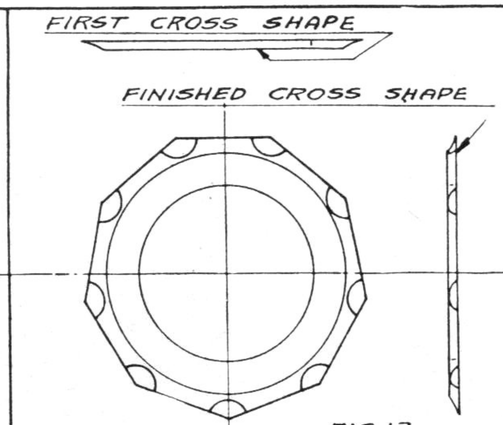
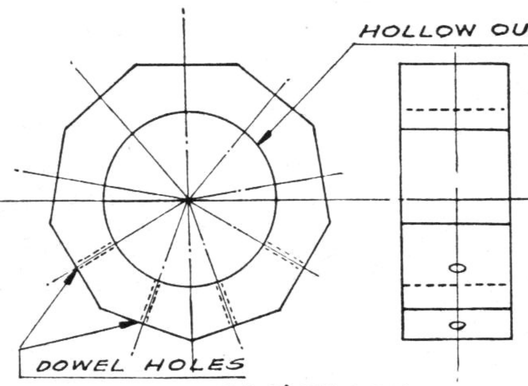


FIG. 13

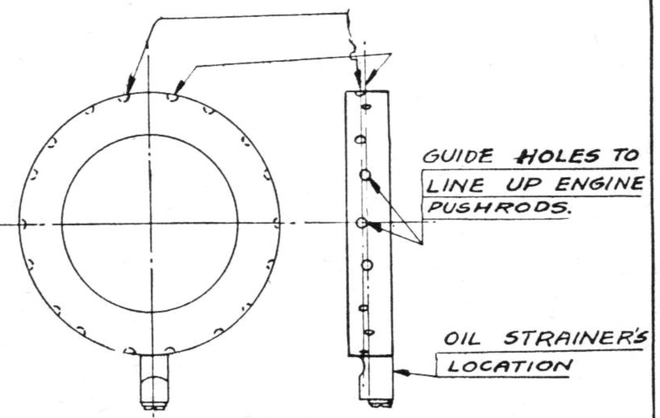
FRONT SPACER

FIG. 14



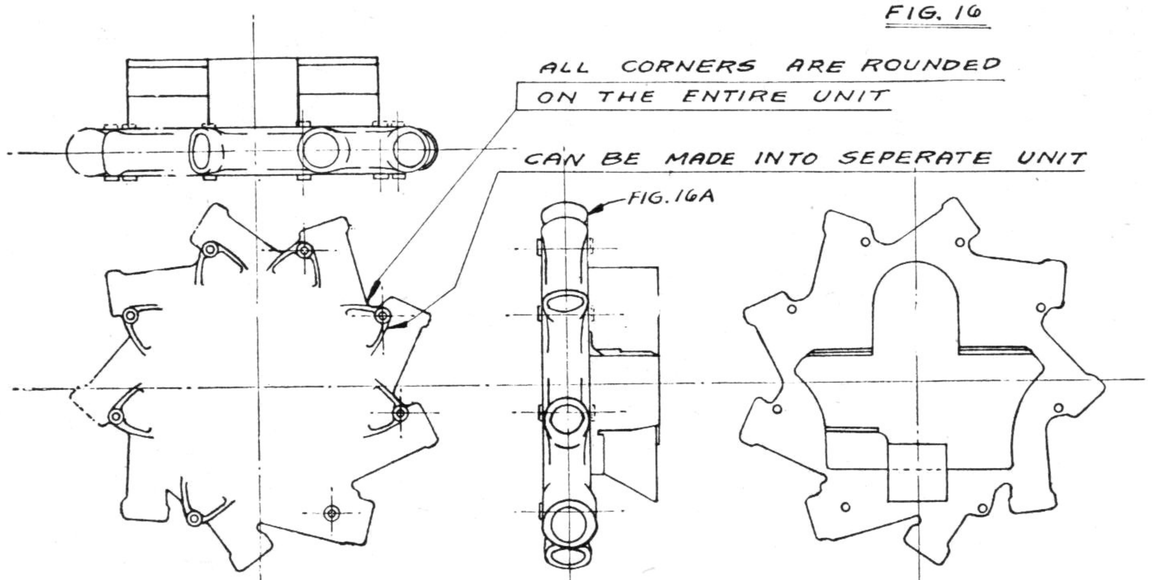
CYLINDERS' BLOCK

FIG. 15



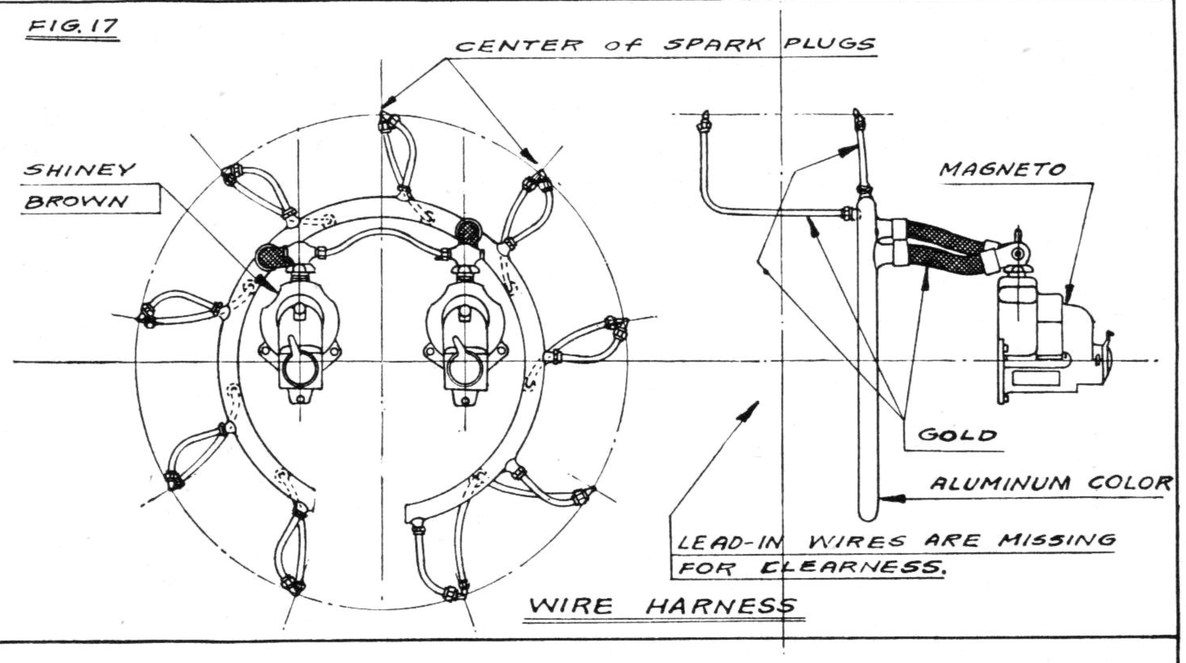
REAR SPACER

FIG. 16



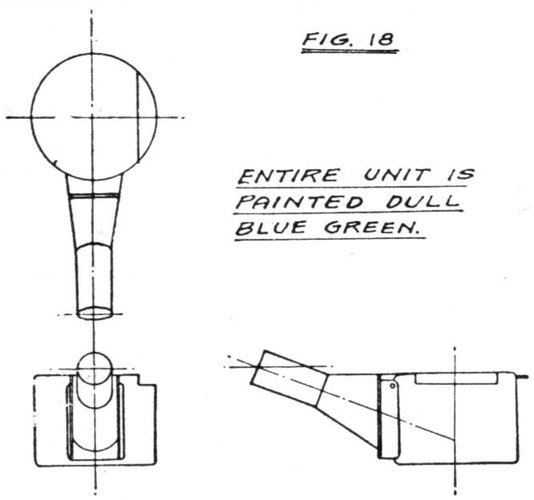
MOTOR MOUNT, INTAKE SECTION and REAR SUPPORT

FIG. 17



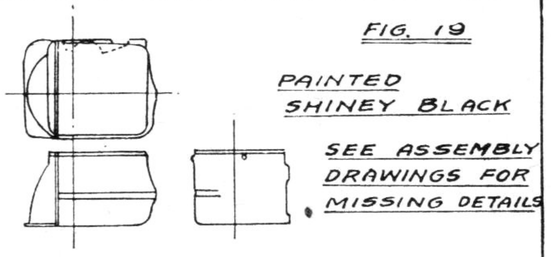
WIRE HARNESS

FIG. 18



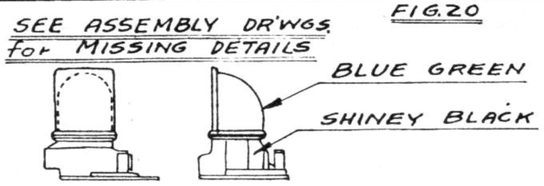
CARBURATOR HEATER

FIG. 19



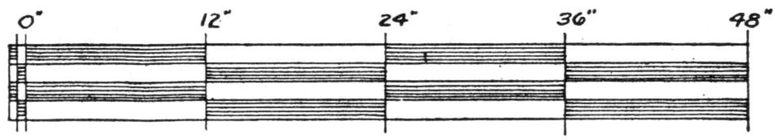
CARBURATOR

FIG. 20



CARBURATOR ATTACHM'TS

NOTICE: WHEN MAKING CYLINDERS, BESURE THAT THE WIDTH of EACH CYLINDERS IS PERFECT; TO ALLOW EASY INSTALLATION WITHOUT INTERFERENCE — IN OTHER WORDS, MAKE SURE THAT THERE WILL BE SUFFICIENT CLEARANCE BETWEEN THE CYLINDER'S SIDE BEFORE THEY ARE FIRMLY ATTACHED TO THE CYLINDER BLOCK (FIG.).

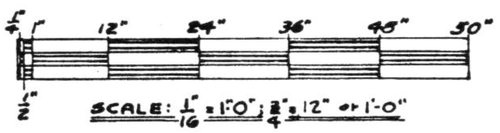


SCALE OF WRIGHT "WHIRLWIND"

DRAWN BY...
WILLIAM A. WYLAM

PLATE No. 4
SCALE: 3/4"-1'-0"
DRAWN BY.. W.A.WYLAM

PRATT & WHITNEY TWIN ROW-14 CLY'S. "WASP, Jr."

A	℄ FRONT CYLINDERS
B	℄ REAR CYLINDERS
C	CONTROLLABLE PROP. VALVE
D	GENERATOR MOUNTING FLANGE
E	MAGNETO
F	CARBURATOR HEATER
G	CARBURATOR UNIT
H	FUEL PUMP
I	OIL SUMP
J	RETURN OIL LINE
K	AUXILIARY OIL SUMP
L	"40 PROP. SHAFT & SPLINES
M	OIL STRAINER UNIT
N	COWL MOUNTING BOSSES
O	INNER-EAR OIL DRAIN
P	INNER-CAP OIL DRAIN
Q	OIL BREATHER UNIT LINE
R	OIL BREATHER UNIT
S	CYLINDER HEAD BAFFLE
T	FRONT CYLINDER BAFFLE
U	FRONT & REAR CYLIND'R. BAFFLES
V	INTAKE PIPE
W	EXHAUST PORTS
X	MACHINE GUN SYNCHRONIZER

SCALE: 1/16" = 1'-0"; 3/4" = 12" or 1'-0"

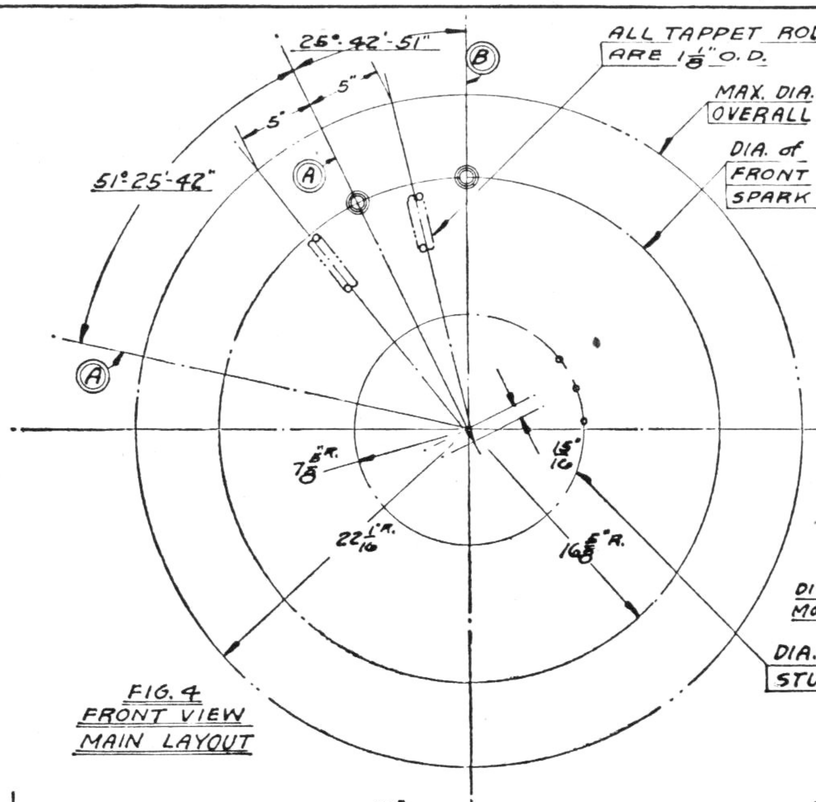


FIG. 4
FRONT VIEW
MAIN LAYOUT

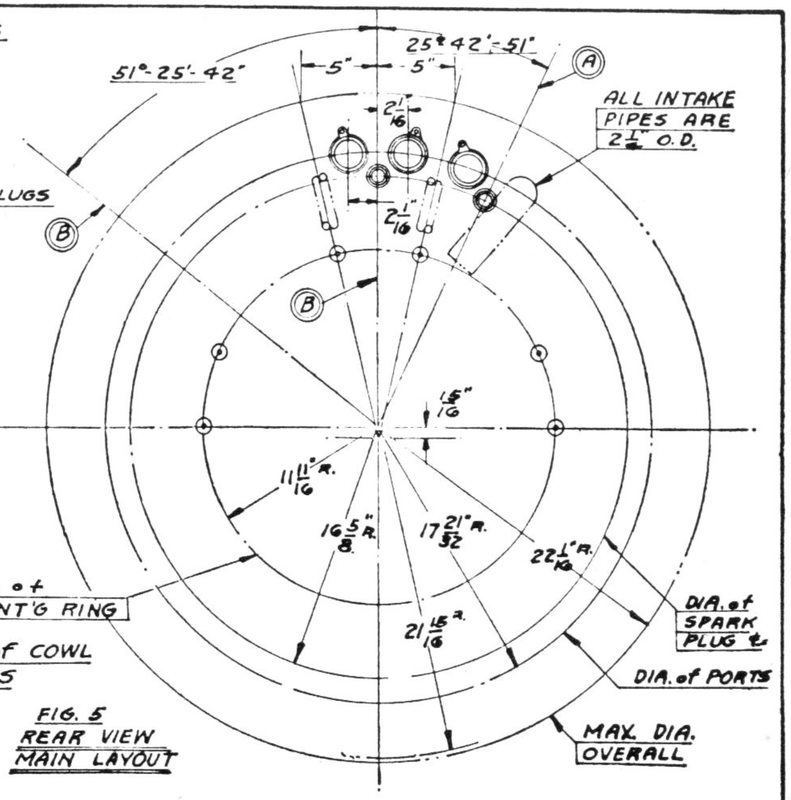


FIG. 5
REAR VIEW
MAIN LAYOUT

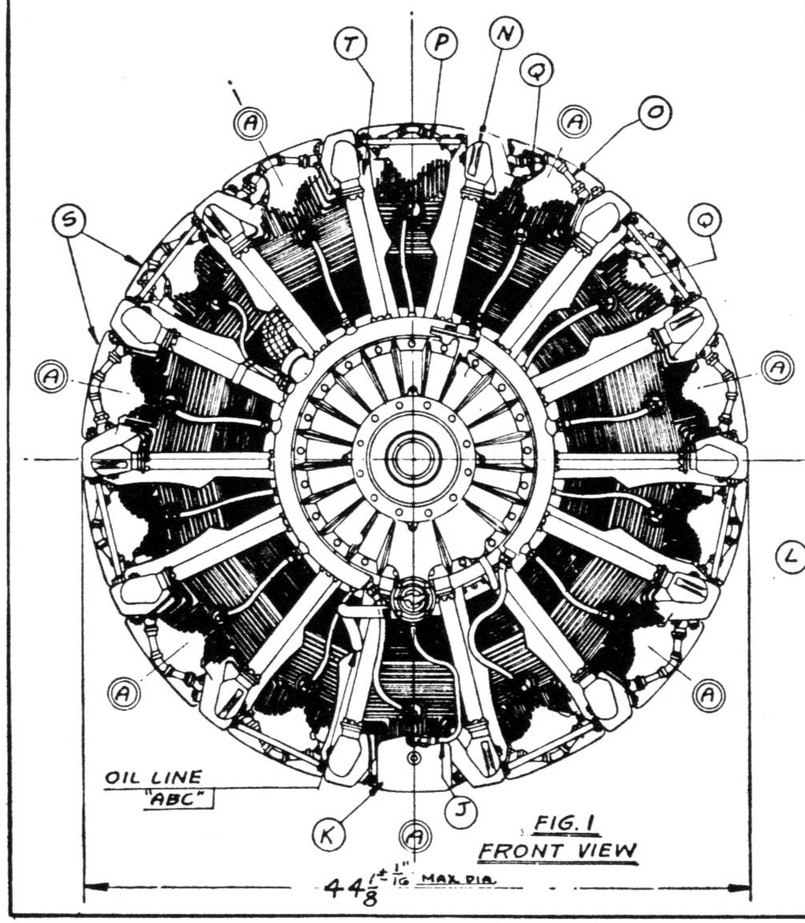


FIG. 1
FRONT VIEW

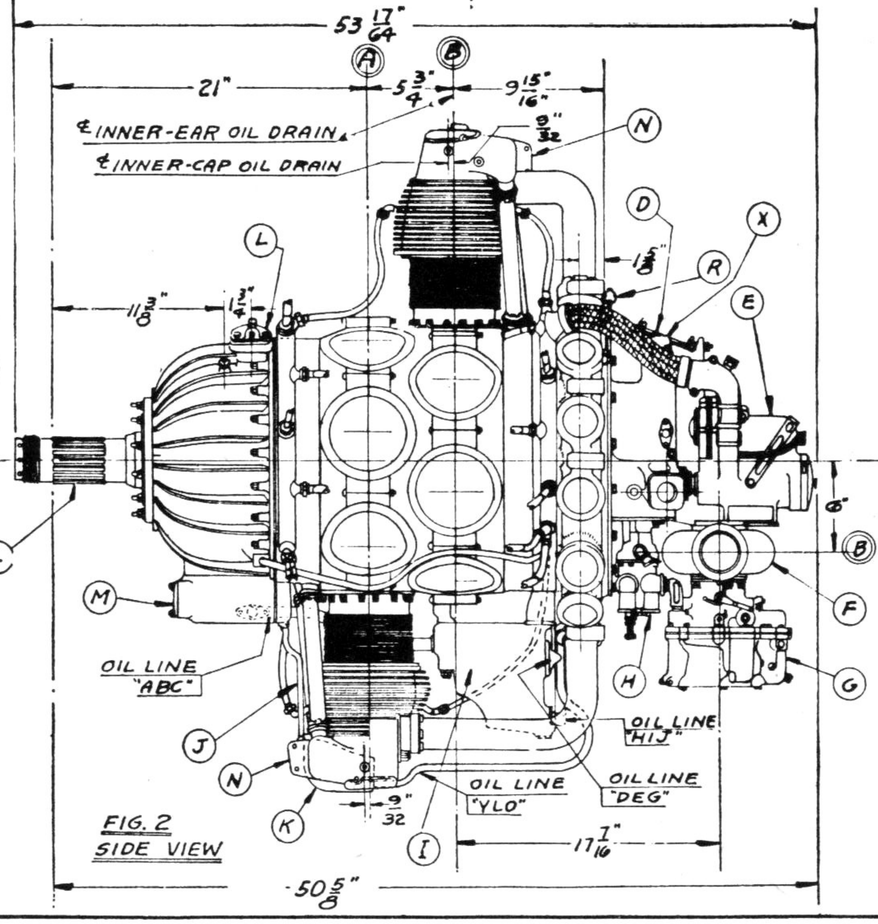


FIG. 2
SIDE VIEW

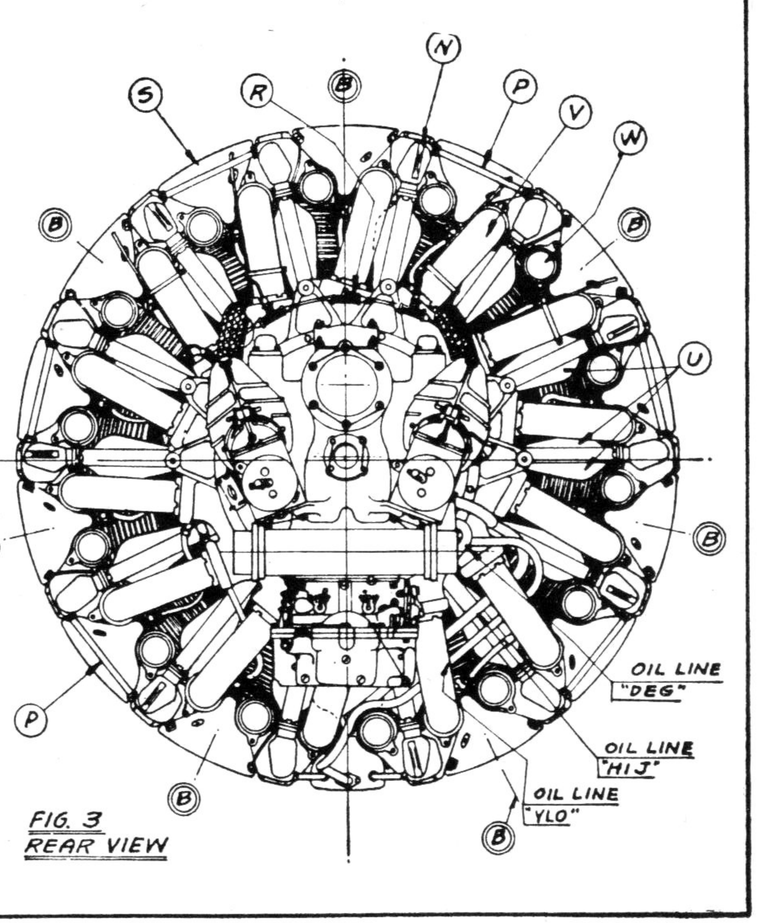


FIG. 3
REAR VIEW

FIG. 6 TRUE SHAPE GEAR HOUSING

PAINT: GRAY ENAMEL

TRUE SHAPE of RIB

ROUND ALL CORNERS

FINISH FRONT VIEW

GASKET

TRADE MARK SEE PLATE Nº1

FRONT-VIEW "JRL" SIDE-VIEW REAR-VIEW

CONNECT OIL LINE "ABC" HERE

CONNECT OIL LINE "DEG" HERE

CONNECT OIL LINE "HIJ" HERE

COMMON OIL PLUGS

BOTTOM VIEW

PAINT: GRAY ENAMEL

FIG. 11 OIL SUMP DETAILS

NOTE: SHAPE "JRL" TO FIT POWER CASE AT POINTS "VRL." (FIG. 7) (SEE ALSO, SIDE VIEW - FIG. 2)

FIG. 7 POWER CASE TRUE SHAPE

FRONT VIEW

REAR VIEW

SECTION "B-B"

SECTION "G-G"

BOLTS "UXZ"

TAPPET HOLES MINUS GUIDES

Pts. "VRL"

INTAKE

EXHAUST

PAINT POWER CASE & ACCESSORY SECTION GRAY ENAMEL

SECTION "A-A"

DRILL HOLES HERE TO FIT BOLTS "UXZ"

FRONT VIEW

OIL BREATHER

BOLTS "MXR"

REAR-VIEW

PAINT: GRAY ENAMEL

SIDE-VIEW

FIG. 8 SUPER CHARGER SECTION

THIS PLATE SUPPORT MAGNETO ¼" THICK

DRILL TO FIT BOLTS "MXR"

TACHOMETER CON'N.

OIL INLET THERMO CONN.

VACUUM PUMP MOUNTING FLANGE

OIL TANK VENT

OIL PRESSURE GUAGE CON'N.

OIL PRESSURE RELIEF VALVE

CONNECT OIL LINE "HIJ" HERE

CONNECT OIL LINE "YLQ" HERE

CONNECT OIL LINE "DEG" HERE

OIL OUTLET CONNECTION

FIG. 9 ACCESSORY SECTION

BRONGE FLEXIBLE WEAVED TUBING

BLACK RUBBER COVERING

ALUMINUM MANIFOLD

MAGNETO SHINEY AMBER BROWN BAKELITE FINISH

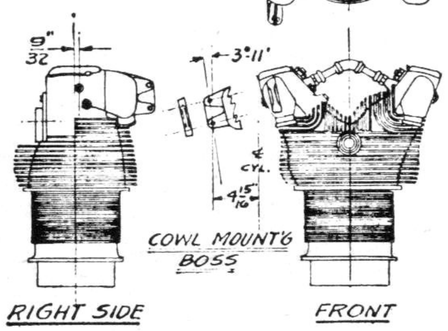
FIG. 10 WIRING HARNESS DETAILS

NOTE: ALL DRAWINGS ON THIS PAGE WERE SIMPLIFIED FOR MODEL WORK.

PLATE Nº 5	PRATT & WHITNEY TWIN ROW - 14 CYL'S. "WASP, Jr."
SCALE: ¾" - 1'-0"	
DRAWN BY... W.A.WYLAM	

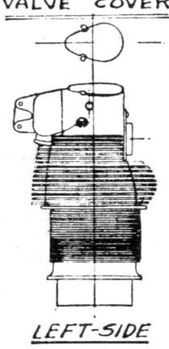
TOP - VIEW

FIG. 12
FRONT CYLINDER DESIGN
(SIMPLIFIED for MODEL WORK)



RIGHT SIDE

FRONT

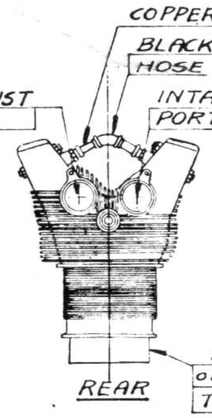


LEFT-SIDE

TOP - VIEW
VALVE COVER

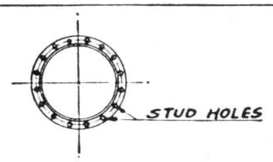
EXHAUST PORT

COPPER TUBING
BLACK RUBBER HOSE
INTAKE PORT

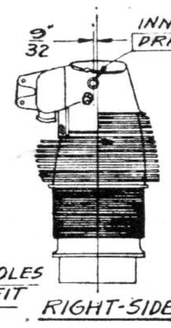


REAR

DRILL CYLINDER HOLES on POWER CASE TO FIT THIS BARREL

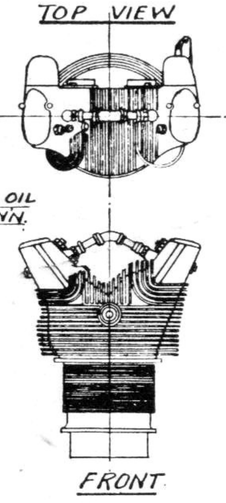


BOTTOM VIEW
CYLINDER



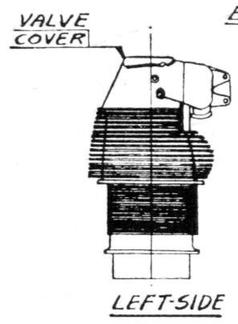
RIGHT-SIDE

TOP VIEW

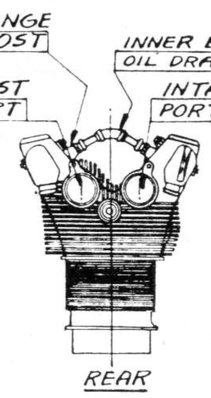


FRONT

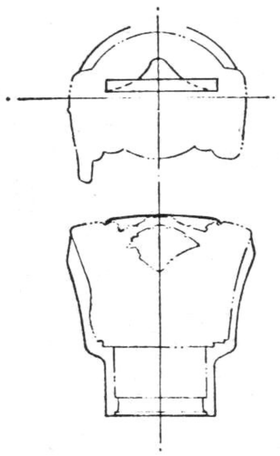
FIG. 12A
REAR CYLINDER DESIGN
(SIMPLIFIED for MODEL WORK)



LEFT-SIDE

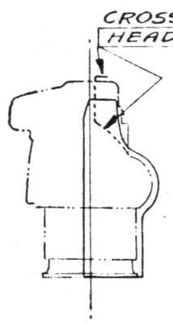


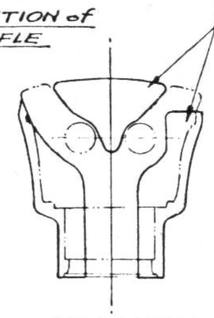
REAR



FRONT CYLINDER BAFFLE LAYOUT

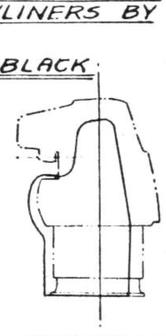
CROSS SECTION of HEAD BAFFLE

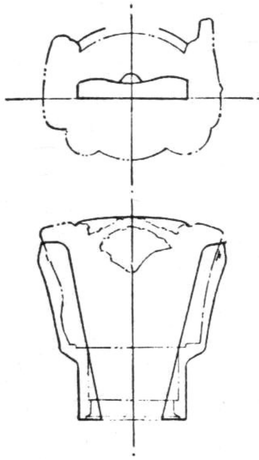




ALL BAFFLES ARE MADE of PRESSED DURALUMIN & ARE ATTACHED TO CYLINERS BY LUGS & BOLTS.

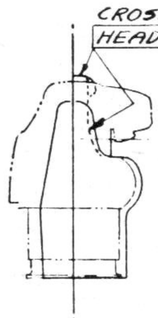
COLOR: SHINEY BLACK

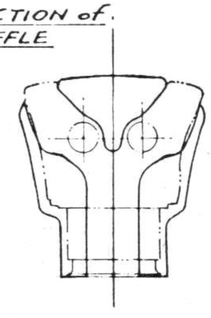




REAR CYLINDER BAFFLE LAYOUT

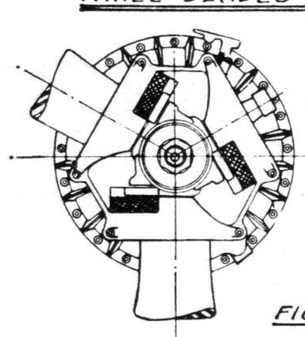
CROSS SECTION of HEAD BAFFLE





HAMILTON STANDARD PROPELLORS

THREE BLADED CONTROLLABLE



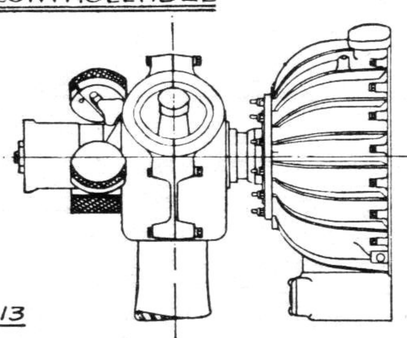
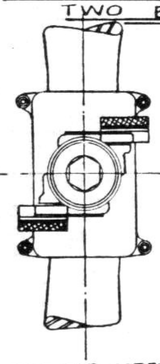


FIG. 13
MOUNTED POSITION

TWO BLADED CONTROLLABLE



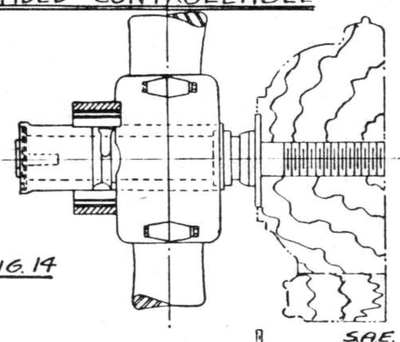
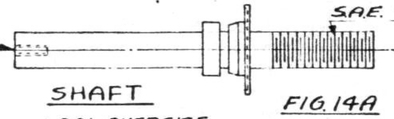


FIG. 14

TAP FOR SCREW

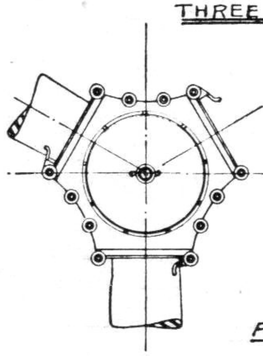
S.A.E. THREAD



SHAFT

FIG. 14A

THREE BLADED HYDROMATIC



FRONT

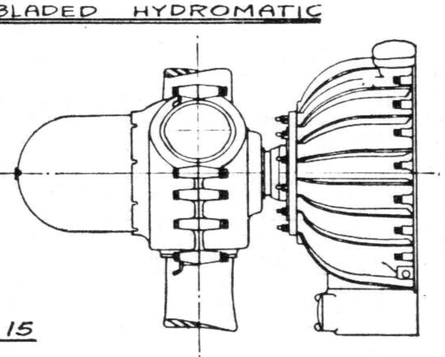


FIG. 15
SIDE-VIEW & MOUNTED POSITION

CARBURATOR UNIT

PAINT: SHINEY BLACK

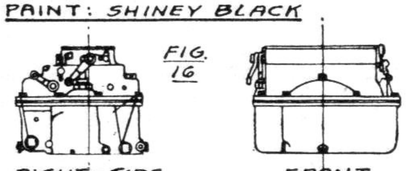


FIG. 16

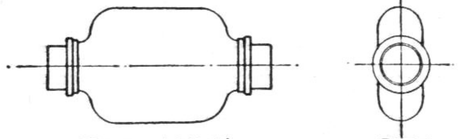
RIGHT-SIDE

FRONT

NOTE: REFER TO FIG. 2 & 3 for LEFT-SIDE & REAR VIEWS.

CARBURATOR HEATER

FIG. 17

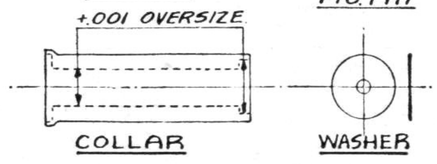


TOP - VIEW

SIDE

PAINT: GRAY ENAMEL

+.001 OVERSIZE

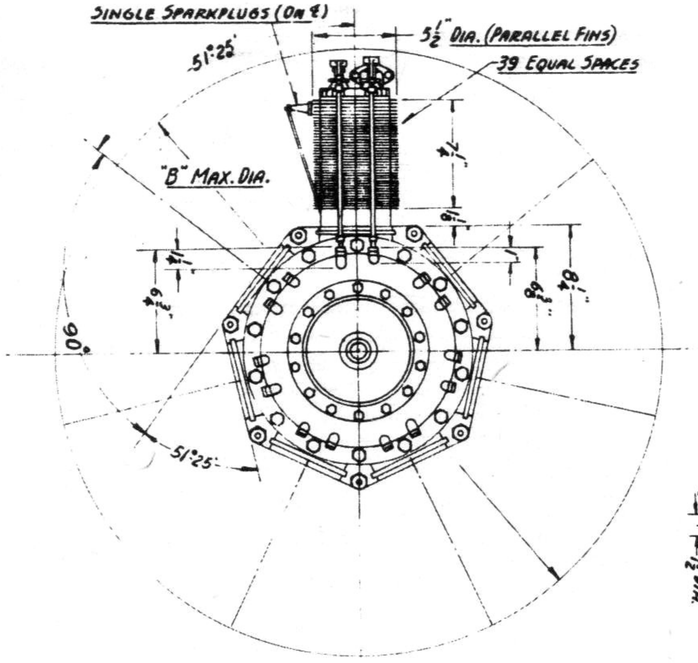


COLLAR

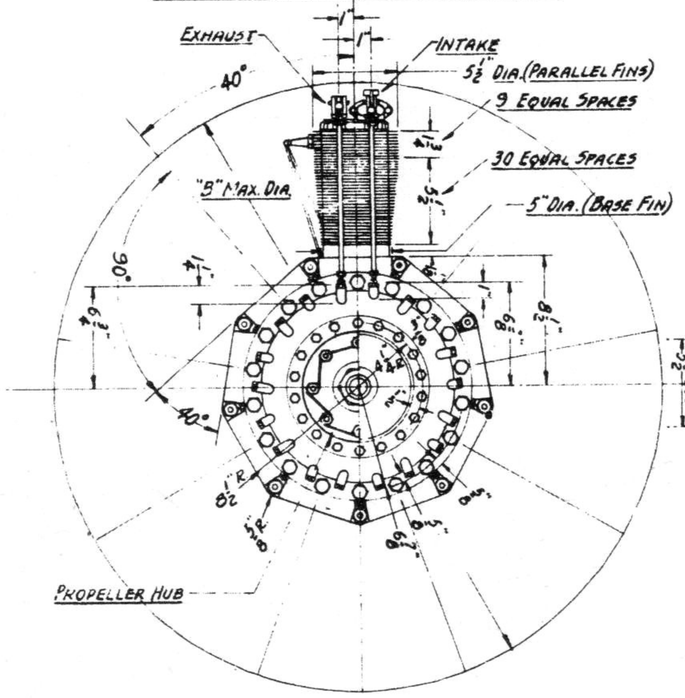
WASHER

SUGGESTED STEEL PROPELLOR SHAFT

PLATE No. 6	PRATT & WHITNEY TWIN ROW - 14 CYL'S. "WASP, Jr."
SCALE: 3/4"=1'0"	
DRAWN BY... W.A.WYLAM	



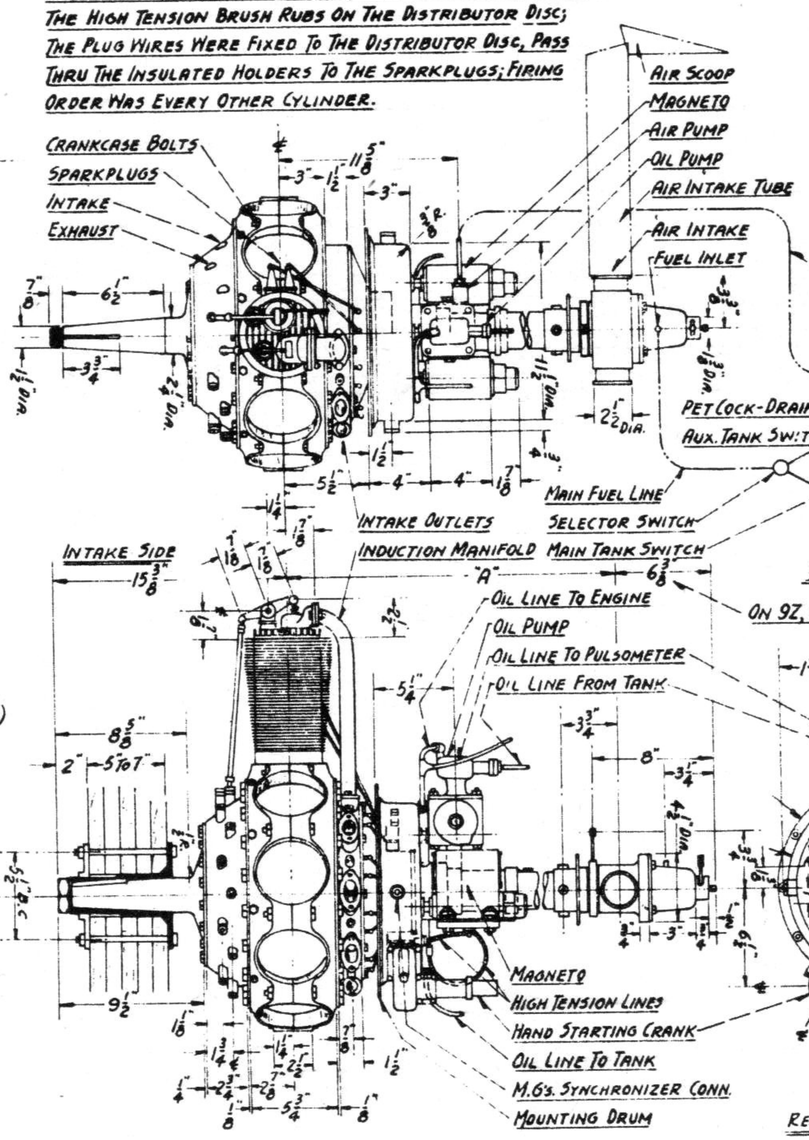
MODEL 7Y, & 7Z CLERGET-SEVEN CYLINDERS



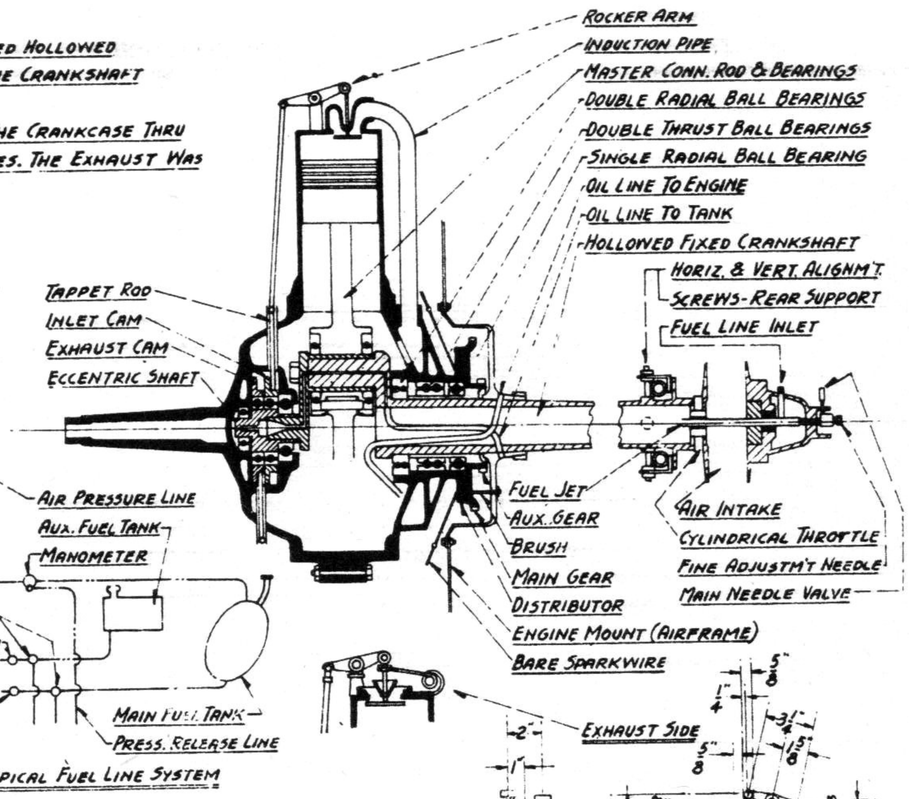
MODEL 9Y, 9Z, 9B, 9F, & 9BF CLERGET NINE CYLINDERS
(MODEL 9Y HAD SAME FINS ON CYLINDERS AS 7Y)

NOTES:
CYLINDER DIMENSIONS & OTHER MAIN DIMENSIONS ARE THOSE OF THE POPULAR 130 H.P. VERSION. OTHER VERSIONS HAD MINOR ALTERATIONS ON DIMENSIONS, DESIGN, AND PLACEMENT OF THE FIXED REAR ACCESSORIES. SOME VERSIONS OF THE SAME MODEL HAD VARIATIONS ON THE REAR ACCESSORIES ARRANGEMENT—THAT IS- SOME 9B'S HAD SHORTER LENGTHS THAN THE STANDARD 9B'S "A" LENGTH.

NOTES ON SECTIONAL DRAWINGS:
THE HEAVY BLACK OUTLINES ARE THOSE OF THE ASSEMBLY WHICH ROTATES ON THE FIXED HOLLOWED CRANKSHAFT. THE CRANKCASE WAS MOUNTED ON FRONT & REAR BALL BEARINGS; THE CRANKSHAFT WAS FIXED TO THE AIRFRAME AT THE DRUM AND THE REAR SUPPORT. THE ECCENTRIC SHAFT PROVIDES THE CAM MOVEMENTS. THE GAS VAPOR ENTERS THE CRANKCASE THRU THE HOLLOWED CRANKSHAFT; IT ENTERS THE CYLINDERS THRU THE INDUCTION PIPES. THE EXHAUST WAS EJECTED INTO THE ATMOSPHERE AT THE EXHAUST PORTS.
THE HIGH TENSION BRUSH RUBS ON THE DISTRIBUTOR DISC; THE PLUG WIRES WERE FIXED TO THE DISTRIBUTOR DISC, PASS THRU THE INSULATED HOLDERS TO THE SPARKPLUGS; FIRING ORDER WAS EVERY OTHER CYLINDER.



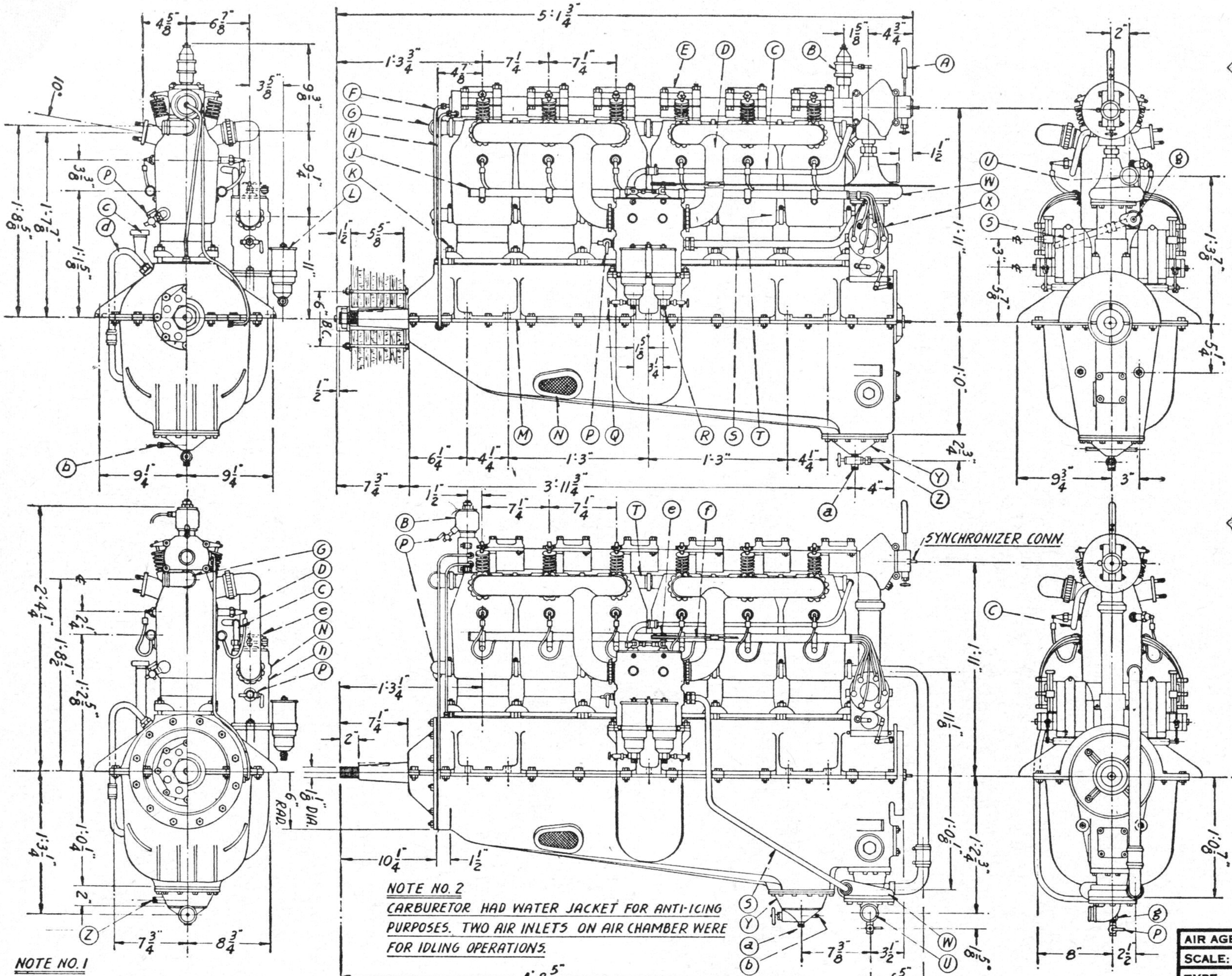
TYPICAL FUEL LINE SYSTEM



THANKS TO GLENN D. ANGLE; REF: "AEROSPHERE OF 1939"

MODEL	H.P. @ R.P.M.	BORE	STROKE	FUEL RATE	WEIGHT	WEIGHT/H.P.	CLERGET HANDBOOK "B" MAX. DIA.	CLERGET HANDBOOK "A" LENGTH
7Y	60 1200	4.72"	4.72"	.63 LBS/HOUR	198 LBS.	3.3 LBS.	35.5"	16.625"
7Z	85 1200	4.72	5.91	.665	216	2.7	36.25	16.625
9Y	110 1200	4.72	5.91	.675	395	3.6	36.25	20.625
9Z	121 1200	4.72	6.3	.79	367	3.03	40.25	27.625
9B	130 1250	4.72	6.3	.665	381	2.93	40.25	28.0
9F	200 1325	4.72	6.69	.687	374	1.87	40.25	29.25
9BF	140 1250	4.72	6.77	.656	381	2.72	40.25	28.0
9J	100 1300	4.13	5.51	.156	250	2.5	36.25	20.625

AIR AGE INC., 551 FIFTH AVE., NEW YORK 17, N.Y.
SCALE: ¾" = 1'0"
TYPE: ROTARY
COPYRIGHT 1947 WILLIAM A. WYLAM
GENERAL ARRANGEMENTS
FRENCH AIRCOOLED ENGINE
CLERGET
BUILT 1915-18 BY CLERGET, BLIN & CIE, PARIS, FRANCE



F-1466

BORE	5.51"
STROKE	6.3"
160 H.P. @	1,400 R.P.M.

- (A) DE-COMPRESSION LEVER
- (B) AIR PUMP (FUEL PRESSURE)
- (C) CARBURETOR HEAT (WATER)
- (D) INTAKE MANIFOLD
- (E) CAMSHAFT & ROCKER CASING
- (F) OIL LINE TO OIL PUMP
- (G) WATER INLET ELBOW
- (H) OIL LINE FROM OIL PUMP
- (J) FIBER SUPPORT TUBE (WIRES)
- (K) CYLINDER HOLD-DOWN BOLTS
- (L) TWIN JET CARBURETORS
- (M) ENGINE MOUNT
- (N) CARBURETOR AIR INTAKE
- (P) PET COCK - WATER DRAIN
- (Q) PET COCK - CARBURETOR DRAIN
- (R) FUEL LINE CONNECTIONS

F-1466D-3A

BORE	5.51"
STROKE	6.3"
180 H.P. @	1,400 R.P.M.

- (S) CARBURETOR HEAT (TO PUMP)
- (T) WATER INLET CONNECTIONS
- (U) WATER OUTLET (TO RADIATOR)
- (W) WATER PUMP
- (X) TWIN MAGNETOS
- (Y) OIL PUMP
- (Z) OIL LINE CONN. (FROM TANK)
- (a) OIL DRAIN
- (b) OIL TEMPERATURE GAGE CONN.
- (c) OIL SUMP FILL
- (d) OIL BYPASS LINE
- (e) THROTTLE PULLEY
- (f) THROTTLE CONTROL CABLES
- (g) WATER TEMP. GAGE CONN.
- (h) AIR CHAMBER

SYNCHRONIZER CONN.

1⅛" DIA. 6" RAD.

NOTE NO. 1
AIR SUPPLY PASS THRU PASSAGE INSIDE OF CRANKCASE TO AIR CHAMBER. INTERNAL OIL COOLING FINS WARMED THE INRUSHING AIR SUPPLY.

NOTE NO. 2
CARBURETOR HAD WATER JACKET FOR ANTI-ICING PURPOSES. TWO AIR INLETS ON AIR CHAMBER WERE FOR IDLING OPERATIONS.

NOTE NO. 3
DE-COMPRESSION LEVER WAS USED TO REDUCE COMPRESSION DURING STARTING OPERATIONS.

NOTE NO. 4
MACHINE GUN SYNCHRONIZER UNIT WAS ATTACHED TO THE REAR END OF THE CAMSHAFT.

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

SCALE: ¾" = 1'-0"

TYPE: INLINE

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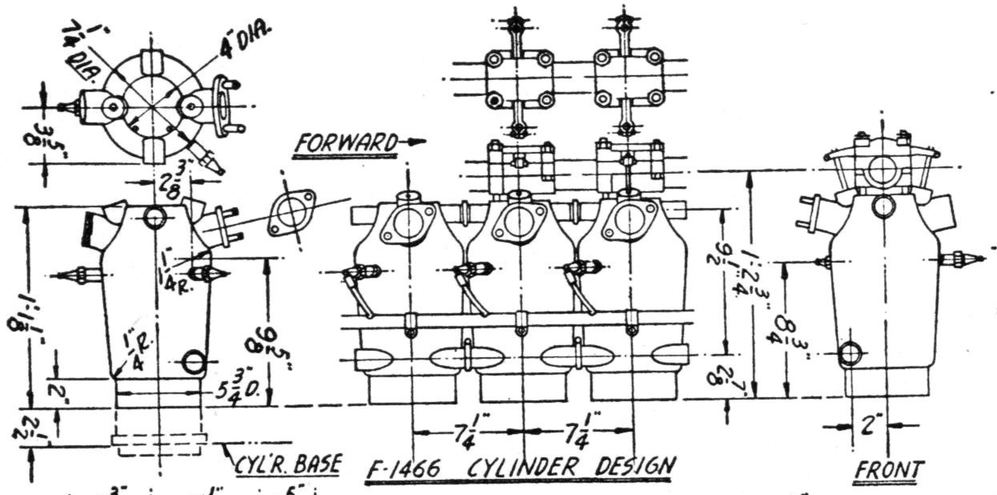
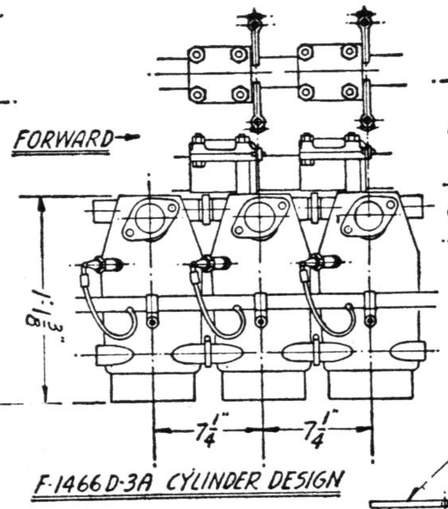
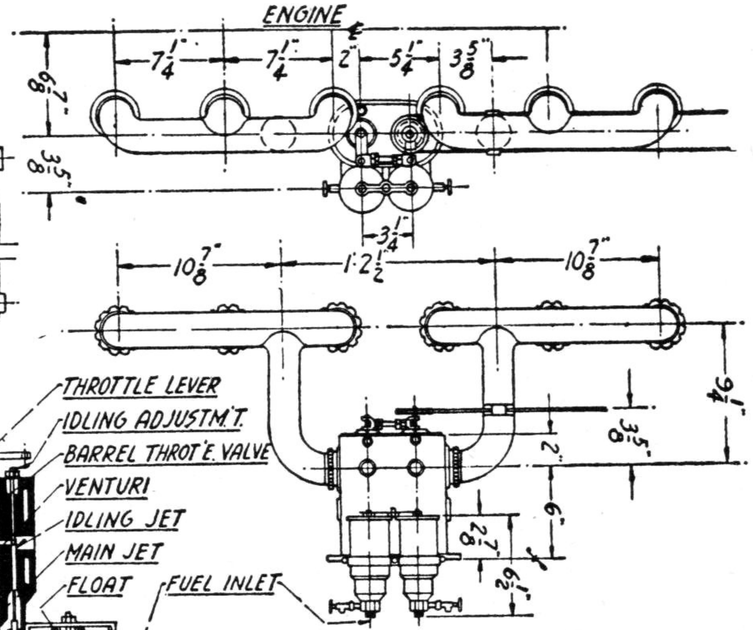
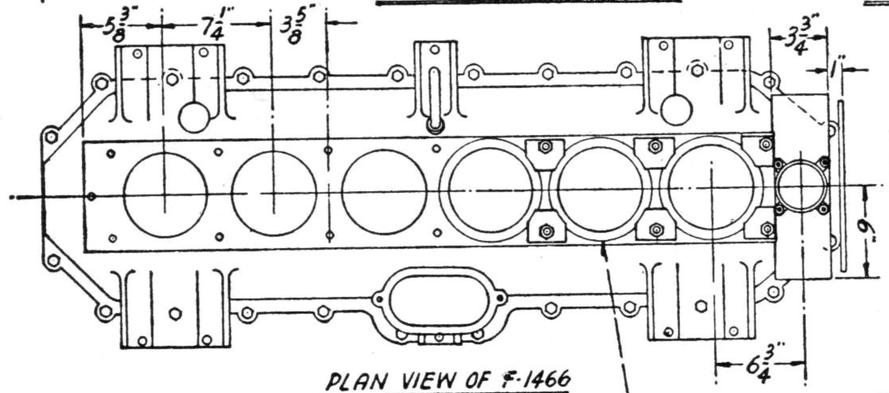
GENERAL ARRANGEMENT
GERMANY'S 160 & 180 H.P.
MERCEDES

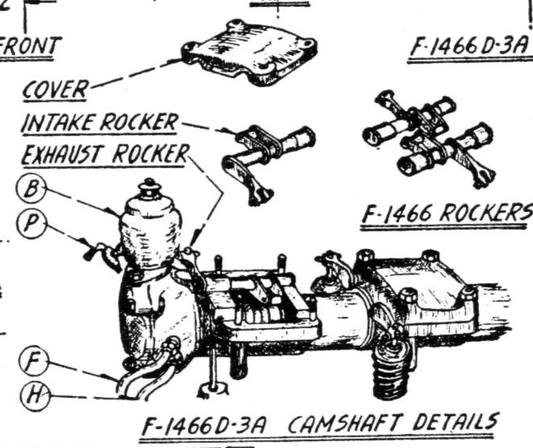
BUILT 1914-18 BY DAIMLER-MOTOREN GESELLSCHAFT

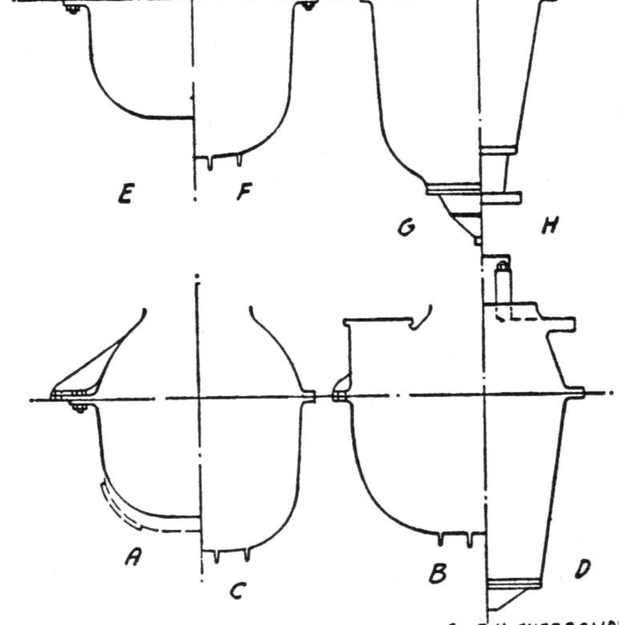


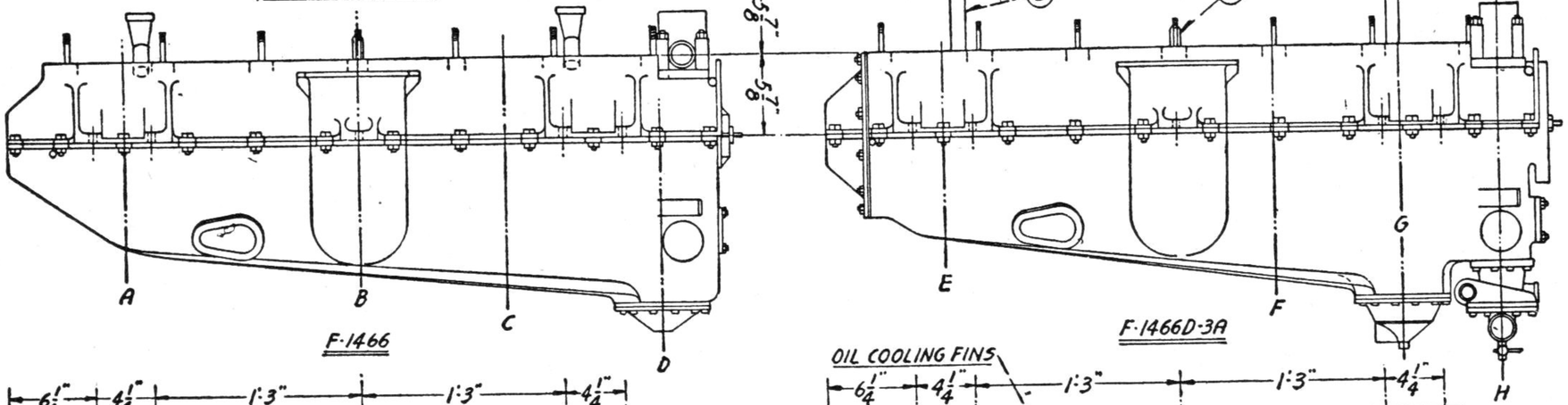


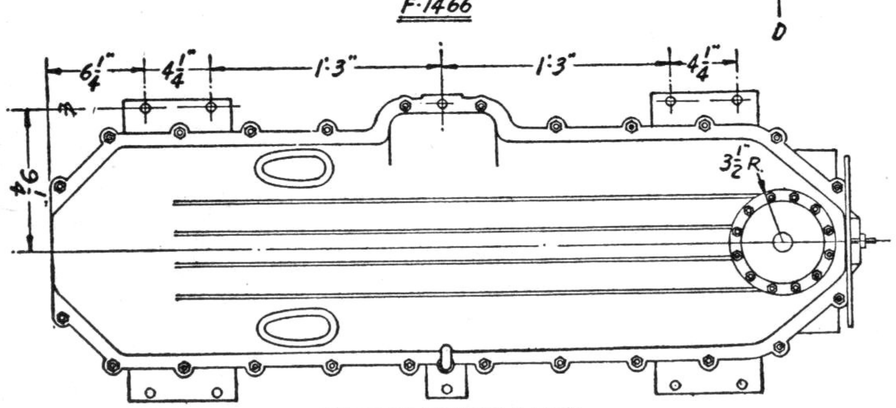


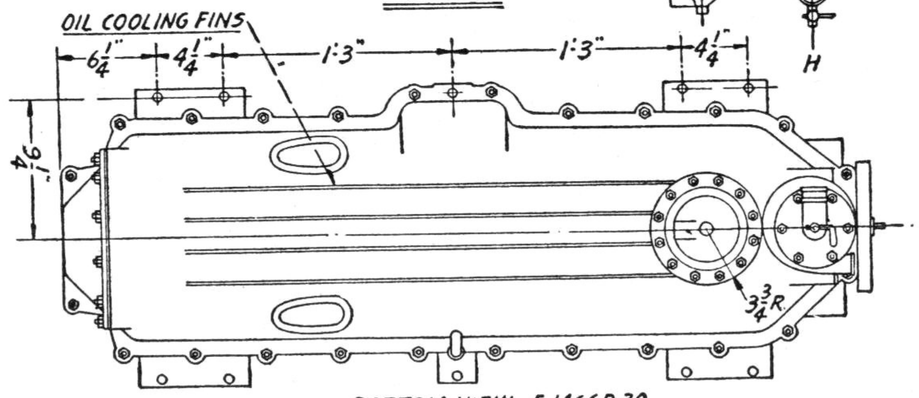












Thanks To Glen D. Angle & E.H. Sherbondy

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

SCALE: 3/4" = 1'-0"

TYPE: INLINE

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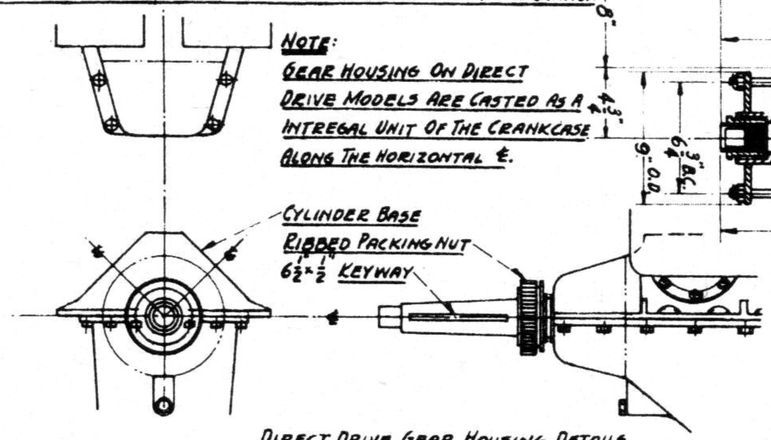
LAYOUTS & DETAILS GERMANY'S 160 & 180 H.P.

MERCEDES

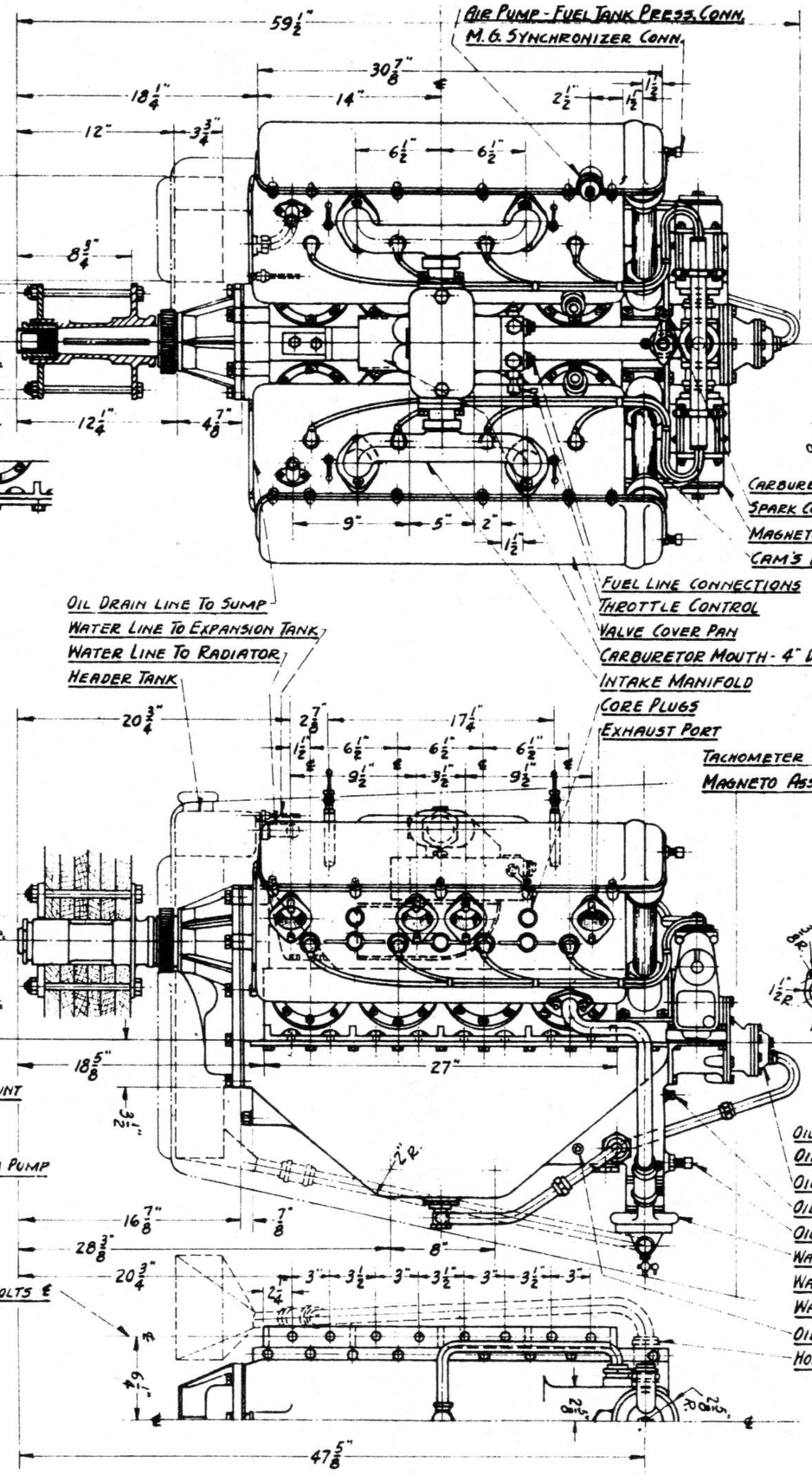
BUILT 1914-18 BY DAIMLER-MOTOREN GESELLSHAFT

MODEL	H.P.	GEARING	BORE	DESIGN CHANGES
A	150	DIRECT DRIVE	4.72"	SAME AS MODELS "C" AND "D"
C	200	PROP. RED. GEAR	4.72"	MODEL SHOWN - SAME AS A, P
D	220	PROP. RED. GEAR	4.72"	PROVISION FOR M.G. IN VEE
E	180	DIRECT DRIVE	5.33"	LARGER CARBURETOR
F	220	PROP. RED. GEAR	4.72"	NO PROVISION FOR GUN IN VEE
H	300	DIRECT DRIVE	5.51"	RECTANGULAR OIL SUMP, 4 CARB'S.
K	300	PROP. RED. GEAR	5.51"	FOR 37mm. CANNON IN VEE
M	300	DIRECT DRIVE	5.51"	NO PROVISION FOR 37mm. CANNON

NOTE:
GEAR HOUSING ON DIRECT DRIVE MODELS ARE CASTED AS A INTREGAL UNIT OF THE CRANKCASE ALONG THE HORIZONTAL ℄.



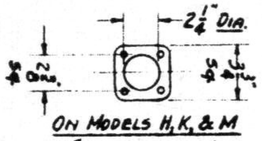
DIRECT DRIVE GEAR HOUSING DETAILS
MODELS A, E, H, & M



MODEL "F" SHOWN MODELS A, C, D, AND E ARE SIMILAR WITH CHANGES ON GEARINGS

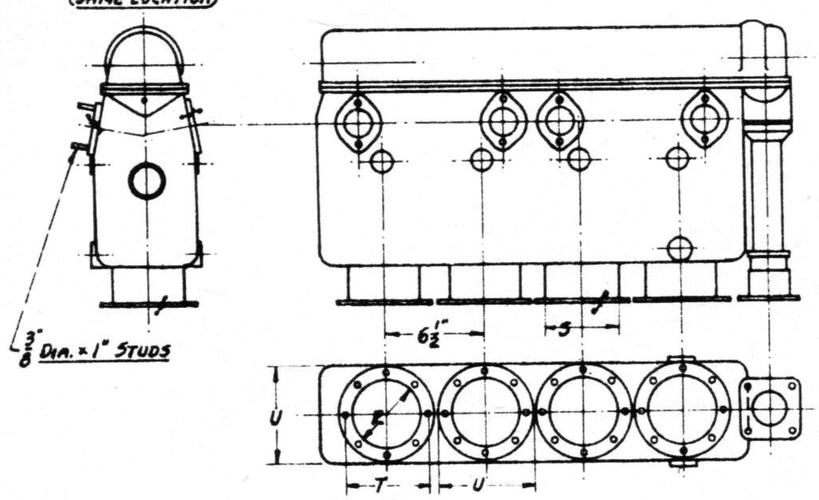
AIR AGE INC., 551 FIFTH AVE., NEW YORK 17, N.Y.	
SCALE: ¾ = 1'-0"	GENERAL ARRANGEMENTS AND INSTALLATION DATA
DATE:	
DRAWN BY ... W. A. WYLAM	HISPANO-SUIZA

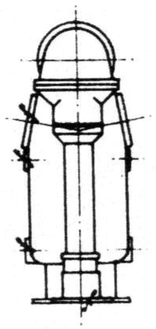
EXHAUST PORT



ON MODELS H, K, & M (SAME LOCATION)

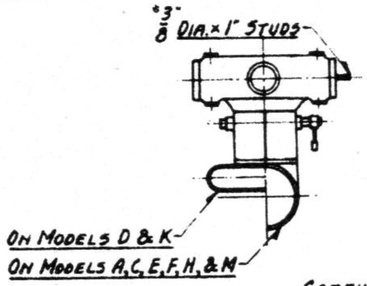
CYLINDER BLOCK - 2 REQ'D - 1 R.H. & 1 L.H.

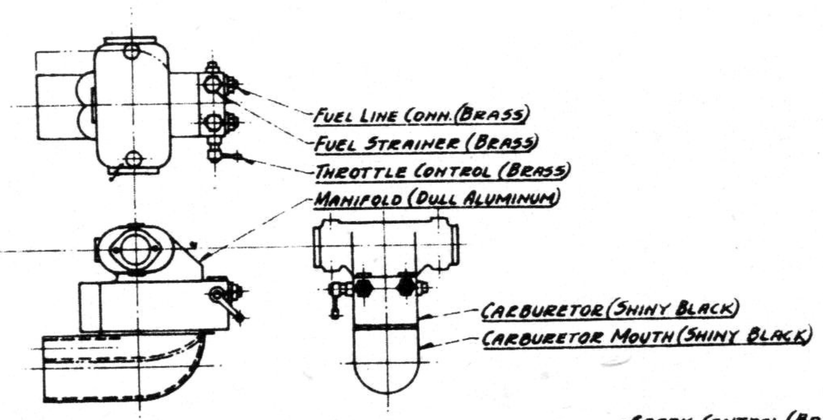




ENTIRE CYLINDER BLOCK IS OF SHINY BAKED BLACK ENAMEL

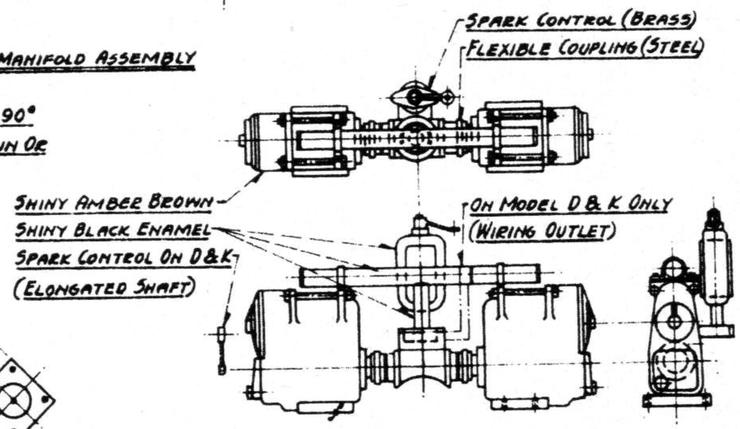
ALL TUBING & PIPING	BRASS
INTAKE MANIFOLD	ALUMINUM
VALVES (DRAIN)	BRASS
SPARK PLUGS	PORCELAIN WHITE
SPARK PLUG WIRES	RED





CARBURETOR & INTAKE MANIFOLD ASSEMBLY

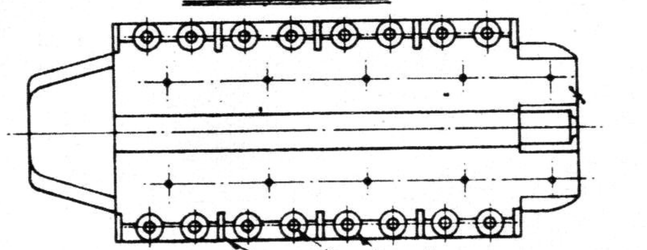
SPARK CONTROL UNIT IS TURNED ± 90° FOR INSTALLATION OF MACHINE GUN OR CANNON IN VEE (MODELS D & K).

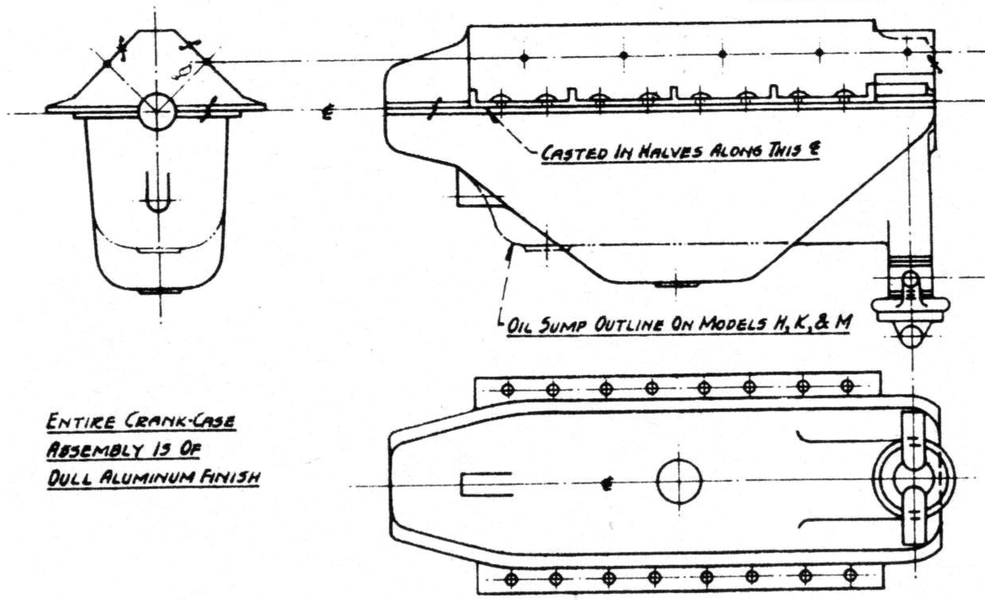


MAGNETO ASSEMBLY DETAILS

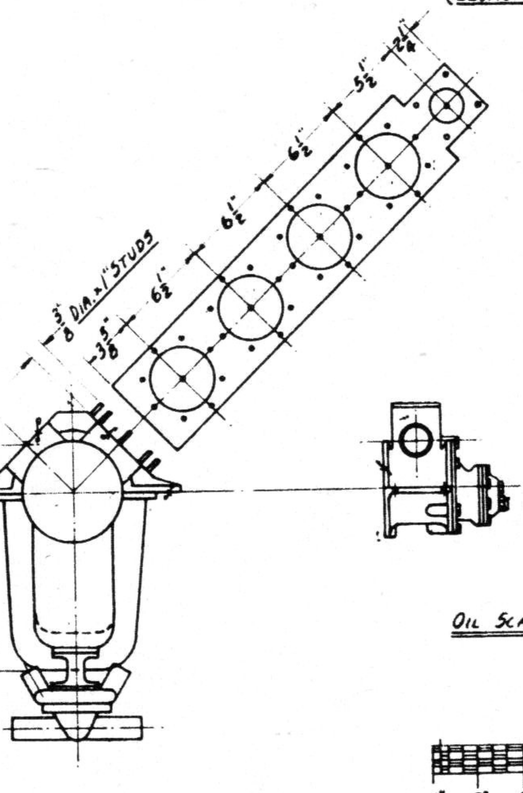
MODEL	R	S	T	U
A	4.72	5.00	5.75	6.75
C	4.72	5.00	5.75	6.75
D	4.72	5.00	5.75	6.75
E	5.33	5.50	6.375	7.375
F	4.72	5.00	5.75	6.75
H	5.51	5.75	6.50	7.50
K	5.51	5.75	6.50	7.50
M	5.51	5.75	6.50	7.50

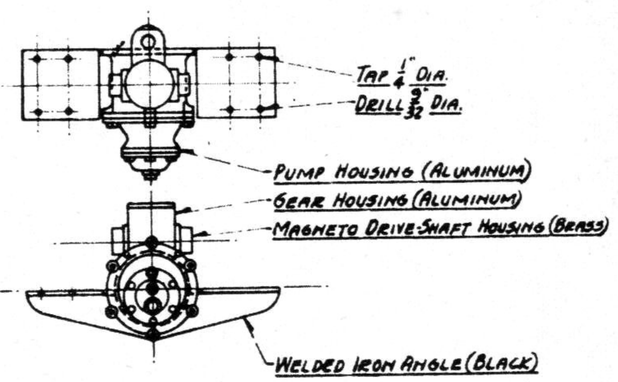
CRANK-CASE DETAILS





ENTIRE CRANK-CASE ASSEMBLY IS OF DULL ALUMINUM FINISH





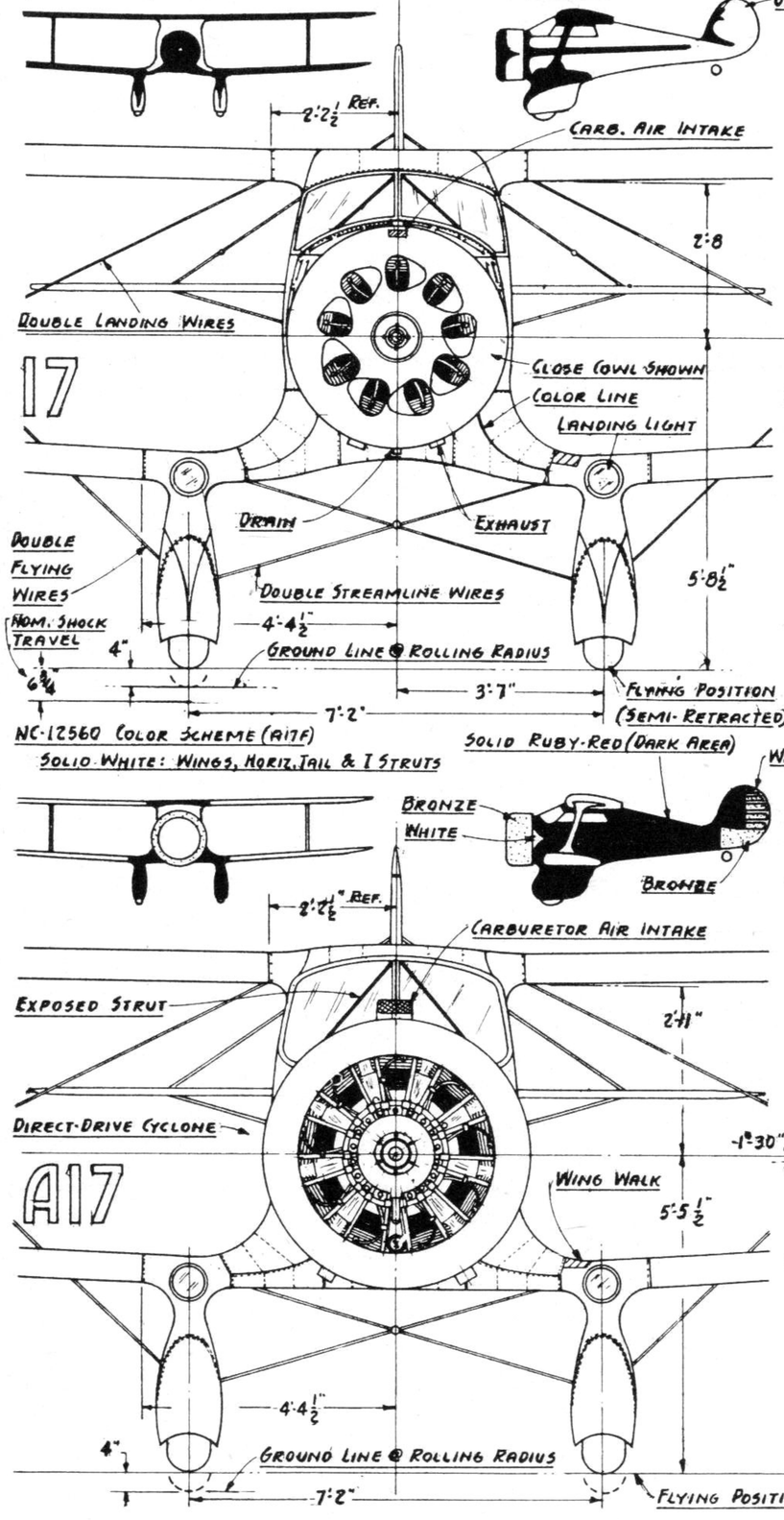
OIL SCAVENGER PUMP DETAILS

AIR AGE INC., 551 FIFTH AVE., NEW YORK 17, N.Y.	
SCALE: 3/4" = 1'-0"	GENERAL DESIGN DETAILS & SPECIFICATIONS
DATE:	
DRAWN BY ... W. A. WYLAM	HISPANO-SUIZA

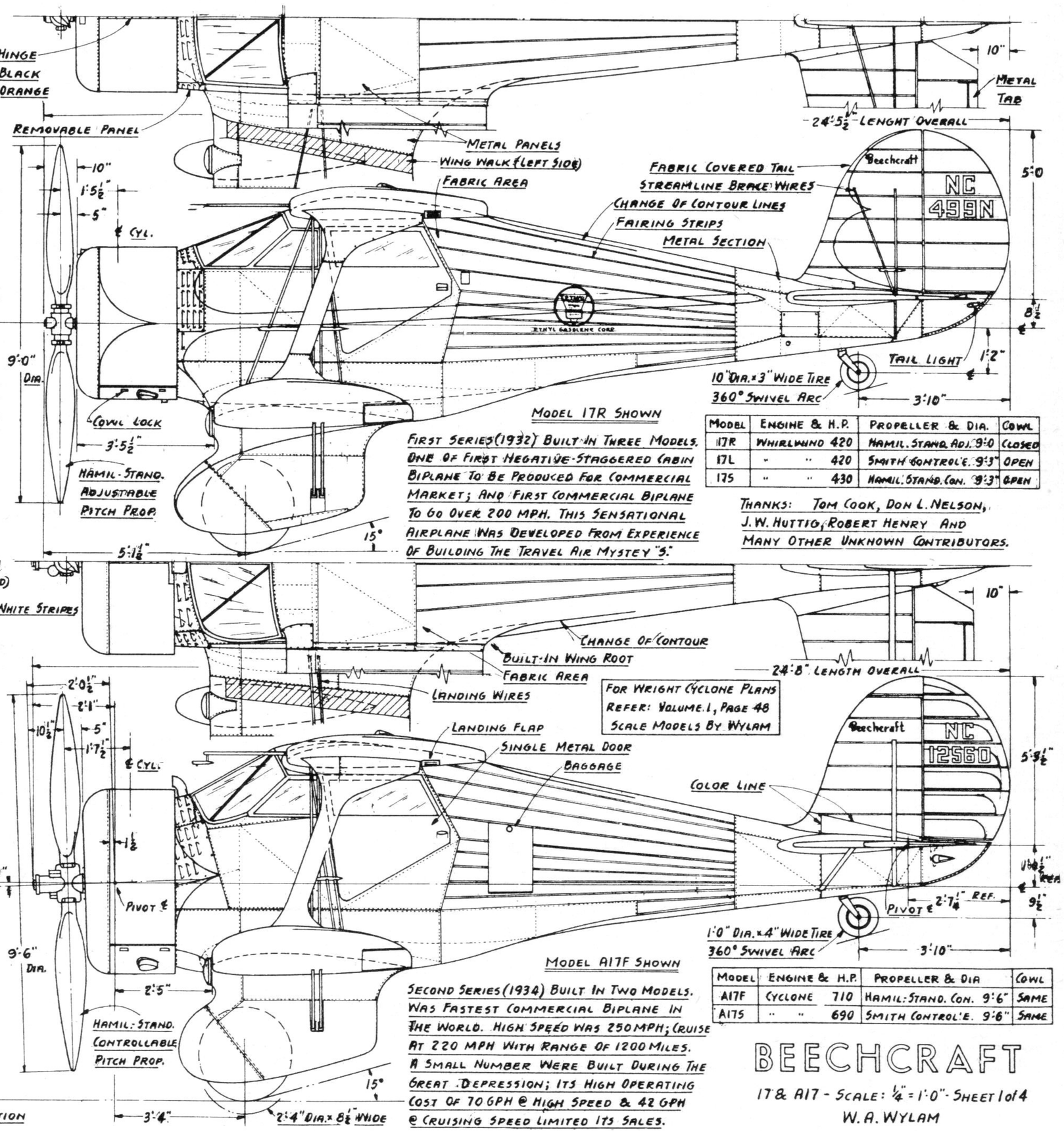
THE BEECH FAMILY

NC
21934

NC-499N COLOR SCHEME (17R)
SOLID BLACK: WINGS, HORIZ. TAIL & I STRUTS
ORANGE: BALANCE AS SHOWN



NC-12560 COLOR SCHEME (A17F)
SOLID WHITE: WINGS, HORIZ. TAIL & I STRUTS
SOLID RUBY-RED (DARK AREA)
WHITE STRIPES
BRONZE
WHITE
BRONZE



MODEL 17R SHOWN

FIRST SERIES (1932) BUILT IN THREE MODELS. ONE OF FIRST NEGATIVE-STAGGERED CABIN BIPLANE TO BE PRODUCED FOR COMMERCIAL MARKET; AND FIRST COMMERCIAL BIPLANE TO GO OVER 200 MPH. THIS SENSATIONAL AIRPLANE WAS DEVELOPED FROM EXPERIENCE OF BUILDING THE TRAVEL AIR MYSTEY "5."

MODEL	ENGINE & H.P.	PROPELLER & DIA.	COWL
17R	WHIRLWIND 420	HAMIL. STAND. ADJ. 9'-0	CLOSED
17L	" " 420	SMITH CONTROL'E. 9'-3"	OPEN
17S	" " 430	HAMIL. STAND. CON. 9'-3"	OPEN

THANKS: TOM COOK, DON L. NELSON, J.W. HUTTIG, ROBERT HENRY AND MANY OTHER UNKNOWN CONTRIBUTORS.

FOR WRIGHT CYCLONE PLANS REFER: VOLUME 1, PAGE 48
SCALE MODELS BY WYLAM

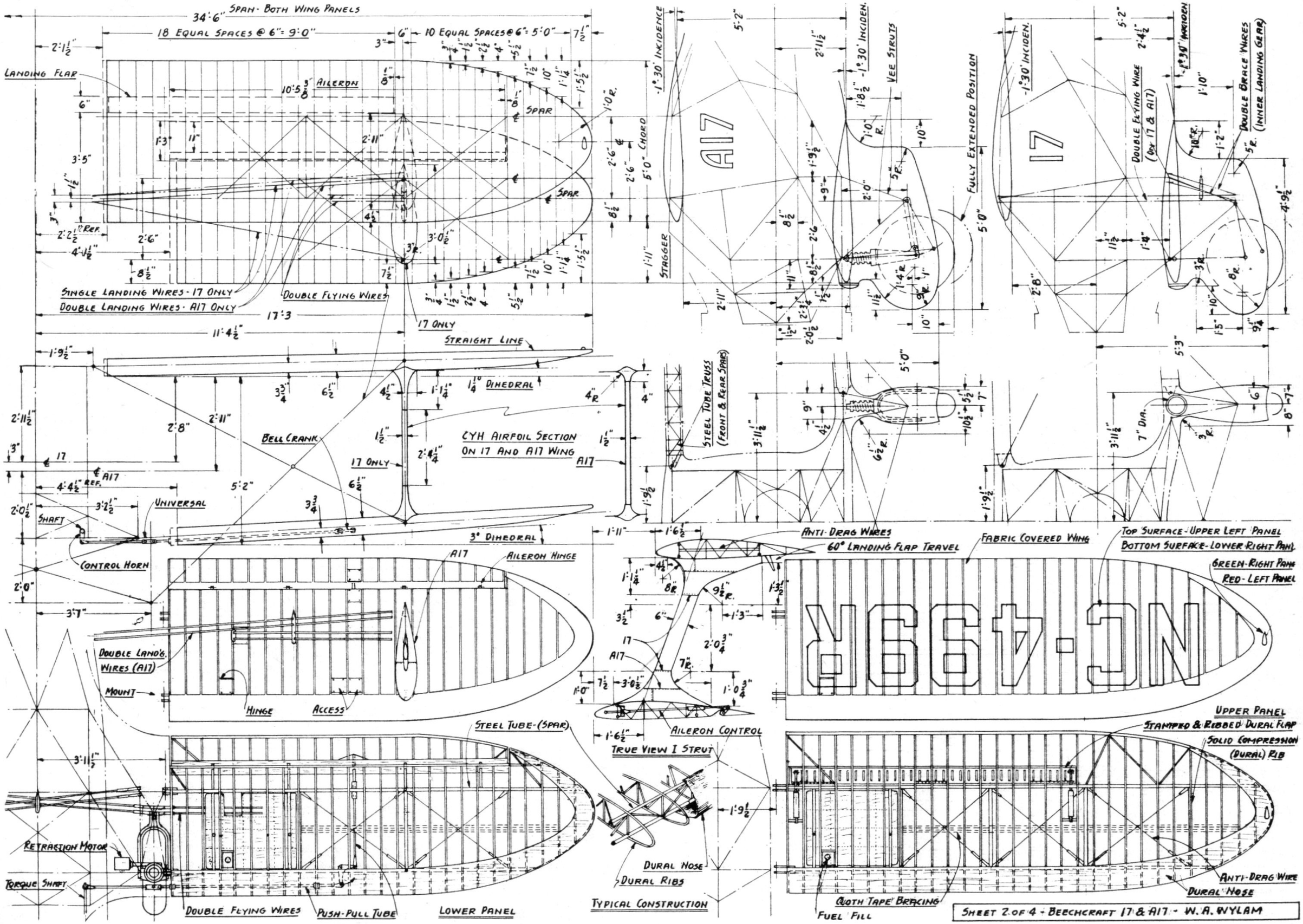
MODEL A17F SHOWN

SECOND SERIES (1934) BUILT IN TWO MODELS. WAS FASTEST COMMERCIAL BIPLANE IN THE WORLD. HIGH SPEED WAS 250 MPH; CRUISE AT 220 MPH WITH RANGE OF 1200 MILES. A SMALL NUMBER WERE BUILT DURING THE GREAT DEPRESSION; ITS HIGH OPERATING COST OF 70 GPH @ HIGH SPEED & 42 GPH @ CRUISING SPEED LIMITED ITS SALES.

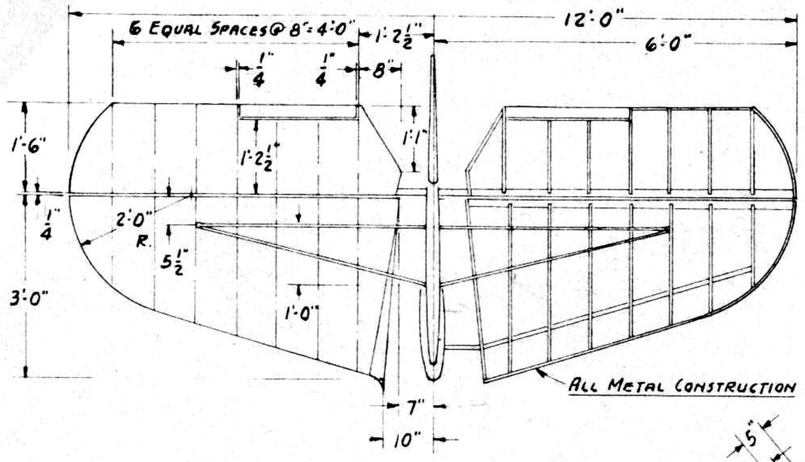
MODEL	ENGINE & H.P.	PROPELLER & DIA	COWL
A17F	CYCLONE 710	HAMIL: STAND. CON. 9'-6"	SAME
A17S	" " 690	SMITH CONTROL'E. 9'-6"	SAME

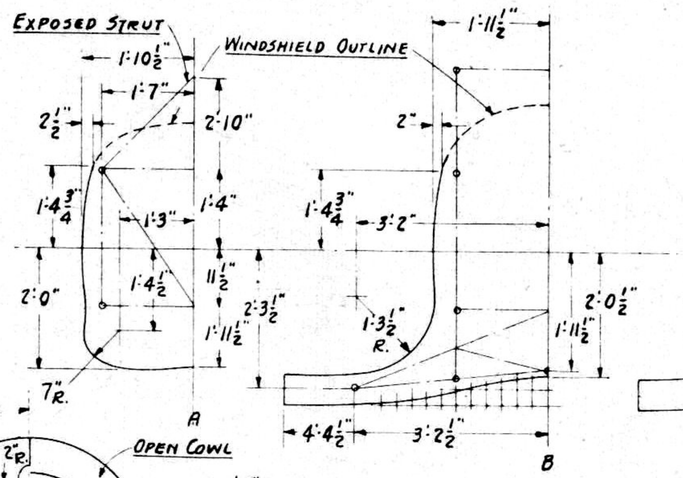
BEECHCRAFT

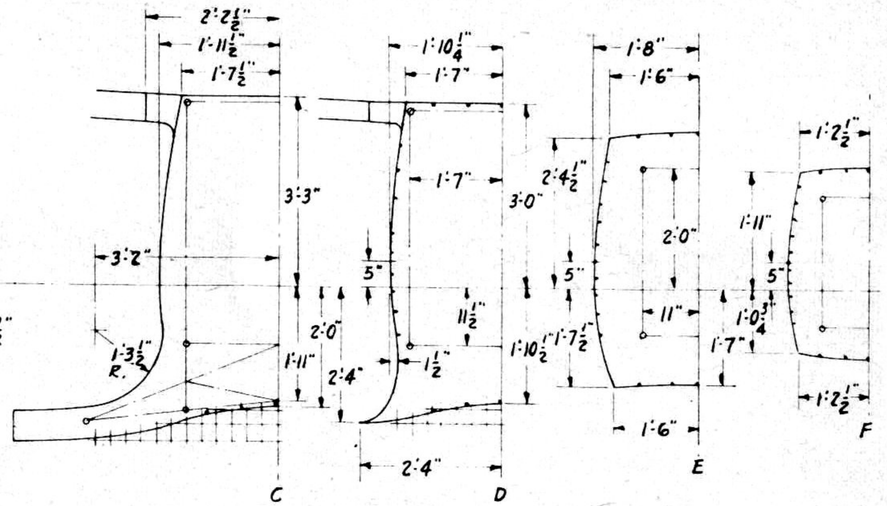
17 & A17 - SCALE: ¼" = 1'-0" - SHEET 1 of 4
W. A. WYLAM

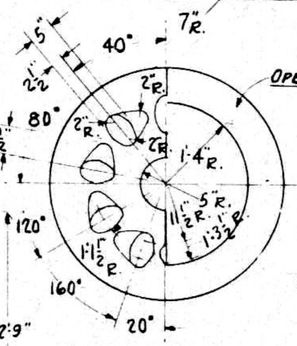


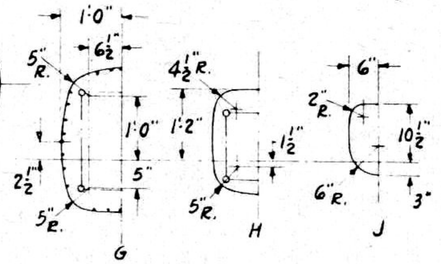
SHEET 2 OF 4 - BEECHCRAFT 17 & A17 - W. A. WYLAM

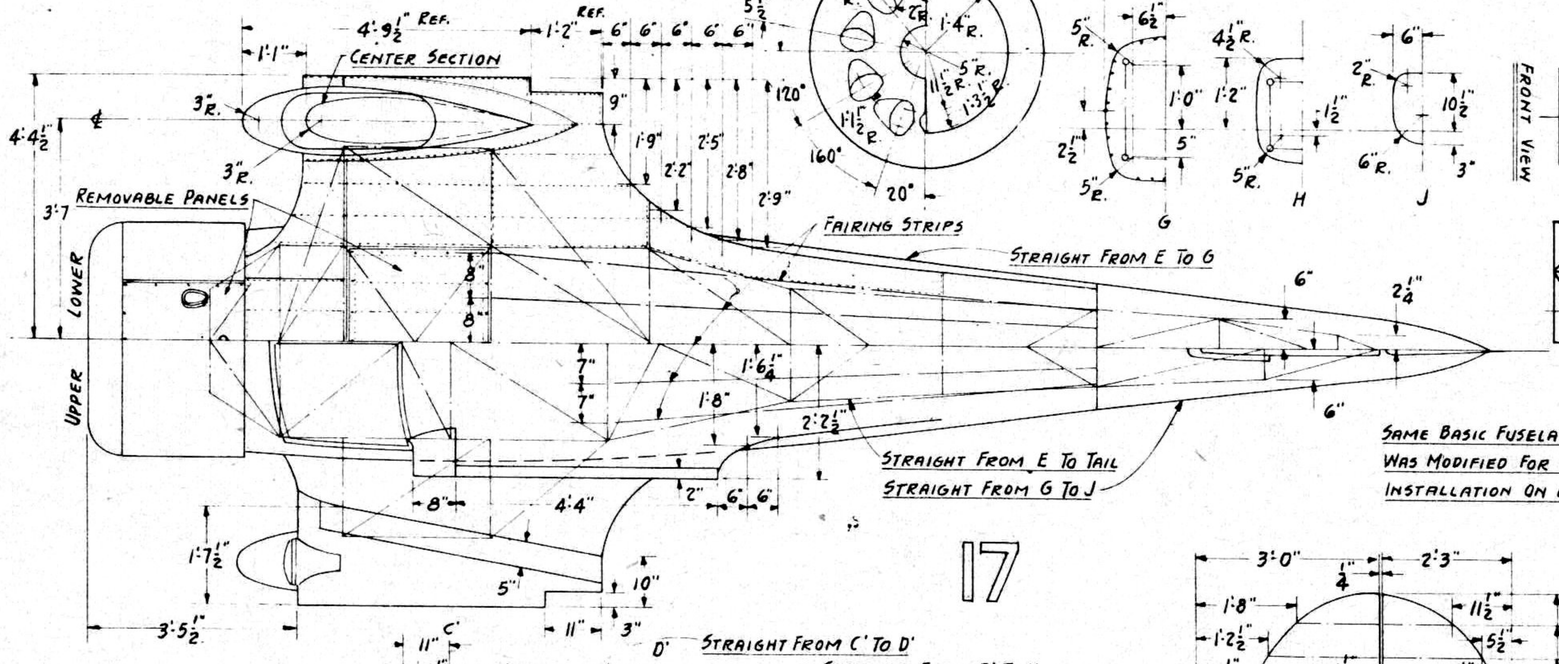


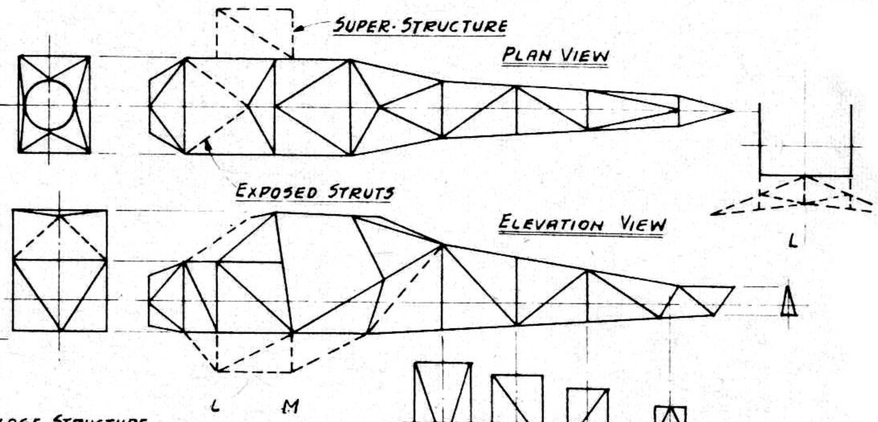




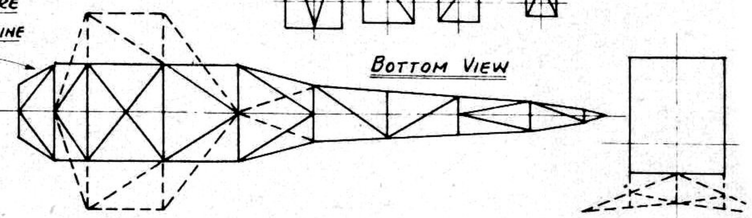






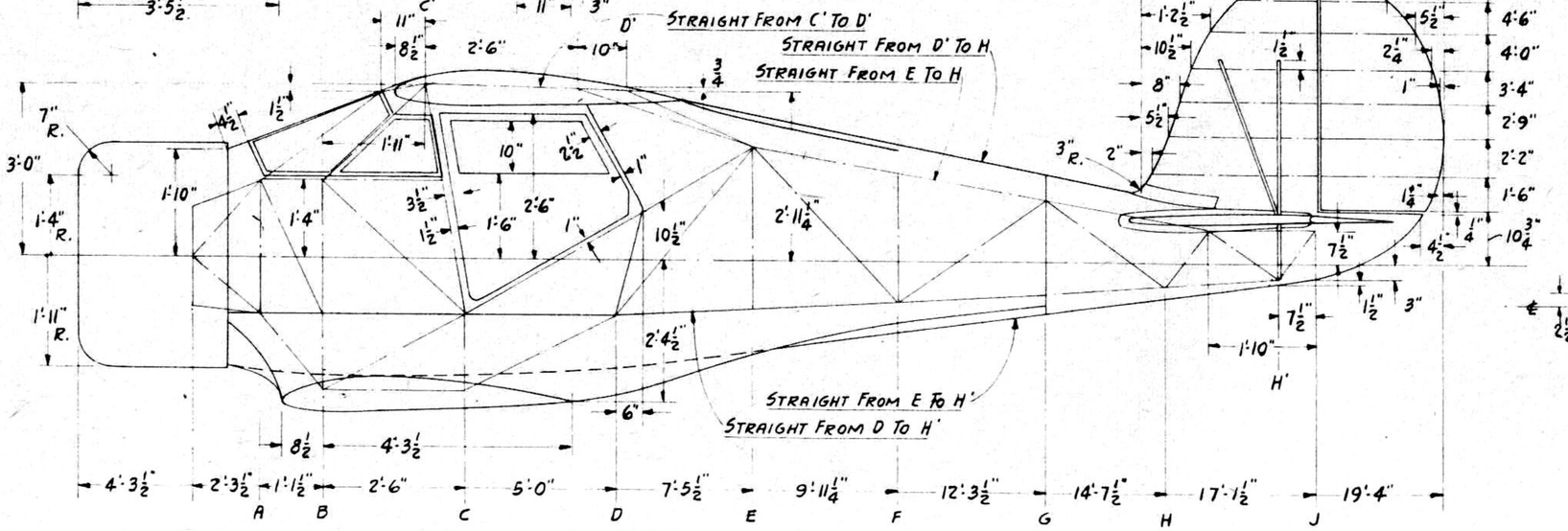


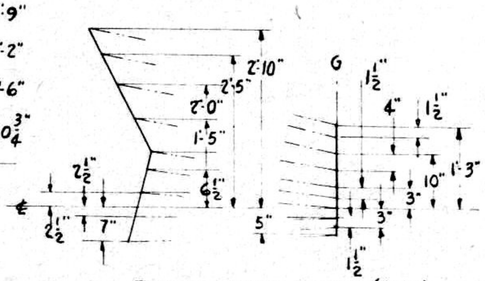
SAME BASIC FUSELAGE STRUCTURE WAS MODIFIED FOR CYCLONE ENGINE INSTALLATION ON A17 MODEL.

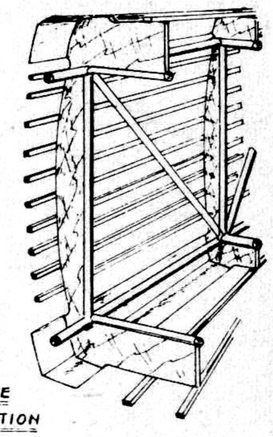


FUSELAGE STRUCTURE DIAGRAM

17

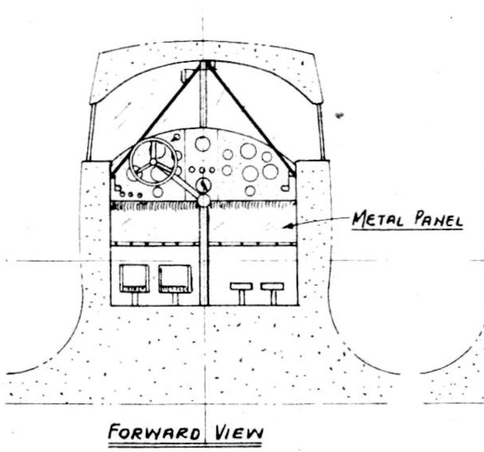




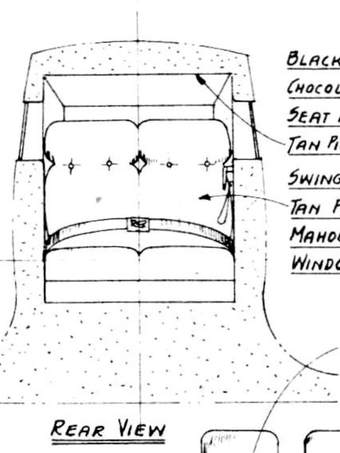


TYPICAL FUSELAGE CONSTRUCTION

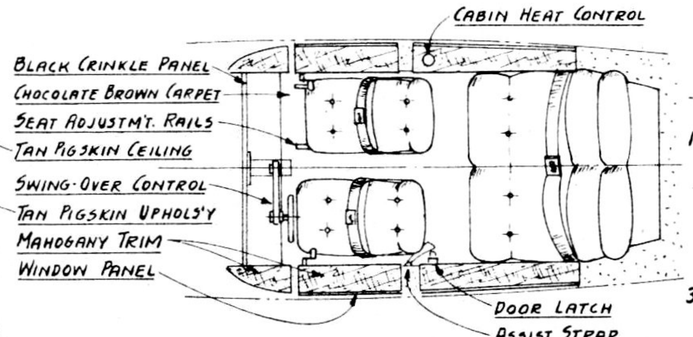
BEECHCRAFT 17 & A17 - SHEET 3 of 4 - W. A. WYLAM

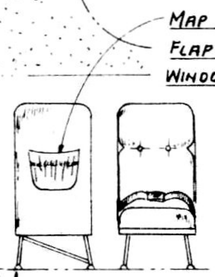


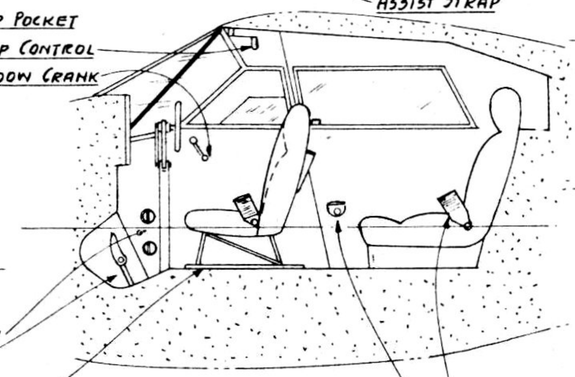
FORWARD VIEW



REAR VIEW

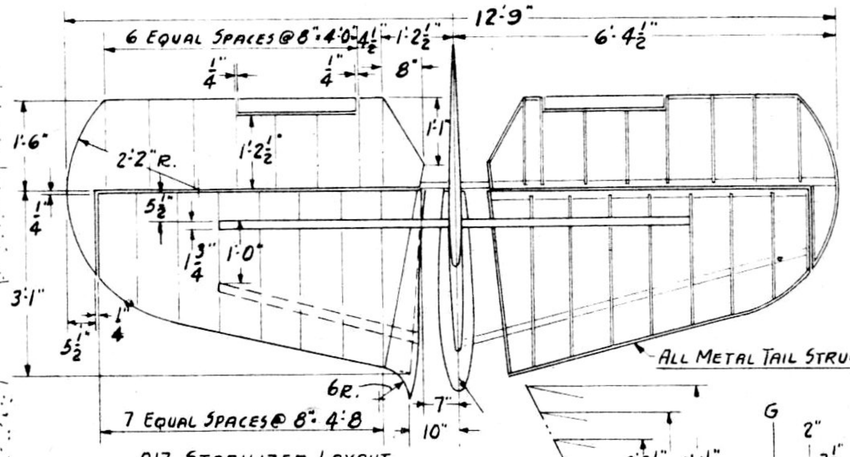




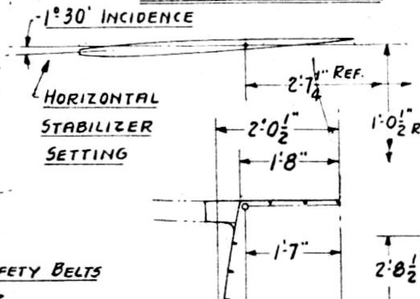


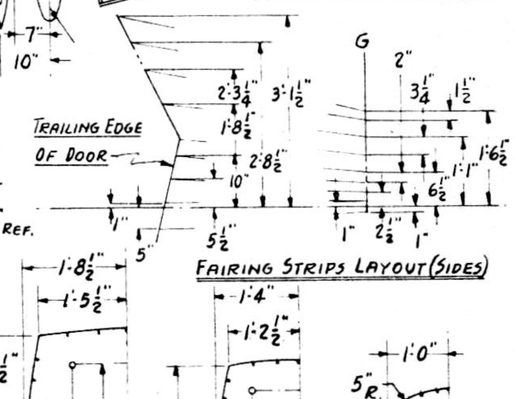
TYPICAL INTERIOR VIEWS

GREEN SAFETY BELTS
ASH RECEIVER

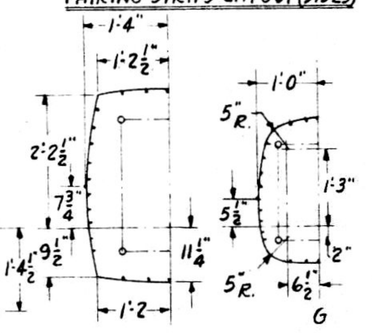


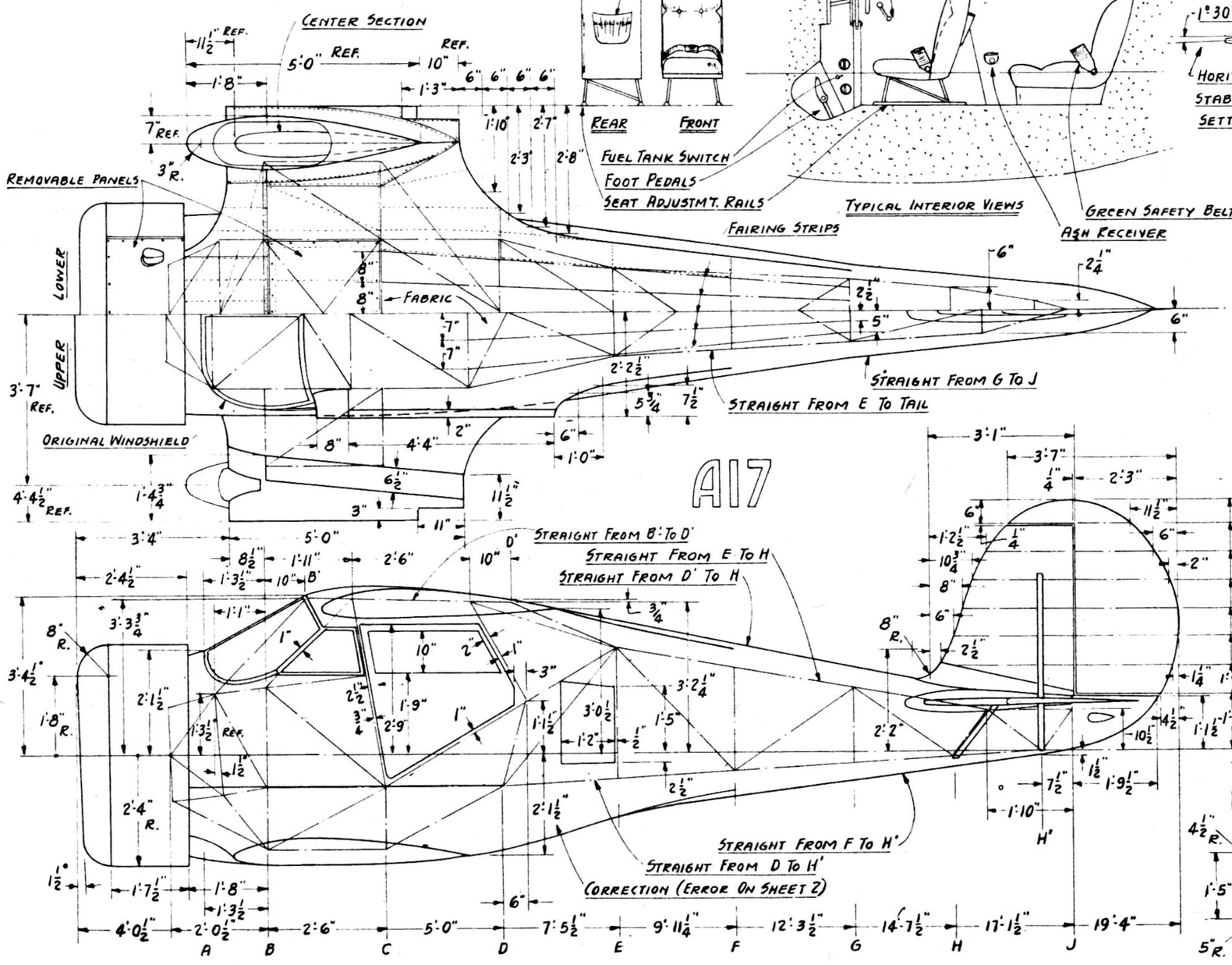
A17 STABILIZER LAYOUT





FAIRING STRIPS LAYOUT (SIDES)





BEECHCRAFT

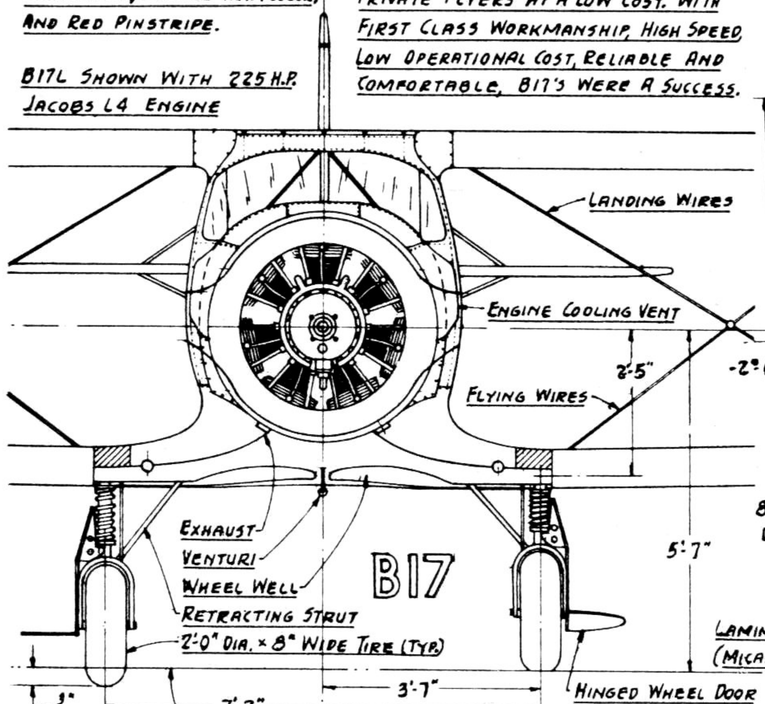
17 & A17 - SCALE: 1/4" = 1'-0" - SHEET 4 of 4

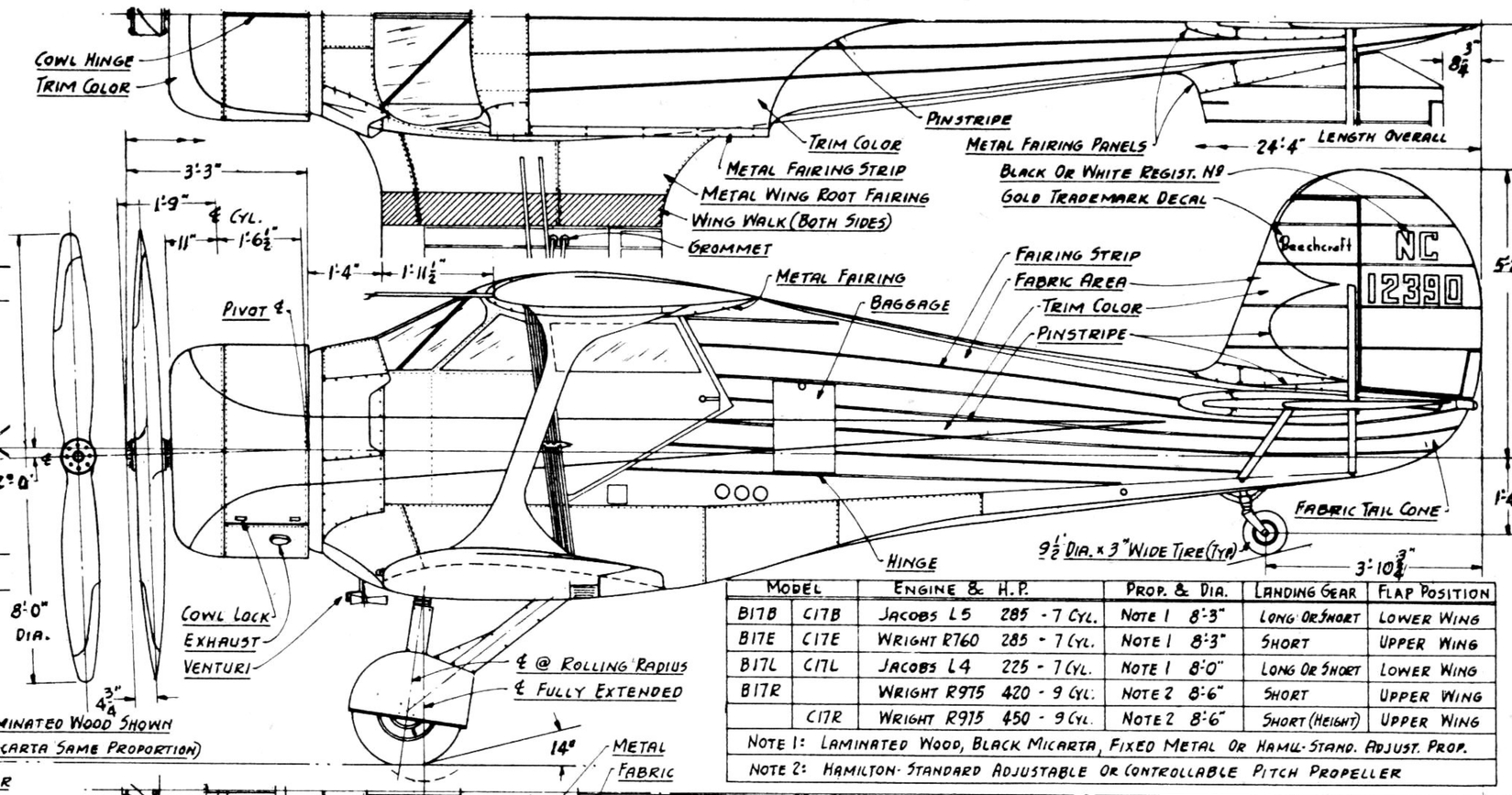
W. A. WYLAM

THIRD SERIES (1935) BUILT IN FOUR BASIC MODELS FOR COMPETITION WITH STINSON & WACO. FIRST PRODUCTION AIRPLANE WITH RETRACTABLE L/G FOR PRIVATE FLYERS AT A LOW COST. WITH FIRST CLASS WORKMANSHIP, HIGH SPEED LOW OPERATIONAL COST, RELIABLE AND COMFORTABLE, B17'S WERE A SUCCESS.

NC12390 WAS FOREST GREEN BACKGROUND, BRONZE TRIM COLOR, AND RED PINSTRIPE.

B17L SHOWN WITH 225 H.P. JACOBS L4 ENGINE





MODEL		ENGINE & H.P.	PROP. & DIA.	LANDING GEAR	FLAP POSITION
B17B	C17B	JACOBS L5 285 - 7 CYL.	NOTE 1 8'-3"	LONG OR SHORT	LOWER WING
B17E	C17E	WRIGHT R760 285 - 7 CYL.	NOTE 1 8'-3"	SHORT	UPPER WING
B17L	C17L	JACOBS L4 225 - 7 CYL.	NOTE 1 8'-0"	LONG OR SHORT	LOWER WING
B17R		WRIGHT R975 420 - 9 CYL.	NOTE 2 8'-6"	SHORT	UPPER WING
	C17R	WRIGHT R975 450 - 9 CYL.	NOTE 2 8'-6"	SHORT (HEIGHT)	UPPER WING

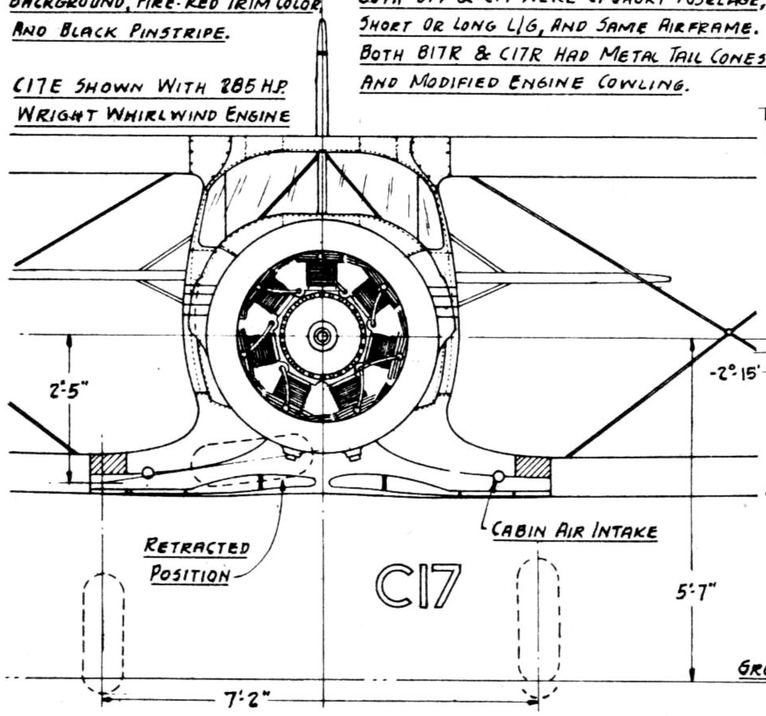
NOTE 1: LAMINATED WOOD, BLACK MICARTA, FIXED METAL OR HAMIL. STAND. ADJUST. PROP.

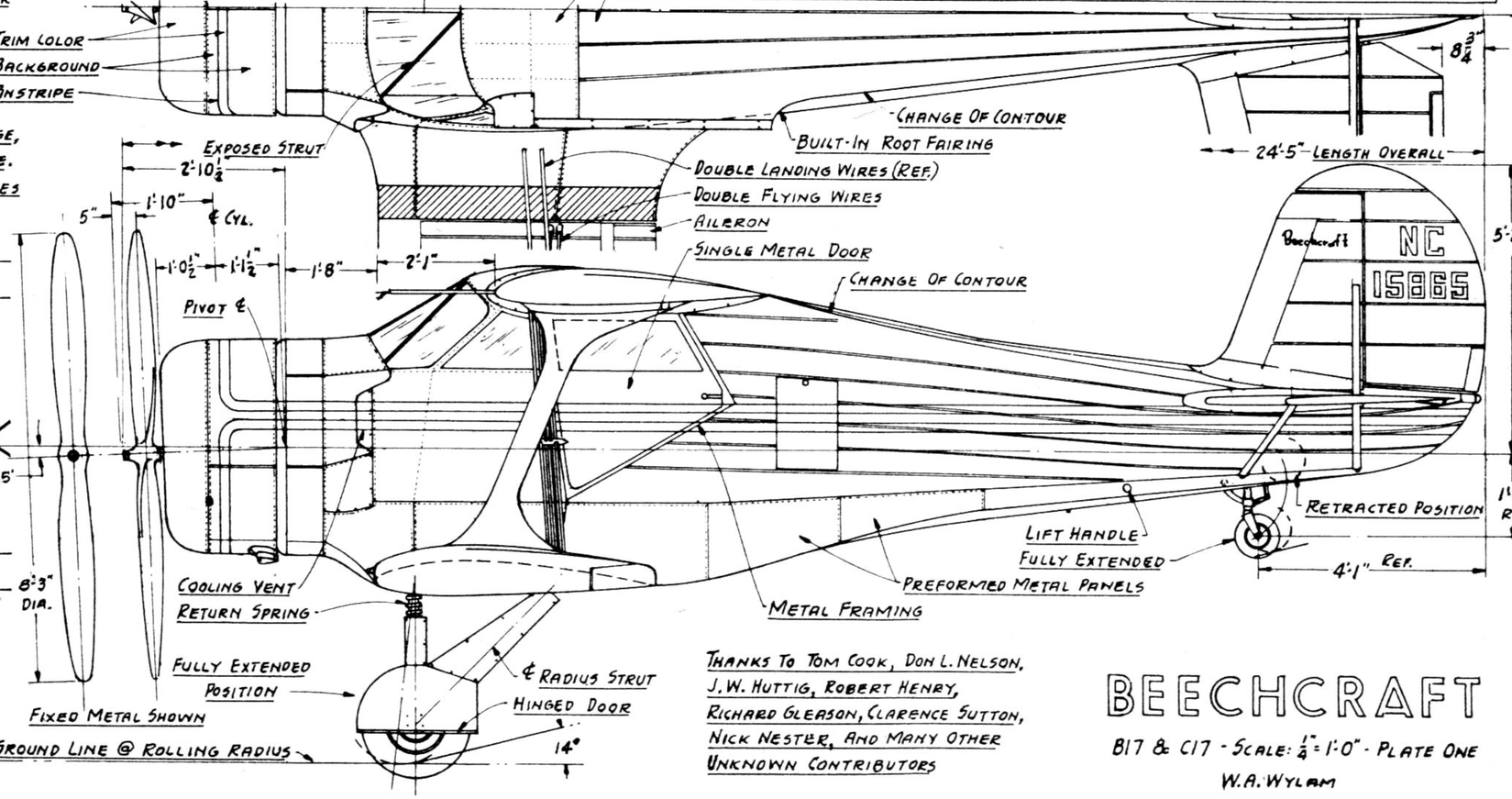
NOTE 2: HAMILTON STANDARD ADJUSTABLE OR CONTROLLABLE PITCH PROPELLER

FOURTH SERIES (1936) WAS IMPROVED VERSION OF THE FOUR B17 MODELS. BOTH B17 & C17 WERE OF SHORT FUSELAGE, SHORT OR LONG L/G, AND SAME AIRFRAME. BOTH B17R & C17R HAD METAL TAIL CONES AND MODIFIED ENGINE COWLING.

NC15865 WAS METALLIC SEA GREEN BACKGROUND, FIRE-RED TRIM COLOR AND BLACK PINSTRIPE.

C17E SHOWN WITH 285 H.P. WRIGHT WHIRLWIND ENGINE



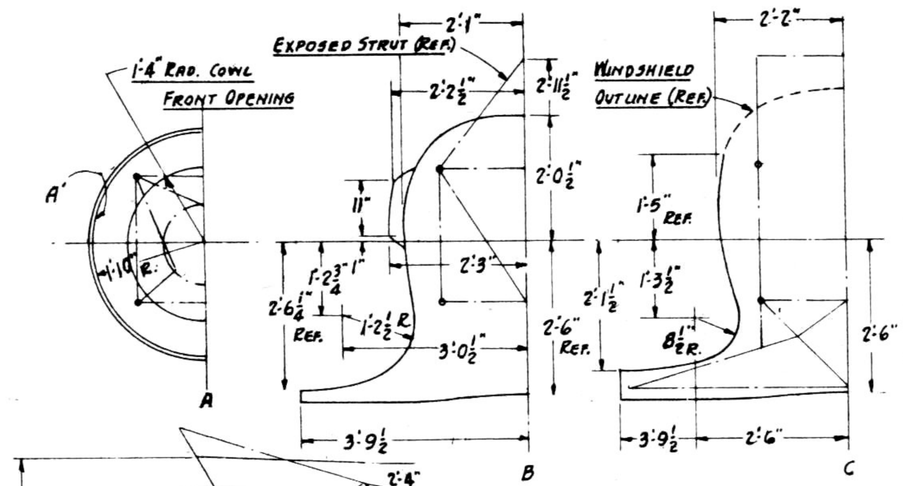


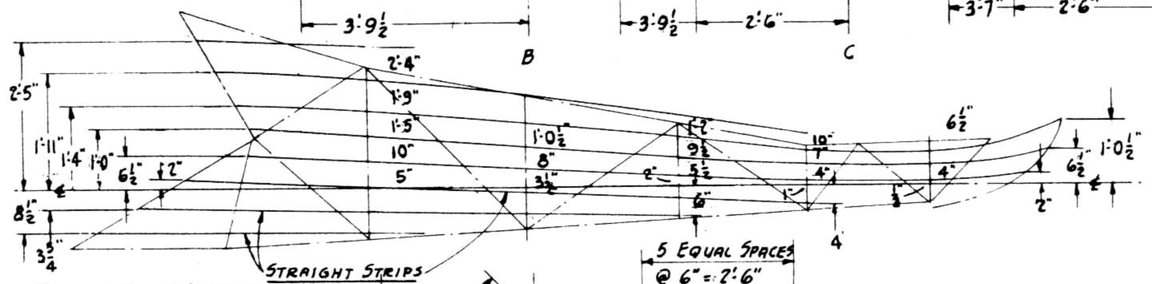
THANKS TO TOM COOK, DON L. NELSON, J.W. HUTTIG, ROBERT HENRY, RICHARD GLEASON, CLARENCE SUTTON, NICK NESTER, AND MANY OTHER UNKNOWN CONTRIBUTORS

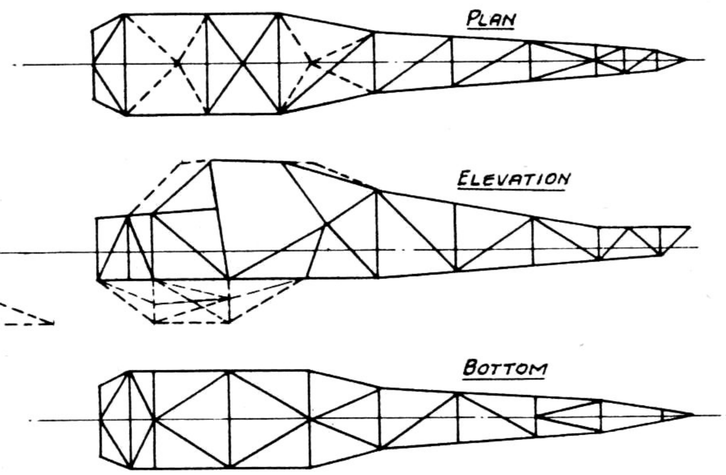
BEECHCRAFT

B17 & C17 - SCALE: 1/4" = 1'-0" - PLATE ONE

W.A. WYLAM



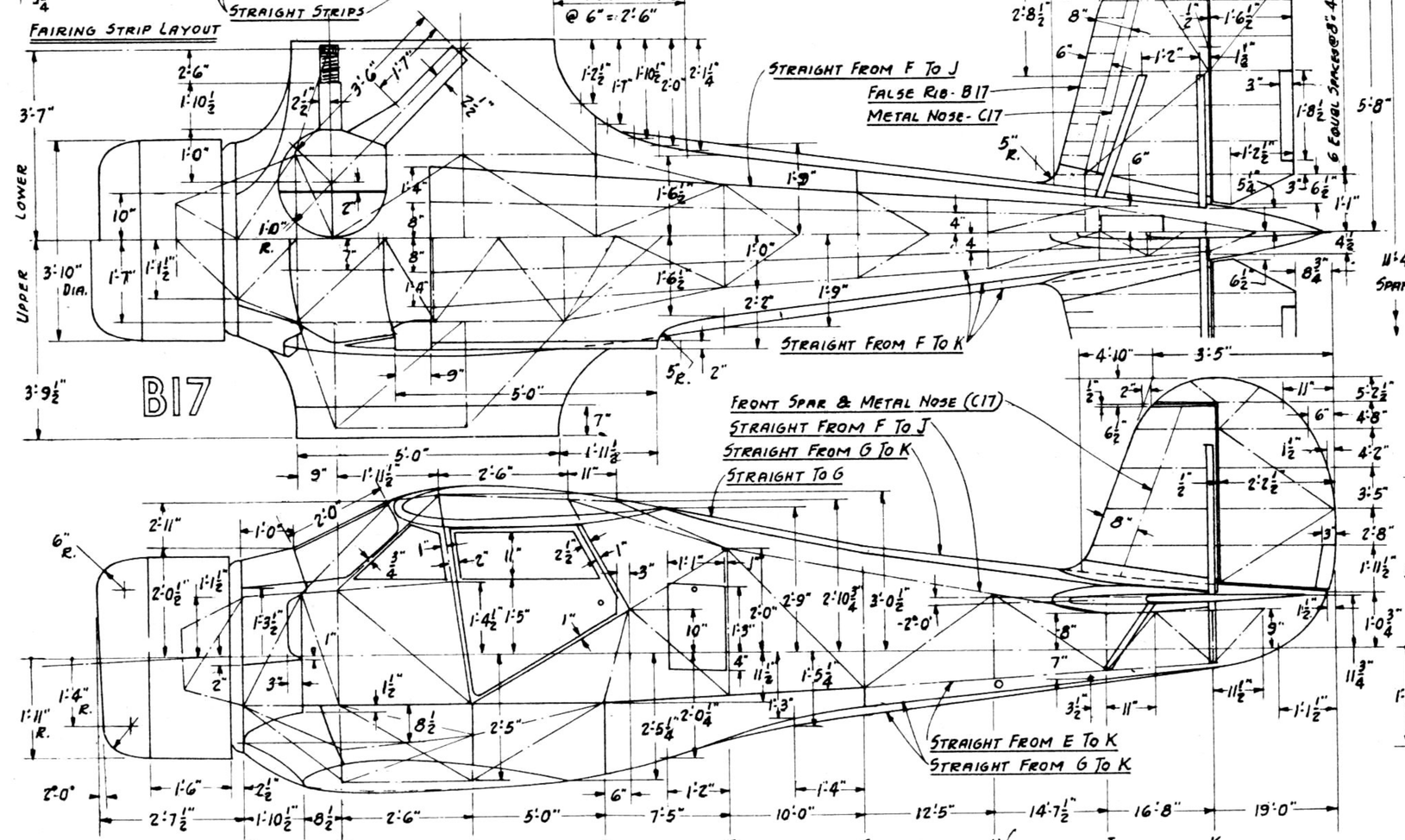


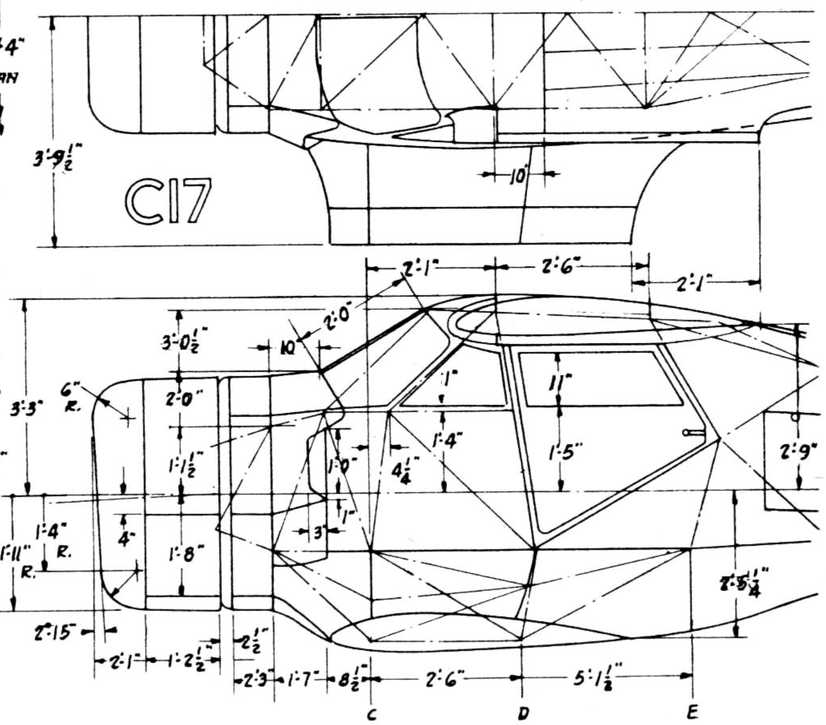


Fuselage Structure Diagram

All Dimensions Were Scaled Off Of Prints And Are Close For Model Work

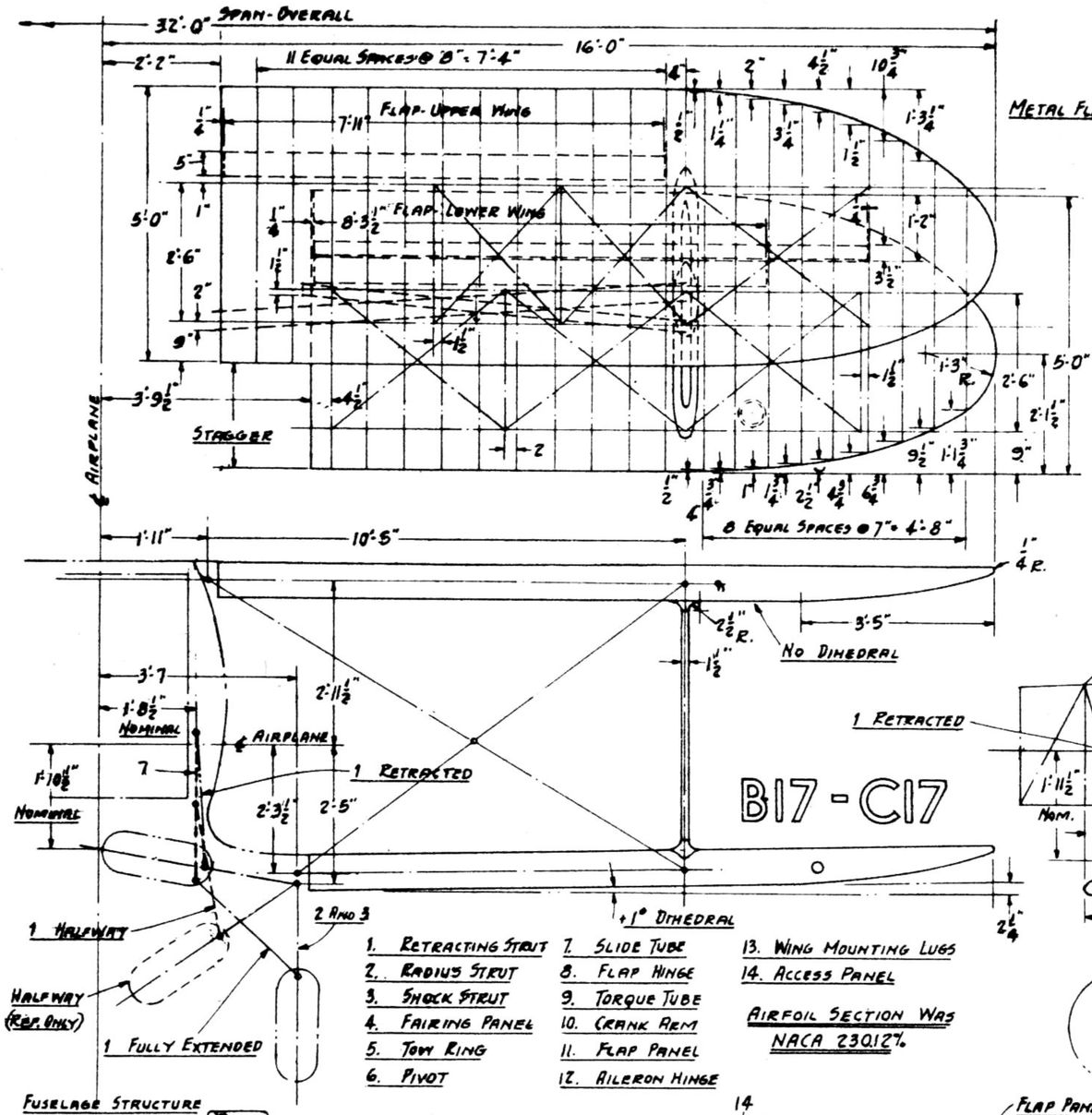
Fairing Strip Layout





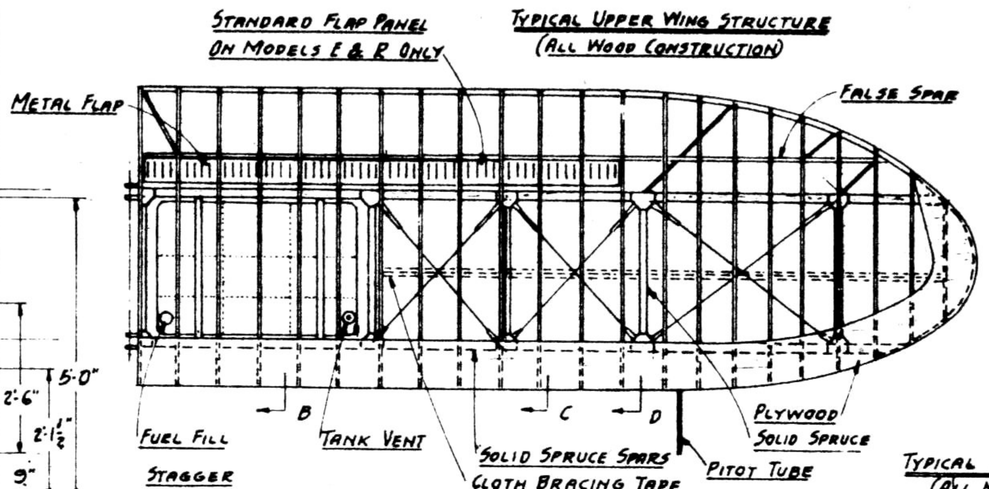
Beechcraft B17 & C17 - Plate Two - Scale: 1/4" = 1'0" - W.A. Wylam

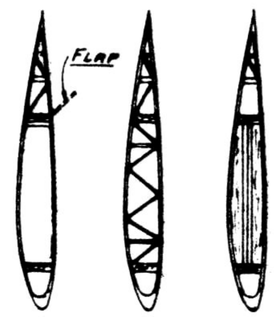
B17 - C17

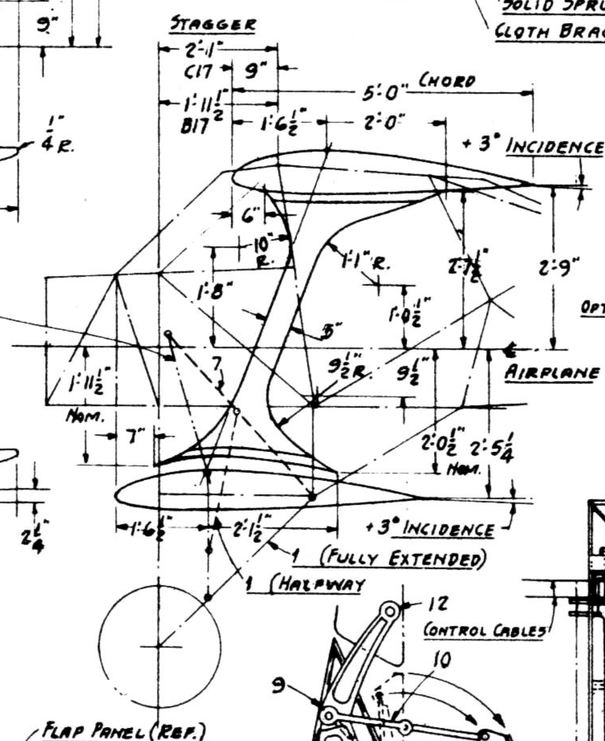


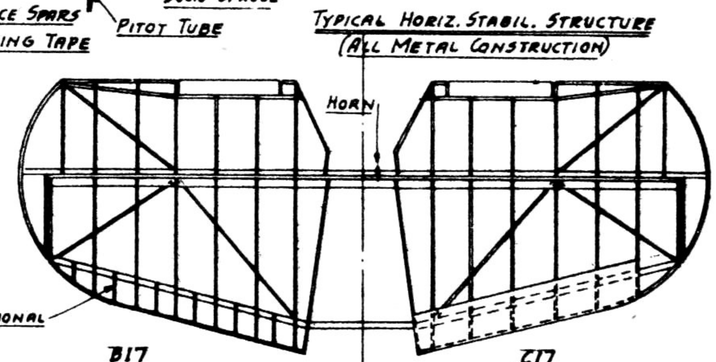
1. Retracting Strut
2. Radius Strut
3. Shock Strut
4. Fairing Panel
5. Tow Ring
6. Pivot
7. Slide Tube
8. Flap Hinge
9. Torque Tube
10. Crank Arm
11. Flap Panel
12. Aileron Hinge
13. Wing Mounting Lugs
14. Access Panel

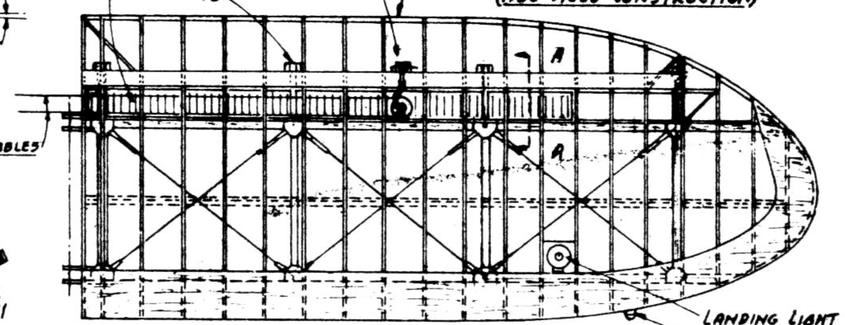
Airfoil Section Was NACA 23012%

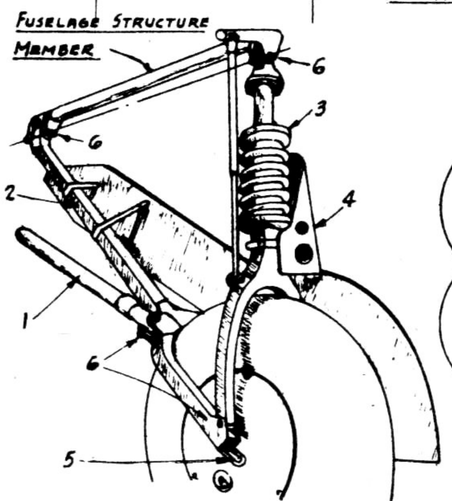




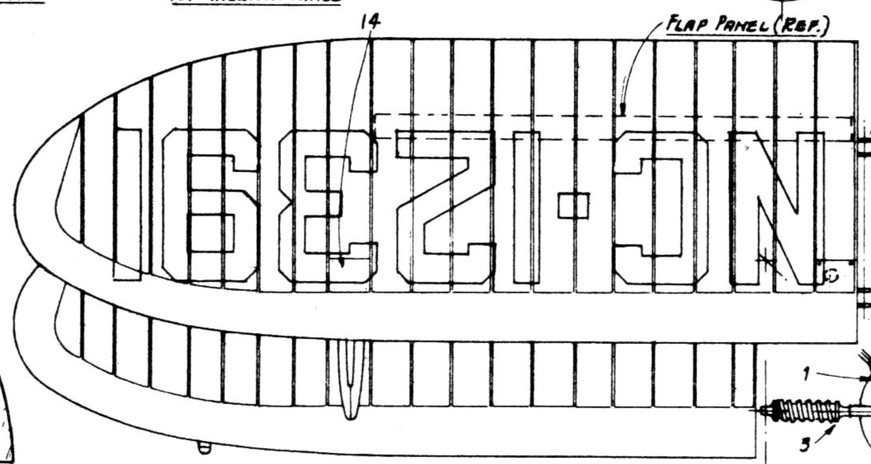




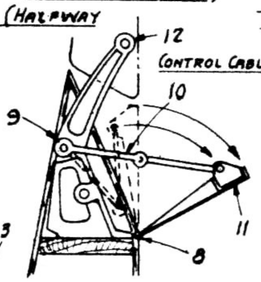




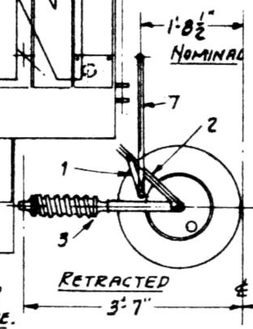
Typical Beech 17 Main Gear Detail

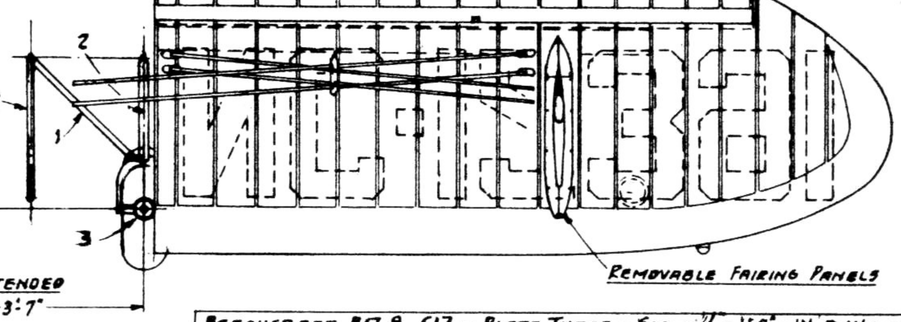


Wing Panels And I Struts Were Painted Solid Background Or Trim Color. Special Color Patterns & Stripings Were Rare.

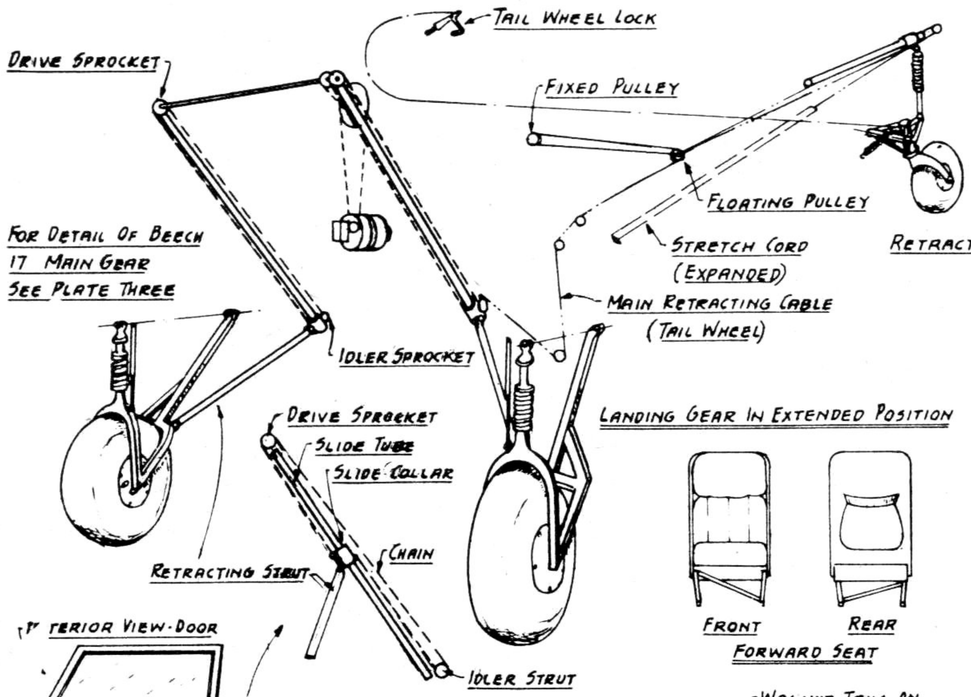


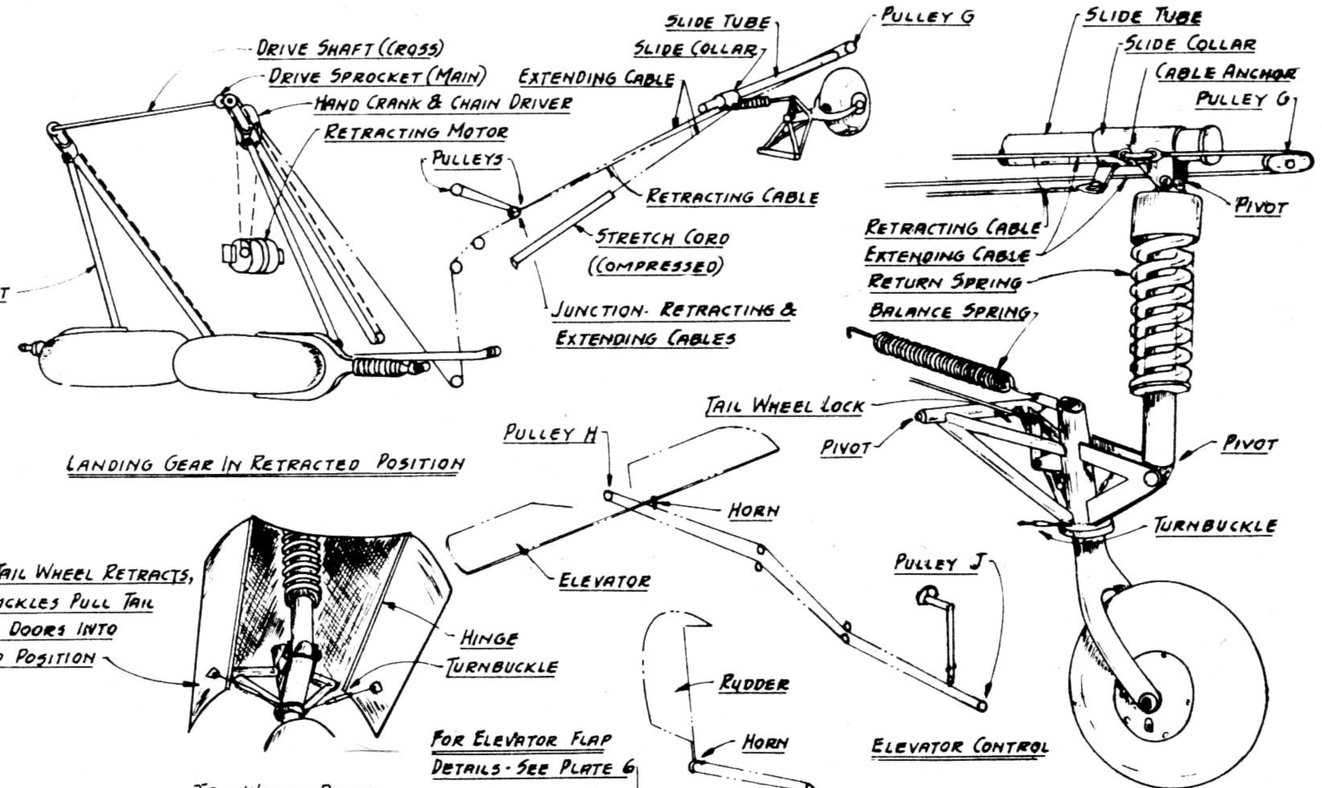
Section A-A (Lower Wing Only)

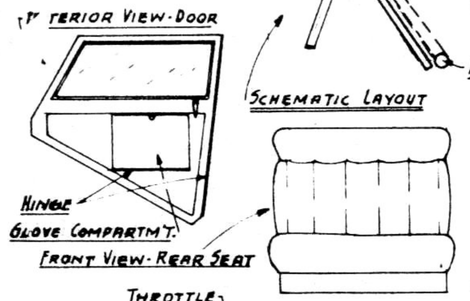


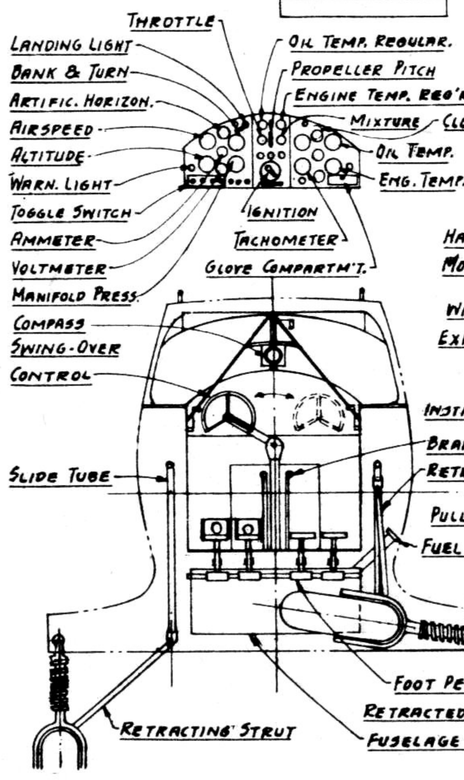


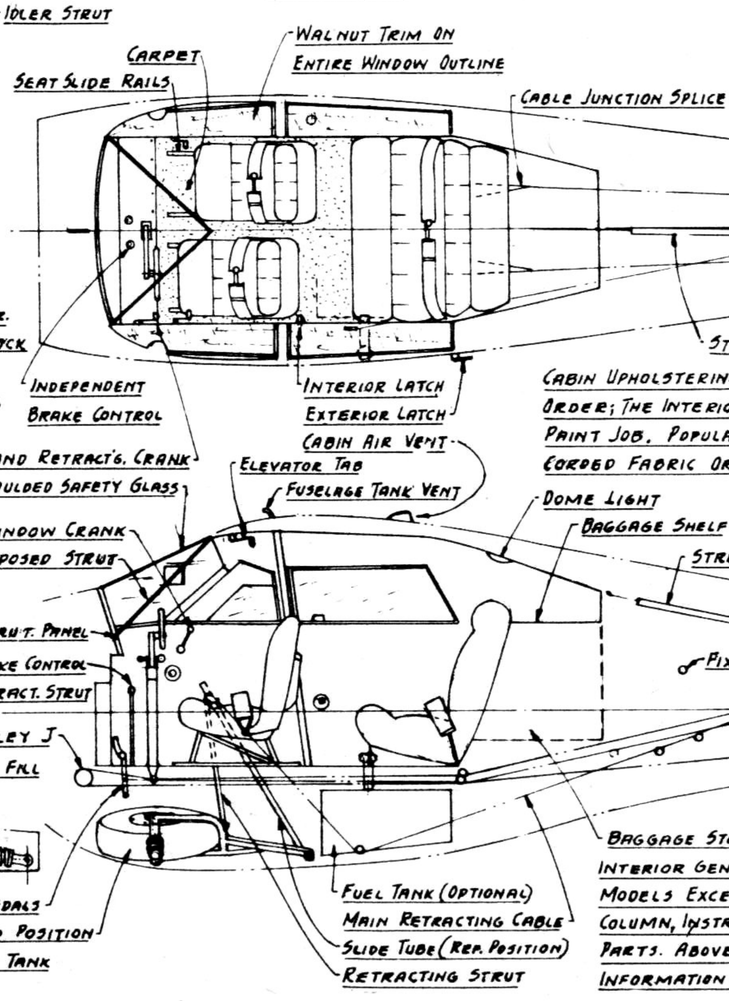
Beechcraft B17 & C17 - Plate Three - Scale: ¼" = 1'-0" - W. A. Wylam





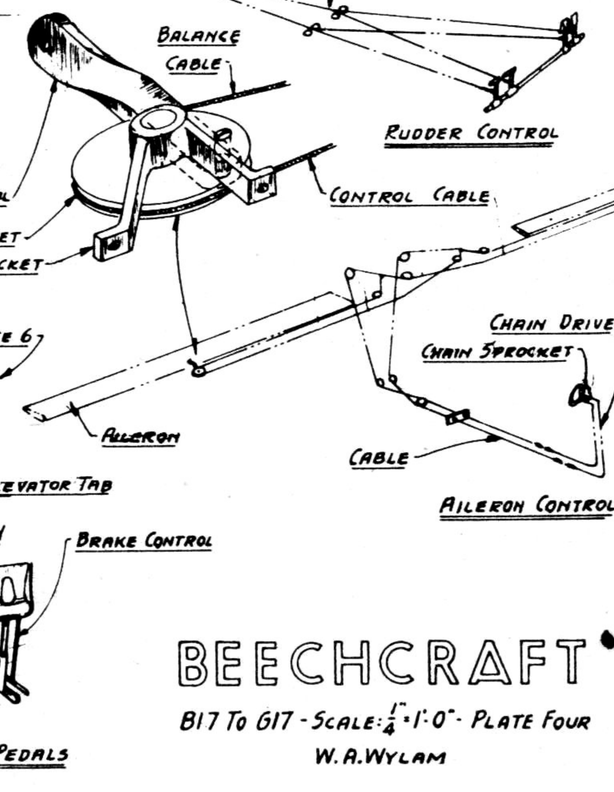






CABIN UPHOLSTERING MATERIALS & COLORS WERE PER CUSTOMER ORDER; THE INTERIOR COLORS HARMONIZED WITH THE EXTERIOR PAINT JOB. POPULAR NEUTRAL INTERIOR COLORS WERE GREY CORDED FABRIC OR GOLDEN-TAN PIGSKIN LEATHER.

INTERIOR GENERAL ARRANGEMENTS IS COMMON FOR ALL MODELS EXCEPT FOR DETAIL CHANGES ON CONTROL COLUMN, INSTRUM'T. PANEL, UPHOLSTER'G., AND OTHER PARTS. ABOVE IS FOR B17 & C17 SERIES WITH NO INFORMATION AVAILABLE ON B17-C17 WING FLAP CONTROLS

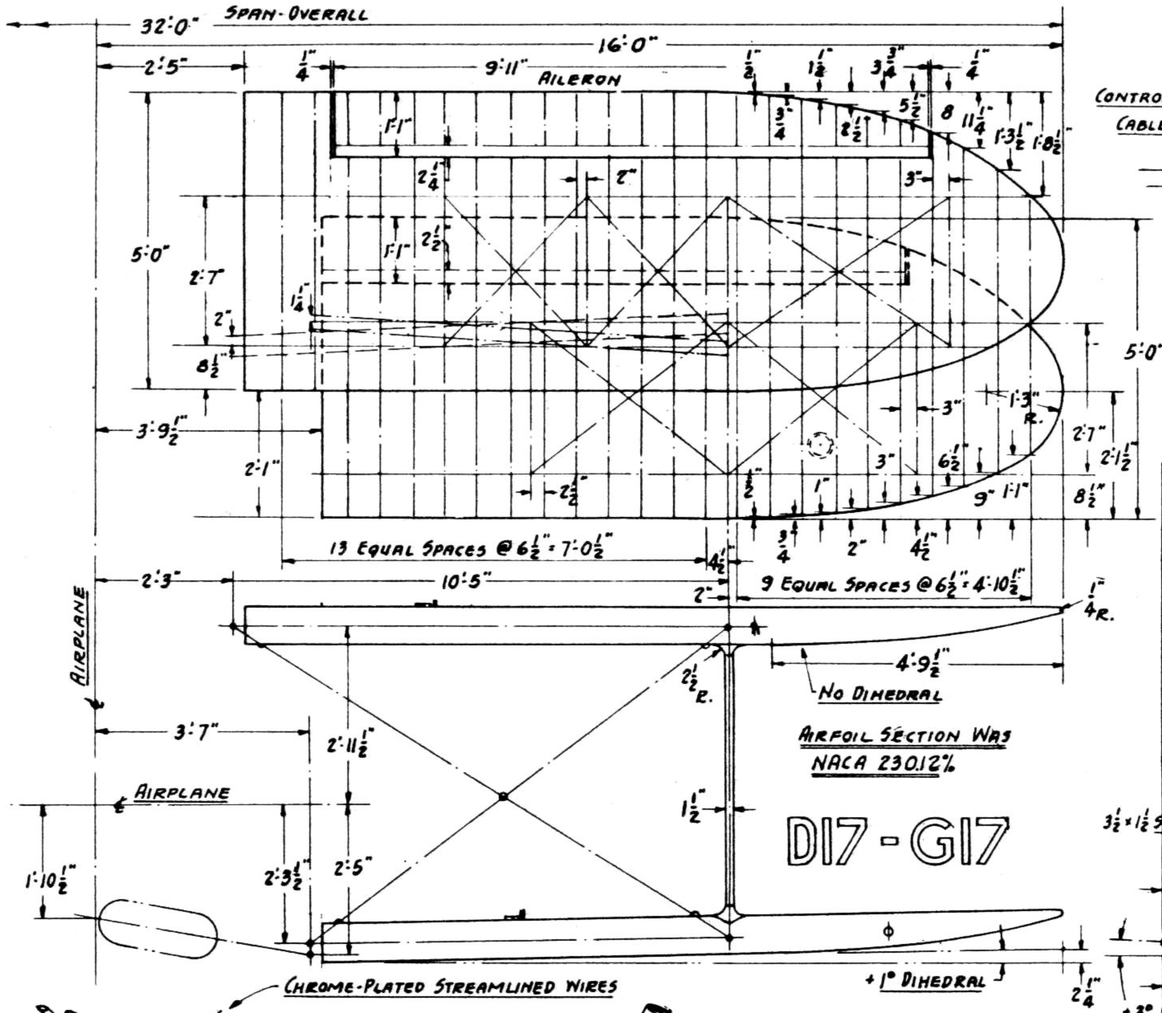


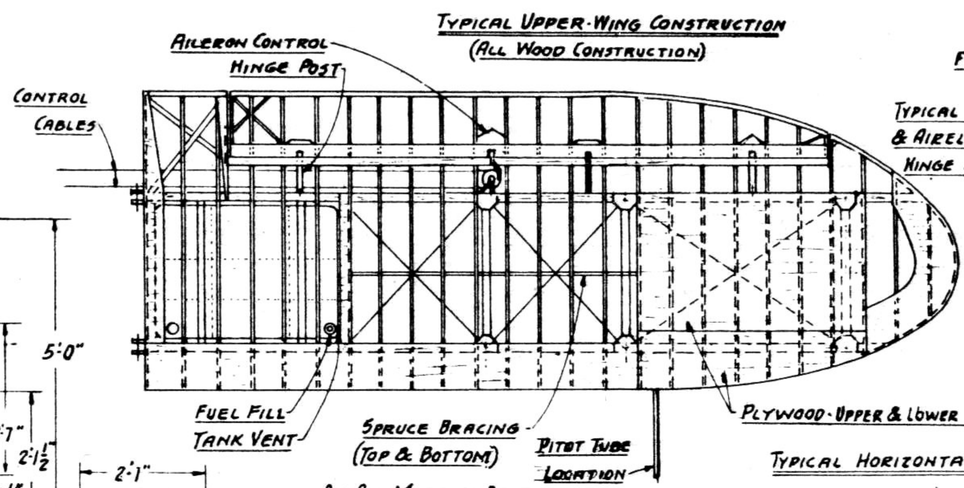
BEECHCRAFT

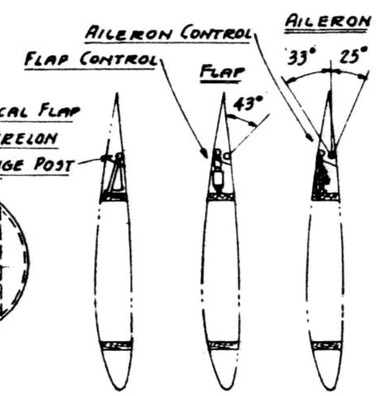
B17 TO G17 - SCALE: 1" = 1'-0" - PLATE FOUR

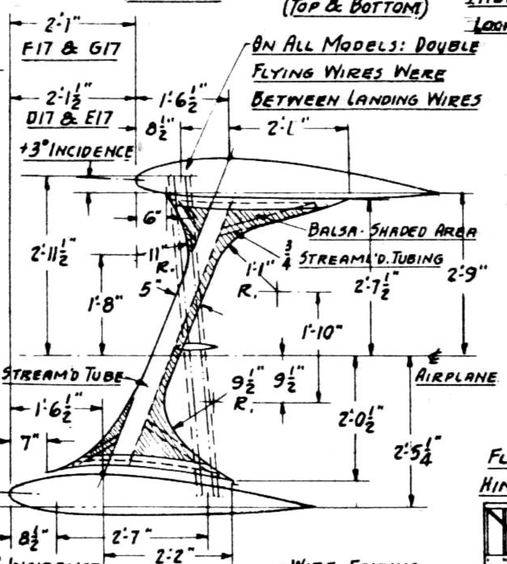
W. A. WYLAM

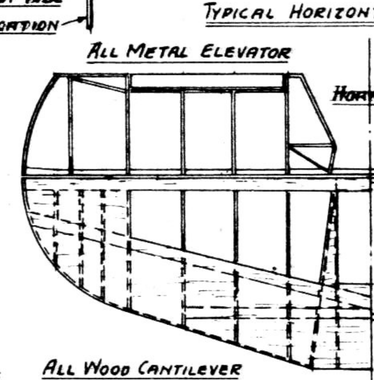
D17 - G17

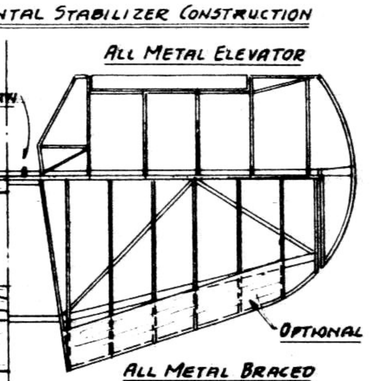


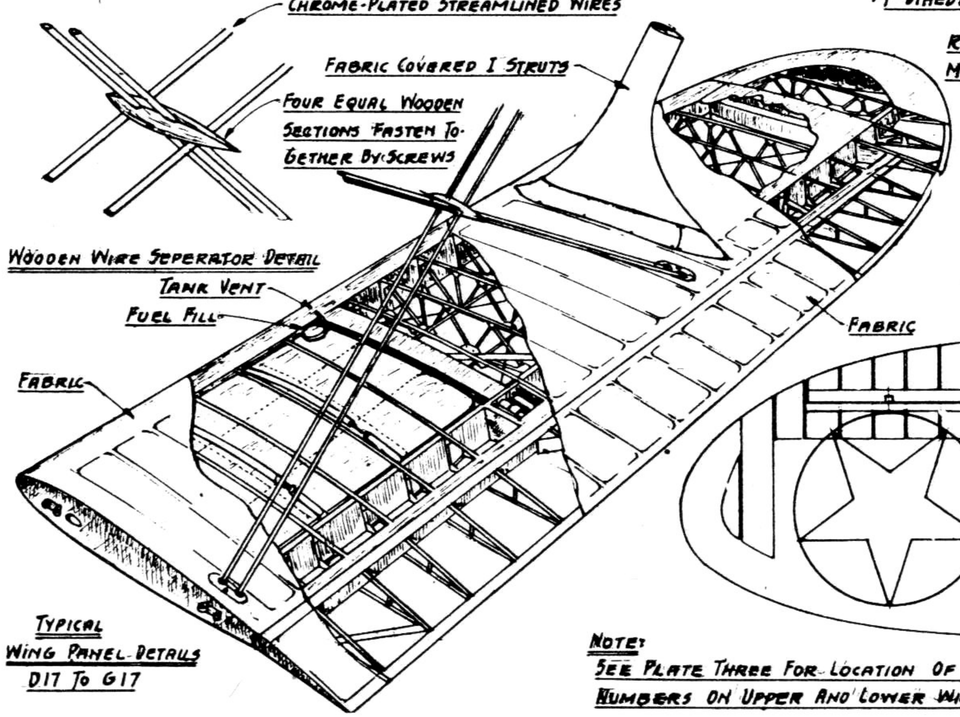


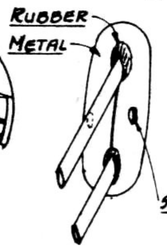


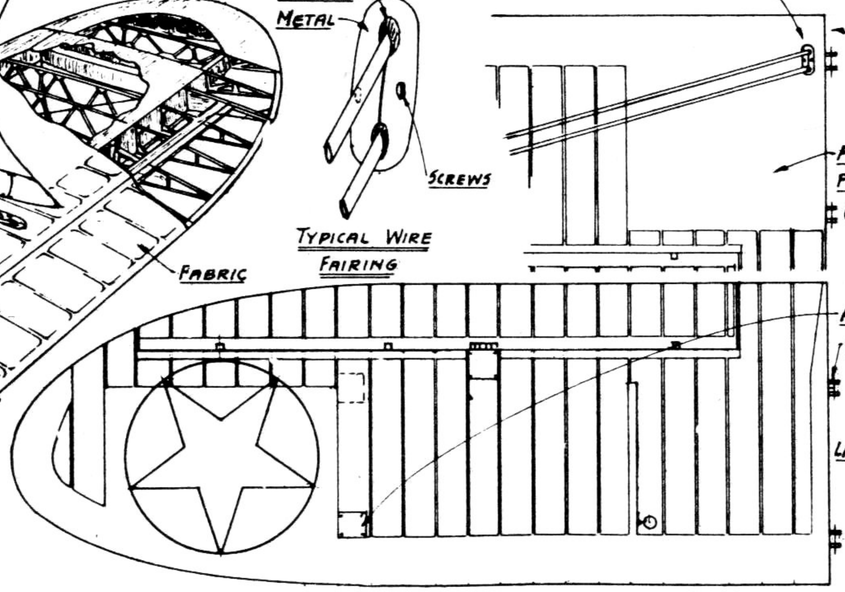


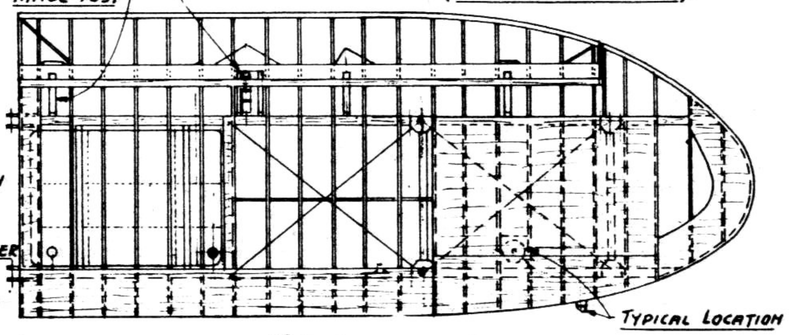


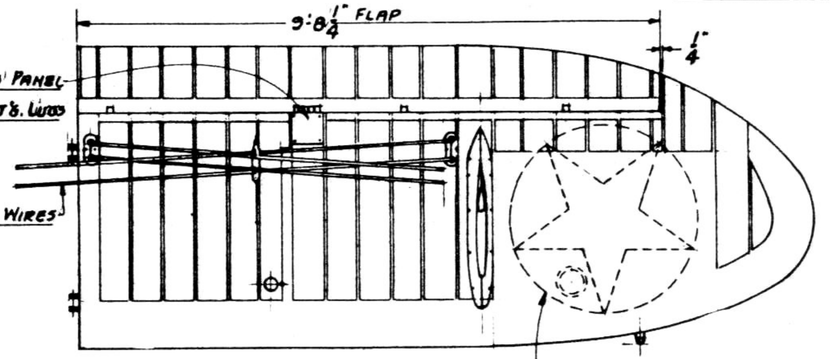






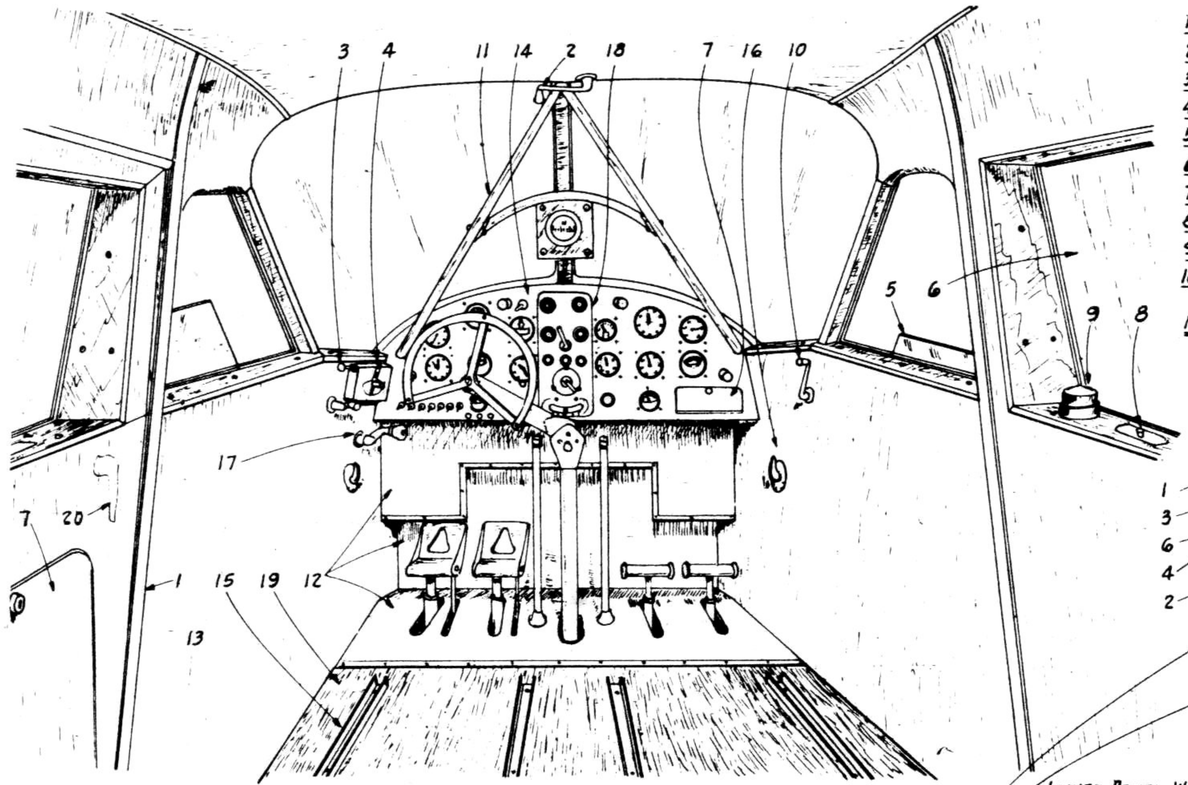






NOTE: SEE PLATE THREE FOR LOCATION OF REGISTRATION NUMBERS ON UPPER AND LOWER WING PANELS.

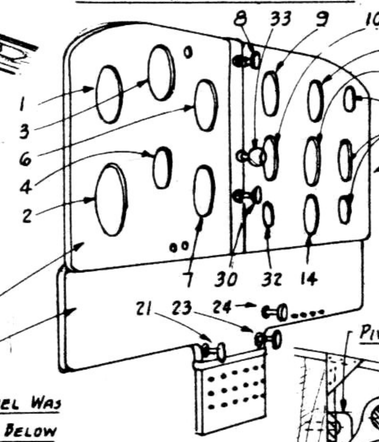
BEECHCRAFT D17 TO G17 - PLATE FIVE - SCALE ½" = 1'0" - W.A. WYLAM.



TYPICAL BEECH B17 & C17 FRONT INTERIOR VIEW

1. MOULDING STRAP
2. ELEVATOR TAB
3. RUDDER TAB
4. TAILWHEEL LOCK
5. ADJUST. WINDOW
6. FIXED WINDOW
7. GLOVE COMPARTMENT
8. ASH RECEIVER
9. LIGHTER
10. WINDOW CRANK
11. EXPOSED STRUT
12. METAL PANEL
13. UPHOL. PANEL
14. METAL INSTRU. PANEL
15. SLIDE RAILS
16. FUEL SWITCH
17. RETRACT. CRANK
18. RAISED PANEL
19. CARPET
20. DOOR LATCH

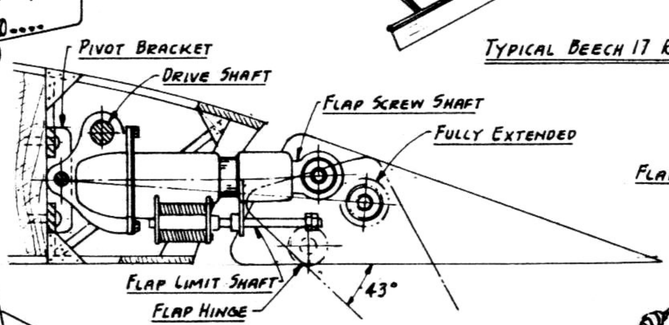
NOTE:
SEE PLATE FOUR FOR INSTRUMENT PANEL LAYOUT AND CALL-OUTS.

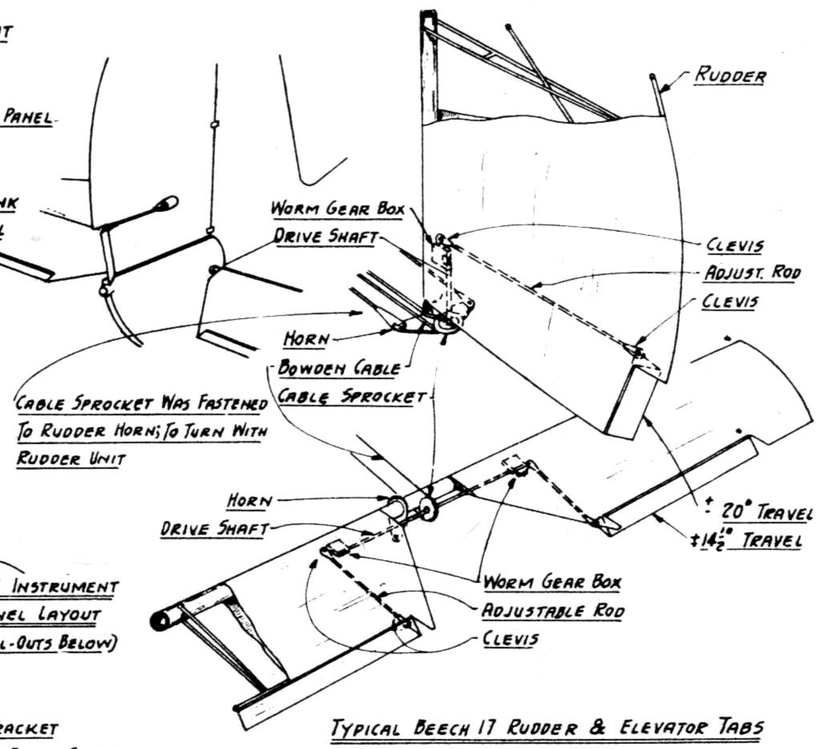


D17 INSTRUMENT PANEL LAYOUT (CALL-OUTS BELOW)

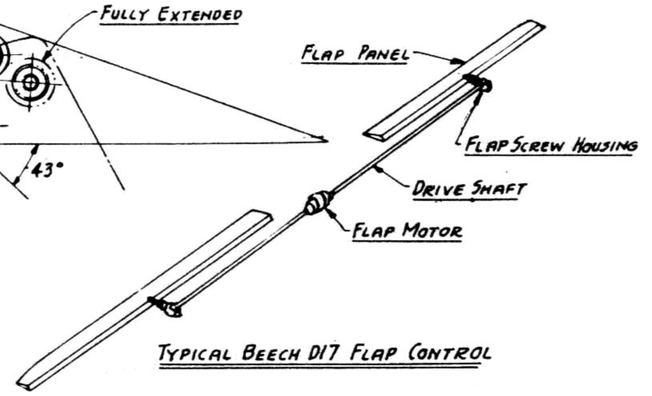
LOWER PANEL WAS SIMILAR TO BELOW

PRE-FORMED METAL PANEL FINISH WAS BAKED FLAT GRAY, BLACK OR BROWN

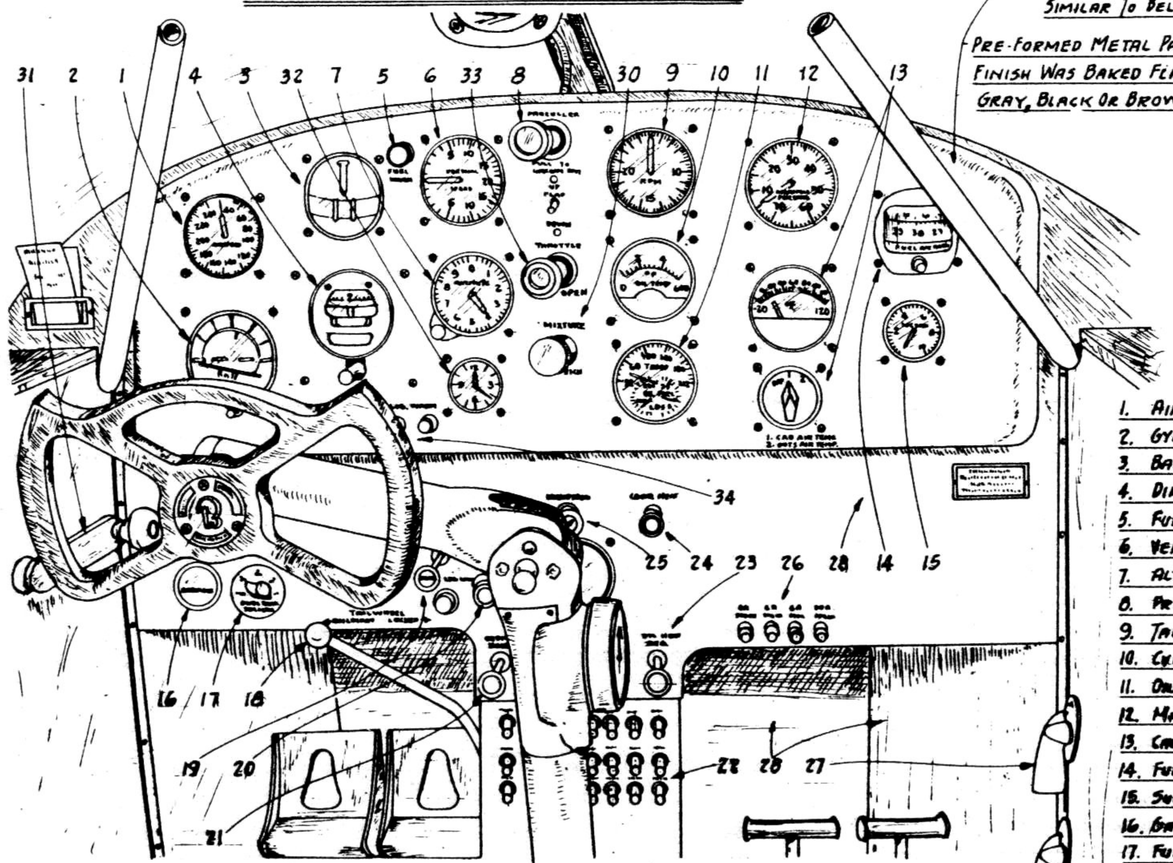




TYPICAL BEECH 17 RUDDER & ELEVATOR TABS

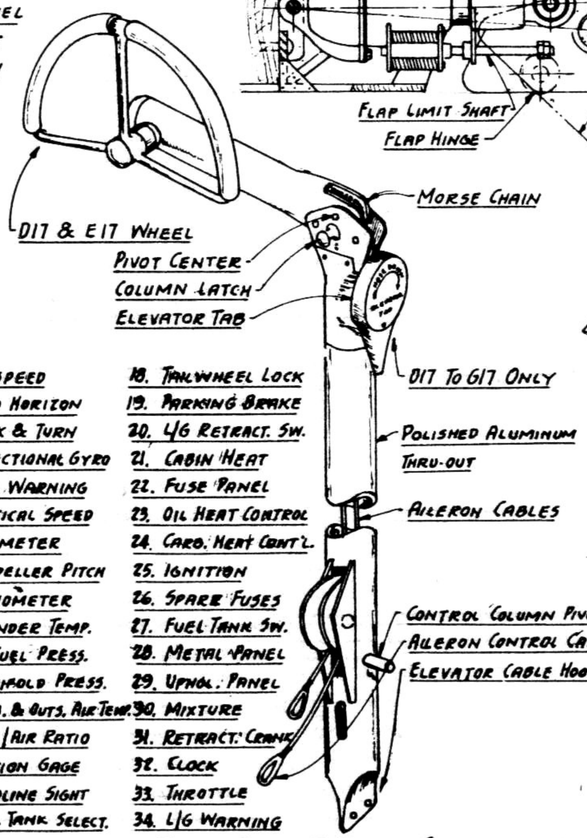


TYPICAL BEECH D17 FLAP CONTROL

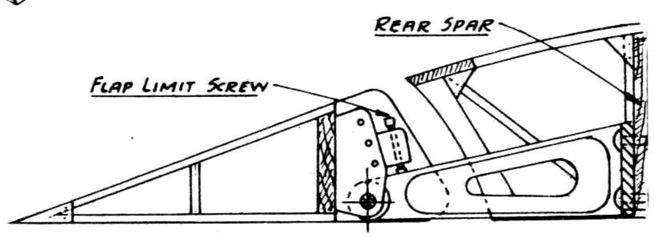


TYPICAL BEECH E17 TO G17 FRONT INTERIOR VIEW (D17 SIMILAR)

1. AIRSPEED
2. GYRO HORIZON
3. BANK & TURN
4. DIRECTIONAL GYRO
5. FUEL WARNING
6. VERTICAL SPEED
7. ALTIMETER
8. PROPELLER PITCH
9. TACHOMETER
10. CYLINDER TEMP.
11. OIL/FUEL PRESS.
12. MANIFOLD PRESS.
13. CARB. & OUTS. AIR TEMP.
14. FUEL/AIR RATIO
15. SUCTION GAGE
16. GASOLINE SIGHT
17. FUEL TANK SELECT.
18. TAILWHEEL LOCK
19. PARKING BRAKE
20. L/G RETRACT. SW.
21. CABIN HEAT
22. FUSE PANEL
23. OIL HEAT CONTROL
24. CARB. HEAT CONT'L.
25. IGNITION
26. SPARE FUSES
27. FUEL TANK SW.
28. METAL PANEL
29. UPHOL. PANEL
30. MIXTURE
31. RETRACT. CRANK
32. CLOCK
33. THROTTLE
34. L/G WARNING



TYPICAL BEECH 17 CONTROL COLUMN



TYPICAL BEECH 17 AILERON & FLAP HINGE

BEECHCRAFT

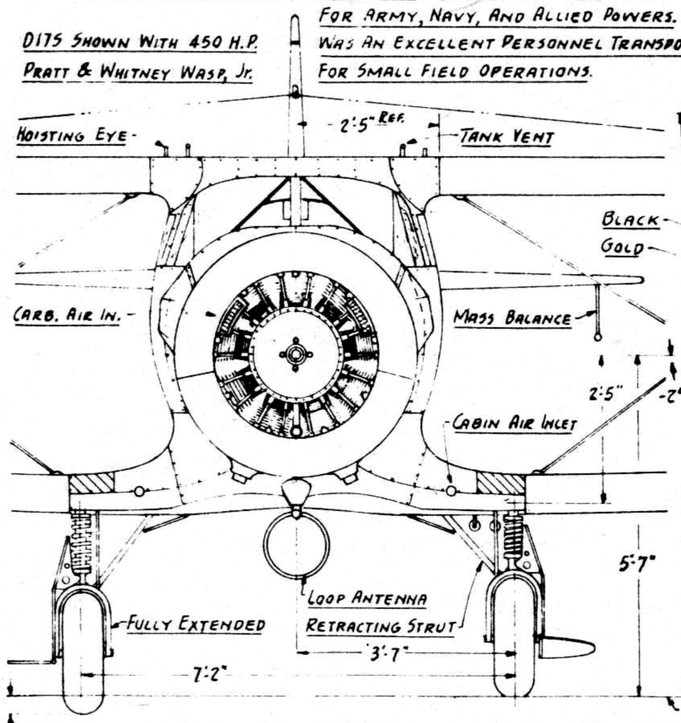
D17 TO G17 · SCALE: ¼" = 1'-0" · PLATE SIX

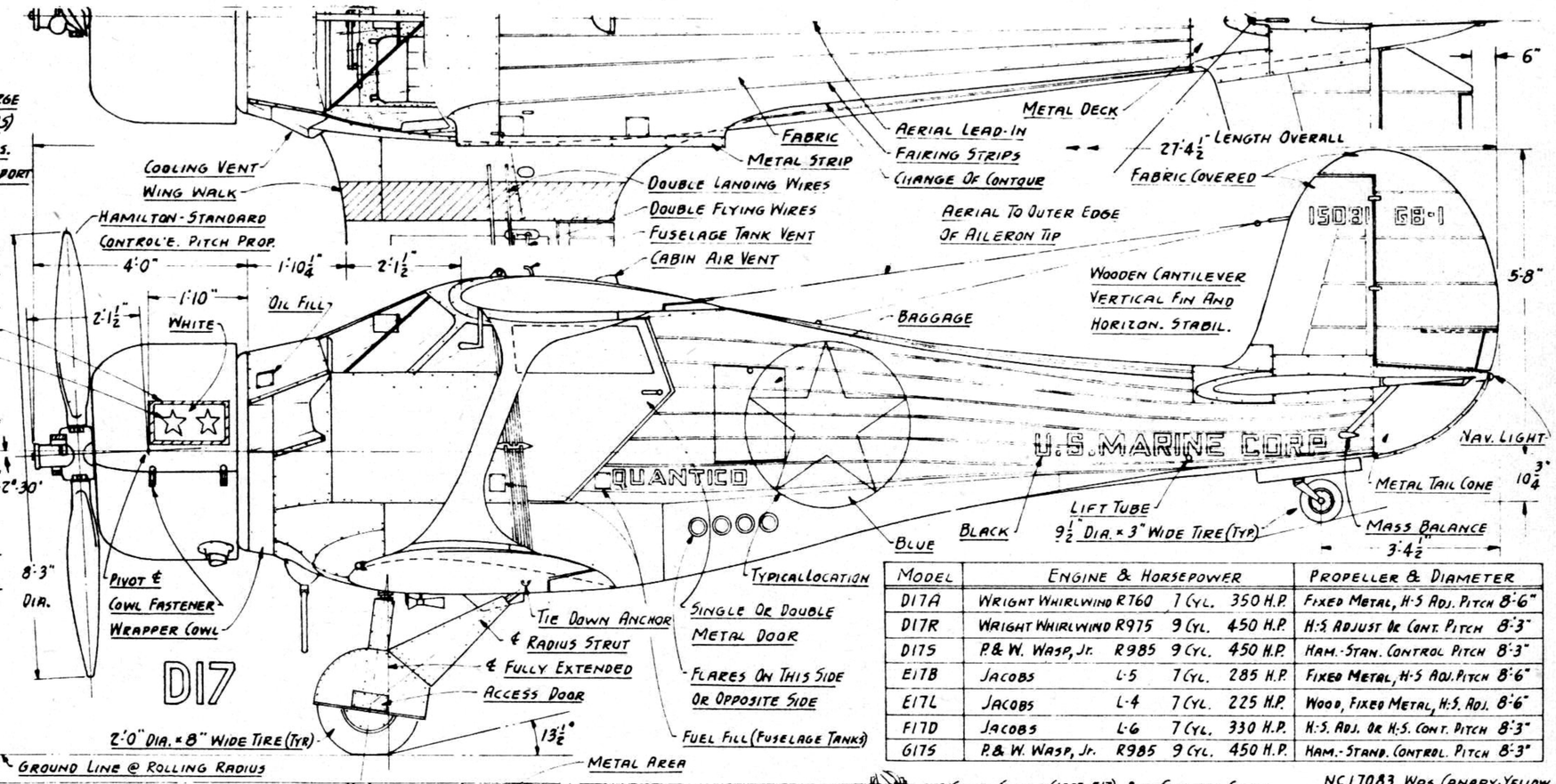
W.A.WYLAM

NAVY - SOLID SILVER
ARMY - SOLID BLUE
CHINA - SOLID OLIVE DRAB
U.K. - SPINACH & SAND CAMOU. WITH EGG WHITE LOWER

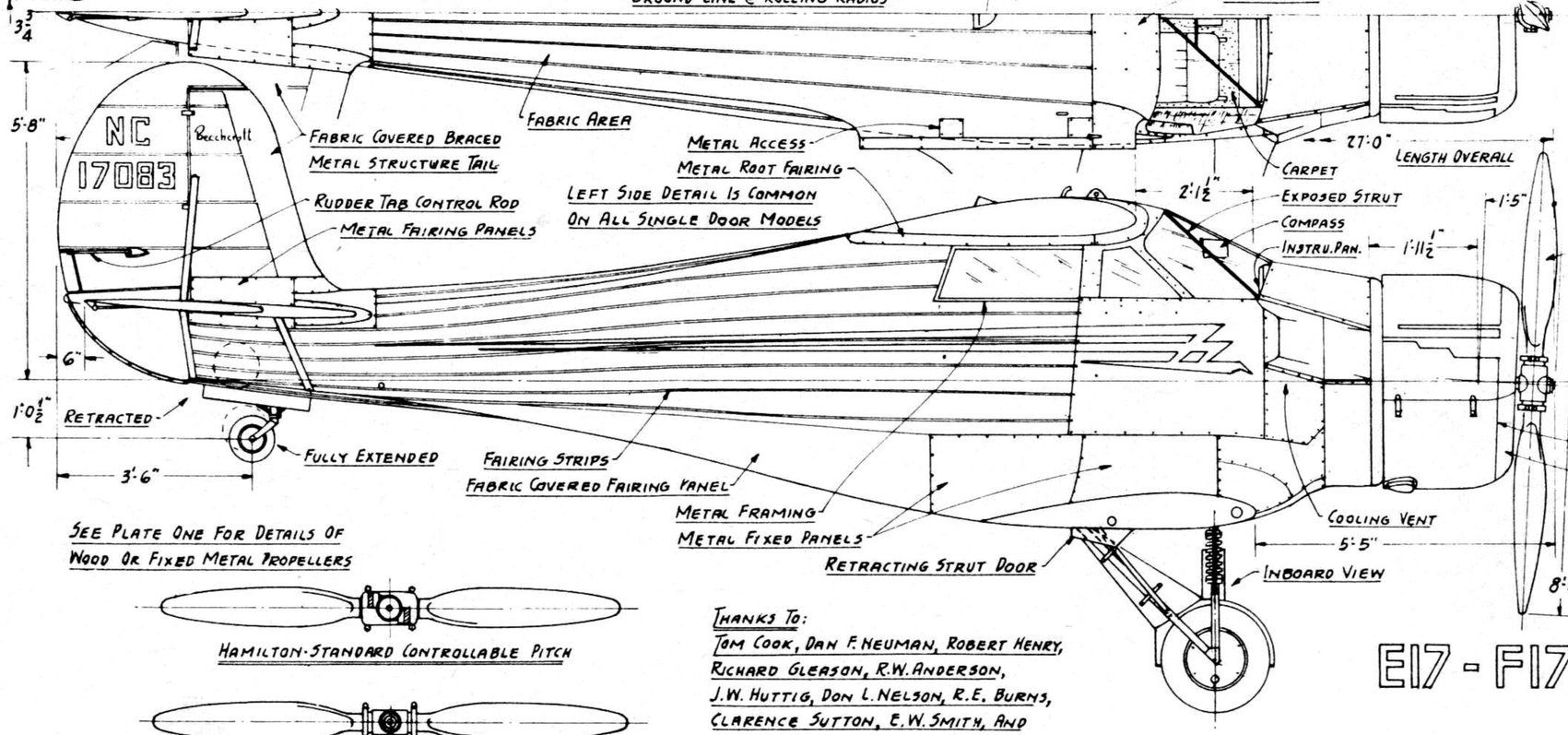
FIFTH SERIES (1937) WITH NEW WING, FUSELAGE & TAIL. DESIGNED TO AN SPECIFICATIONS FOR COMMERIAL AND GOVERNMENT MARKETS. BUILT IN LARGE QUANTITIES, 1941 TO 1945, (D17R & D17S) FOR ARMY, NAVY, AND ALLIED POWERS. WAS AN EXCELLENT PERSONNEL TRANSPORT FOR SMALL FIELD OPERATIONS.

D17S SHOWN WITH 450 H.P. PRATT & WHITNEY WASP, Jr.





MODEL	ENGINE & HORSEPOWER			PROPELLER & DIAMETER
D17A	WRIGHT WHIRLWIND R760	7 CYL.	350 H.P.	FIXED METAL, H-S ADJ. PITCH 8'6"
D17R	WRIGHT WHIRLWIND R975	9 CYL.	450 H.P.	H-S ADJUST OR CONT. PITCH 8'3"
D17S	P & W. WASP, Jr. R985	9 CYL.	450 H.P.	HAM.-STAN. CONTROL PITCH 8'3"
E17B	JACOBS	L-5	7 CYL. 285 H.P.	FIXED METAL, H-S ADJ. PITCH 8'6"
E17L	JACOBS	L-4	7 CYL. 225 H.P.	WOOD, FIXED METAL, H-S. ADJ. 8'6"
F17D	JACOBS	L-6	7 CYL. 330 H.P.	H-S. ADJ. OR H-S. CONT. PITCH 8'3"
G17S	P & W. WASP, Jr.	R985	9 CYL. 450 H.P.	HAM.-STAND. CONTROL. PITCH 8'3"



SEE PLATE ONE FOR DETAILS OF WOOD OR FIXED METAL PROPELLERS

HAMILTON-STANDARD CONTROLLABLE PITCH

HAMILTON-STANDARD ADJUSTABLE PITCH

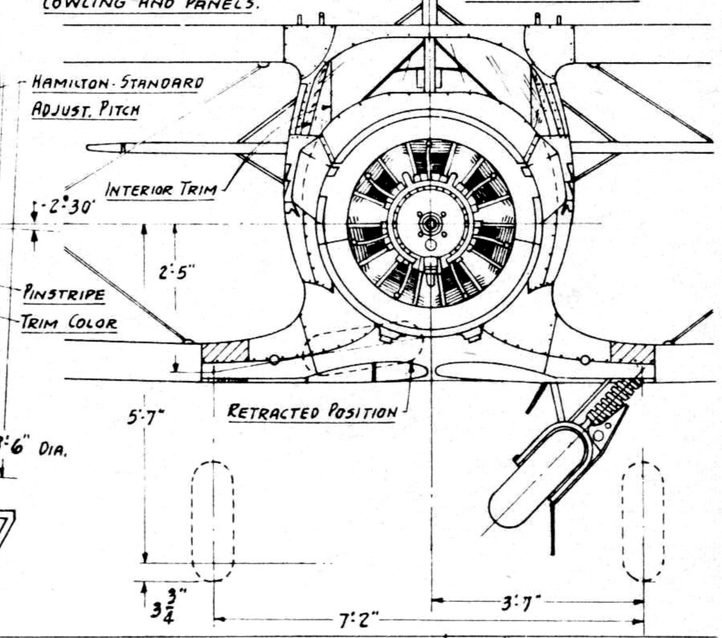
THANKS TO:
TOM COOK, DAN F. NEUMAN, ROBERT HENRY, RICHARD GLEASON, R.W. ANDERSON, J.W. HUTTIG, DON L. NELSON, R.E. BURNS, CLARENCE SUTTON, E.W. SMITH, AND MANY OTHER UNKNOWN CONTRIBUTORS

E17 - F17

SIXTH SERIES (1937-E17) AND SEVENTH SERIES (1938-F17); BOTH E17 & F17 WERE IDENTICAL IN EXTERIOR DESIGN. SAME WING AND FUSELAGE AS D17 BUT WITH METAL TAIL STRUCTURE AND MODIFIED ENGINE COWL. F17D HAD SLIGHTLY MODIFIED ENGINE COWLING AND PANELS.

NC17083 WAS CANARY-YELLOW BACKGROUND, BLACK TRIM COLOR AND RED PINSTRIPE

E17B SHOWN WITH 285 H.P. JACOBS L-5 ENGINE



BEECHCRAFT D17 TO G17 - PLATE SEVEN - SCALE: ¼" = 1'0" - W.A. WYLAM

NC 21935 WAS SOLID SNOW-WHITE, RED TRIM COLOR AND GOLD PINSTRIPE.

EIGHT SERIES (1946); THE LAST MODEL OF THE STAGGERED WING BUILT BY BEECH. WITH RE-MODELED D17'S FUSELAGE, ENGINE COWLING, AND VERTICLE TAIL. THE G17 WAS THE BEST LOOKING STAGGERED WING BUILT BY BEECH. ENDED IN 1948, THE FABRIC BIPLANE WAS REPLACED BY THE METAL MONOPLANE (BONANZA).

G17S SHOWN WITH 450 H.P. PRATT & WHITNEY WASP, Jr.

G17

HINGE
OIL FILL
INSTRUMENT PANEL
INTERIOR TRIM
HAMILTON-STANDARD CONTROLLABLE PITCH
CABIN VENT
ACCESS PANEL
FUSELAGE TANK VENT
HOISTING EYE
LEAD-IN
AERIAL TO OUTER AILERON TIPS
27'-9½"
LENGHT OVERALL
6"
ALL WOOD CANTILEVER FIN & STABILIZER (FABRIC COVERED)
EARLY G17S HAD D17'S FIN & RUDDER
5'-8"
10¾"
3'-4½"
LIFT TUBE
FABRIC COVERED FAIRING
FAIRING STRIPS
METAL TAIL CONE
WHITE NAVIGATION LIGHT
HINGE
BAGGAGE DOOR
SINGLE OR DOUBLE METAL DOOR
FLARES ON RIGHT OR LEFT SIDE
OPTIONAL SCUFF PLATE
FUEL FILL-FRONT
FUEL FILL-REAR
RETRACTING STRUT DOOR ACCESS DOOR
EARLY G17S HAD D17'S LANDING GEAR FAIRINGS
13½"
RETRACTING STRUT DOOR
HINGE
1'-6"
2'-6½"
2'-2½"
1'-4½"
2'-1"
1'-2"
2°-30'
8'-3" DIA.
PINSTRIPE
℄ PIVOT
TRIM COLOR
ADJUST. COOLING VENT
2'-5"
5'-7"
WHEEL WELL
ADJUST. COOLING VENT
DOUBLE VENTURI (OPTIONAL)
SPRING LOADED RETRACT'G. STRUT DOOR
RETRACTING STRUT
GROUND LINE @ ROLLING RADIUS
HINGED COVER DOOR
3'-7"
7'-2"
G17S ONLY
8½"
2'-7"
3'-7"
ADJUST. COOLING VENT
SEMI-FIXED PANEL
COWL FASTENERS
D17 ONLY
D17 TO F17 ONLY
REMOVABLE PANELS
METAL ROOT FAIRING
FABRIC AREA
ACCESS PANELS
METAL ELEVATOR FRAME (FABRIC COVERED)
MASS BALANCE
HINGE
D17 & G17 CANTILEVER FABRIC COVERED WOODEN HORIZONTAL STABILIZER
11'-6"
METAL FAIRING PANEL
METAL FRAMING
E17 & E17 FABRIC COVERED BRACED METAL TAIL FRAME
SEMI-FIXED PANELS
1'-10" REF.
-3° 40' INCIDENCE
℄ AIRPLANE (REF.)
HORIZONTAL STABILIZER SETTING
FUEL TANK AREA - UPPER WING
FUEL TANK AREA - LOWER WING
AILERON
FLAP PANEL
TYPICAL BEECH 17 BOTTOM VIEW

1'-0"
½" RAD.
9"
C
2¼"
D17 & G17 LAYOUT
B
4"
℄ AIRPLANE
A
3"
5'-9"
E17 & F17 LAYOUT
HORIZONTAL STABILIZER LAYOUT
3'-2½"
2'-6"
5'-3"
4'-10½"
4'-5¼"
4'-0"
3'-1½"
2'-3"
11"
1'-4½"
11"
11'-6"
7"
1'-1"
11"
1'-8"
9½"
2'-4¾"
3'-1"
3'-10"
4'-6½"
5'-1½"
1'-11"
1"
2'-3" R.
2'-9" R.
1'-8"
1/4"
1/8"
2'-6½"
3"
1'-4½"
2'-3"
4'-0"
5'-0"
6"
30°
2'-9" R.
1/4"
1/8"
1'-4½"
2'-3"
3'-1½"
4'-0"
5'-0"
45°
C
B
2" DIA. TUBING
A
CROSS SECTIONS

BEECHCRAFT
D17 TO G17 - SCALE: 1/4" = 1'-0" - PLATE EIGHT
W. A. WYLAM

D17

STRAIGHT FROM D TO K
STRAIGHT FROM E TO H
STRAIGHT FROM E TO K
FAIRING STRIPS IN SAME POSITION ON TOP & BOTTOM SURFACES
STRAIGHT FROM E TO H
STRAIGHT FROM X TO F
STRAIGHT FROM H TO K
STRAIGHT FROM F TO H
6175 D17, E17, F17
WAS 1'-10" (ERROR PLATE 8)
STRAIGHT FROM G TO K
STRAIGHT FROM D TO J
℄ PIVOT
D17, E17 & F17 WHEEL FAIRING
HINGED COVER DOOR

PLAN VIEW

VIEW @ X-X

SIDE VIEW

FUSELAGE STRUCTURE DIAGRAM

VIEW @ Z-Z

NOTE:
BOTH E17 & F17 HAD SEMI-CANTILEVER ALL WOOD HORIZONTAL AND VERTICAL FIXED STABILIZERS. ORIGINAL E17 HAD ALL METAL AS SHOWN.

E17 - F17

F17
E17

℄ PIVOT

TO TRAILING EDGE-RUDDER

G17

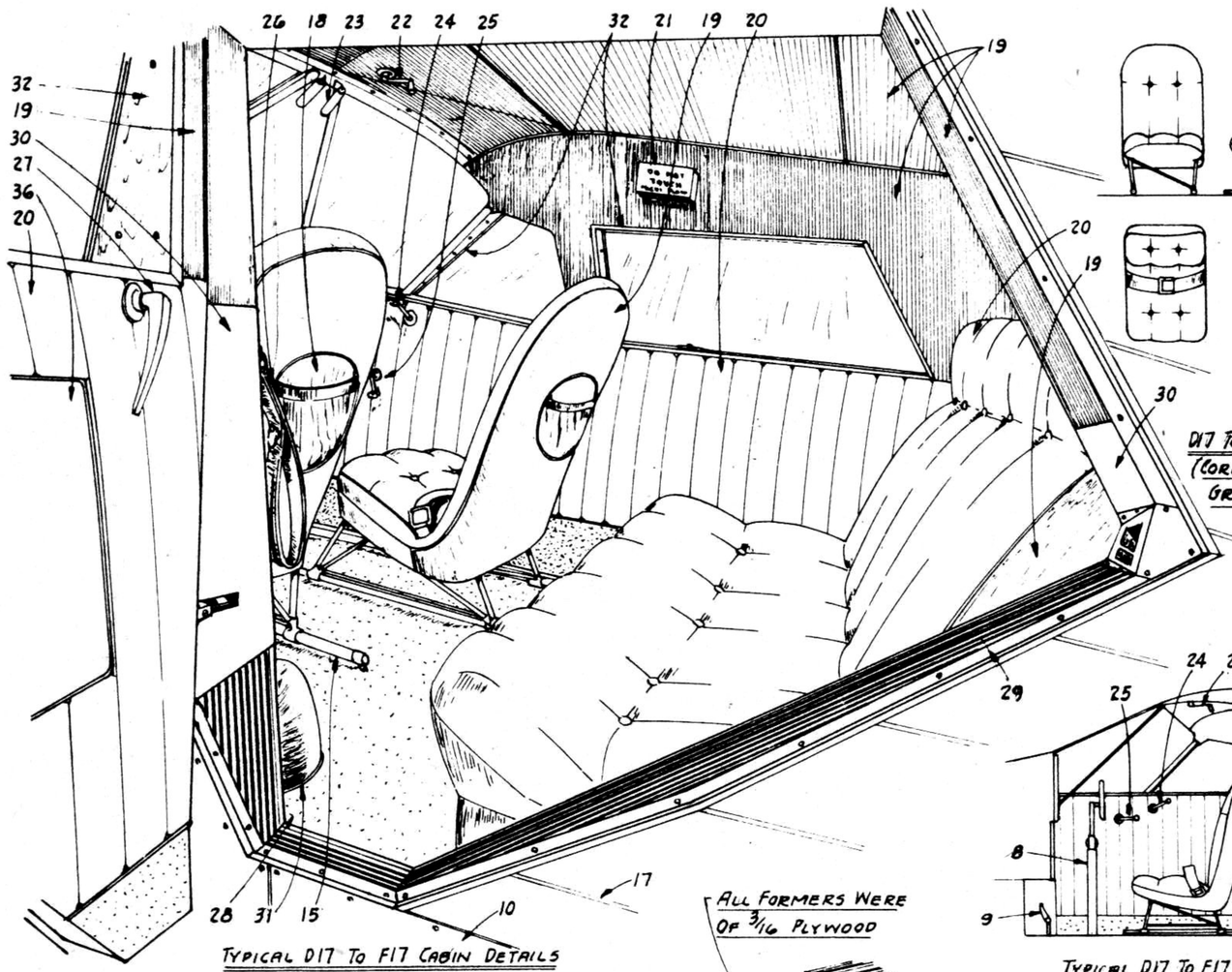
℄ PIVOT

ON VERTICAL SIDES, THE FAIRING STRIPS ARE EQUALLY SPACED APART; SPACING DISTANCE IS REDUCED ON EACH SECTION TOWARD TAIL.

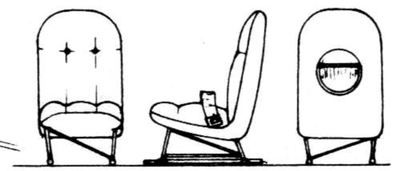
ACCESS PANEL

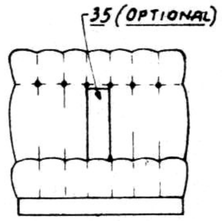
TO TRAILING EDGE-RUDDER

BEECHCRAFT D17 TO G17 - PLATE NINE - SCALE: ¼" = 1'-0" - W.A. WYLAM



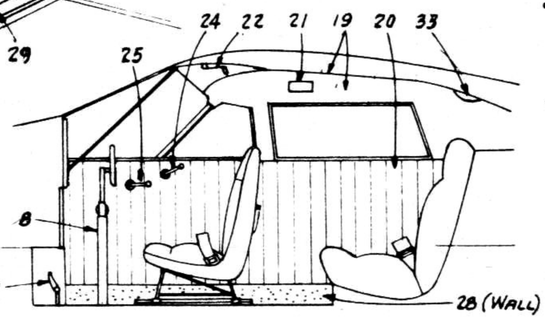
Typical D17 To F17 Cabin Details



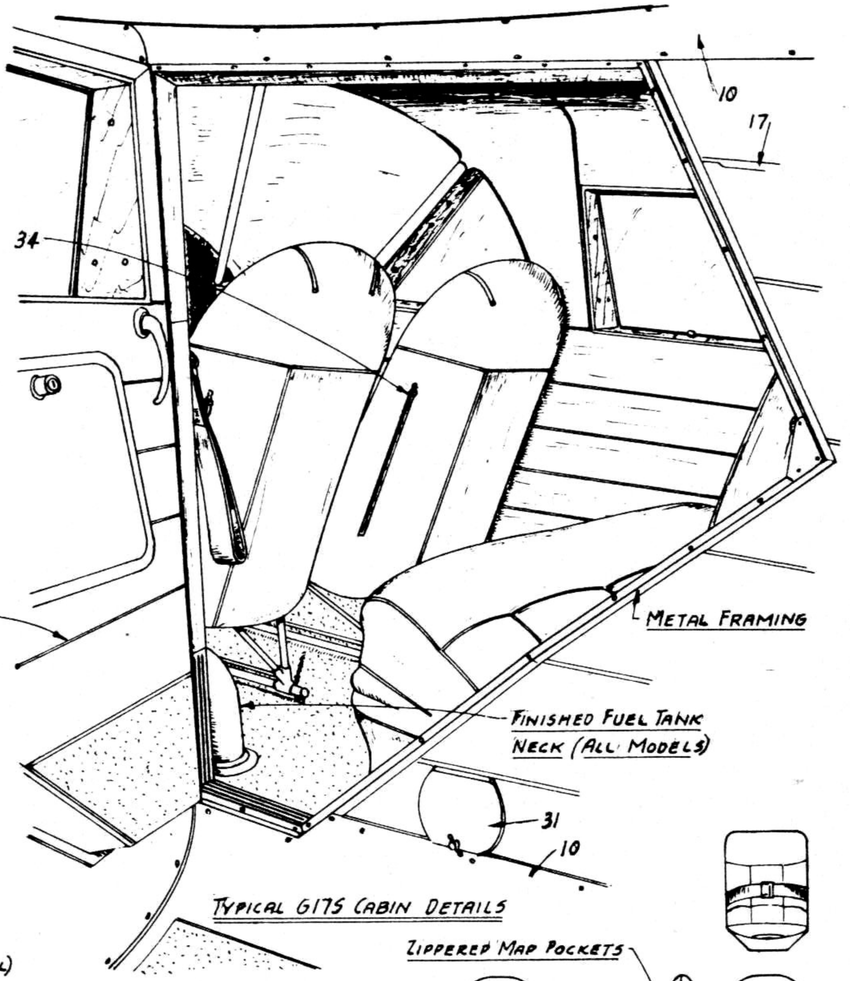


D17 To F17 Seating Details
(Corded Fabric In Brown, Grey Or Off Color Shades)

Leather Beading

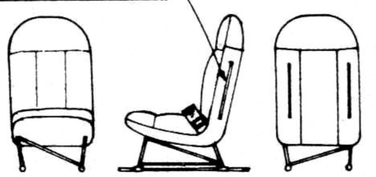


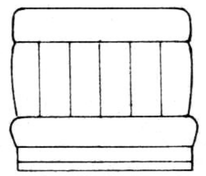
Typical D17 To F17 Interior Elevation View
(Pleated Leather And Corded Fabric)



Typical G17S Cabin Details

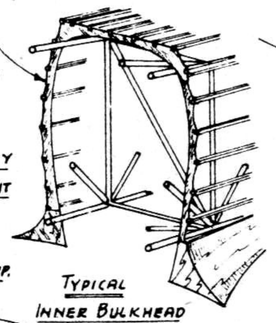
Zippered Map Pockets





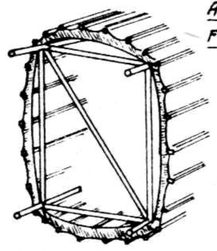
Front View
(Rear Seat)

All Formers Were 3/16 Plywood

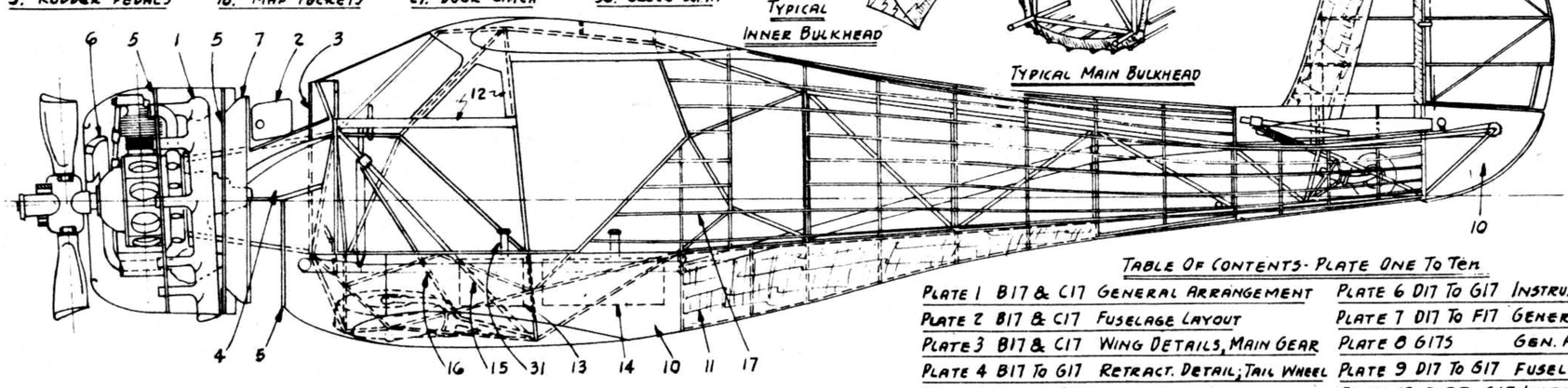


Typical Inner Bulkhead

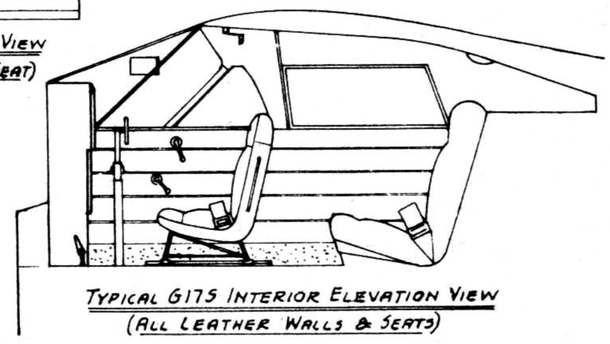
All Wood Cantilever Fin Shown (D17 & G17)



Typical Main Bulkhead



Typical Beech 17 Fuselage Framework



Typical G17S Interior Elevation View
(All Leather Walls & Seats)

1. Exhaust Collector	10. Metal Panel	19. Corded Fabric	28. Carpet
2. Oil Tank	11. Plywood Panel	20. Pleated Leather	29. Aluminum
3. Firewall	12. Wood Framing	21. Flares Control	30. Leather
4. Louver Shroud	13. Front Tank	22. Rudder Tab	31. Fuel Fill
5. Support Ring	14. Rear Tank	23. Spotlights	32. Mahogany
6. Carb. Air Filter	15. Slide Tube	24. Window Crank	33. Dome Light
7. Shroud, Cowling	16. Retract. Strut	25. Wobble Pump	34. Zipper
8. Control Column	17. Spruce Strips	26. Assist Strap	35. Arm Rest
9. Rudder Pedals	18. Map Pockets	27. Door Latch	36. Glove Comp.

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Plate 1 B17 & C17 General Arrangement
Plate 2 B17 & C17 Fuselage Layout
Plate 3 B17 & C17 Wing Details, Main Gear
Plate 4 B17 To G17 Retract. Detail; Tail Wheel
Plate 5 D17 To G17 Wing Details
Plate 6 D17 To G17 Instru. Panel, Tab & Flap
Plate 7 D17 To F17 General Arrangement
Plate 8 G17S Gen. Arrang; Bottom View
Plate 9 D17 To G17 Fuselage Layouts
Plate 10 D17 To G17 Interior Details

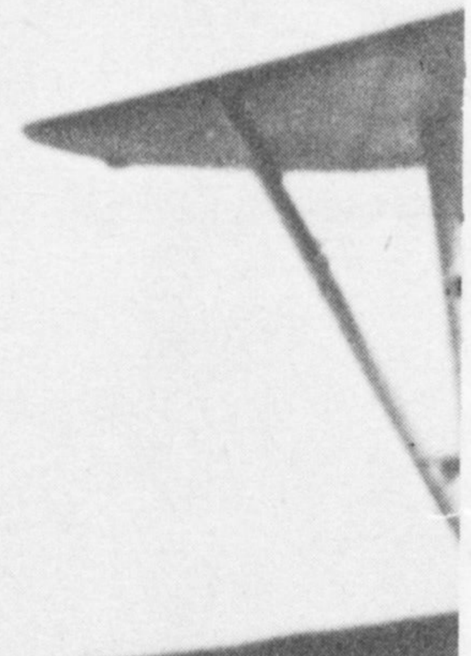
BEECHCRAFT

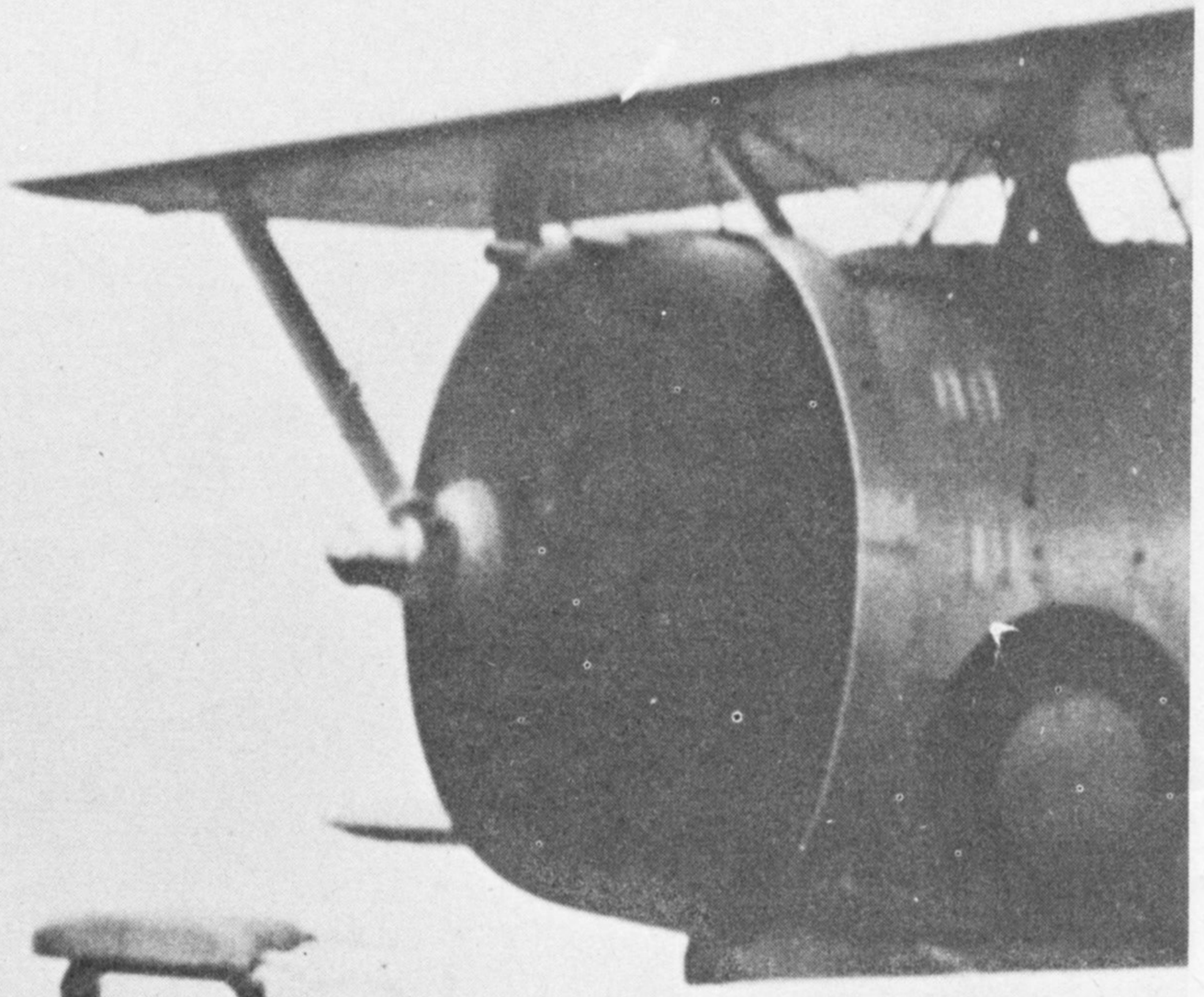
D17 To G17 - Scale: 1/4" = 1'-0" - Plate 10 of 10

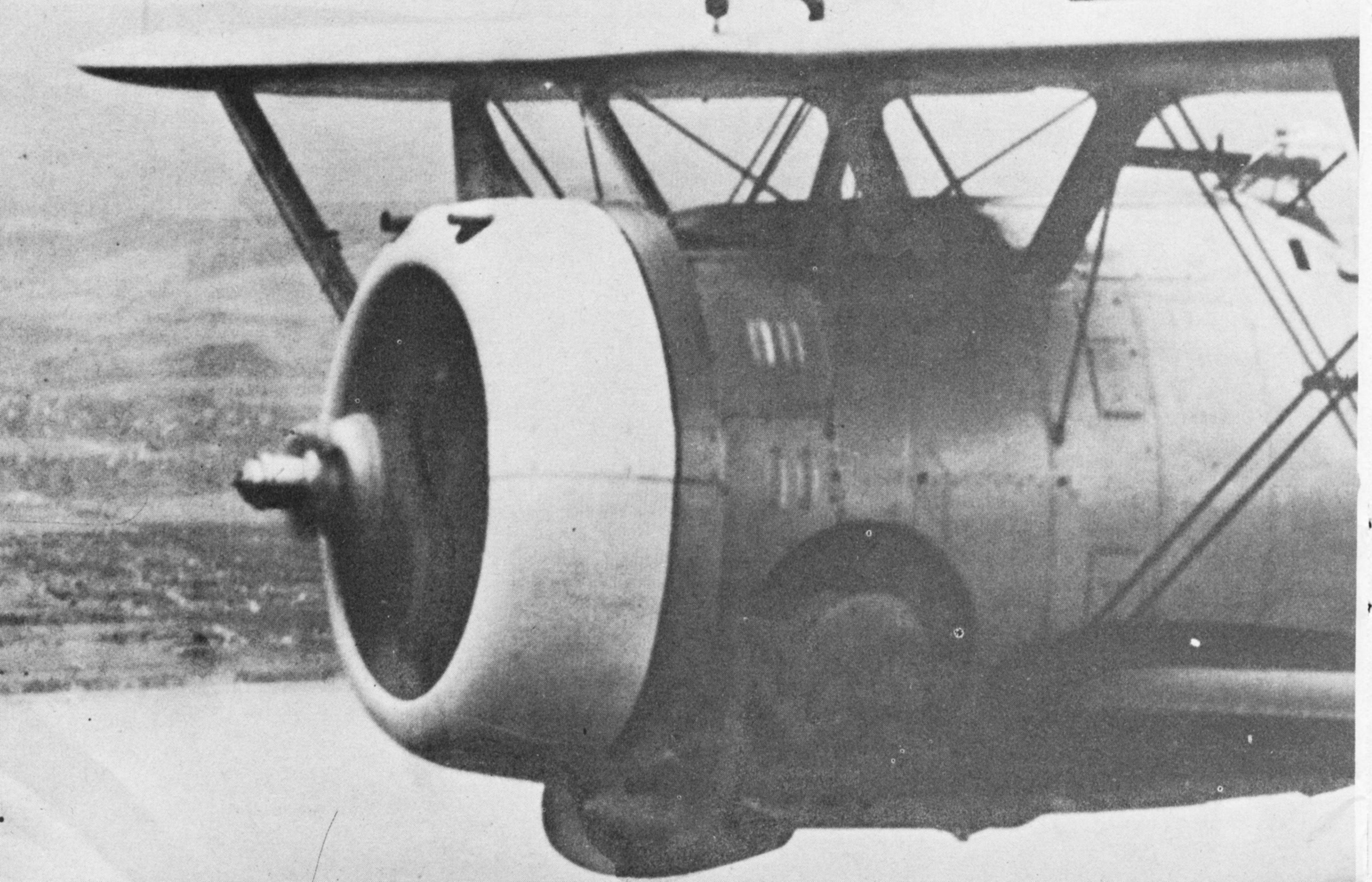
W.A. Wylam

OLD FAVORITES

PLANE	PAGE NO.
GRUMMAN F3F-1	48
BOEING F4B-4	52
GREAT LAKES TRAINER	56
WESTLAND LYSANDER	58

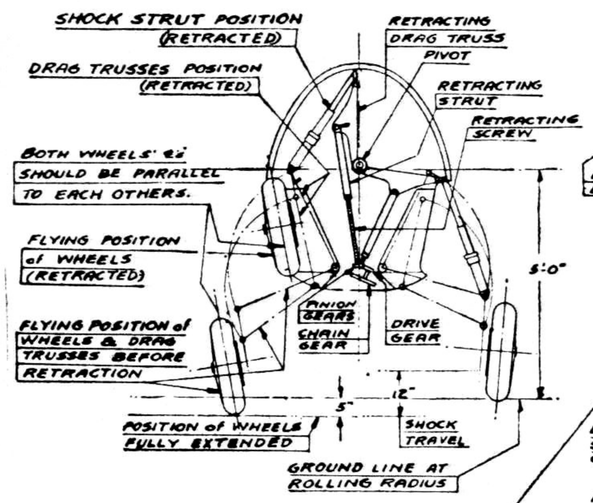


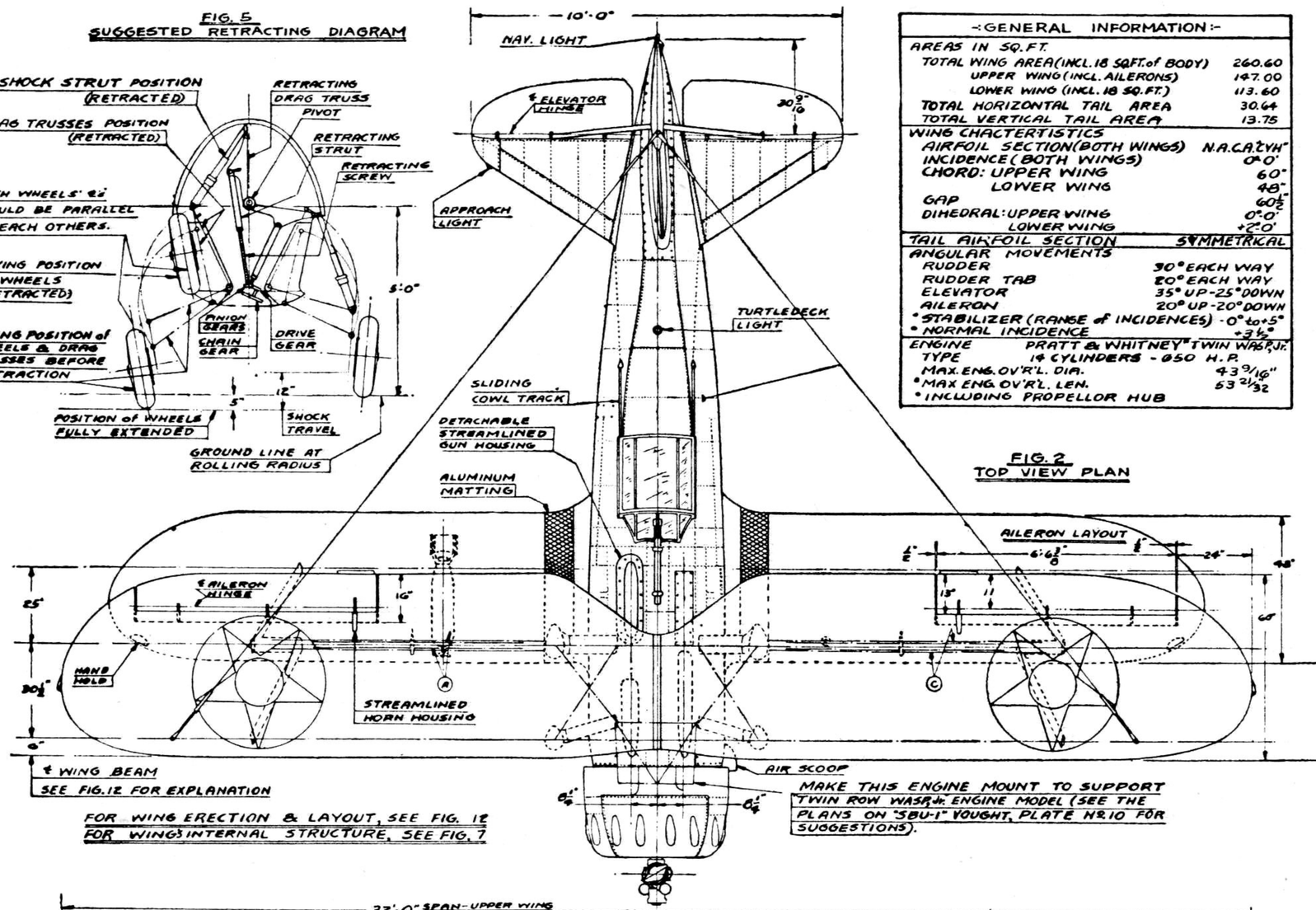




0878
2-MF-10
0873
F3F-2
2-MF-4

FIG. 5
SUGGESTED RETRACTING DIAGRAM





FOR WING ERECTION & LAYOUT, SEE FIG. 12
FOR WING'S INTERNAL STRUCTURE, SEE FIG. 7

FIG. 2
TOP VIEW PLAN

GENERAL INFORMATION	
AREAS IN SQ. FT.	
TOTAL WING AREA (INCL. 18 SQ.FT. of BODY)	260.60
UPPER WING (INCL. AILERONS)	147.00
LOWER WING (INCL. 18 SQ. FT.)	113.60
TOTAL HORIZONTAL TAIL AREA	30.64
TOTAL VERTICAL TAIL AREA	13.75
WING CHACTERTISTICS	
AIRFOIL SECTION (BOTH WINGS)	N.A.CA. 2 VH
INCIDENCE (BOTH WINGS)	0° 0'
CHORD: UPPER WING	60"
LOWER WING	48"
GAP	60 1/2"
DIHEDRAL: UPPER WING	0° 0'
LOWER WING	+2° 0'
TAIL AIRFOIL SECTION	SYMMETRICAL
ANGULAR MOVEMENTS	
RUDDER	30° EACH WAY
RUDDER TAB	20° EACH WAY
ELEVATOR	35° UP - 25° DOWN
AILERON	20° UP - 20° DOWN
* STABILIZER (RANGE of INCIDENCES)	-0° to +5°
* NORMAL INCIDENCE	+3 1/2°
ENGINE	PRATT & WHITNEY "TWIN WASP, JR."
TYPE	14 CYLINDERS - 050 H.P.
MAX. ENG. OV'R'L. DIA.	43 9/16"
* MAX ENG. OV'R'L. LEN.	53 21/32
* INCLUDING PROPELLOR HUB	

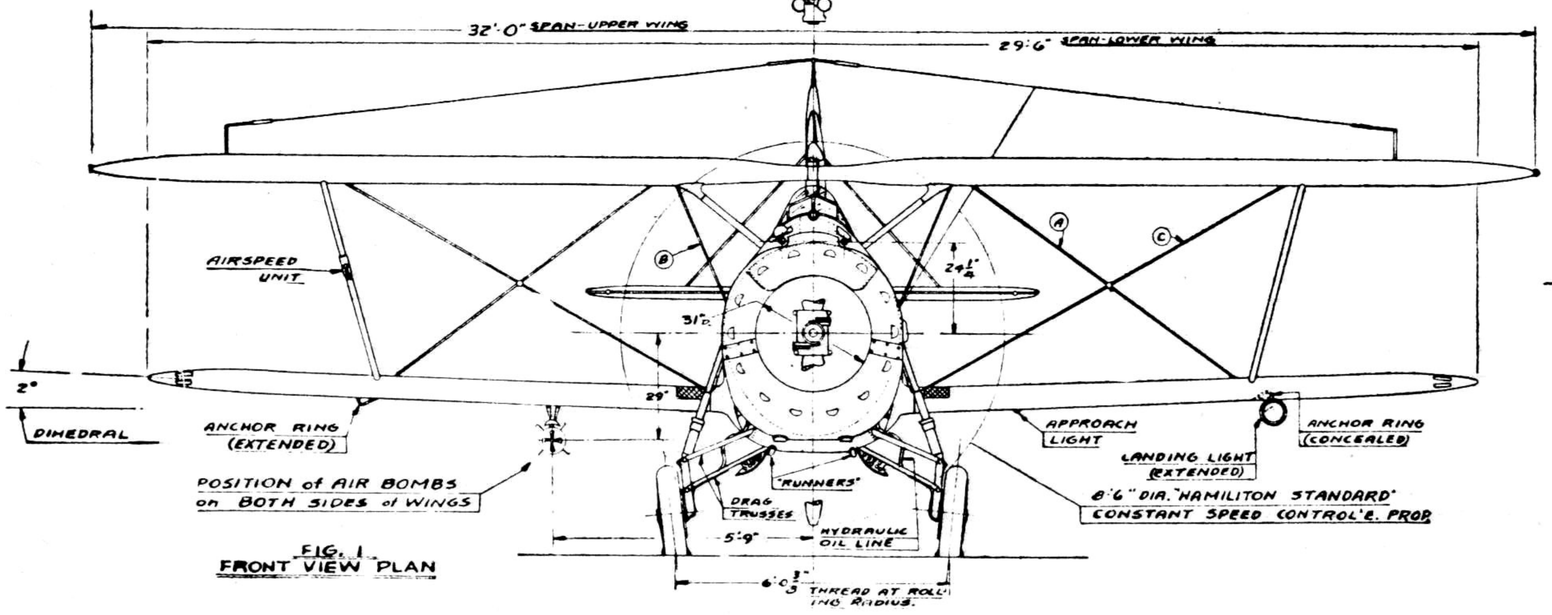


FIG. 1
FRONT VIEW PLAN

FOR VERTICAL TAIL LAYOUT & DETAILS—SEE FIG. 14

FOR FUSELAGE LAYOUT & CROSS SECTIONS—SEE FIG. 13 & FIG. 17

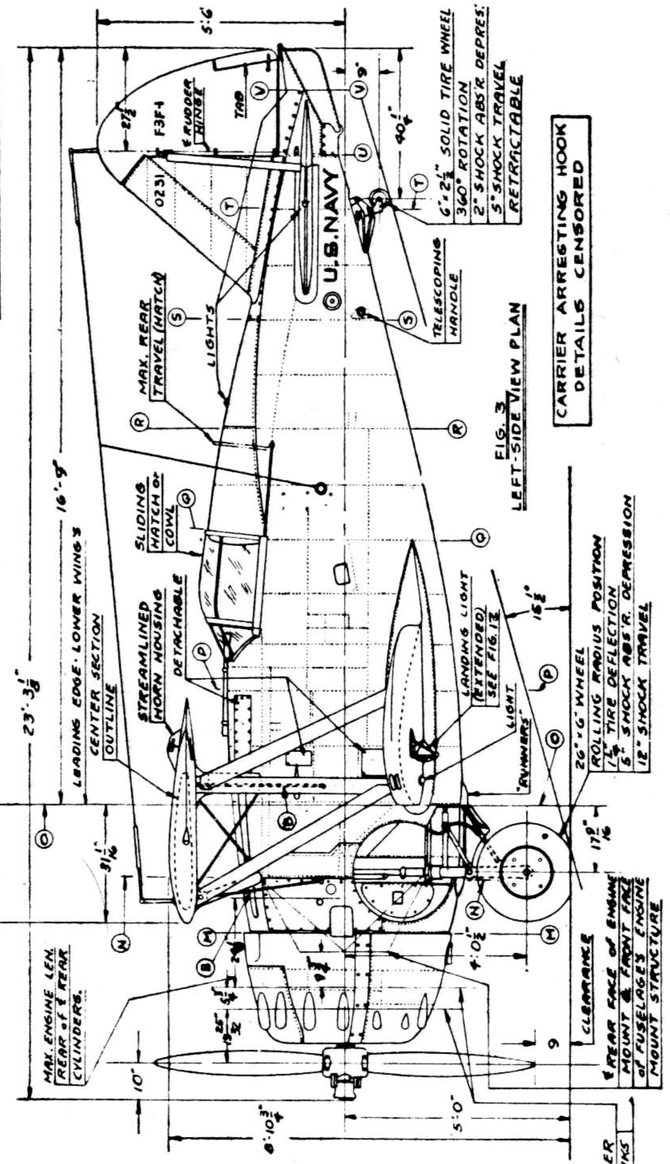


FIG. 3
LEFT-SIDE VIEW PLAN

CARRIER ARRESTING HOOK DETAILS CENSORED

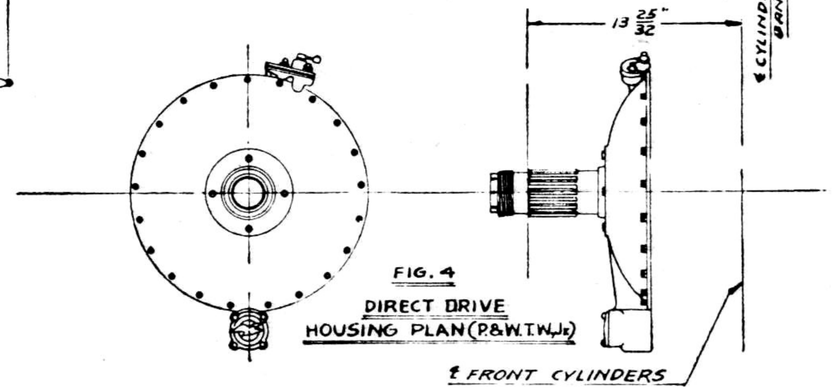


FIG. 4
DIRECT DRIVE HOUSING PLAN (P&W.T.W.,Jr.)

℄ FRONT CYLINDERS

PLATE NR. 12	THREE VIEW ASSEMBLY
SCALE: 3/16" - 1'-0"	GRUMMAN
DRAWN BY... W.A.WYLAM	"F3F-1"

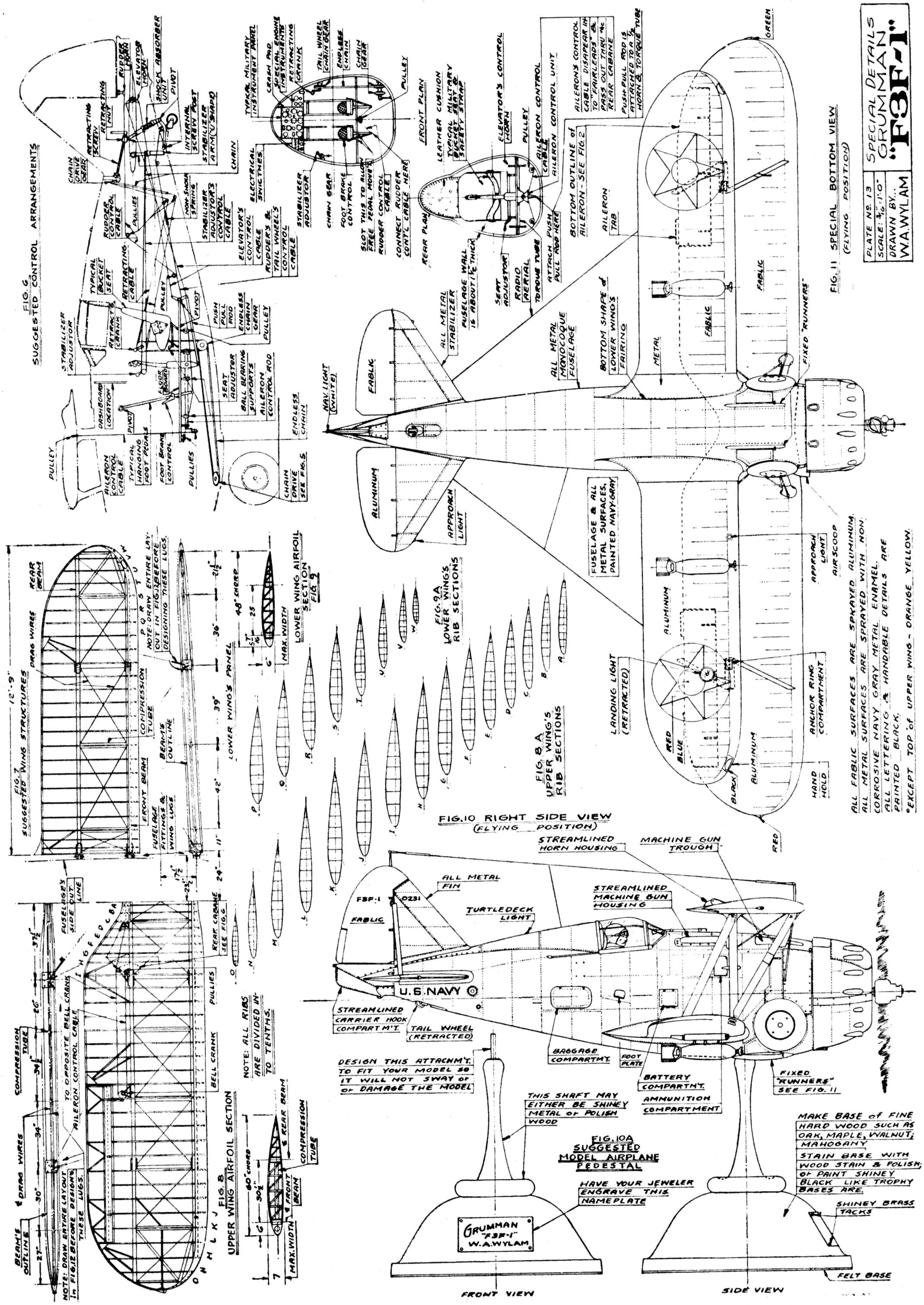
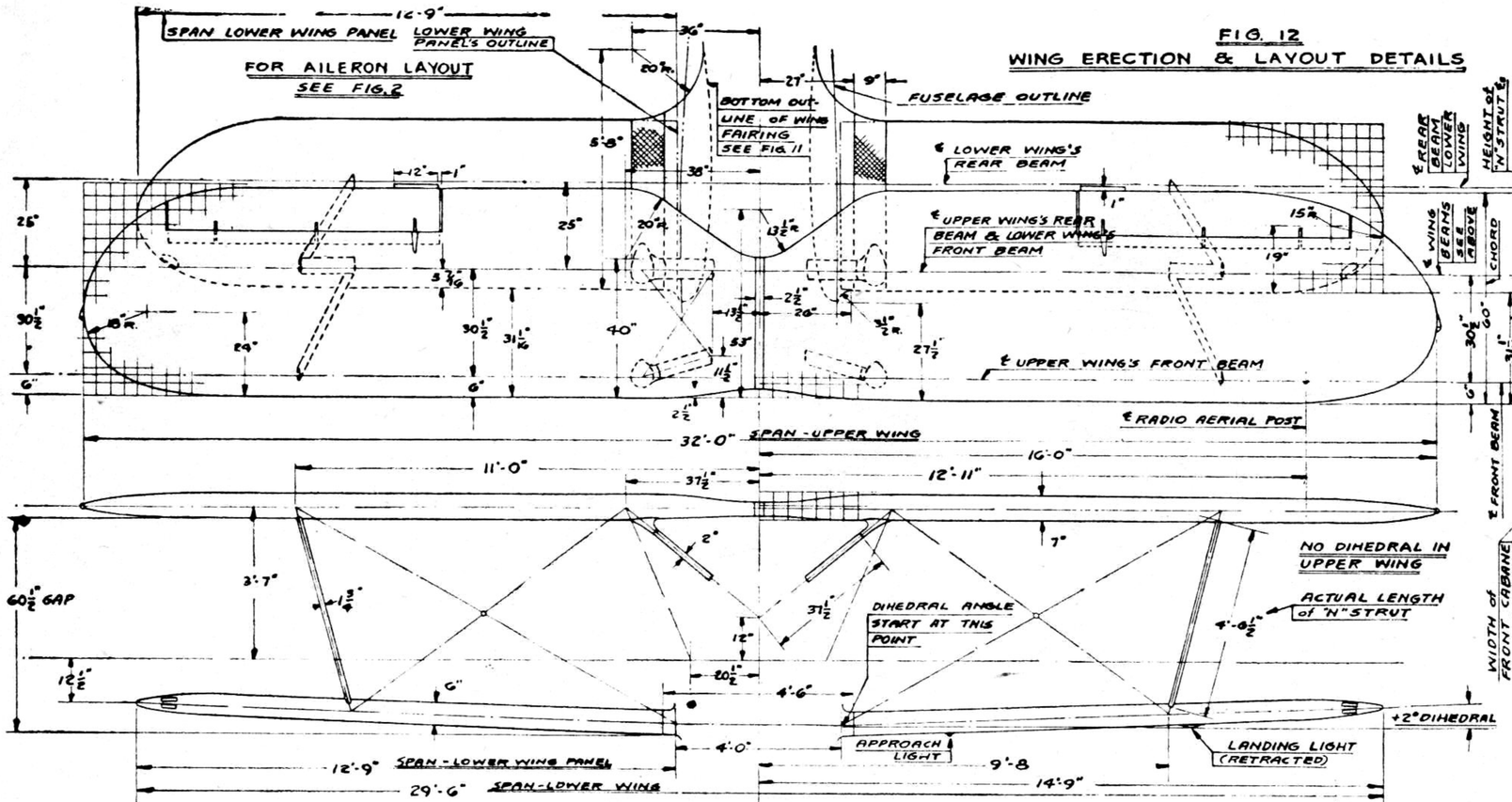


FIG. 6
SUGGESTED CONTROL ARRANGEMENTS
FIG. 7
SUGGESTED WING STRUCTURES
FIG. 8
UPPER WING AIRFOIL SECTION
FIG. 9
LOWER WING AIRFOIL SECTION
FIG. 9A
LOWER WING'S RIB SECTIONS
FIG. 8A
UPPER WING'S RIB SECTIONS
FIG. 10 RIGHT SIDE VIEW
(FLYING POSITION)
FIG. 10A
SUGGESTED MODEL AIRPLANE PEDESTAL
FRONT VIEW
SIDE VIEW
FIG. 11 SPECIAL BOTTOM VIEW
(FLYING POSITION)
PLATE No. 13
SCALE: 3/16"-1'-0"
DRAWN BY... W.A.WYLAM
SPECIAL DETAILS
GRUMMAN
"F3F-1"
U.S. NAVY
GRUMMAN "F3F-1" W.A.WYLAM
ALL FABLIC SURFACES ARE SPRAYED ALUMINUM.
ALL METAL SURFACES ARE SPRAYED WITH NON-CORROSIVE NAVY GRAY METAL ENAMEL.
ALL LETTERING & HANDABLE DETAILS ARE PAINTED BLACK.
*EXCEPT TOP of UPPER WING - ORANGE YELLOW.

FIG. 12
WING ERECTION & LAYOUT DETAILS



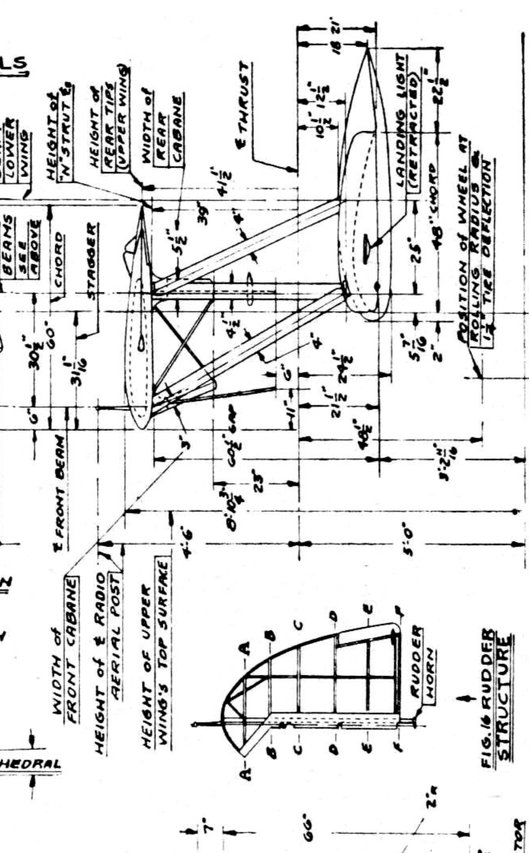


FIG. 16 RUDDER STRUCTURE

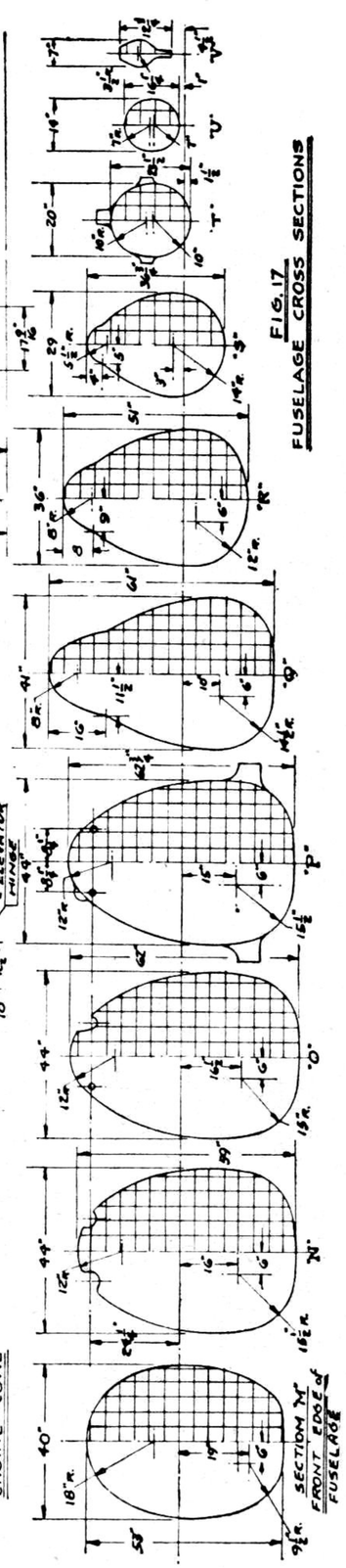


FIG. 17
FUSELAGE CROSS SECTIONS

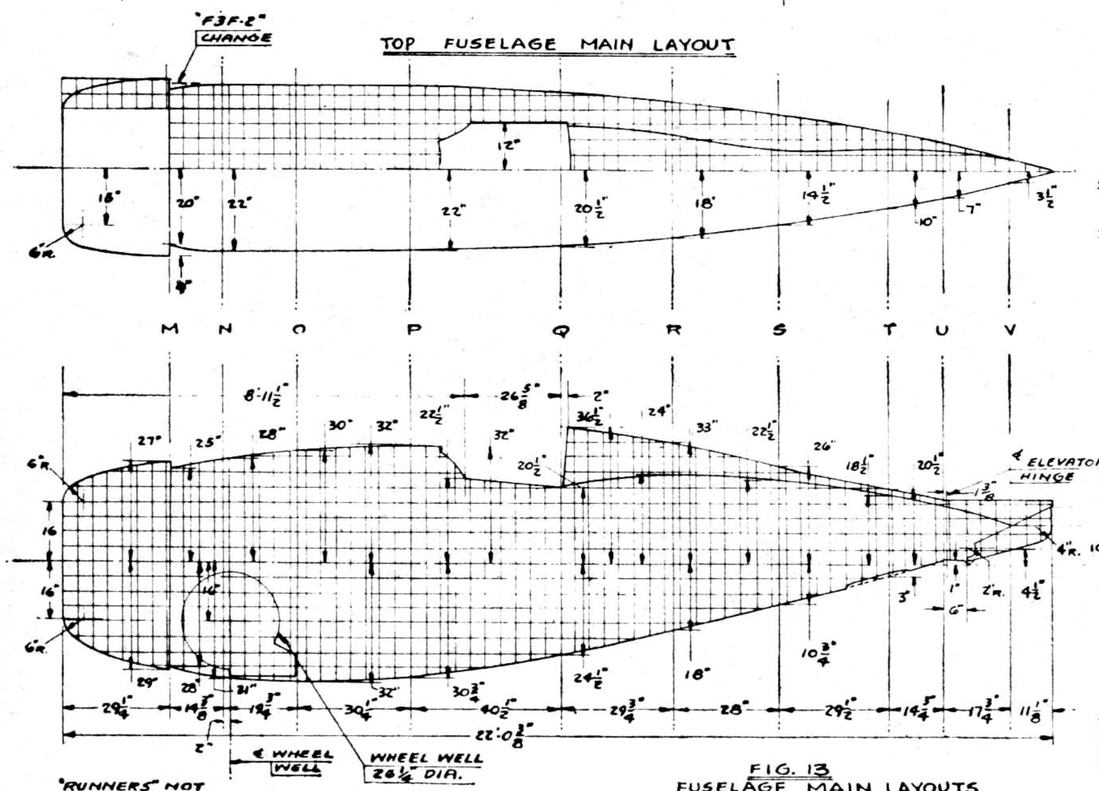


FIG. 13
FUSELAGE MAIN LAYOUTS

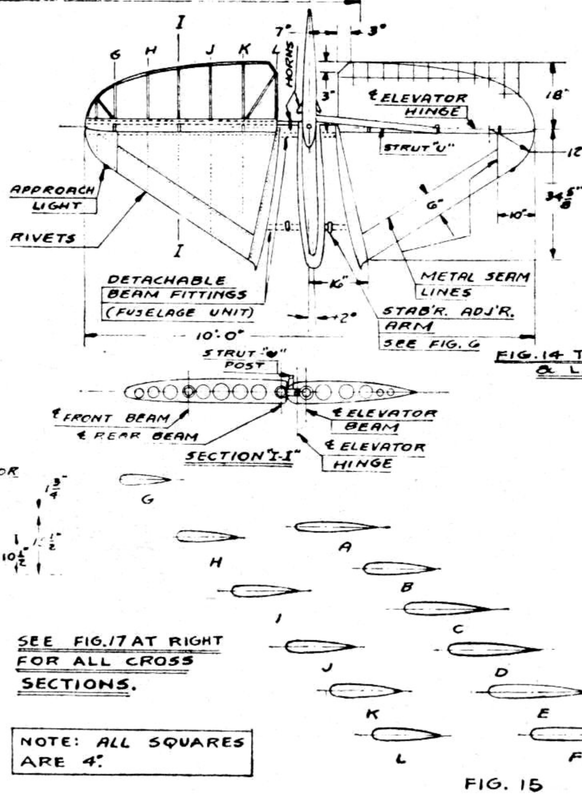
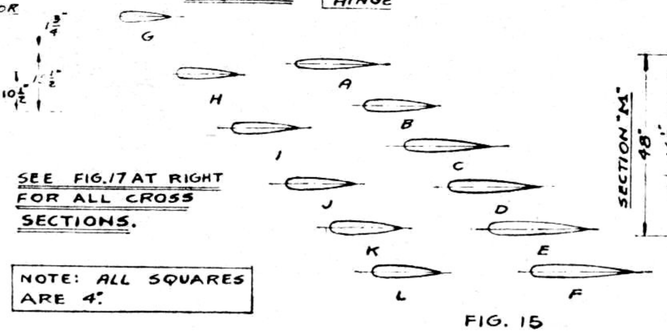


FIG. 14 TAIL ERECTION & LAYOUT DETAILS



SEE FIG. 17 AT RIGHT FOR ALL CROSS SECTIONS.

NOTE: ALL SQUARES ARE 4".

FIG. 15
TAIL'S CROSS SECTIONS

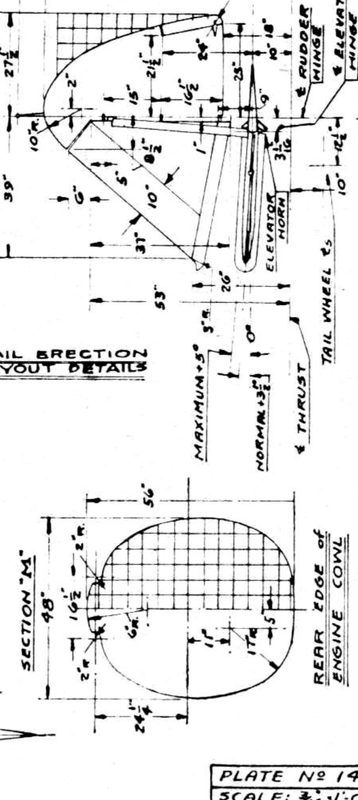
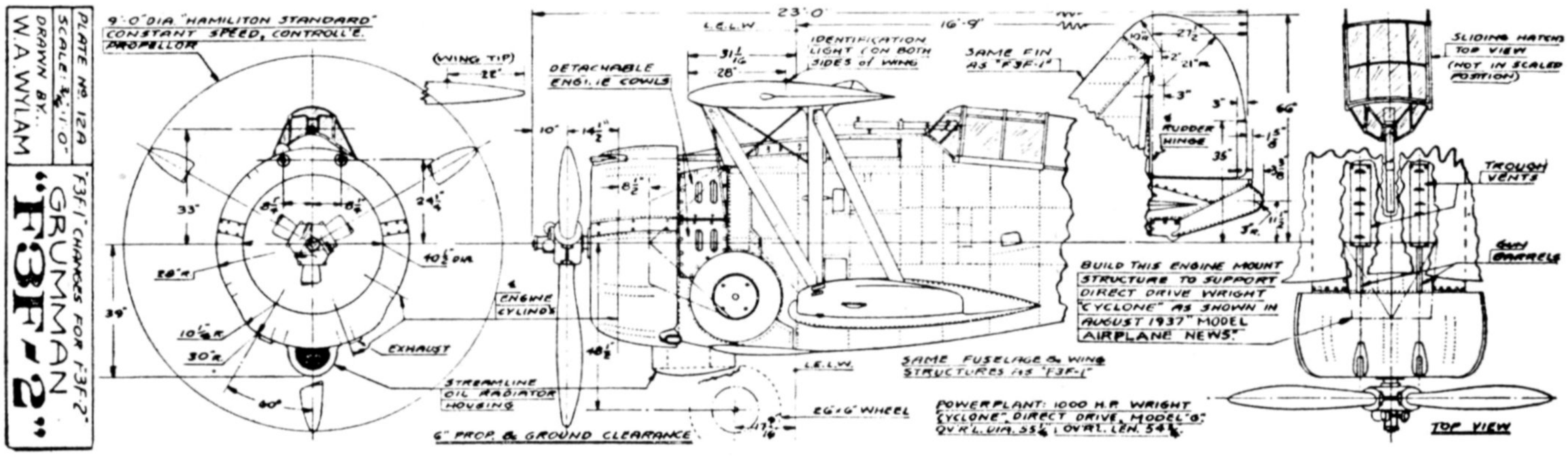


PLATE Nº 14	LAYOUTS & CROSS SECTIONS GRUMMAN "F3F-1"
SCALE: 3/16"-1'-0"	
DRAWN BY... W.A.WYLAM	



Above drawing shows F3F-1 changes for F3F-2 variations of Grumman Fighter.

GRUMMAN PROTOTYPE XF3F-1

F4B P-12

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

SCALE: $\frac{1}{4}$" = 1'-0" — F4B-1, F4B-2, P-12, P-12B, P-12C FUSELAGE ARRANGEMENT

PAGE 1 of 4

DRAWN BY... WILLIAM A. WYLAM

BUILT 1928-30 BY BOEING AIRPLANE COMPANY

SQUADRON COLORS WERE RODEO

ENTIRE TAIL - LIGHT GREY

STENCILING - BLACK

FABRIC - ALUMINUM

METAL SURFACES - LIGHT GREY

NAVY FUSELAGE COLORATION

180° SWIVEL'G. - NAVY

6" DIA. × 2½" WIDE

ARMY TAIL STRIPES

RED — BLUE — WHITE

FIXED FIN

ADJUST. STABILIZER +2°- 4°

FABRIC

ARMY FUSELAGE

RIGHT SIDE VIEW (F4B-2 SHOWN) DETAILS ARE COMMON ON ALL MODELS EXCEPT MODEL "100". NAVY HAD ALTERED FUSELAGE FOR CARRIER HOOK, (ABANE WIRES, WIDER TRACK & HEAVIER UNDERCARRIAGE. LATE P-12B, P-12C, F4B-1 AND F4B-2 HAD TOWNSEND ENGINE RING.

GUN SIGHT - ARMY-NAVY

OPTIONAL PADDING ARMY-NAVY

REAR VIEW MIRROR

30 CAL. BROWNING M/Gs

VENTURI

BOMB SIGHT - NAVY

AIR INTAKE

BUTTERFLY VALVE

AREA HEATER EXHAUST

OPTIONAL COVER (P-12C & F4B2)

(ABANE WIRE (NAVY)

2" DIA. BLAST TUBE (OPTIONAL F4B-1)

COWL BRACE

COWL WAS MADE IN SIX EQUAL SECTIONS; HELD TOGETHER BY RING & SAFETY PINS; SUPPORTED BY THREE COWL BRACES (DARK LINES)

FRONT & REAR VIEWS OF P. & W. WASP (COMMON ON ALL MODELS ON PAGES 1 & 2)

SECTION "Z-Z"

(CYLINDER HEAD FAIRINGS WERE REMOVED FROM EARLY P-12Bs BECAUSE OF COOLING TROUBLES

Z

louvers & EXHAUST VARIES ON SAME MODELS

9'-7"

20'-7⅜" MODELS XF4B, EARLY "100" F4B-2 & P-12C

RIGHT SIDE IS SIMILAR (WITHOUT BAGGAGE DOOR)

FABRIC - MODEL "100", XF4B

FABRIC (P-12)

(CROSSED AXLE UNDERCARRIAGE

SPLIT AXLE TYPE UNDERCARRIAGE

GROUND LINE AT ROLLING RAD.

E/2

E TRACK

C

F

D

1'-5"

MODEL	PROP. DIA.	ENGINE
P-12 "100"	9'-2"	400 H.P. P.&W. WASP
P-12B F4B-1	9'-0"	410 H.P. P.&W. WASP
P-12C F4B-2	9'-0"	450 H.P. P.&W. WASP

RIGHT SIDE VIEW (F4B-2 SHOWN) DETAILS ARE COMMON ON ALL MODELS EXCEPT MODEL "100". NAVY HAD ALTERED FUSELAGE FOR CARRIER HOOK, (ABANE WIRES, WIDER TRACK & HEAVIER UNDERCARRIAGE. LATE P-12B, P-12C, F4B-1 AND F4B-2 HAD TOWNSEND ENGINE RING.

NAVY FUSELAGE COLORATION
METAL SURFACES - LIGHT GREY
FABRIC - ALUMINUM
STENCILING - BLACK
ENTIRE TAIL - LIGHT GREY
SQUADRON COLORS WERE RODEO

6" DIA. × 2½" WIDE
180° SWIVEL'G. - NAVY

ARMY TAIL STRIPES
RED — BLUE — WHITE

FIXED FIN
ADJUST. STABILIZER +2°- 4°

FABRIC

ARMY FUSELAGE

GUN SIGHT - ARMY-NAVY
OPTIONAL PADDING ARMY-NAVY
REAR VIEW MIRROR
30 CAL. BROWNING M/Gs
VENTURI
BOMB SIGHT - NAVY
AIR INTAKE
BUTTERFLY VALVE
AREA HEATER EXHAUST
OPTIONAL COVER (P-12C & F4B2)
(ABANE WIRE (NAVY)
2" DIA. BLAST TUBE (OPTIONAL F4B-1)
COWL BRACE

COWL WAS MADE IN SIX EQUAL SECTIONS; HELD TOGETHER BY RING & SAFETY PINS; SUPPORTED BY THREE COWL BRACES (DARK LINES)

FRONT & REAR VIEWS OF P. & W. WASP (COMMON ON ALL MODELS ON PAGES 1 & 2)

GROUND LINE AT ROLLING RAD.

E/2

E

CROSSED AXLE TYPE UNDERCARRIAGE
MODEL 100, XF4B, F4B-1, P-12, P-12B

SHOCK ABSORBER STRUT WAS ENCASED IN STREAMLINE HOUSING. HOUSING WAS SPLIT AT LEADING EDGE; HELD TOGETHER BY CLAMP BANDS "R" AND SCREWS "U." SAME CONTRUCTION ON AXLE STRUT AND SPLIT AXLE TYPE UNDERCARRIAGE.

SCREEN
LATE P-12B

A
B
C
D
E
F

PROP.

3"
1'-1 23/32" TO 1'-2½" "U"
"R"
4¾"

30" DIA. × 5" WIDE ALL MODELS

VERTICAL TAIL IS COMMON ON ALL MODELS
OPTIONAL NAV. LIGHT - ARMY
DOUBLE HINGED ACCESS PANEL
HINGED BAGGAGE DOOR
BLACK LEATHER
METAL DECK & SIDE FRAMING
FUEL LEVEL GAGE
REJECT CHUTE

U.S. ARMY
BOEING P-12B
A.C. 29-332

BLACK OR WHITE
BLACK STENCIL'G. - ARMY
LEFT SIDE ONLY

180° SWIVELING - OLEO TYPE TAIL SKID - ARMY

LEFT SIDE VIEW (P-12B SHOWN) DETAILS ARE COMMON ON ALL MODELS EXCEPT MODEL "100" VARIABLES ARE: EXHAUST, COOLING LOUVERS, UNDERCARRIAGE, WINGS, TAIL SKIDS, M.G. TROUGHS, AND HORIZONTAL TAIL.

MODEL	A	B	C	D	E	F
100	20'-1⅜"	3'-1"	3'-9"	5'-10"	6'-3"	15°
P-12	20'-1⅜"	3'-1"	3'-9"	5'-10"	6'-3"	15°
P-12B	20'-0 19/32"	3'-0 7/32"	3'-8 7/32"	5'-6"	6'-3 5/16"	15°
P-12C	20'-0 29/32"	3'-0 3/32"	3'-8 3/32"	5'-3"	6'-3 9/16"	14½°
F4B-1	20'-1⅜"	3'-1"	3'-9"	5'-10"	6'-3"	15°
F4B-2	20'-0 23/32"	3'-0 3/32"	3'-8 3/32"	5'-4"	6'-4 9/16"	13°

METAL PANELS
FUEL TANK VENT
REMOVABLE PANEL

CARRIER HOOK - NAVY
TAIL SKID SHOE - ARMY

DRAIN
EXHAUST OUTLETS
49 GAL. DROP TANK

FABRIC

TYPICAL BOTTOM VIEW

ARMY FUSELAGE COLORATION
ENTIRE FUSE. & TAIL - OLIVE DRAB
STENCILING — BLACK
RUDDER - SEE RIGHT SIDE VIEW

AIR AGE INC., 551 FIFTH AVE., NEW YORK 17, N.Y.		
SCALE: 1/4"=1'-0"	F4B-3, F4B-4, P-12D, P-12E FUSELAGE ARRANGEMENT	F4B P-12
PAGE 2 of 4		
DRAWN BY... WILLIAM A. WYLAM	BUILT/93/-'33 BY BOEING AIRPLANE COMPANY	

DETAILS OF WINGS ON PAGE THREE

DETAILS OF FUSELAGE ON PAGE FOUR

P-12D ONLY

7"O.D. × 2" WIDE PNEUMATIC
180° SWIVEL REC. - P12E ONLY

RIGHT SIDE VIEW (P-12E SHOWN) DETAILS OF P-12D, P-12E, P-12F & F4B-3 WEEE COMMON EXCEPT FOR INERTIA STARTING SYSTEM (R.H. REMY - L.H. NAVY) AND SIDE COWLING PANELS. EXHAUST STACKS WERE TAPERED AS SHOWN, OR WERE CUT SQUARE 4" FROM MOUNTING FACE. COLLECTOR RING WAS INSTALLED ON LATE P-12E. P-12F HAD SLIDING HATCH OVER COCKPIT.

ACCESS DOOR
WHITE NAV. LIGHT - ARMY
WHITE
BLUE
RED
FIXED FIN
ADJUST. STAB. +2°-4°
REJECT CHUTE
BLACK PADDING
BOMB SIGHT - NAVY
GUN SIGHT - ARMY - NAVY
TWIN .30 CAL. M 6's.
OPTIONAL .50 CAL. M.G.
INDUCTION MANIFOLD

P-12D, E, F AND F4B-3

F4B-4

ADJUST. DAMPER

ARMY ONLY

20'-4 11/16 ALL MODELS ON THIS PAGE

SAME RUDDER ON ALL MODELS

3'-4"

DOUBLE STAYS F4B-4 ONLY

1'-6 1/2" ¢ CYLINDERS

3

F4B-3 & F4B-4

F4B-4 ONLY
BLACK WEATHER COVER
ALL MODELS

CANVAS HOUSING - NAVY

6" DIA. × 2 1/2" WIDE SOLID WHEEL
180° SWIVEL ARC
(P-12E HAD MODIFIED METAL HOUSING)

9'-0" PROP. DIA. ALL MODELS

6 1/2 6 1/2
3
2'-5 1/2
1'-5
2'-6

NAMEPLATE

55 GAL. DROP TANK ALL MODELS

5'-4

15 1/2°

LEFT SIDE VIEW (F4B-4 SHOWN) SAME FUSELAGE ON ALL MODELS WITH MINOR EXTERIOR CHANGES. P-12E & F4B-3 WERE IDENTICAL EXCEPT FOR CABANE WIRES & DOUBLE ROW OF RIVETS. F4B-4 DIFFERS BY HEADREST, FIN, EXHAUST, AND LEFT SIDE ENGINE COWL PANEL.

3'-2 9/32"

4'-0"

6'-4 9/16"

GROUND LINE AT ROLLING RADIUS

FIXED UNDERCARRIAGE FAIRING

FABRIC (WING) REMOVABLE PANEL

CARRIER HOOK

TAIL WHEEL CABLE

COWL WAS MADE IN 6 EQUAL SECTIONS

EXHAUST OUTLET ALL MODELS

TYPICAL BOTTOM VIEW

FUSELAGE COLORATION

	ARMY	NAVY
FUSELAGE	BLUE	LIGHT GREY
*TAIL	ORANGE-YELLOW	LIGHT GREY
STENCILING	BLACK	BLACK
ENGINE COWLS	BLUE	LIGHT GREY

SQUADRON COLORS WERE ADDED

*ARMY RUDDER HAD STRIPES AS SHOWN

RIGHT SIDE VIEW F4B-4

RIGHT SIDE
LEFT SIDE
(ARR. HEAT INLET ¢
F4B-3 COWLING PANELS

SCREENED INLET
INERTIA STARTER
STARTER CRANK DOOR

P-12D COWLING PANELS

RIGHT SIDE
LEFT SIDE
¢ WHEEL & AXLE
HINGED FUEL FILL PANEL
HINGED OIL FILL PANEL

FUEL LEVEL GAGE - ALL MODELS
SCREENED INLET - ARMY
PUSH ROD FAIRING

LEFT SIDE
P-12E

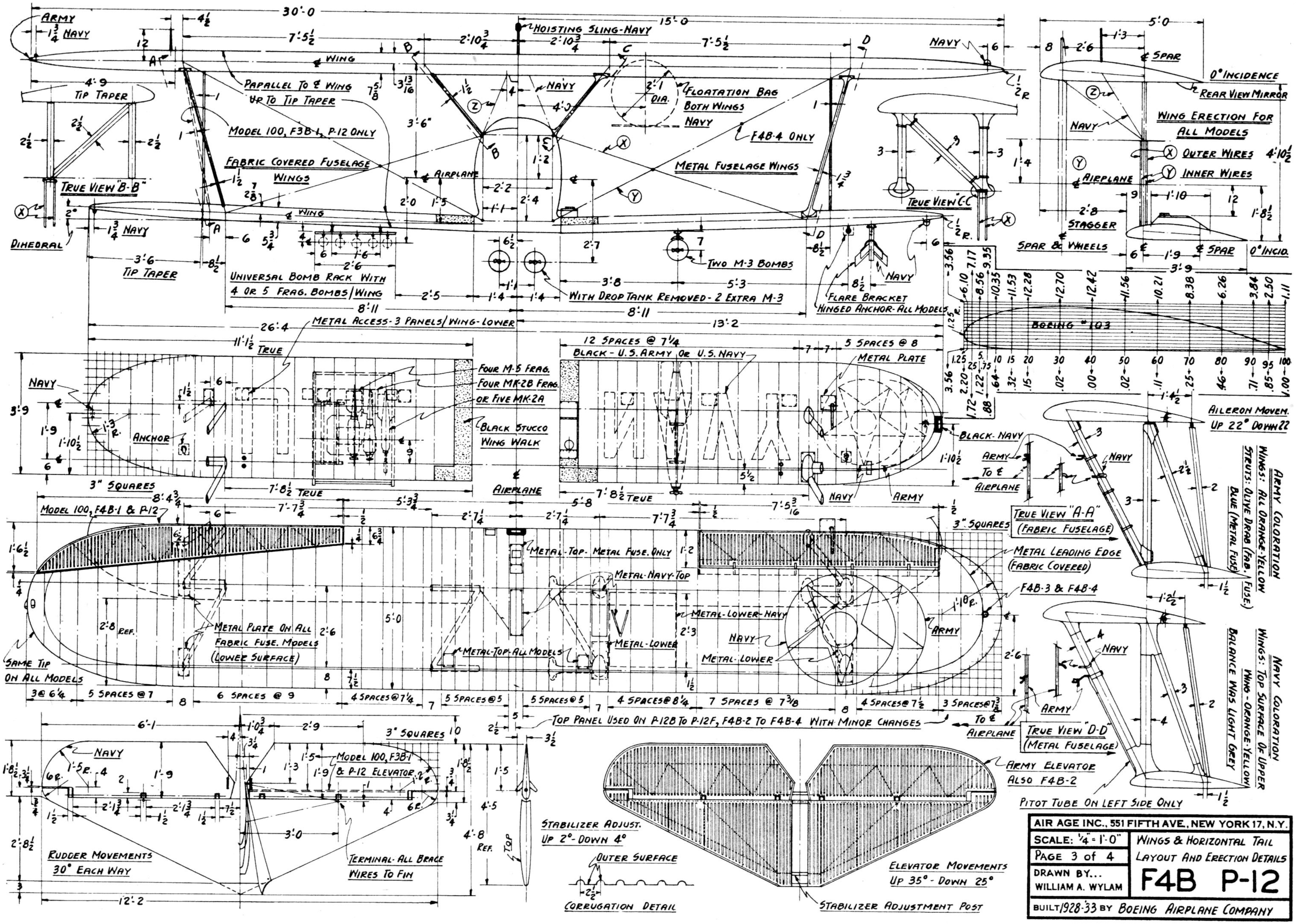
ALL MODELS EXCEPT F4B-4 (ARR. HEAT MANIFOLD)

FAIRING - ARMY ONLY

GROUND LINE AT ROLLING RADIUS

30" DIA. × 5" WIDE WHEEL - ALL MODELS

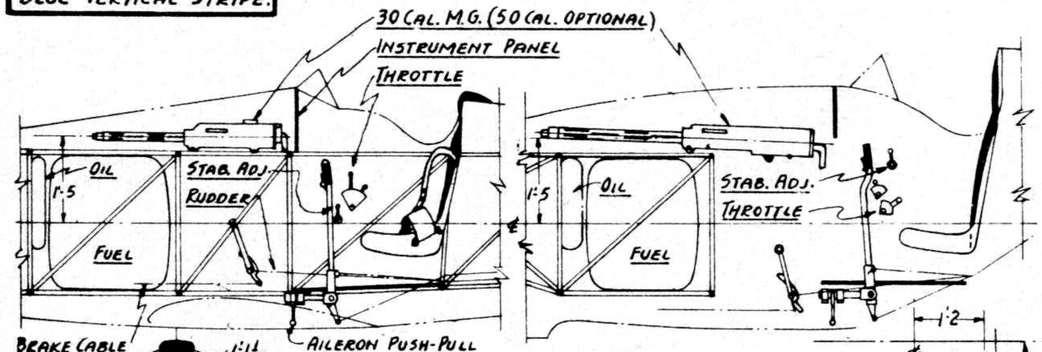
15 1/2°

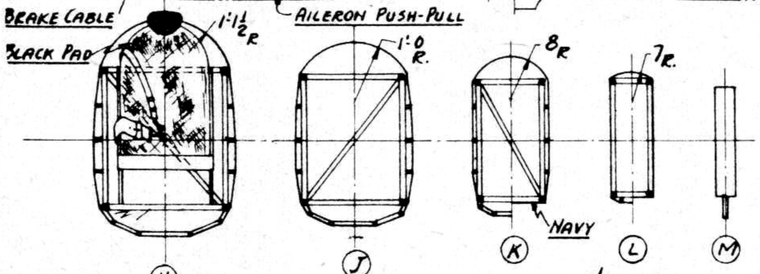


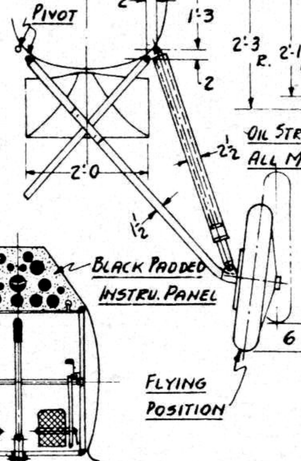
AIR AGE INC., 551 FIFTH AVE., NEW YORK 17, N.Y.	
SCALE: ¼" = 1'-0"	WINGS & HORIZONTAL TAIL LAYOUT AND ERECTION DETAILS
PAGE 3 of 4	
DRAWN BY... WILLIAM A. WYLAM	F4B P-12
BUILT 1928-33 BY BOEING AIRPLANE COMPANY	

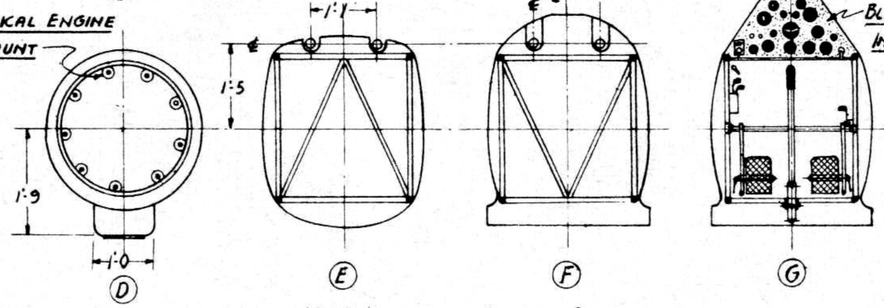
NOTICE: ERROR ON PAGES 1 AND 2 ARMY RUDDER COLORATION SHOULD BE RED & WHITE HORIZONTAL STRIPES WITH BLUE VERTICAL STRIPE.

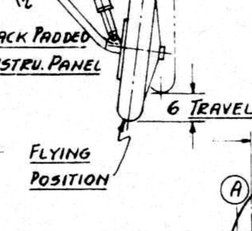
MODEL	ENGINE
F4B-3 P-12D	500 H.P. P. & W. WASP
F4B-4 P-12E	550 H.P. P. & W. WASP

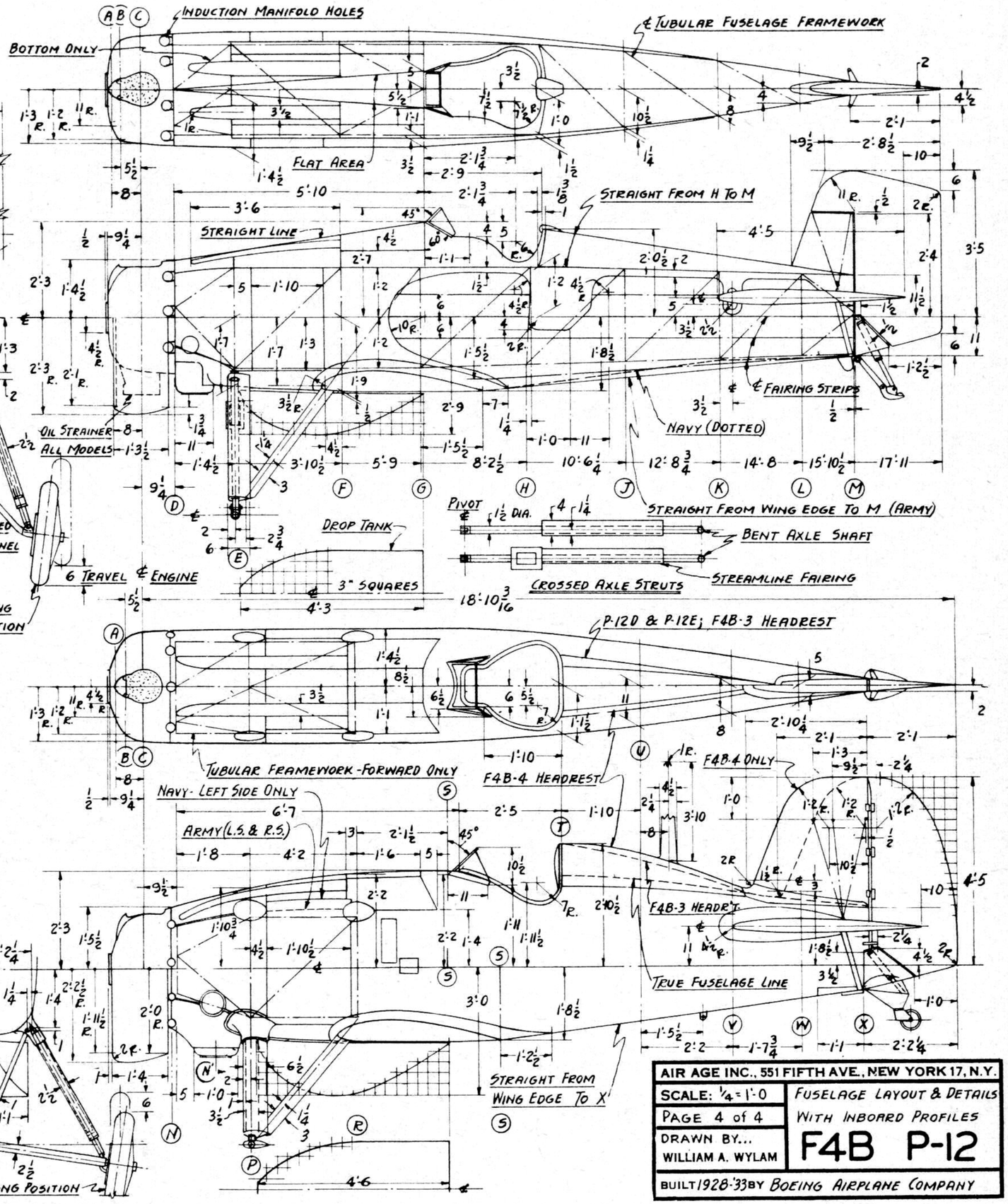


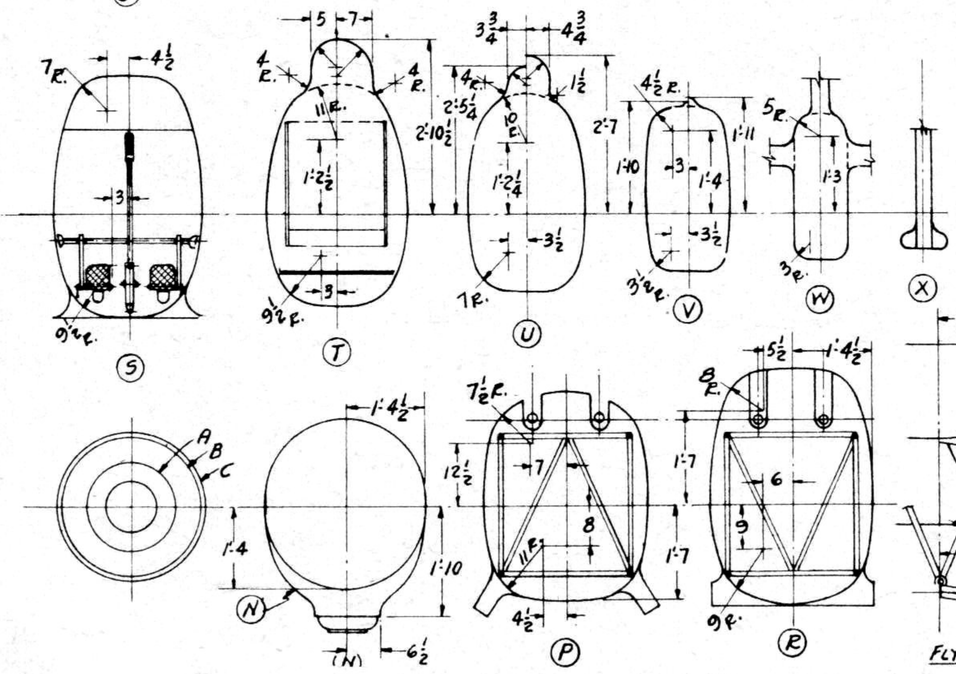












AIR AGE INC., 551 FIFTH AVE., NEW YORK 17, N.Y.	
SCALE: 1/4 = 1'-0	FUSELAGE LAYOUT & DETAILS WITH INBOARD PROFILES
PAGE 4 of 4	F4B P-12
DRAWN BY... WILLIAM A. WYLAM	
BUILT 1928-33 BY BOEING AIRPLANE COMPANY	

AIR AGE INC., 551 FIFTH AVE, NEW YORK 17, N.Y.	GENERAL ARRANGEMENT
SCALE: 1/4"-1'-0"	GREAT LAKES SPORT TRAINER
PAGE 1 of 2	2T-1A | 2T-1E
DRAWN BY... WILLIAM A. WYLAM	BUILT 1929-33 BY GREAT LAKES AVIATION CORP.

MODEL 2T-1A WITH UPRIGHT A.C.E. (IRRUS III 4 CYLINDER IN-LINE, AIR COOLED 95 H.P. - SINGLE OR TWO PLACE. SAME CONSTRUCTION ON ALL MODELS WITH MINOR CHANGES ON ENGINE COWLINGS, PROPELLER, WHEELS & FAIRINGS.

BROWN LEATHER
BUCKET SEAT
SAFETY BELT
STAB. ADJ.
THROTTLE
BRAKE
RUDDER
WORM & GEAR HOUSING
CONNECTING TUBE "A"
GRAVITY FEED
FUEL LINES ON
TRAILING EDGE
OF FRONT L.H.&
REAR R.H. (ABANE
STRUTS.

1. PRIMER
2. TACHOMETER
3. OIL TEMP.
4. CLOCK
5. BANK & TURN
6. CYL. HEAD TEMP.
7. IGNITION
8. COMPASS
9. OIL PRESS
10. AIR SPEED

STABILIZER ADJUSTER
BELL CRANK

STAB. ADJ. CRANK
ELEVATOR TUBE
RUDDER CABLES
DURALUMIN ROD
DOUBLE BRACE WIRES
-AUX. SPAR
-METAL FAIRING
SPRUCE FAIRING STRIPS
STAB. ADJ. TUBE
UNIVERSAL JOINT
AILERON TORQUE TUBE
THROTTLE CONTROL
FUEL VENT
DASHBOARD
EXHAUST
-FIREWALL
COOLING AIR OUTLET
-FRONT RUDDER POST
(CONNECTING TUBE "A"
OPTIONAL: WOODEN
OR STEEL ADJ. PEDR
(WOODEN SHOWN)
STAB. ADJ. CRANK
STRAP & RACK
ELEVATOR PUSH-PULL TUBE
WORM & GEAR HOUSING (AILERONS)

PLAN VIEW OF COCKPIT & CONTROLS

ELEVATOR TUBE
RUDDER CABLES
DURALUMIN ROD
DOUBLE BRACE WIRES
-AUX. SPAR
-METAL FAIRING
SPRUCE FAIRING STRIPS
METAL FAIRING PANEL
FABRIC (OVERED DECK
METAL HEADREST
DURALUMIN FIGS & SPARS
WORM & GEAR HOUSING
RUDDER PEDAL AXLE
-FRONT RUDDER POST
POLISHED FOOT PLATE
EXHAUST STACKS
FUEL FILL
-FUEL TANK-26 GALS
3:9
FUEL VENT
FUEL LINE (ON TRAILING STRUT R.H.)
OPTIONAL WINDSHIELD
METAL DECK
FIXED TOP PANEL
REMOVABLE PANEL
DOUBLE (ABANE WIRES
(CONNECTING TUBE "A"
-RUDDER PEDAL AXLE
-FRONT RUDDER POST
POLISHED FOOT PLATE
EXHAUST STACKS
FUEL FILL
-FUEL TANK-26 GALS
FUEL VENT
FIREWALL
EXHAUST

FUEL FILL
FUEL GAGE
EXHAUST
FUEL VENT
FUEL LINE
FUSELAGE
OIL FILL
STEP
FLYING POSITION
STANDARD TIRE
24" O.D. × 5½" WIDE
5:10
3
4:8½
FRONT
LEFT SIDE
FUSELAGE
2½
FIREWALL
PLAN
OPTIONAL ENGINE
MENASCO PIRATE B-4
INVERTED 4 CYL. IN LINE
AIRCOOLED 90 H.P.
METAL OR WOOD PROPELLER
20:3 15/16 —

BOTTOM & PLAN VIEWS OF ENGINE COWLINGS WERE THE SAME, EXCEPT FOR EXHAUST, ON BOTH UPRIGHT & INVERTED CIRRUS ENGINES.

STEP HERE
NO STEP
BLACK STUCCO WALKWAY
±3° STABILIZER ADJUSTMENT RANGE
GREAT LAKES' TRADEMARK WAS GOLD WITH BLACK OR SILVER TRIM

20:3 15/16 LENGTH - METAL PROPELLER - ALL MODELS
20:3 13/16 LENGTH - WOOD PROPELLER - ALL MODELS

MODEL 2T-1E WITH INVERTED A.C.E. CIRRUS "HI-DRIVE" 4 CYLINDER IN-LINE, AIR COOLED, 95 H.P. - SINGLE OR TWO PLACE WITH OR WITHOUT WING FAIRINGS & WHEEL PANTS.

STAB. ADJ. ACCESS

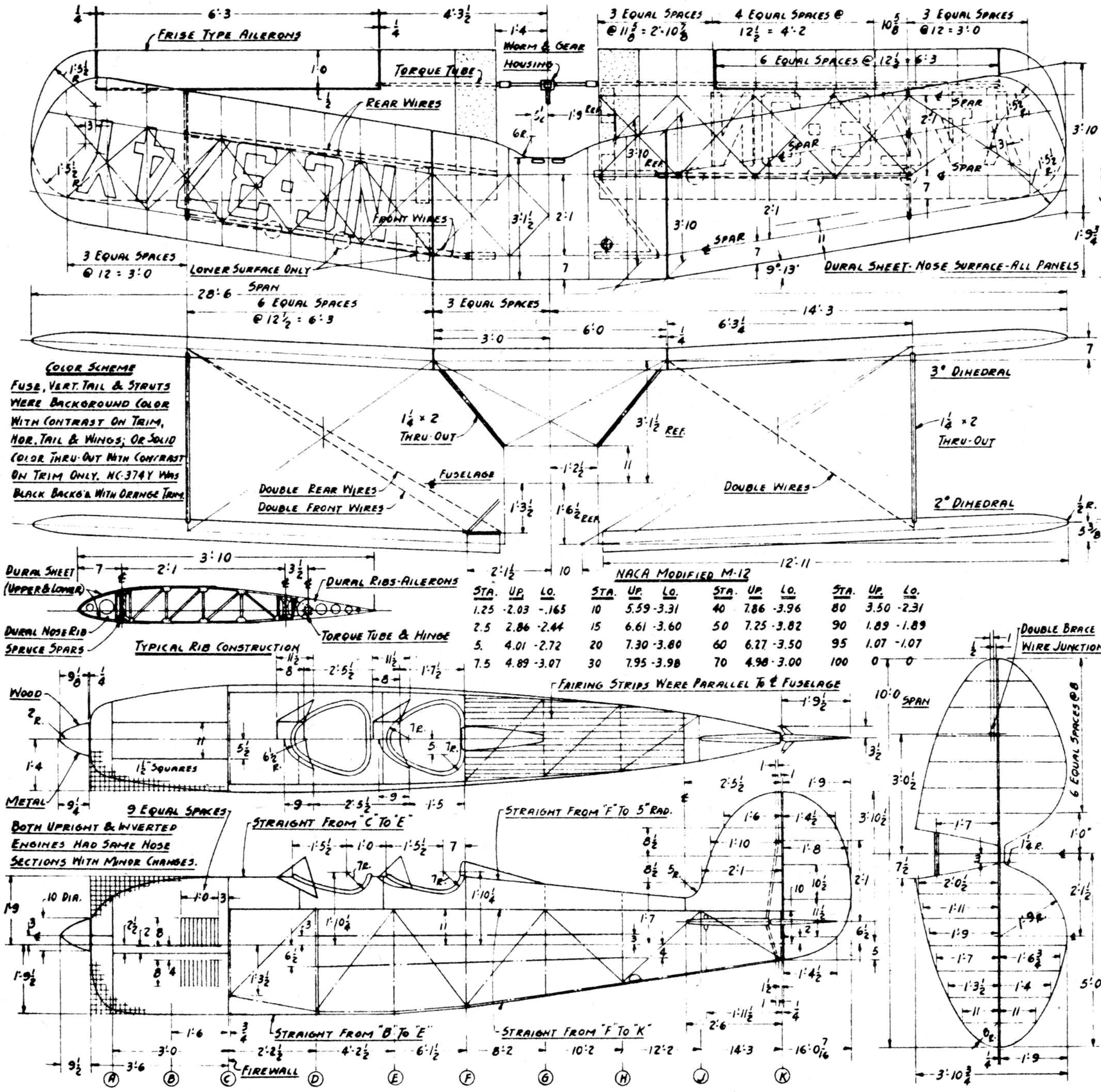
NC 374Y
GREAT LAKES AVIATION CORP.

RIGHT SIDE
3:9⅛
TRIM COLOR
3
4:7½
EXHAUST
OPTIONAL: 22 O.D. × 8½ WIDE "AIRWHEEL" TIRES
FLYING POSITION
3
6:2 TRACK
GROUND LINE AT ROLLING RADIUS
14½°
BAGGAGE DOOR
CABANE POSTS
FUEL FILL
CABANE WIRES
GROMMETS
LEAFSPRING SKID
MANGANESE SHOE

VIEW SHOWING DETAILS OF SINGLE PLACE ARRANGEMENT WITH OPTIONAL FUEL TANK (30 GALS.) AND BAGGAGE COMPARTMENT

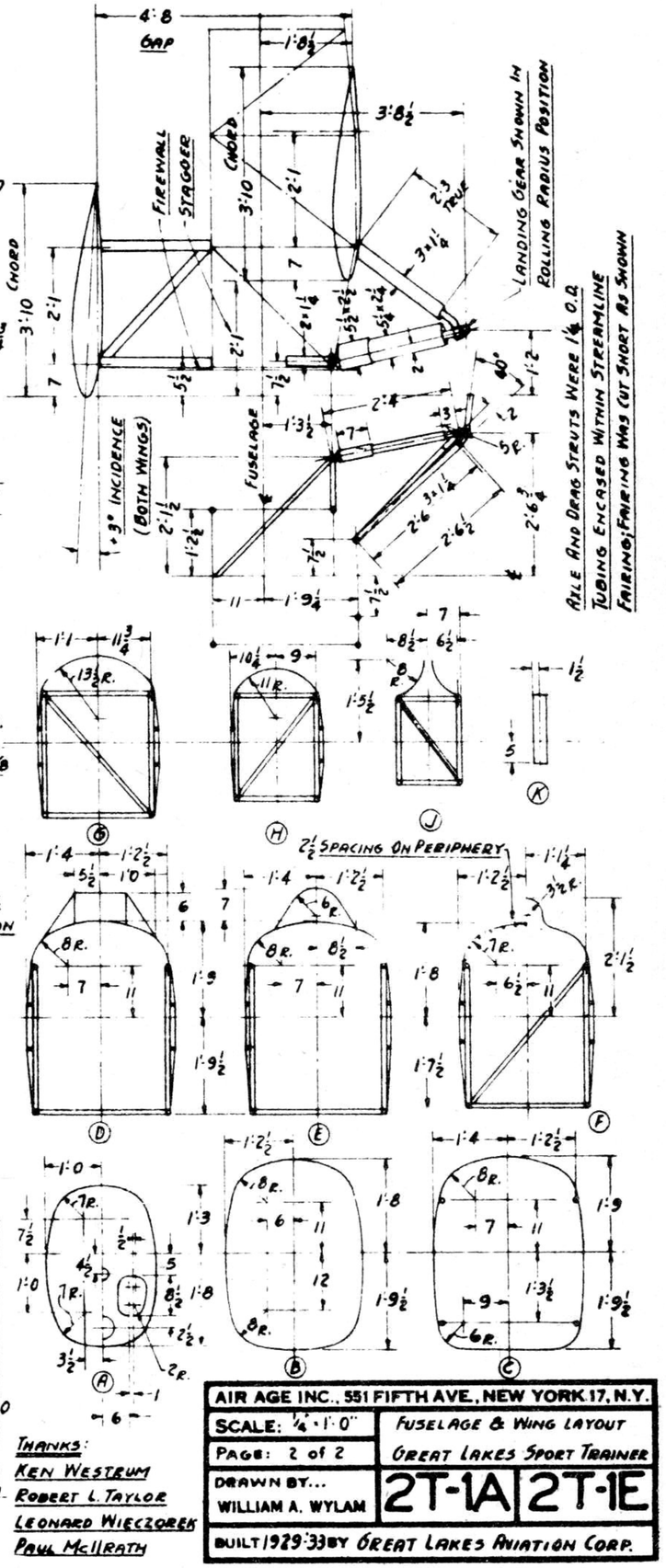
WHEEL AXLE
METAL PLATES
L/G SUPERSTRUCTURE
WING NUT PANEL LOCKS
FIXED PANEL
FIREWALL
FABRIC
FUSELAGE
FABRIC
BUTTON HEAD RIVETS
REMOVABLE PANELS
HAND HOLD
RUDDER CONTROL CABLE

7:0
HAMILTON STANDARD STEEL ADJUSTABLE PROPELLER
6:6
MARTEEL WOODEN PROPELLER WITH OPTIONAL SPINNER



COLOR SCHEME

FUSE., VERT. TAIL & STRUTS WERE BACKGROUND COLOR WITH CONTRAST ON TRIM, HOR. TAIL & WINGS; OR SOLID COLOR THRU-OUT WITH CONTRAST ON TRIM ONLY. NC-374Y WAS BLACK BACKG'D. WITH ORANGE TRIM.



STA.	UP	LO.	STA.	UP.	LO.	STA.	UP.	LO.	STA.	UP.	LO.
1.25	-2.03	-.165	10	5.59	-3.31	40	7.86	-3.96	80	3.50	-2.31
2.5	2.86	-2.44	15	6.61	-3.60	50	7.25	-3.82	90	1.89	-1.89
5.	4.01	-2.72	20	7.30	-3.80	60	6.27	-3.50	95	1.07	-1.07
7.5	4.89	-3.07	30	7.95	-3.98	70	4.98	-3.00	100	0	0

Thanks:
Ken Westrum
Robert L. Taylor
Leonard Wieczorek
Paul McIlrath

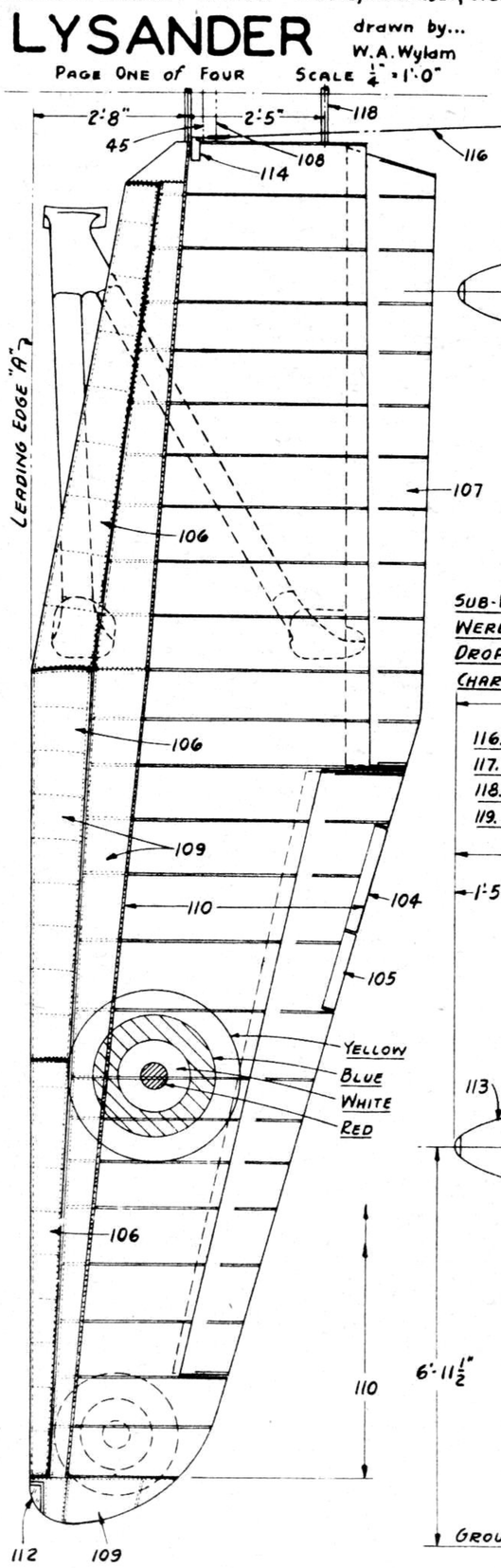
AIR AGE INC., 551 FIFTH AVE., NEW YORK 17, N.Y.	
SCALE: ¼" = 1'0"	FUSELAGE & WING LAYOUT
PAGE: 2 of 2	GREAT LAKES SPORT TRAINER
DRAWN BY... WILLIAM A. WYLAM	2T-1A | 2T-1E
BUILT 1929-33 BY GREAT LAKES AVIATION CORP.	

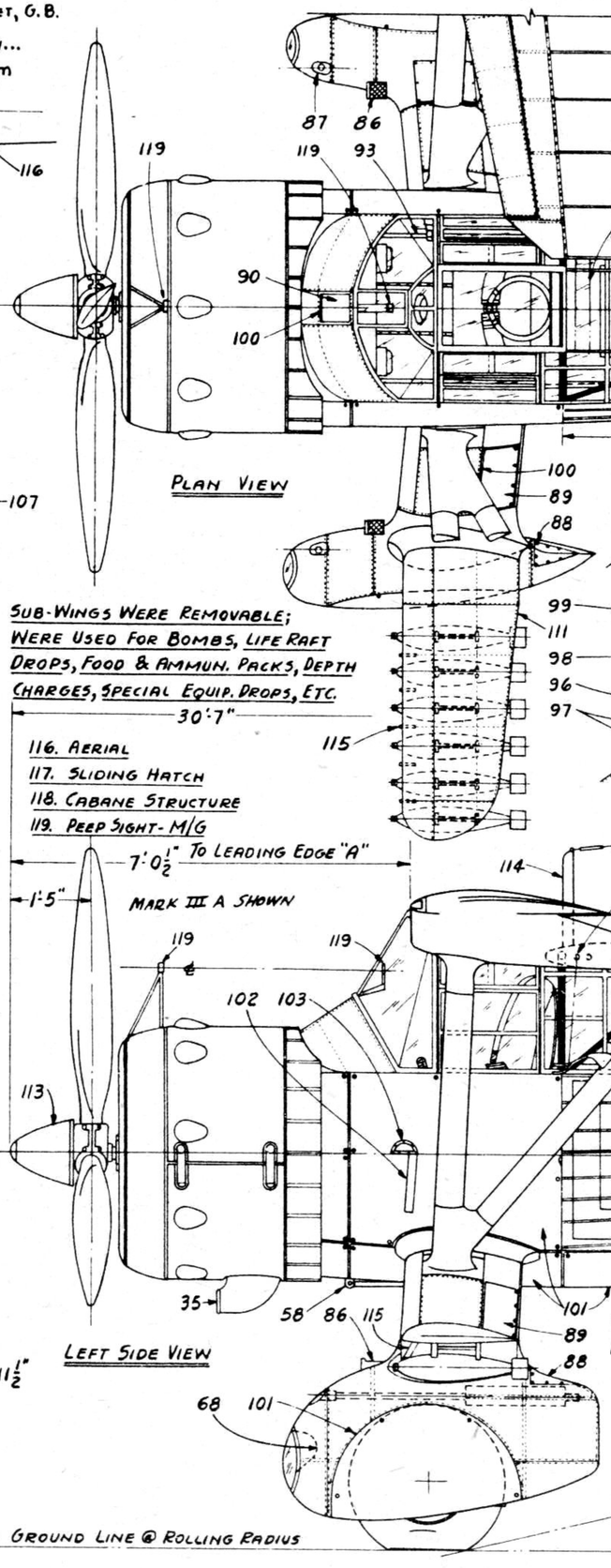
WESTLAND AIRCRAFT LIMITED · YEOVIL, SOMERSET, G.B.

LYSANDER

drawn by... W.A. Wylam

PAGE ONE of FOUR SCALE $\frac{1}{4}$" = 1'-0"



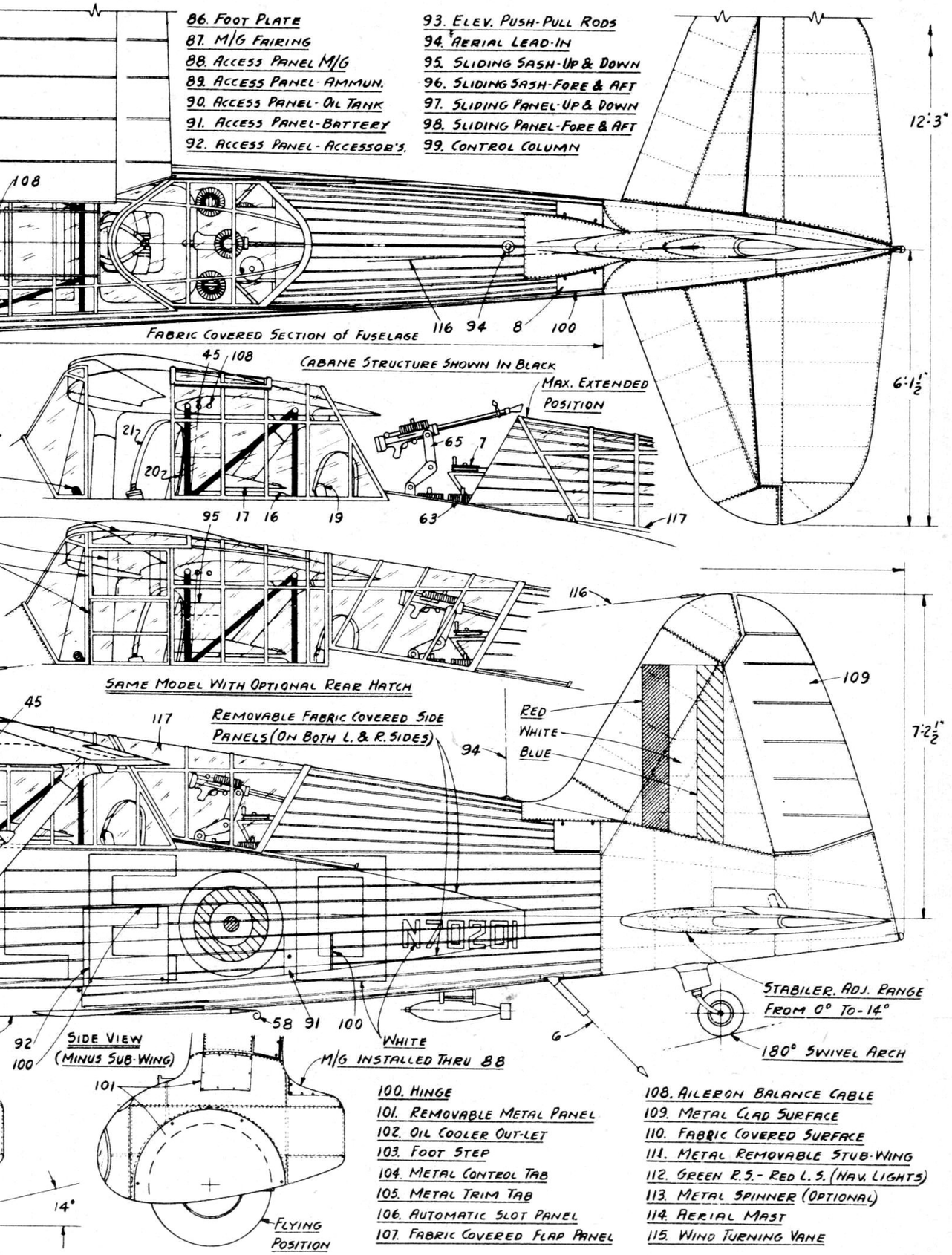


PLAN VIEW

SUB-WINGS WERE REMOVABLE; WERE USED FOR BOMBS, LIFE RAFT DROPS, FOOD & AMMUN. PACKS, DEPTH CHARGES, SPECIAL EQUIP. DROPS, ETC.

116. AERIAL
117. SLIDING HATCH
118. CABANE STRUCTURE
119. PEEP SIGHT - M/G

LEFT SIDE VIEW



FABRIC COVERED SECTION of FUSELAGE

CABANE STRUCTURE SHOWN IN BLACK

MAX. EXTENDED POSITION

SAME MODEL WITH OPTIONAL REAR HATCH

REMOVABLE FABRIC COVERED SIDE PANELS (ON BOTH L. & R. SIDES)

SIDE VIEW (MINUS SUB-WING)

M/G INSTALLED THRU 88

FLYING POSITION

86. FOOT PLATE
87. M/G FAIRING
88. ACCESS PANEL M/G
89. ACCESS PANEL - AMMUN.
90. ACCESS PANEL - OIL TANK
91. ACCESS PANEL - BATTERY
92. ACCESS PANEL - ACCESSOR'S.
93. ELEV. PUSH-PULL RODS
94. AERIAL LEAD-IN
95. SLIDING SASH - UP & DOWN
96. SLIDING SASH - FORE & AFT
97. SLIDING PANEL - UP & DOWN
98. SLIDING PANEL - FORE & AFT
99. CONTROL COLUMN

100. HINGE
101. REMOVABLE METAL PANEL
102. OIL COOLER OUT-LET
103. FOOT STEP
104. METAL CONTROL TAB
105. METAL TRIM TAB
106. AUTOMATIC SLOT PANEL
107. FABRIC COVERED FLAP PANEL
108. AILERON BALANCE CABLE
109. METAL CLAD SURFACE
110. FABRIC COVERED SURFACE
111. METAL REMOVABLE STUB-WING
112. GREEN P.S. - RED L.S. (NAV. LIGHTS)
113. METAL SPINNER (OPTIONAL)
114. AERIAL MAST
115. WIND TURNING VANE

ALL METAL FIXED FIN

FABRIC COVERED RUDDER

1. RUDDER HORN
2. ELEV. HORN
3. STAB. ADJ. SCREW
4. ENDLESS CHAIN
5. PARACHUTE FLARES
6. TRAILING AERIAL
7. AERIAL WINCH
8. START'G. CRANK STOR'E.
9. STAB. HINGE POST
10. TORQUE STRUT
11. BATTERY
12. CAMERA
13. RADIO
14. TAIL LIGHT
15. METAL SHELF
16. FUEL TANK
17. CHART TABLE
18. PULLEY
19. SWIVEL ADJ. SEAT
20. ADJ. HT. SEAT
21. SHOULDER STRAP
22. STABIL. ADJUST.
23. ENGINE CONTROL
24. INSTRUM'T. PANEL
25. OIL TANK
26. OIL COOLER
27. FLOORBOARD
28. SEAT ADJ.
29. EXHAUST COLL'R RING
30. EXHAUST OUTLET
31. EXHAUST SUPPORT
32. EXHAUST STACK
33. OIL SUMP
34. ADJ. COOLING GILLS
35. CARB. AIR INTAKE
36. IGNITION & PLUGS
37. FIREWALL
38. SNAP FASTENER

EXHAUST COLLECTOR SUPPORT (VIEW A)

DE HAVILLAND CONSTANT SPEED STEEL PROPELLER

FRONT VIEW-HUB (MINUS SPINNER)

BRISTOL "MERCURY XX" (VIEW 'B')

RIGHT SIDE VIEW

RIGHT SIDE VIEW-COWLING

DOWTY SELF-CASTORING INTERNALLY SPRUNG T.W.

PUSH-PULL RODS (46) WERE HELD TO FUSELAGE CURVATURE BY CAPITIVE ROLLER BEARINGS

39. MAIN BEARING
40. TORQUE TUBE
41. ELEV. SHAFT
42. BALL SOCKET
43. UNIVERSAL
44. PIVOT ℄
45. AILERON CABLE
46. FLEXIBLE PUSH-PULL
47. BRAKE PAD
48. M/G CHARGING
49. BOMB RELEASE
50. COUNTER-M/G
51. ELEC. SWITCH
52. REAR BOMB RELEASE
53. INDICATOR LIGHTS
54. M/G & BOMB CONTROL
55. METAL HOOD
56. SLIDING LADDER & DOOR
57. JACK-KNIFE BRACE
58. MESSAGE PICK-UP HOOK
59. MESSAGE HOOK WENCH
60. SLIDING PANEL

61. LEWIS .303 CAL SWIVEL M/G
62. BROWNING .303 FIXED M/G
63. AMMUNITION DRUM
64. AMMUNITION TRAY
65. FOLDING GUN MOUNT
66. FIXED GUN MOUNT
67. EMPTY SHELL CHUTE
68. LANDING LIGHT REFLECTOR
69. REINFORCED STRUCTURE
70. TORQUE LEVER

DOWTY INTERNALLY SPRUNG (SHOCK ABSORBING) WHEELS

FLIGHT CONTROLS (SCHEMATIC)

AUX. BOMB RACK

FABRIC COVERED SECTION OF FUSELAGE

BOTTOM VIEW

INBOARD VIEW of WHEEL FAIRING

71. OIL GAGE
72. OIL PRESS.
73. OIL TEMP.
74. VOLTMETER
75. CLOCK
76. ALTIMETER
77. BANK & TURN
78. INCLINOMETER
79. TACHOMETER
80. AIR SPEED
81. ENGINE TEMP.
82. IGNITION
83. DASH LIGHT
84. PROP. SETT'G. CONTROL
85. FLAP CONTROL LEVER

ALL METAL ELEV. & STABILIZER

ALL METAL FUSELAGE TAIL SECTION

CABANE STRUCTURE SHOWN IN BLACK

SPRUCE FAIRING STRIPS MOUNTED ON WOODEN FORMERS

"F"

"E"

"D"

SECTION @ "C"

ONE PIECE, FIXED LENGTH, 2½" SQ. STEEL TUBING LANDING GEAR STRUT WITH STREAMLINE HOUSING

WESTLAND AIRCRAFT LIMITED

LYSANDER

PAGE TWO of FOUR

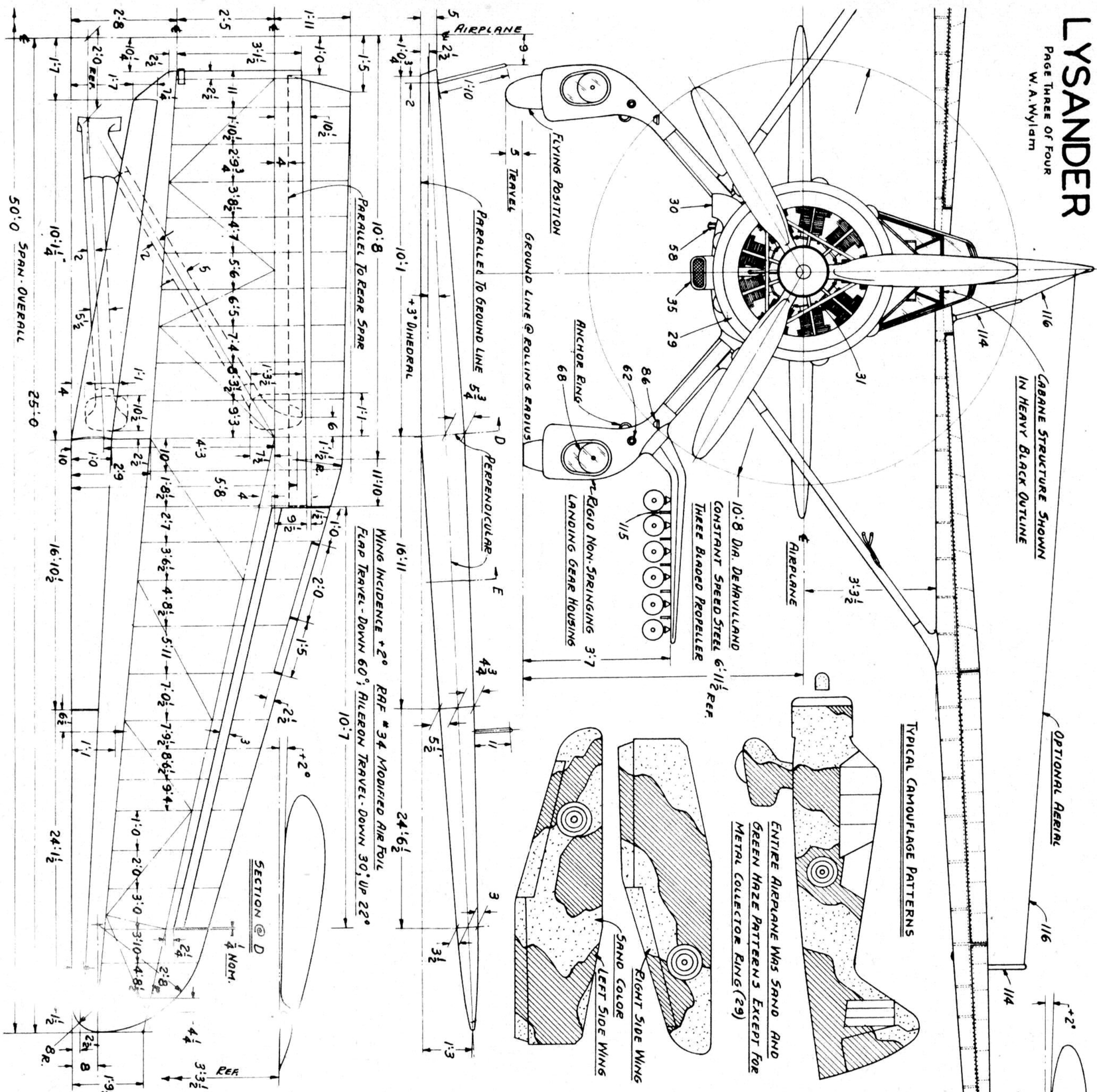
W. A. Wylam

WESTLAND AIRCRAFT LIMITED

LYSANDER

PAGE THREE OF FOUR

W.A. Wylam



NOTE:
FLAPS & SLOT WERE AUTOMATIC BY THROTTLE CONTROL;
(FLAPS CAN BE LOWERED, INDEPENDENTLY, BY 85

120. FLAP/SLOT BALANCE CABLES
121. HYDRAULIC CYLINDER
122. THREE POINT BELL CRANK
123. SLOT THRUST ROD
124. FLAP THRUST ROD
125. CLEVIS & PIN
126. TUBULAR REAR SPAR
127. BUILT-UP METAL SPAR
128. METAL FAIRING PANEL
129. SQUARE TUBE DRAG STRUT
130. FLAP HINGE BRACKET
131. TWO POINT BELL CRANK
132. ONE POINT BELL CRANK
133. AILERON THRUST ROD
134. TAB CONTROL
135. CONTROL SHAFT (SLOTS)
136. RACK & PINION
137. AILERON HINGE
138. WING STRUT LUGS
139. SUPER-STRUCTURE (WING STRUTS)
140. BEARINGS
141. GUSSET PLATES
142. METAL NOSE RIB

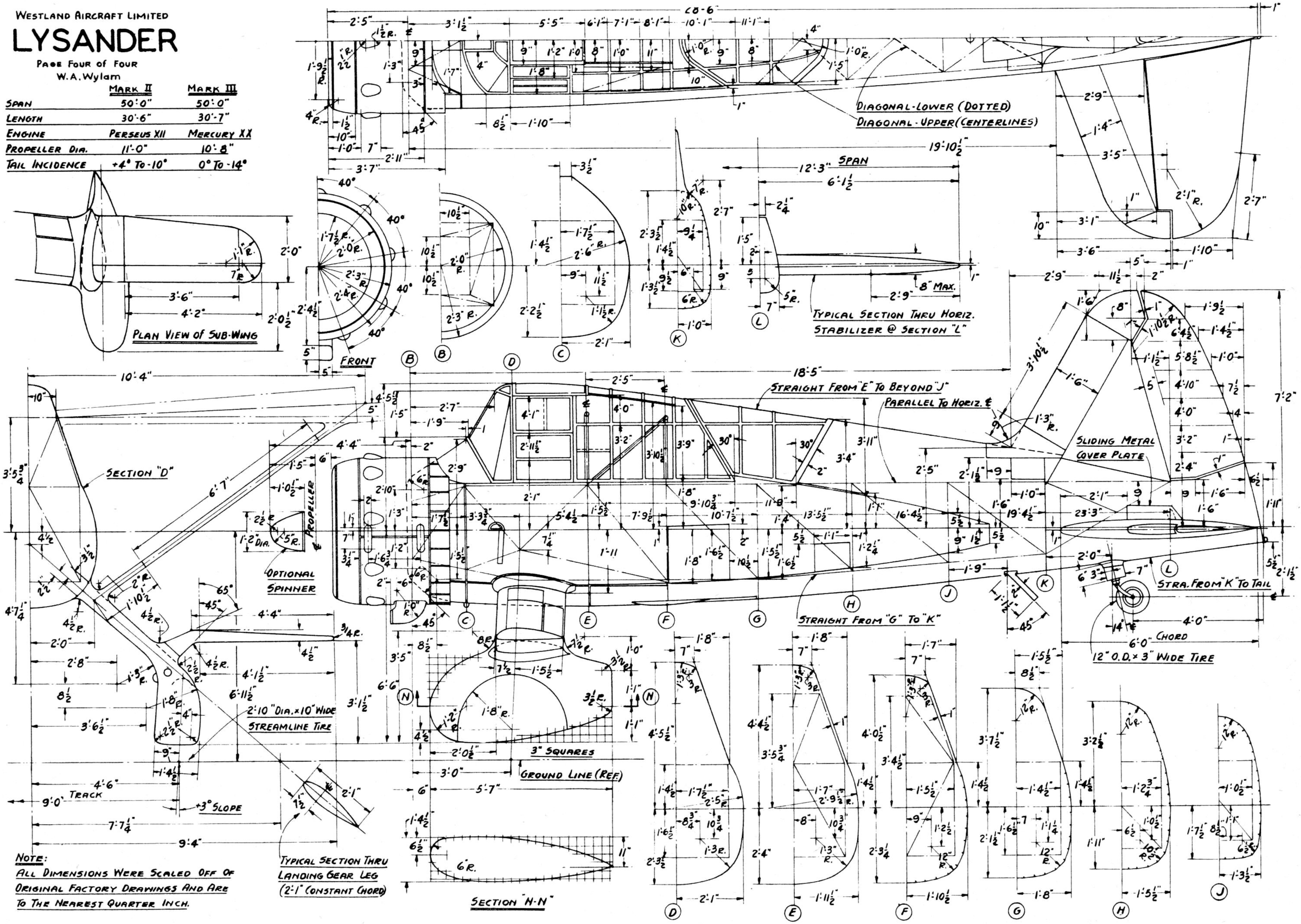
WESTLAND AIRCRAFT LIMITED

LYSANDER

PAGE FOUR of FOUR

W. A. Wylam

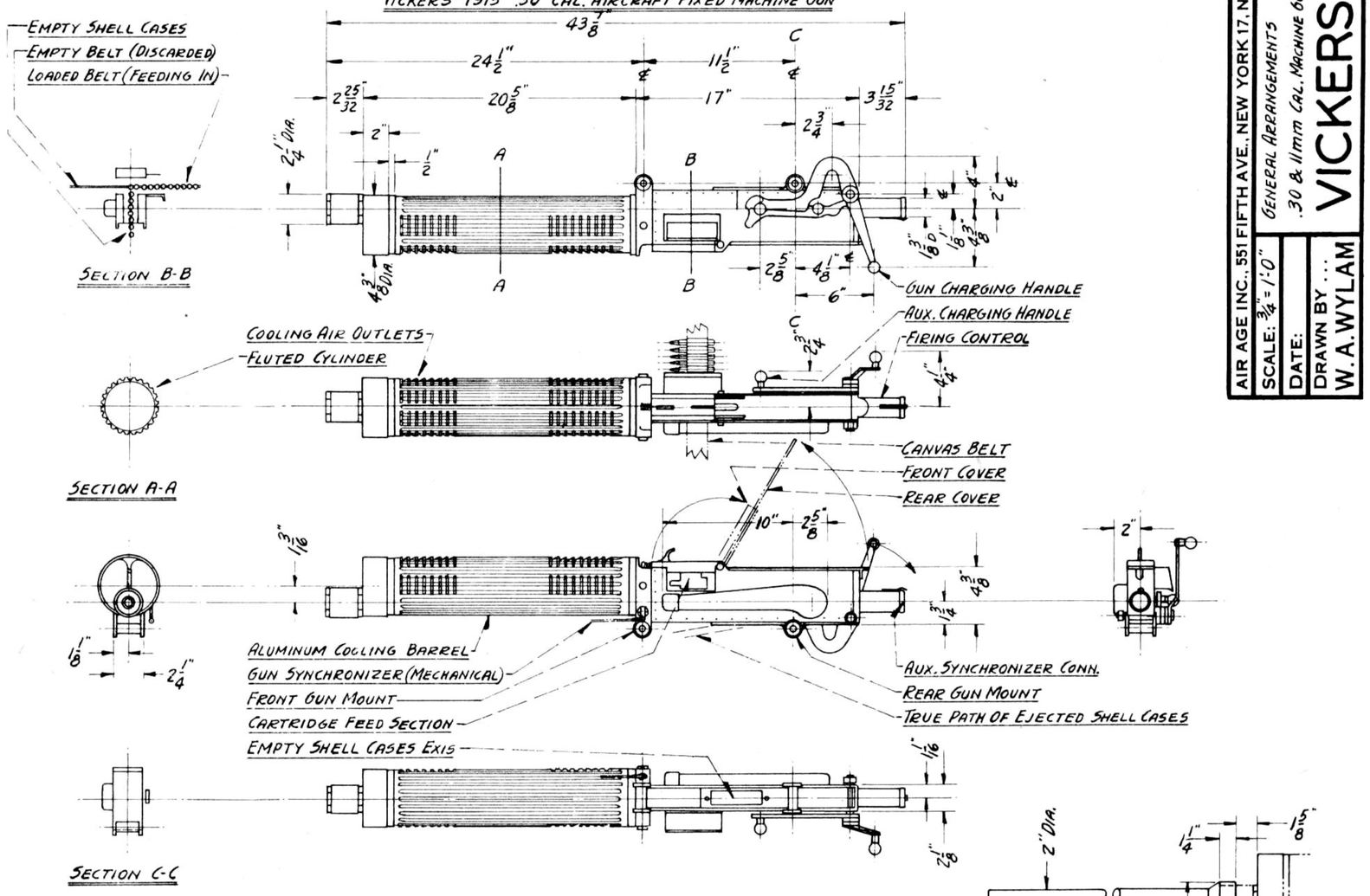
	MARK II	MARK III
SPAN	50'-0"	50'-0"
LENGTH	30'-6"	30'-7"
ENGINE	PERSEUS XII	MERCURY XX
PROPELLER DIA.	11'-0"	10'-8"
TAIL INCIDENCE	+4° TO -10°	0° TO -14°



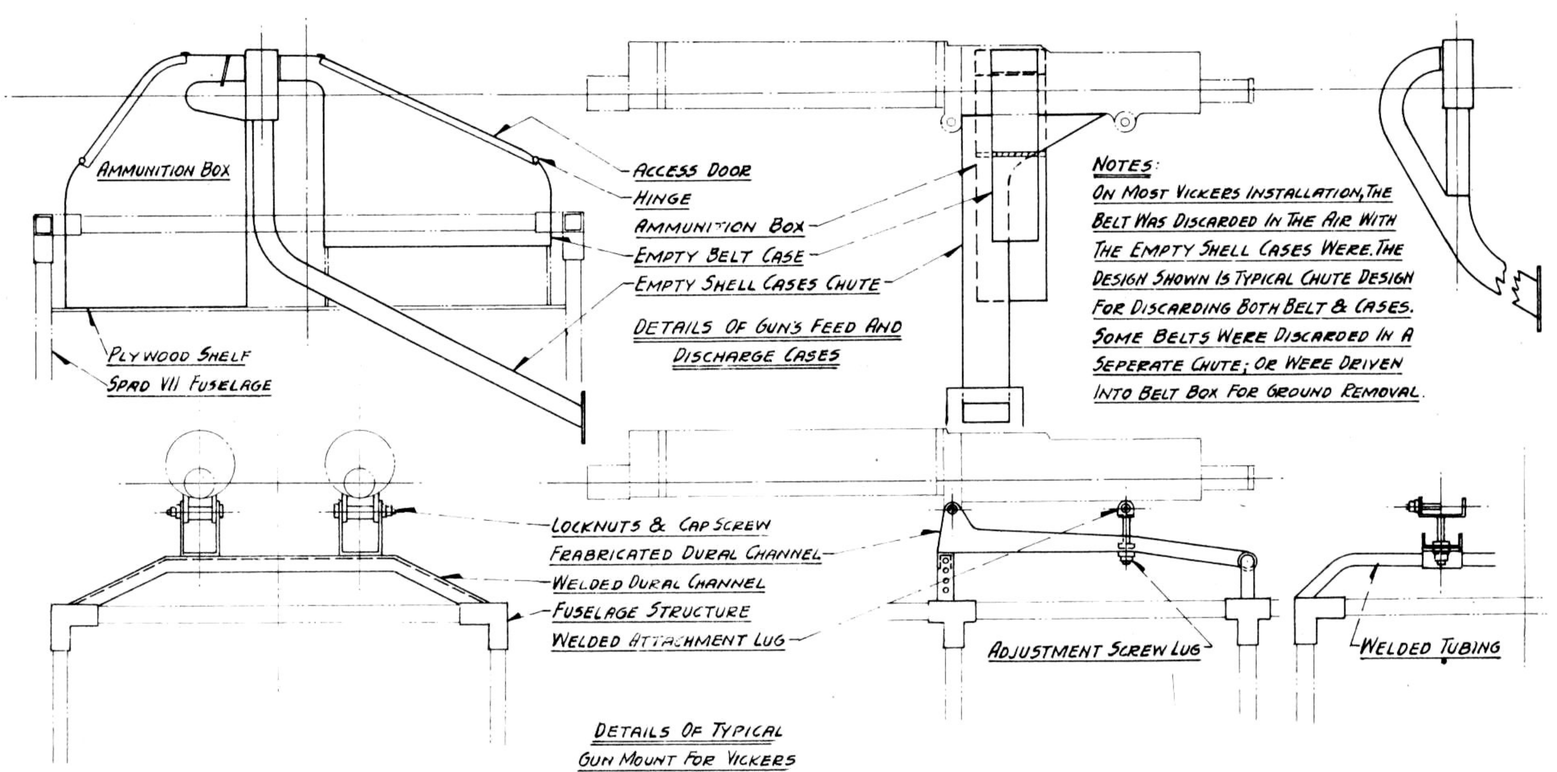
NOTE:
ALL DIMENSIONS WERE SCALED OFF OF ORIGINAL FACTORY DRAWINGS AND ARE TO THE NEAREST QUARTER INCH.

VICKERS 1915 .30 CAL. AIRCRAFT FIXED MACHINE GUN

AIR AGE INC., 551 FIFTH AVE., NEW YORK 17, N.Y.
SCALE: 3/4" = 1'-0"
DATE:
DRAWN BY ... W.A.WYLAM
GENERAL ARRANGEMENTS
.30 & 11MM CAL. MACHINE GUNS
VICKERS



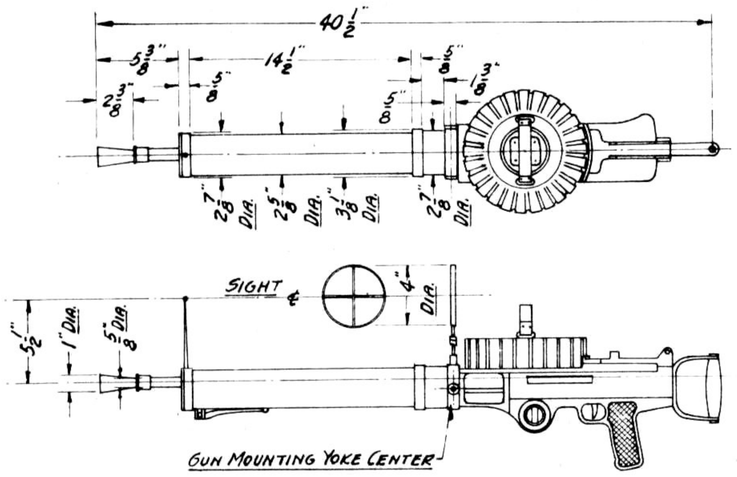
NOTE:
ENTIRE GUN WITH EXCEPTION OF STEEL MOVING PARTS (CHARGING UNIT) WAS DULL (ELECTROLYTIC) NON-RUST BLACK.



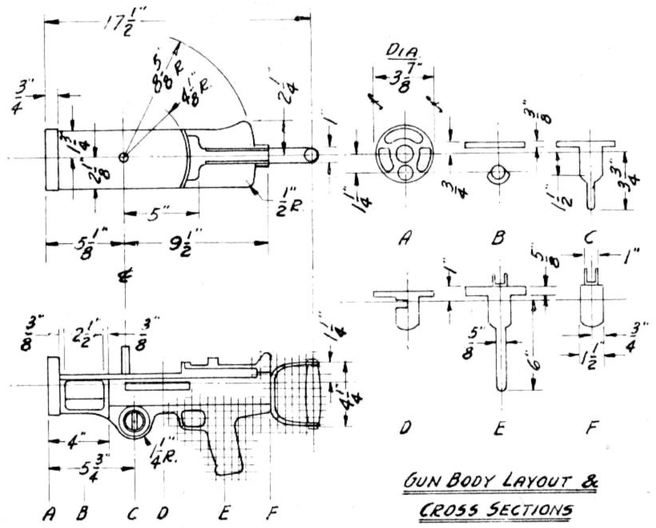
AIR AGE INC., 551 FIFTH AVE., NEW YORK 17, N.Y.
SCALE: 3/4" = 1'-0"
DATE:
DRAWN BY ... W. A. WYLAM

GENERAL ARRANGEMENTS
30 CAL. AIRCRAFT MACHINE GUN

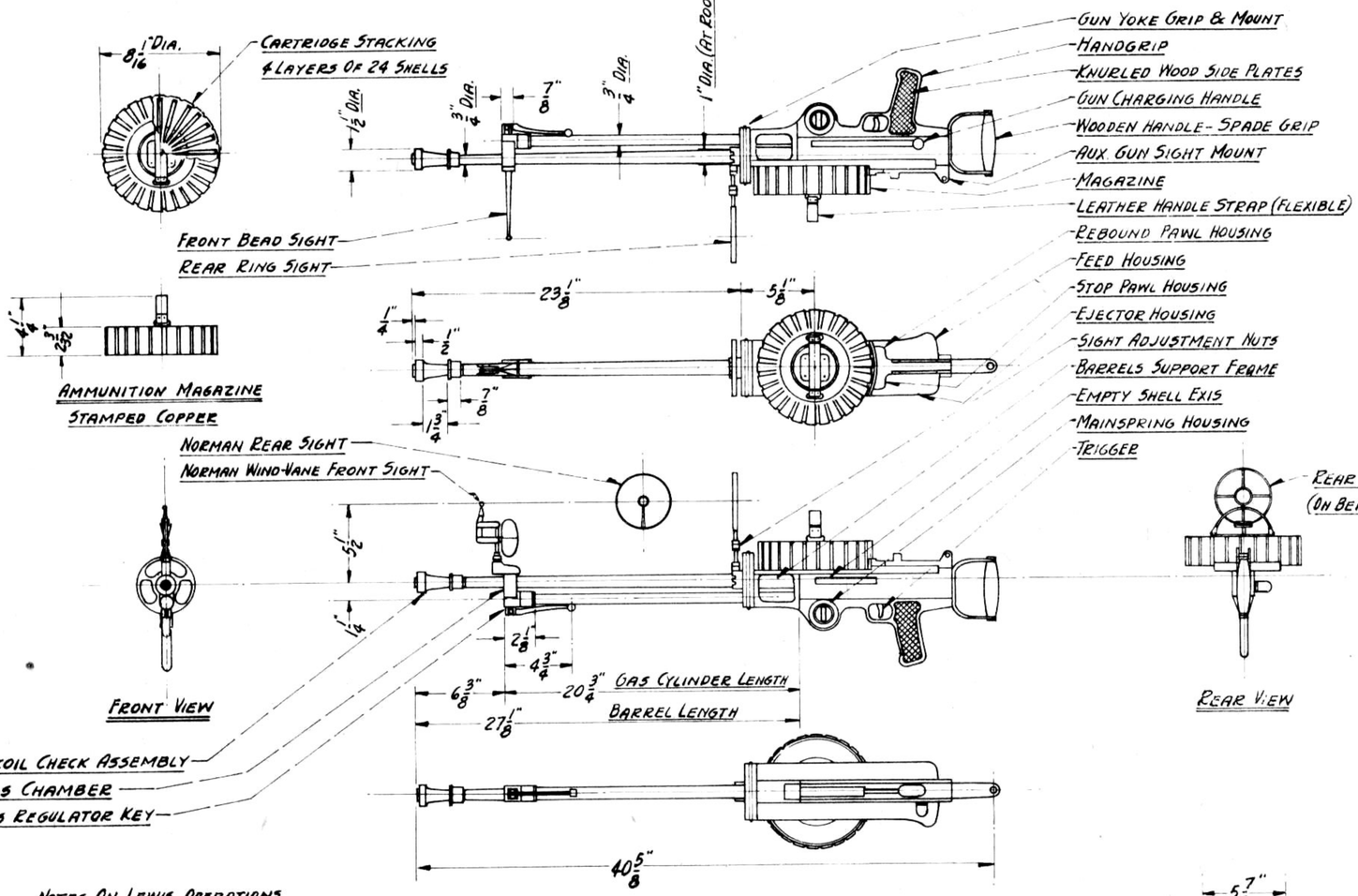
LEWIS



1915 LEWIS .30 CAL. AIRCRAFT MACHINE GUN



GUN BODY LAYOUT & CROSS SECTIONS



FRONT VIEW

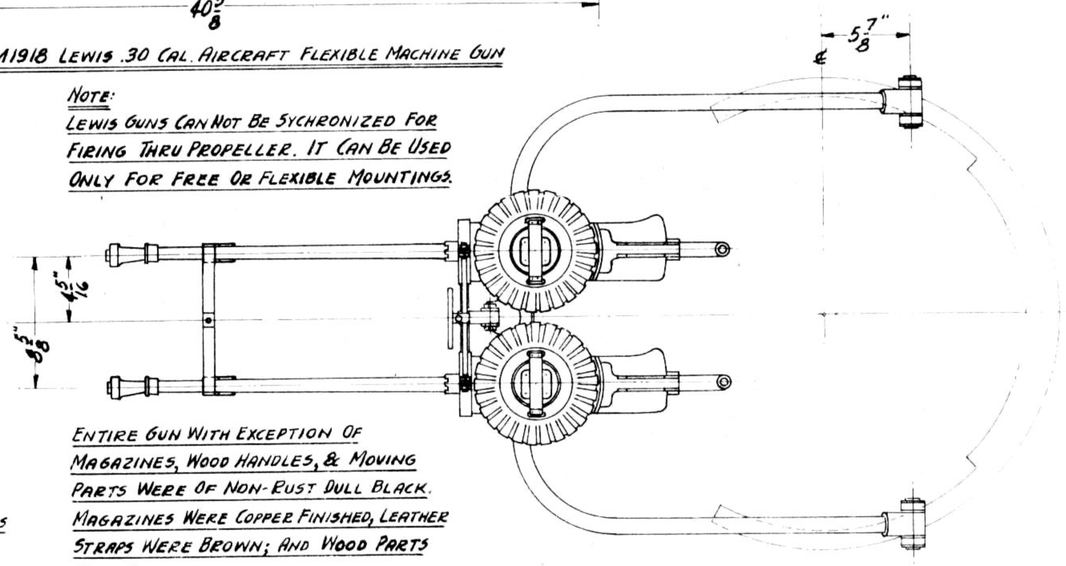
REAR VIEW

NOTES ON LEWIS OPERATIONS

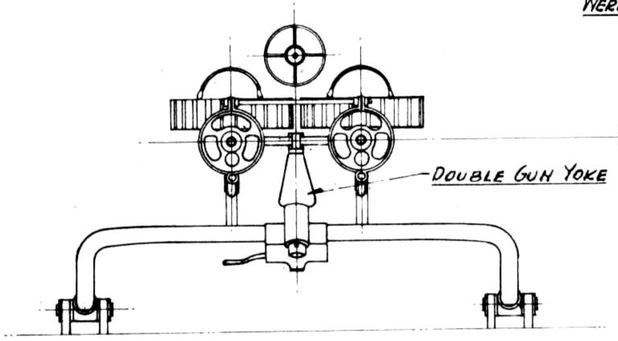
THIS TYPE OF MACHINE GUN WAS GAS OPERATED, FULLY AUTOMATIC, AND AIR COOLED. IT FUNCTIONS ON THE POWER PRODUCED BY THE EXPANSION OF GAS. THIS GAS WAS CREATED BY THE FIRING OF THE CARTRIDGE WHICH DRIVES THE BULLET OUT THRU THE BARREL. WHEN THE BULLET PASSED THE PORTHOLE IN THE GAS CHAMBER, THE GAS IS EXPANDED INTO A DRIVING FORCE. THIS DRIVES THE PISTON & SHAFT BACK TOWARD THE REAR. THIS BACKWARD MOVEMENT IN THE GAS CYLINDER CAUSED THE CARTRIDGE TO UNLOCK & TO DROP INTO THE HOLD, EXTRACT THE EMPTY SHELL CASE AND TO THROW IT OUT THRU THE EMPTY SHELL EXIS; ROTATE THE MAGAZINE; AND TO WIND UP THE MAINSPRING. THE FORWARD MOVEMENT OF THE PISTON & SHAFT WAS CAUSED BY THE MAINSPRING PRESSURE WHICH FEEDS AND LOCK THE CARTRIDGE IN THE FIRING CHAMBER; AND FIRES THE CARTRIDGE WHEN THE TRIGGER IS PRESSED.

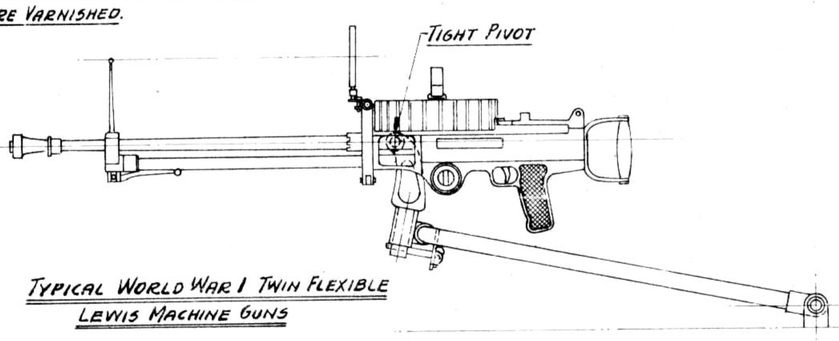
M1918 LEWIS .30 CAL. AIRCRAFT FLEXIBLE MACHINE GUN

NOTE:
LEWIS GUNS CAN NOT BE SYCHRONIZED FOR FIRING THRU PROPELLER. IT CAN BE USED ONLY FOR FREE OR FLEXIBLE MOUNTINGS.



ENTIRE GUN WITH EXCEPTION OF MAGAZINES, WOOD HANDLES, & MOVING PARTS WERE OF NON-RUST DULL BLACK. MAGAZINES WERE COPPER FINISHED, LEATHER STRAPS WERE BROWN; AND WOOD PARTS WERE VARNISHED.





TYPICAL WORLD WAR I TWIN FLEXIBLE LEWIS MACHINE GUNS

AVRO LANCASTER I

WORLD'S GREATEST BOMB CARRIER

303 cal. twin machine guns in all powered-turrets
trim tab
balance tab
fabric covered elevators
mass balance
all metal stabilizer
de-icing strip
flame damper
computing sight
Rolls-Royce "Merlin XX" - 1.260 h.p. engines
flap panel
fairing panel
molding strap
trim tab
balance tab
fabric covered ailerons
formation light
navigation light
observation blister
direction finder
navigator's sighting dome
front powered-turret
landing light
de-icing strip
DeHavilland constant-speed full-feathering propellers
ventilator
bombardier's flat
bomb bay
camera aperture
front entrance
pitot tube
cowl flap
antenna mast
hinged leading edge
cabin air intake
landing gear door
hydraulic brake
ground line at rolling radius
flame damping exhaust muff
carburetor air intake
glycol cooler
oil cooler
Green-haze and sandy-brown camouflage on top surface only. Dull-black on side and lower surfaces.
airfoil section
six-inch squares
yellow
red
white
blue
gray
upper powered-turret
radio antenna
rear powered-turret
trailing radio antenna
telescoping ground post
landing gear door
landing gear actuating arm
static suppressor
rear entrance
lower powered-turret
identification light
all metal rudders and vertical stabilizers
non-retracting
William A. Wylam

0" 5' 10' 15' 20'