

The Paul Matt Collection

Archive 4



4

This CD-ROM contains the following Paul Matt 3-view drawings and photos:

(CD-ROM also contains contents files in the following formats: TXT, DOC)

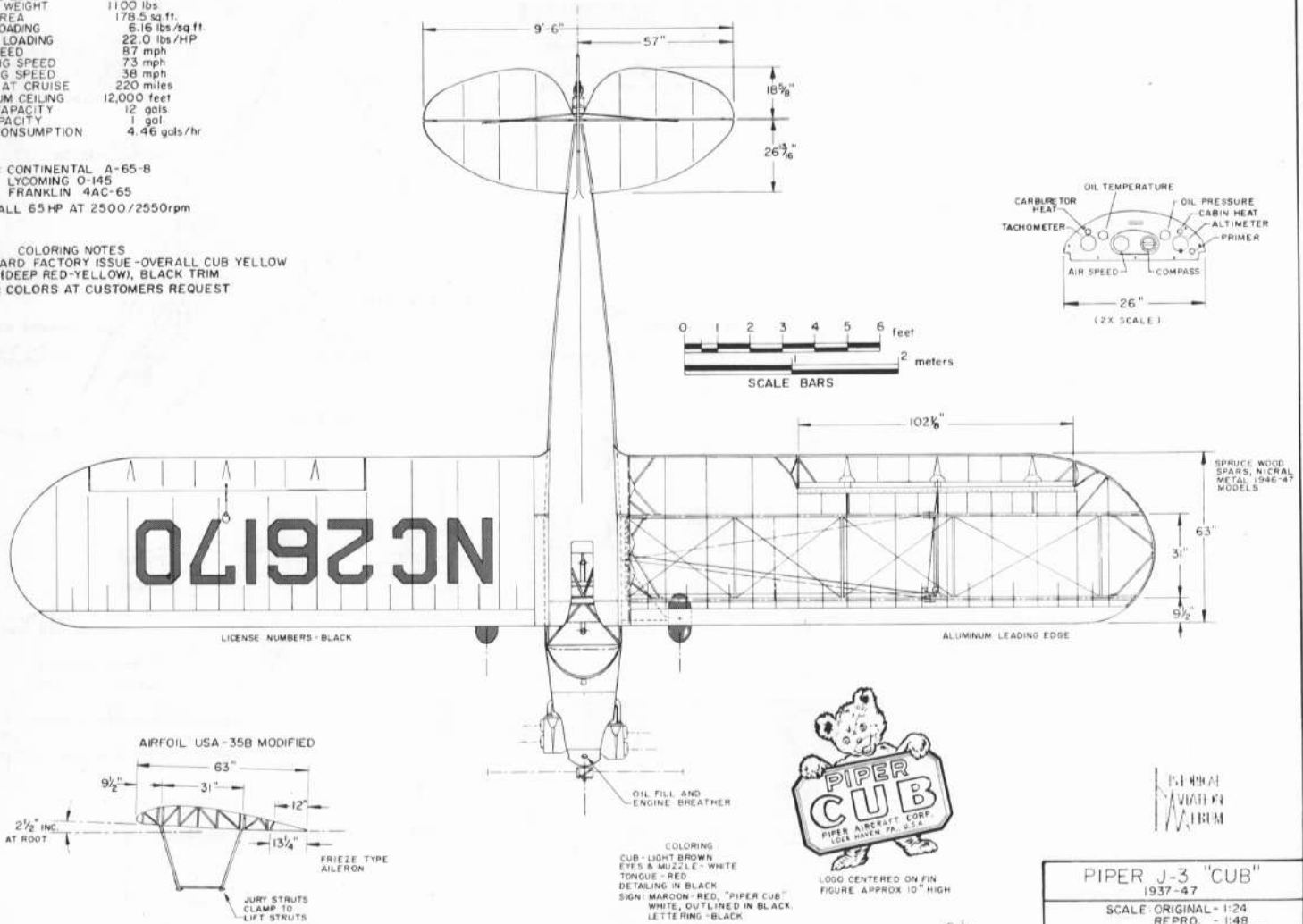
PIPER J-3	SIKORSKY S-39	VULTEE V-1A
PIPER J-4	STANDARD J-1	WACO UMF-5, YMF-5
PIPER PA-12	TAYLOR E-2	WACO UPF-7
REPUBLIC RC-3	TAYLOR J-2	WACO YKS-6
ROVER (ENGINE)	THOMAS-MORSE MB-3	WATERMAN
RYAN B-5	TIMM C-170	WATERMAN OX-5
RYAN FR-1&4	VERVILLE-SPERRY R-3	WRIGHT F2W-1
RYAN SCW	VOUGHT F4U-1	WRIGHT F2W-2
RYAN FR-1	VOUGHT SBU-1	WRIGHT BROTHERS 1903 "FLYER"
SEVERSKY BT-8	VOUGHT XF5U-1	WRIGHT-MARTIN MODEL V
SEVERSKY P-35		

GENERAL SPECIFICATION

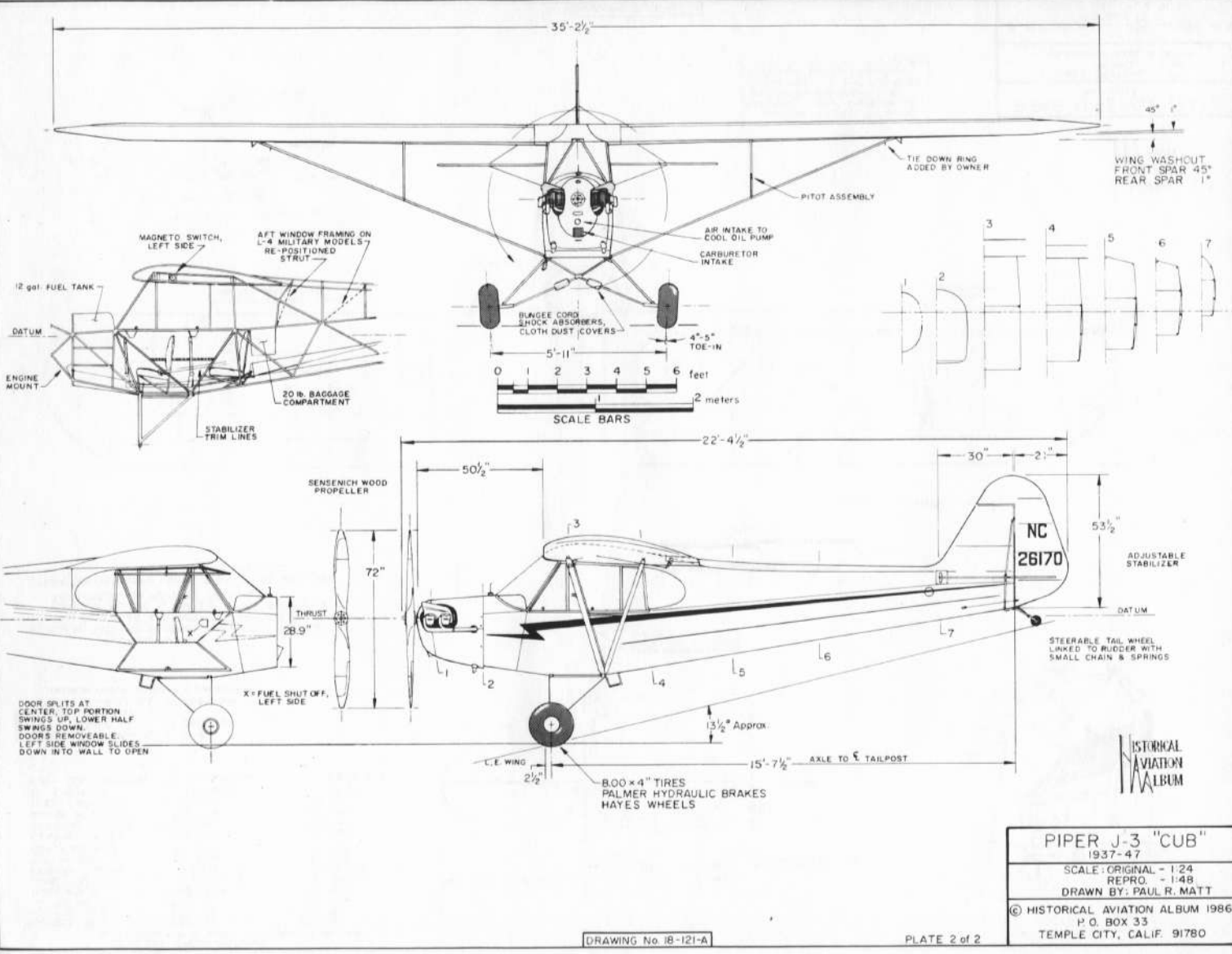
WEIGHT EMPTY 680 lbs.
 USEFUL LOAD 540 lbs.
 GROSS WEIGHT 1100 lbs.
 WING AREA 178.5 sq ft.
 WING LOADING 6.16 lbs/sq ft.
 POWER LOADING 22.0 lbs/HP
 TOP SPEED 87 mph
 CRUISING SPEED 73 mph
 LANDING SPEED 38 mph
 RANGE AT CRUISE 220 miles
 MAXIMUM CEILING 12,000 feet
 FUEL CAPACITY 12 gals
 OIL CAPACITY 1 gal.
 FUEL CONSUMPTION 4.46 gals/hr

POWER CONTINENTAL A-65-B
 LYCOMING O-145
 FRANKLIN 4AC-65
 ALL 65 HP AT 2500/2550rpm

COLORING NOTES
 STANDARD FACTORY ISSUE - OVERALL CUB YELLOW
 (DEEP RED-YELLOW), BLACK TRIM
 OTHER COLORS AT CUSTOMERS REQUEST



PIPER J-3 "CUB"	
1937-47	
SCALE ORIGINAL - 1:24	RE PRO. - 1:48
DRAWN BY: PAUL R. MATT	
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P. O. BOX 33	
TEMPLE CITY, CALIF. 91780	



































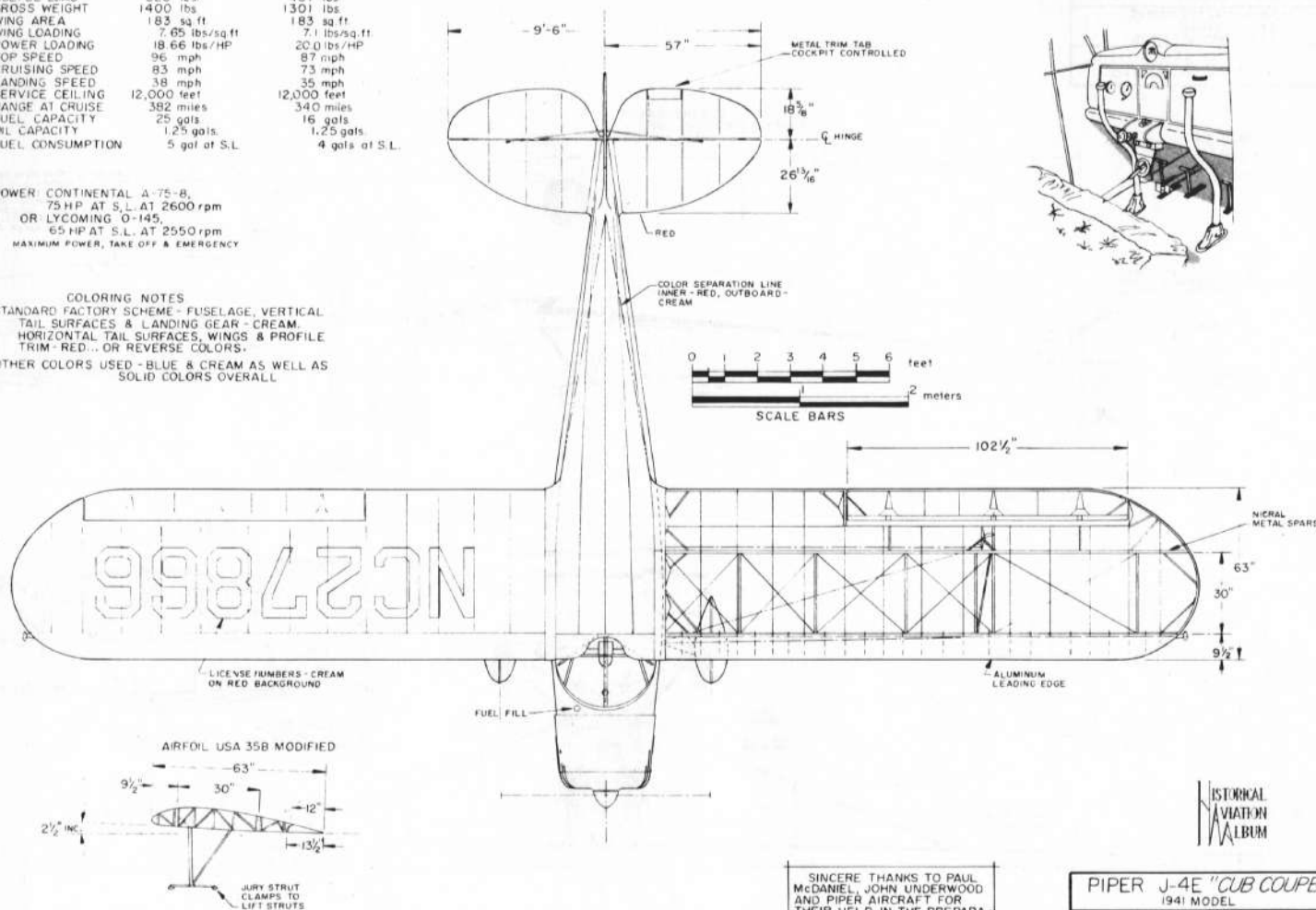


GENERAL SPECIFICATIONS

	CONTINENTAL A-75-B, 75 HP	LYCOMING O-145, 65 HP
WEIGHT EMPTY	890 lbs.	800 lbs.
USEFUL LOAD	520 lbs.	401 lbs.
GROSS WEIGHT	1400 lbs.	1301 lbs.
WING AREA	183 sq ft	183 sq ft
WING LOADING	7.65 lbs./sq ft	7.1 lbs./sq ft
POWER LOADING	18.66 lbs./HP	20.0 lbs./HP
TOP SPEED	96 mph	87 mph
CRUISING SPEED	83 mph	73 mph
LANDING SPEED	38 mph	35 mph
SERVICE CEILING	12,000 feet	12,000 feet
RANGE AT CRUISE	382 miles	340 miles
FUEL CAPACITY	25 gals.	16 gals.
OIL CAPACITY	1.25 gals.	1.25 gals.
FUEL CONSUMPTION	5 gal of S.L.	4 gal of S.L.

POWER: CONTINENTAL A-75-B,
75 HP AT S.L. AT 2600 rpm
OR LYCOMING O-145,
65 HP AT S.L. AT 2550 rpm
MAXIMUM POWER, TAKE OFF & EMERGENCY

COLORING NOTES
STANDARD FACTORY SCHEME - FUSELAGE, VERTICAL
TAIL SURFACES & LANDING GEAR - CREAM.
HORIZONTAL TAIL SURFACES, WINGS & PROFILE
TRIM - RED... OR REVERSE COLORS.
OTHER COLORS USED - BLUE & CREAM AS WELL AS
SOLID COLORS OVERALL



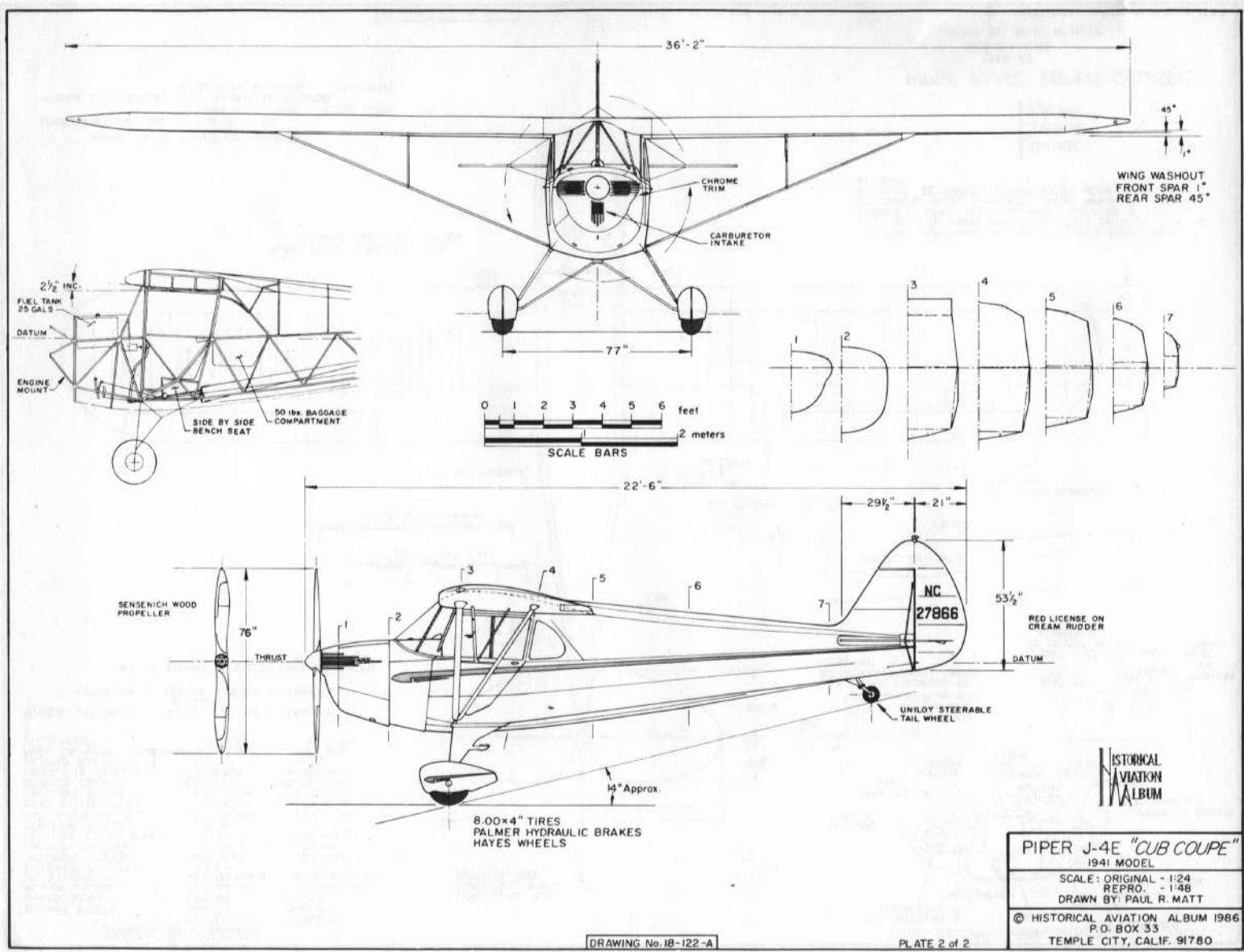
SINCERE THANKS TO PAUL
MCDANIEL, JOHN UNDERWOOD
AND PIPER AIRCRAFT FOR
THEIR HELP IN THE PREPARA-
TIONS OF THESE DRAWINGS.

HISTORICAL AVIATION ALBUM

PIPER J-4E "CUB COUPE"
1941 MODEL

SCALE ORIGINAL - 1:24
REPRO - 1:48
DRAWN BY PAUL R. MATT

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Piper J-4 Coupe









Piper Cub

Piper J-4 Cub Coupe

In the uncertain 1930s it took an individual of independent nature and determination to fashion a light private aircraft that could be acceptable to the low budget flyer. There were many talented engineers around with the same idea. . . a low cost, easy to fly airplane: one that mister average citizen could afford. However, there were so many constraints that best these pioneers in the lightplane field at this time that the task was monumental. The major stumbling block was a suitable powerplant. Big manufacturers thought and produced in terms of hundreds of horsepower. Airplanes needed to go higher, faster and carry more. The market was not ready for simple flying. To simplify was to go backwards. Airframe builders designed around power available. The whole history and success of the personal lightplane revolves around the development of the small, reliable air cooled engine.

One such man working toward solving these problems was Clarence Gilbert Taylor, a self taught aeronautical engineer, independent, intense completely absorbed in his work. As early as 1926, he had designed and built a high-wing monoplane, featuring side-by-side seating and appropriately called the Chummy. Together with his brother, Gordon, they formed a small manufacturing company in Rochester, New York to build airplanes. They called themselves the Taylor Brothers Aircraft Corp.

They were to be several designs before the J-4 Cub Coupe was to go on the airplane market. There were the, Taylor Chummy, E-2 Cub, J-2 Cub and then the ever popular J-3 Cub.

The Overwhelming success of the Cubs led to the decision to diversify, add new models to the line. Competition was also a major factor. As early as 1937 Aeronca had put the Model K on the market. It was a two-place, with side-by-side seating, oleo/spring landing gear, wheel brakes, tail wheel and dual wheel controls. And who should come along with a similar side-by-side seat lightplane but C.G. Taylor with his new Taylorcraft Model A. It was right up there with the best of them. The market was ripe even though Bill Piper was personally reluctant to move into the field.

Design of a side-by-side seater at Piper started in late 1937. Led by Hanford Eckman, the design proceeded smoothly, a prototype was built, the Air type Certificate granted in October 1938 and production commenced. They called it the J-4 Cub

Coupe. Power was the 50 hp Continental. They built thirty-one Coupes before the books were closed in 1938.

The Coupe was promoted as a complete package airplane. Originally priced at \$1,995, it came equipped with wheel brakes, oleo shock absorbers, wheel pants, full swivel tail wheel, entrance doors on both sides — with locks, sliding side windows, upholstered seats, two-tone naugahyde cabin interior, glove compartment, navigation lights, battery and a 15 gallon fuel tank.

By 1940, the Lycoming 65 hp (J-4F) was available, the Continental 65 hp (J-4A) and Franklin 60 hp (J-4B), were certified for installation in the Coupe. Added to the refinements were a parking brake, stainless steel exhaust muffler, cabin heater, chrome plated control sticks, and RCA radio and the engine was completely cowled in.

The Coupe was a departure from the staid and simple tandem machines that were Piper hallmarks for nearly ten years. However there still was "Piper" in the design, handling, stability and performance. Sales although and not as great as for the J-3, were surprisingly high. Between 1938 and 1942, 1,250 were built. This was gratifying to the skeptics at Piper who were afraid to break the bread and butter J-3 mold. The J-4s popularity added emphasis to adding more models to the line. The three-placed J-5 Cruiser came out in 1940.

Eventually the Coupe was offered with the 75 hp Continental engine which gave it a better performance than the J-3. The colors used on the coupe lined varied greatly, more so than the early J-4s were painted solid colors but later Piper offered two-tone schemes at no extra cost. By 1940 the standard was red and cream or blue and yellow. The cream and red colors and style of decor was the same as used later on the post-war PA-12 Super Cruiser (a dressed up J-5.) The J-4s popularity was gaining when the production was terminated.

Late in 1940 Piper Aircraft reduced the cost of its three current production airplanes. The basic J-3 Cub Trainer was offered for an unprecedented \$995, with the A-40-5 engine. An attempt to reduce the inventory of A-40s and close out this model engine. The J-4 Coupe, complete, was down to \$1,848 and the J-5 Cruiser was \$1,798. This campaign was successful. A year later the lowest powered engines considered standard were the 65 ph series.



Piper Cub

Piper J-4 Cub Coupe Specifications/Descriptions & Performance

General Specifications:

Wing Span	36'2"
Wing Chord	5'3"
Length	22'6"
Height	6'10"
Wing Area	183 sq. ft.
Dihedral	0°-45' @ front spar
Incidence	1°-37' @ wing root
Aileron Length	8' 6 1/2"
Aileron Chord	1' 1 1/2"
Aileron Area	19.2 sq. ft.
Stabilizer Area	14.66 sq. ft.
Elevator Area	10.64 sq. ft.
Fin Area	4.66 sq. ft.
Rudder Area	6.76 sq. ft.
Service Ceiling	12,000 feet

Performance:

	Continental A-75-8	Lycoming O-145
Horsepower	75 hp	65 hp
Empty Weight	880 lbs	800 lbs
Useful Load	520 lbs	401 lbs.
Gross Weight	1400 lbs	1301 lbs.
Wing Loading	7.65 lbs./sq. ft.	701 lbs./sq. ft
Power Loading	18.66 lbs./hp	20.0 lbs./hp
Top Speed	96 mph	87 mph
Cruising Speed	83 mph	73 mph
Landing Speed	38 mph	35 mph
Range at Cruise	382 mph	340 miles
Fuel Capacity	25 gals.	16 gals.
Oil Capacity	1.25 gals.	1.25 gals.
Fuel Consumption	5 gal. at S.L.	4 gal. at S.L.

Coloring Notes:

Standard Factory Scheme	
Fuselage	Cream
Vertical Tail Surface	Cream
Landing Gear	Cream
Horizontal Tail Surface	Red
Wings	Red
Profile Trim	Red

All could be in reverse colors.
Other colors used: Blue & Cream as well as solid colors overall.

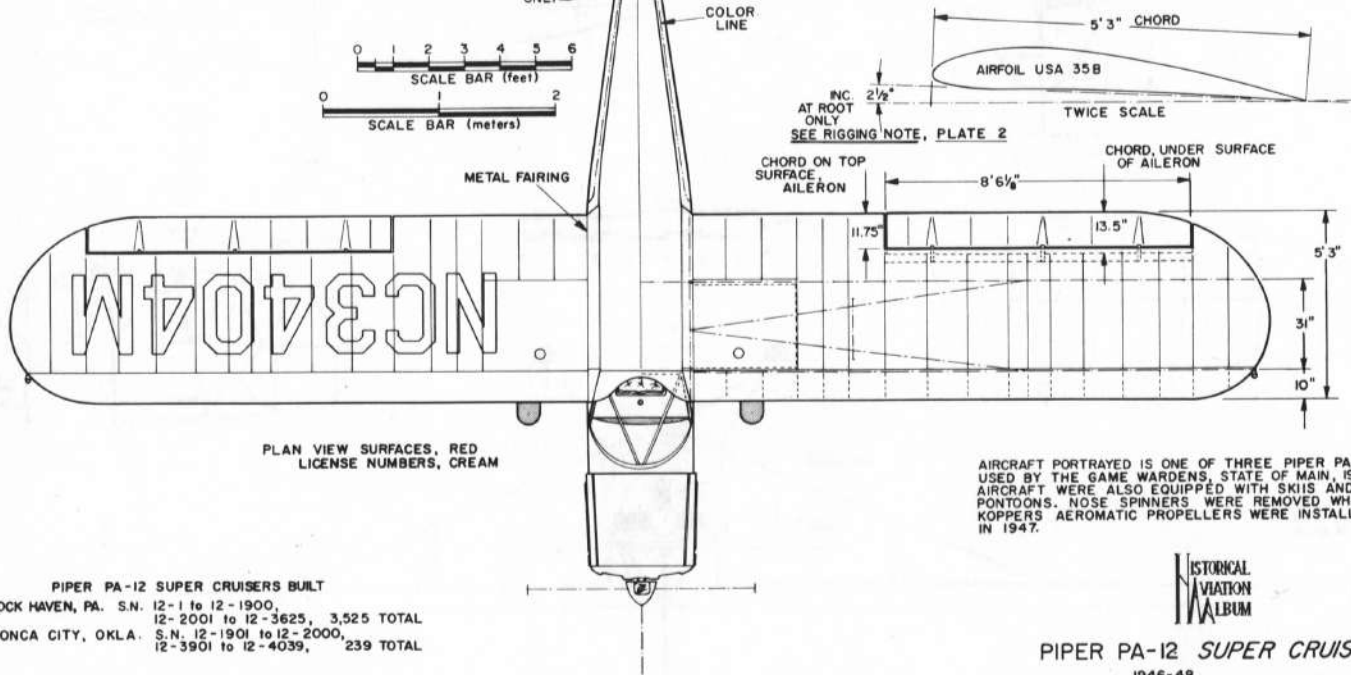
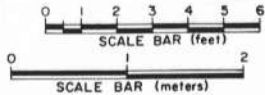
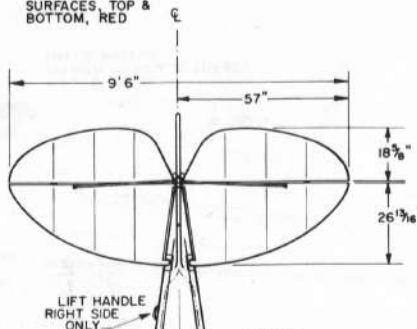
GENERAL SPECIFICATIONS

	NORMAL	UTILITY
WEIGHT EMPTY	950 lbs.	950 lbs.
GROSS WEIGHT	1750 lbs.	1500 lbs.
POWER	17.5 lbs./H.P.	15 lbs./H.P.
WING LOADING	9.8 lbs./sq.ft.	8.36 lbs./sq.ft.
BAGGAGE CAPACITY	41 lbs.	---
CRUISING SPEED	103 m.p.h.	103 m.p.h.
LIMITED TOP SPEED	110 m.p.h.	138 m.p.h.
RED LINE DIVING SPEED	138 m.p.h.	148 m.p.h.
STALLING SPEED	49 m.p.h.	---
RATE OF CLIMB, S.L.	600 ft./min.	750 ft./min.
BEST CLIMB SPEED	75 m.p.h.	70 m.p.h.
CRUISING RANGE	600 miles	600 miles
SERVICE CEILING	12,600 feet	15,700 feet
ABSOLUTE CEILING	15,500 feet	18,000 feet
GLIDING RATIO	11:1	11:1
FUEL CAPACITY (73/80 OCTANE)	38 gals.	38 gals.
OIL CAPACITY	6 quarts	6 quarts

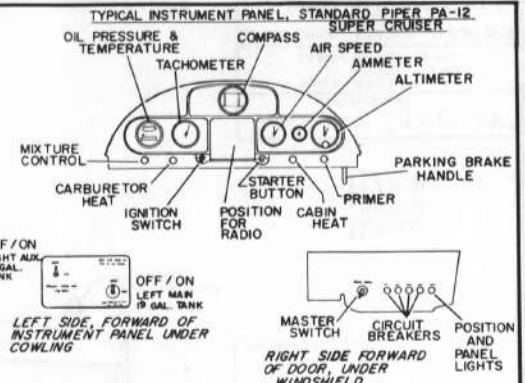
POWER - LYCOMING O-235-C 100 H.P. at 2600 r.p.m.
OR LATER
LYCOMING O-235-C1 108 H.P. at 2600 r.p.m.

THE -C1 ENGINE BOOSTED CRUISING SPEED TO 105 m.p.h.

HORIZONTAL TAIL SURFACES, TOP & BOTTOM, RED



PLAN VIEW SURFACES, RED
LICENSE NUMBERS, CREAM



LEFT SIDE, FORWARD OF INSTRUMENT PANEL UNDER COWLING

RIGHT SIDE FORWARD OF DOOR, UNDER WINDSHIELD
MASTER SWITCH
CIRCUIT BREAKERS
POSITION AND PANEL LIGHTS

AIRCRAFT PORTRAYED IS ONE OF THREE PIPER PA-12s USED BY THE GAME WARDENS, STATE OF MAINE, 1946-50. AIRCRAFT WERE ALSO EQUIPPED WITH SKIS AND PONTOONS. NOSE SPINNERS WERE REMOVED WHEN KOPPERS AEROMATIC PROPELLERS WERE INSTALLED IN 1947.



PIPER PA-12 SUPER CRUISER

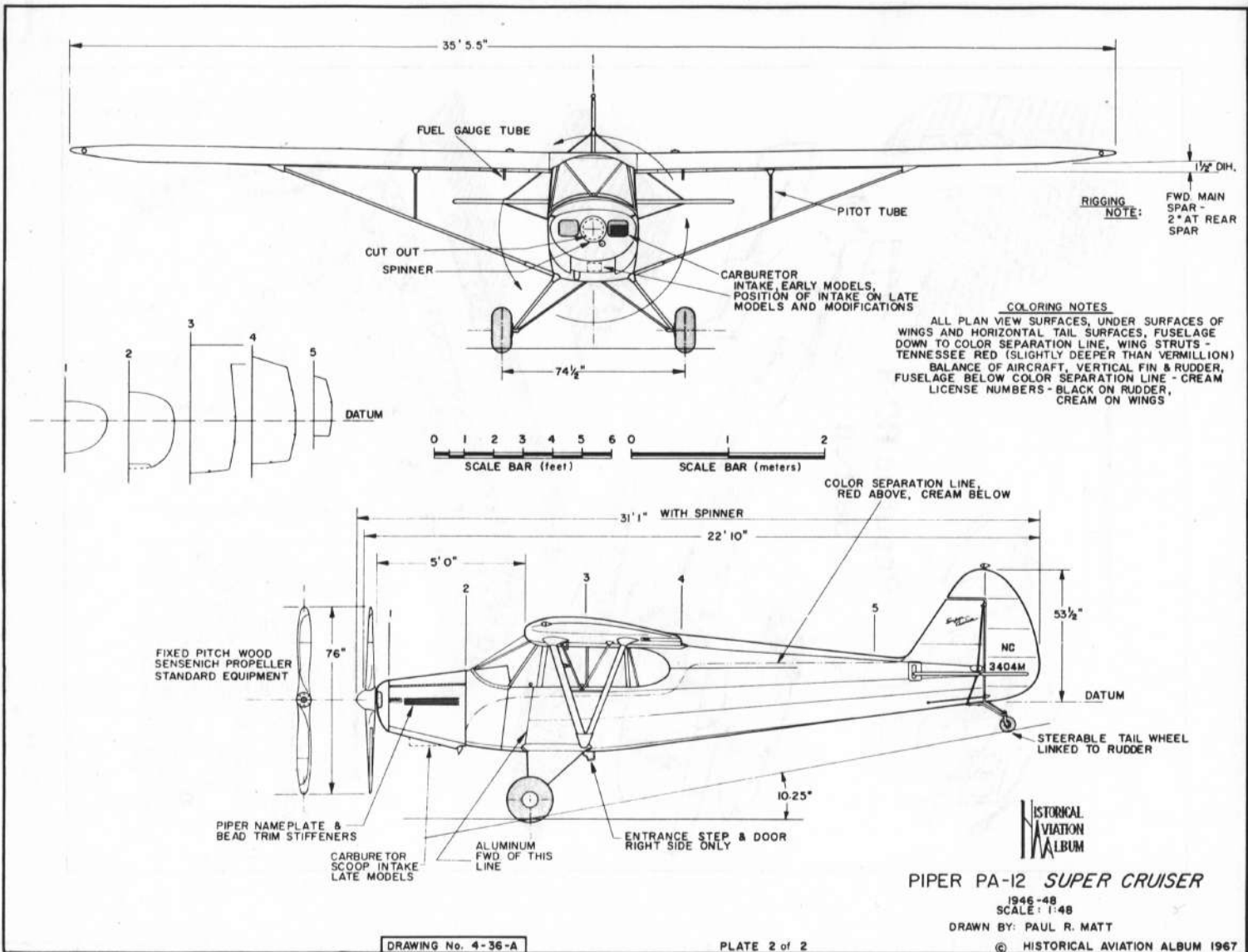
1946-48
SCALE - 1:48

DRAWN BY: PAUL R. MATT

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DRAWING No. 4-36-A

PLATE 1 of 2



























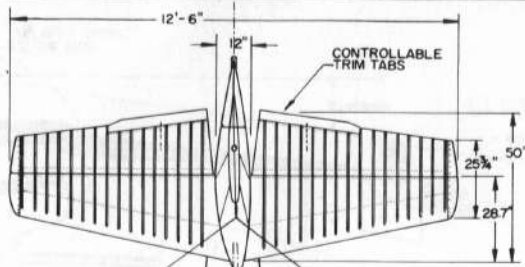
GENERAL SPECIFICATIONS

WEIGHT EMPTY	2,100 lbs.
USEFUL LOAD	1,050 lbs.
GROSS WEIGHT	3,150 lbs.
WING AREA	196 sq. ft.
WING LOADING	15.3 lbs./sq. ft.
POWER LOADING	14.2 lbs./H.P.
TOP SPEED	120 mph
CRUISING SPEED	103 mph
LANDING SPEED	58 mph
CRUISING RANGE	520 miles
RATE OF CLIMB, INITIAL, S.L.	700 ft./min.
SERVICE CEILING	12,000 ft.
FUEL CAPACITY	75 gals.
OIL CAPACITY	13 qts.

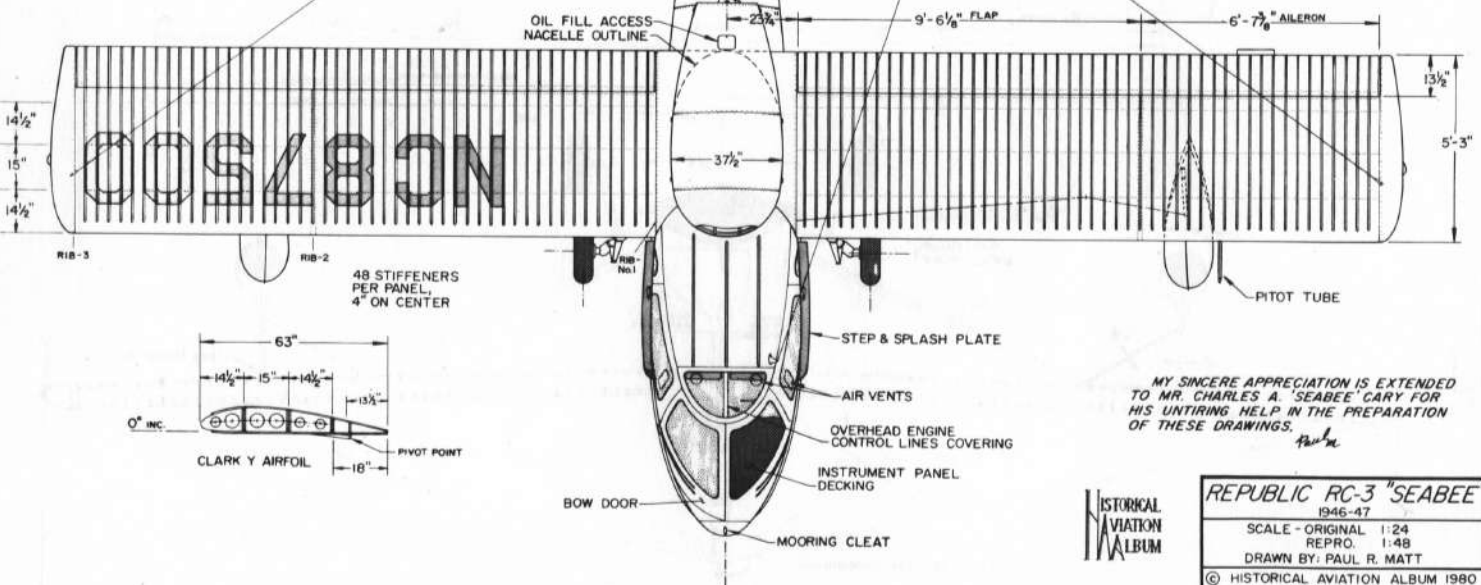
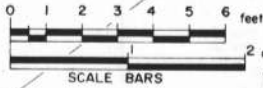
POWER: FRANKLIN "500", 6-CYLINDER,
215 HP at 2500 r.p.m.,
MODEL 6AB-215-B9F

COLORING NOTES
ENTIRE AIRCRAFT PAINTED SILVER
TRIM, AS MARKED, FOREST GREEN

CUSTOMIZED, \$200 EXTRA
ENTIRE AIRCRAFT PAINTED CREAM
TRIM, AS MARKED, RED



KOPPERS "AEROMATIC", GROUND ADJUSTABLE
PROPELLER, 84" DIA.
(HARTZELL HYDRO-SELECTIVE HC-12x20, 84" DIA,
VARIABLE & REVERSIBLE - OPTIONAL)



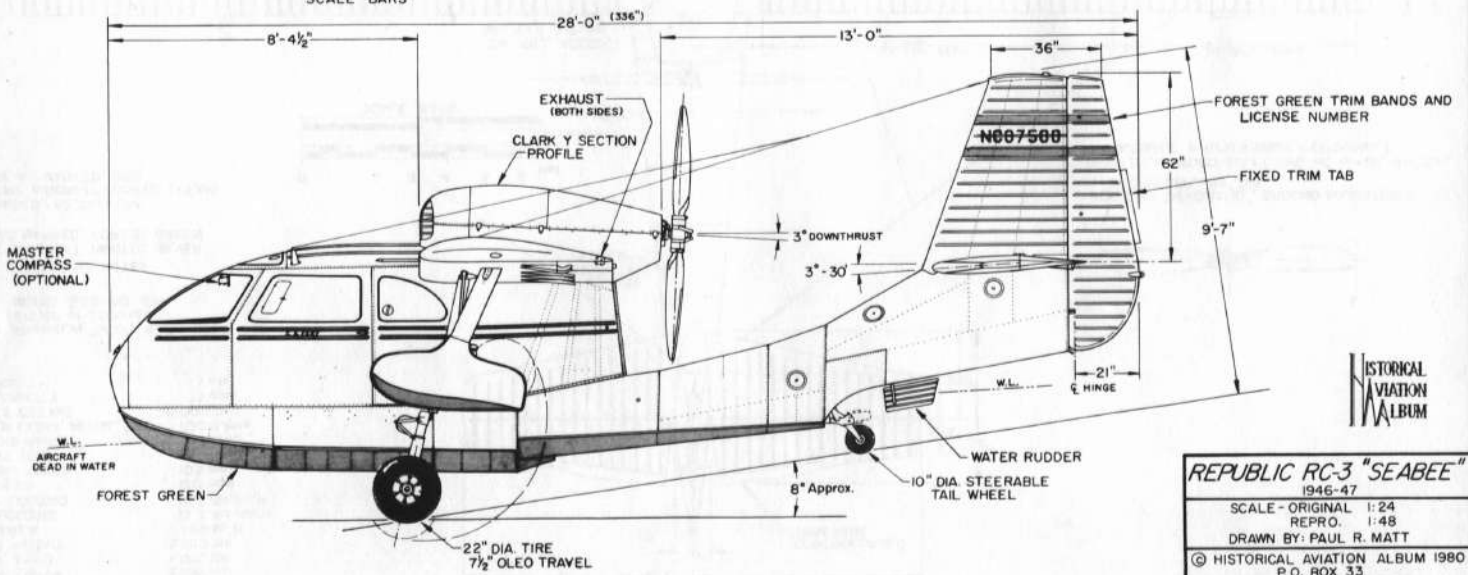
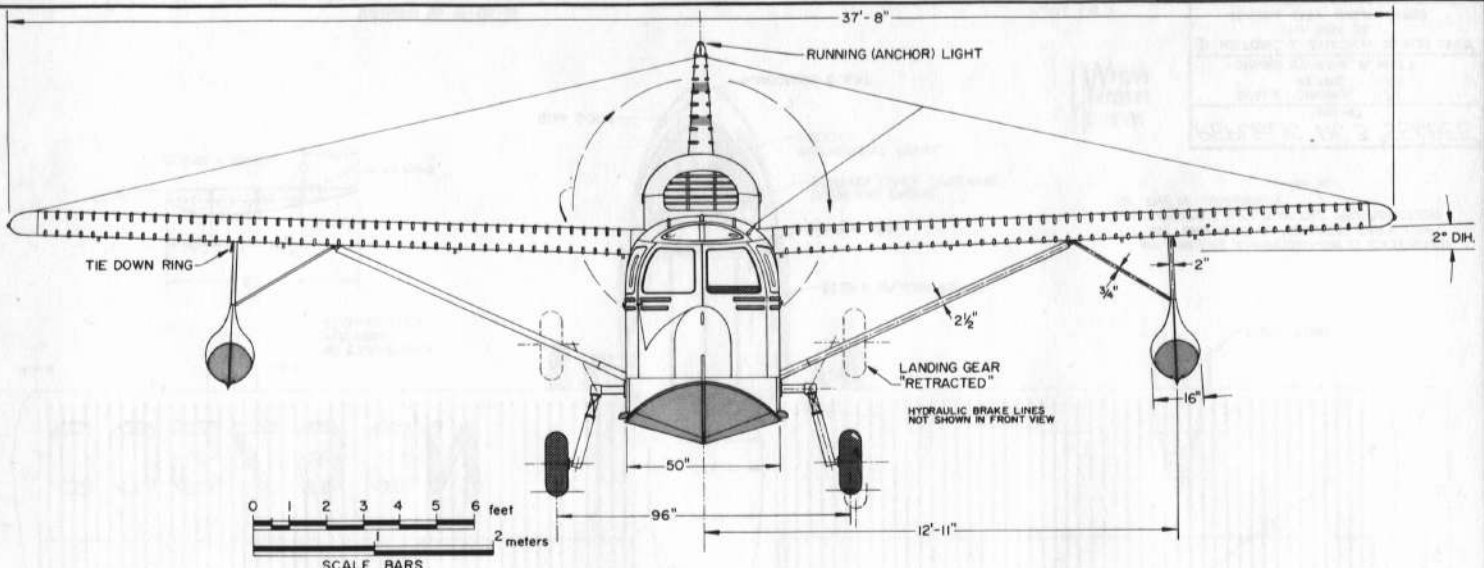
MY SINCERE APPRECIATION IS EXTENDED
TO MR. CHARLES A. 'SEABEE' CARY FOR
HIS UNTIRING HELP IN THE PREPARATION
OF THESE DRAWINGS.
Paul R. Matt

HISTORICAL
NAVIGATION
ALBUM

REPUBLIC RC-3 "SEABEE"
1946-47
SCALE - ORIGINAL 1:24
REPRO. 1:48
DRAWN BY: PAUL R. MATT
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DRAWING No. 16-109-A

PLATE 1 of 3

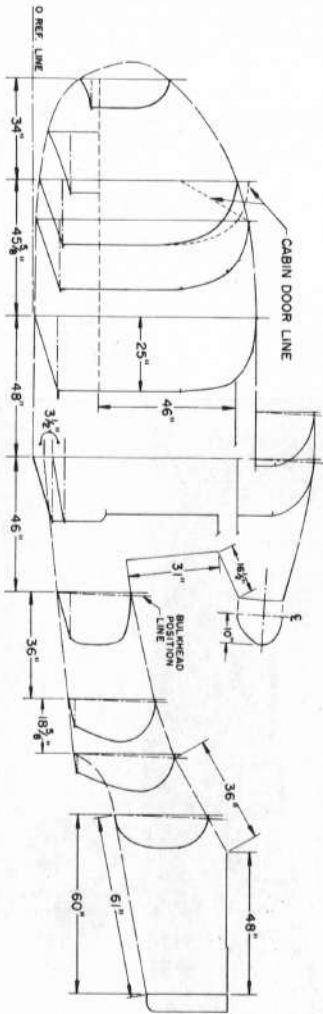


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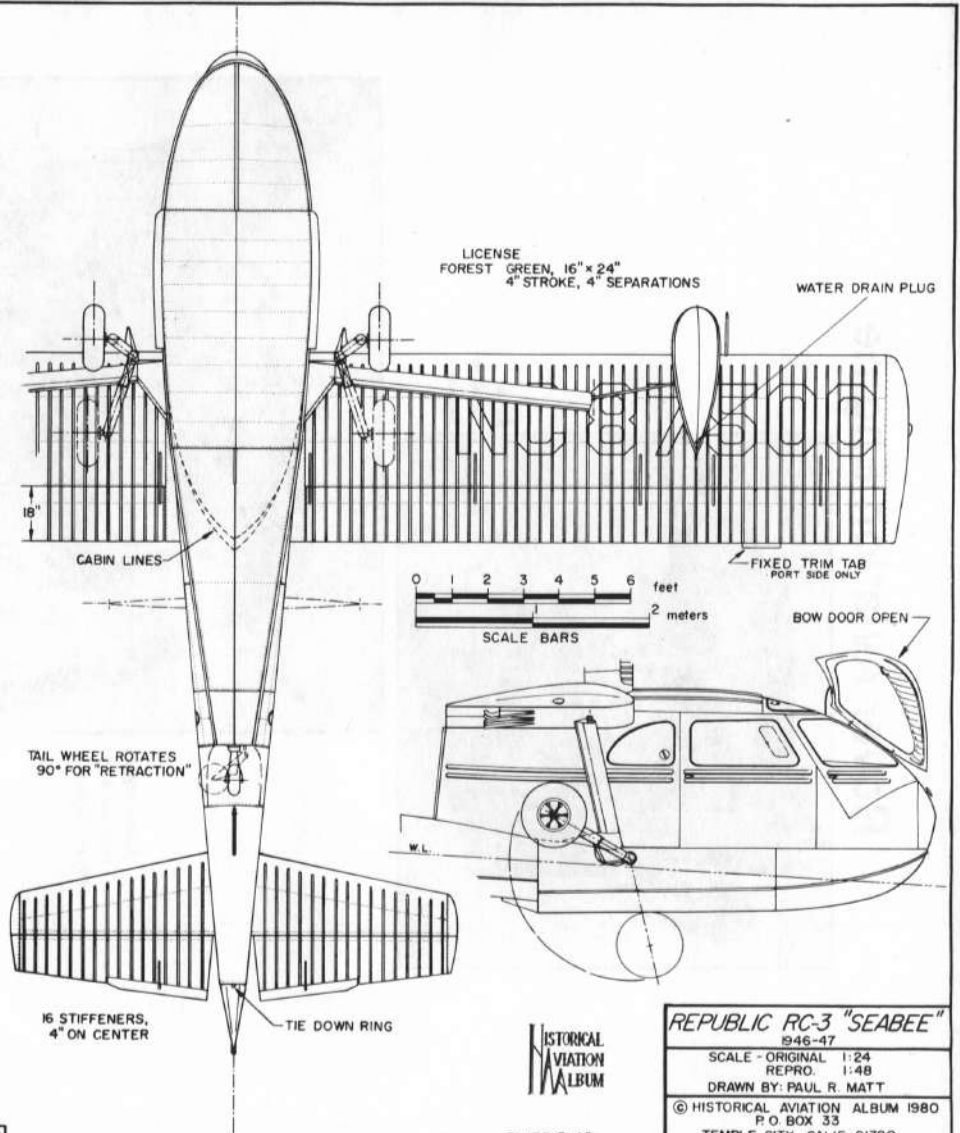
PLATE 2 of 3

HISTORICAL AVIATION ALBUM

REPUBLIC RC-3 "SEABEE"
 1946-47
 SCALE - ORIGINAL 1:24
 REPRO. 1:48
 DRAWN BY: PAUL R. MATT
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KEEL LINE TEMPLATES



DRAWING No. 16-109-A

PLATE 3 of 3

HISTORICAL AVIATION ALBUM

REPUBLIC RC-3 "SEABEE"	
946-47	
SCALE - ORIGINAL	1:24
REPRO.	1:48
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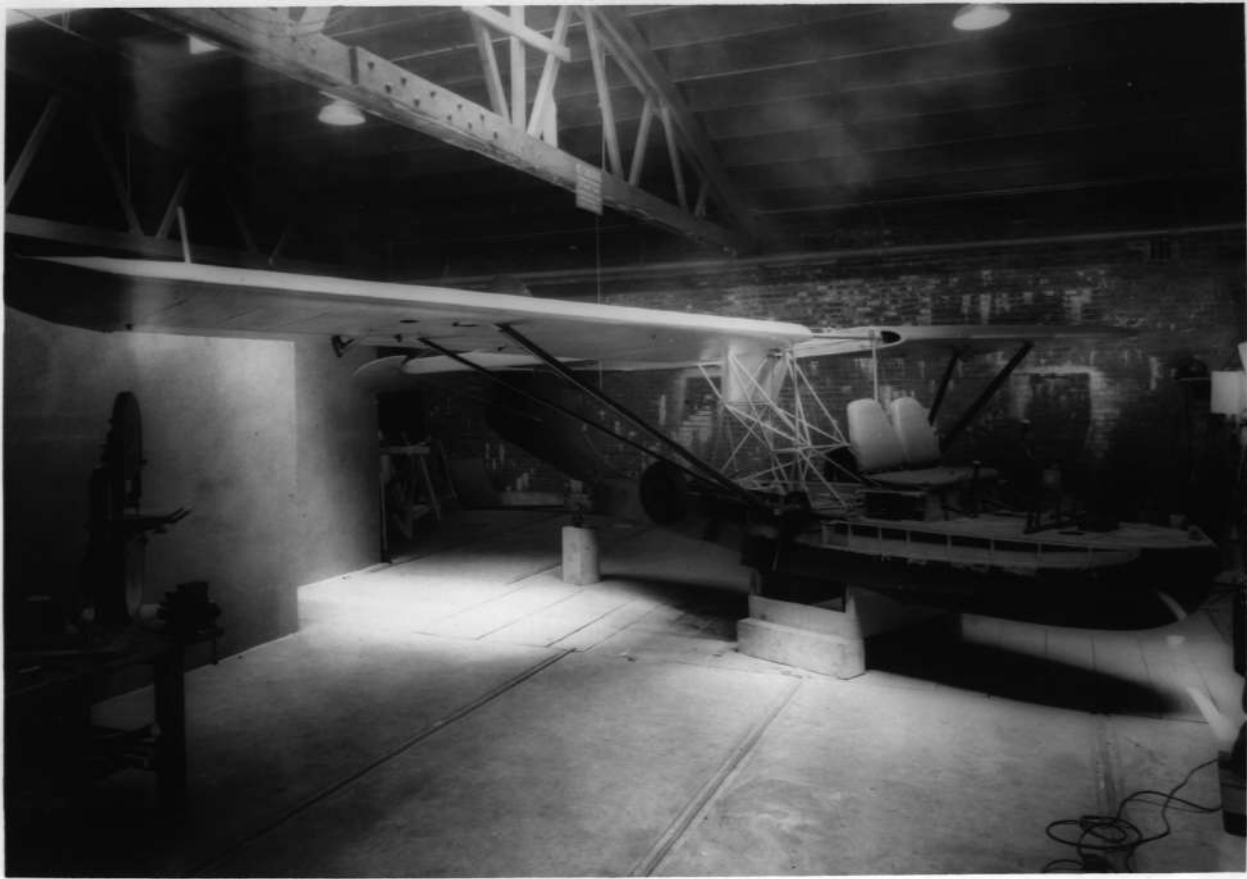












GENERAL SPECIFICATIONS

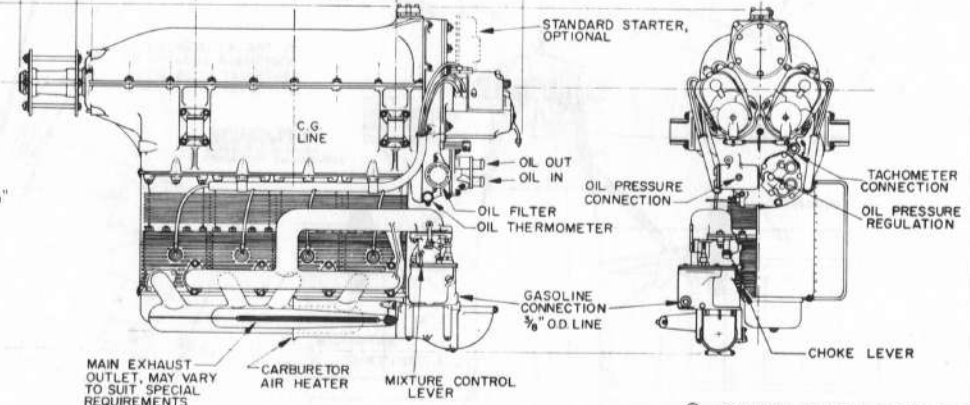
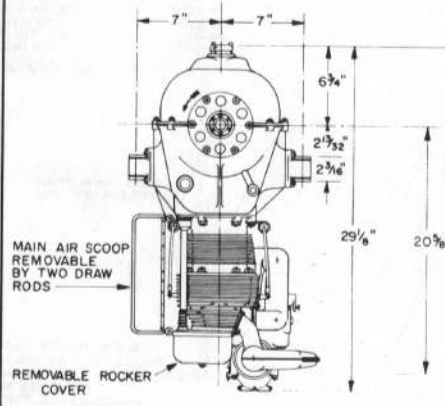
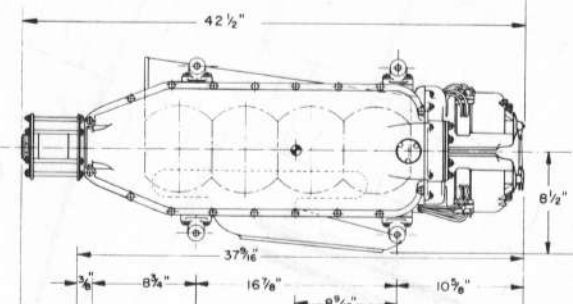
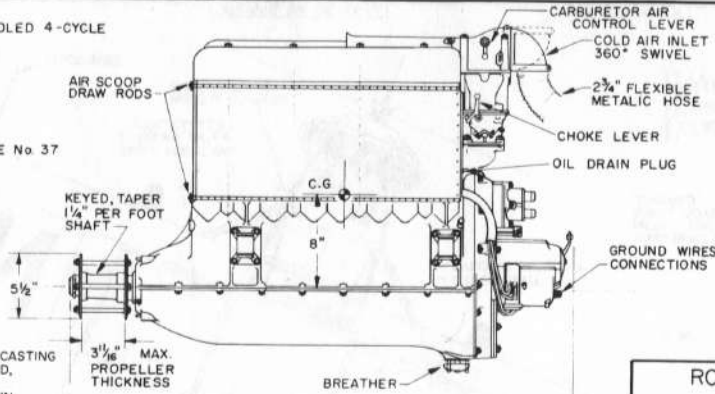
TYPE - FOUR CYLINDER IN-LINE, INVERTED AIR COOLED 4-CYCLE
 BORE - 4.125"
 STROKE - 5.000"
 DISPLACEMENT - 267.28 cu. in. TOTAL
 COMPRESSION RATIO - 5.1:1
 WEIGHT DRY - 240 lbs
 FUEL CONSUMPTION - .55 - .56 lbs./H.P. HOUR
 OIL CONSUMPTION - .010 - .015 lbs./H.P. HOUR
 RATED H.P., NORMAL - 75 H.P. at 1975 r.p.m.
 DEPT. OF COMMERCE APPROVED TYPE CERTIFICATE No 37
 RATINGS FROM BUREAU OF STANDARDS
 POWER CURVE GRAPH
 71 H.P. at 1800 r.p.m.
 67 H.P. at 1700 r.p.m.
 63 H.P. at 1600 r.p.m.
 58 H.P. at 1500 r.p.m.

CARBURETION - STROMBERG NA-R-3
 IGNITION - SCINTILLA MAGNETOS, DUAL IGNITION
 LUBRICATION - OIL DRAWN BY CONVENTIONAL
 TWO GEAR PRESSURE PUMP

MATERIAL

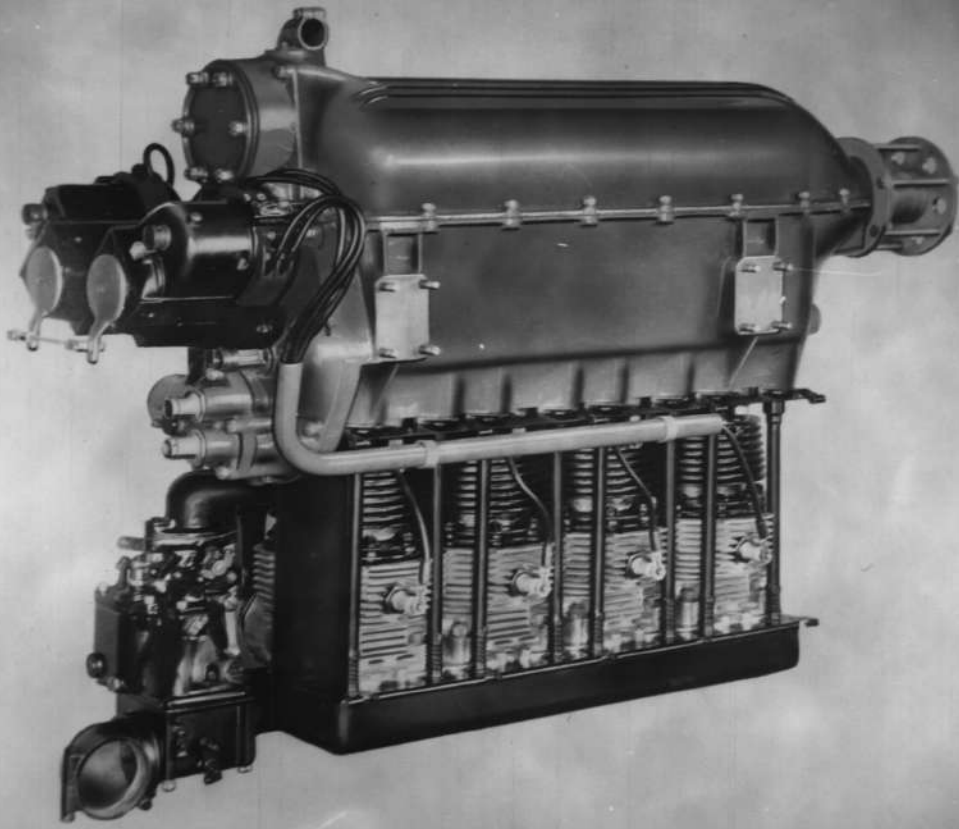
CRANKCASE - DEEP WELL RIBBED ALUMINUM ALLOY CASTING
 CRANKSHAFT - 4 THROW, 5 BEARING, HOLLOW BORED,
 MACHINED ALLOY STEEL
 CONNECTING RODS - H SECTION, FORGED DURALUMIN,
 BABBITT LINED, SHRUNK BRONZE
 PISTON PIN BUSHINGS
 PISTONS - FULL TRUNK, RIBBED TYPE DIE CAST
 ALUMINUM ALLOY
 CYLINDERS - ALUMINUM ALLOY HEADS, BOLTED TO CAST
 NICKLE IRON CYLINDERS
 VALVES - STEEL, BRONZE VALVE SEATS
 CAMSHAFT - SINGLE FIVE BEARING, MACHINED STEEL
 VALVE GEAR - BRONZE BUSHED CAM FOLLOWERS,
 ALEMITE LUBRICATED

WE EXTEND OUR SINCERE APPRECIATION
 TO MR. HAROLD MOREHOUSE FOR HIS
 ASSISTANCE, INTEREST AND PATIENCE IN
 THE PREPARATION OF THIS DRAWING
 AND ACCOMPANYING ARTICLE.



HISTORICAL AVIATION ALBUM

ROVER AVIATION ENGINE
Model L-267
 CIRCA 1929 - 32
 DESIGNED BY - HAROLD E. MOREHOUSE
 MANUFACTURED BY - MICHIGAN AERO-ENGINE CORP
 DIVISION OF MICHIGAN SCREW
 PRODUCTS CORP.
 LANSING, MICH.
 SCALE, ORIGINAL 1:6 (2" = 1")
 REPRO. 1:12 (1" = 1")
 DRAWN BY - PAUL R. MATT
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 TEMPLE CITY, CALIF, 91780

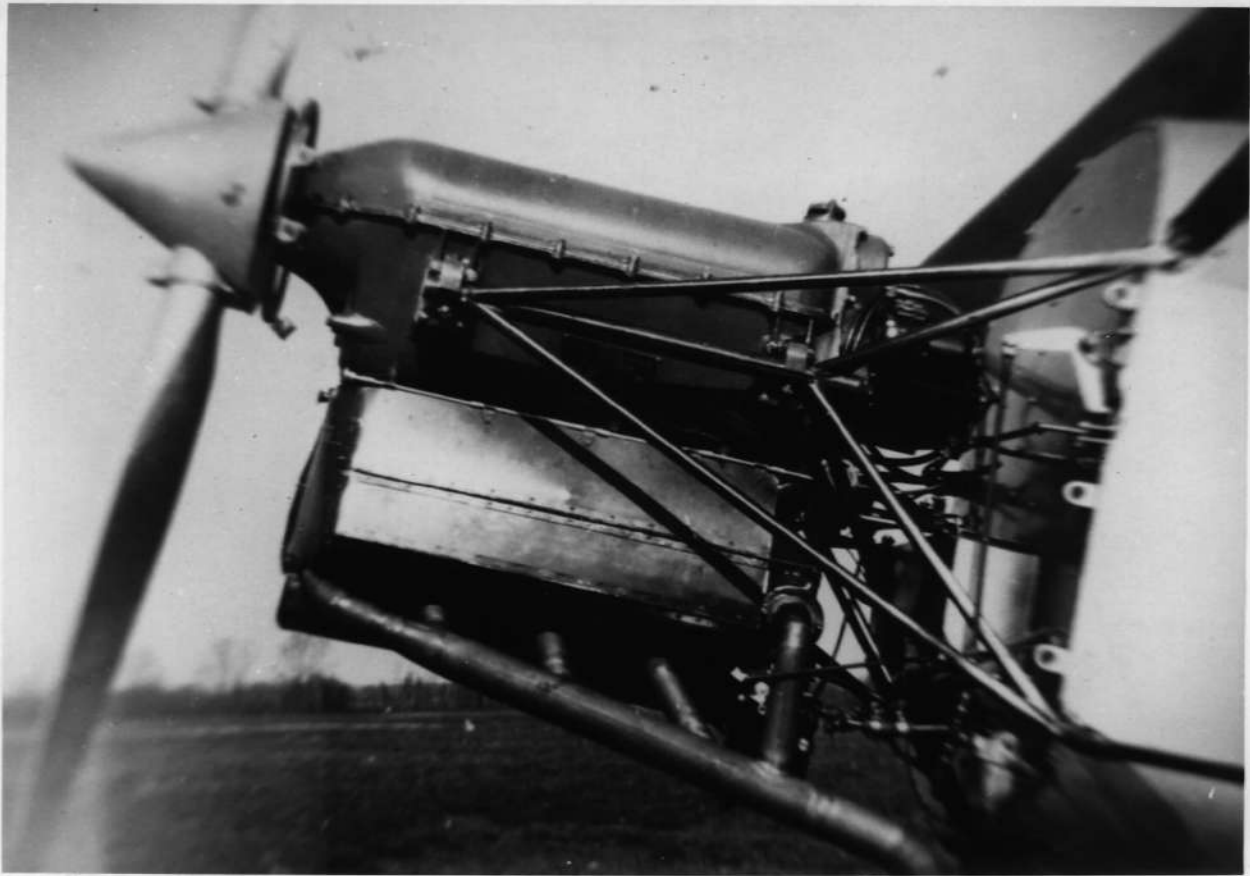




AIR SCOOP SIDE



AIR EXIT SIDE



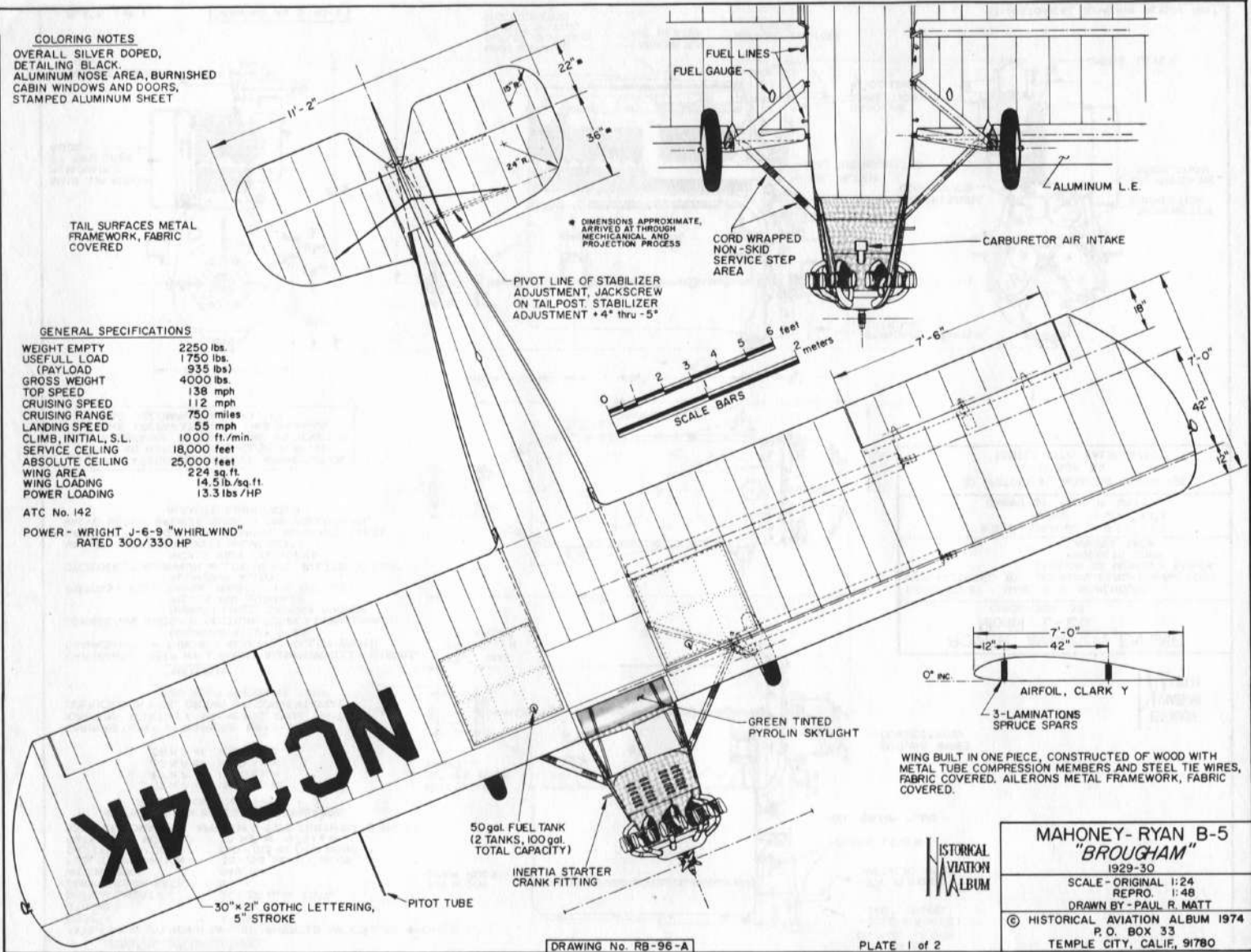
COLORING NOTES
 OVERALL SILVER DOPED,
 DETAILING BLACK.
 ALUMINUM NOSE AREA, BURNISHED
 CABIN WINDOWS AND DOORS,
 STAMPED ALUMINUM SHEET

TAIL SURFACES METAL
 FRAMEWORK, FABRIC
 COVERED

GENERAL SPECIFICATIONS

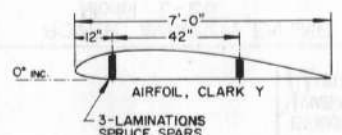
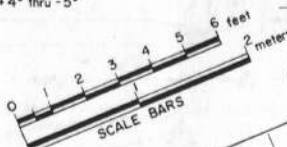
WEIGHT EMPTY	2250 lbs.
USEFUL LOAD	1750 lbs.
(PAYLOAD)	935 lbs.
GROSS WEIGHT	4000 lbs.
TOP SPEED	138 mph
CRUISING SPEED	112 mph
CRUISING RANGE	750 miles
LANDING SPEED	55 mph
CLIMB, INITIAL, S.L.	10,000 ft./min.
SERVICE CEILING	18,000 feet
ABSOLUTE CEILING	25,000 feet
WING AREA	224 sq. ft.
WING LOADING	14.5 lb./sq. ft.
POWER LOADING	13.3 lbs./HP

ATC No. 142
 POWER - WRIGHT J-6-9 "WHIRLWIND"
 RATED 300/330 HP



* DIMENSIONS APPROXIMATE,
 ARRIVED AT THROUGH
 MECHANICAL AND
 PROJECTION PROCESS

PIVOT LINE OF STABILIZER
 ADJUSTMENT, JACKSCREW
 ON TAILPOST. STABILIZER
 ADJUSTMENT +4° thru -5°



WING BUILT IN ONE PIECE, CONSTRUCTED OF WOOD WITH
 METAL TUBE COMPRESSION MEMBERS AND STEEL TIE WIRES,
 FABRIC COVERED.AILERONS METAL FRAMEWORK, FABRIC
 COVERED.

50 gal. FUEL TANK
 (2 TANKS, 100 gal.
 TOTAL CAPACITY)

INERTIA STARTER
 CRANK FITTING

GREEN TINTED
 PYROLIN SKYLIGHT

30" x 21" GOTHIC LETTERING,
 5" STROKE

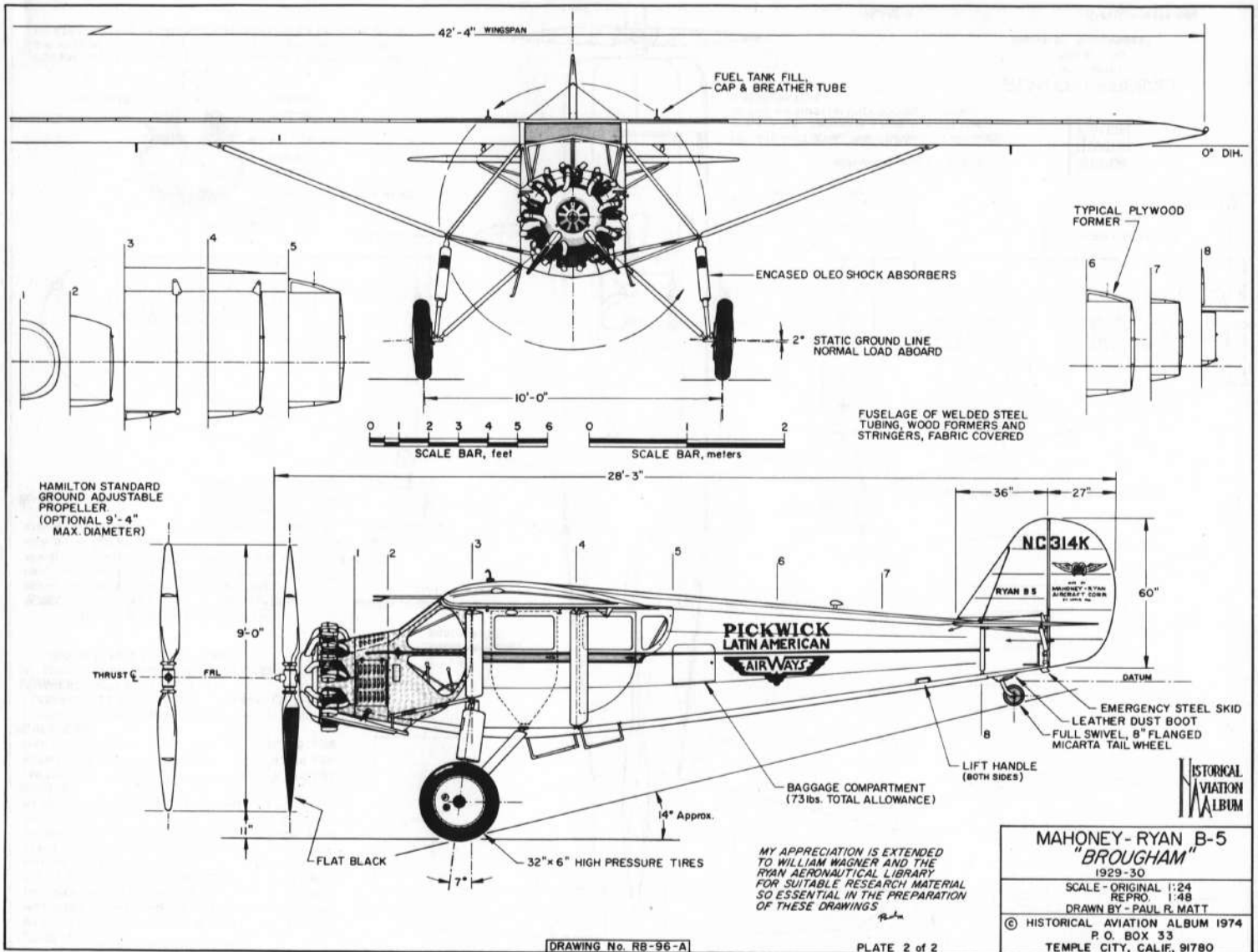
PITOT TUBE

HISTORICAL
 AVIATION
 ALBUM

MAHONEY- RYAN B-5 "BROUGHAM"	
1929-30	
SCALE - ORIGINAL	1:24
REPRO.	1:48
DRAWN BY - PAUL R. MATT	
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TEMPLE CITY, CALIF, 91780	

DRAWING No. RB-96-A

PLATE 1 of 2







8-5

C-150
L-503





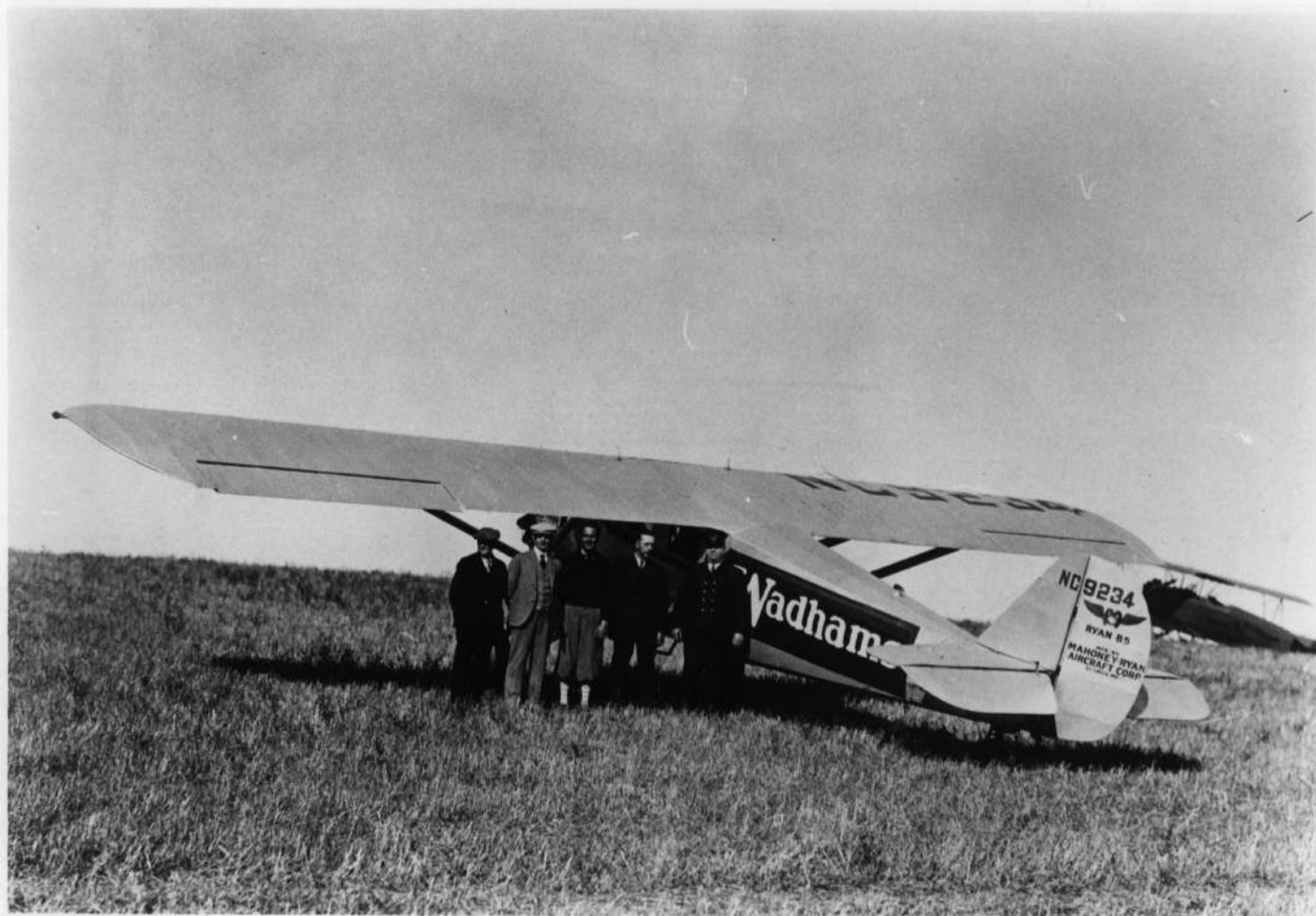
C/N 194

L-649





*Hatchcock
1916-17*



L-587



Head of Yellowstone Lake
Battle Creek
Landed at this angle
under power.

7420'





SHIPPING ANTELOPE FAWNS BY AIRPLANE

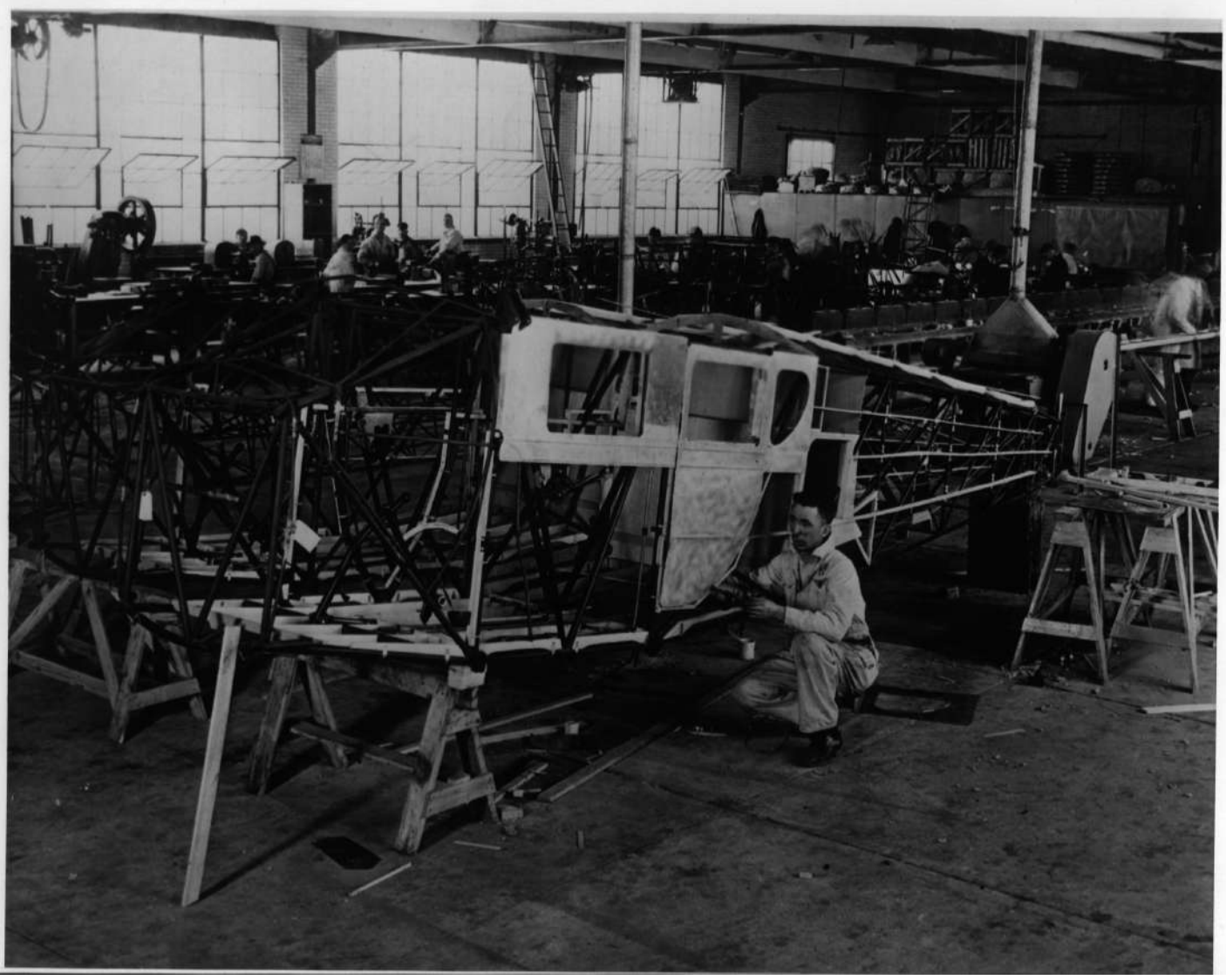
L-414



778 272

B-5





GENERAL SPECIFICATIONS -

PERFORMANCE DATA

MAX SPEED (BOTH ENGINES) @ 18,000 FT. — 425 MPH
 MAX SPEED (BOTH ENGINES) @ SEA LEVEL — 399 MPH
 MAX SPEED (PISTON ENGINE ONLY) — 320 MPH
 CRUISE SPEED (PISTON ENGINE ONLY) — 153 MPH
 MAX SPEED (JET ENGINE ONLY) — 300 MPH
 CLIMB TO 20,000 FT. (BOTH ENGINES) — 5.6 MIN
 INITIAL CLIMB RATE (BOTH ENGINES) — 4,800 F.P.M.
 SERVICE CEILING — 40,000 FT +
 RANGE (PISTON ENGINE ONLY @ 153 MPH) — 1,030 MILES

WEIGHTS

EMPTY — 7,635 LBS.
 NORMAL LOADED — 9,958 LBS.
 MAX GROSS A.U.W. — 10,595 LBS.

POWER PLANT

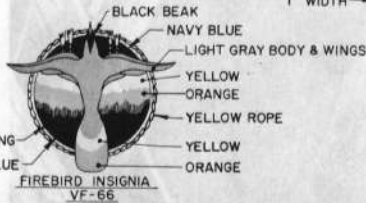
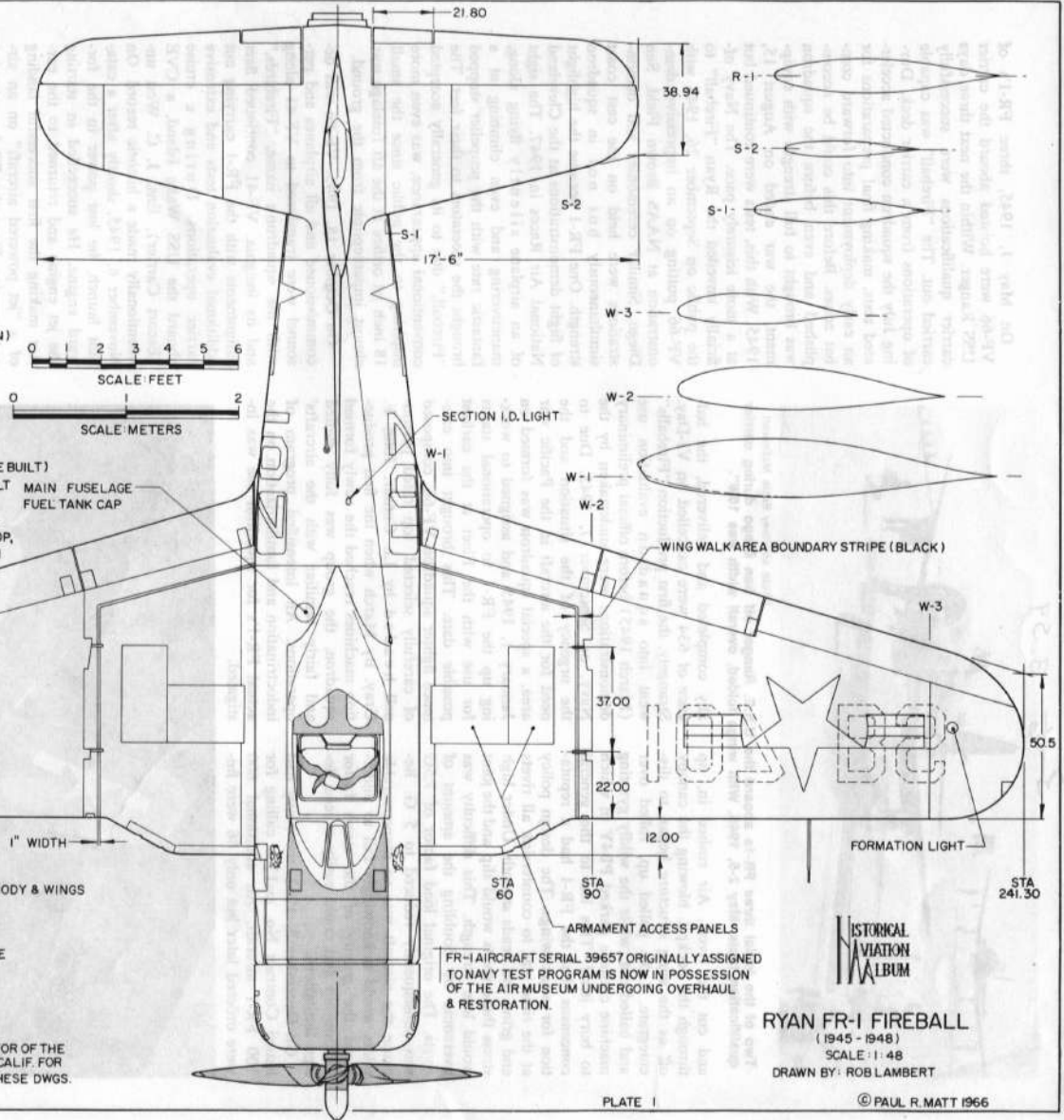
1 WRIGHT CYCLONE R1820-72W — 1,350 H.P.
 1 GENERAL ELECTRIC I-16 (U-31) — 1,600 LB THRUST

ARMAMENT (WITH AUX. FUEL TANK)

4 50 CALIBER MACHINE GUNS (IN WING CENTER SECTION)
 1 1,000 LB BOMB & 8 60 LB. HVAR'S

SERIAL NO ASSIGNMENTS, RYAN FR-1

MODEL	SERIAL	DESCRIPTION
XFR-1	48232 - 48234	PROTOTYPES
FR-1	39647 - 39712	PROD. SERIES (VF-66)
XFR-2	104572 - 105175	IMPROVED VERSION (NONE BUILT)
XFR-3	NOT ASSIGNED	HIGHER H.P. PROP. NOT BUILT
XFR-4	39665 ONLY	HIGHER H.P., FLUSH AIR INTAKES, MODIFIED TAIL.
XFR-1	39661 ONLY	"DARK SHARK" TURBO-PROP, TURBO-JET COMBINATION

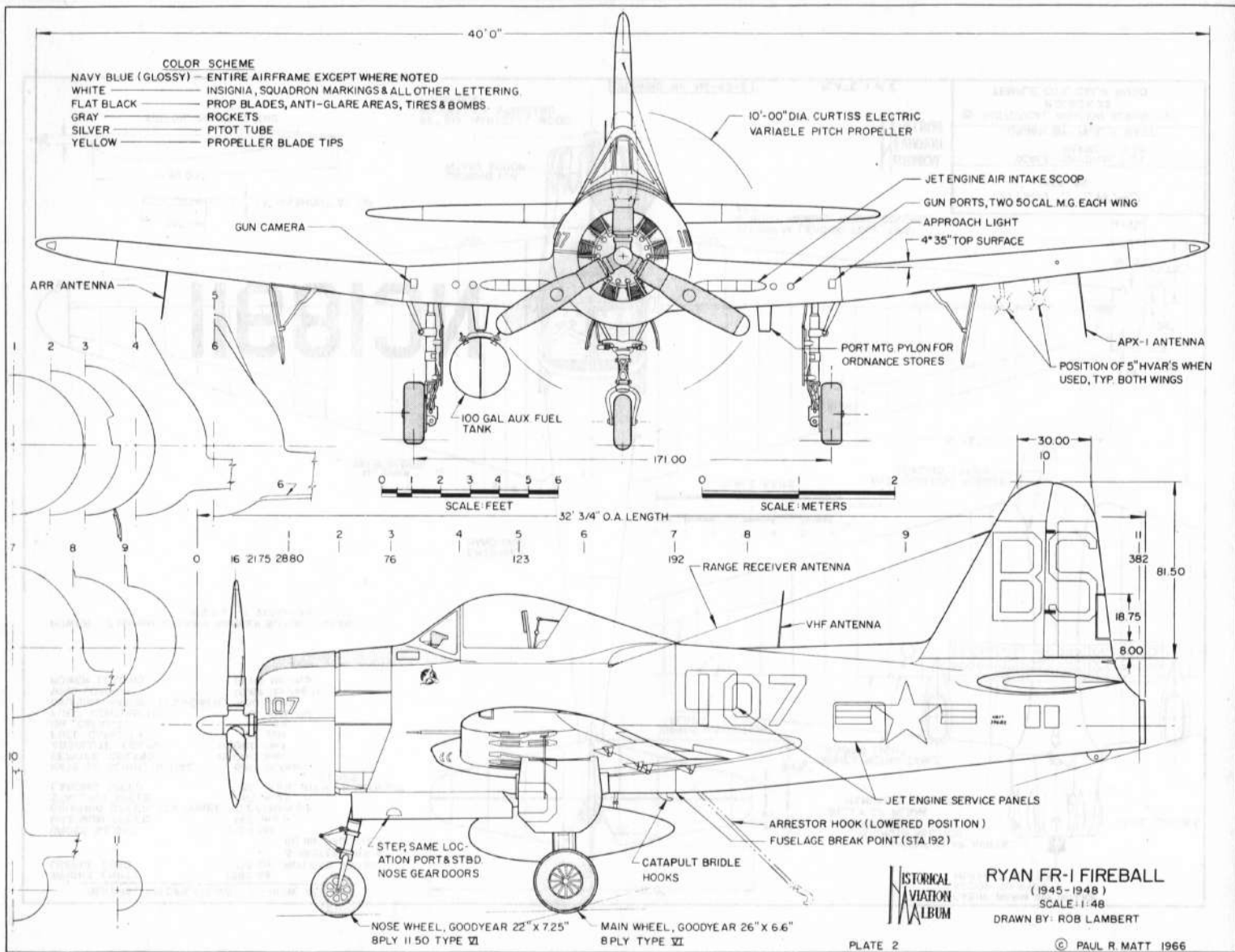


FR-1 AIRCRAFT SERIAL 39657 ORIGINALLY ASSIGNED TO NAVY TEST PROGRAM IS NOW IN POSSESSION OF THE AIR MUSEUM UNDERGOING OVERHAUL & RESTORATION.



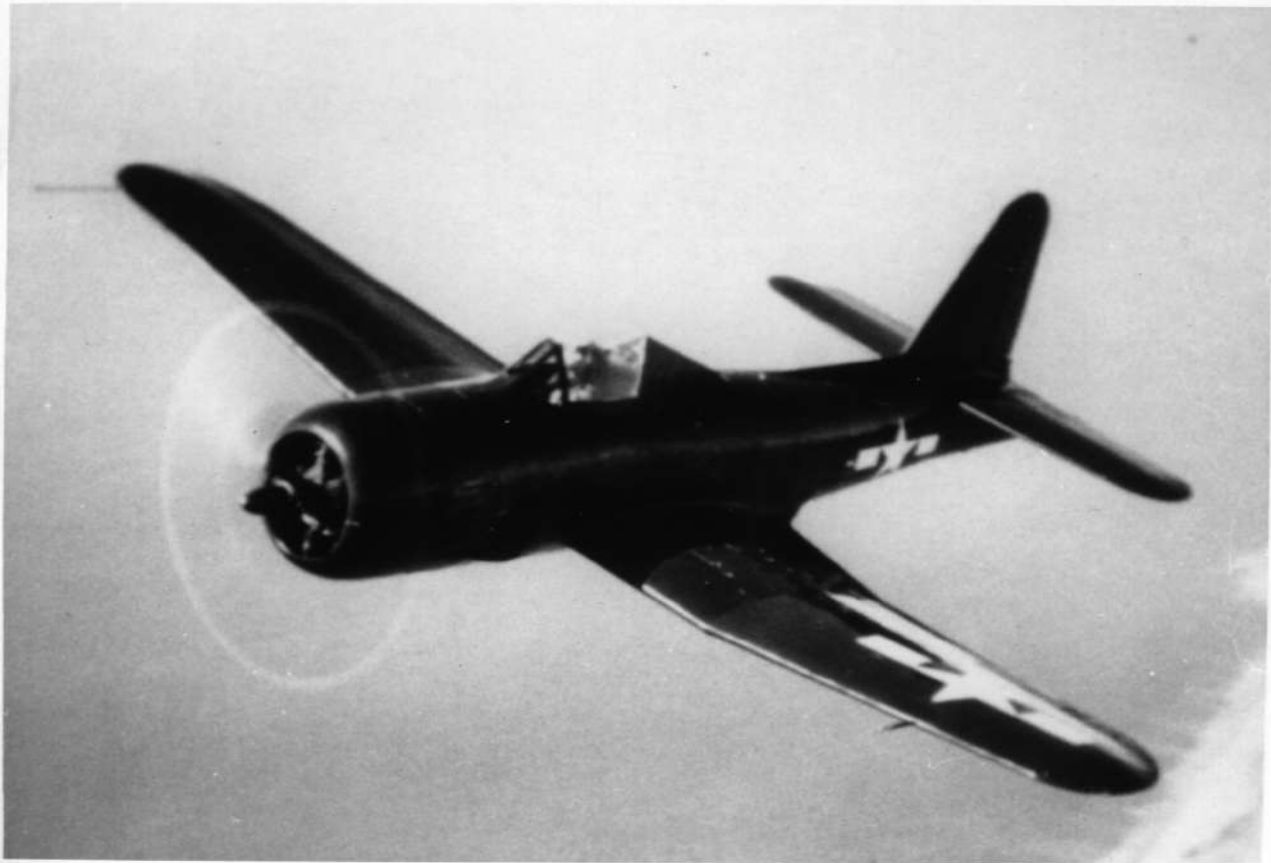
RYAN FR-1 FIREBALL
 (1945 - 1948)
 SCALE: 1:48
 DRAWN BY: ROB LAMBERT

OUR SINCERE APPRECIATION TO MR. ED MALONEY, DIRECTOR OF THE AIR MUSEUM, ONTARIO INTERNAT'L. AIRPORT, ONTARIO, CALIF. FOR HIS ASSISTANCE WITH MATERIAL FOR PREPARATION OF THESE DWGS.





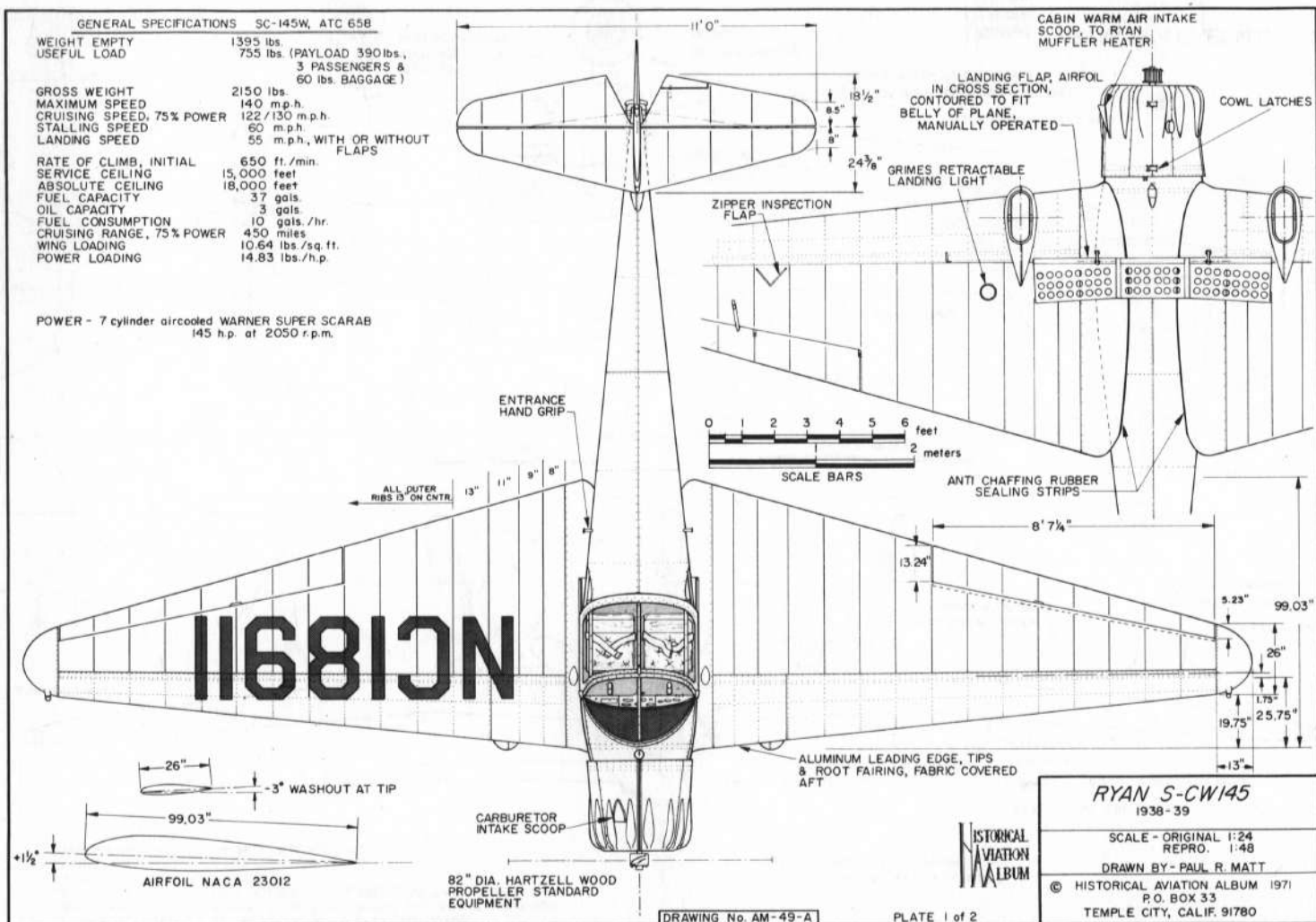




GENERAL SPECIFICATIONS SC-145W, ATC 65B

WEIGHT EMPTY	1395 lbs.
USEFUL LOAD	755 lbs. (PAYLOAD 390 lbs., 3 PASSENGERS & 60 lbs. BAGGAGE)
GROSS WEIGHT	2150 lbs.
MAXIMUM SPEED	140 m.p.h.
CRUISING SPEED, 75% POWER	122 / 130 m.p.h.
STALLING SPEED	60 m.p.h.
LANDING SPEED	55 m.p.h., WITH OR WITHOUT FLAPS
RATE OF CLIMB, INITIAL	650 ft./min.
SERVICE CEILING	15,000 feet
ABSOLUTE CEILING	18,000 feet
FUEL CAPACITY	37 gals.
OIL CAPACITY	3 gals.
FUEL CONSUMPTION	10 gals./hr.
CRUISING RANGE, 75% POWER	450 miles
WING LOADING	10.64 lbs./sq. ft.
POWER LOADING	14.83 lbs./h.p.

POWER - 7 cylinder aircooled WARNER SUPER SCARAB
145 h.p. at 2050 r.p.m.



RYAN S-CW145
1938-39

SCALE - ORIGINAL 1:24
REPRO. 1:48

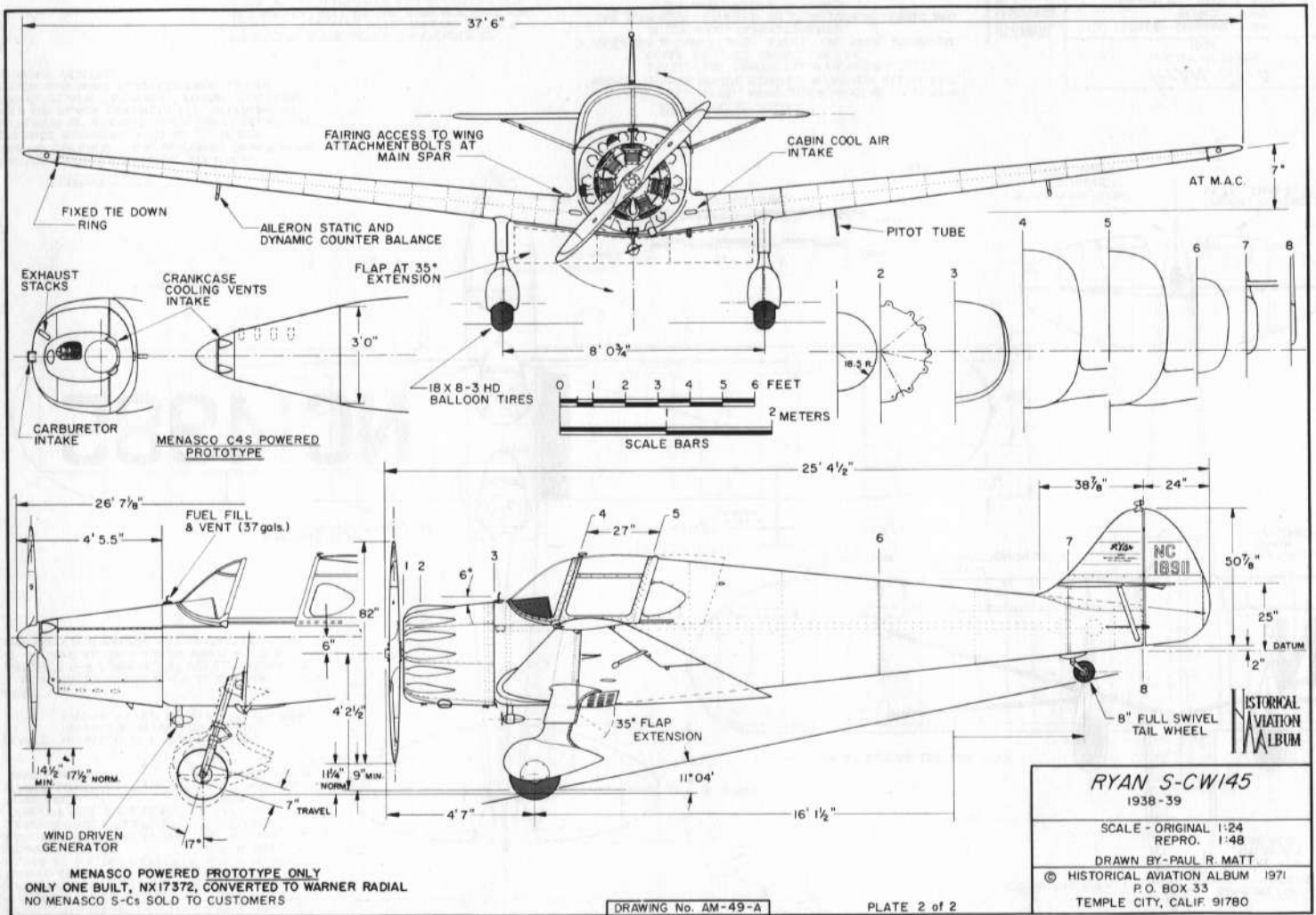
DRAWN BY - PAUL R. MATT

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DRAWING No. AM-49-A

PLATE 1 of 2



MENASCO POWERED PROTOTYPE ONLY
 ONLY ONE BUILT, NX17372, CONVERTED TO WARNER RADIAL
 NO MENASCO S-C's SOLD TO CUSTOMERS

DRAWING No. AM-49-A

PLATE 2 of 2

Ryan SC Chronology

200	Re; Boyd - Not used, because number did not sound good.
201	X-17372 SCM Menasco C-4s Prototype. Mexico SCW Warner S-50 XA-CUT. Now in USA
202	NC-18908 SC-W Warner S-50 Civil Air Patrol Ship
203	NC-18909 SC-W Warner S-50 Civil Air Patrol Ship
204	NC-18910 SC-W Warner S-50 Lost in fire at San Diego Aerospace Museum
205	NC-18911 SC-W Warner S-50 In movie "Wake Island"
206	NC-18912 SC-W Warner S-50 Civil Air Patrol Ship. In movie "Wake Island."
207	NC-18913 SC-W Warner S-50 Civil Air Patrol Ship. Lost in fire, 1948.
208	NC-18914 SC-W Warner S-50 Firestone Co. test ship
209	PP-TEC SC-W Warner S-50 Sold to Brazil. Crash June 17, 1958.
210	NC-18915 SC-W Warner S-50 In movie "Wake Island" Mexico XA-DIR NC-75395 & N-147W
211	NC-18916 SC-W Warner S-50 Civil Air Patrol ship N-126 & N-46207
212	NC-18917 SC-W Warner S-50 Civil Air Patrol ship
213	Never assembled. Used at Ryan School of Aeronautics
214	N-305W SC Warner Built up from parts. N-18900
215	300 This block of numbers reserved for future production but never used or materialized.

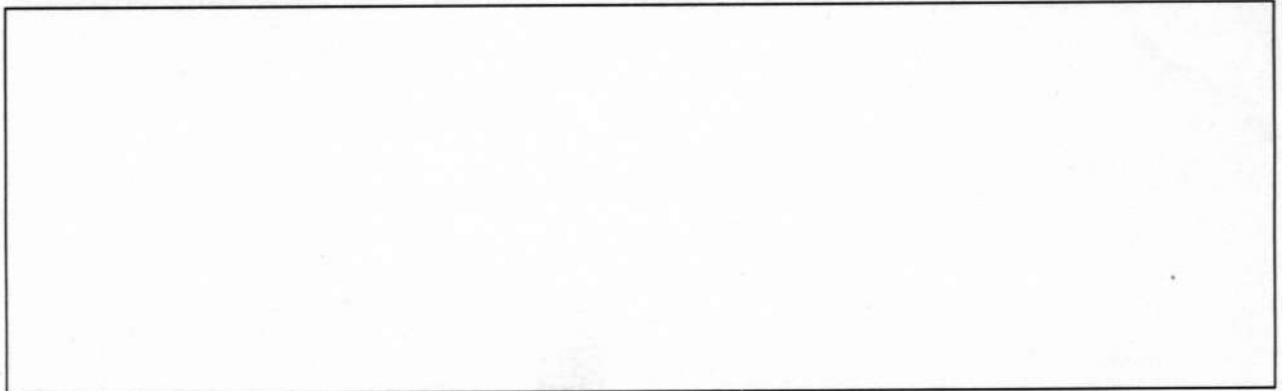
Ryan SC Standard Equipment

Split, perforated-type wing flap
 Trimming tab controlled by convenient crank or knurled knob in cabin
 Wheel pants, wing fillets and fairings throughout.
 Modified NACA type engine cowling.
 Full swiveling, pneumatic tail wheel
 Wheel breaks, differentially actuated by both sets of controls
 Parking brake
 Full air wheels
 Position lights, wiring and switch
 Complete set of dual controls
 Roller-type sun curtains
 Reserve fuel supply system
 Eclipse electric starter
 Storage battery
 Exhaust manifold system
 Hot air cabin ventilation system
 Cold air cabin ventilation system
 Cold weather carburetor heater
 Seats designed to accommodate chair or standard
 Seat pack parachutes

Complete upholstering interior finish
 Long stroke oleo-type shock absorbers
 Altimeter
 Tachometer
 Compass
 Air speed indicator
 Oil pressure gauge
 Direct reading fuel gauge
 First aid kit
 Fire extinguisher
 Tool kit
 Aircraft and engine log books
 Aircraft and engine instruction manuals

Optional SC Equipment

Grimes electrically retractable landing lights
 International type parachute flares
 Lear or RCA radio receiver
 Hodges wind driven generator or Bosch engine driven generator
 Turn and bank indicator
 Sensitive altimeter





63315



63312



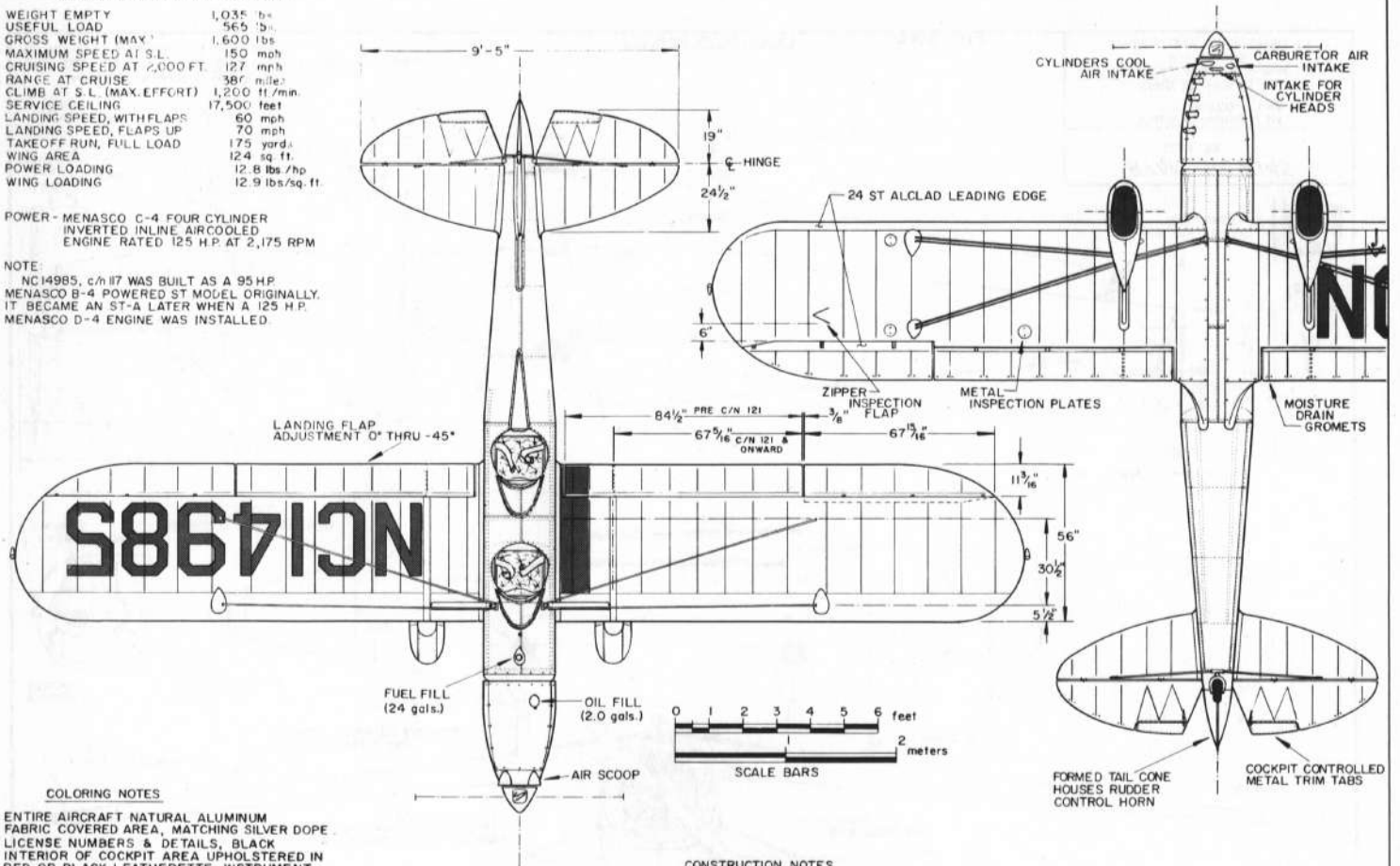


GENERAL SPECIFICATIONS
ST-A, MENASCO C-4, 125 hp ENGINE

WEIGHT EMPTY 1,035 lbs.
USEFUL LOAD 565 lbs.
GROSS WEIGHT (MAX.) 1,600 lbs.
MAXIMUM SPEED AT S.L. 150 mph
CRUISING SPEED AT 7,000 FT. 127 mph
RANGE AT CRUISE 387 miles
CLIMB AT S.L. (MAX. EFFORT) 1,200 ft./min.
SERVICE CEILING 17,500 feet
LANDING SPEED, WITH FLAPS 60 mph
LANDING SPEED, FLAPS UP 70 mph
TAKEOFF RUN, FULL LOAD 175 yards
WING AREA 124 sq. ft.
POWER LOADING 12.8 lbs./hp
WING LOADING 12.9 lbs./sq. ft.

POWER - MENASCO C-4 FOUR CYLINDER
INVERTED INLINE AIRCOOLED
ENGINE RATED 125 H.P. AT 2,175 RPM

NOTE:
NC14985, c/n 117 WAS BUILT AS A 95 H.P.
MENASCO B-4 POWERED ST MODEL ORIGINALLY.
IT BECAME AN ST-A LATER WHEN A 125 H.P.
MENASCO D-4 ENGINE WAS INSTALLED.



COLORING NOTES

ENTIRE AIRCRAFT NATURAL ALUMINUM
FABRIC COVERED AREA, MATCHING SILVER DOPE.
LICENSE NUMBERS & DETAILS, BLACK
INTERIOR OF COCKPIT AREA UPHOLSTERED IN
RED OR BLACK LEATHERETTE, INSTRUMENT
PANEL BLACK "CRINKLE" FINISH, CONTROL
STICK AND WING FLAP CONTROL LEVER
CHROME PLATED.

MY SINCERE APPRECIATION IS EXTENDED TO
MESSRS. T. CLAUDE RYAN, WILLIAM WAGNER,
AND MAC CATRELL OF THE RYAN AERONAUTICAL
CORP., EV. CASSAGNERES AND FLOYD CARTER
FOR THEIR VALUABLE AND UNSELFISH HELP
IN THE PREPARATION OF THESE DRAWINGS

CONSTRUCTION NOTES

FUSELAGE - ALL METAL, MONOCOQUE, ALCLAD 24 ST SKIN
WINGS - SPRUCE SPARS, STAMPED ALUMINUM ALLOY RIBS,
STEEL TUBE COMPRESSION MEMBERS, STEEL
CABLE TIE LINES, FABRIC COVERED.
AILERONS & WING FLAPS - STEEL TUBE SPAR, ALUMINUM
ALLOY RIBS, FABRIC COVERED.
TAIL SURFACES - RIVETED 24 ST ALUMINUM TUBING AND
ALLOY RIBS, FABRIC COVERED.

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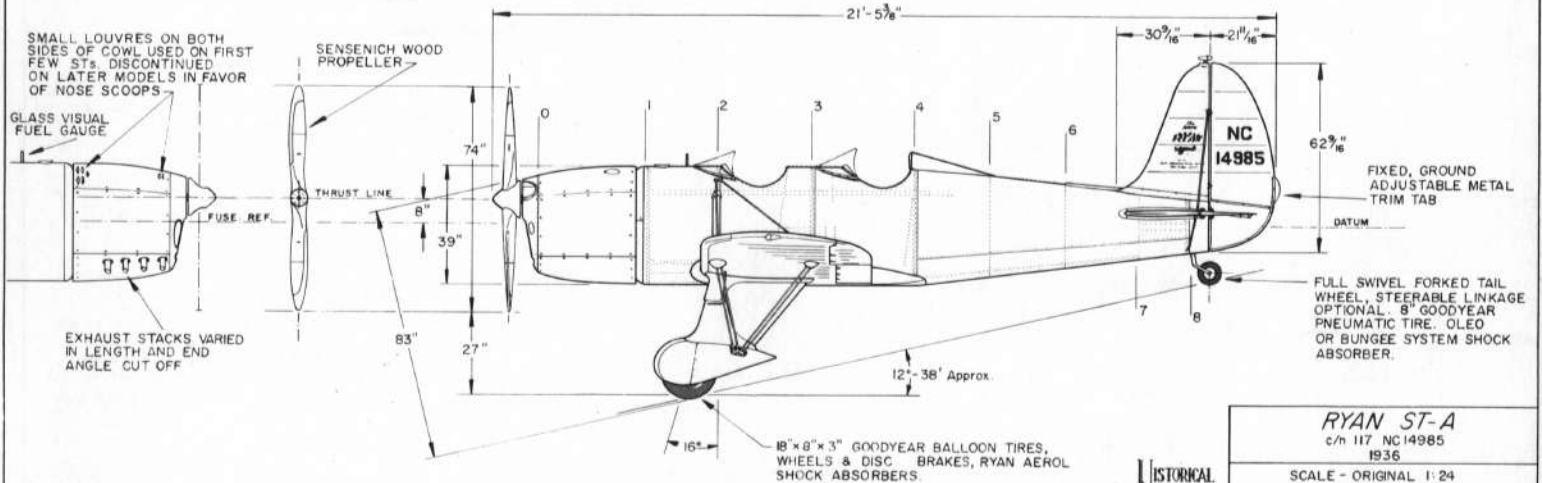
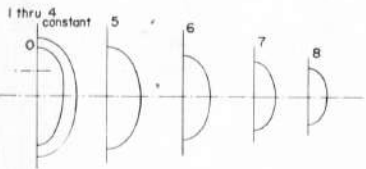
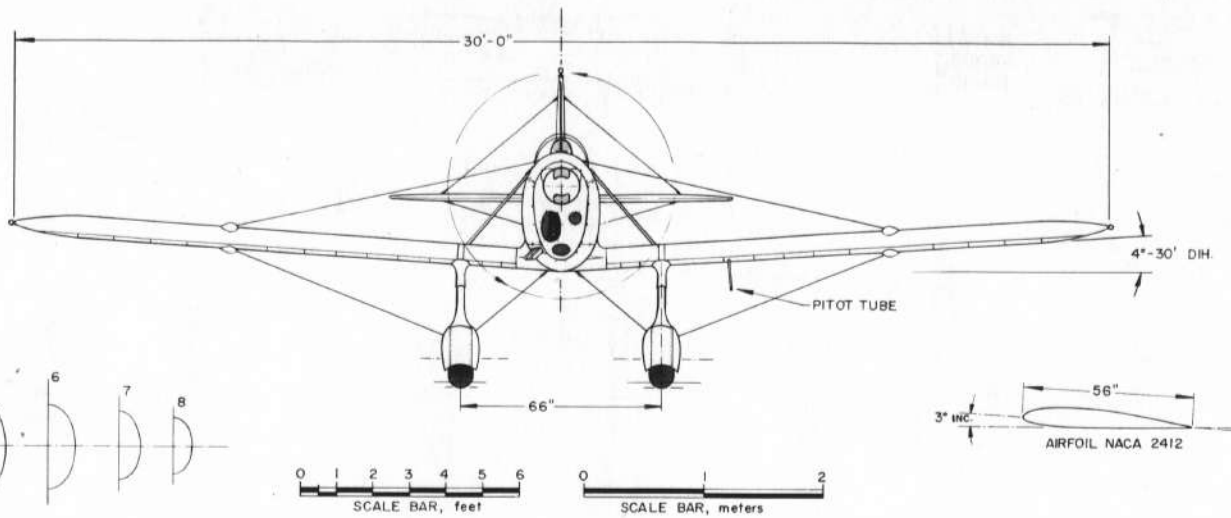
RYAN ST-A
c/n 117 NC14985
1936

SCALE - ORIGINAL 1:24
REPRO. 1:48
DRAWN BY - PAUL R. MATT

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PLATE 1 of 2



RYAN ST-A
 c/n 117 NC14985
 1936

SCALE - ORIGINAL 1:24
 REPRO. 1:48
 DRAWN BY - PAUL R. MATT

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DRAWING No. 9-76-A

PLATE 2 of 2

15



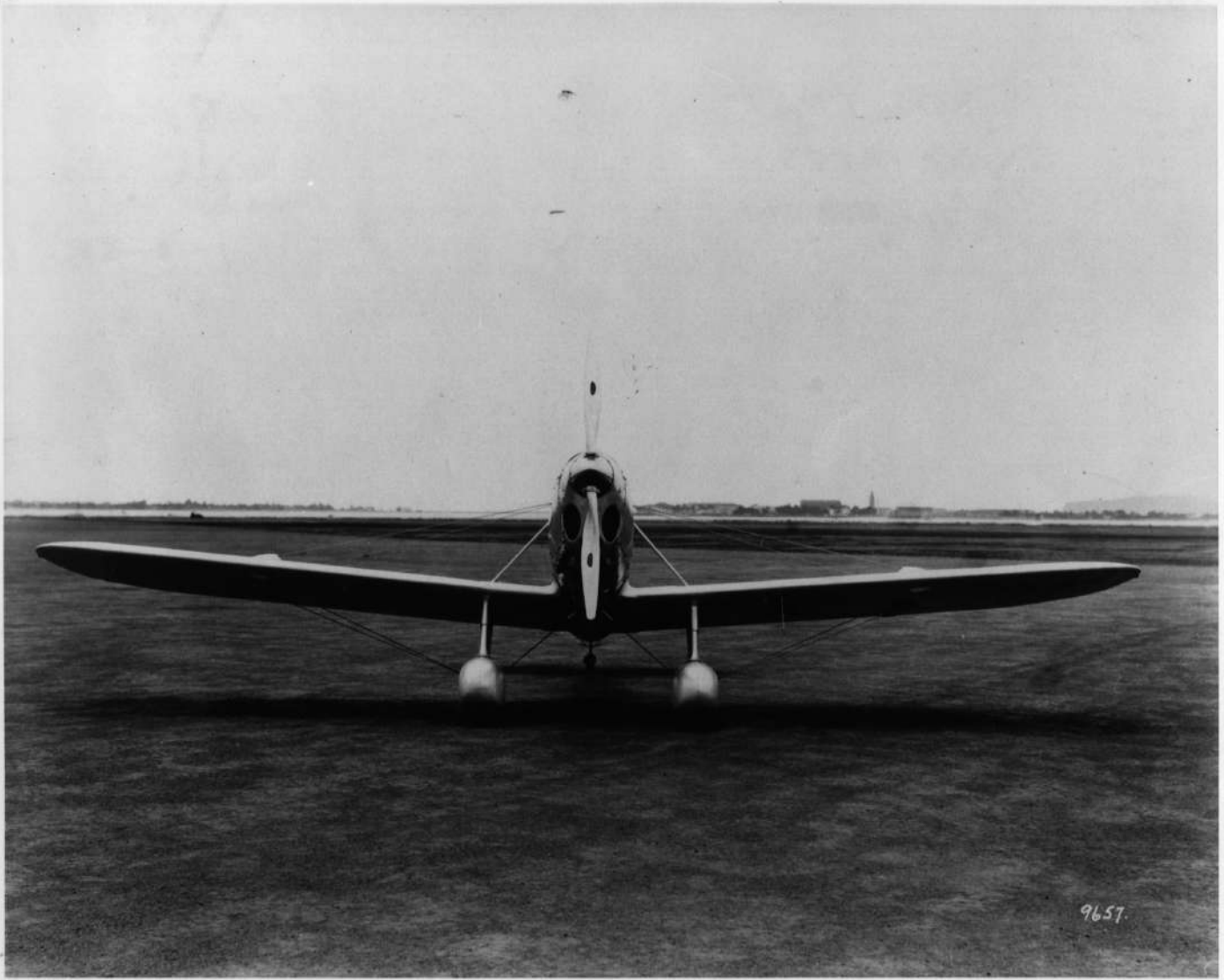




RYAN
RYAN SCHOOL OF AERONAUTICS - RYAN AERONAUTICAL CO.





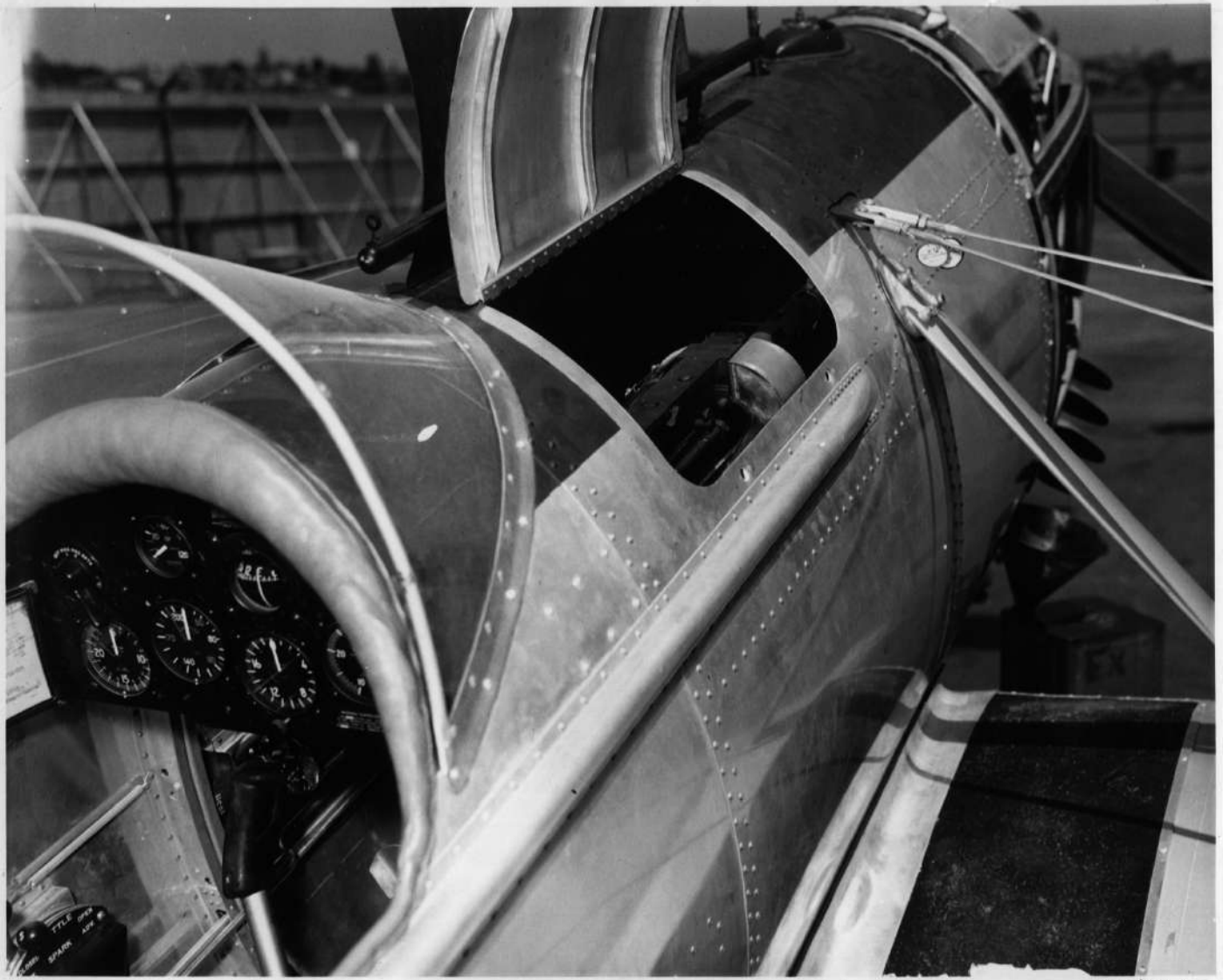






2450





2451



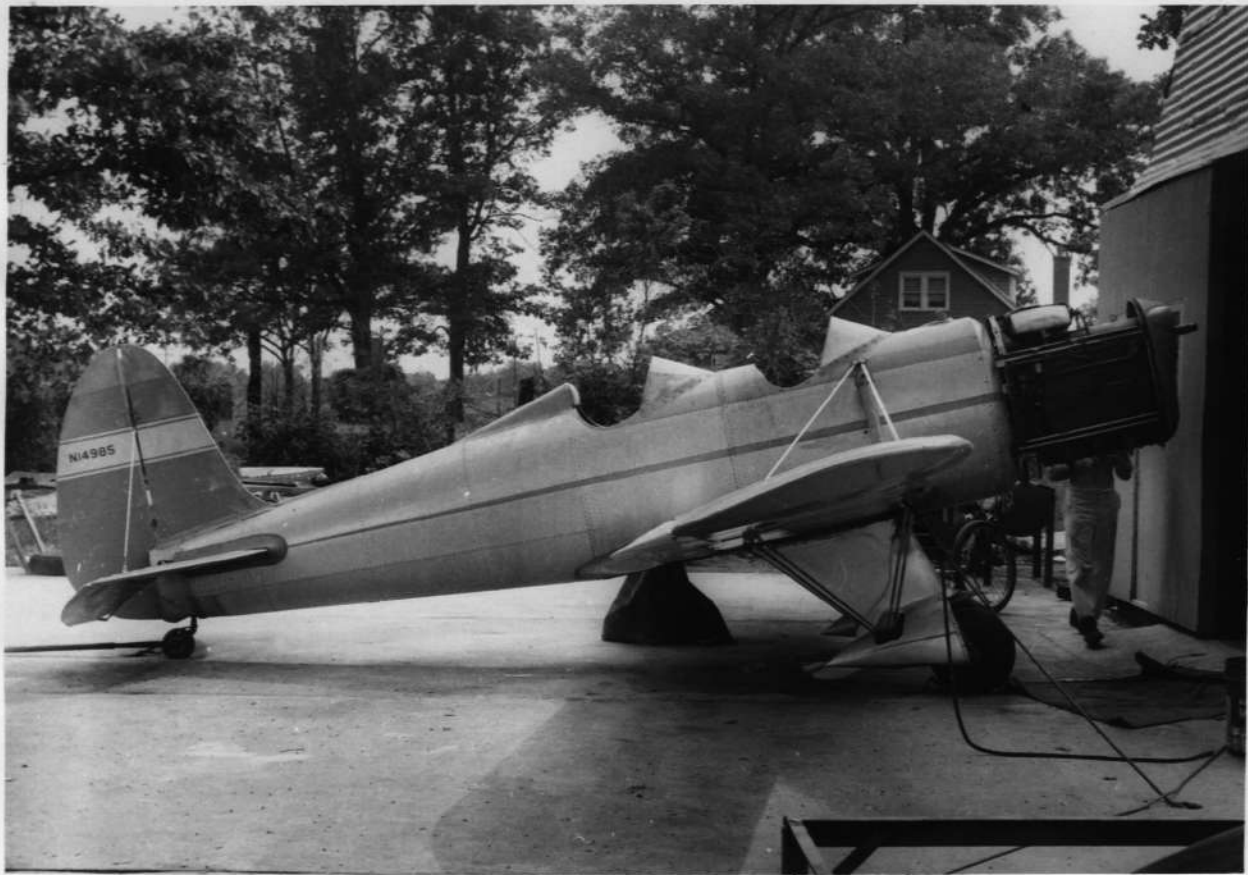














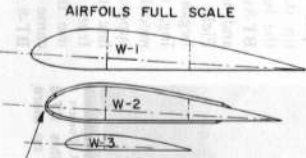


GENERAL SPECIFICATIONS

WEIGHT EMPTY	2730 lbs.
USEFUL LOAD	1320 "
GROSS WEIGHT	4050 "
TOP SPEED	168 mph
CRUISING SPEED	120 "
LANDING SPEED, WITH FLAPS	60 "
RATE OF CLIMB	650 ft./min.
FUEL CAPACITY	200 gals.
OIL CAPACITY	12 "
SERVICE CEILING	15,000 ft.
WING AREA, INCL. AILERONS	220 sq. ft.

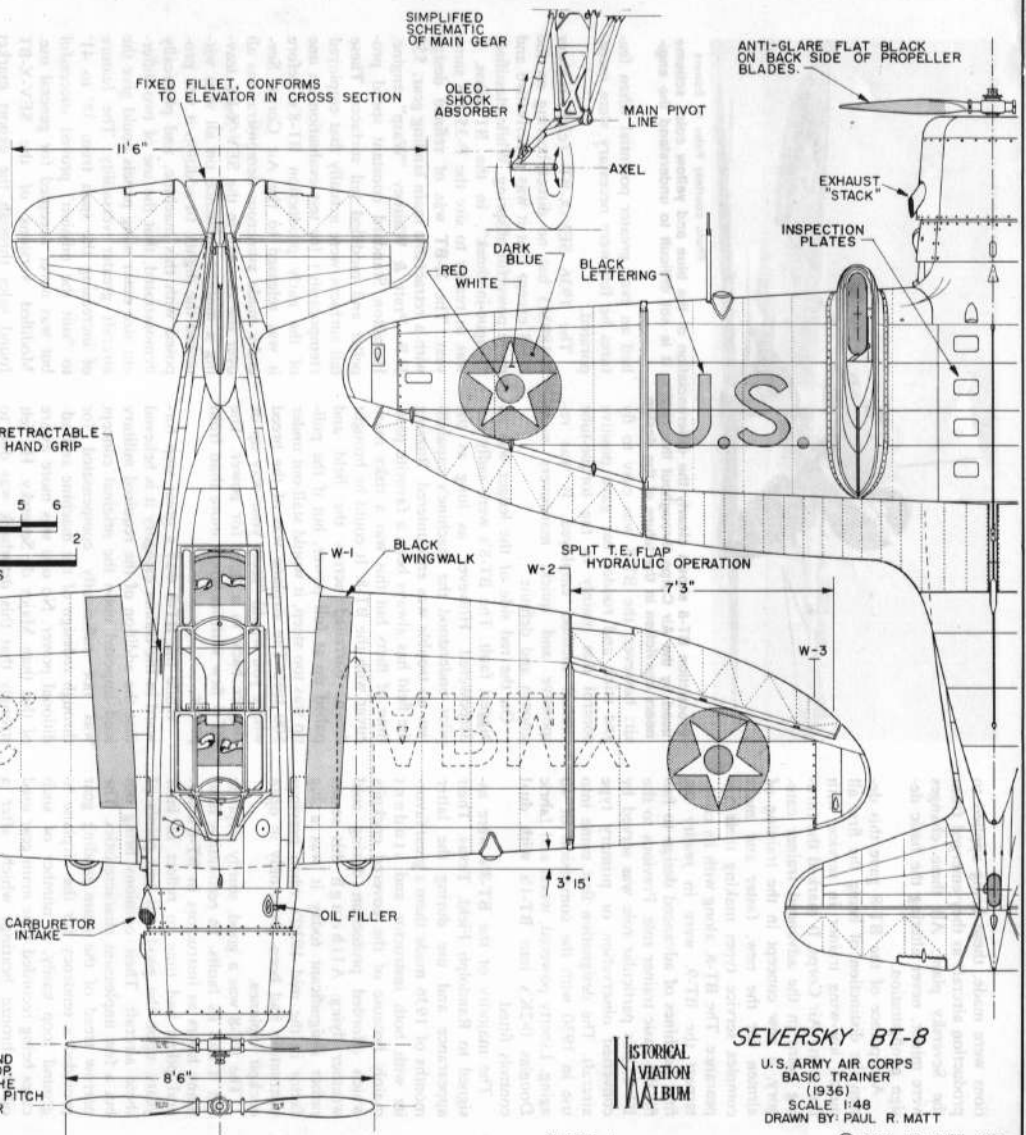
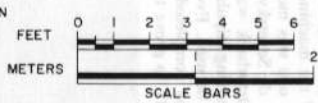
PERFORMANCE FIGURES APPROXIMATE
BASED UPON PILOT'S EXPERIENCES,
EXACT DATA NOT AVAILABLE

POWER - PRATT & WHITNEY R-985-11
400 H.P. AT 2,200 rpm at 5,000 ft.
450 H.P. AT 2,300 rpm - MILITARY RATING



EXACT AIRFOIL UNKNOWN
BELIEVED TO BE A
MODIFIED CLARK Y

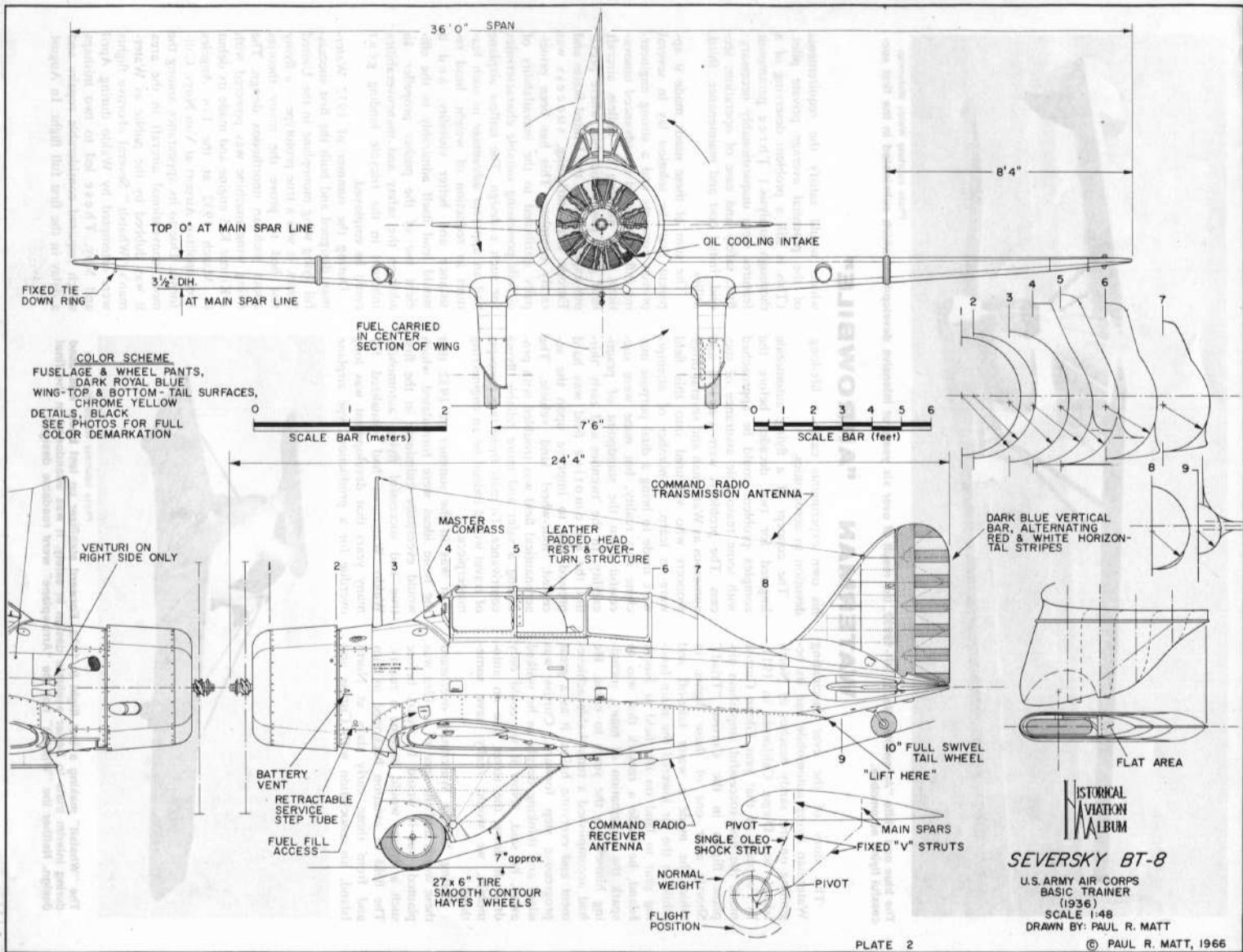
L.E. OF WING JOINT FAIRING
FLATENS OUT FOR EASIER
FORMING OVER COMPOUND
CURVE.



SEVERSKY BT-8
SERIAL NUMBERS, A.C-35-247 THROUGH 35-276
PROCURED ON CONTRACT AC 7348
SPECIFICATION 98-1766

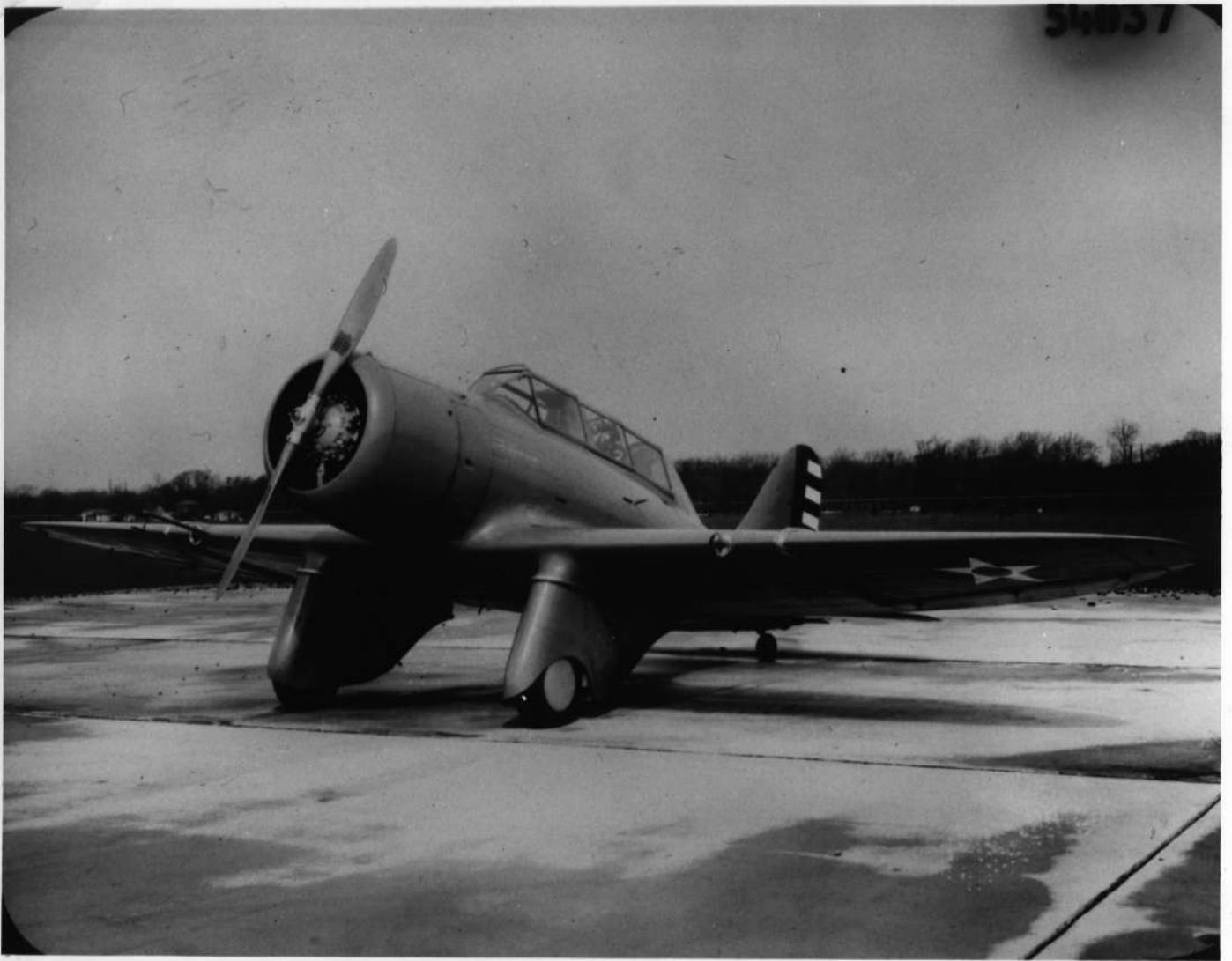


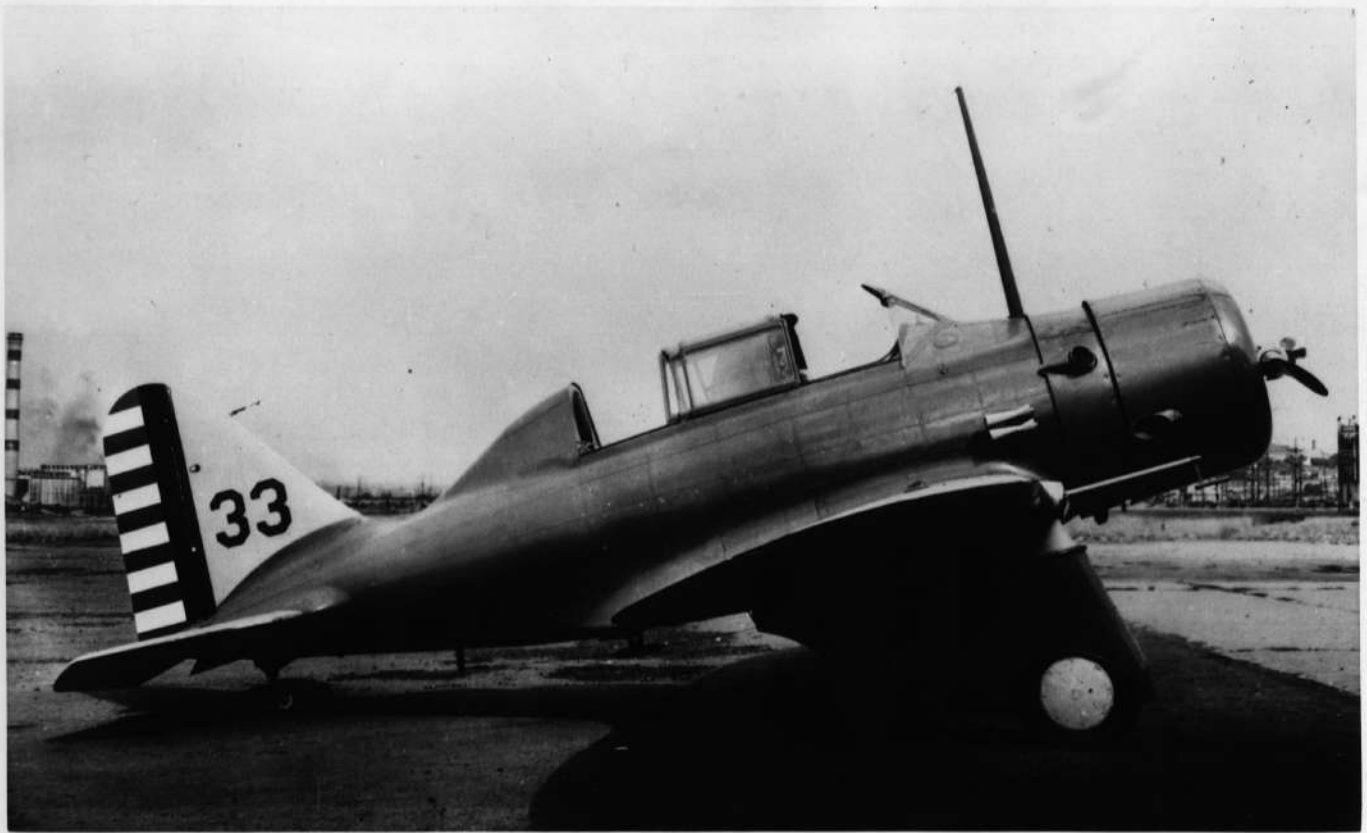
SEVERSKY BT-8
U.S. ARMY AIR CORPS
BASIC TRAINER
(1935)
SCALE 1:48
DRAWN BY: PAUL R. MATT





(098-467J-PDX) 26-37-10-AX(10) BT-8 IN FLIGHT RANDOLPH FIELD TEXAS 13350A.C

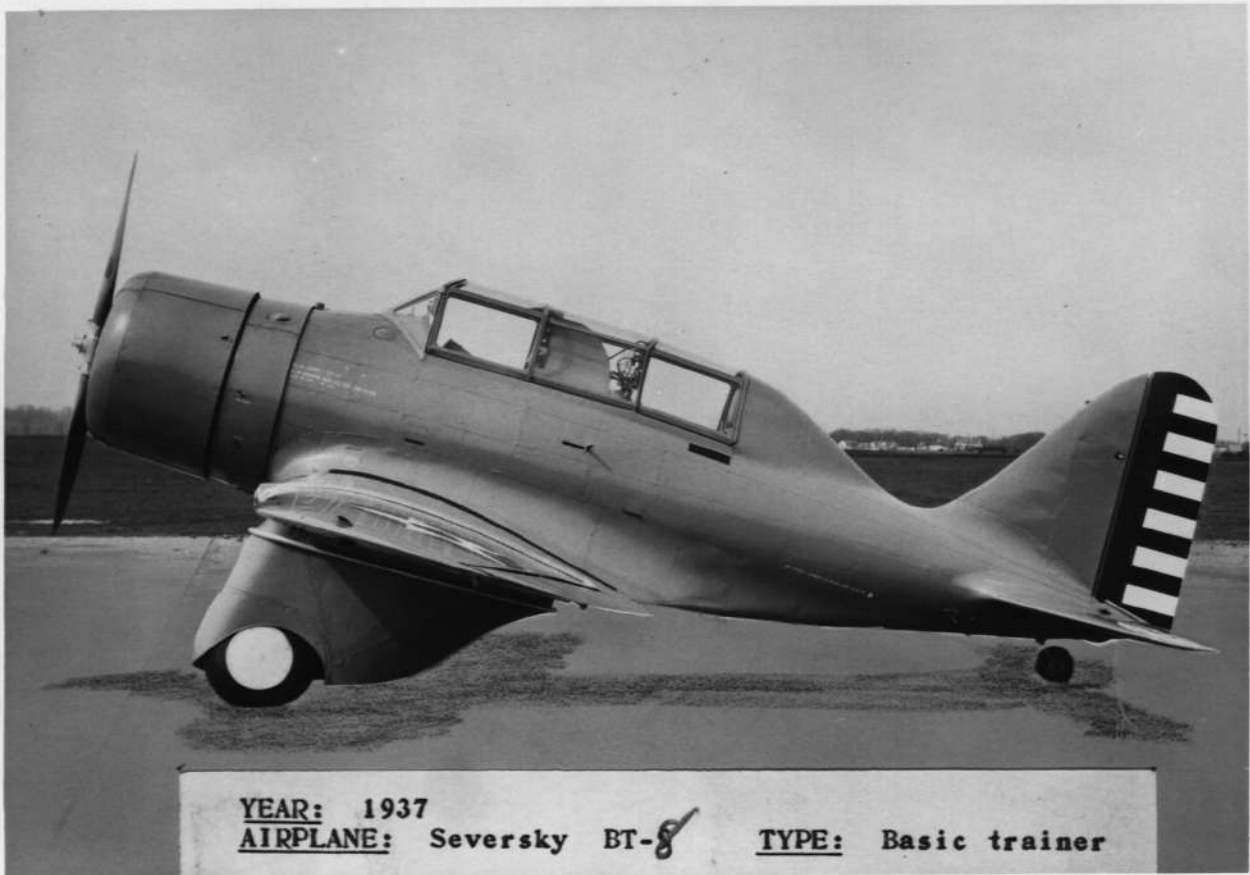








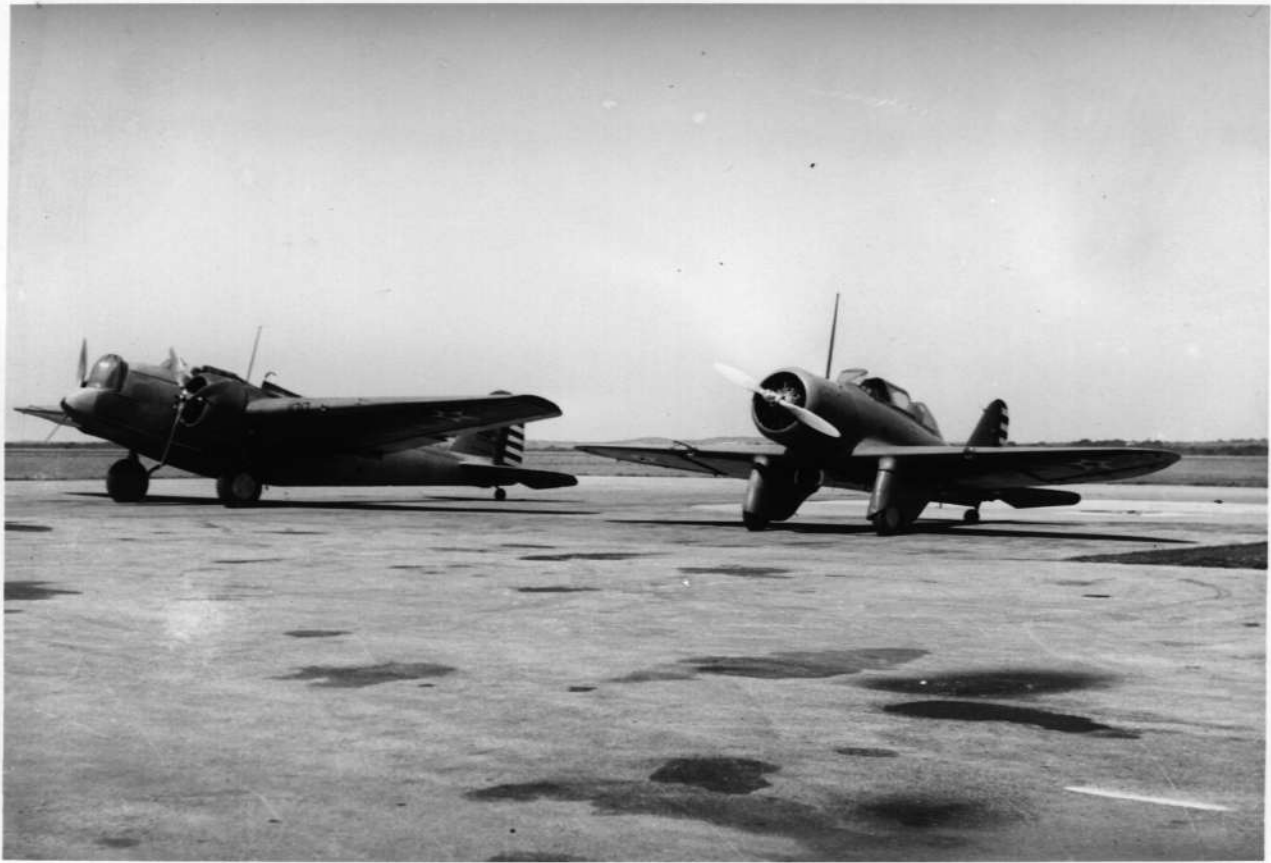


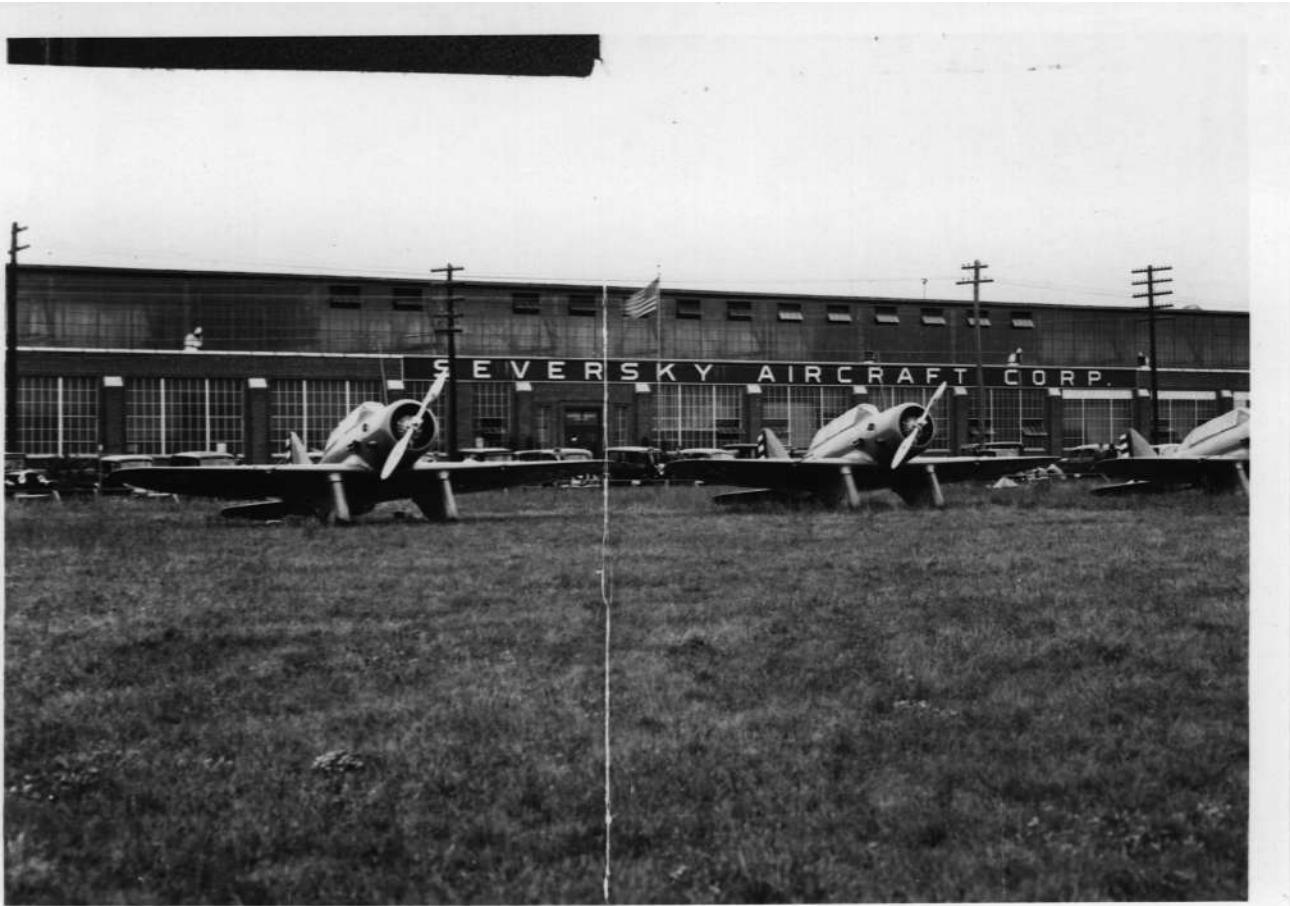












GENERAL SPECIFICATIONS

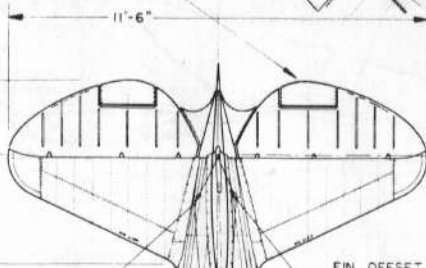
WEIGHT EMPTY	4,318 lbs.
USEFUL LOAD	1,284 lbs.
GROSS WEIGHT	5,602 lbs.
WING AREA	220 sq ft
MAXIMUM SPEED	281 m.p.h. at 10,000 feet
CRUISING SPEED	200 m.p.h. approx.
STALLING SPEED	78 m.p.h.
CLIMB, INITIAL	3,175 ft./min.
SERVICE CEILING	29,685 ft.
FUEL CAPACITY	200 gals.
OIL CAPACITY	12 gals.
RANGE AT CRUISE	1,000 miles
POWER - P & W R-1830-9 TWIN WASP	
	950 hp. max.
ARMAMENT - TWO .30 cal. OR ONE .30 cal. & ONE .50 cal. BROWNING MACHINE GUNS	



INDIAN HEAD INSIGNIA, P-35 AIRCRAFT, 94th PURSUIT SQUADRON

FACE BROWN WITH BLACK, BLUE & RED MARKINGS, WAR BONNET WHITE FEATHERS TIPPED WITH BLUE, YELLOW & BLUE HEAD BANDS, RIBBONS RED & BLUE

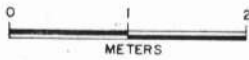
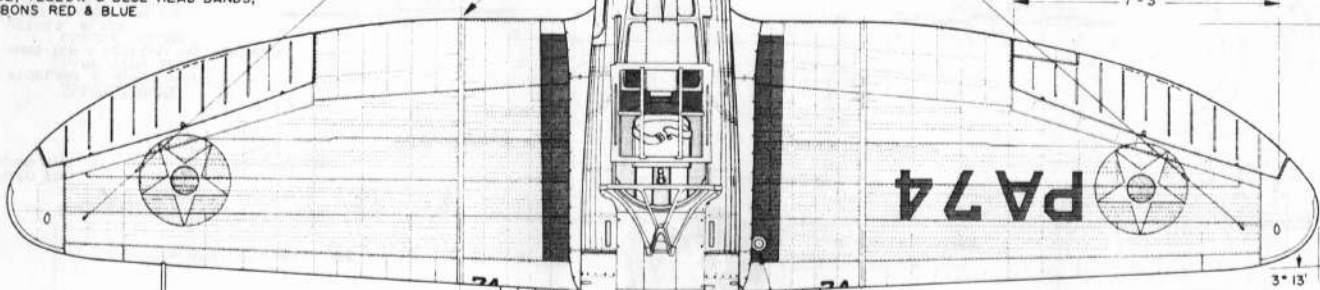
METAL TRIM TABS, FABRIC COVERED CONTROL SURFACES



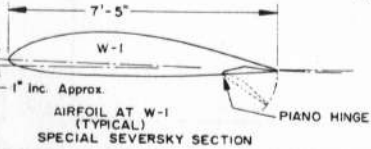
FIN OFFSET 2" TO LEFT
BATTERY COMP.

PROTRUDING HANDLE

NOTE: ELEPTICAL TRAILING EDGE STARTS AT OUTER WING PANEL

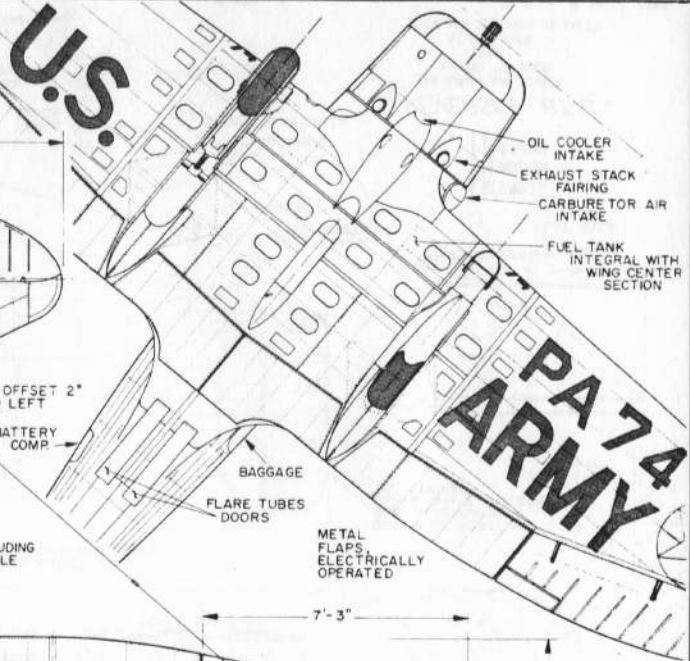


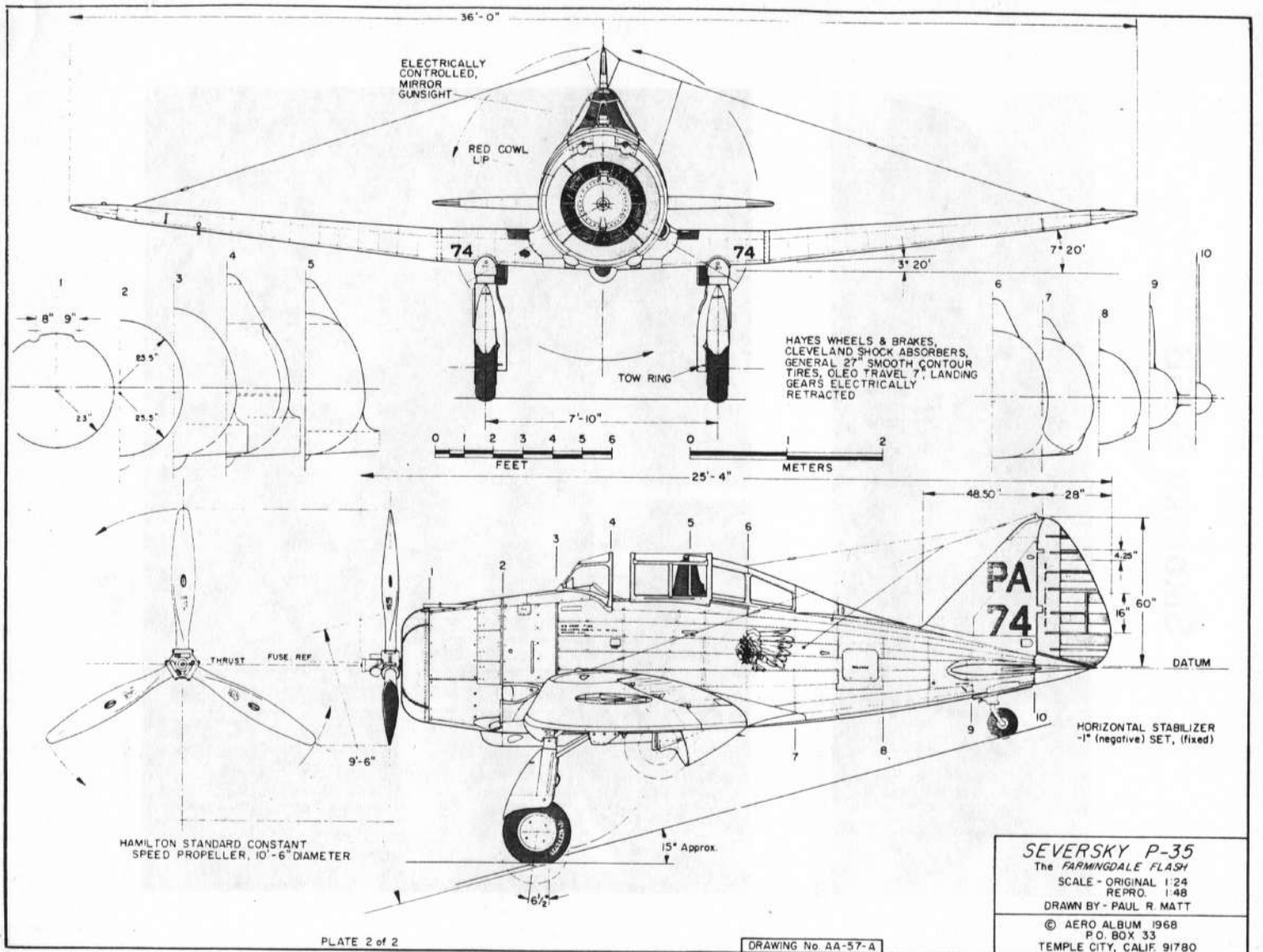
STANDARD 30" DIA NATIONAL INSIGNIA



ONLY MAJOR PANELING AND PROMINENT RIVET LINES ARE SHOWN, ALL WERE NOT NECESSARILY TRANSFERRED FROM ONE VIEW TO ANOTHER.

SEVERSKY P-35
The FARMINGDALE FLASH
SCALE - ORIGINAL 1:24
REPRO. 1:48
DRAWN BY - PAUL R. MATT
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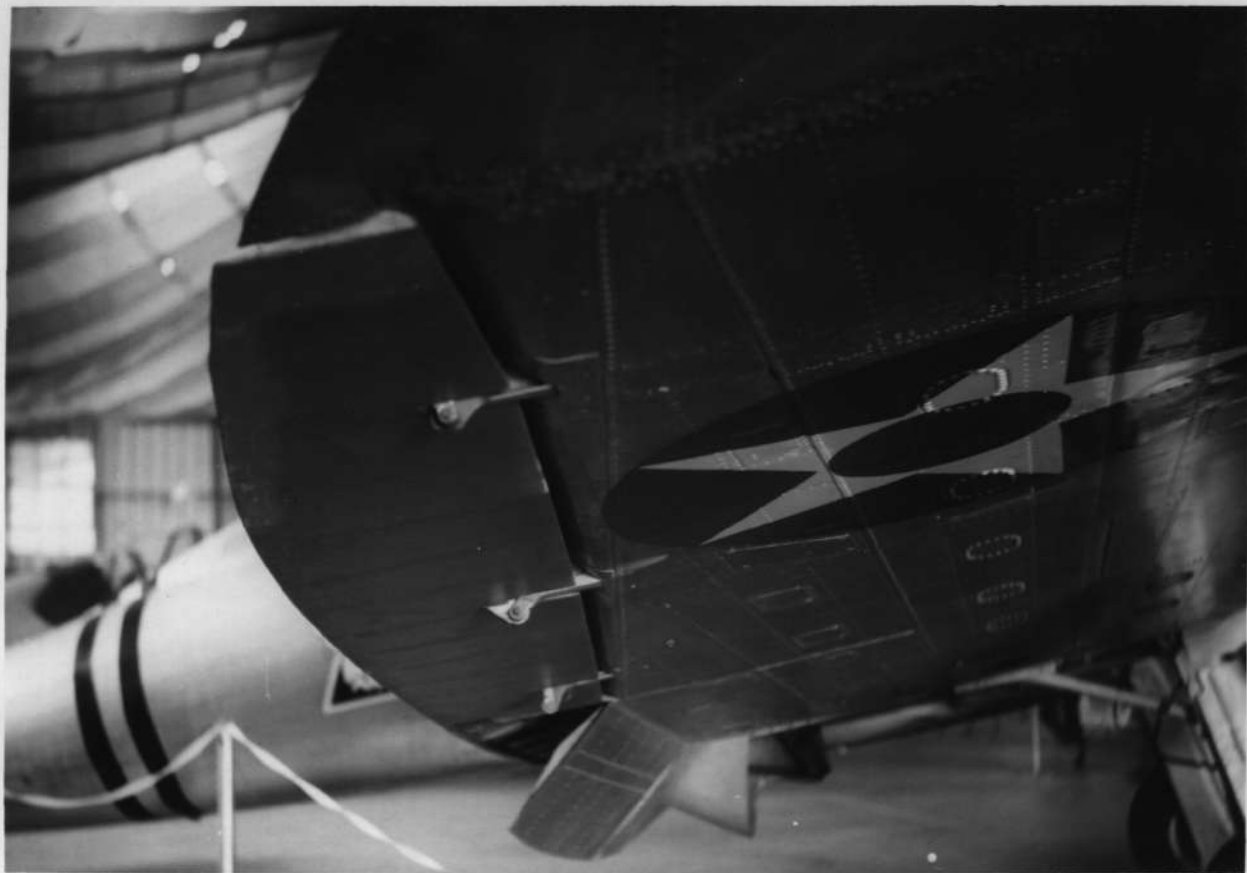










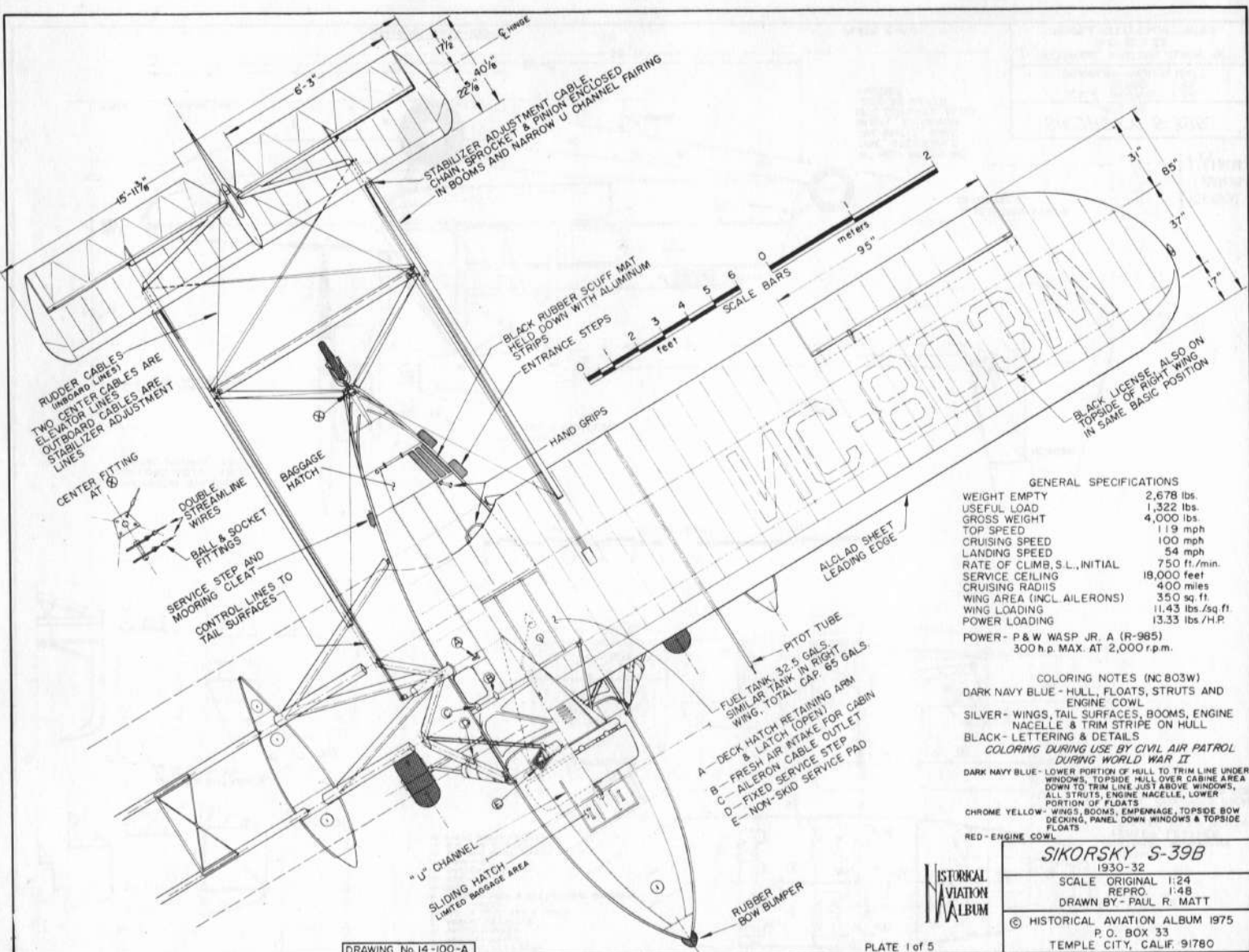












DRAWING No 14-100-A

GENERAL SPECIFICATIONS	
WEIGHT EMPTY	2,678 lbs.
USEFUL LOAD	1,322 lbs.
GROSS WEIGHT	4,000 lbs.
TOP SPEED	119 mph
CRUISING SPEED	100 mph
LANDING SPEED	54 mph
RATE OF CLIMB, S.L., INITIAL	750 ft./min.
SERVICE CEILING	18,000 feet
CRUISING RADIUS	400 miles
WING AREA (INCL.AILERONS)	350 sq. ft.
WING LOADING	11.43 lbs./sq. ft.
POWER LOADING	13.33 lbs./H.P.
POWER - P & W WASP JR. A (R-985) 300 h.p. MAX. AT 2,000 r.p.m.	
COLORING NOTES (NC 803W)	
DARK NAVY BLUE - HULL, FLOATS, STRUTS AND ENGINE COWL	
SILVER - WINGS, TAIL SURFACES, BOOMS, ENGINE NACELLE & TRIM STRIPE ON HULL	
BLACK - LETTERING & DETAILS	
COLORING DURING USE BY CIVIL AIR PATROL DURING WORLD WAR II	
DARK NAVY BLUE - LOWER PORTION OF HULL TO TRIM LINE UNDER WINDOWS, TOPSIDE HULL OVER CABINE AREA DOWN TO TRIM LINE JUST ABOVE WINDOWS, ALL STRUTS, ENGINE NACELLE, LOWER PORTION OF FLOATS	
CHROME YELLOW - WINGS, BOOMS, EMPENNAGE, TOPSIDE BOW DECKING, PANEL DOWN WINDOWS & TOPSIDE FLOATS	
RED - ENGINE COWL	
SIKORSKY S-39B 1930-32 SCALE ORIGINAL 1:24 REPRO. 1:48 DRAWN BY - PAUL R. MATT © HISTORICAL AVIATION ALBUM 1975 P. O. BOX 33 TEMPLE CITY, CALIF. 91780	



1. STABILIZER ADJUSTMENT WHEEL
2. LANDING GEAR PUMP
3. PARKING BRAKE
4. WHEEL BRAKES
5. ENGINE CONTROLS
6. HATCH LOCK BAR & CATCH
7. BOAT HOOK
8. FOLDING STEP & PART OF SEAT BACKREST
9. INSIDE STEP
10. COMPASS
11. BATTERY BOX
12. HANDHOLD
13. LANDING GEAR VALVES
14. BAGGAGE COMPARTMENT
15. FIXED HATCH LOCK ARMS

INTERIOR FINISH -
NATURAL MAHOGANY
VENEER, LEATHER
COVERED REAR BENCH
SEAT, INSTRUMENT
PANEL, CONTROLS, FRONT
BUCKET SEATS - BLACK

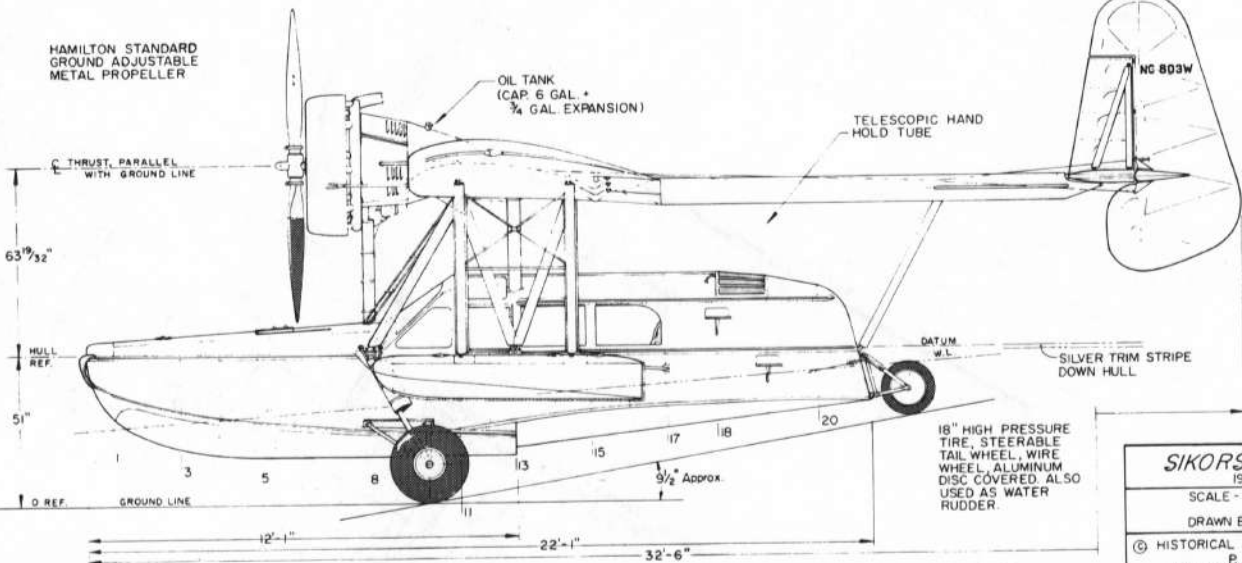


HAMILTON STANDARD
GROUND ADJUSTABLE
METAL PROPELLER

OIL TANK
(CAP. 6 GAL. +
3/4 GAL. EXPANSION)

TELESCOPIC HAND
HOLD TUBE

NC 803W



DRAWING No 14-100-A

PLATE 2 of 5

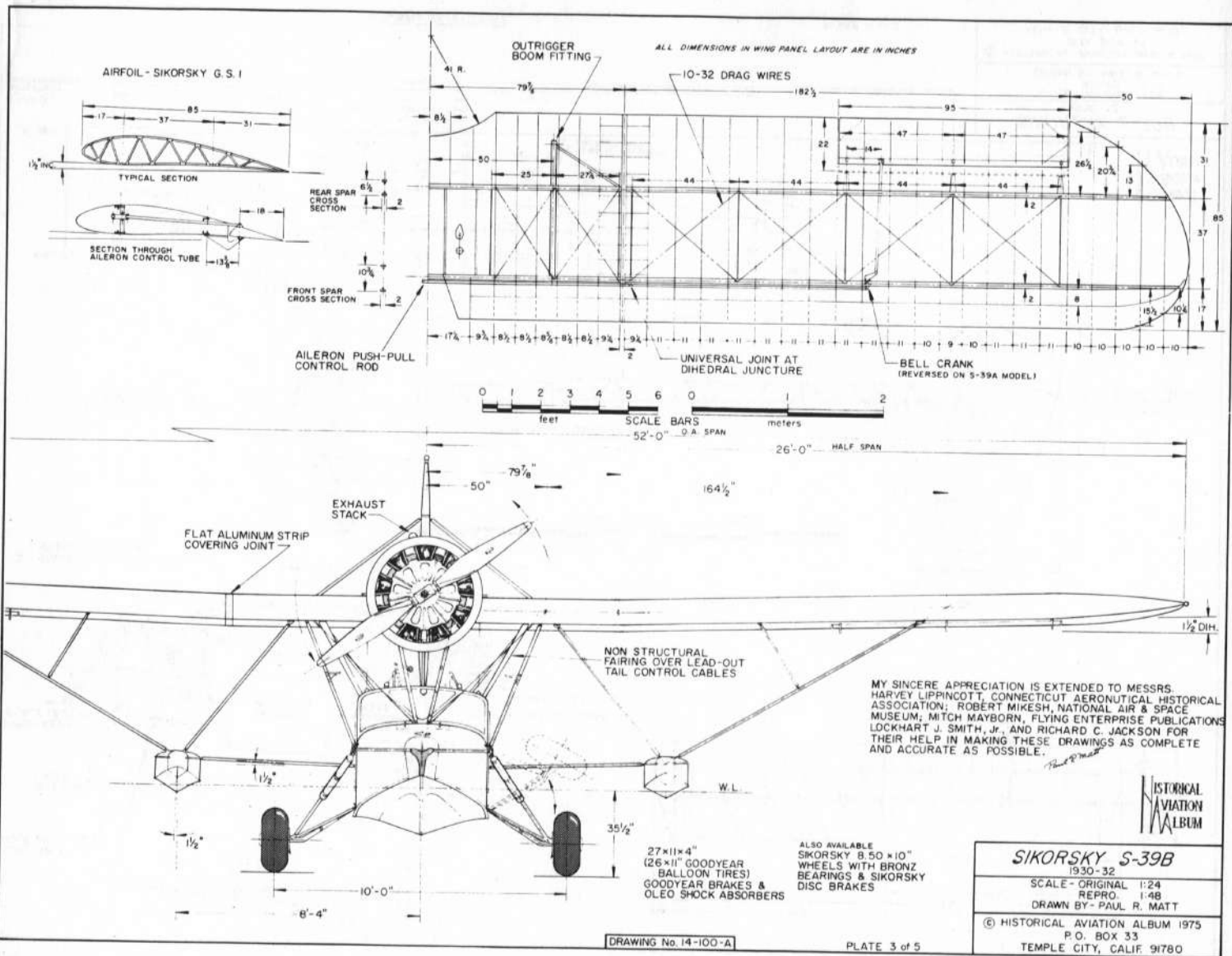
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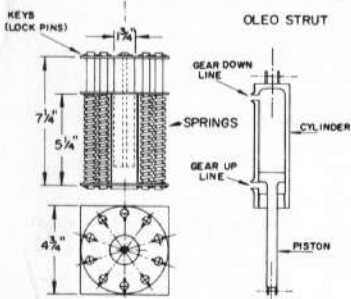
SIKORSKY S-39B

1930-32

SCALE - ORIGINAL 1:24
REPRO 1:48
DRAWN BY - PAUL R. MATT

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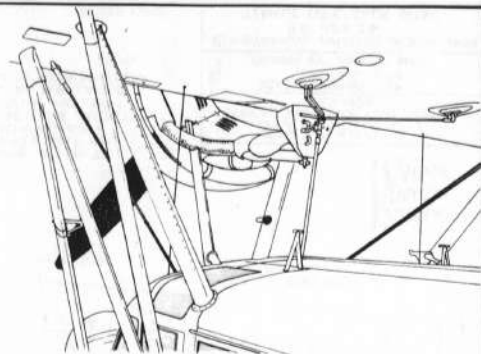
HYDRAULIC SHOCK ACCUMULATOR FOR RAISING AND LOWERING LANDING GEAR. TWO REQUIRED, ONE FOR RIGHT & ONE FOR LEFT GEAR

**HYDRAULIC RETRACTING SYSTEM
S-39 LANDING GEAR**

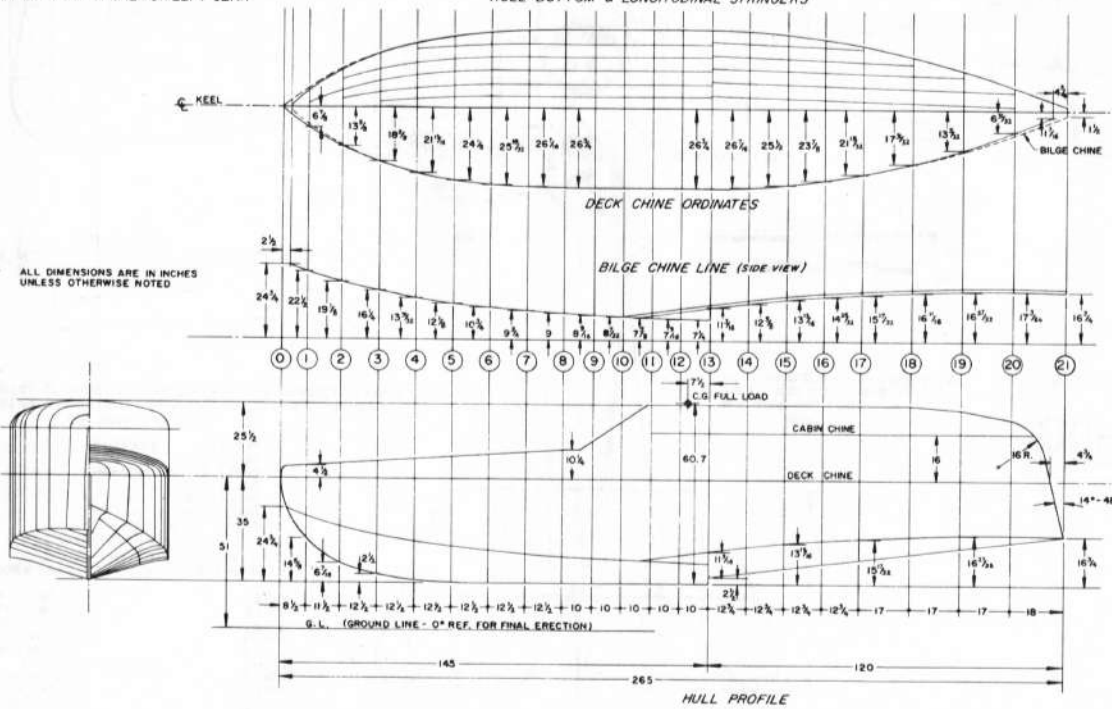
THE OLEO STRUT HAS TWO HYDRAULIC LINES, ONE AT THE TOP AND ONE AT THE BOTTOM OF THE CYLINDER. TWO SHOCK ACCUMULATORS, ONE FOR EACH LANDING GEAR, WHICH ARE MOUNTED IN THE FORWARD BAGGAGE COMPARTMENT AT STATION No. 8.

ON THE CENTER INSTRUMENT PANEL IS A GEAR-UP OR GEAR-DOWN SELECTOR HANDLE. A HAND PUMP, BETWEEN THE PILOT'S SEATS, IS USED TO PUMP FLUID FROM A RESERVOIR TANK, THROUGH THE PUMP AND OUT TO THE OLEO STRUT. IF THE SELECTOR HANDLE IS UP, THE FLUID WILL BE PUMPED TO THE BOTTOM OF THE CYLINDER; IF DOWN, THE FLUID GOES TO THE TOP OF THE CYLINDER, EFFECTIVELY EXTENDING OR PUSHING THE LANDING GEAR DOWN.

UPON LANDING ON LAND, THE INITIAL SHOCK IS TAKEN BY THE TIRES, THEN TRANSFERRED TO THE HYDRAULIC SHOCK ACCUMULATOR, THE IMPACT FORCES THE FLUID OUT OF THE STRUT INTO THE ACCUMULATOR-COMPRESSING THE SPRINGS AND RESULTING ABSORPTION.



HULL BOTTOM & LONGITUDINAL STRINGERS



HISTORICAL AVIATION ALBUM

SIKORSKY S-39B	
1930-32	
SCALE - ORIGINAL	1:24
REPRO.	1:48
DRAWN BY PAUL R. MATT	
© HISTORICAL AVIATION ALBUM 1975	
P. O. BOX 33	
TEMPLE CITY, CALIF. 91780	



1918

















SEA PLANE ON LAKE OKOBOJI-IA.

L-233









LANDING GEAR - WHEEL DOWN

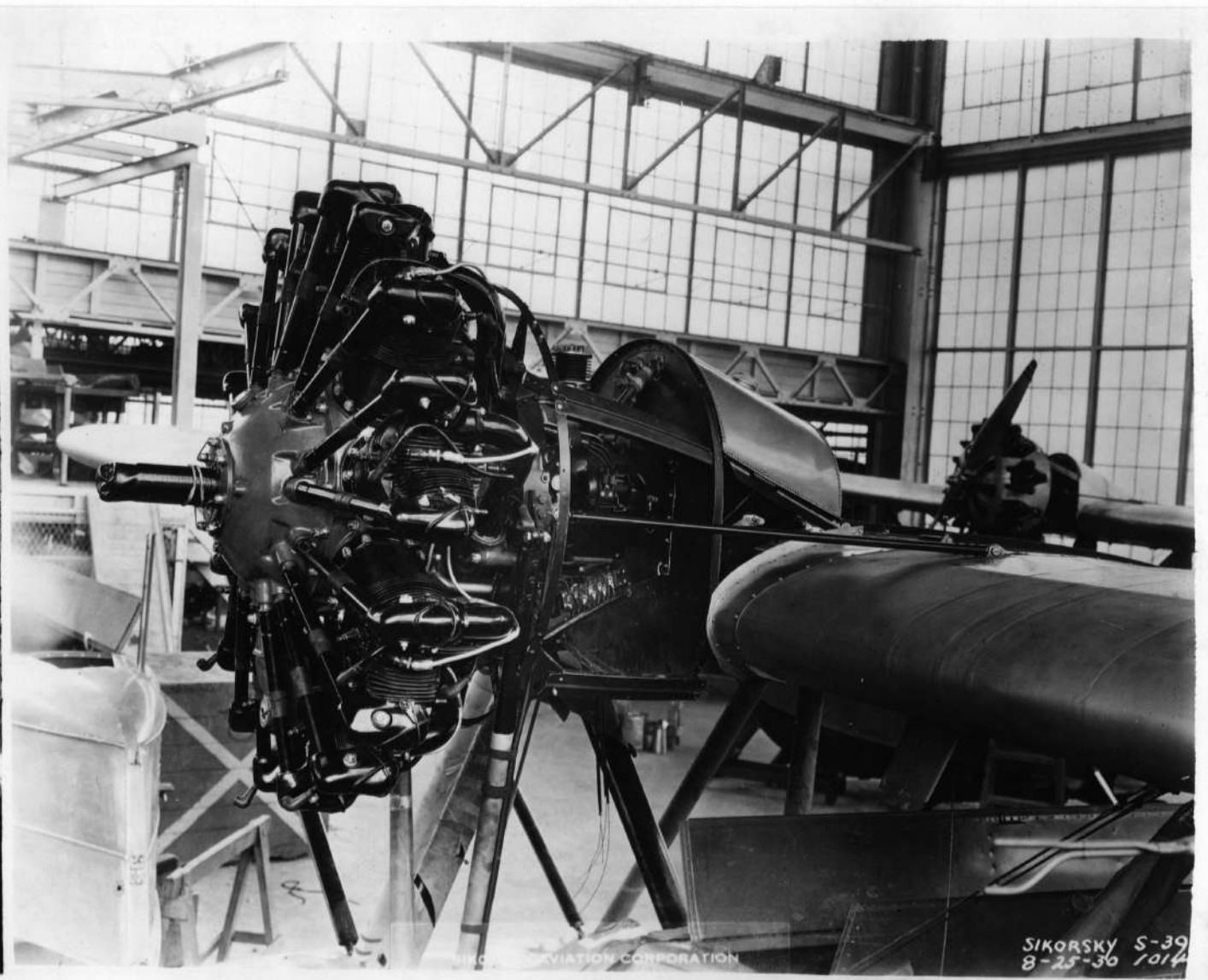


SIKORSKY AVIATION CORPORATION

5-39-1400

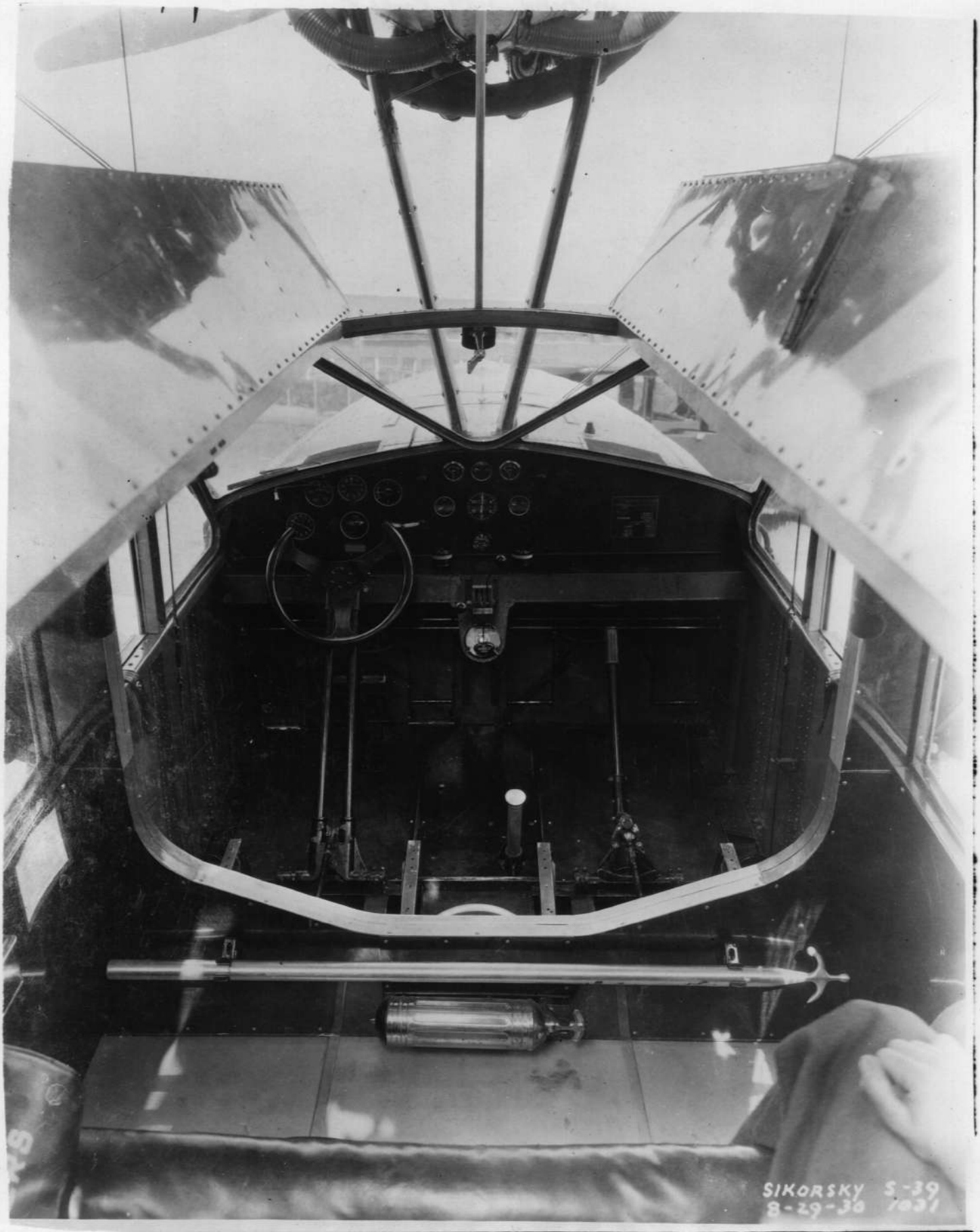


SIKORSKY S-30
B-25-30



SIKORSKY AVIATION CORPORATION

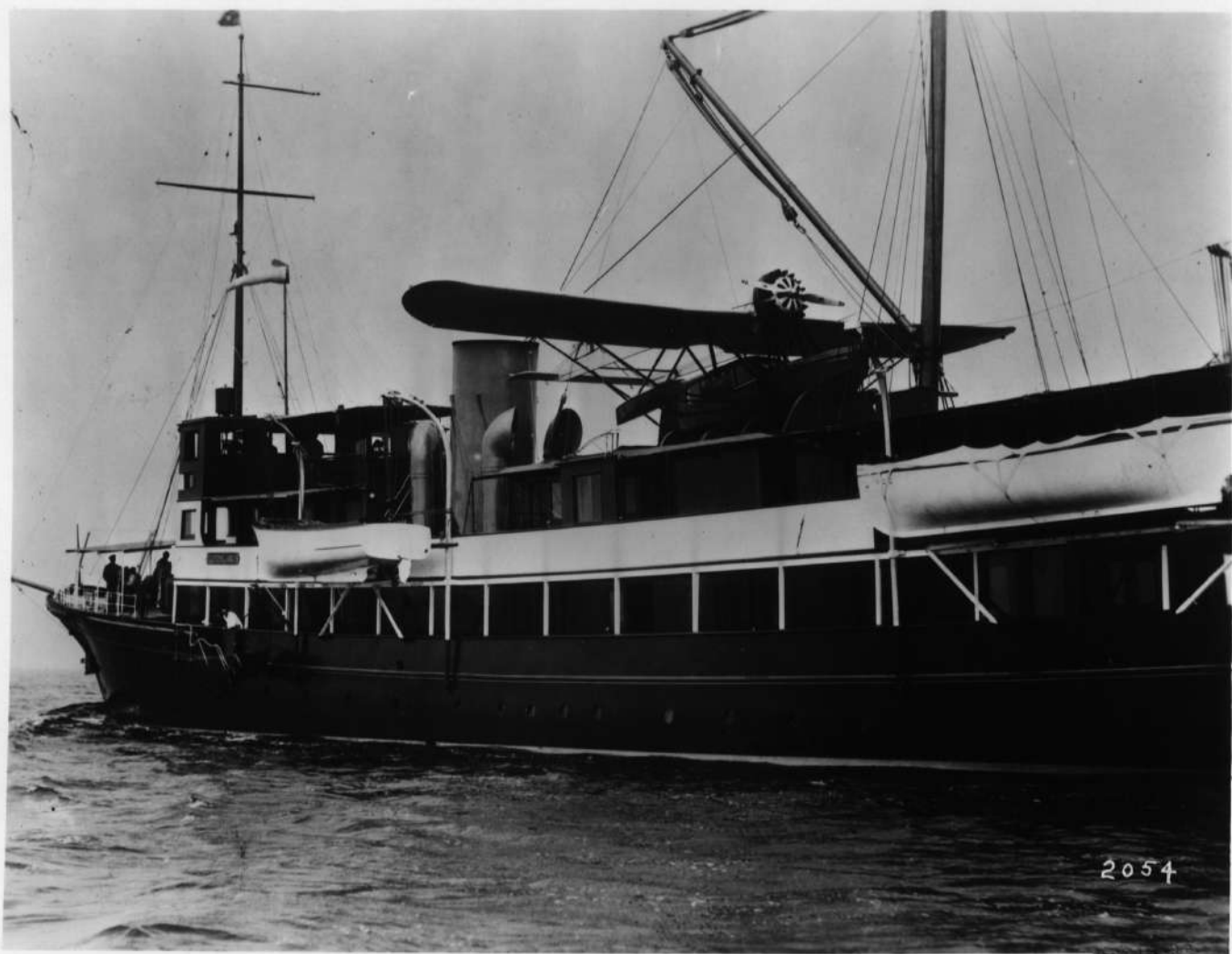
SIKORSKY S-39
8-25-30 1014



SIKORSKY S-39
8-29-36 1931



SIKORSKY S-39
8-29-30 1029





SIKORSKY AVIATION CORP.

SIKORSKY S-39
6-4-30 873



GENERAL SPECIFICATION

WEIGHT EMPTY 1,874 lbs.
 INCL. WATER, OIL BUT WITHOUT FUEL
 USEFUL LOAD 426 lbs.
 GROSS WEIGHT 2,300 lbs.
 WING AREA (INCL. AILERONS) 429 sq. ft.
 AILERON AREA, EACH 21 sq. ft.
 HIGH SPEED 85 mph
 NORMAL CRUISE 68 mph
 LANDING SPEED 37 mph
 FUEL CAPACITY 30 gals.
 OIL CAPACITY 3 gals.

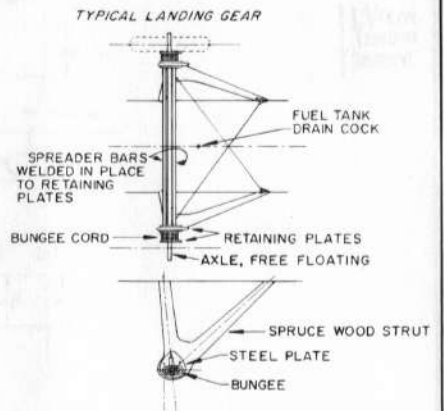
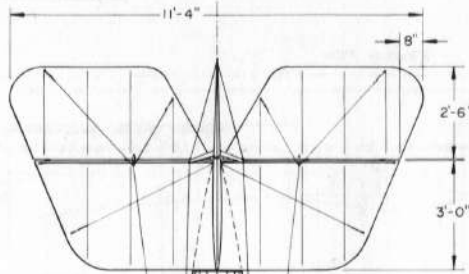
POWER: VIRTUALLY ANY IN-LINE ENGINE OF THE ERA 90hp TO 180hp

COMMON ENGINES USED:

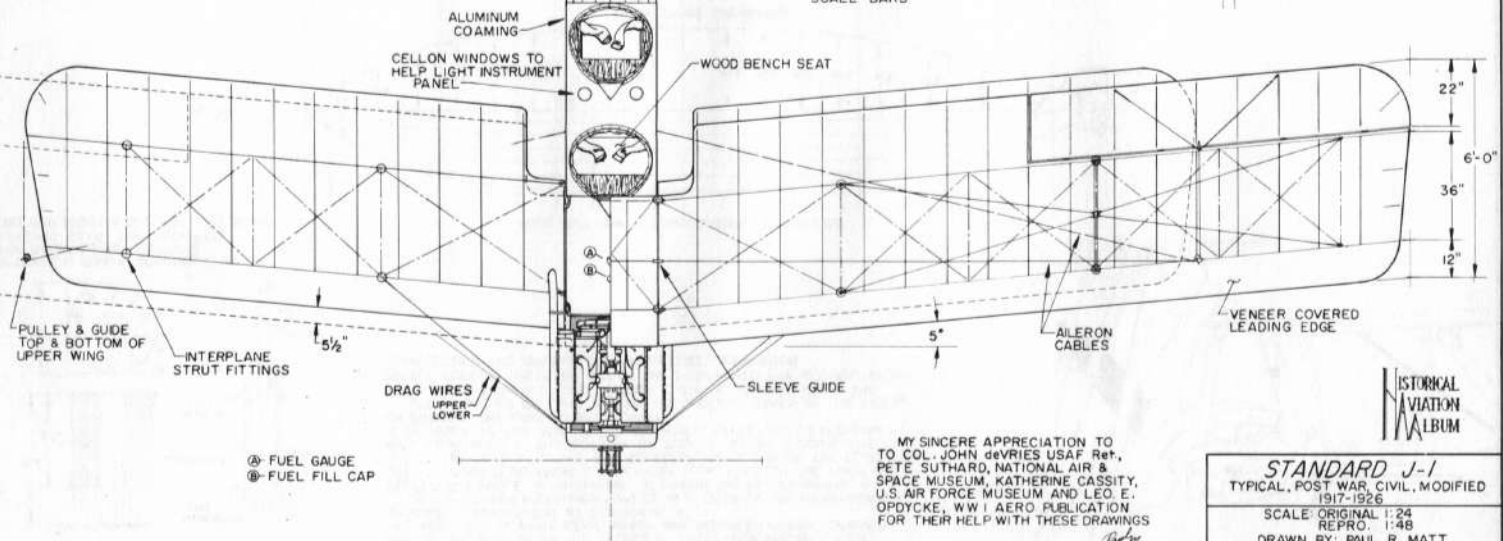
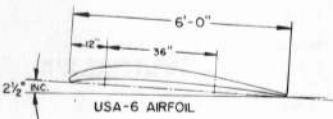
CURTISS OX-5 90 hp
 HALL-SCOTT A-7 90 hp
 A-7A 100 hp
 A-5 125 hp
 HISPANO-SUIZA-A 150 hp
 -B 180 hp
 ROBERTS 100 hp

COLORING NOTES

ENTIRE AIRCRAFT CLEAR DOPED OR SILVER PIGMENTED, METAL DECKING AND COWLING - COLOR OF OWNERS CHOICE



NOTE
 ALL TRAILING EDGES OF WINGS AND TAIL SURFACES ARE FORMED WITH SPRUCE WOOD



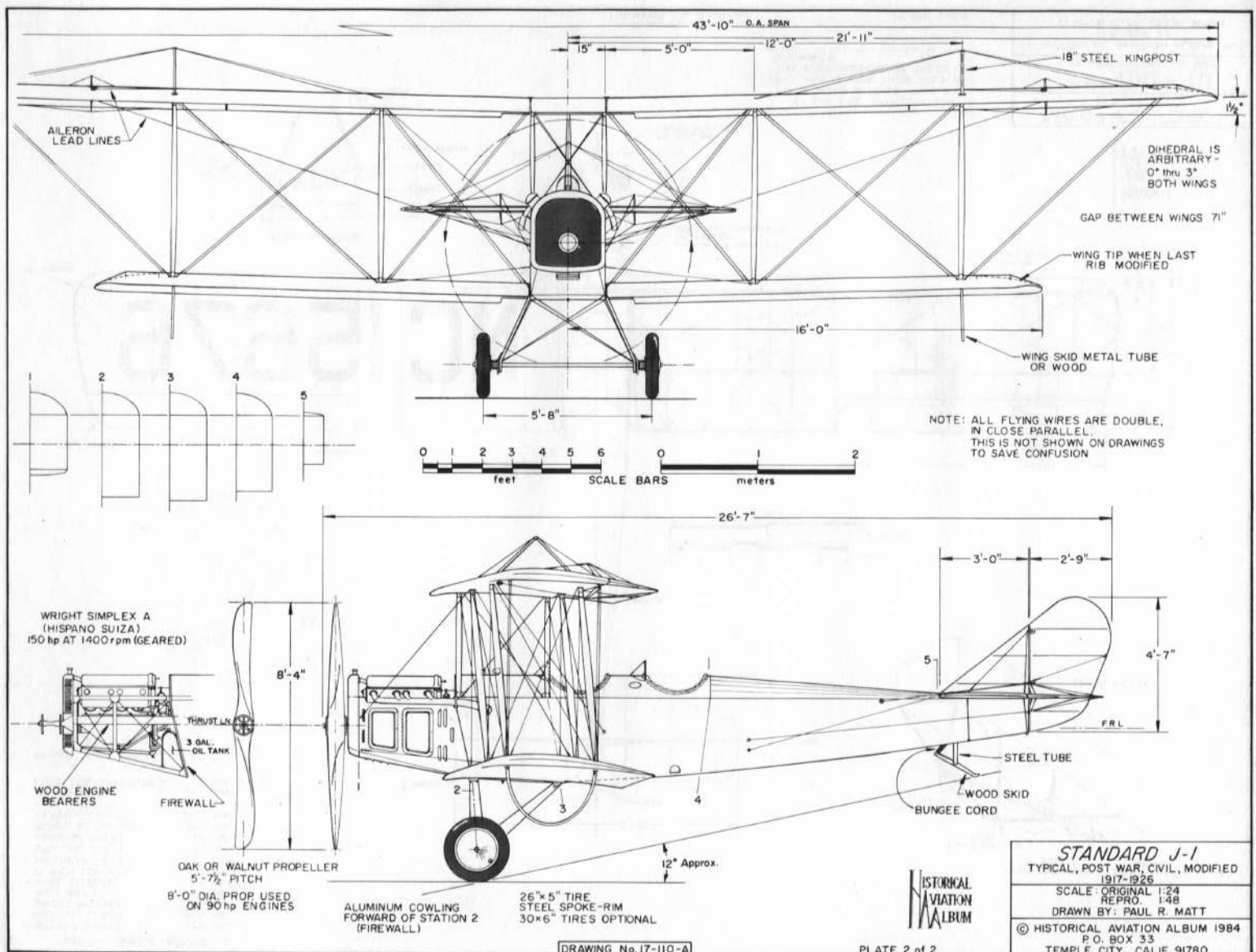
MY SINCERE APPRECIATION TO
 TO COL. JOHN DEVRIES USAF Ret.,
 PETE SUTHARD, NATIONAL AIR &
 SPACE MUSEUM, KATHERINE CASSITY,
 U.S. AIR FORCE MUSEUM AND LEO E.
 OPDYCKE, WW I AERO PUBLICATION
 FOR THEIR HELP WITH THESE DRAWINGS

HISTORICAL AVIATION ALBUM

STANDARD J-1
 TYPICAL, POST WAR, CIVIL, MODIFIED
 1917-1926
 SCALE: ORIGINAL 1:24
 REPRO. 1:48
 DRAWN BY: PAUL R. MATT
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 P.O. BOX 33
 TEMPLE CITY, CALIF. 91780

DRAWING No. 17-110-A

PLATE 1 of 2



HISTORICAL AVIATION ALBUM

STANDARD J-1
 TYPICAL, POST WAR, CIVIL, MODIFIED 1917-1926
 SCALE: ORIGINAL 1:24
 REPRO: 1:48
 DRAWN BY: PAUL R. MATT
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DRAWING No. 17-110-A

PLATE 2 of 2

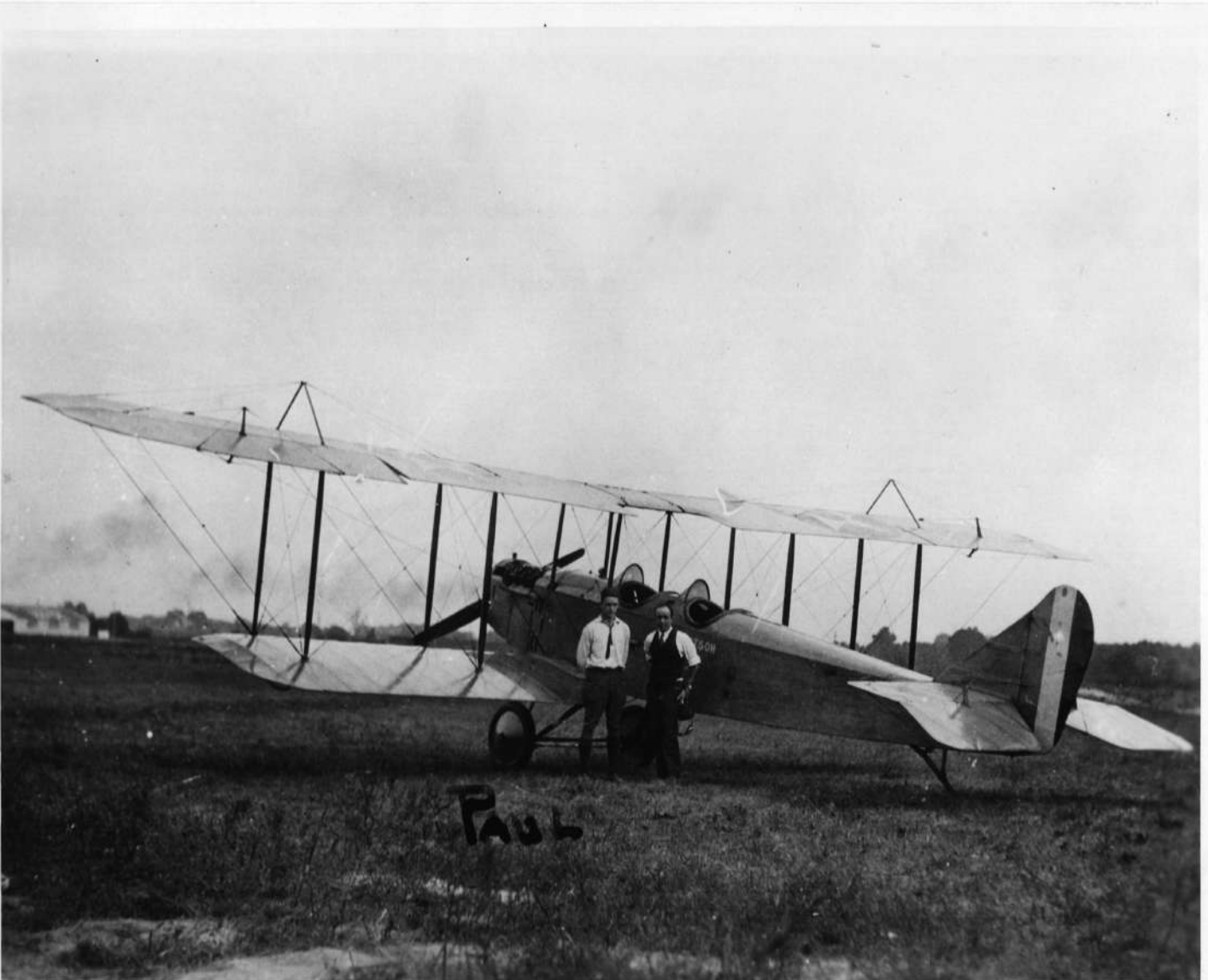




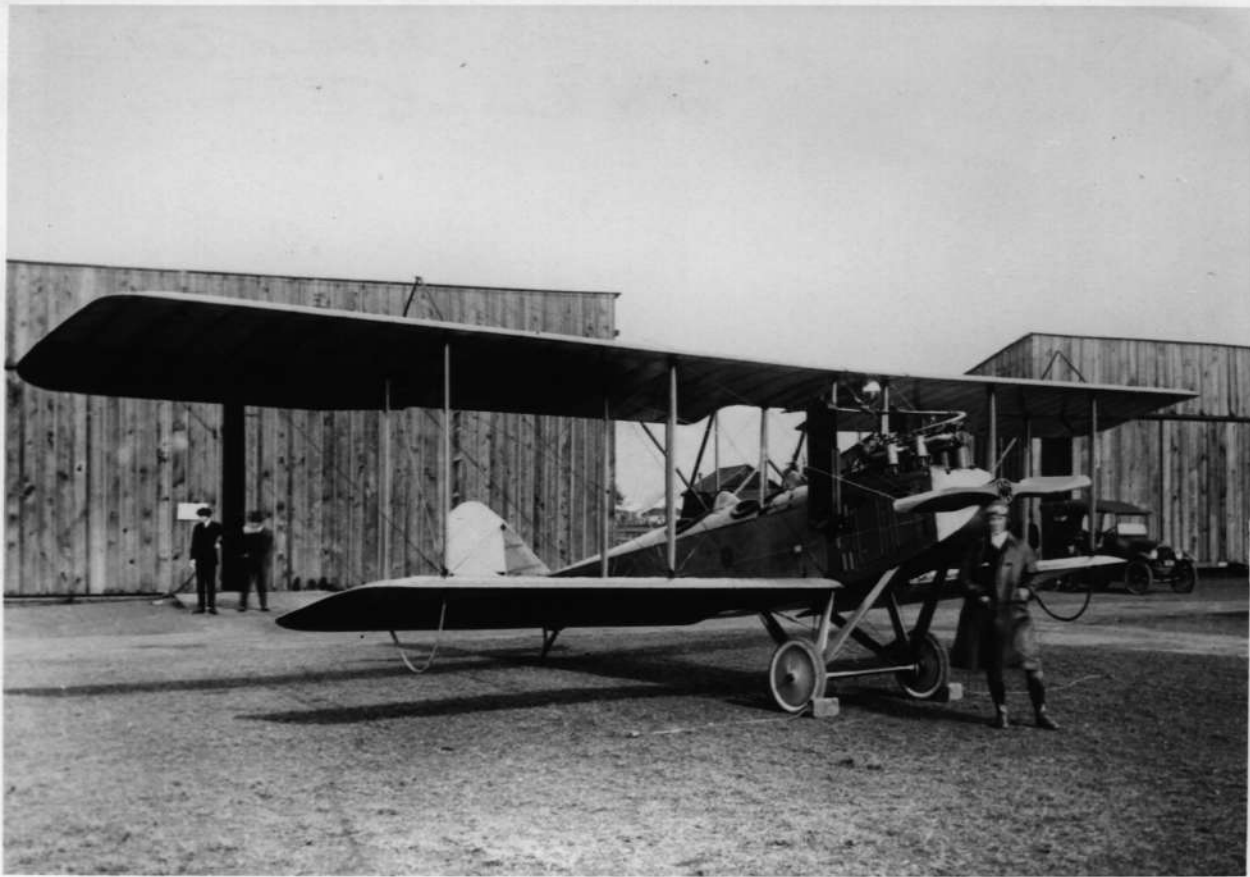


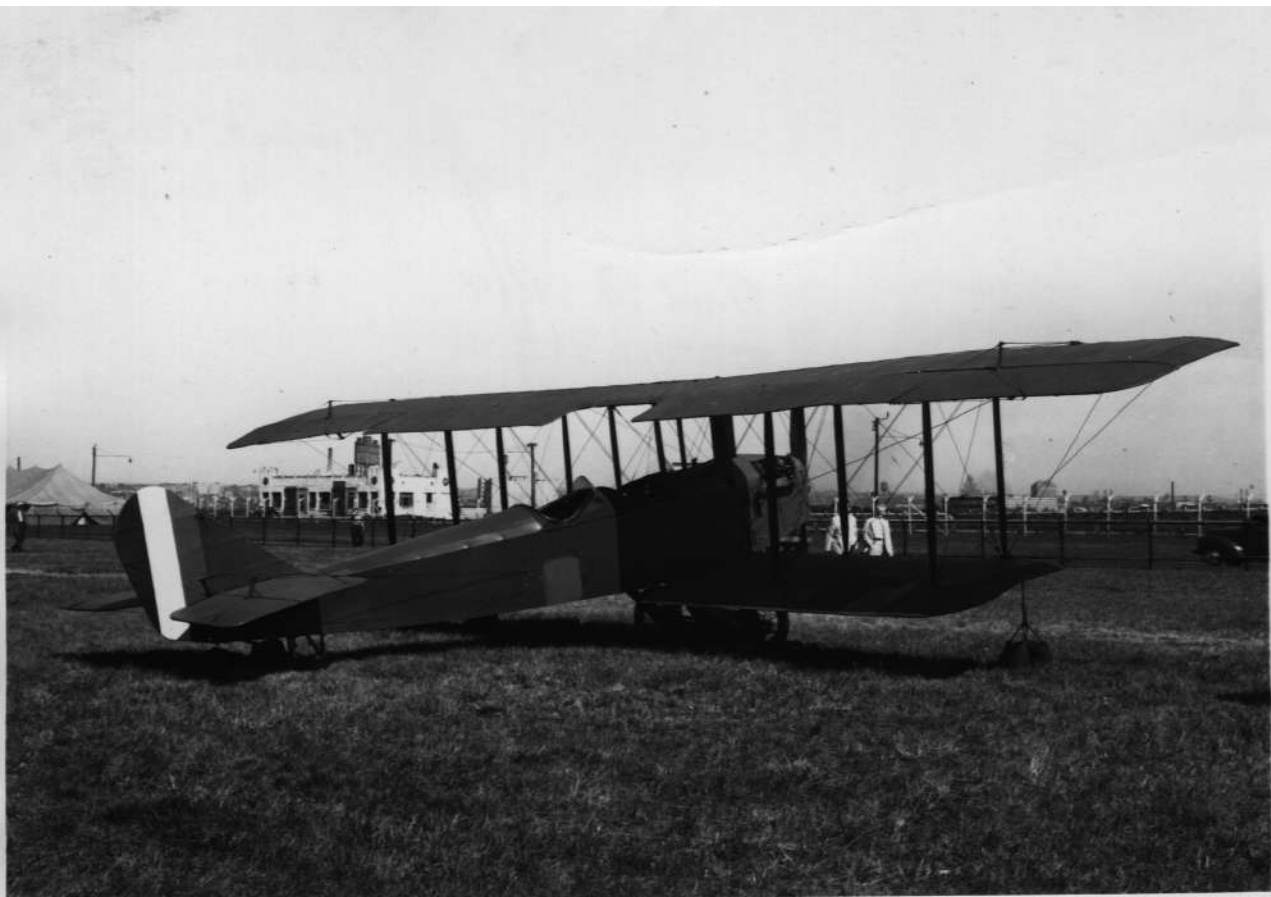




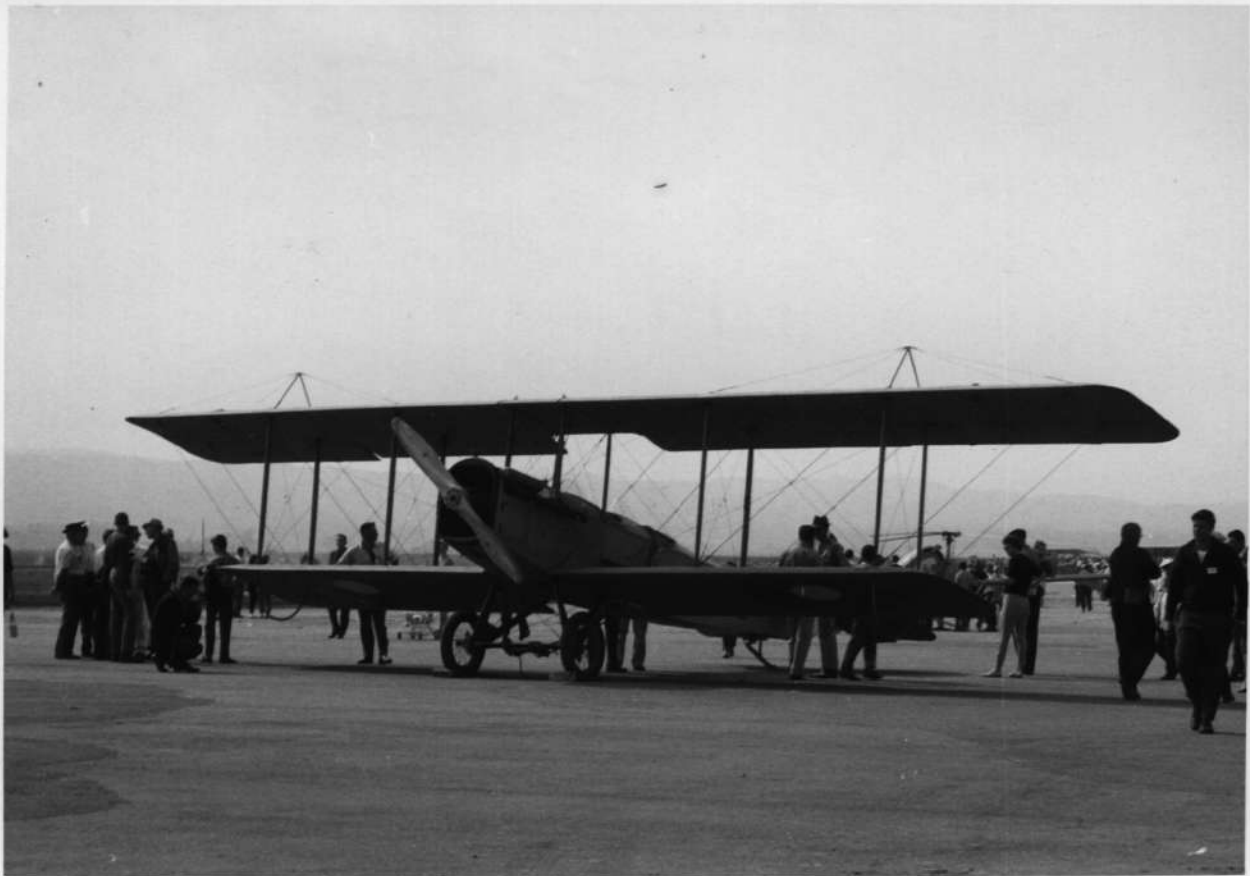




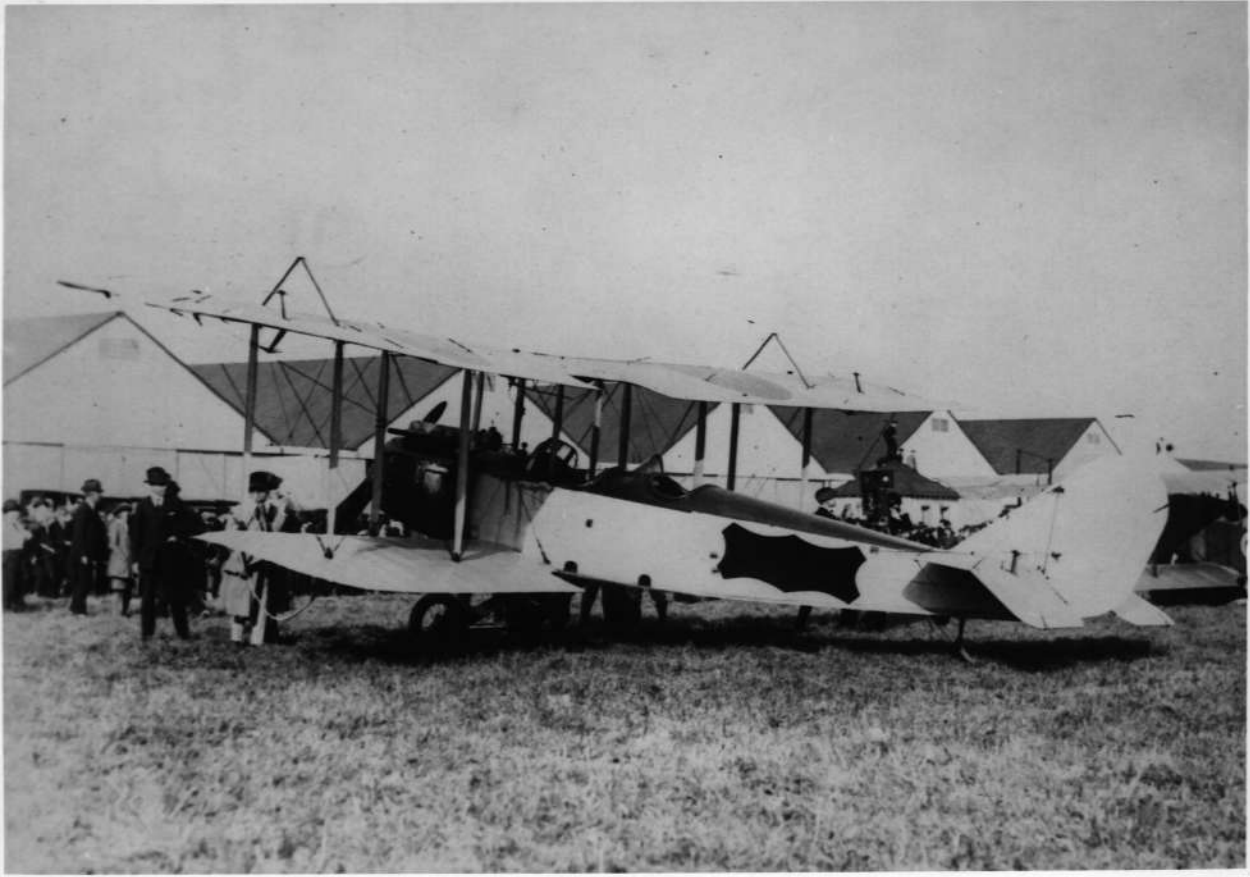




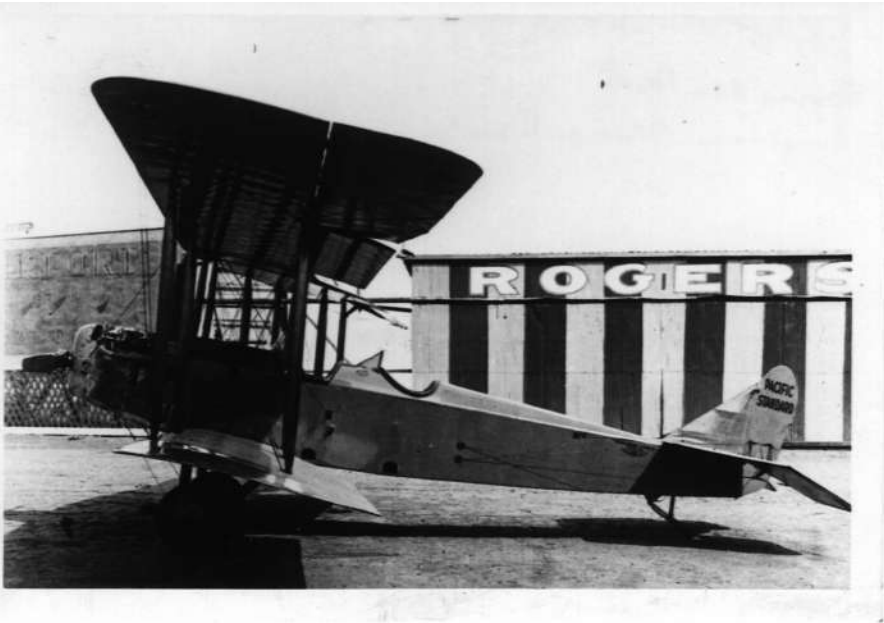














MAR 63



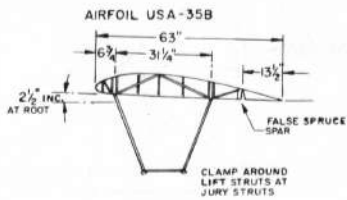
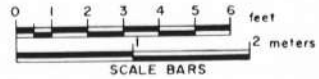
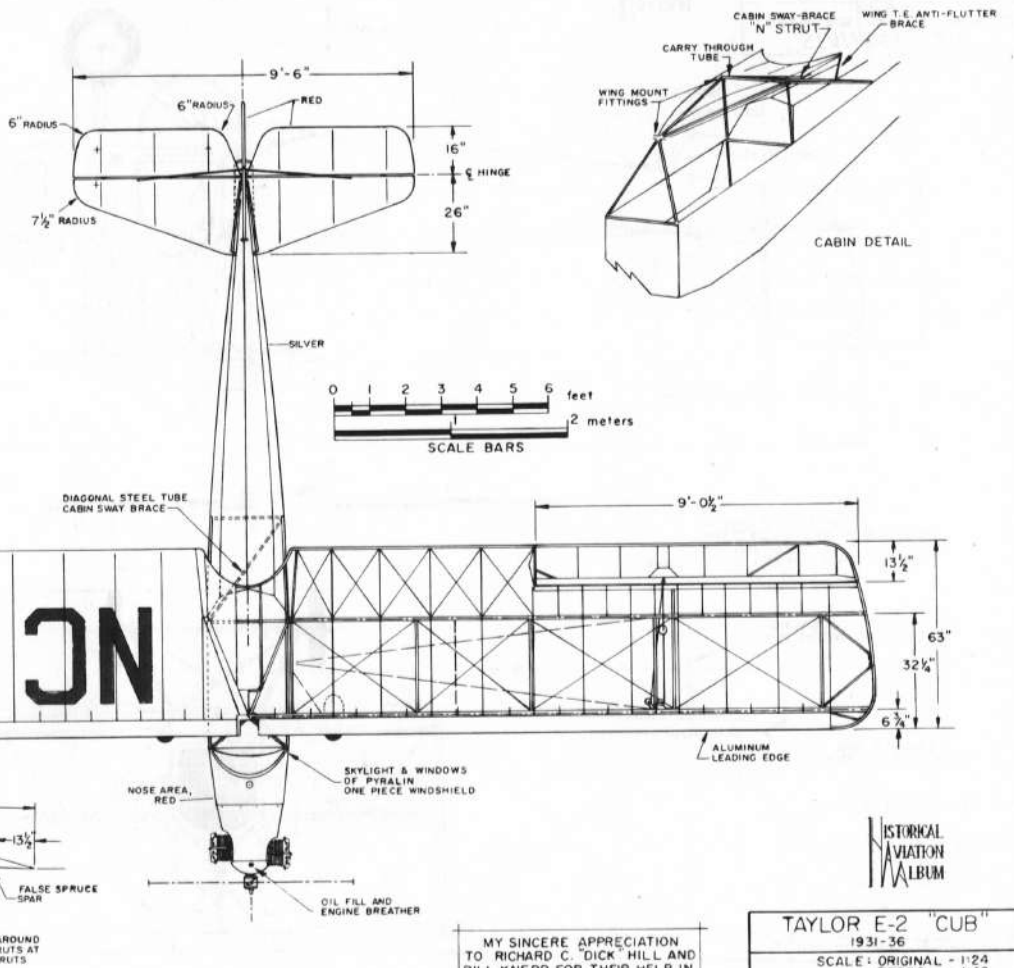
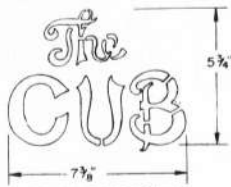




GENERAL SPECIFICATIONS

WEIGHT EMPTY 525 lbs
 USEFUL LOAD 400 lbs
 GROSS WEIGHT 925 lbs
 WING AREA 164 lbs
 WING LOADING 6 lbs/sq.ft
 POWER LOADING 22 lbs/HP
 MAXIMUM SPEED 80 mph at 3000 feet
 CRUISING SPEED 58 mph
 LANDING SPEED 28 mph
 RANGE AT CRUISE 204 miles
 SERVICE CEILING 12,000 feet
 FUEL CAPACITY 9 gals.
 OIL CAPACITY 4 quarts
 FUEL CONSUMPTION 3 gal/hr.

POWER: CONTINENTAL A-40-2,
 35-37 HP at 2,550 rpm



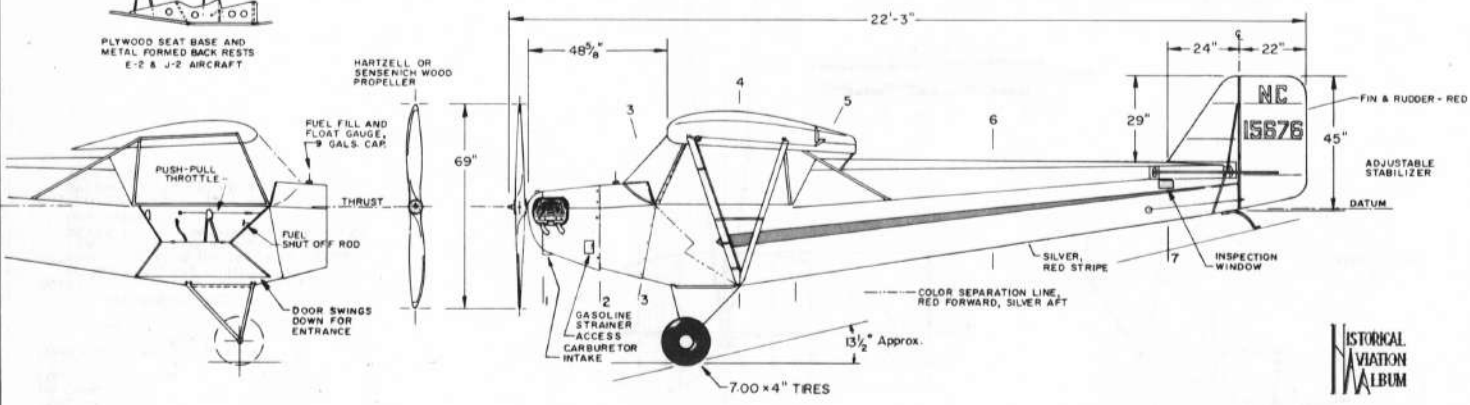
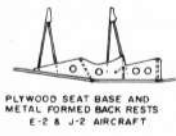
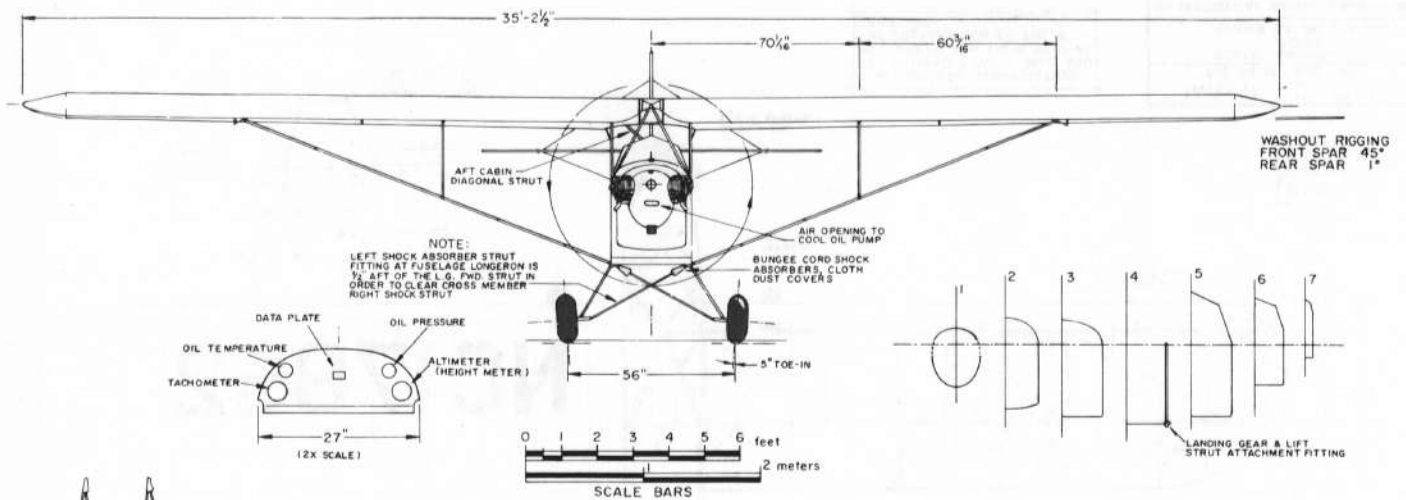
MY SINCERE APPRECIATION TO RICHARD C. 'DICK' HILL AND BILL KNEPP FOR THEIR HELP IN THE PREPARATION OF THESE DRAWINGS.
 Paul R. Matt

HISTORICAL AVIATION ALBUM

TAYLOR E-2 "CUB"	
1931-36	
SCALE: ORIGINAL - 1:24	REPRO - 1:48
DRAWN BY: PAUL R. MATT	
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TEMPLE CITY, CALIF. 91780	

DRAWING No. 18-119-A

PLATE 1 of 2



HISTORICAL AVIATION ALBUM

TAYLOR E-2 "CUB"	
1931-36	
SCALE: ORIGINAL - 1:24	REPRO. - 1:48
DRAWN BY: PAUL R. MATT	
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PLATE 2 of 2













"LETS TRY To MAKE PARIS BY SUNDOWN"









The
CUE

TAYLOR AIRCRAFT CO.
BRANFORD PA.

NC
15333



Mike Murphy at takeoff in 1937

TAYLOR J-2 cub taking off from moving car - also
landed on platform.



MIKE MURPHY MODIFIED TAYLOR E-2 built for comic stunt work

112

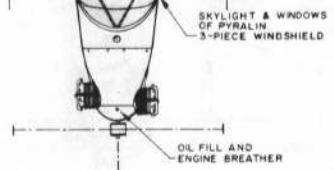
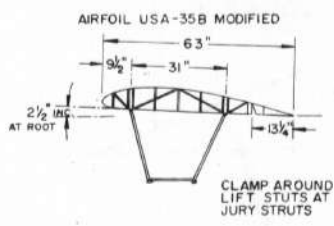
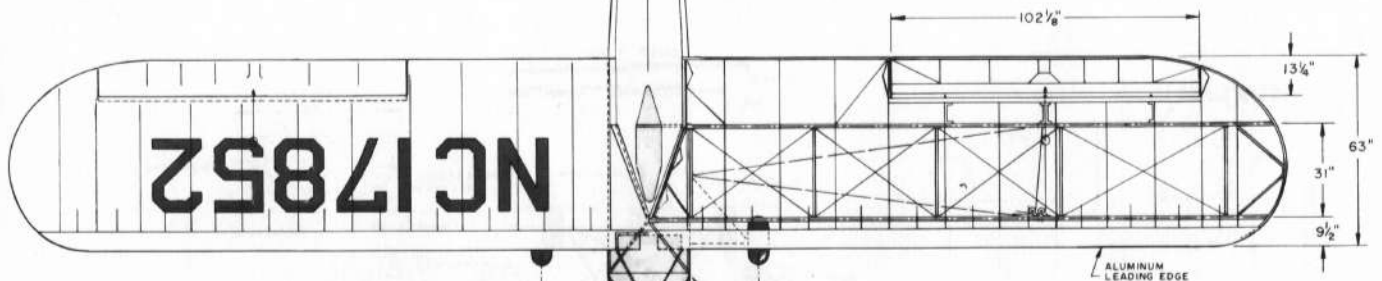
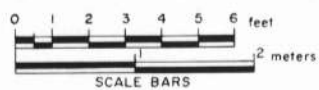
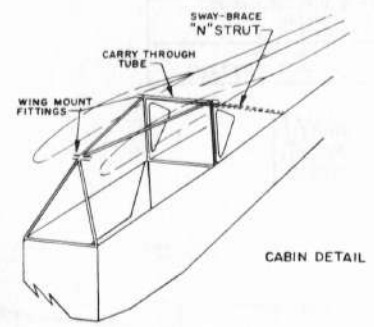
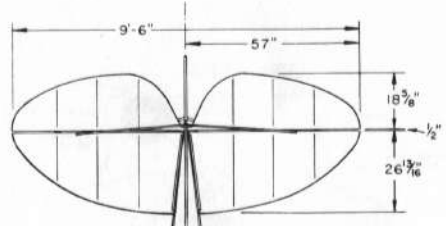
GENERAL SPECIFICATIONS

WEIGHT EMPTY	563 lbs.
USEFUL LOAD	407 lbs
GROSS WEIGHT	970 lbs
WING AREA	178 sq. ft.
WING LOADING	5.44 lbs/sq ft.
POWER LOADING	25.5 lbs/HP
MAXIMUM SPEED	85 mph
CRUISING SPEED	70 mph
LANDING SPEED	29 mph
RANGE AT CRUISE	200 miles
SERVICE CEILING	12,000 feet
FUEL CAPACITY	9 gals
OIL CAPACITY	4 quarts
FUEL CONSUMPTION	3 gal/hr.

POWER: CONTINENTAL A-40-4,
37 HP at 2550 rpm
40 HP at 2575 rpm LIMITED

COLORING NOTES

OVERALL SILVER WITH THREE DARK BLUE OR RED FUSELAGE STRIPES
OPTIONAL-RED, BLUE OR GREEN FUSELAGE, VERTICAL, STRUTS & LANDING GEAR WITH SILVER OR YELLOW WINGS & HORIZONTAL TAIL SURFACES
CUSTOM COLORS AVAILABLE INCLUDING OVERALL METALLIC BRONZE-GOLD WITH RED TRIM



ALUMINUM LEADING EDGE

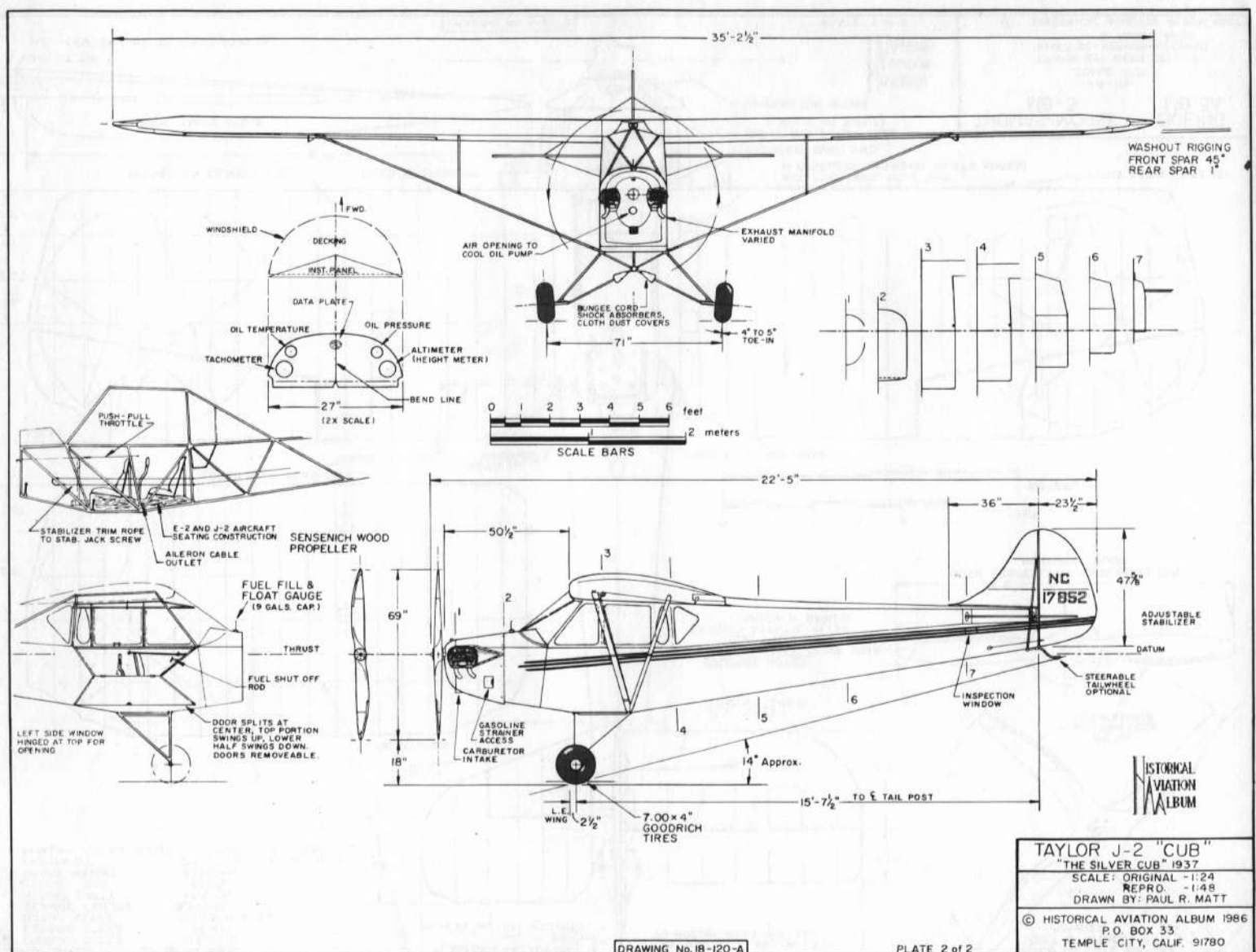
HISTORICAL AVIATION ALBUM

MY SINCERE APPRECIATION TO RICHARD C. "DICK" HILL AND BILL KNEPP FOR THEIR HELP IN THE PREPARATION OF THESE DRAWINGS.

TAYLOR J-2 "CUB"	
"THE SILVER CUB" 1937	
SCALE: ORIGINAL - 1:24	REPRO. - 1:48
DRAWN BY: PAUL R. MATT	
© HISTORICAL AVIATION ALBUM 1986	
P.O. BOX 33	
TEMPLE CITY, CALIF. 91780	

DRAWING No. IB-120-A

PLATE 1 of 2



DRAWING No. 18-120-A

















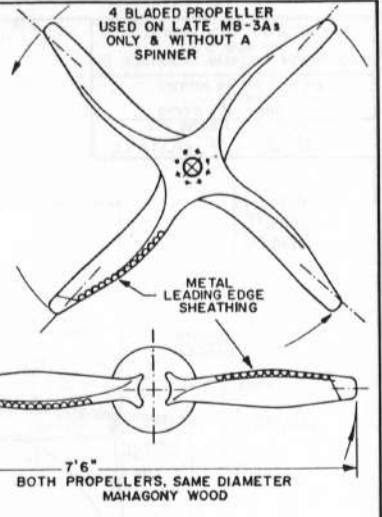
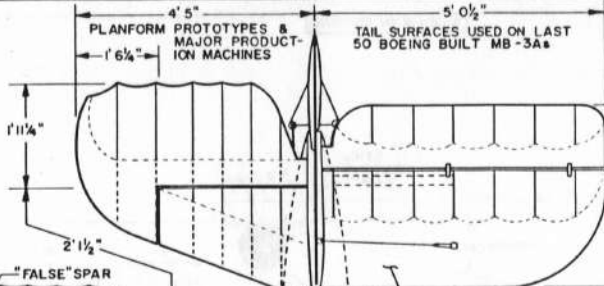
Taylor J-2 Cont.



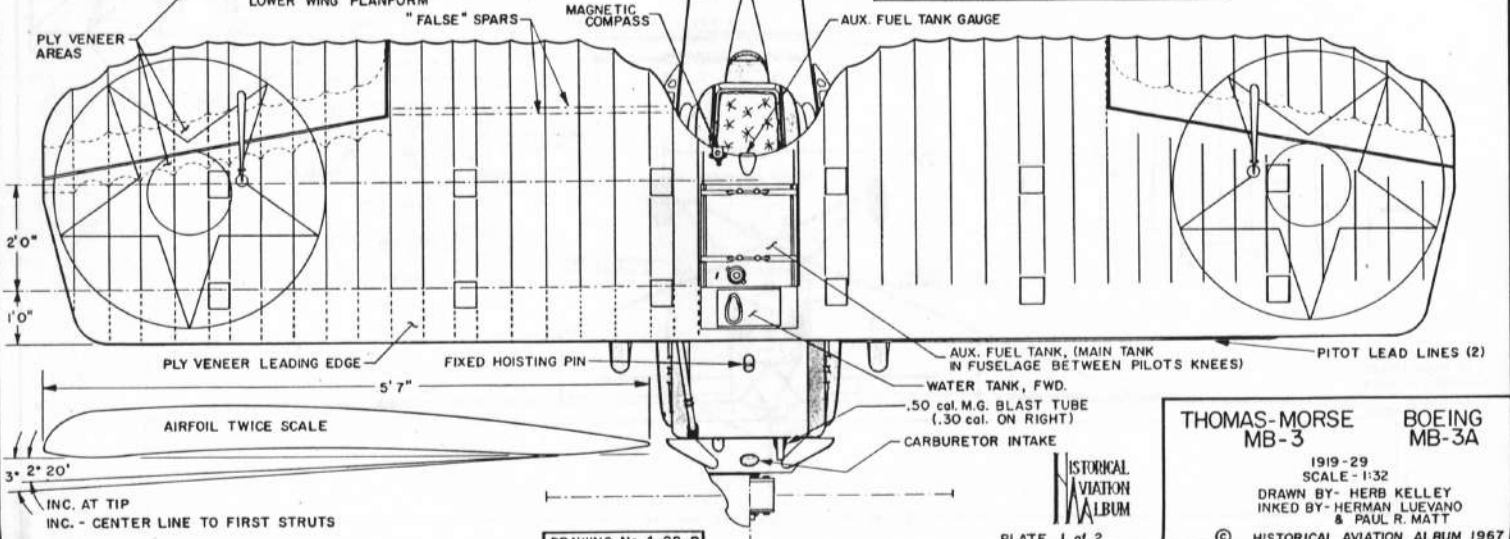
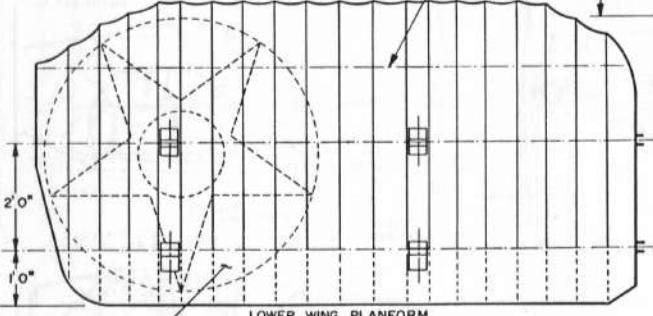
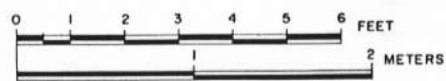
Mike Murphy at Bakland. 1938

GENERAL SPECIFICATIONS MB-3A

TOP SPEED 138 to 141 m.p.h.
 CRUISING SPEED 125 m.p.h.
 LANDING SPEED 55 m.p.h.
 INITIAL CLIMB 1230 ft./min. S.L.
 SERVICE CEILING 19,500 ft.
 WEIGHT EMPTY 1716 lbs.
 USEFUL LOAD 823 lbs.
 GROSS WEIGHT 2539 lbs.
 ENDURANCE 2 hrs. 15 min. (45 gals. fuel)
 POWER - 300 h.p. WRIGHT-HISPANO H-3 ENGINE



COLORING NOTES
 ENTIRE AIRCRAFT, OLIVE DRAB.
 BLACK MARKINGS
 EXPOSED STRUTS, CLEAR
 VARNISHED SPRUCE



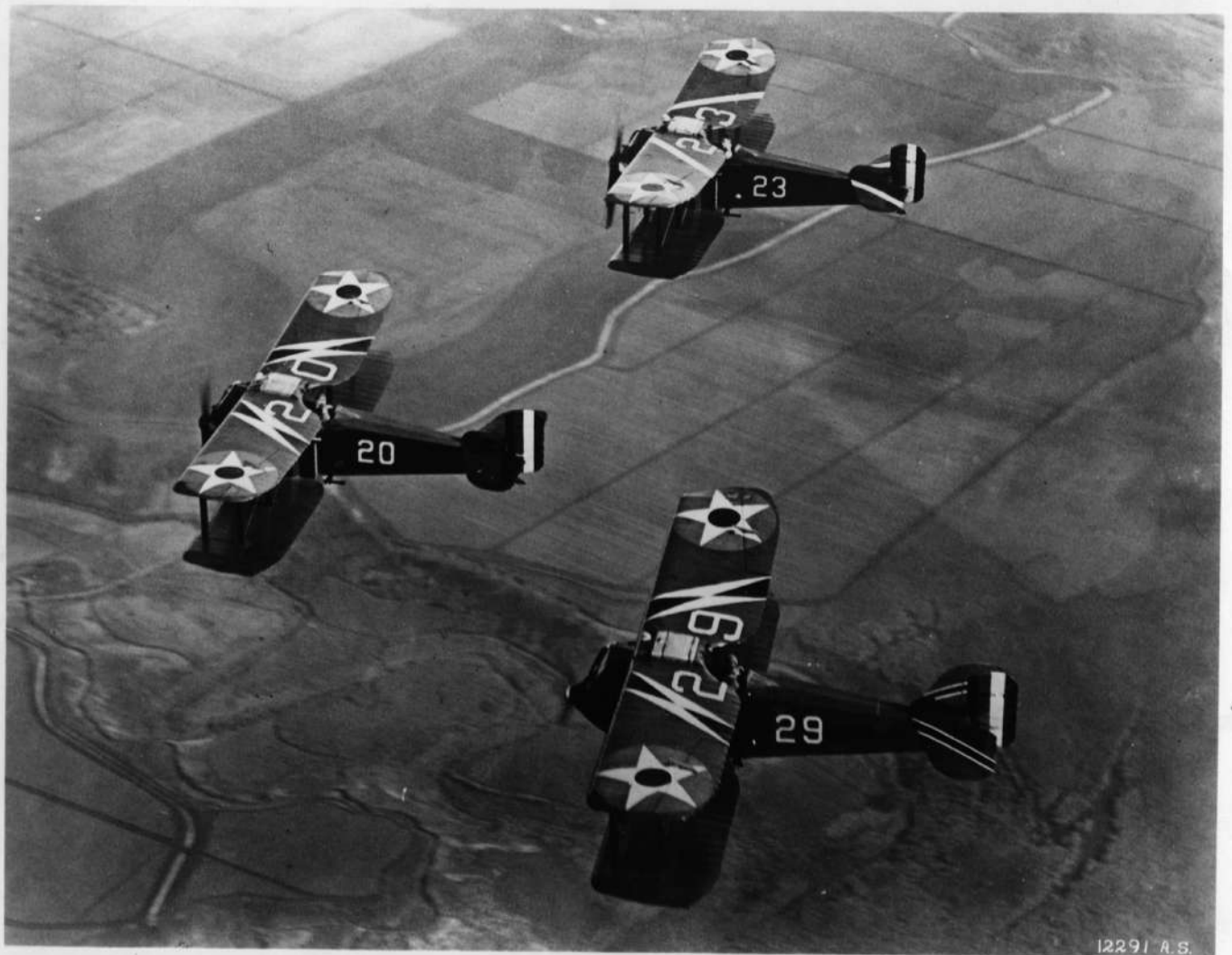
DRAWING No. 4-28-B

HISTORICAL AVIATION ALBUM
 PLATE 1 of 2

THOMAS-MORSE MB-3 BOEING MB-3A
 1919-29
 SCALE - 1:32
 DRAWN BY - HERB KELLEY
 INKED BY - HERMAN LUEVANO & PAUL R. MATT
 © HISTORICAL AVIATION ALBUM 1967



U-90 457G-22 (1024) (12-40) MB3-A IN AIR.



12291 A.S.



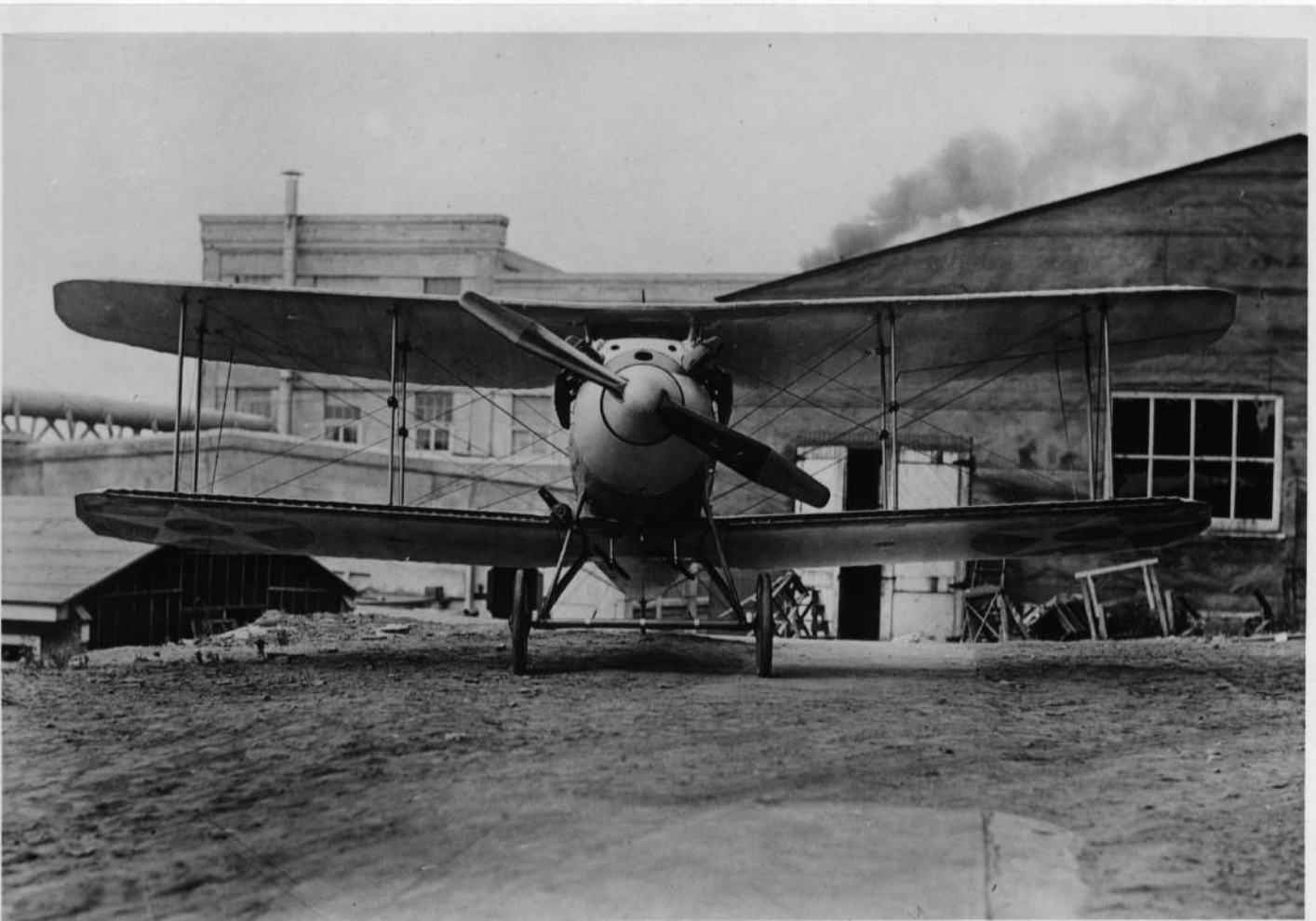


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Seattle, Wash.

111-B
6/7/22



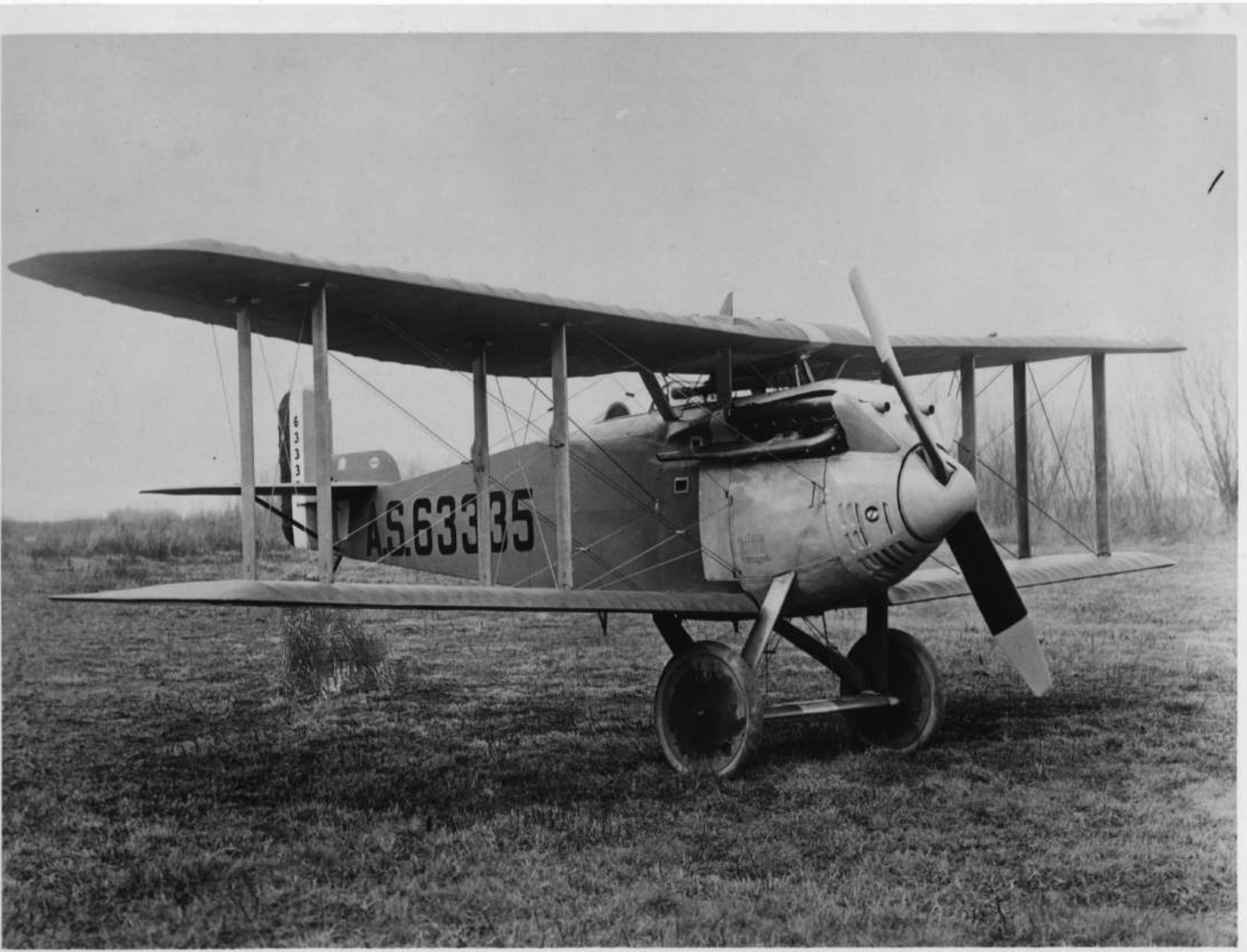










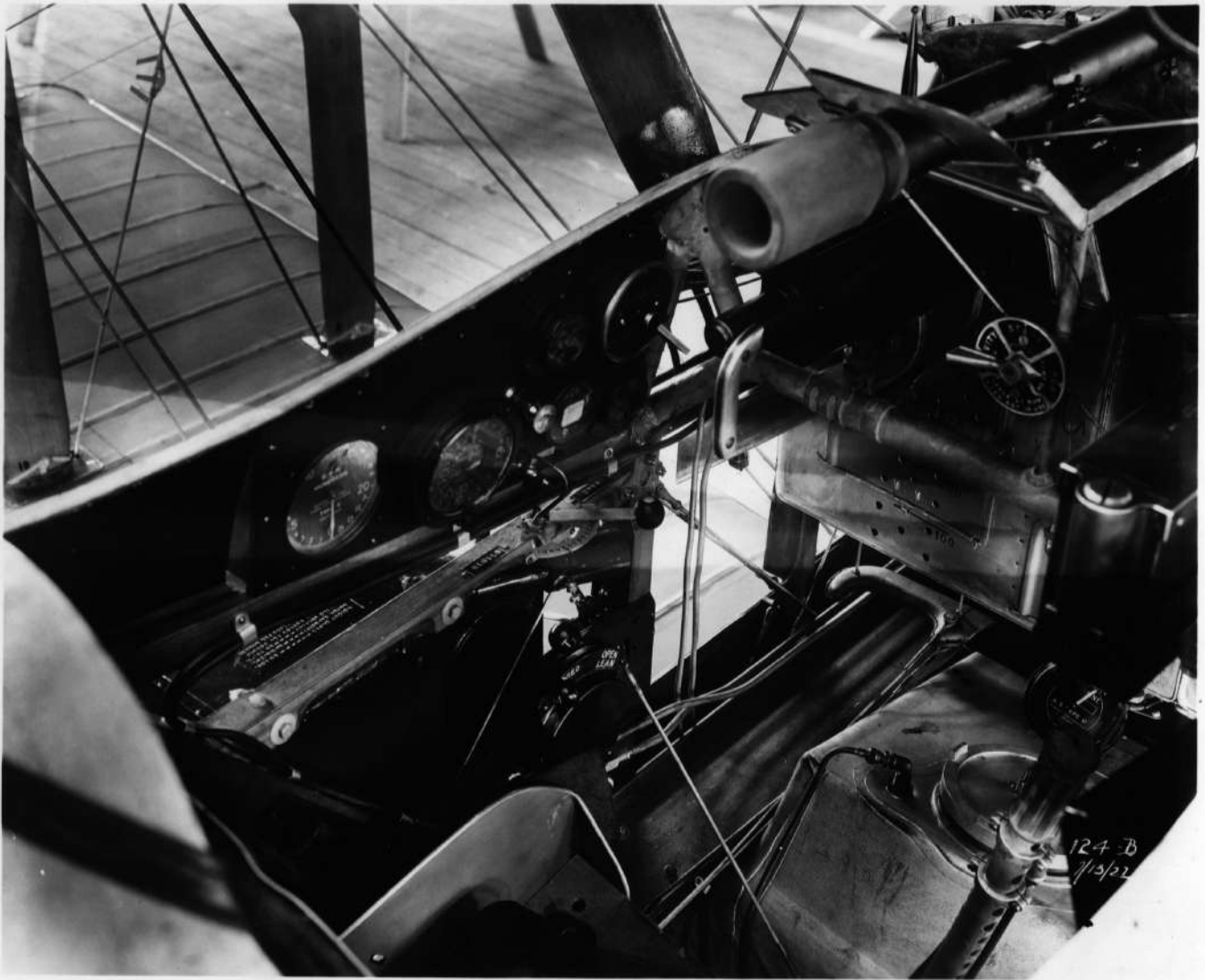


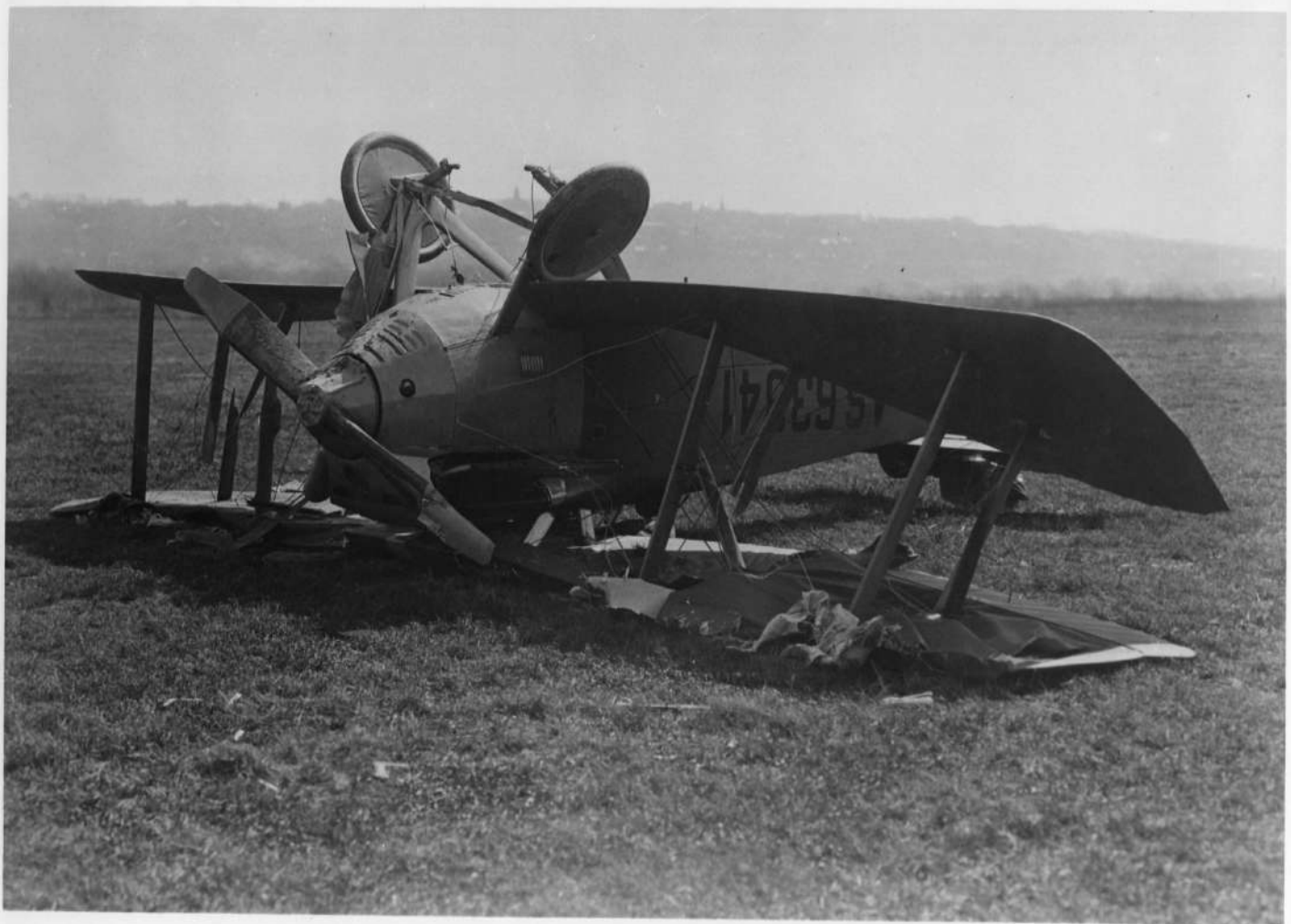
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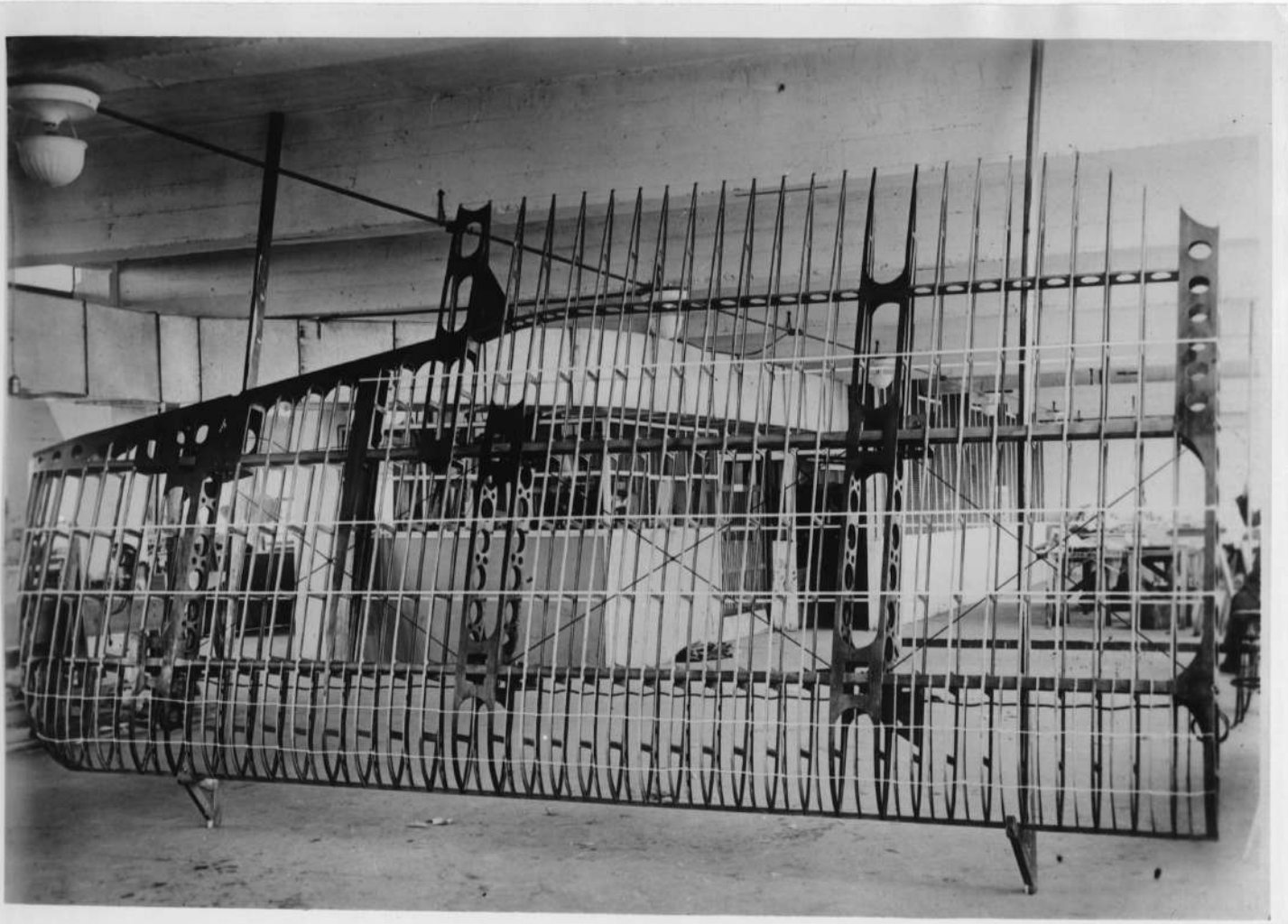


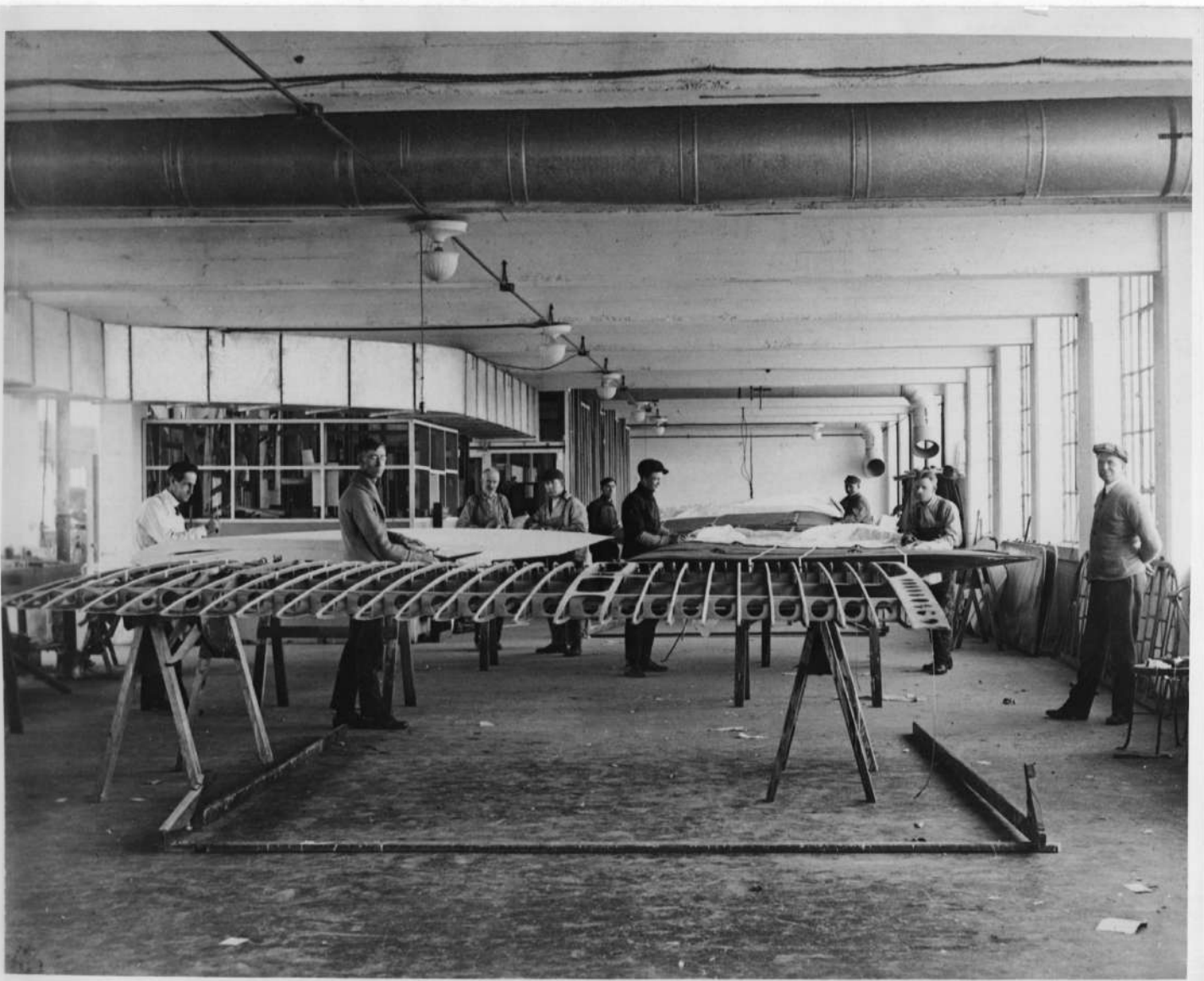












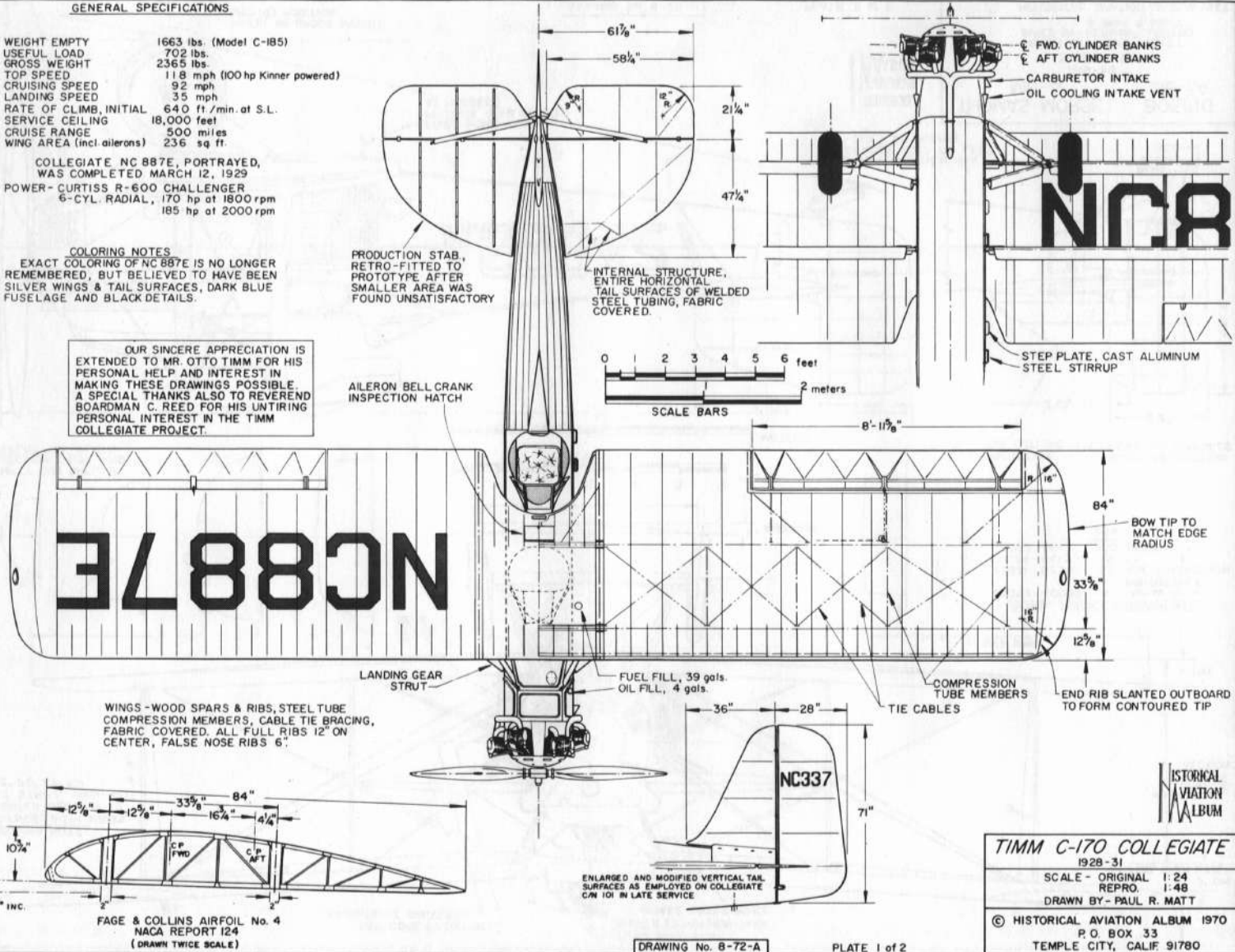
GENERAL SPECIFICATIONS

WEIGHT EMPTY 1663 lbs. (Model C-1B5)
 USEFUL LOAD 702 lbs.
 GROSS WEIGHT 2365 lbs.
 TOP SPEED 118 mph (100 hp Kinner powered)
 CRUISING SPEED 92 mph
 LANDING SPEED 35 mph
 RATE OF CLIMB, INITIAL 640 ft./min. at S.L.
 SERVICE CEILING 18,000 feet
 CRUISE RANGE 500 miles
 WING AREA (incl ailerons) 236 sq. ft.

COLLEGIATE NC 887E, PORTRAYED,
 WAS COMPLETED MARCH 12, 1929
 POWER - CURTISS R-600 CHALLENGER
 6-CYL. RADIAL, 170 hp at 1800 rpm
 185 hp at 2000 rpm

COLORING NOTES
 EXACT COLORING OF NC 887E IS NO LONGER
 REMEMBERED, BUT BELIEVED TO HAVE BEEN
 SILVER WINGS & TAIL SURFACES, DARK BLUE
 FUSELAGE AND BLACK DETAILS.

OUR SINCERE APPRECIATION IS
 EXTENDED TO MR. OTTO TIMM FOR HIS
 PERSONAL HELP AND INTEREST IN
 MAKING THESE DRAWINGS POSSIBLE.
 A SPECIAL THANKS ALSO TO REVEREND
 BOARDMAN C. REED FOR HIS UNTIRING
 PERSONAL INTEREST IN THE TIMM
 COLLEGIATE PROJECT.



HISTORICAL AVIATION ALBUM

TIMM C-170 COLLEGIATE
 1928-31
 SCALE - ORIGINAL 1:24
 REPRO. 1:48
 DRAWN BY - PAUL R. MATT
 © HISTORICAL AVIATION ALBUM 1970
 P.O. BOX 33
 TEMPLE CITY, CALIF 91780



BRIEF COLLEGIATE LISTING

COLLEGIATE No. 102, NC887E

The second Collegiate, built in 1929, also flew with the underpowered 100 hp Kinner K-5 engine, but it was subsequently replaced by a 165 hp Comet E-7. The Trojan Flying Club of Los Angeles owned it for about five years. Early in 1931 they installed a rare 120 hp Western Enterprise L-7 radial but it was too heavy and ran "hot". Within a year a change was made to a 185 hp Curtiss R-600 Challenger which served faithfully for over 15 years, long after the plane was converted to a crop duster. The agricultural conversion was nearly identical to that of c/n 101. Its restricted category license NR887E was issued in May 1944. The plane operated around Blythe and Delano, Calif. with c/n 101. In the spring of 1957 the wing was removed for recovering at Eagle Field, Dos Palos but on May 16, it was lost in a hangar fire. The fuselage stood in the weather and was stripped over the years until this writer acquired the bare bones.

COLLEGIATE No. 103, NC888E

The third Collegiate was built in 1930 and always flew with a 185 hp Curtiss R-600 Challenger engine, under Group 2-202 approval. It was owned by the Shell Oil Company for several years and painted in the characteristic red and yellow colors of the fleet. In 1937 it went to an Oregon owner and remained at Eugene throughout WW II. It is believed to have crashed into a populated area shortly thereafter.

COLLEGIATE No. 104, NC16E

The fourth Collegiate was completed May 24, 1930 with a 165 hp Continental A-70 engine. It was approved for NC licensing under Group 2-265 on Aug. 4, 1930 at a gross weight of 2475 lbs., heaviest approved for any Collegiate. The fin and rudder were enlarged in March 1931 and the engine changed to a Challenger. Approved gross weight was reduced to 2212 lbs. It was flown around the Los Angeles area some fourteen years as a sport plane. It was purchased late in WW II and converted to a crop duster with metalized fuselage, completely rebuilt wing and an engine mount from a Waco UPF-7. Power was a surplus 220 hp Continental W-670-6A. The restricted NR16E license was issued June 6, 1945. The first and fourth Collegiates appear to have been near duplicates in their agricultural configuration. On Nov. 19, 1947 the plane had been "permanently retired from service" — in other words cracked-up and piled in a corner somewhere.

COLLEGIATE No. 105, NC279V

The fifth Collegiate was completed in Dec. 1929 and delivered to J. Warren MacClatchie whose manufacturing company in Compton, Calif. developed an aviation engine known as the MacClatchie X-2 Panther. The Collegiate was licensed X-279V and became a flying test bed for the fourth X-2 engine. This was a 7 cylinder aircooled radial of L-head design, having no rocker arms or push rods, and developed about 150 hp. When the engine received its ATC, the Collegiate went to NC279V on July 11, 1930. In November 1930

this aircraft and engine established a unique endurance record at the MacClatchie Ranch near Rosamond Dry Lake in the Mojave Desert of Southern Calif. The plane was named "City of Los Angeles".

The purpose of the flights was to prove that aircraft with low powered engines were equally reliable as the big Whirlwinds and Wasps which powered the record breaking flights of the era. The event was termed a non-maintenance flight in which landings and takeoffs at four hour intervals to permit a changing of a pilot and refueling. Under the observation of a N.A.A. observer the rules were set that at no time was the engine or plane to be repaired, altered, adjusted, greased or to be otherwise maintained. Not even a spark plug could be changed. The engine was never stopped. Three pilots flew 4-hour shifts every 24 hours. At the end of the tests the Panther engine was in excellent condition. The flights were finally terminated due to a fouled spark plug. The tabulation was most impressive. The engine ran continuously for 378 hours, 48 minutes. Ninety-seven landings were made, the average time on the ground for pilot change and refueling was 10.2 min., and the plane flew some 27,667 miles. Gasoline consumption was 2717 gals. (approx. 7.1 gals/hr) and 18½ gals. of oil were used. There were eleven oil changes accounting for 66 gals. Despite this record neither the Panther engine nor the Timm Collegiate gained any fame or further interest.

A new MacClatchie Panther was installed in it in March 1936, but NC279V was sold to a succession of six private owners in California between Dec. 1935 and June 1941. One month later it was damaged in a nose-over accident at the San Mateo Airport. In March 1942 the Morris Plan Co. acquired it for \$749, probably a repossession. The next owner was the Prescott Arizona Public Schools, but they sold it, too, eventually and by Feb. 1964 the FAA status report had the plane stored with plans to make it operational again in Buckeye, Arizona. Since then all but the wings have been moved outside, and in June 1968, it was seriously deteriorating outside the adobe-brick hangar at Fram Field, Phoenix, Arizona.

COLLEGIATE No. 106, NC945Y

The sixth and last Collegiate was completed on Dec. 20, 1930 and received its NC on Jan. 17, 1931. It was sold to Western Enterprise Engine Co. of Los Angeles on Jan. 17, 1931. Powerplant was the 120 hp Western Enterprise L-7 radial. When this engine manufacturer went into receivership in Feb. 1932 the plane was sold to a private concern which kept it at the United Airport, Burbank, Calif. Between April 1932 and Dec. 1939, NC945Y had seven different owners. Timm Aircraft however converted it to a 185 hp Curtiss Challenger on May 21, 1932 at the request of its second owner. It also had a camera mount installed in the rear cockpit during 1935. On Dec. 13, 1939 it crashed into some walnut trees from an altitude of about 500 feet over Tarzana, Calif. Investigation showed the accident was clearly pilot error and the plane a complete washout.



City of Los Angeles established a unique endurance record in November 1930. Owned by J. Warren MacClatchie and powered by an engine of his own development, it flew some 27,667 miles without an engine shut down or maintenance of any kind. It was the sole Timm M-150 Collegiate, c/n 105. Power was the MacClatchie X-2 Panther engine of 150 hp. Colors were overall red with black trim and white pin striping.

Peter M. Bowers



The City of Los Angeles as seen at Fram Field, Phoenix, Arizona, summer 1966. It was in the same position but deteriorating fast some three years later.

J. R. Qualls



Otto Timm

Original Timm Collegiate of 1928. Power was a 120 hp Anzani engine with front exhaust collector system.







GENERAL SPECIFICATIONS
R-3 IN FINAL CONFIGURATION

WEIGHT EMPTY 2032 lbs. WITH WATER
 USEFUL LOAD 471 lbs. INCLUDING 271 lbs. OF DISPOSABLE WEIGHT
 GROSS WEIGHT 2503 lbs.
 MAXIMUM SPEED 219 m.p.h. I.A.S. at 2400 r.p.m. OVER MEASURED TRIANGLE COURSE (T.A.S. 235mph)
 LANDING SPEED 73.2 m.p.h.
 STALLING SPEED 78 m.p.h.
 FUEL CAPACITY 40 gals.
 OIL CAPACITY 4 gals.
 WING AREA 146.5 sq. ft.
 POWER - CURTISS D-12 500 h.p. at 2200 r.p.m. 507 h.p. at 2380 r.p.m. (NOT HIGH COMPRESSION ENGINE)

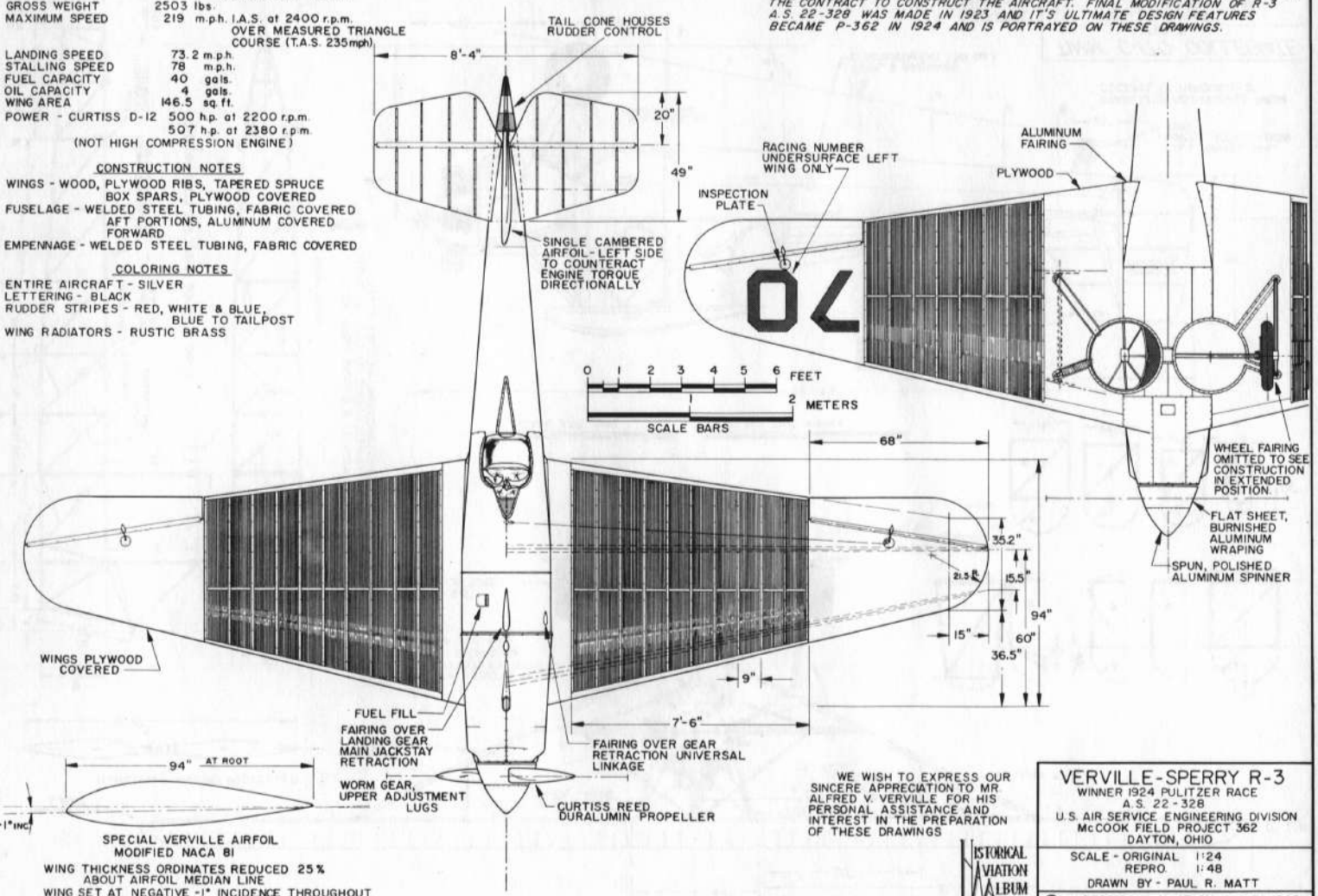
CONSTRUCTION NOTES

WINGS - WOOD, PLYWOOD RIBS, TAPERED SPRUCE BOX SPARS, PLYWOOD COVERED
 FUSELAGE - WELDED STEEL TUBING, FABRIC COVERED AFT PORTIONS, ALUMINUM COVERED FORWARD
 EMPENNAGE - WELDED STEEL TUBING, FABRIC COVERED

COLORING NOTES

ENTIRE AIRCRAFT - SILVER
 LETTERING - BLACK
 RUDDER STRIPES - RED, WHITE & BLUE.
 BLUE TO TAILPOST
 WING RADIATORS - RUSTIC BRASS

THREE R-3s WERE BUILT, A.S. 22-326, 22-327 AND 22-328 (1922). DESIGNED BY ALFRED V. VERVILLE, CHIEF OF PURSUIT AND RACING PLANE DESIGN PROJECTS, USAS ENGINEERING DIVISION, MCCOOK FIELD, DAYTON, OHIO BY DIRECTION OF BRIG. GEN. WILLIAM MITCHELL, ASST. CHIEF U.S. ARMY AIR SERVICE. LAWRENCE SPERRY AIRCRAFT CO., FARMINGDALE, LONG ISLAND WAS AWARDED THE CONTRACT TO CONSTRUCT THE AIRCRAFT. FINAL MODIFICATION OF R-3 A.S. 22-328 WAS MADE IN 1923 AND IT'S ULTIMATE DESIGN FEATURES BECAME P-362 IN 1924 AND IS PORTRAYED ON THESE DRAWINGS.



WE WISH TO EXPRESS OUR SINCERE APPRECIATION TO MR. ALFRED V. VERVILLE FOR HIS PERSONAL ASSISTANCE AND INTEREST IN THE PREPARATION OF THESE DRAWINGS



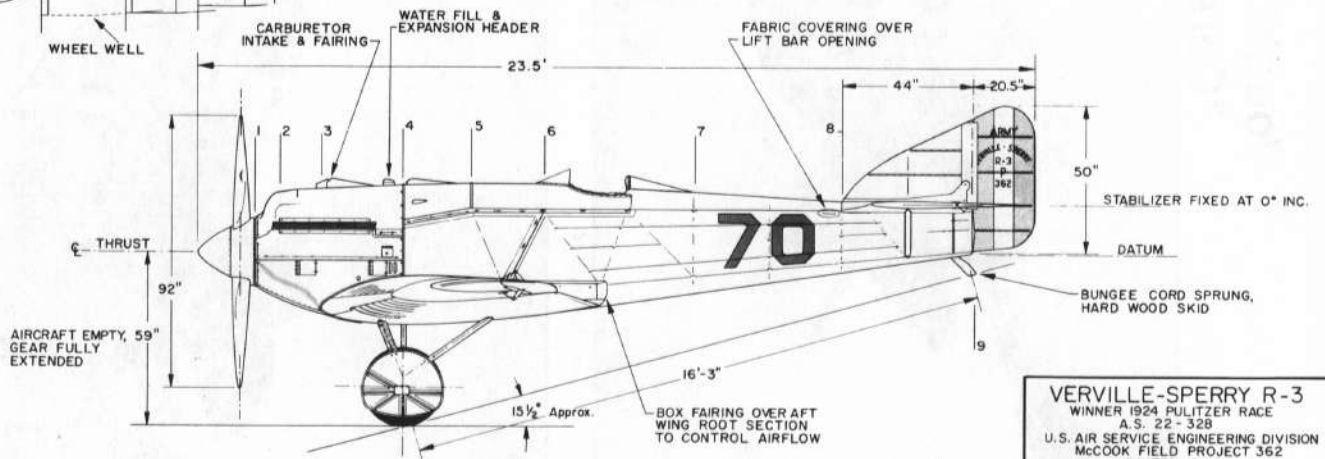
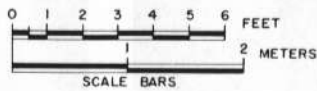
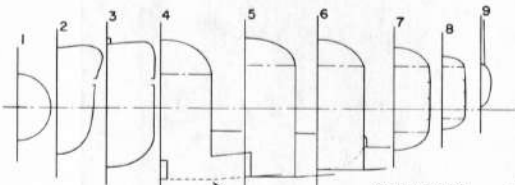
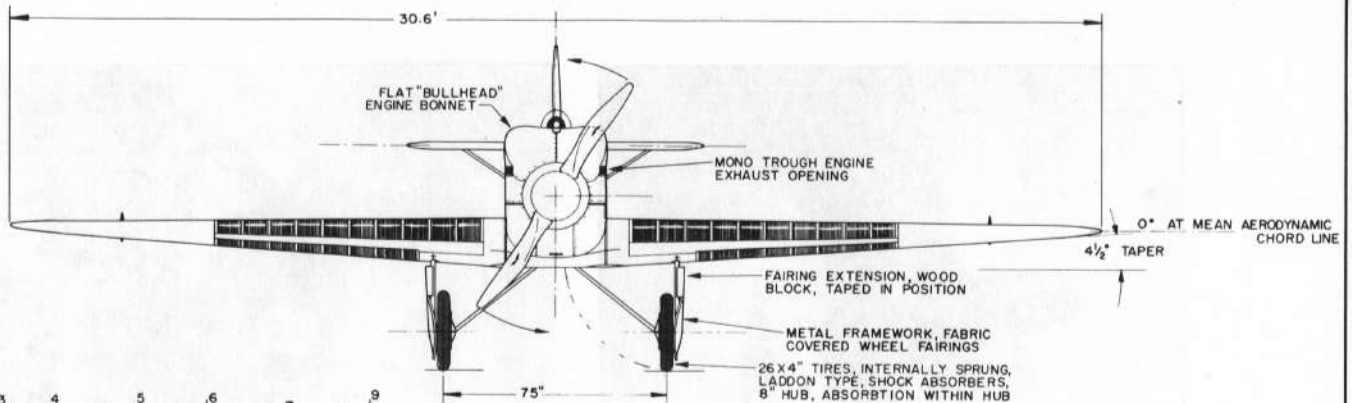
VERVILLE-SPERRY R-3
 WINNER 1924 PULITZER RACE
 A.S. 22-328
 U.S. AIR SERVICE ENGINEERING DIVISION
 MCCOOK FIELD PROJECT 362
 DAYTON, OHIO

SCALE - ORIGINAL 1:24
 REPRO 1:48
 DRAWN BY - PAUL R. MATT

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 TEMPLE CITY, CALIF. 91780

DRAWING No. 6-58-A

PLATE 1 of 2



HISTORICAL AVIATION ALBUM

VERVILLE-SPERRY R-3
 WINNER 1924 PULITZER RACE
 A.S. 22-328
 U.S. AIR SERVICE ENGINEERING DIVISION
 MCCOOK FIELD PROJECT 362
 DAYTON, OHIO

SCALE - ORIGINAL	1:24
REPRO.	1:48

DRAWN BY - PAUL R. MATT

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DRAWING No. 6-58-A

PLATE 2 of 2

23472

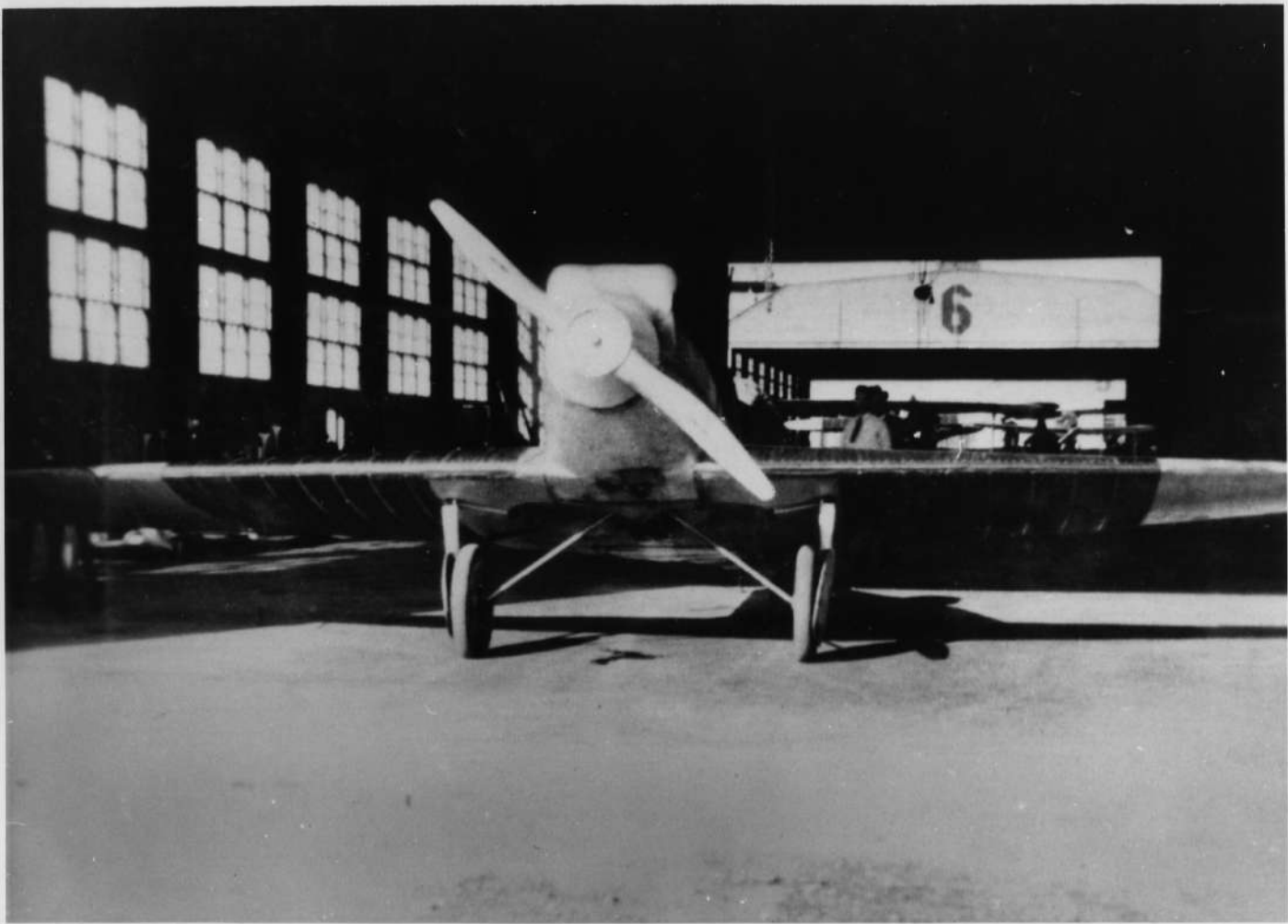


23473



23475

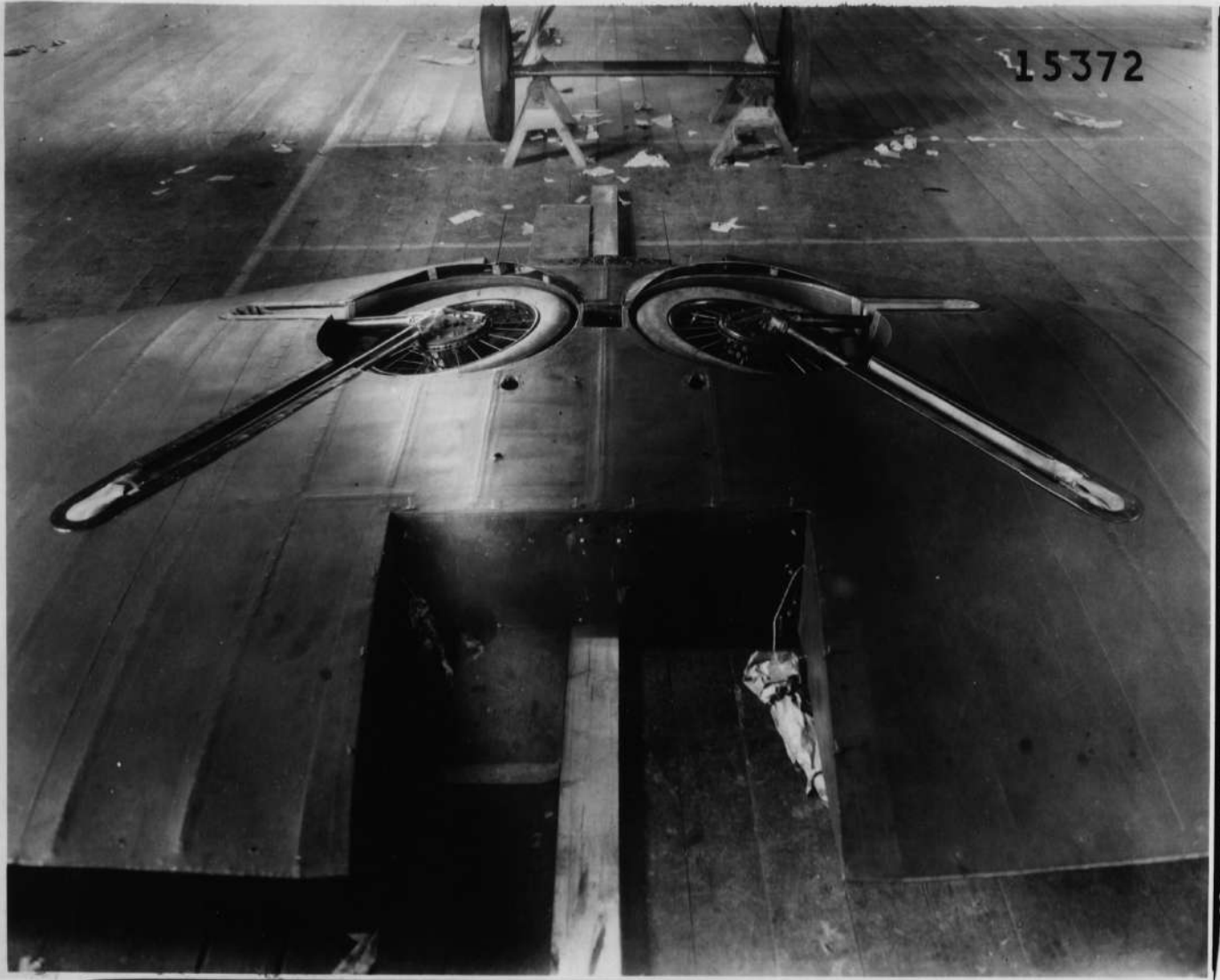






Lt. H. H. Mills after winning 1924 Pulitzer Race

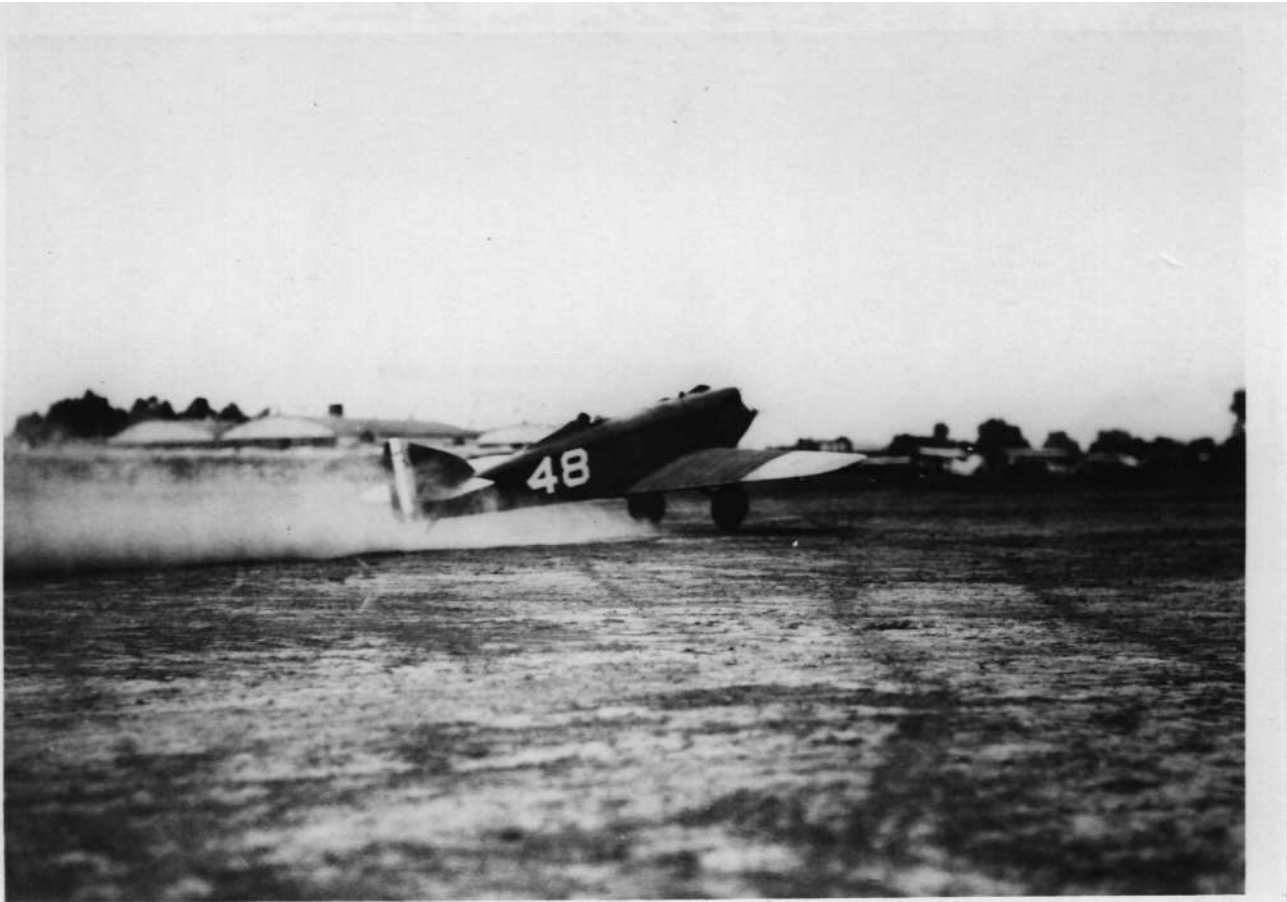






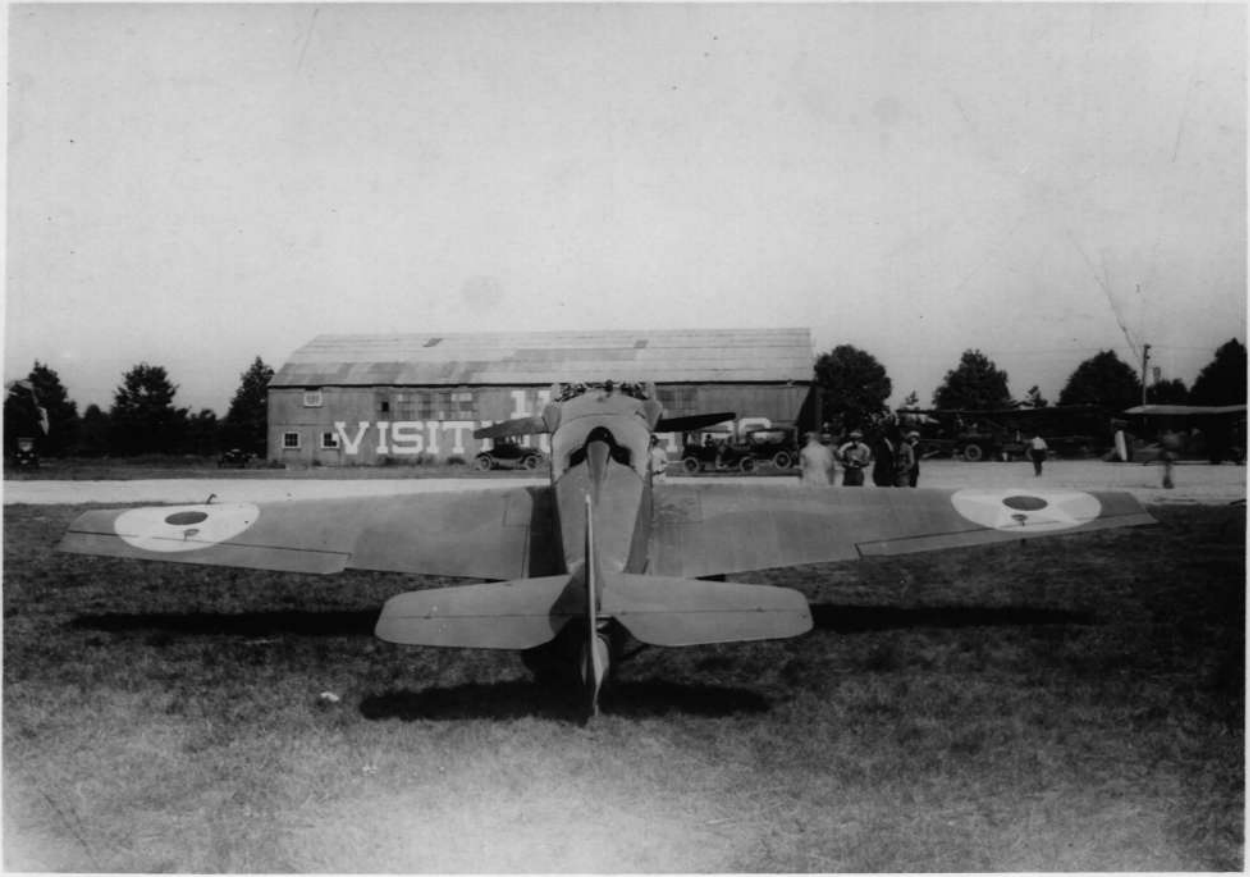






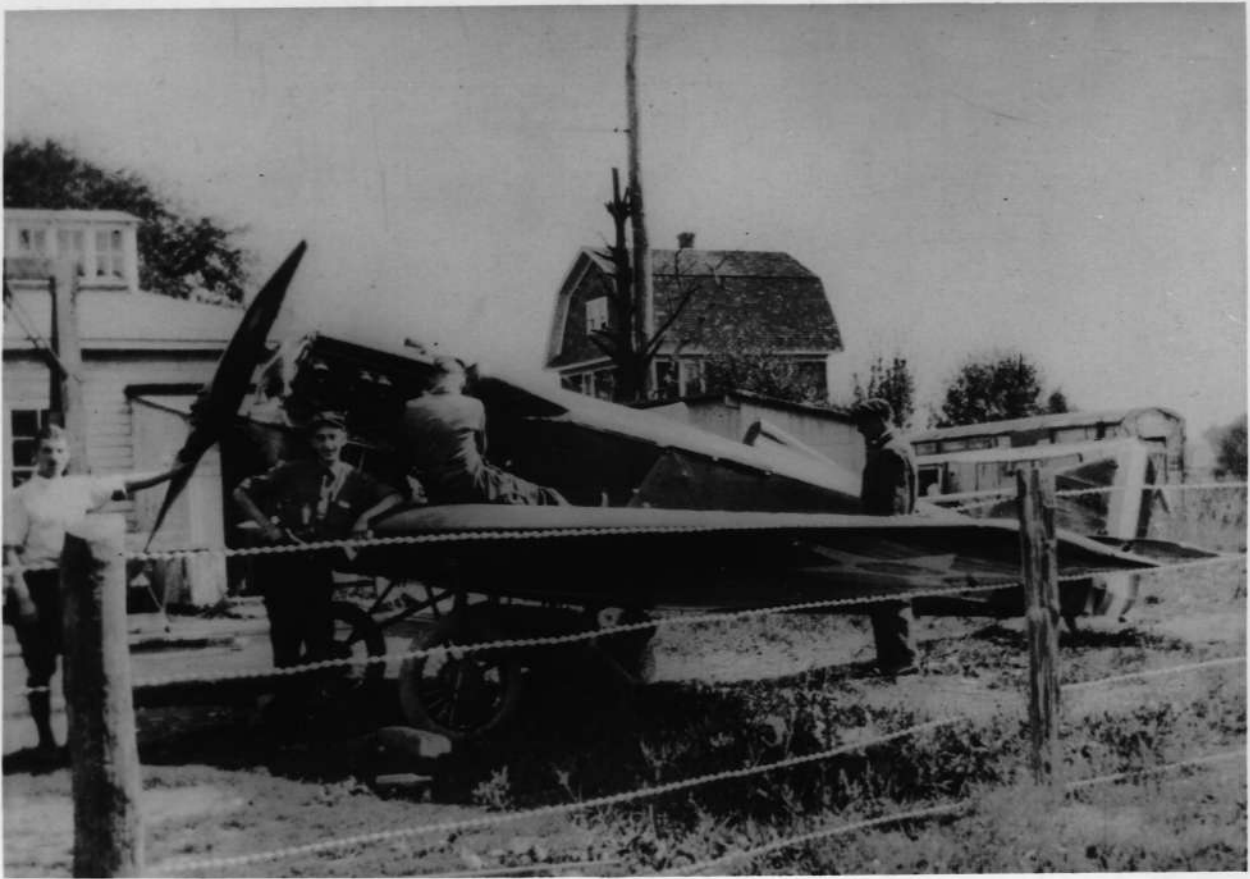












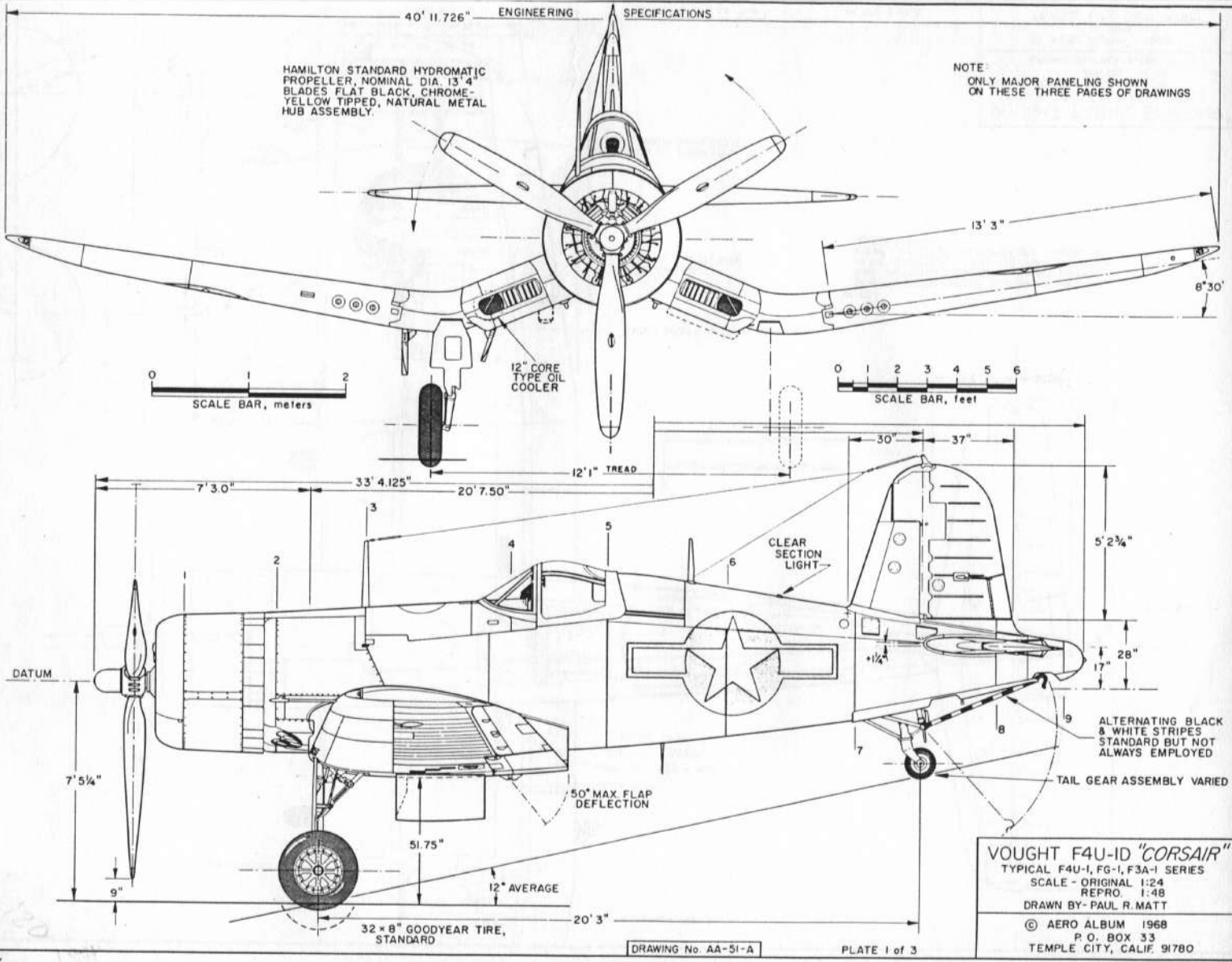




40' 11.726" ENGINEERING SPECIFICATIONS

HAMILTON STANDARD HYDROMATIC PROPELLER, NOMINAL DIA. 13' 4" BLADES FLAT BLACK, CHROME-YELLOW TIPPED, NATURAL METAL HUB ASSEMBLY.

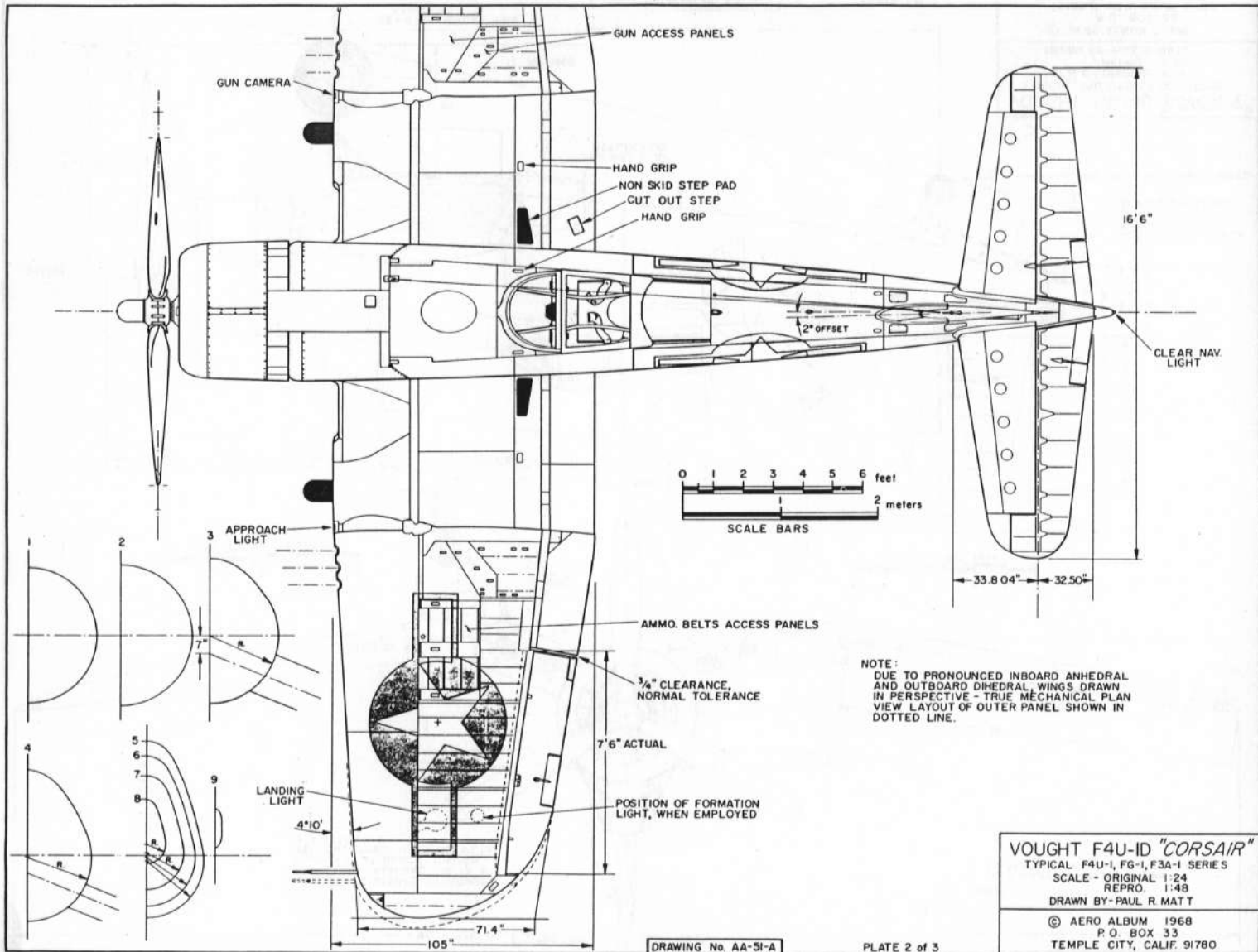
NOTE: ONLY MAJOR PANELING SHOWN ON THESE THREE PAGES OF DRAWINGS



VOUGHT F4U-ID "CORSAIR"
TYPICAL F4U-1, FG-1, F3A-1 SERIES
SCALE - ORIGINAL 1:24
REPRO. 1:48
DRAWN BY- PAUL R. MATT
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P. O. BOX 33
TEMPLE CITY, CALIF. 91780

DRAWING No AA-51-A

PLATE 1 of 3

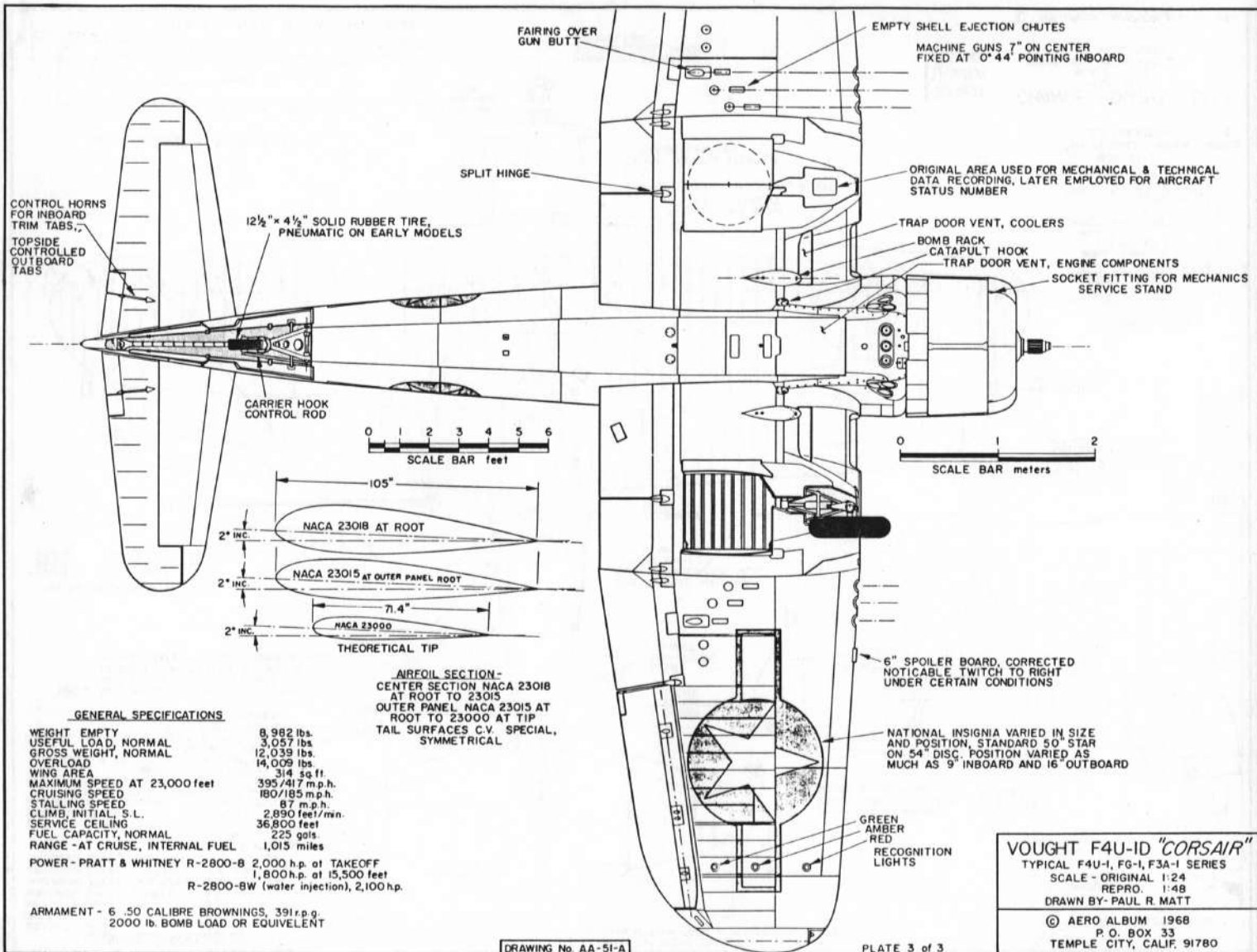


NOTE:
 DUE TO PRONOUNCED INBOARD ANHEDRAL
 AND OUTBOARD DIHEDRAL WINGS DRAWN
 IN PERSPECTIVE - TRUE MECHANICAL PLAN
 VIEW LAYOUT OF OUTER PANEL SHOWN IN
 DOTTED LINE.

VOUGHT F4U-ID "CORSAIR"
 TYPICAL F4U-1, FG-1, F3A-1 SERIES
 SCALE - ORIGINAL 1:24
 REPRO. 1:48
 DRAWN BY- PAUL R. MATT
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DRAWING No. AA-SI-A

PLATE 2 of 3



















CV-14846 COPY CORSAIRS OF THE ROYAL NAVY USMC 6/6/44









XP4U-1







59-E

(R27)



CV 16197 F4U-1 COCKPIT OF NO. 02169 DIVE TEST AIRPLANE.

9/13/44

ELEVATOR TAB CONTROL

AND INDICATOR

CO₂ VAPOR DILUTION KNOB

(WING TANKS)

RUDDER TAB CONTROL

AND INDICATOR

TAIL WHEEL LOCK HANDLE

LANDING GEAR

EMERGENCY RELEASE

WING FOLD CONTROL

AND LOCK

MANUAL WING HINGE

PIN LOCKING HANDLE

MASTER GUN SWITCH

HYDRAULIC HAND PUMP

GUN HEATER SWITCH

FUEL SELECTOR VALVE

MIXTURE CONTROL HANDLE

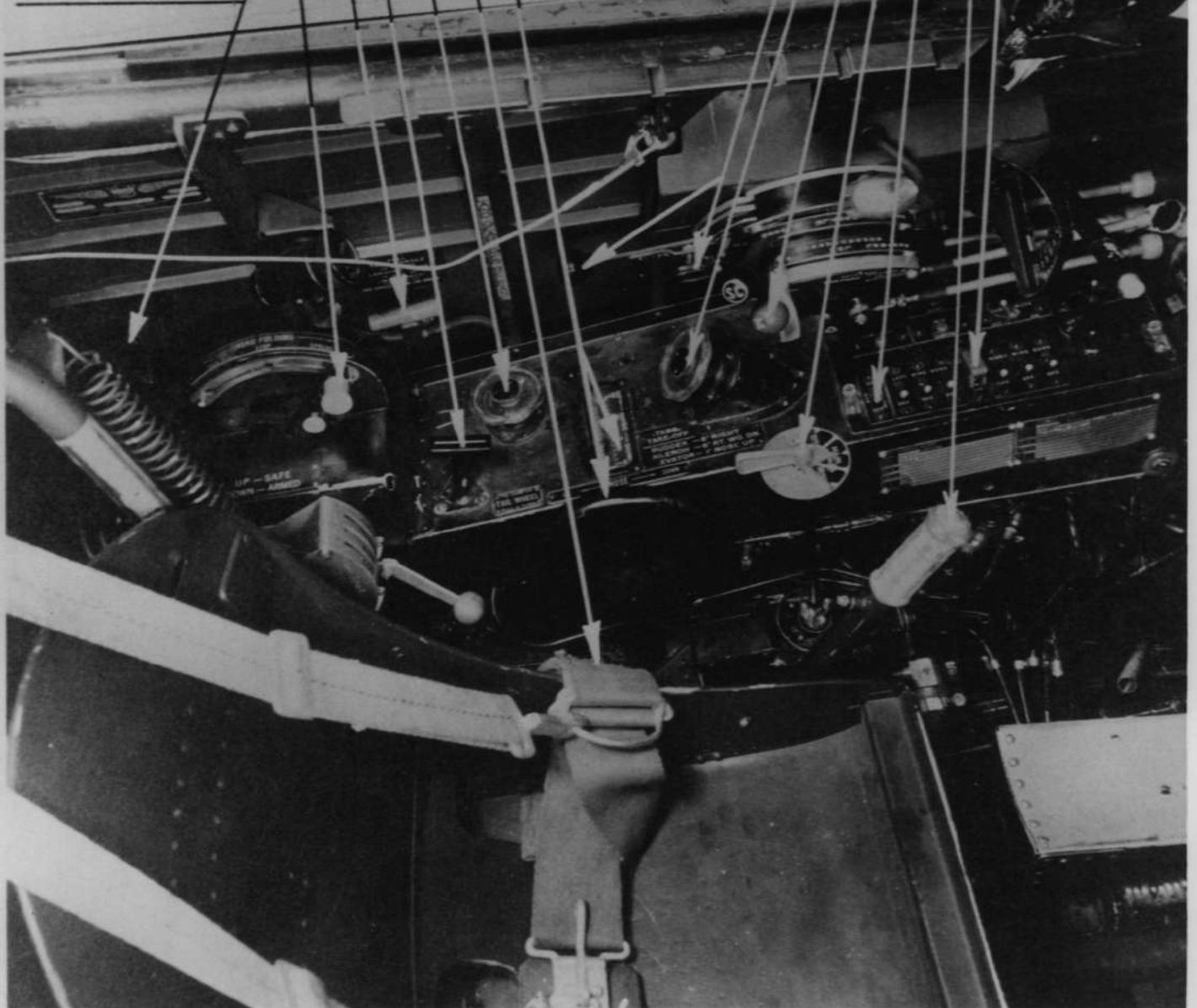
AILERON TAB CONTROL

AND INDICATOR

PROPELLER CONTROL

HANDLE AND VERNIER

ADJUSTMENT



124

GENERAL SPECIFICATIONS

WEIGHT EMPTY 3600 lbs.
 USEFUL LOAD 1920 "
 GROSS WEIGHT 5520 "
 MAXIMUM SPEED (EMPTY) 200 mph
 MAXIMUM SPEED (MILITARY LOAD) 165 mph
 CRUISING SPEED (EMPTY) 169 mph
 CRUISING SPEED (MILITARY LOAD) 130 mph
 1/4 THROTTLE, FORMATION FLIGHT
 LANDING SPEED (CARRIER, FULL FLAPS) 65/75 knts
 SERVICE CEILING 23,700 ft.
 ENDURANCE AT CRUISE 5.5 hrs. - 750 nautical mi.
 NORMAL SCOUTING MISSION 3 hrs. ENDURANCE
 RED LINE DIVE SPEED (FULL LOAD, FULL FLAPS, PROP IN HIGH PITCH) - 200 knts.
 CAPABLE OF 275 knots IN DIVE BUT NOT NORMAL PROCEDURE
 ENGINE, PRATT & WHITNEY R-1535-80, 600 H.P. (700 H.P. MAX. MILITARY POWER)

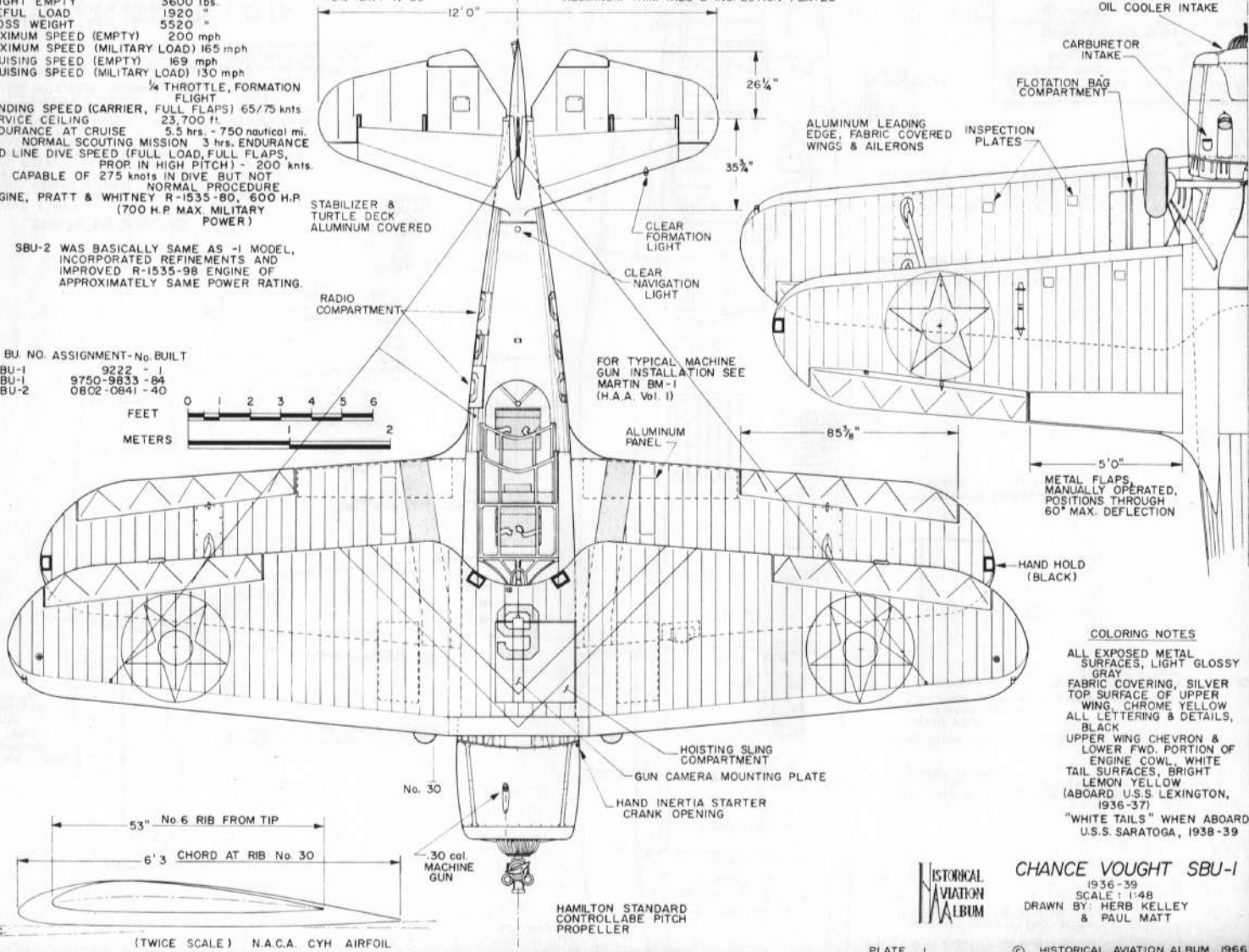
SBU-2 WAS BASICALLY SAME AS -1 MODEL, INCORPORATED REFINEMENTS AND IMPROVED R-1535-98 ENGINE OF APPROXIMATELY SAME POWER RATING.

BU. NO. ASSIGNMENT-No. BUILT
 XSBU-1 9222 - 1
 SBU-1 9750-9833 - 84
 SBU-2 0802-0841 - 40



VERTICAL TAIL AIRFOIL
75% NAVY N-69

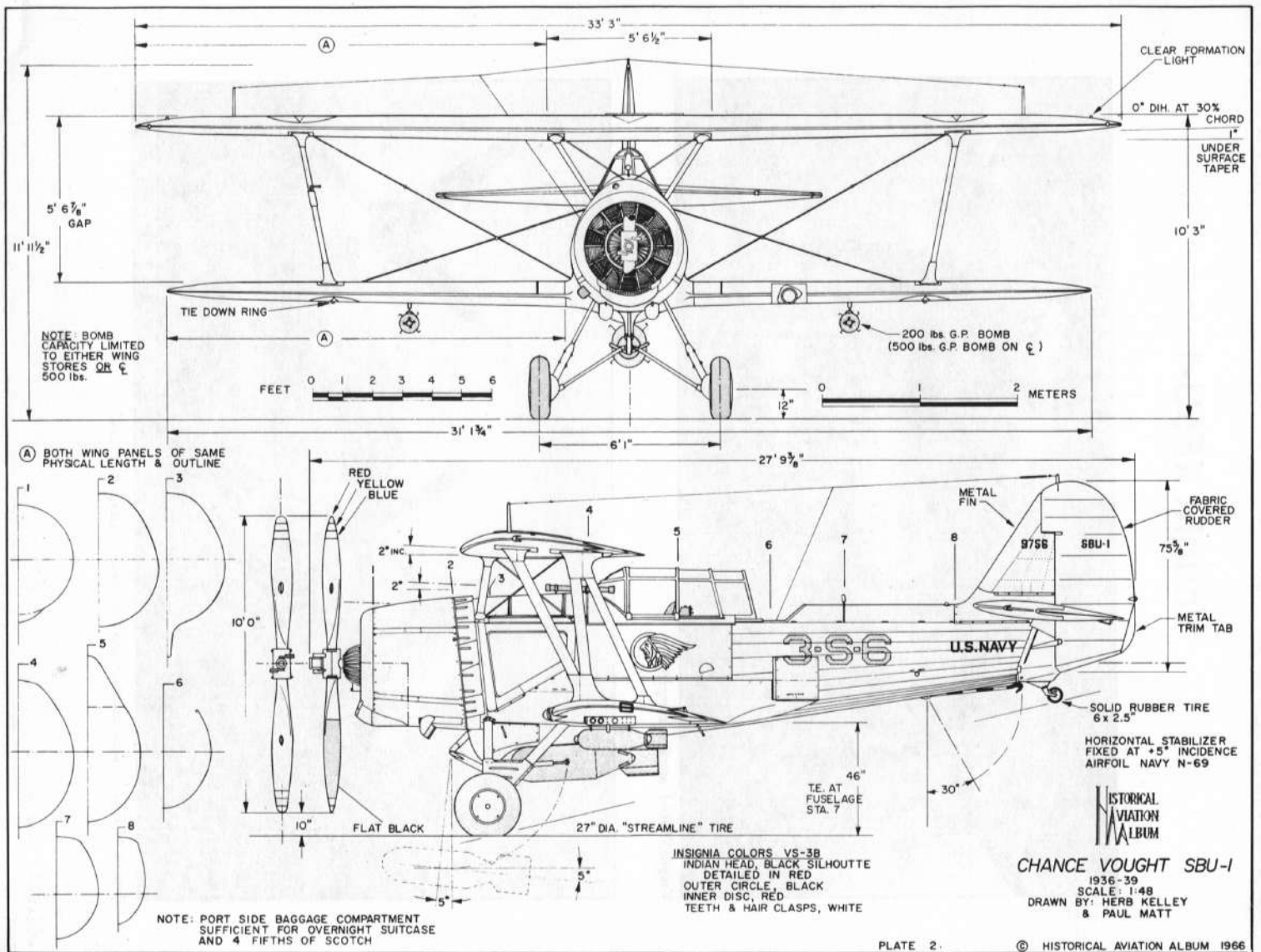
ELEVATORS FABRIC COVERED
ALUMINUM TRIM TABS & INSPECTION PLATES



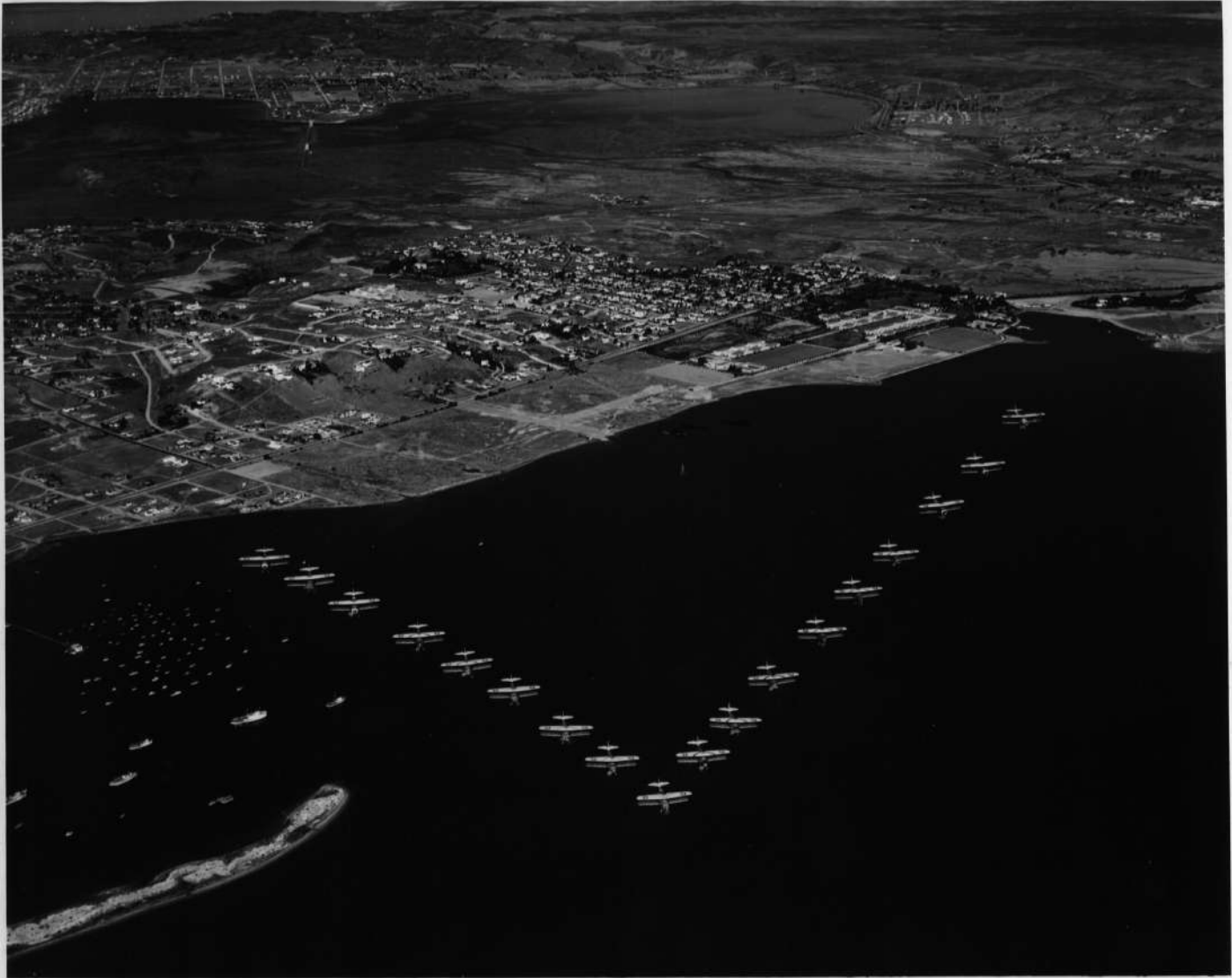
COLORING NOTES
 ALL EXPOSED METAL SURFACES, LIGHT GLOSSY GRAY
 FABRIC COVERING, SILVER
 TOP SURFACE OF UPPER WING, CHROME YELLOW
 ALL LETTERING & DETAILS, BLACK
 UPPER WING CHEVRON & LOWER FWD. PORTION OF ENGINE COWL, WHITE
 TAIL SURFACES, BRIGHT LEMON YELLOW (ABOARD U.S.S. LEXINGTON, 1936-37)
 "WHITE TAILS" WHEN ABOARD U.S.S. SARATOGA, 1938-39

HISTORICAL AVIATION ALBUM

CHANCE VOUGHT SBU-1
 1936-39
 SCALE: 1:148
 DRAWN BY: HERB KELLEY & PAUL MATT



















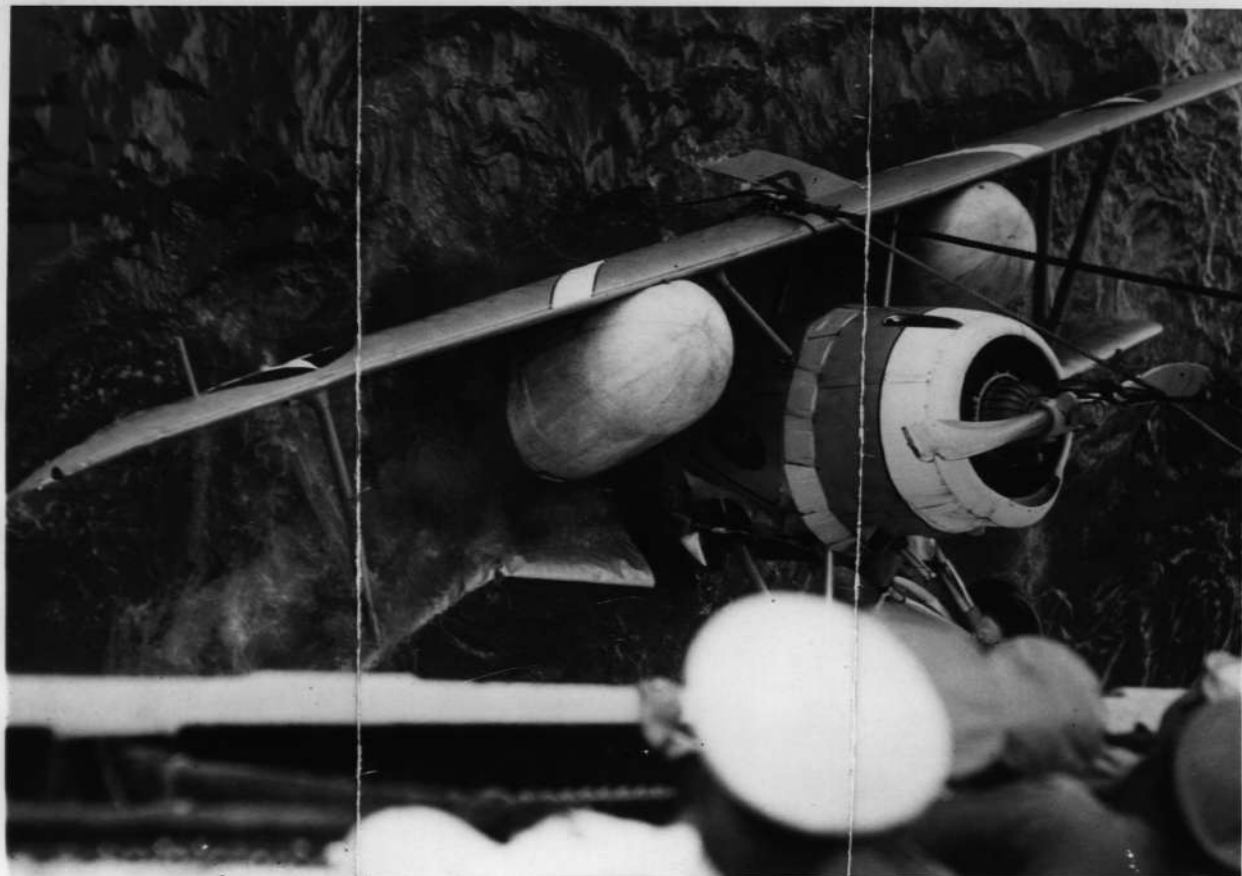








3873 SBU-1 SCOUT BOMBER FLAGPLANE-R. H. SIDE (#9815) 4-10-36





MODEL

DATE

No.

WRIGHT LICENSEE
MANUFACTURED UNDER
VOUGHT
DESIGNS & PATENTS

No.

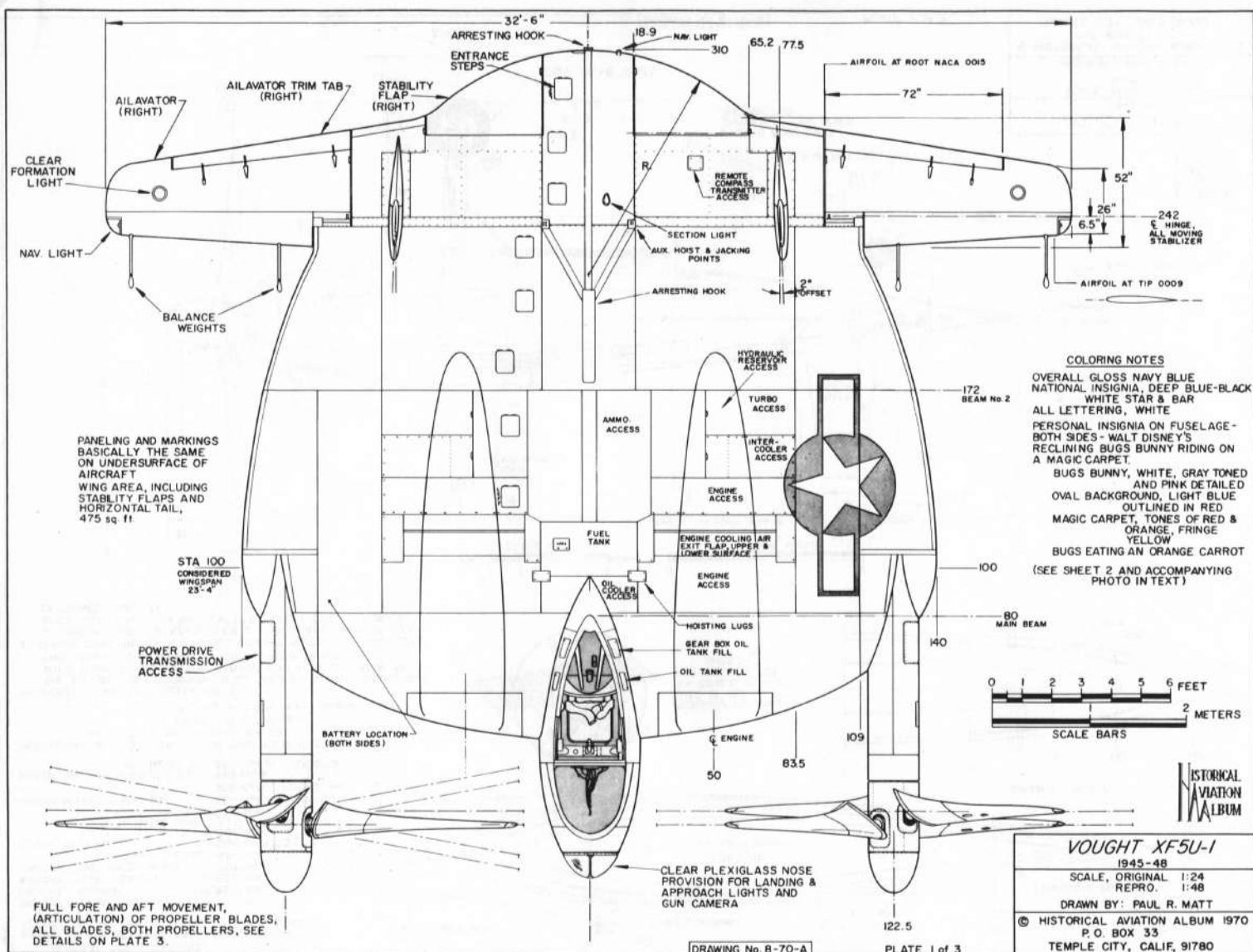
H.P.

MOTOR

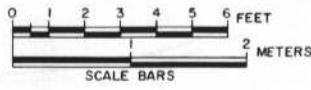
R.P.M.

LEWIS AND VOUGHT CORPORATION

LONG ISLAND CITY, NEW YORK, U.S.A.



COLORING NOTES
 OVERALL GLOSS NAVY BLUE
 NATIONAL INSIGNIA, DEEP BLUE-BLACK
 WHITE STAR & BAR
 ALL LETTERING, WHITE
 PERSONAL INSIGNIA ON FUSELAGE -
 BOTH SIDES - WALT DISNEY'S
 RECLINING BUGS BUNNY RIDING ON A
 MAGIC CARPET.
 BUGS BUNNY, WHITE, GRAY TONED
 AND PINK DETAILED
 OVAL BACKGROUND, LIGHT BLUE
 OUTLINED IN RED
 MAGIC CARPET, TONES OF RED &
 ORANGE, FRINGE
 YELLOW
 BUGS EATING AN ORANGE CARROT
 (SEE SHEET 2 AND ACCOMPANYING
 PHOTO IN TEXT)



HISTORICAL AVIATION ALBUM

VOUGHT XF5U-1
 1945-48
 SCALE, ORIGINAL 1:24
 REPRO. 1:48
 DRAWN BY: PAUL R. MATT
 © HISTORICAL AVIATION ALBUM 1970
 P.O. BOX 33
 TEMPLE CITY, CALIF. 91780

FULL FORE AND AFT MOVEMENT,
 (ARTICULATION) OF PROPELLER BLADES,
 ALL BLADES, BOTH PROPELLERS, SEE
 DETAILS ON PLATE 3.

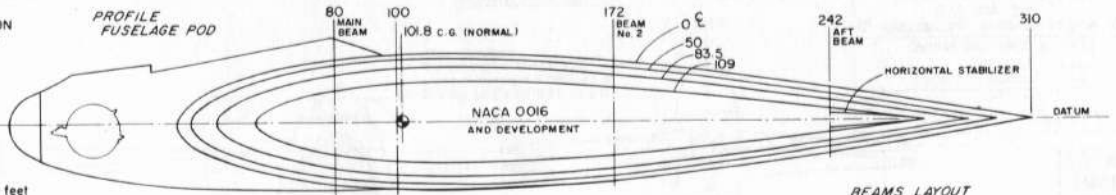
128

GENERAL SPECIFICATIONS
 BASED ON ENGINEERING AND GROUND EVALUATION
 ACTUAL FLIGHT TESTS CANCELLED BY U.S. NAVY

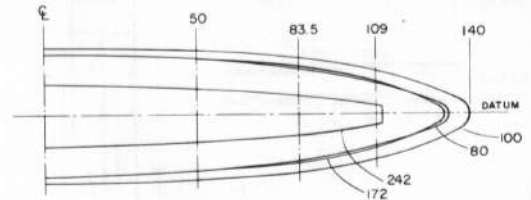
WEIGHT, BASIC (Approx.) 14,500 lbs.
 WEIGHT, NORMAL 16,500 lbs.
 WEIGHT, MAX. LOADED 18,635 lbs.
 TAKEOFF DISTANCE, NO WIND 710 feet
 CLIMB, AT 14,550 lbs. 17 KNOT HEADWIND 490 feet
 TO 3,000 ft./min S.L.
 TO 5,000 feet
 GRADUATING DOWN TO 1,000 ft./min.
 AT 12,000 feet
 MAXIMUM SPEED, CONTIOUS 388 mph at 15,000 feet
 368 mph at 20,000 feet
 RANGE, MAX. (INTERNAL FUEL) 740 miles
 AT CRUISE OF 280 mph at 10,000 feet
 PERFORMANCE BASED ON USE OF TWO P&W R-2000-7
 AIR COOLED RADIAL ENGINES OF
 1,350 h.p. at 2,700 r.p.m.
 1,100 h.p. at 2,550 r.p.m. (NORMAL)

PROPOSED ARMAMENT (NEVER FITTED)
 SIX .50 CAL. COLT BROWNING M.G.s, 400 R.P.G. INTERCHANGABLE
 WITH FOUR 20 mm CANNON AND/OR TWO 1,000 lb BOMBS OR
 TWO 125 gal. LONG RANGE EXTERNAL FUEL TANKS.
 EXTERIOR CONSTRUCTION - CHANCE VOUGHT DEVELOPED METALITE
 ALUMINUM SHEETS BONDED OVER A CORE (SANDWICH) OF BALS
 WOOD. CONSTRUCTION WAS EXCEPTIONALLY STRONG, FINISH
 EXTREMELY SMOOTH.

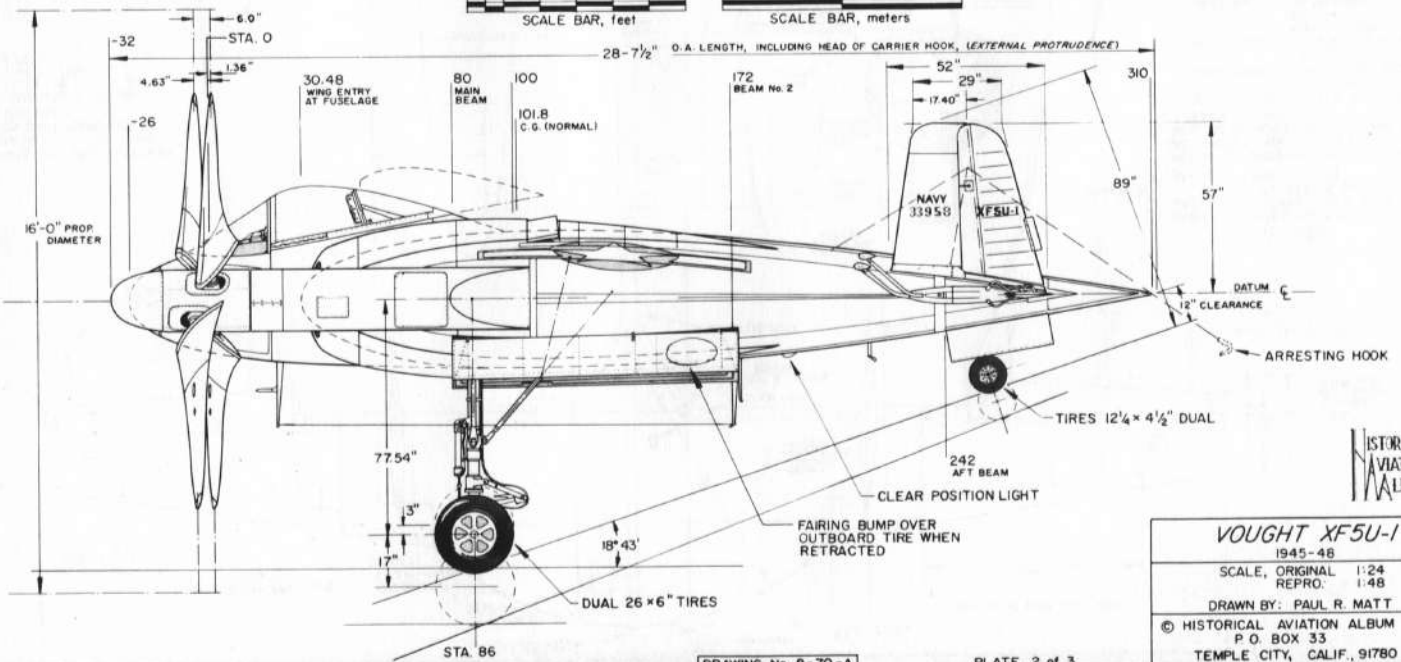
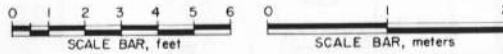
PROFILE
 FUSELAGE POD



BEAMS LAYOUT



PERSONA INSIGNIA
 DISC 18" DIA.
 3x SCALE APPROX.
 FOR DETAILS SEE
 SHEET-1.



HISTORICAL
 AVIATION
 ALBUM

VOUGHT XF5U-1

1945-48

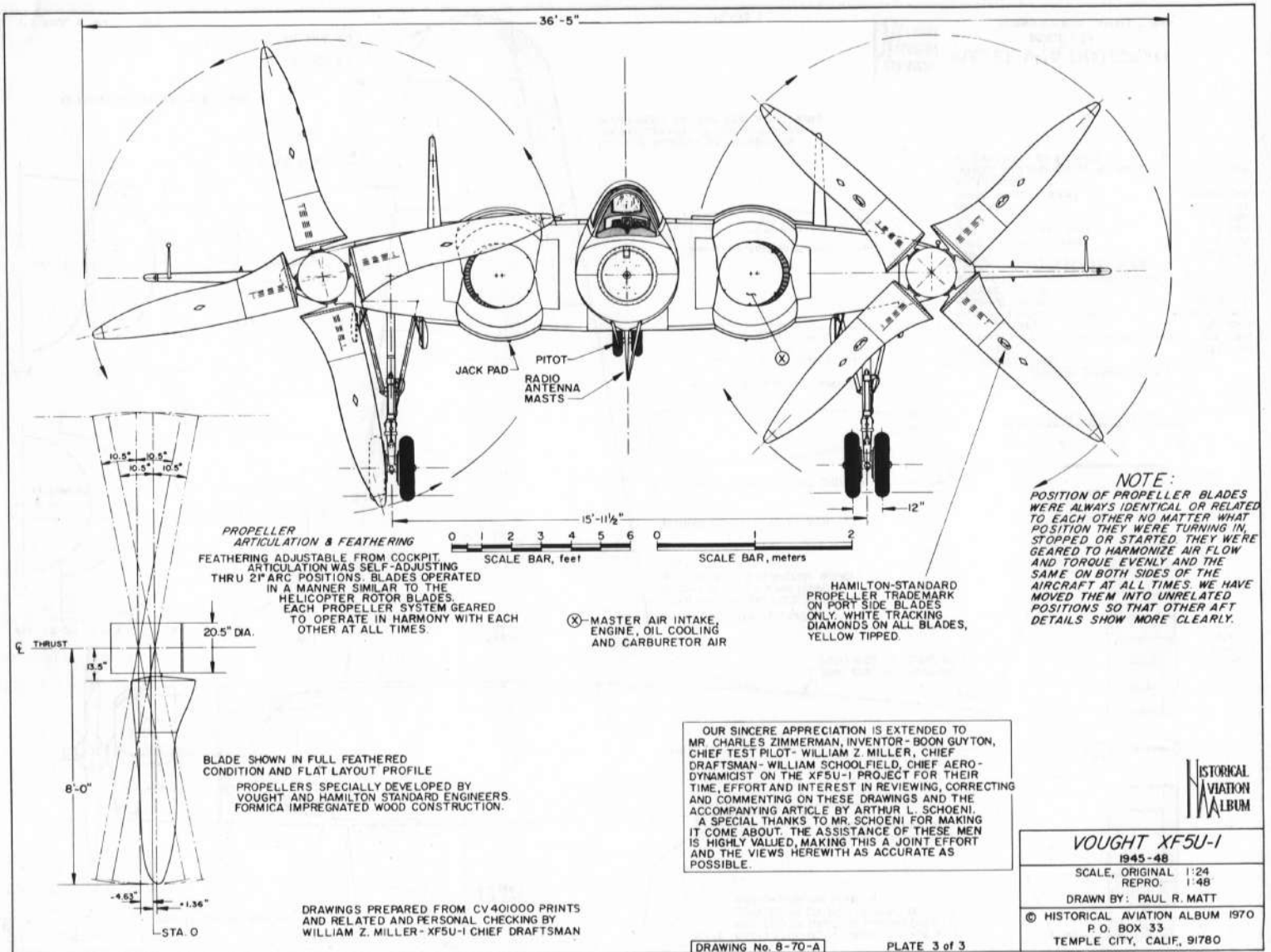
SCALE, ORIGINAL 1:24
 REPRO. 1:48

DRAWN BY: PAUL R. MATT

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 TEMPLE CITY, CALIF., 91780

DRAWING No. 8-70-A

PLATE 2 of 3







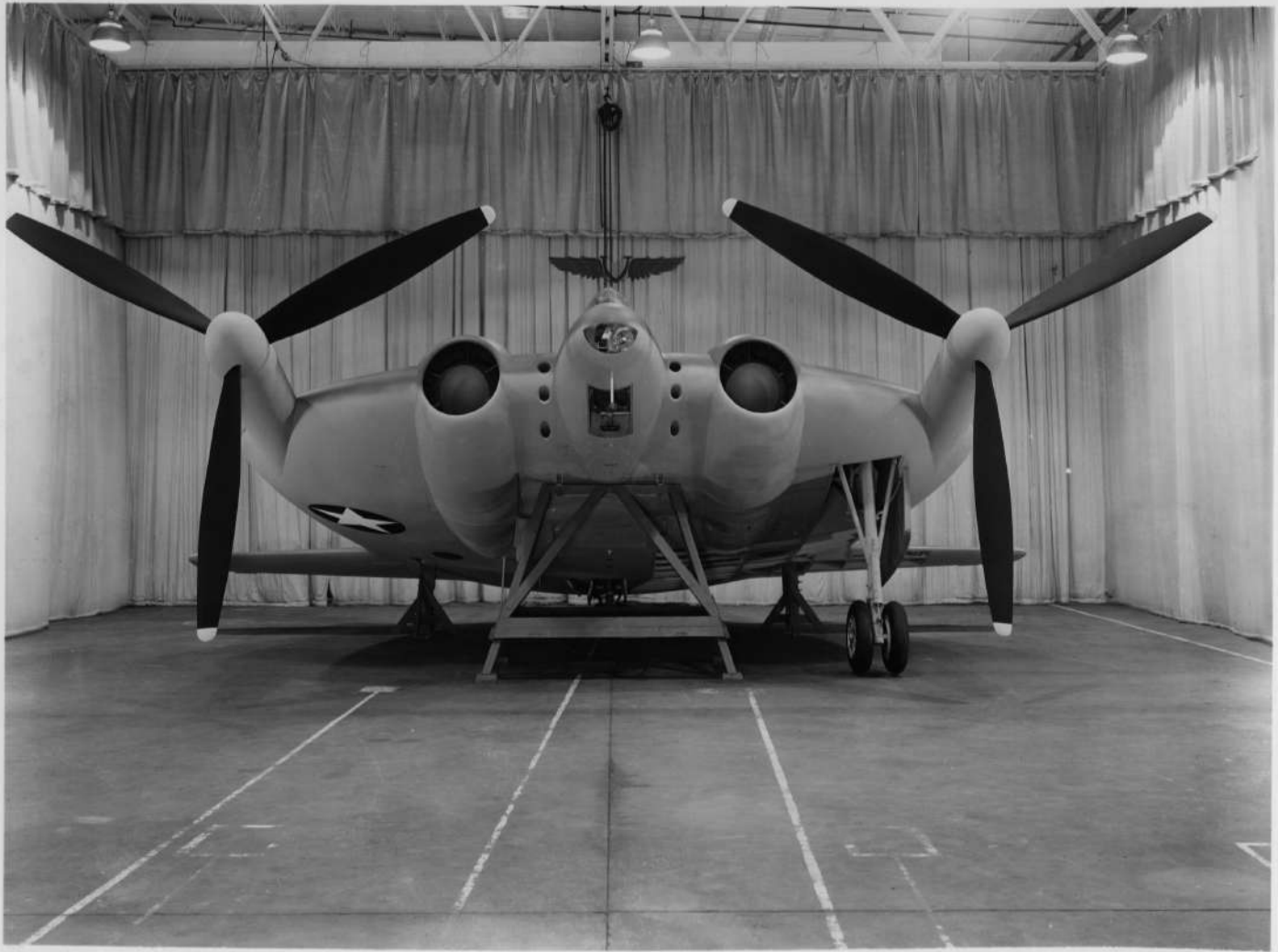
CV-9144 XF5U-1 MOCK UP COMPLETED

6-8-43



CV-9146 XF5U-1 MOCK UP COMPLETED

6-8-43



CV-9143 XF5U-1 MOCK UP COMPLETED

6-8-43



CV 18792 V-173

WHEEL FAIRING INSTALLED 3/4 VIEW-LOOKING
FROM RIGHT AND AFT.

2/26/45



CV-21650 XF5U-1 BU. #33958 - 1ST FLIGHT MODEL
3/4 FRONT VIEW WITH AIRPLANE IN
STATIC 3 POINT POSITION - PRIOR
TO INITIAL ENGINE GROUND RUN -
(STD. HYDROMATIC (F4U-4) PROPS)
8/20/45



CV-21649 XF5U-1 BU. #33958 - 1ST FLIGHT MODEL
3/4 REAR VIEW WITH AIRPLANE IN
STATIC 3 POINT POSITION - PRIOR
TO INITIAL ENGINE GROUND RUN -
(STD. HYDROMATIC (F4U-4) PROPS)
8/20/45



CV-27064 XFSU-1 THREE QUARTER LEFT FRONT VIEW OF MODEL FLYING
AIRPLANE UNDER GROUND RUN CONDITIONS. 8/21/47

note different props.



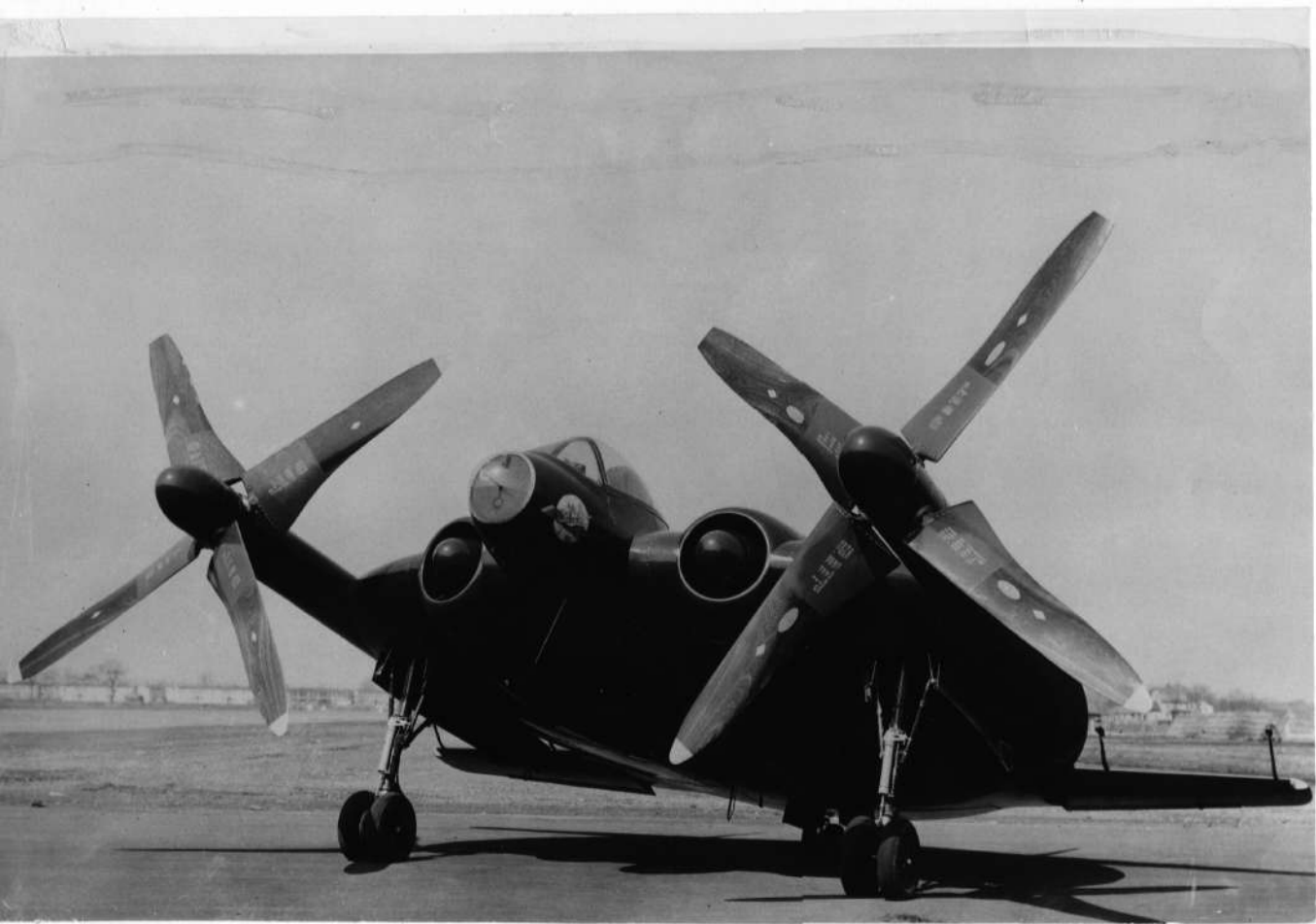
CV-27066 XFSU-1 REAR VIEW OF MODEL FLYING AIRPLANE UNDER
GROUND RUN CONDITIONS. 8/21/47



CV-27069 XFSU-1 THREE QUARTER RIGHT REAR VIEW OF MODEL FLYING
AIRPLANE UNDER GROUND RUN CONDITIONS. 8/21/47



CV 28623 XF5U-1 SIDE VIEW 3/17/48





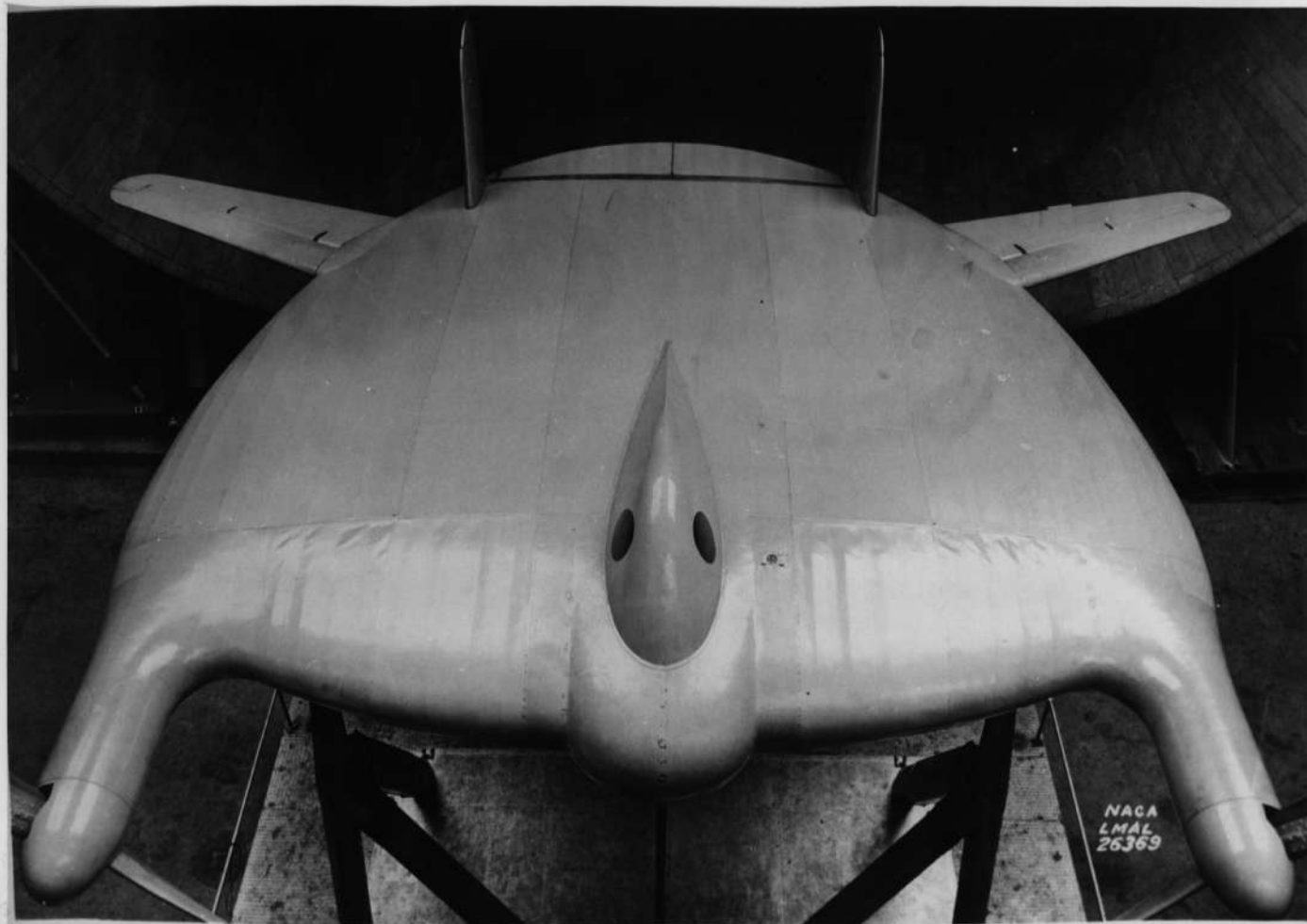


Figure 3.- Top view of the Vought-Sikorsky V-173 airplane mounted in the full-scale wind tunnel.

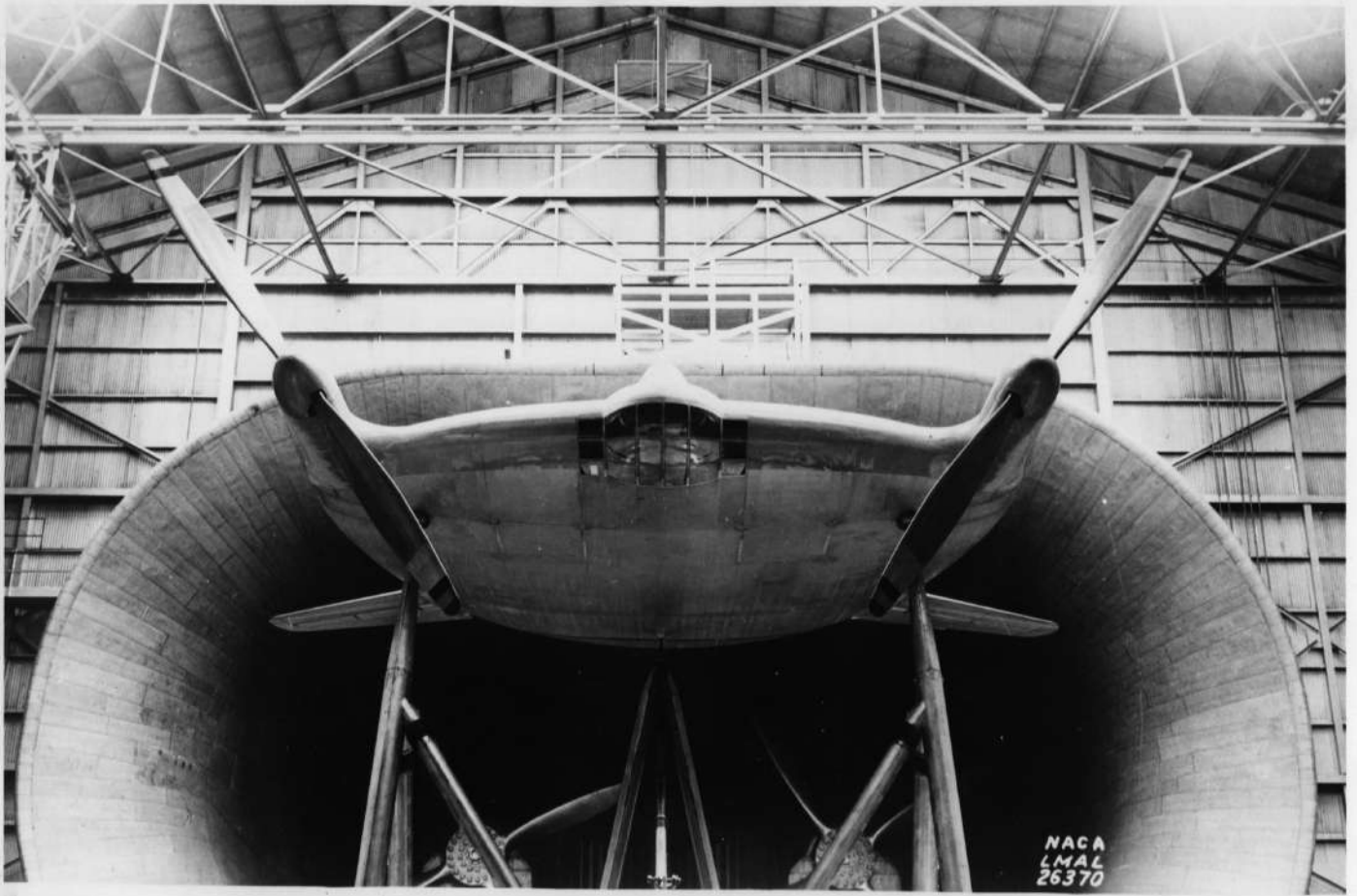


Figure 4.- Front view of the Vought-Sikorsky V-173 airplane mounted in the full-scale wind tunnel.

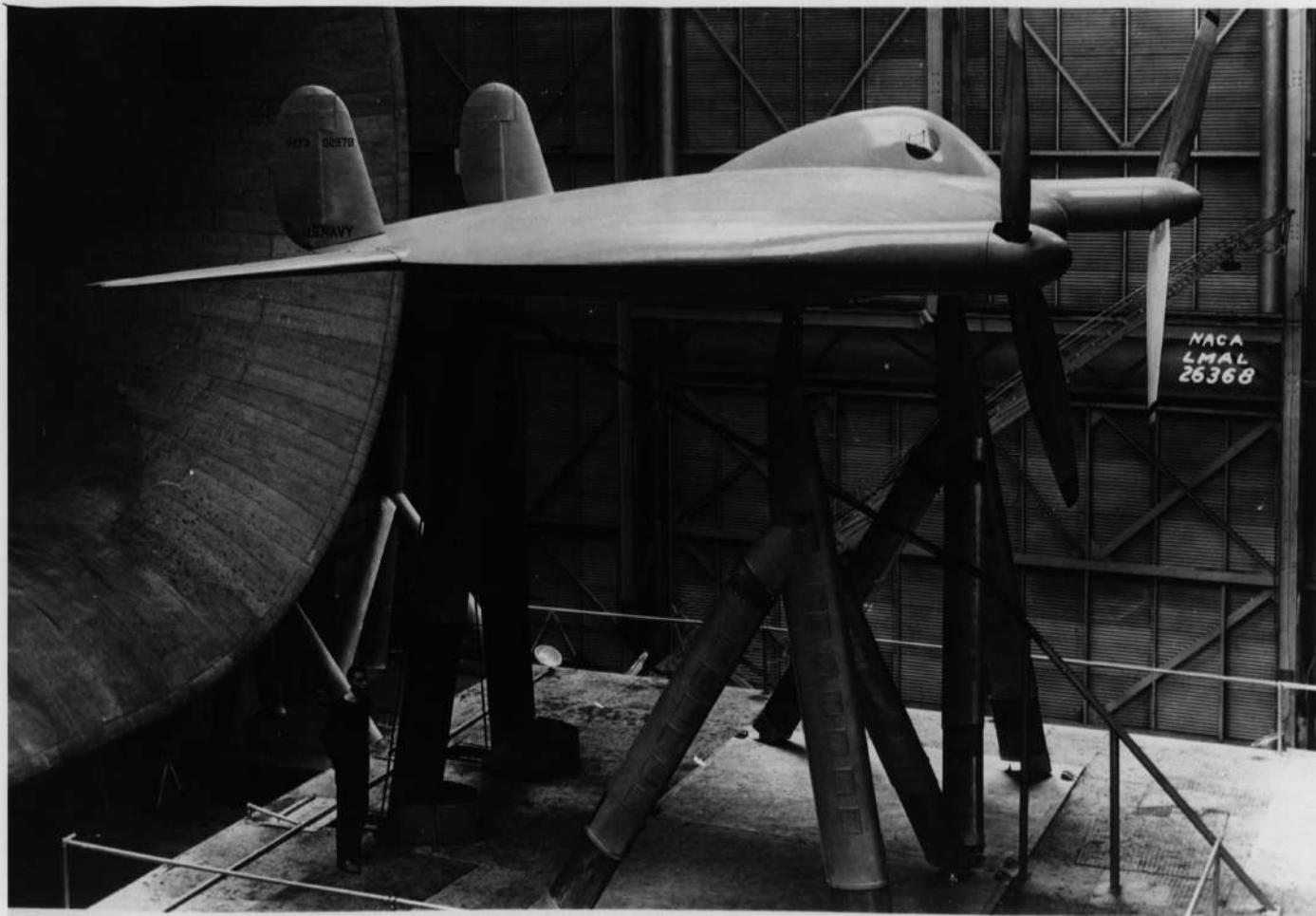
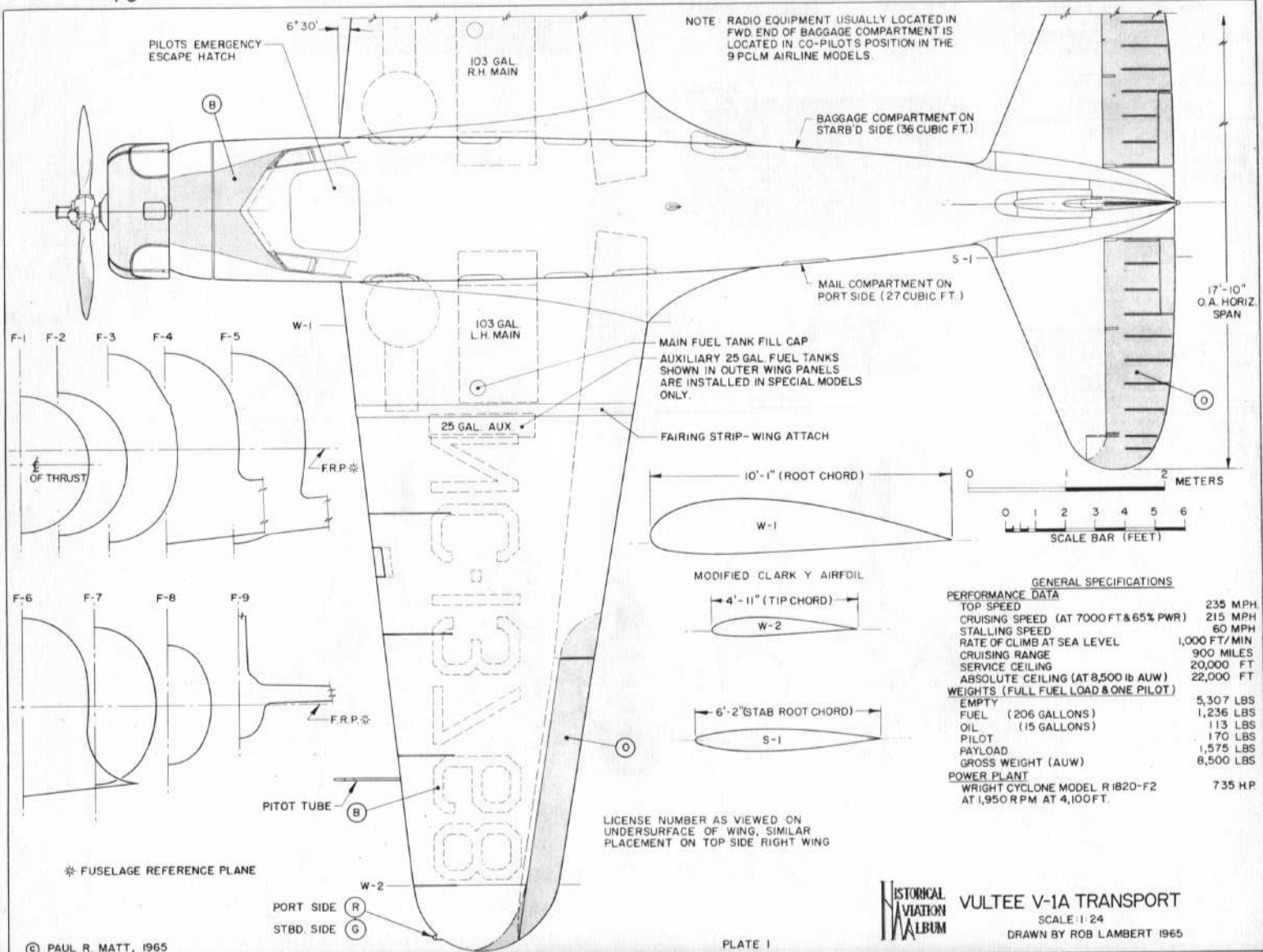
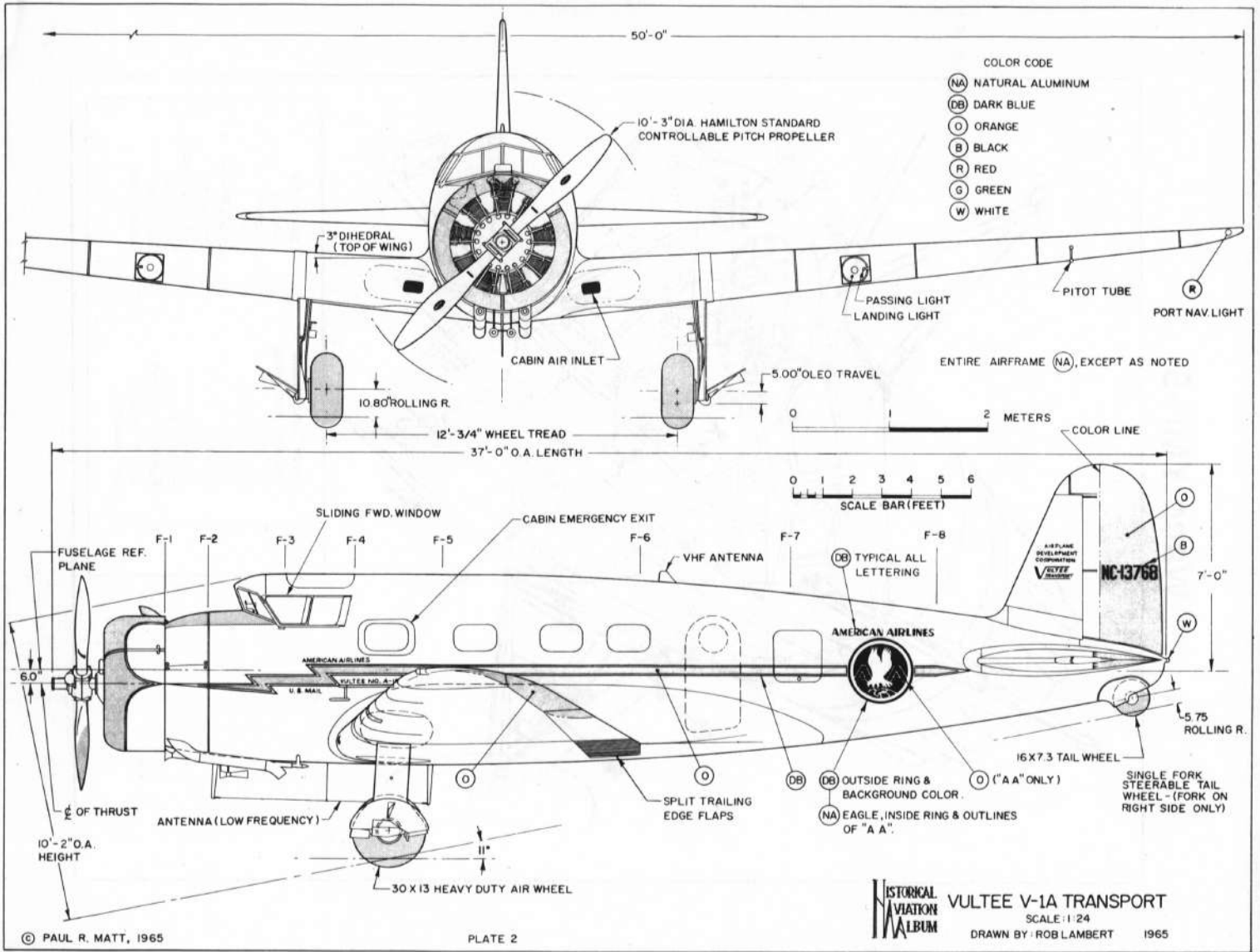


Figure 2.- Three-quarter front view of the Vought-Sikorsky V-173 airplane mounted in the full-scale wind tunnel.



GENERAL SPECIFICATIONS

PERFORMANCE DATA	
TOP SPEED	235 MPH
CRUISING SPEED (AT 7000 FT & 65% PWR)	215 MPH
STALLING SPEED	60 MPH
RATE OF CLIMB AT SEA LEVEL	1,000 FT/MIN
CRUISING RANGE	900 MILES
SERVICE CEILING	20,000 FT
ABSOLUTE CEILING (AT 8,500 lb A/W)	22,000 FT
WEIGHTS (FULL FUEL LOAD & ONE PILOT)	
EMPTY	5,307 LBS
FUEL (206 GALLONS)	1,236 LBS
OIL (15 GALLONS)	113 LBS
PILOT	170 LBS
PAYLOAD	1,575 LBS
GROSS WEIGHT (A/W)	8,500 LBS
POWER PLANT	
WRIGHT CYCLONE MODEL R 1820-F2	735 H.P.
AT 1,950 RPM AT 4,100 FT.	











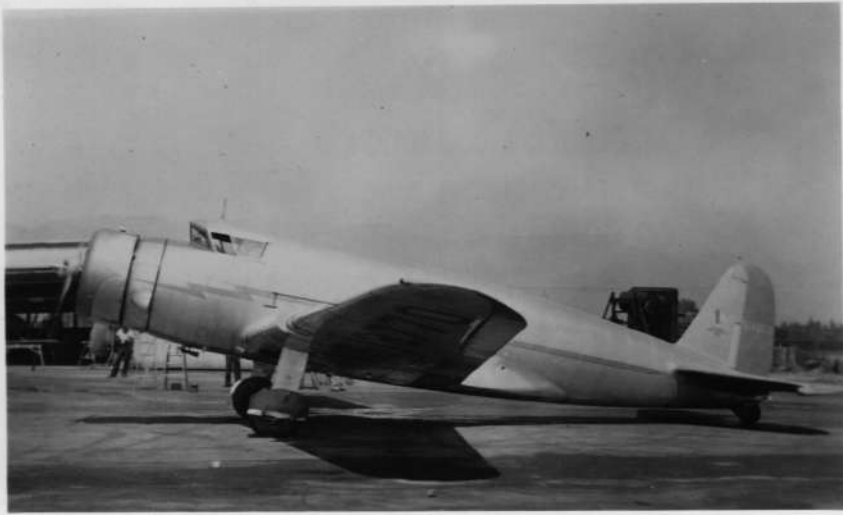












GENERAL SPECIFICATIONS

	MODEL UMF	MODEL YMF
WEIGHT EMPTY	1485 lbs.	1540 lbs.
USEFULL LOAD	1015 lbs.	960 lbs.
GROSS WEIGHT	2500 lbs.	2500 lbs.
TOP SPEED	143 mph	147 mph
CRUISING SPEED	128 mph	129 mph
LANDING SPEED	47 mph	47 mph
RATE OF CLIMB, INITIAL	1100 ft/min	1250 ft/min
FUEL CAPACITY	50 gals.	50 gals.
OIL CAPACITY	5 gals.	5 gals.
CRUISING RANGE	450 miles	430 miles
SERVICE CEILING	14,500 ft.	16,000 ft.
WING AREA	233.5 sq ft.	233.5 sq ft.
WING LOADING	10.7 lbs./sq ft.	10.7 lbs./sq ft.
POWER LOADING	11.9 lbs./h.p.	11.1 lbs./h.p.

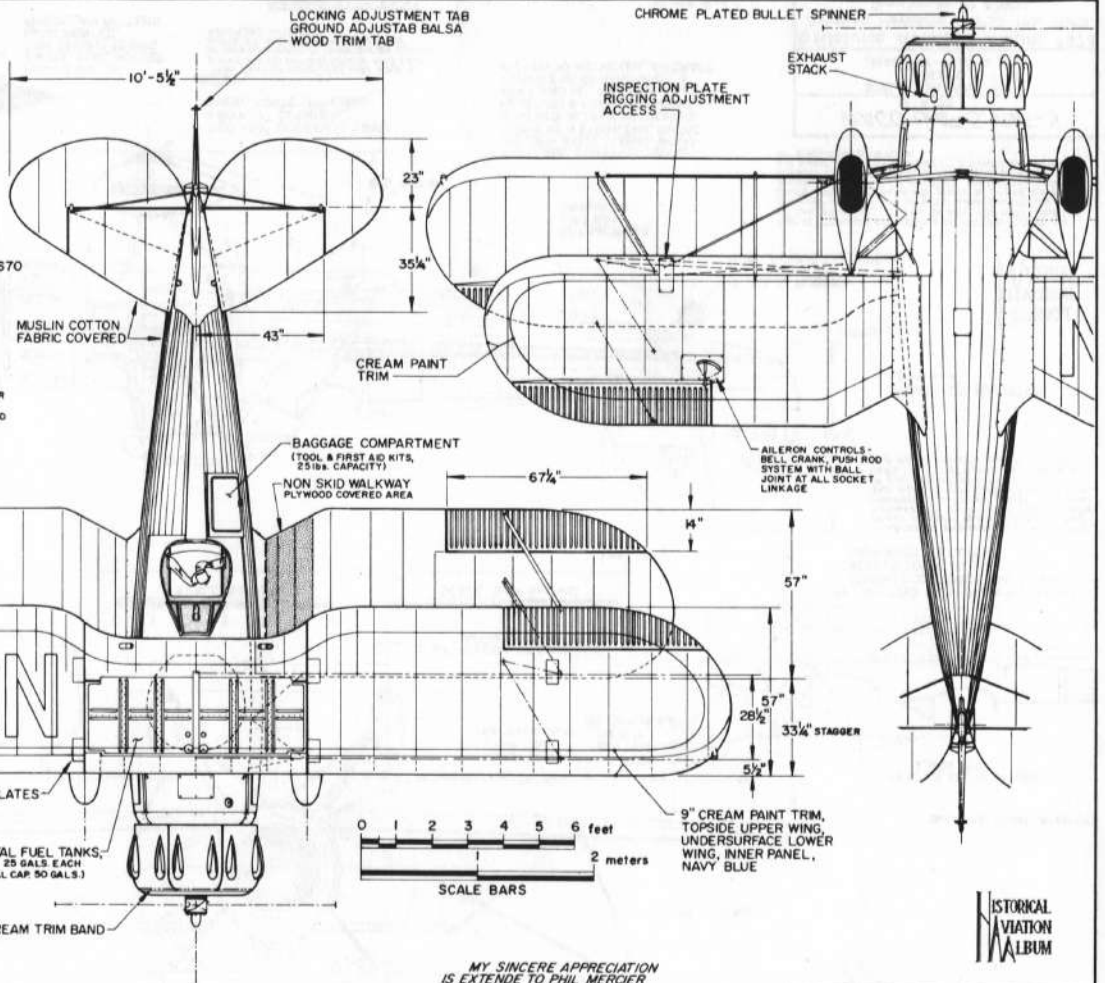
POWER: UMF-3/5 7 Cylinder 210 HP CONTINENTAL W-670
 YMF-3/5 7 Cylinder 225 H.P. JACOBS L-4

COLORING NOTES

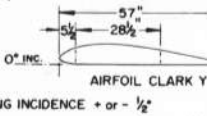
AIRCRAFT PORTRAYED, NC 14031 c/n 3944
 ORIGINAL OWNER, STEPHEN J. PATTERSON
 ENTIRE AIRCRAFT - NAVY BLUE
 TRIM - CREAM

FUSELAGE AND WHEEL PANTS STRIPING, PIN STRIPE ON
 ENGINE COWL & DECOR ON FAIRING BUMPS, WING & RUDDER
 LICENSE, PERSONALIZED EMBLEMS & NAMEPLATE,
 9" EDGING AROUND TOPSIDE OF UPPER WING PANELS AND
 UNDERSURFACE OF LOWER WINGS.
 EXTERIOR FINISH - BLUE LEATHER

STANDARD WACO AILERON
 STAMPED ALUMINUM,
 34 STIFFENERS



15" x 28" CREAM LICENSE
 BLACK OUTLINE,
 4" STROKE



WING CONSTRUCTION, SPRUCE SPARS WITH
 SPRUCE & MAHOGANY RIBS - ALUMINUM SHEET
 LEADING EDGES, LINEN COVERED.

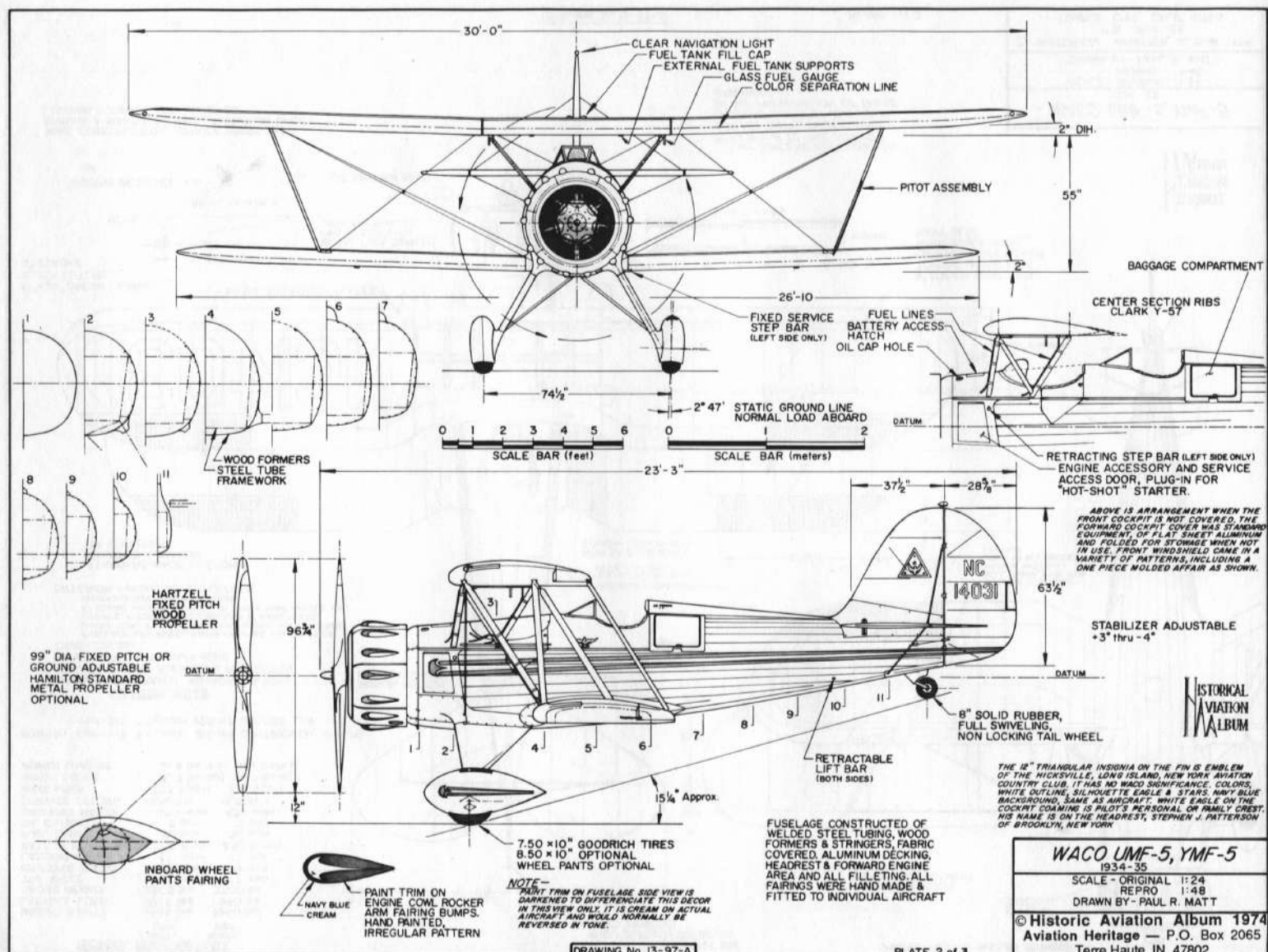
MY SINCERE APPRECIATION
 IS EXTENDED TO PHIL MERCIER
 FOR HIS ENTHUSIASTIC AND
 UNTRING INTEREST AND HELP
 IN THE PREPARATION OF THESE
 DRAWINGS

HISTORICAL
 AVIATION
 ALBUM

WACO UMF-5, YMF-5
 1934 - 35

SCALE - ORIGINAL 1:24
 REPRO. 1:48
 DRAWN BY - PAUL R. MATT

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 P.O. BOX 33
 TEMPLE CITY, CALIF. 91780

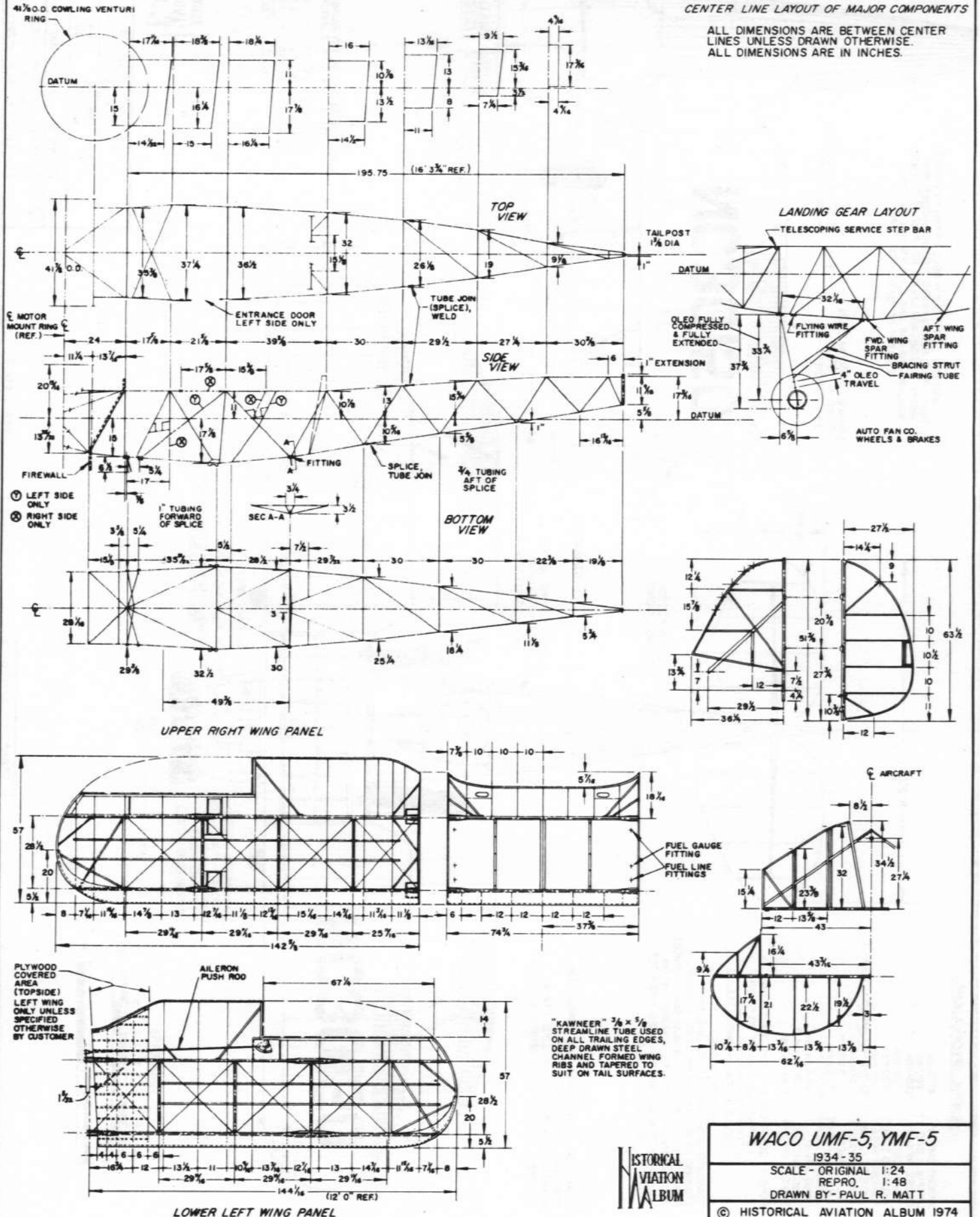


HISTORICAL
AVIATION
ALBUM

WACO UMF-5, YMF-5
1934-35
SCALE - ORIGINAL 1:24
REPRO 1:48
DRAWN BY - PAUL R. MATT
© Historic Aviation Album 1974
Aviation Heritage - P.O. Box 2065
Terre Haute, IN 47802

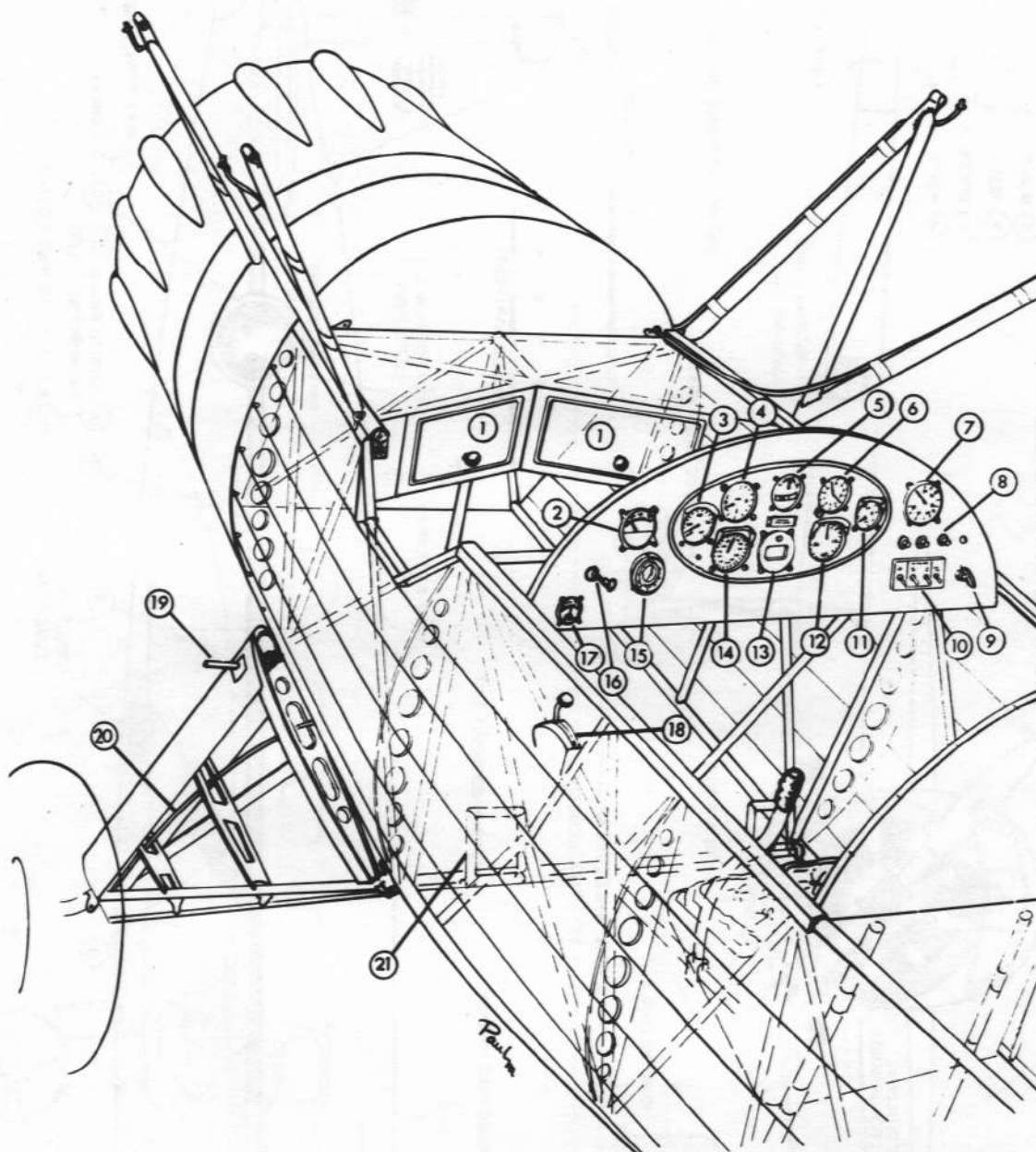
CENTER LINE LAYOUT OF MAJOR COMPONENTS

ALL DIMENSIONS ARE BETWEEN CENTER LINES UNLESS DRAWN OTHERWISE.
ALL DIMENSIONS ARE IN INCHES.



WACO UMF-5, YMF-5	
1934-35	
SCALE - ORIGINAL 1:24	
REPRO. 1:48	
DRAWN BY - PAUL R. MATT	
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TEMPLE CITY, CALIF. 91780	

Waco YMF-5



- | | | | |
|----|---------------------|----|---------------------------------|
| 1 | Glove Compartment | 12 | Tachometer |
| 2 | Cylinder Head Temp. | 13 | Compass |
| 3 | Oil Temp. | 14 | Airspeed |
| 4 | Climb Indicator | 15 | Clock |
| 5 | Turn & Bank | 16 | Engine Primer |
| 6 | Altimeter | 17 | Throttle and
Mixture Control |
| 7 | Manifold Pressure | 18 | Service Step |
| 8 | Electrical Fuses | 19 | Brake Line |
| 9 | Parking Brake Lock | 20 | Rudder Pedal |
| 10 | Ignition Switches | | |
| 11 | Oil Pressure | | |

WACO AIRCRAFT COMPANY, TROY, OHIO

UMF and YMF Wacos				
Serial	Registra.	Model	Date of Mfg.	Original Purchaser
3835	NC13894	UMF-3	1- 1-34	Alice F. DuPont Wilmington, Delaware
3836	NC14041	UMF-3	5-14-34	Waco Sales of New York, Inc., Mineola, L.I. NY
3936	NC13571	UMF-3	6- 6-34	Waco Sales of New York, Inc., Mineola, L.I. NY
3937		UMF-3	5-29-34	Govt. of Guatemala, Guatemala City, Guatemala
3938		UMF-3	5-23-34	" " " " "
3939		UMF-3	5-23-34	" " " " "
3940		UMF-3	5-23-34	" " " " "
3941	NC14076	UMF-3	7-18-34	Tex LaGrone, Municipal Airport, Kansas City, Mo.
3942	NC14044	UMF-3	5-31-34	Waco Sales of New York, Inc., Mineola, L.I. NY
3943	NC14005	UMF-3	6- 4-34	Sent to Brazil as Factory Demonstrator.
3944	NC14031	YMF-3	6-21-34	Waco Sales of New York, Inc., Mineola, L.I. NY
3945	NC14069	YMF-3	7-10-34	Waco Sales of New York, Inc., Mineola, L.I. NY
3956	NC14085	UMF-5	10-26-34	Moss Patterson Oklahoma City, Oklahoma
3957	NC14132	YMF-5	1-14-35	Waco Sales of New York, Inc., Mineola, L.I. NY
3958	NC14603	UMF-5	5- 1-35	Culver Aircraft, Inc., Dallas, Texas
3959	NC14627	UMF-5	7- 3-35	Culver Aircraft, Inc., Dallas, Texas
3960	NC15241	YMF-5	10- 1-35	Waco Sales of New York, Inc., Mineola, L.I. NY
3961	NC14051	YMF-5	6-12-34	Waco Sales of New York, Inc., Mineola, L.I. NY
3962	NC86Y	YMF-5	6-26-34	Waco Sales of New York, Inc., Mineola, L.I. NY
3963	NC14067	YMF-5	7- 2-34	Northern Calif. Waco Dist., San Francisco, Ca.
3964	NC14074	YMF-5	7-10-34	Waco Sales of New York, Inc., Mineola, L.I. NY
3965	NC14063	YMF-5	6-25-34	Alice F. DuPont Wilmington, Delaware
4206	NC14070	YMF-5	7-24-34	Waco Sales of New York, Inc., Mineola, L.I. NY
4207	NC14075	YMF-5	7-13-34	Waco Sales of New York, Inc., Mineola, L.I. NY
4208	NC14138	YMF-5	9-19-34	Waco Sales of New York, Inc., Mineola, L.I. NY
4209	NC14080	YMF-5	7-30-34	Wings Corp. of Phila., Blue Bell, Penna.
4210	NC14082	YMF-5	8- 4-34	Waco Sales of New York, Inc., Mineola, L.I. NY
4211	NC14134	YMF-5	12-12-34	Carpenter Paper Co. of Calif., Los Angeles, Ca.
4212	NC14056	YMF-5	11-20-34	Buffalo Aeronautical Corp. Buffalo, NY
4213	NC14128	YMF-5	12-21-34	Edward F. Booth, Inc. Dallas, Texas
4214	NC14607	YMF-5	3-15-35	Wings Corp. of Phila. Ambler, Penna.
4215	NC14687	UMF-5	7-24-35	Waco Sales of New York, Inc., Mineola, L.I., NY
4548		UMF-3	9-25-37	Jose Martinez, Cuban Govt., Havana, Cuba
4663		UMF-3	9-20-37	" " " " " "
4664		UMF-3	9-21-37	" " " " " "







4041































GENERAL SPECIFICATIONS

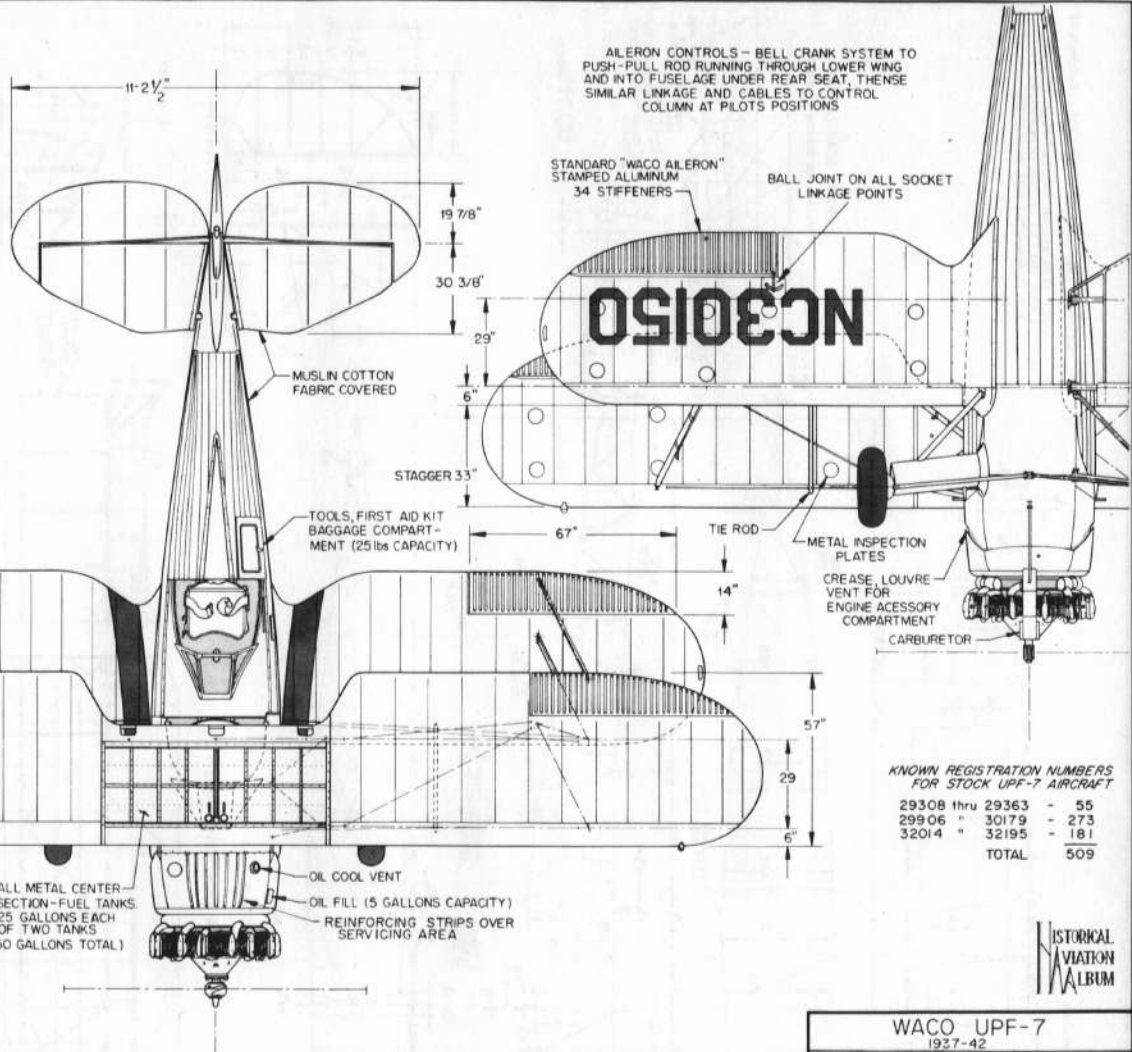
WEIGHT EMPTY 1970 lbs
 USEFUL LOAD 790 lbs
 GROSS WEIGHT 2650 lbs
 TOP SPEED 138 mph
 CRUISING SPEED 120 mph
 LANDING SPEED 48 mph
 RATE OF CLIMB 1000 ft/min, initial, S.L. 800
 FUEL CAPACITY 50 gallons
 OIL CAPACITY 5 gallons
 CRUISING RANGE 520 miles
 SERVICE CEILING 16,000 feet
 WING AREA 244 sq. feet
 WING LOADING 11.81 lbs/sq. ft
 POWER LOADING 11.81 lbs/hp

POWER - CONTINENTAL W 670 - 6A, 220 HP
 225 H.P. MAXIMUM AT 2075 RPM
 COMPRESSION RATIO 5.4:1
 210 H.P. AT CRUISE AND ALTITUDE

COLORING NOTES

STANDARD ARMY AIR CORPS, CIVILIAN PILOT TRAINING PROGRAM AND MILITARY VERSIONS ROYAL BLUE FUSELAGE, VERTICAL TAIL SURFACES AND LANDING GEAR STRUTS, CHROME YELLOW WINGS, HORIZONTAL TAIL SURFACES AND INTER-PLANE STRUTS - DETAILS BLACK

WINGS ARE SPRUCE SPAR WITH SPRUCE AND MAHOGANY RIB CONSTRUCTION, ALUMINUM FORMED LEADING EDGE, LINEN COVERED, TITANINE DOPED BERRYLOID COLORS



KNOWN REGISTRATION NUMBERS FOR STOCK UPF-7 AIRCRAFT

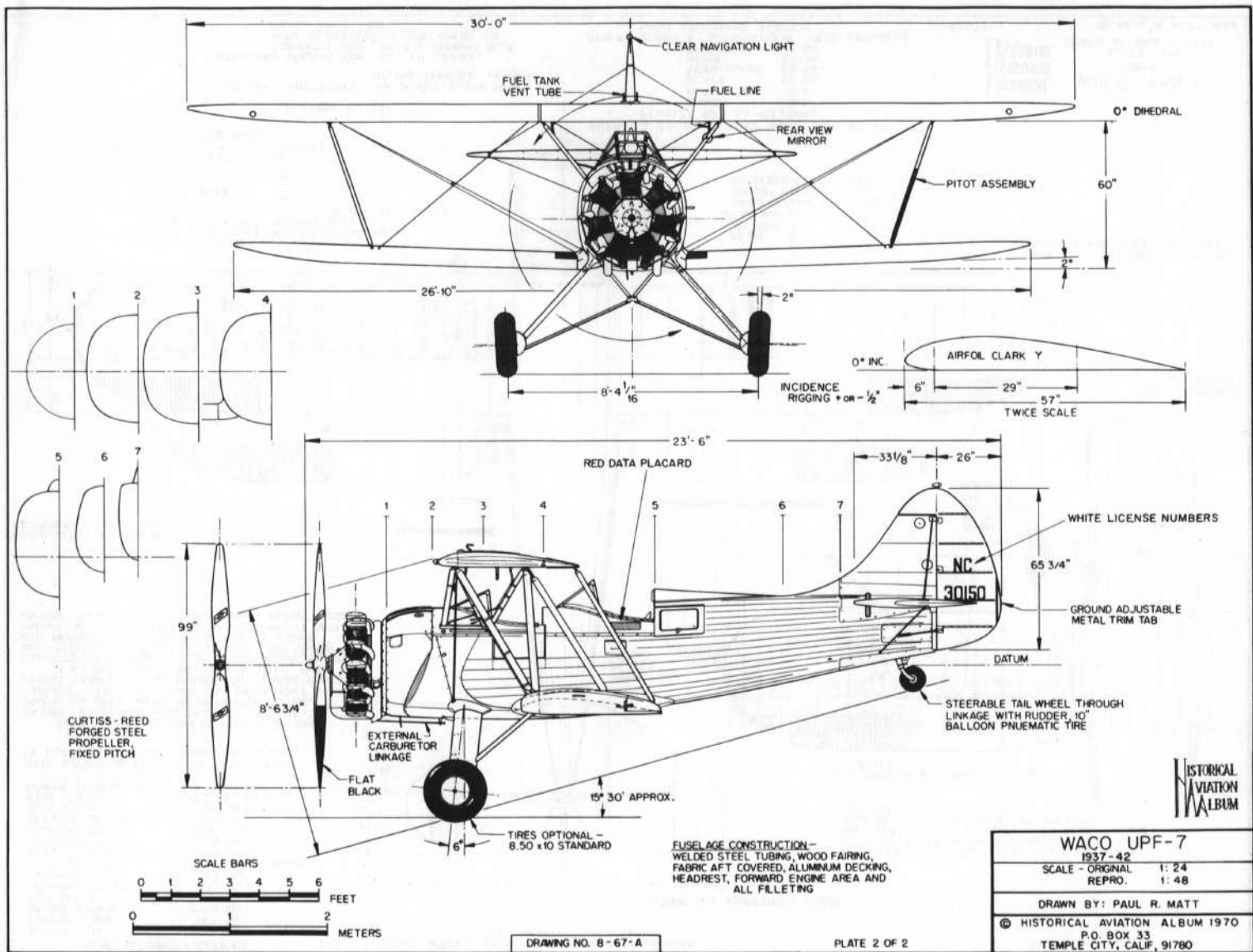
29308 thru 29363	- 55
29906 "	30179 - 273
32014 "	32195 - 181
TOTAL	509

HISTORICAL AVIATION ALBUM

WACO UPF-7	
1927-42	
SCALE - ORIGINAL	1:24
REPRO	1:48
DRAWN BY: PAUL R. MATT	
© HISTORICAL AVIATION ALBUM 1970	
P O BOX 33	
TEMPLE CITY, CALIF. 91780	

DRAWING NO. 8-67-A

PLATE 1 OF 2

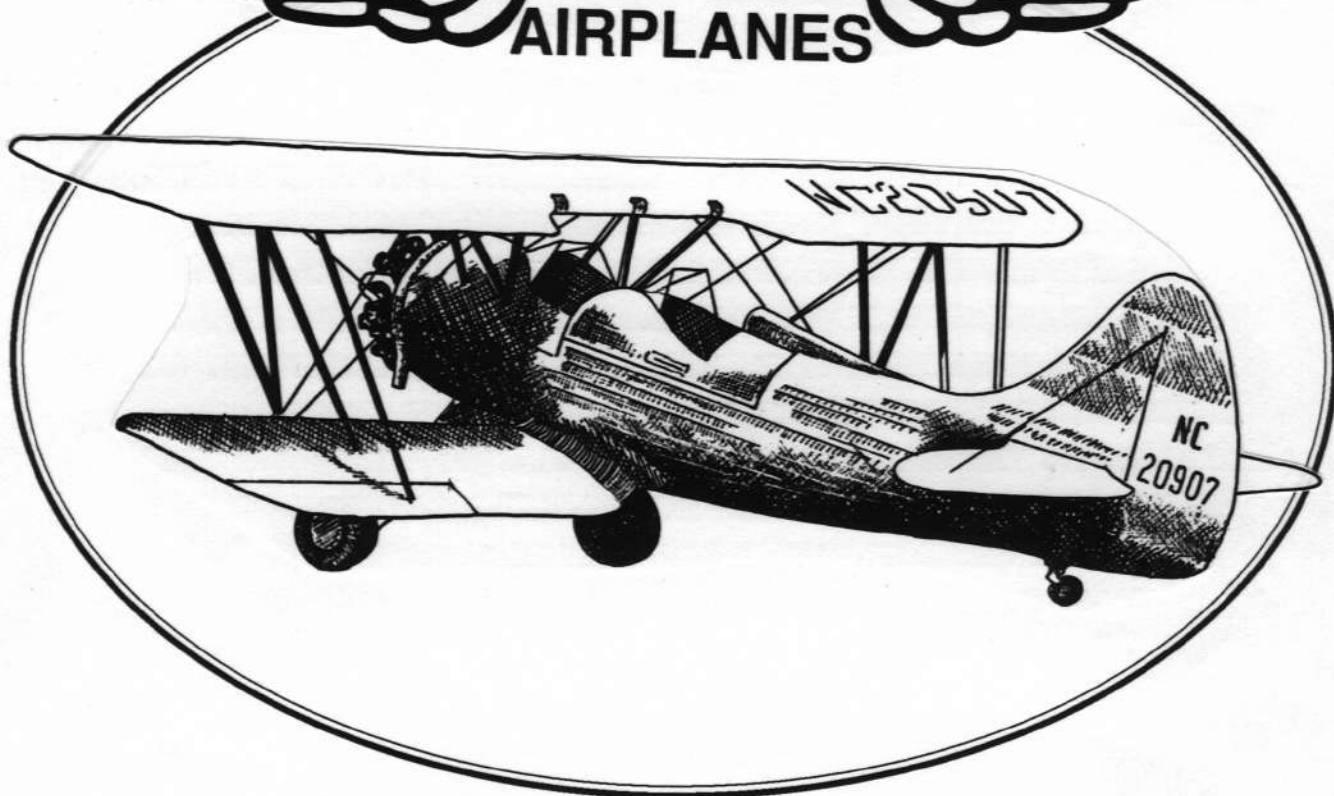


DRAWING NO. 8-67-A

PLATE 2 OF 2

HISTORICAL AVIATION ALBUM

WACO
AIRPLANES



WACO UPF-7
Model & Research Packet

PRESENTED BY
© AVIATION HERITAGE RESEARCH CENTER















Waco UPF-7 modified. N29998 Lycoming R-680-13, January 30, 1961.



Waco UPF-7s, Oakland Airport, CA, September 23, 1941, Boeing School of Aeronautics.



UPF-7 CPTP war machine, December 23, 1941. Large US and red center star was added shortly after December 7 to enable these planes to continue flying in the war zone.

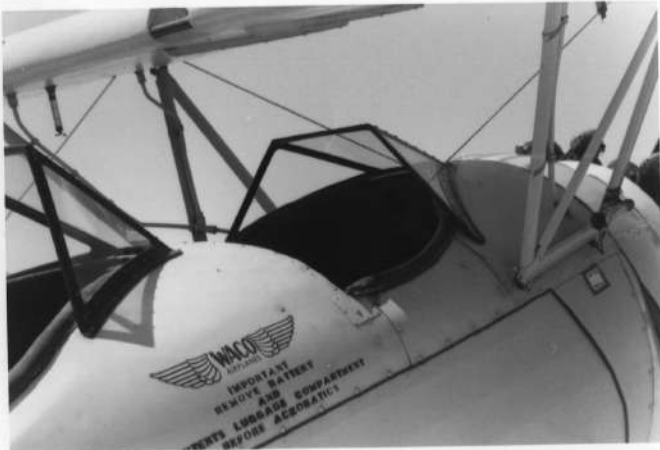


UPF-7 with different paint scheme with cowling and wheel pants.



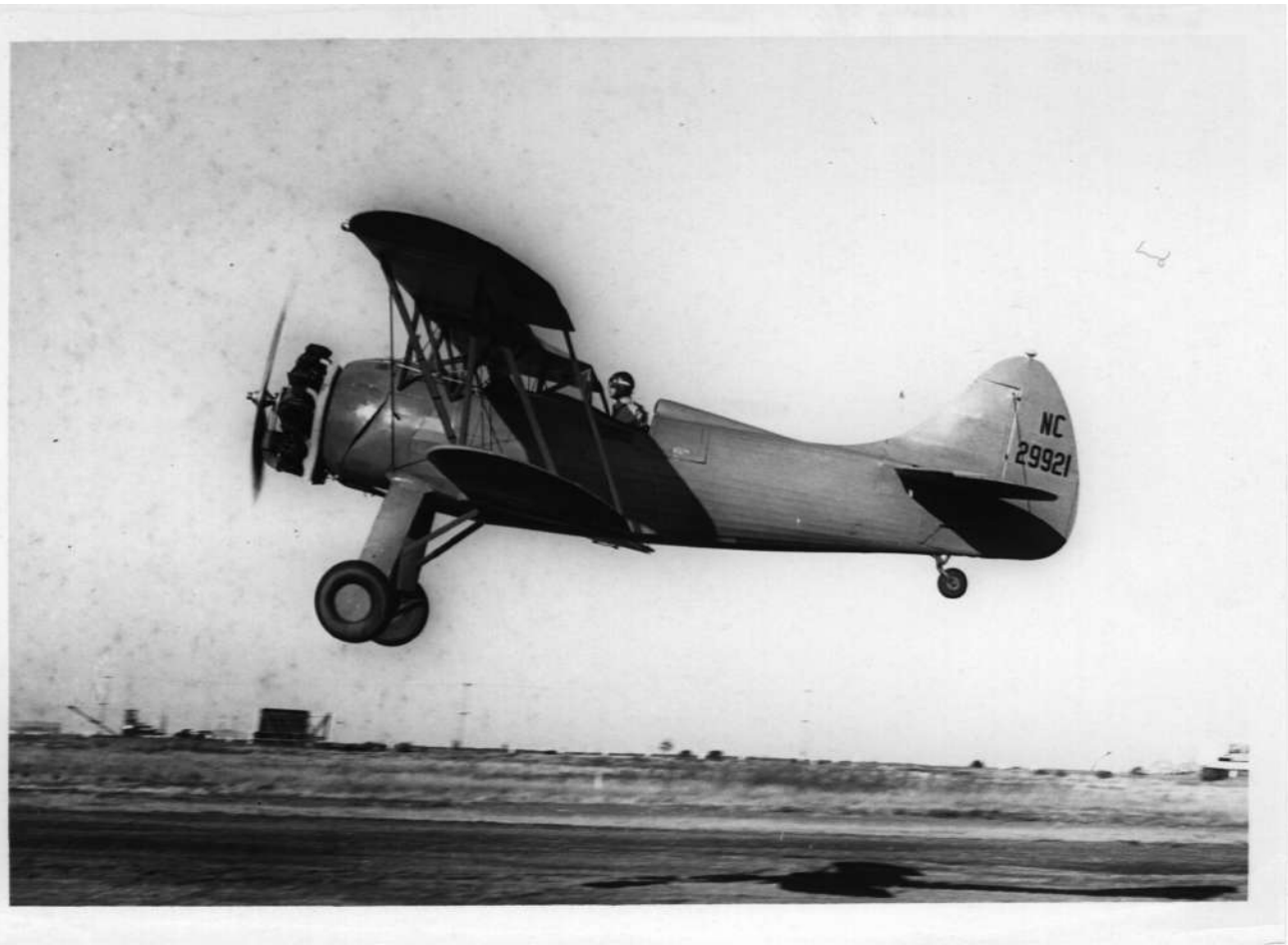
UPF-7 NC 20901 (above) and UPF-7 NC 32125 (below), two of many civil paint schemes.





















138

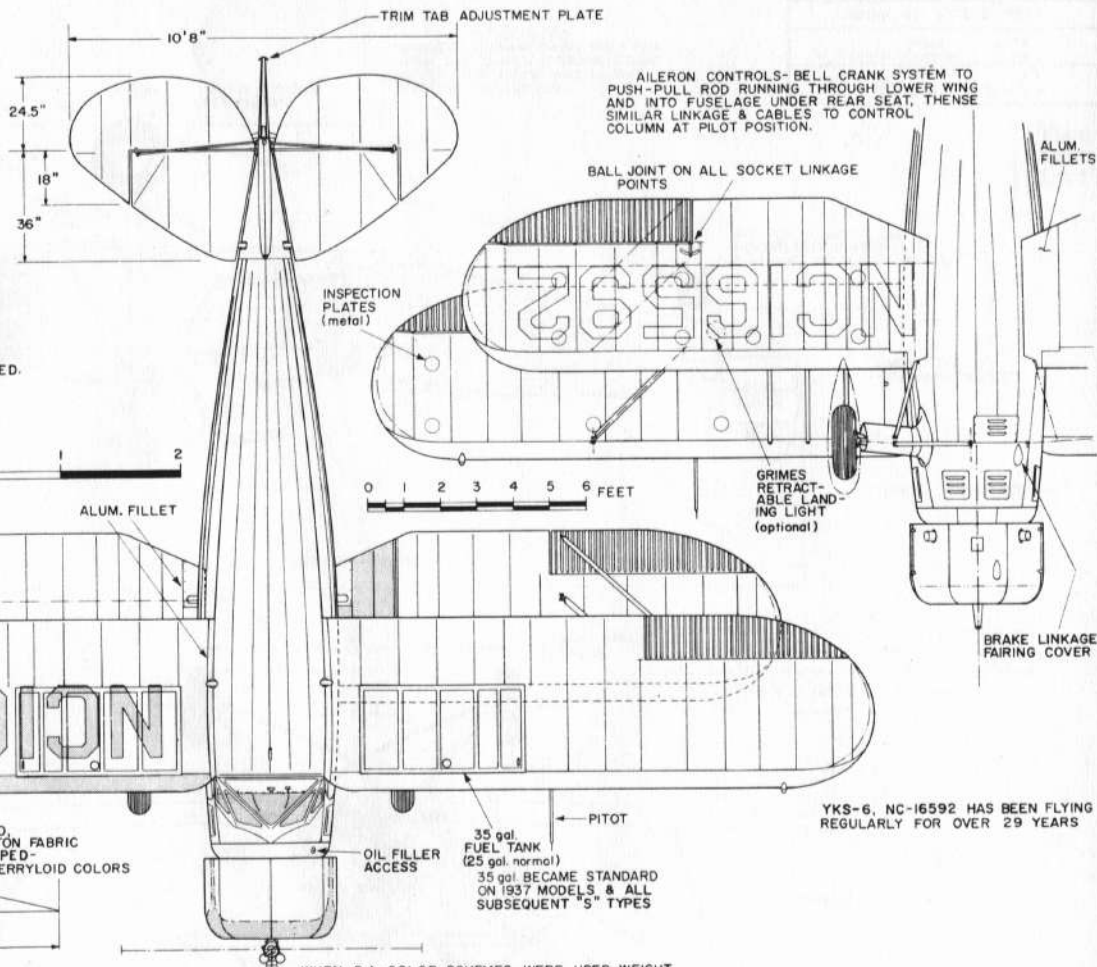
GENERAL SPECIFICATIONS

WEIGHT EMPTY	1945 lbs.
USEFUL LOAD	767 lbs.
GROSS WEIGHT	2745 lbs.
TOP SPEED	144 m.p.h. at S.L.
CRUISING SPEED	135 m.p.h.
LANDING SPEED	55 m.p.h.
RATE OF CLIMB	850 ft./min.-initial
FUEL CAPACITY	70 gals.
OIL CAPACITY	5 gals.
CRUISING RANGE	518 miles
SERVICE CEILING	12,500 ft.
WING AREA	244 sq. ft.
WING LOADING	13.32 lbs./sq. ft.
POWER LOADING	14.44 lbs./H.P.

YKS-6 PLACARD SPEEDS - LEVEL FLIGHT 140 m.p.h. INDICATED
GLIDE OR DIVE 168 m.p.h.

DATA APPROX. & APPLIES TO BASIC YKS-6
IN CLASS II CATEGORY UNDER A.T.C.-533

NOTE: THIS DRAWING IS TYPICAL OF THE
ENTIRE -KS SERIES (UKS, VKS, YKS, ZKS, VKS-7F).
MINOR CHANGES WERE INCORPORATED DURING
VARIOUS YEARS OF PRODUCTION. DIMENSIONS &
DESIGN VARIED LITTLE THROUGHOUT THESE YEARS
O.A. LENGTH WITH PROPELLER USED, FUEL
CAPACITY 50 TO 70 GALS., GEAR TREAD ACCORDING TO
MODIFICATION & WEIGHT CLASS CATEGORY UNDER
ATC PERMIT. GROSS WEIGHT & USEFUL LOADS
VARIED ACCORDING TO OPTIONAL EQUIPMENT (INCL.
ENGINE INSTALLATION) UNDER CLASS PERMIT ISSUED.



COLORING NOTES:
AIRCRAFT PORTRAYED, O.A. SILVER, BLACK TRIM,
NO PIN STRIPING - s/n4526
STANDARD COLORS FOR -KC,-KS SERIES:
GUNMETAL GRAY, SILVER, INSIGNIA BLUE
WITH BLACK, VERMILLION, WHITE OR
FRENCH GRAY TRIM

WHEN O.A. COLOR SCHEMES WERE USED-WEIGHT
PENALTY WAS AS FOLLOWS:
SILVER NONE
DARK BLUE 7 lbs.
BLACK 36 lbs.
VERMILLION 40 lbs.
WHITE 48 lbs.
FRENCH GRAY 51 lbs.
OTHER COLORS & COMBINATIONS WERE AVAILABLE
UPON CUSTOMER REQUEST

HISTORICAL
NAVIGATION
ALBUM

WACO YKS-6
(1936)
SCALE: 1:48
DRAWN BY: PAUL R. MATT

PLATE I

© PAUL R. MATT, 1965



















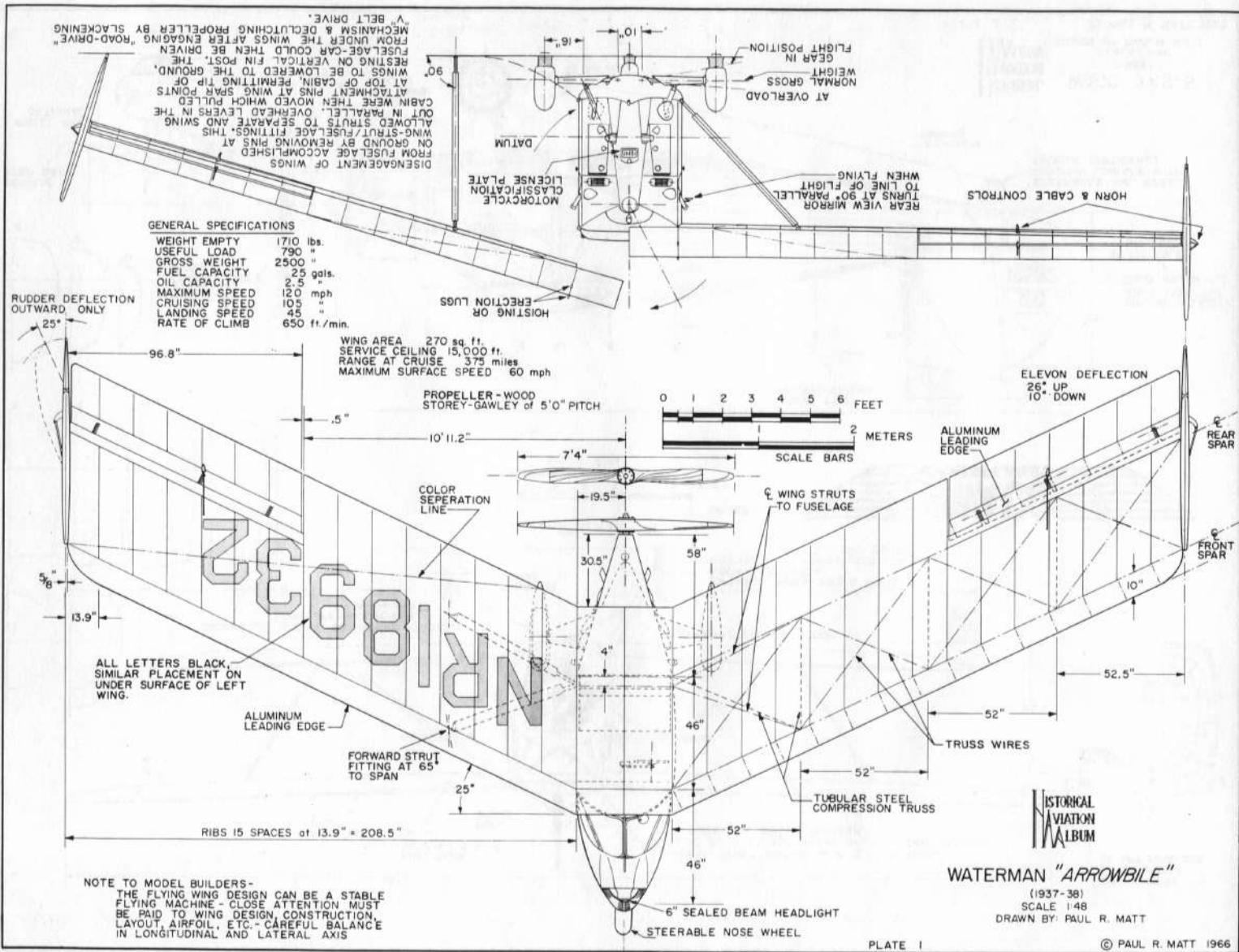




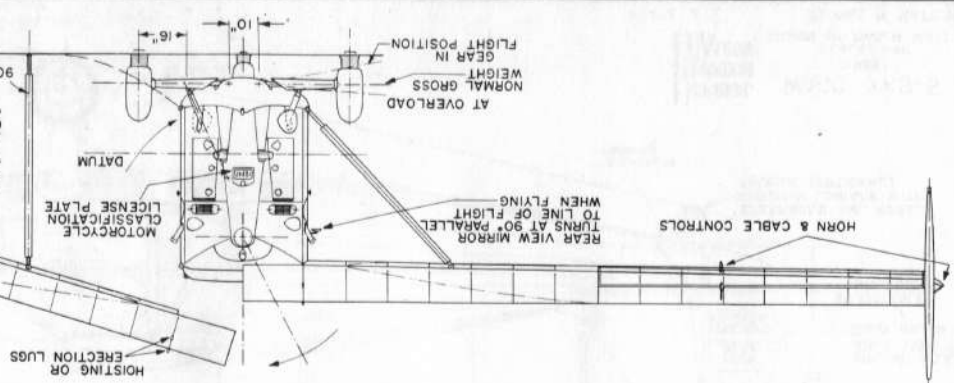








DISENAGEMENT OF WINGS FROM FUSELAGE ACCOMPLISHED AT ATTACHMENT PINS AT WING SPARS AT TOP OF CABIN, PERMITTING WINGS TO BE LOWERED TO THE GROUND, RESTING ON VERTICAL FIN POST. FUSELAGE-CAR COULD THEN BE DRIVEN FROM UNDER THE WINGS AFTER ENGAGING "ROAD-DRIVE" MECHANISM & DECLUTCHING PROPELLER BY SLACKENING V-BELT DRIVE.



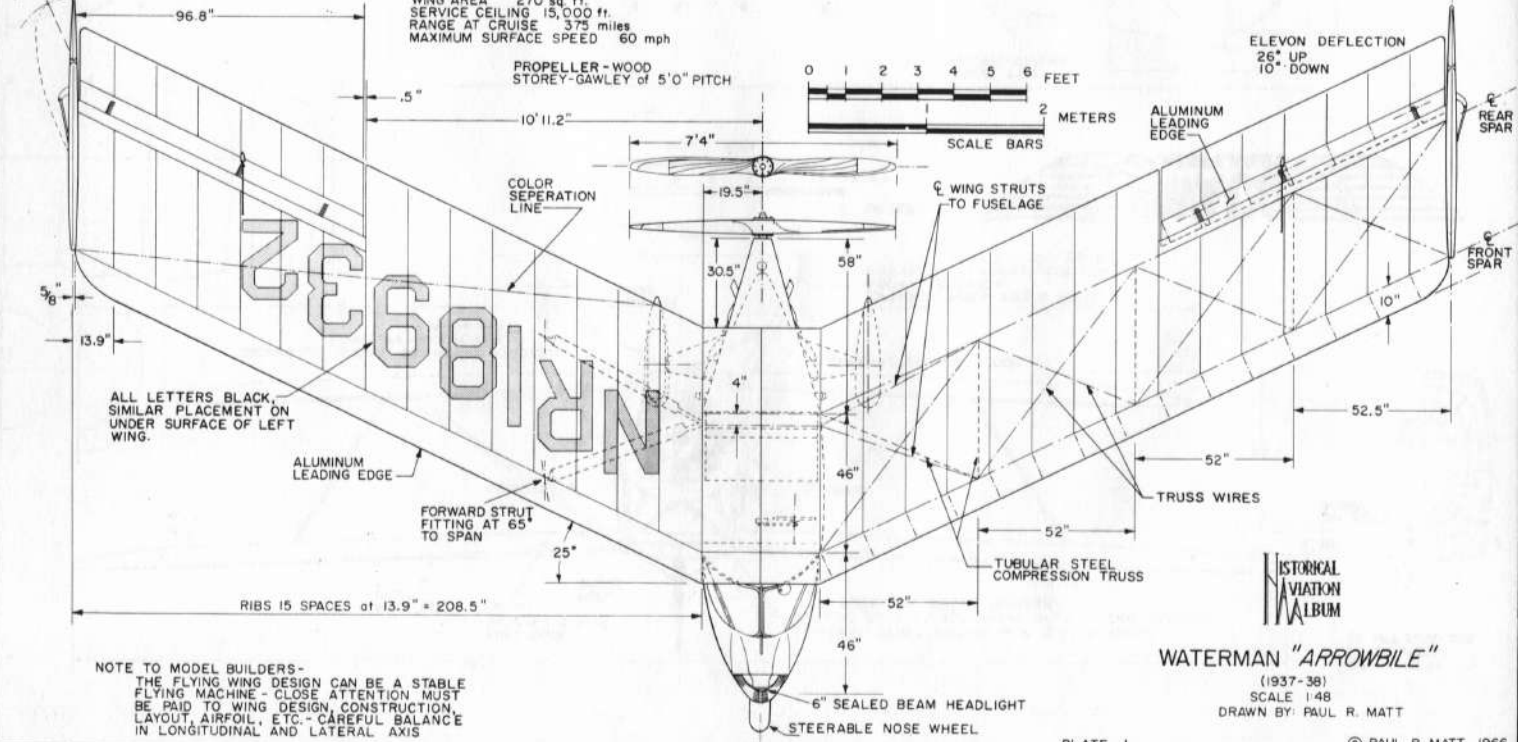
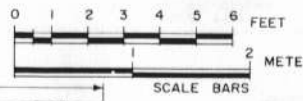
RUDDER DEFLECTION OUTWARD ONLY 25°

ELEVON DEFLECTION 25° UP 10° DOWN

WEIGHT EMPTY 1710 lbs.
 USEFUL LOAD 790 "
 GROSS WEIGHT 2500 "
 FUEL CAPACITY 25 gals.
 OIL CAPACITY 2.5 "
 MAXIMUM SPEED 120 mph
 CRUISING SPEED 105 "
 LANDING SPEED 45 "
 RATE OF CLIMB 650 ft./min.

WING AREA 270 sq. ft.
 SERVICE CEILING 15,000 ft.
 RANGE AT CRUISE 375 miles
 MAXIMUM SURFACE SPEED 60 mph

PROPELLER - WOOD
 STOREY-GAWLEY of 5'0" PITCH



ALL LETTERS BLACK, SIMILAR PLACEMENT ON UNDER SURFACE OF LEFT WING.

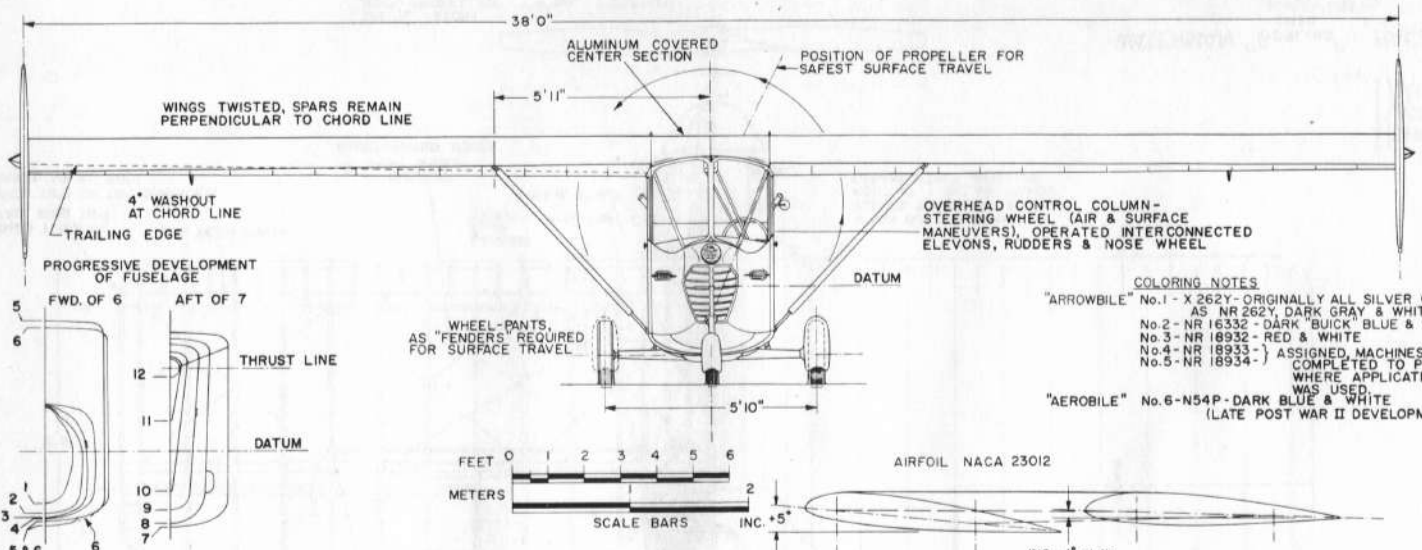
WATERMAN "ARROWBILE"

(1937-38)

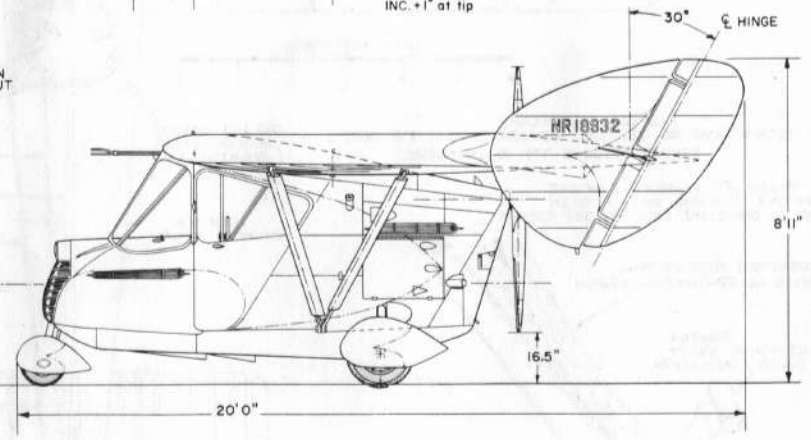
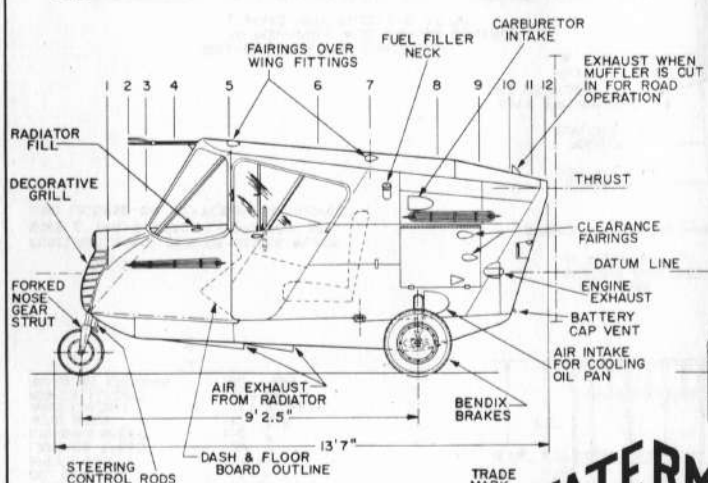
SCALE 1:48

DRAWN BY: PAUL R. MATT

© PAUL R. MATT 1966



COLORING NOTES
 "ARROWBILE" No. 1 - X 262Y - ORIGINALLY ALL SILVER (PROTO)
 AS NR 262Y - DARK GRAY & WHITE
 No. 2 - NR 16332 - DARK "BUICK" BLUE & WHITE
 No. 3 - NR 18932 - RED & WHITE
 No. 4 - NR 18933 -) ASSIGNED MACHINES NOT
 No. 5 - NR 18934 -) COMPLETED TO POINT
 WHERE APPLICATION
 WAS USED.
 "AEROBILE" No. 6 - N54P - DARK BLUE & WHITE
 (LATE POST WAR II DEVELOPMENT)



WATERMAN
ARROWBILE

HISTORICAL
 AVIATION
 ALBUM

WATERMAN "ARROWBILE"
 (1937-38)
 SCALE 1:48
 DRAWN BY: PAUL R. MATT

PLATE 2

© PAUL R. MATT 1966













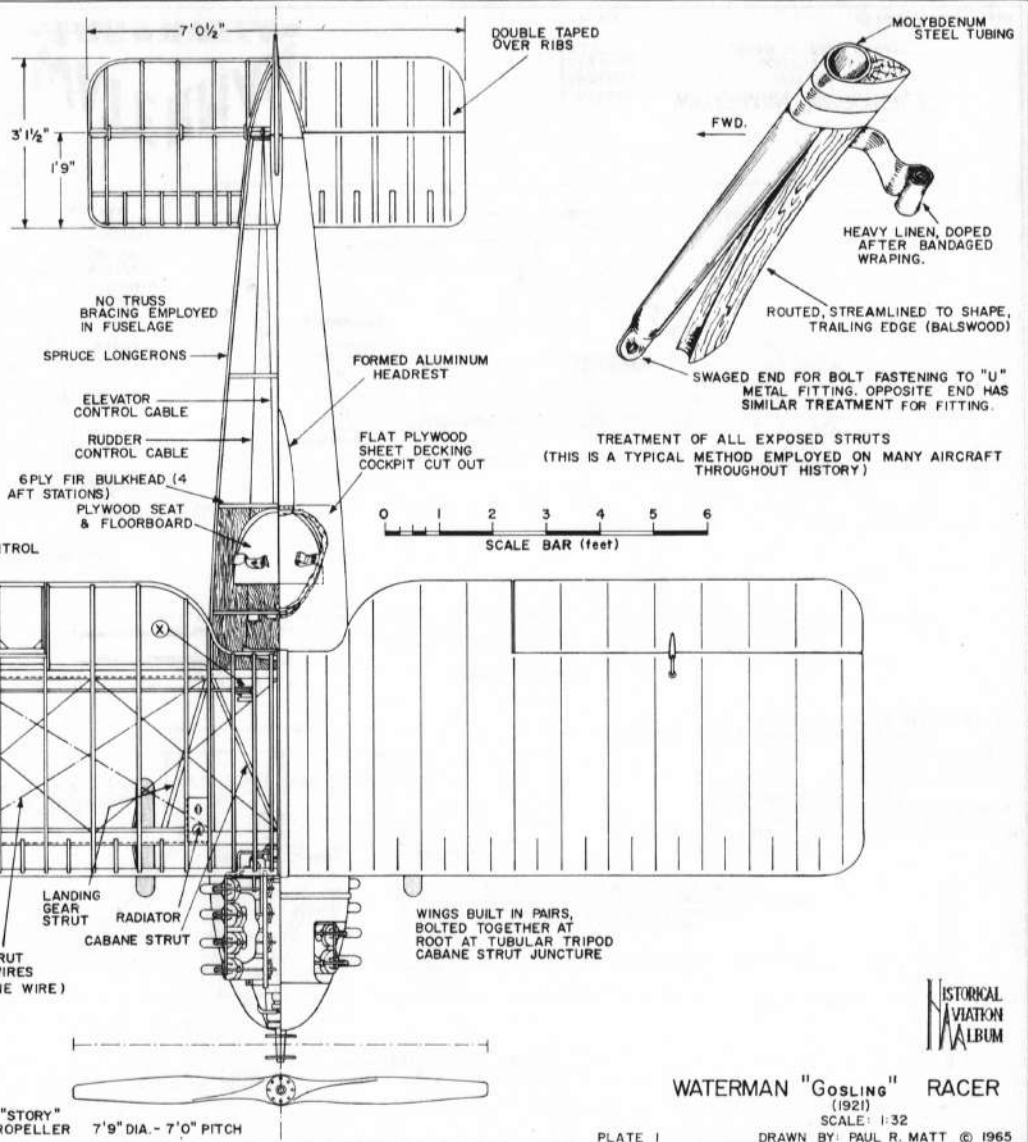


GENERAL SPECIFICATIONS

WEIGHT EMPTY	885 lbs.
USEFUL LOAD	245 "
GROSS WEIGHT	1130 "
FUEL CAPACITY	10 gals.
OIL CAPACITY	3 "
SPEED, MAX.	136 mph
LANDING SPEED	60 "
CRUISING SPEED	110 "
WING AREA	112 sq. ft.
WING LOADING	11.1 lbs/sq. ft.
POWER LOADING	12.5 lbs/H.P.
RANGE AT CRUISING	135 miles

COLORING:

FUSELAGE & ALL STRUTS - GLOSS BLACK
 WING & TAIL SURFACES - CRIMSON RED
 NO LICENSE OR LETTERING EMPLOYED



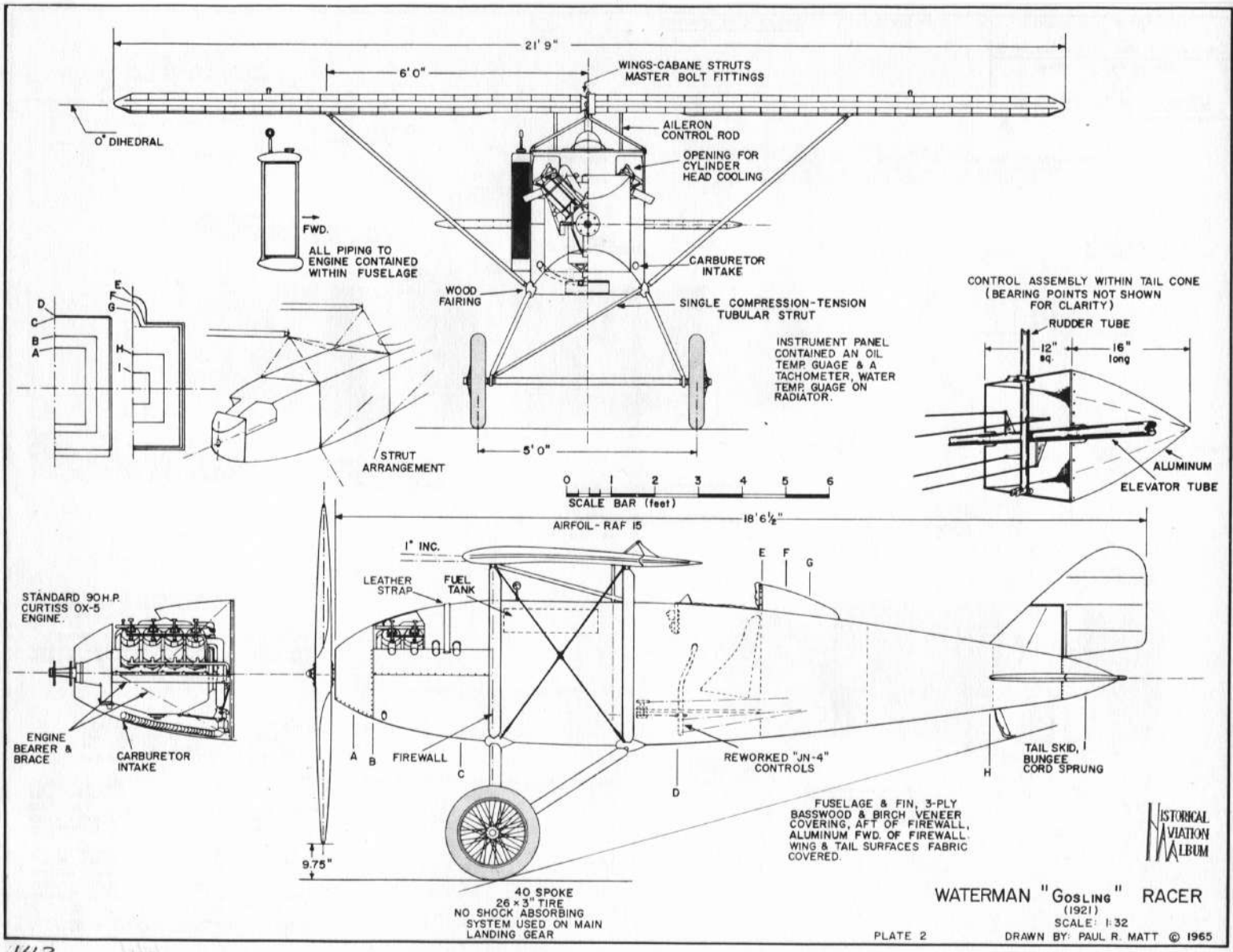
WATERMAN "GOSLING" RACER

(1921)

SCALE: 1:32

PLATE I DRAWN BY: PAUL R. MATT © 1965





WATERMAN "GOSLING" RACER

(1921)

SCALE: 1:32

PLATE 2

DRAWN BY: PAUL R. MATT © 1965







The "Gosling"
Built by Waterman Aircraft Mfg Co 1920 for
C.B. DeMillo









GENERAL SPECIFICATIONS, F2W-1 A-6744

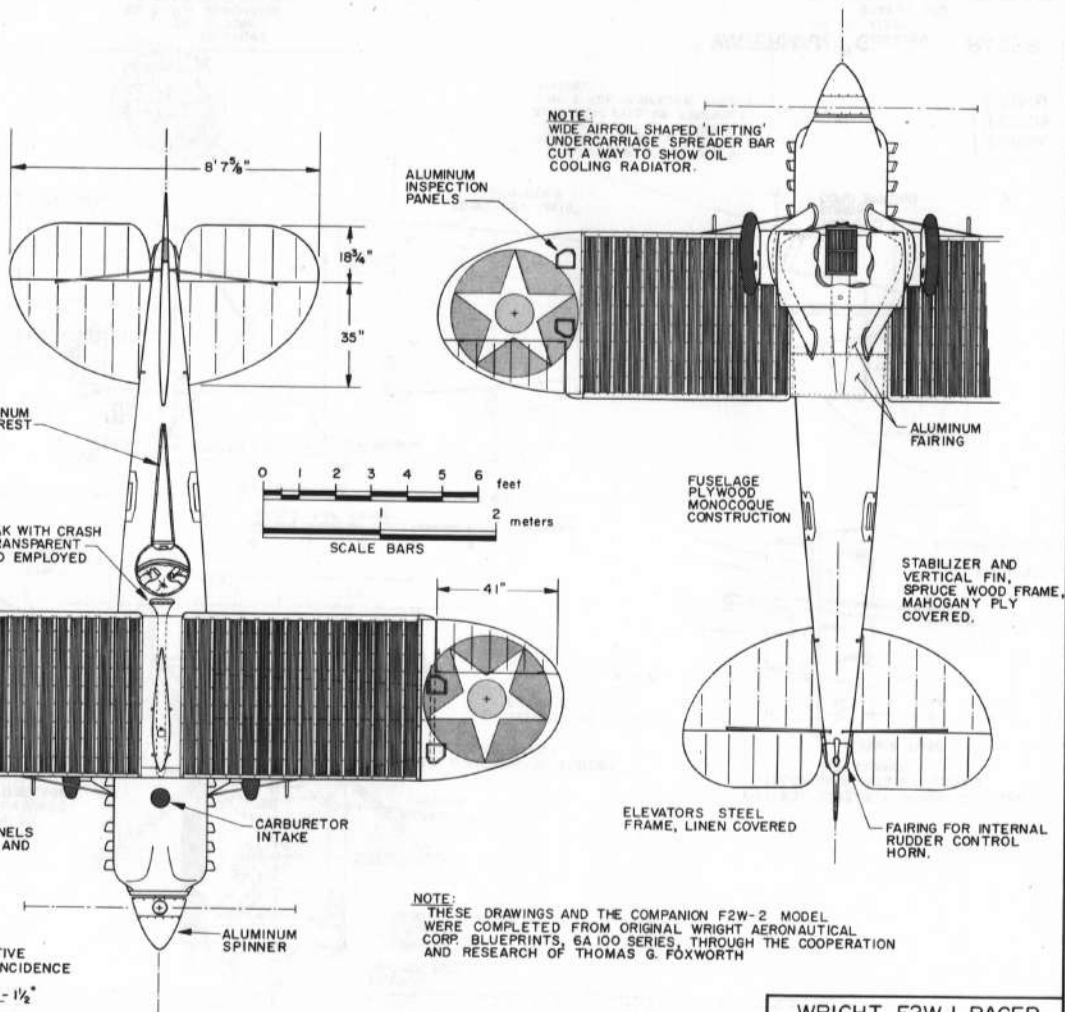
WEIGHT EMPTY 2468 lbs.
 USEFULL LOAD 618 lbs. (not incl. water)
 GROSS WEIGHT 3086 lbs.
 MAXIMUM SPEED 247.7 mph.
 LANDING SPEED 75 m.p.h. approx.
 FUEL CAPACITY 60 gals.
 OIL CAPACITY 31.7 gals. A-6743
 WATER CAPACITY 6.4 gals.
 WING AREA (TOTAL) 174 sq. ft., incl. ailerons
 WING LOADING 16.4 lbs./sq. ft.
 POWER LOADING 3.81 lbs./h.p. (ALL UP WEIGHT)

POWER - WRIGHT T-3, S/N 6372, 750 h.p. max. at 2200 r.p.m., SPECIAL 6.5 in. HIGH COMPRESSION ENGINE, 5.75" BORE, 6.25" STROKE, 1947 cu. in. DISPLACEMENT

COLORING NOTES

FUSELAGE & NOSE SPINNER - FIRE ENGINE RED
 WINGS, OTHER THAN RADIATORS, TAIL SURFACES, LANDING GEAR STRUTS, INTERPLANE STRUTS - GLOSS WHITE

RACING No 8 - WHITE
 LETTERING ON RUDDER - BLACK
 WING RADIATORS - RUSTIC BRASS

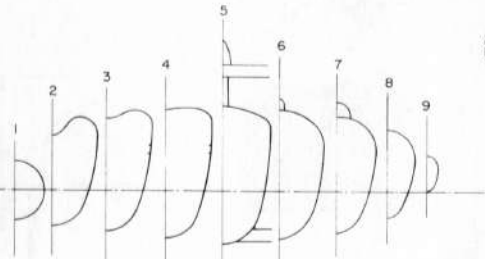
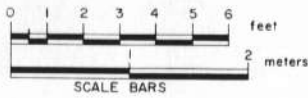
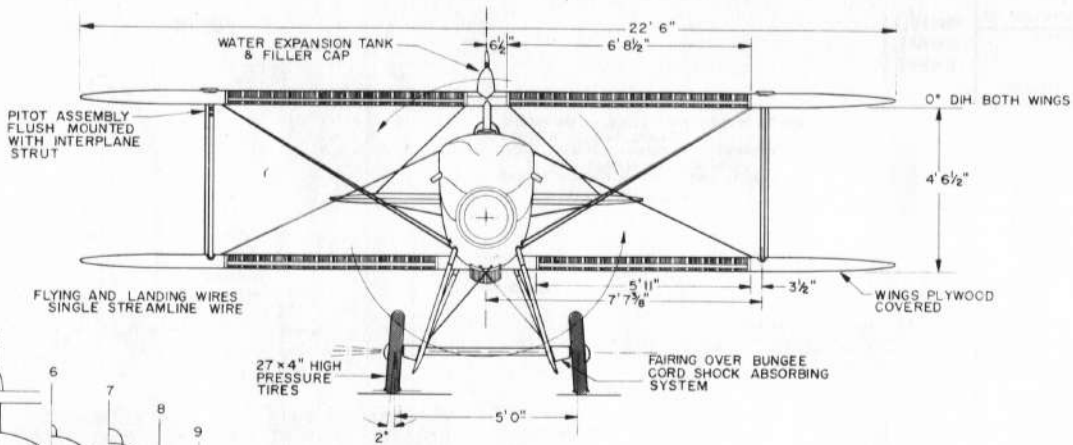


NOTE: THESE DRAWINGS AND THE COMPANION F2W-2 MODEL WERE COMPLETED FROM ORIGINAL WRIGHT AERONAUTICAL CORP. BLUEPRINTS, 6A 100 SERIES, THROUGH THE COOPERATION AND RESEARCH OF THOMAS G. FOXWORTH

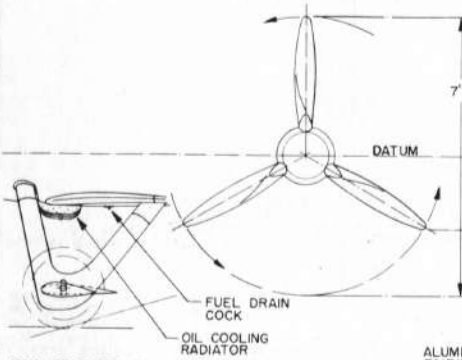
WRIGHT F2W-1 RACER
 1923
 SCALE - 1:24
 DRAWN BY - PAUL R. MATT
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 TEMPLE CITY, CALIF. 91780

DRAWING No. 5-43-A

PLATE 1 of 2

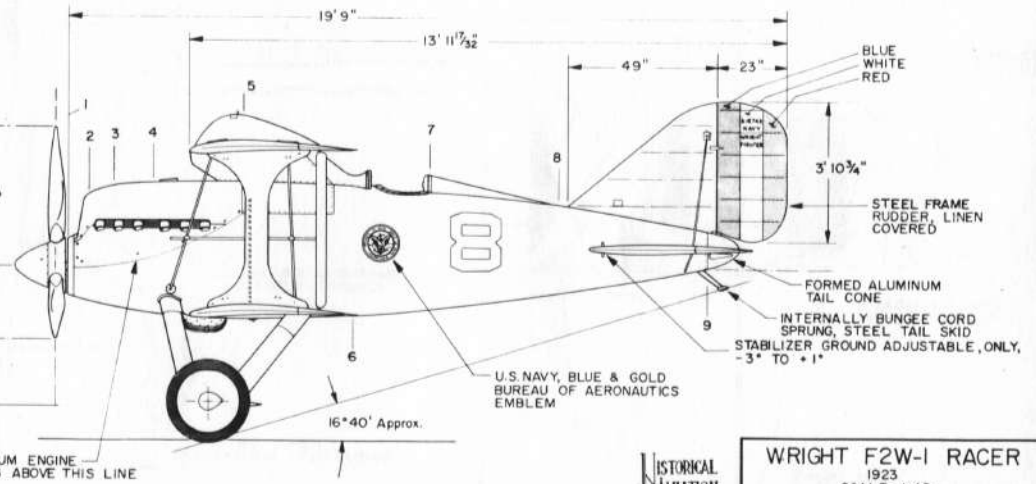


SPECIAL HAMILTON STANDARD FORGED DURALUMIN PROPELLER, GROUND ADJUSTABLE



MAIN GEAR STRUTS, WOOD FAIRING OVER WELDED STEEL FRAME, ALUMINUM FAIRING AT ROOT JUNCTURES.

ALUMINUM ENGINE FAIRING ABOVE THIS LINE



HISTORICAL AVIATION ALBUM

WRIGHT F2W-1 RACER

1923
SCALE - 1:48
DRAWN BY - PAUL R. MATT

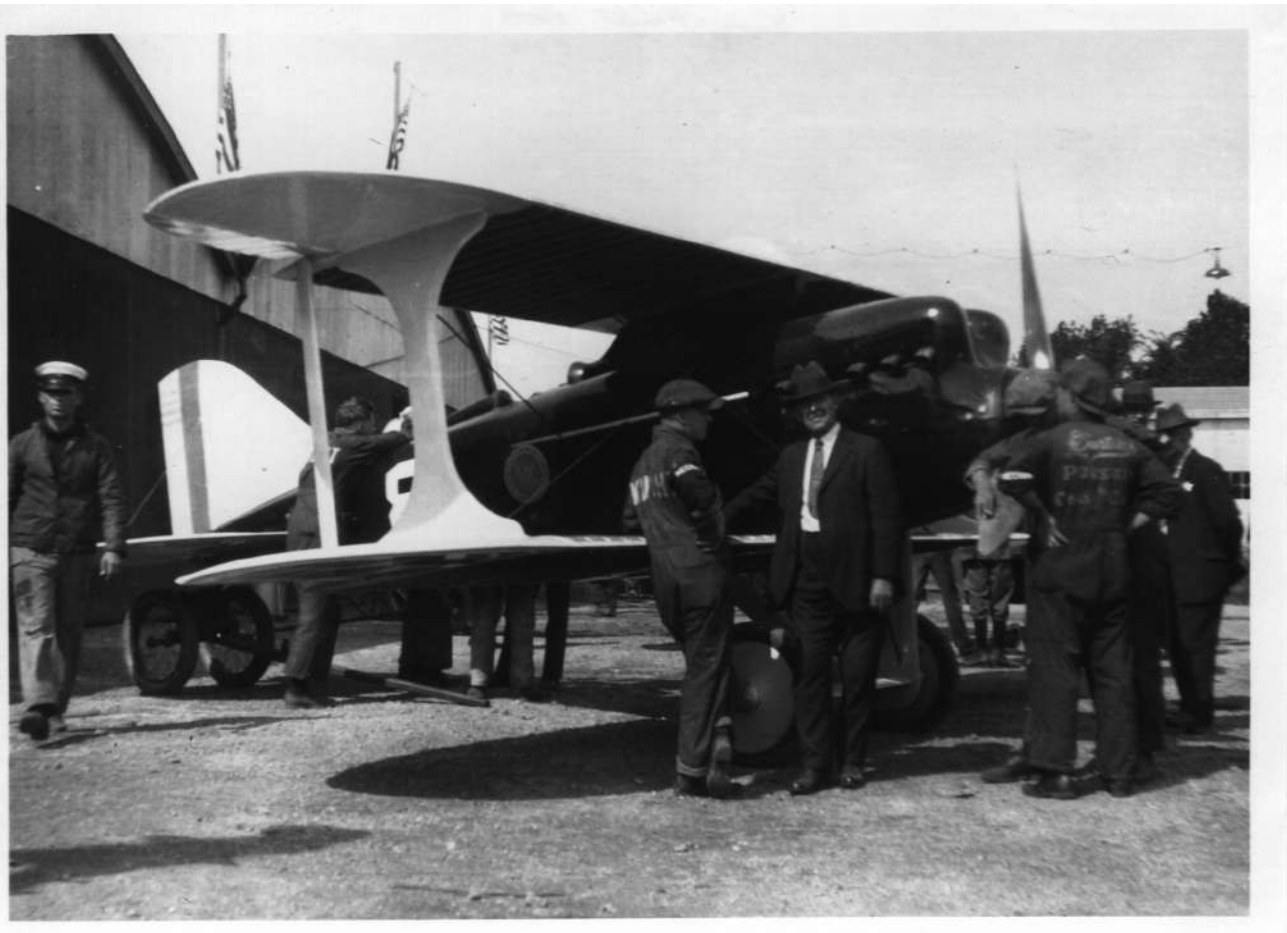
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DRAWING No. 5-43-A

PLATE 2 of 2

145 118







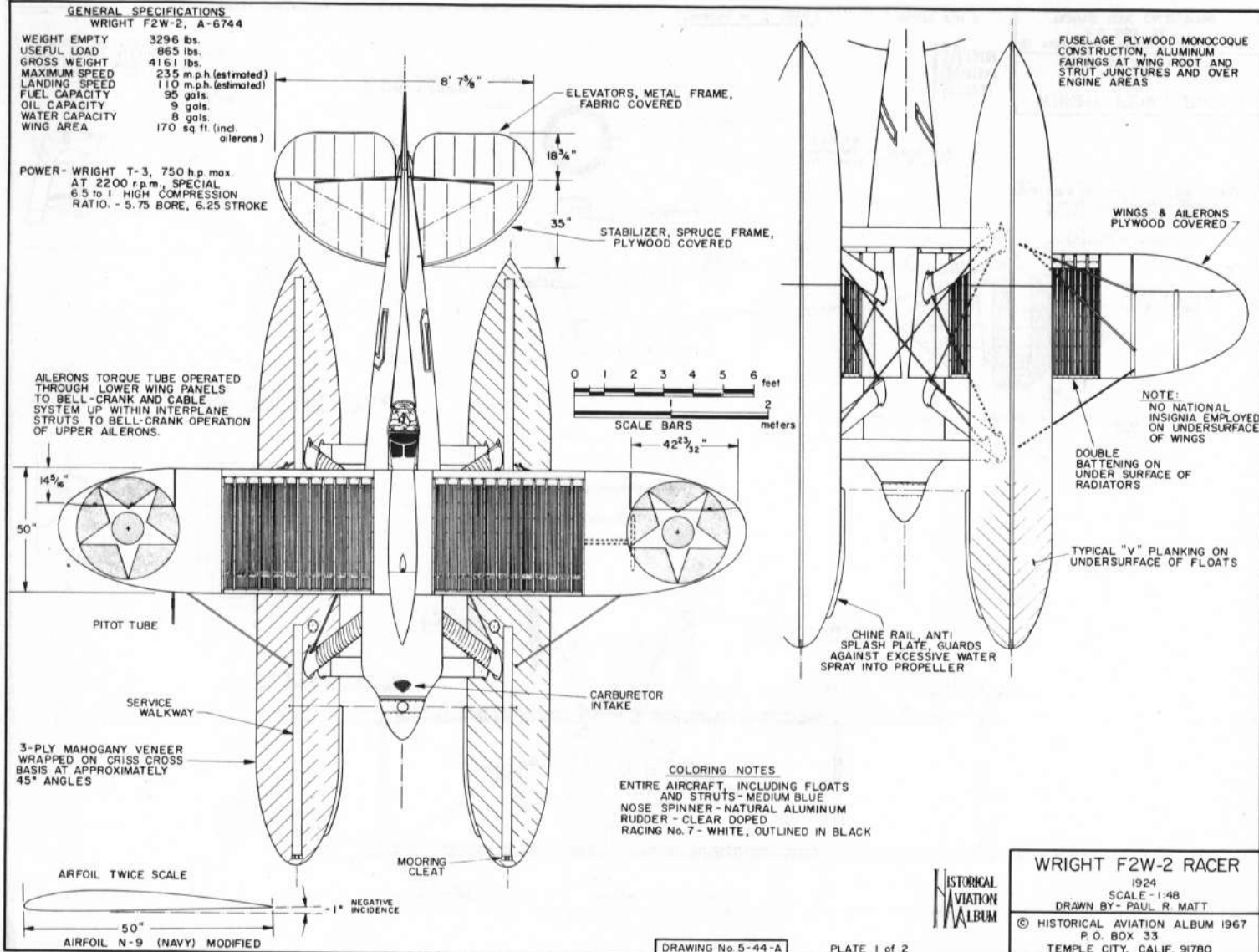
GENERAL SPECIFICATIONS

WRIGHT F2W-2, A-6744

WEIGHT EMPTY 3296 lbs.
 USEFUL LOAD 865 lbs.
 GROSS WEIGHT 4161 lbs.
 MAXIMUM SPEED 235 m.p.h. (estimated)
 LANDING SPEED 110 m.p.h. (estimated)
 FUEL CAPACITY 95 gals.
 OIL CAPACITY 9 gals.
 WATER CAPACITY 8 gals.
 WING AREA 170 sq. ft. (incl. ailerons)

POWER - WRIGHT T-3, 750 h.p. max.
 AT 2200 r.p.m., SPECIAL
 6.5 to 1 HIGH COMPRESSION
 RATIO - 5.75 BORE, 6.25 STROKE

AILERONS TORQUE TUBE OPERATED
 THROUGH LOWER WING PANELS
 TO BELL-CRANK AND CABLE
 SYSTEM UP WITHIN INTERPLANE
 STRUTS TO BELL-CRANK OPERATION
 OF UPPER AILERONS.



HISTORICAL AVIATION ALBUM

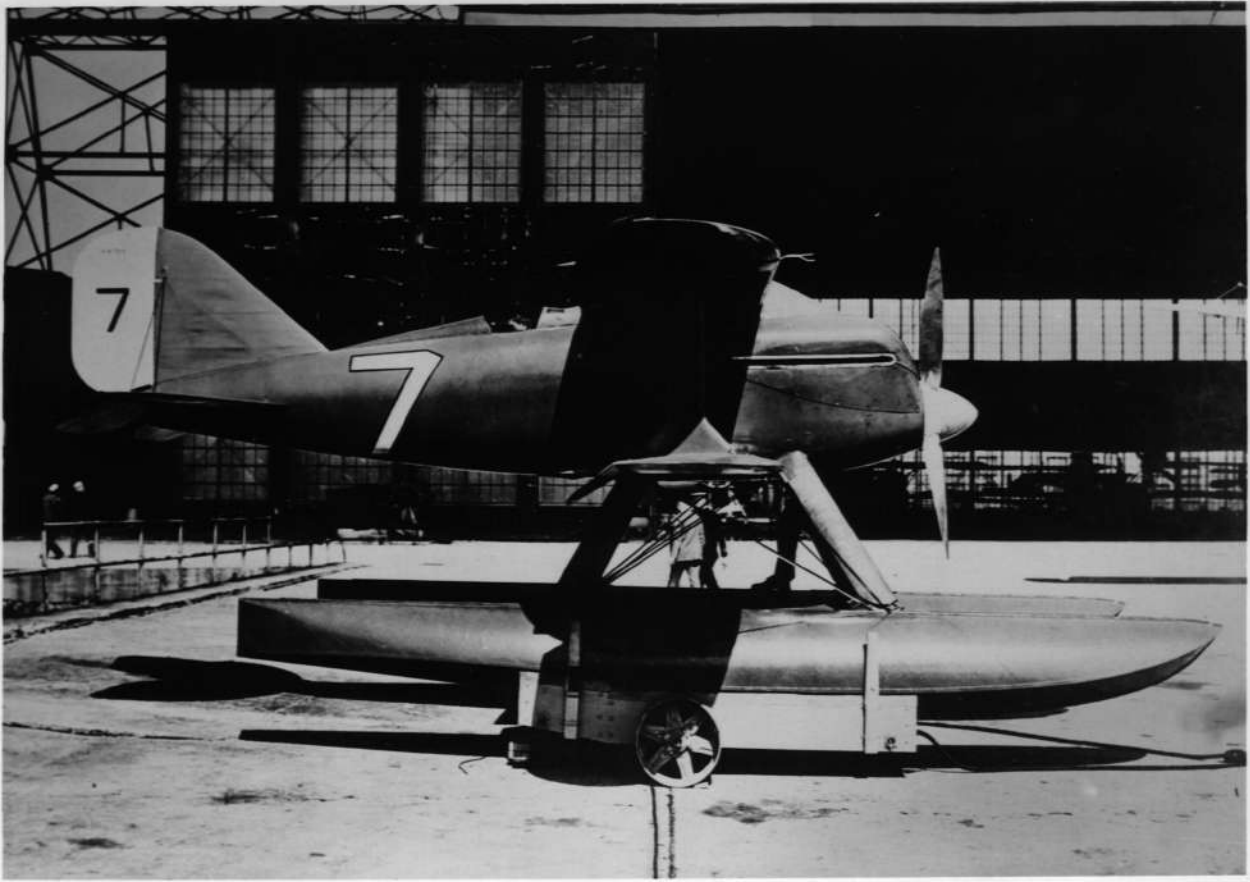
WRIGHT F2W-2 RACER

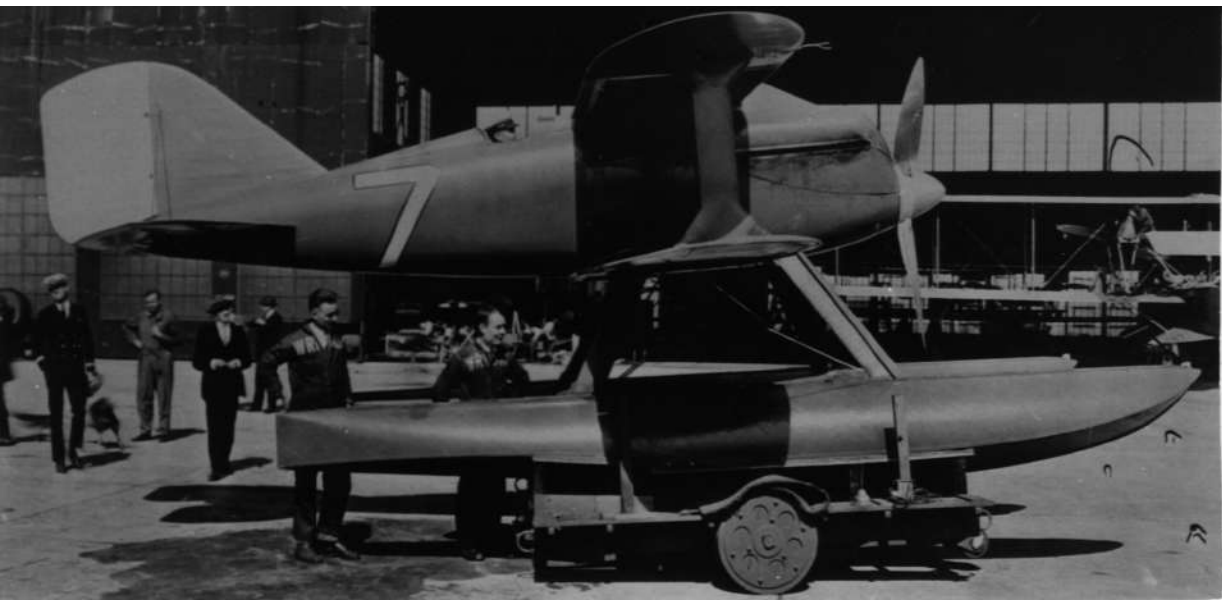
1924
 SCALE - 1:48
 DRAWN BY - PAUL R. MATT

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 P. O. BOX 33
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DRAWING No. 5-44-A

PLATE 1 of 2

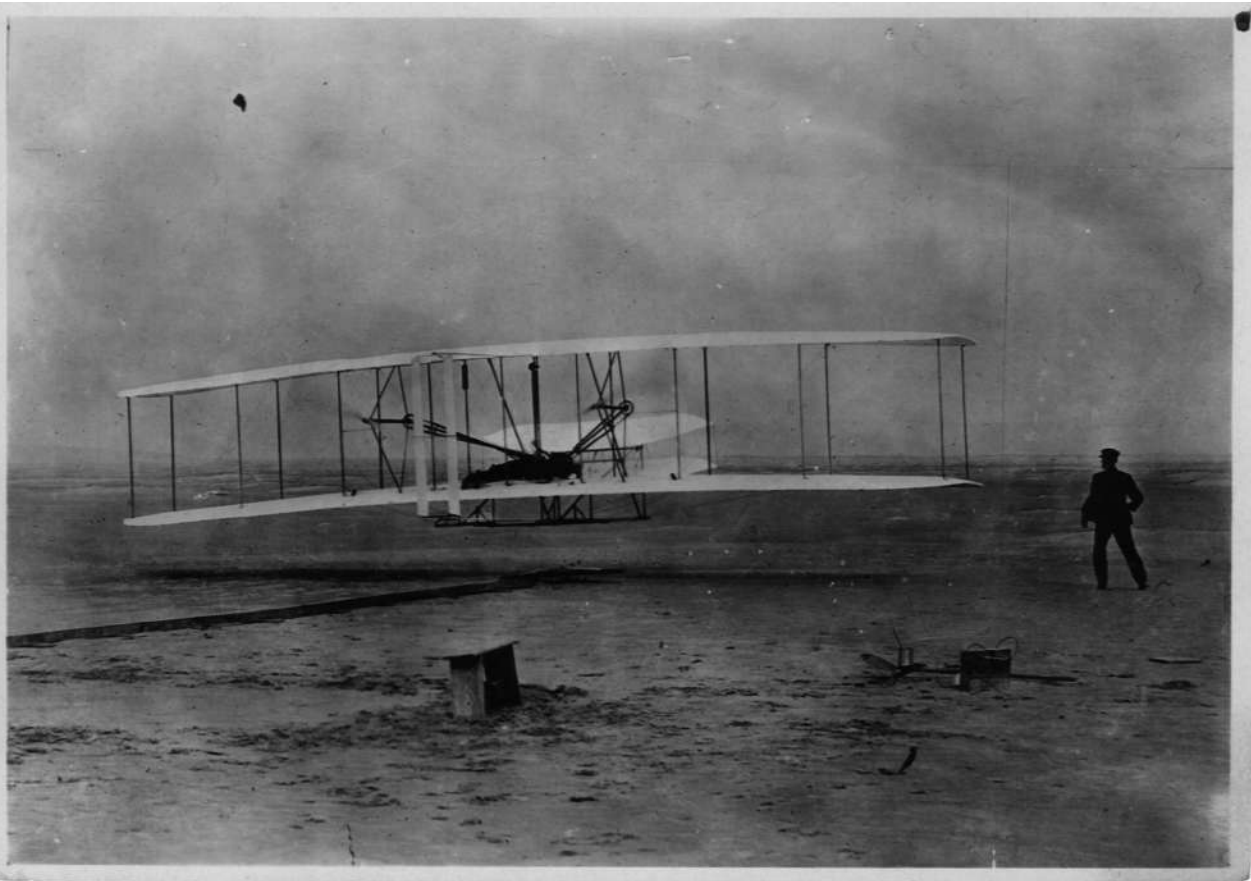


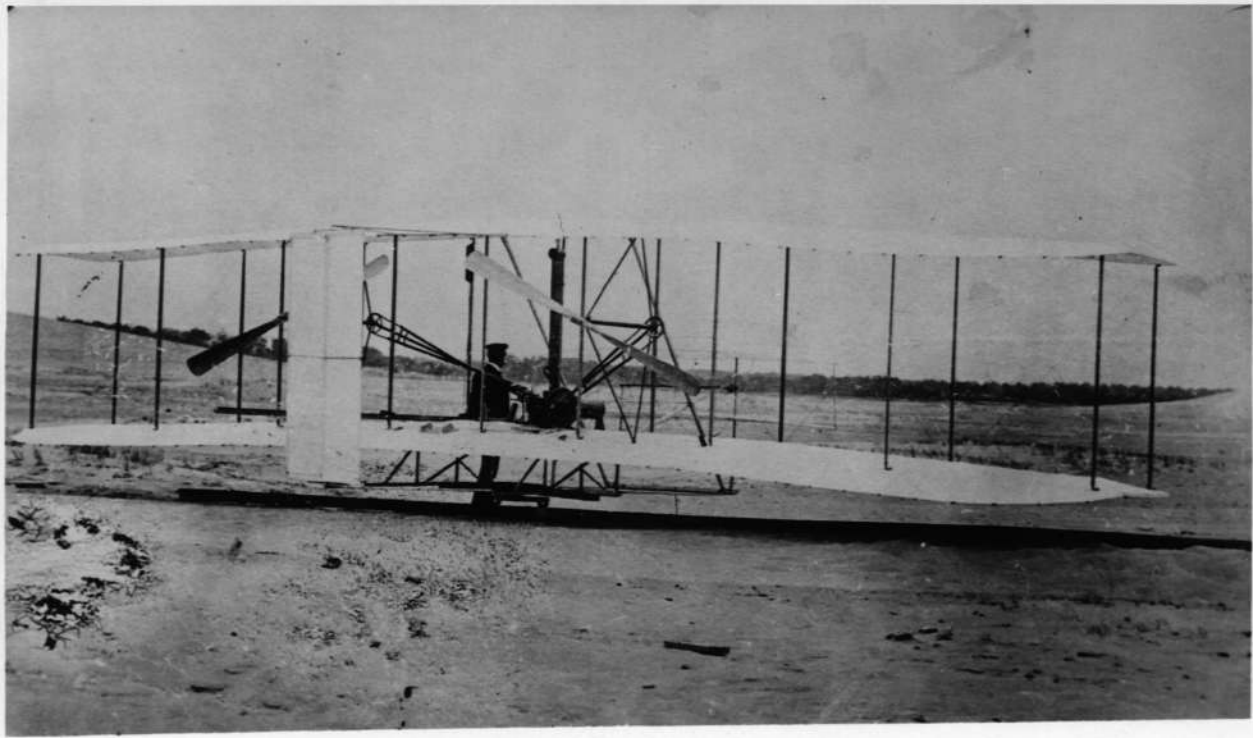


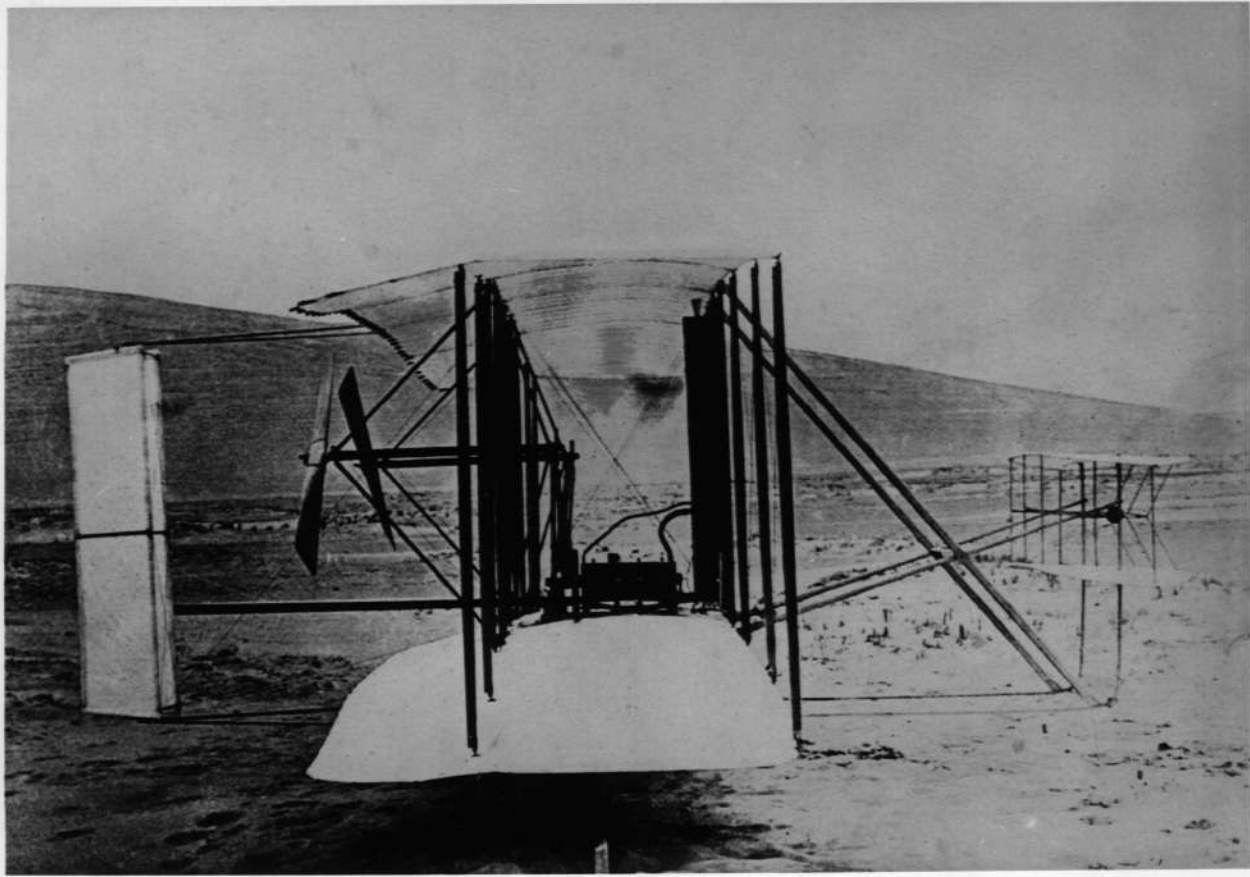


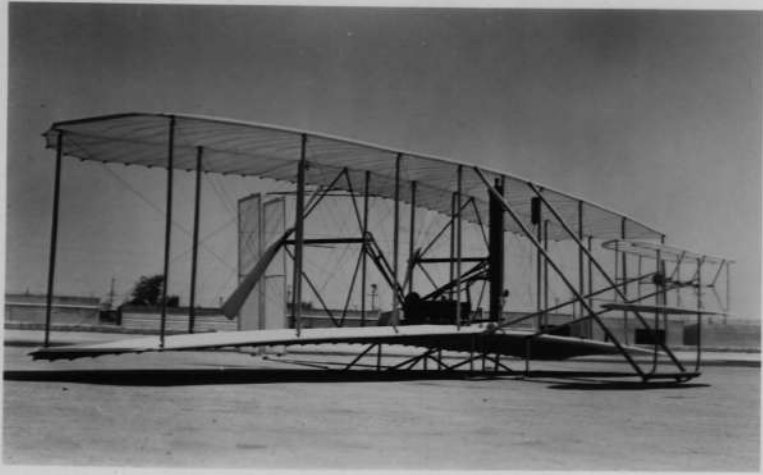


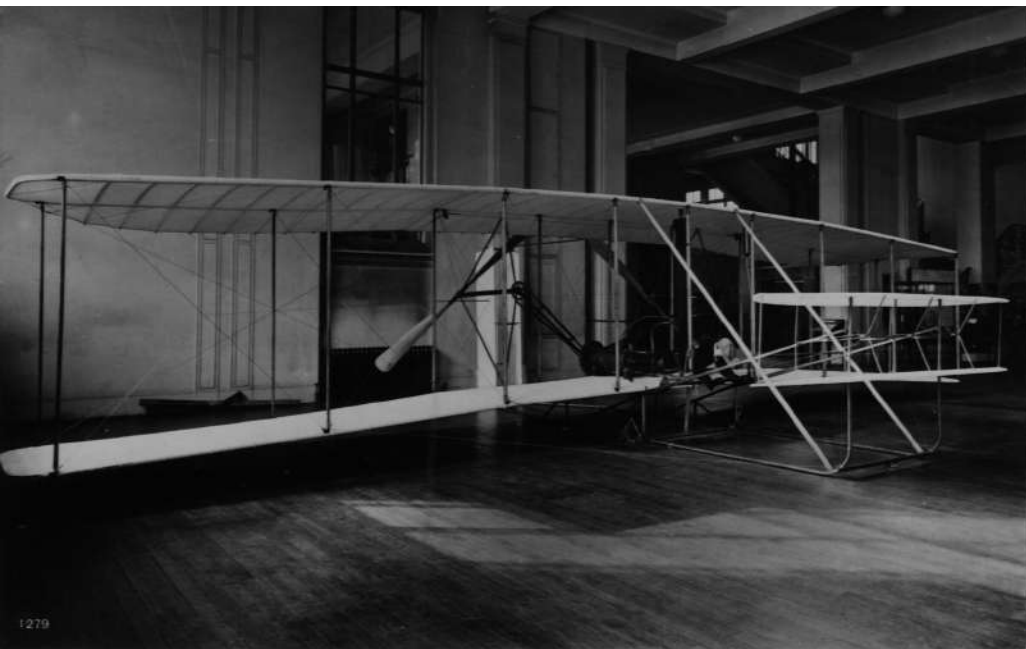




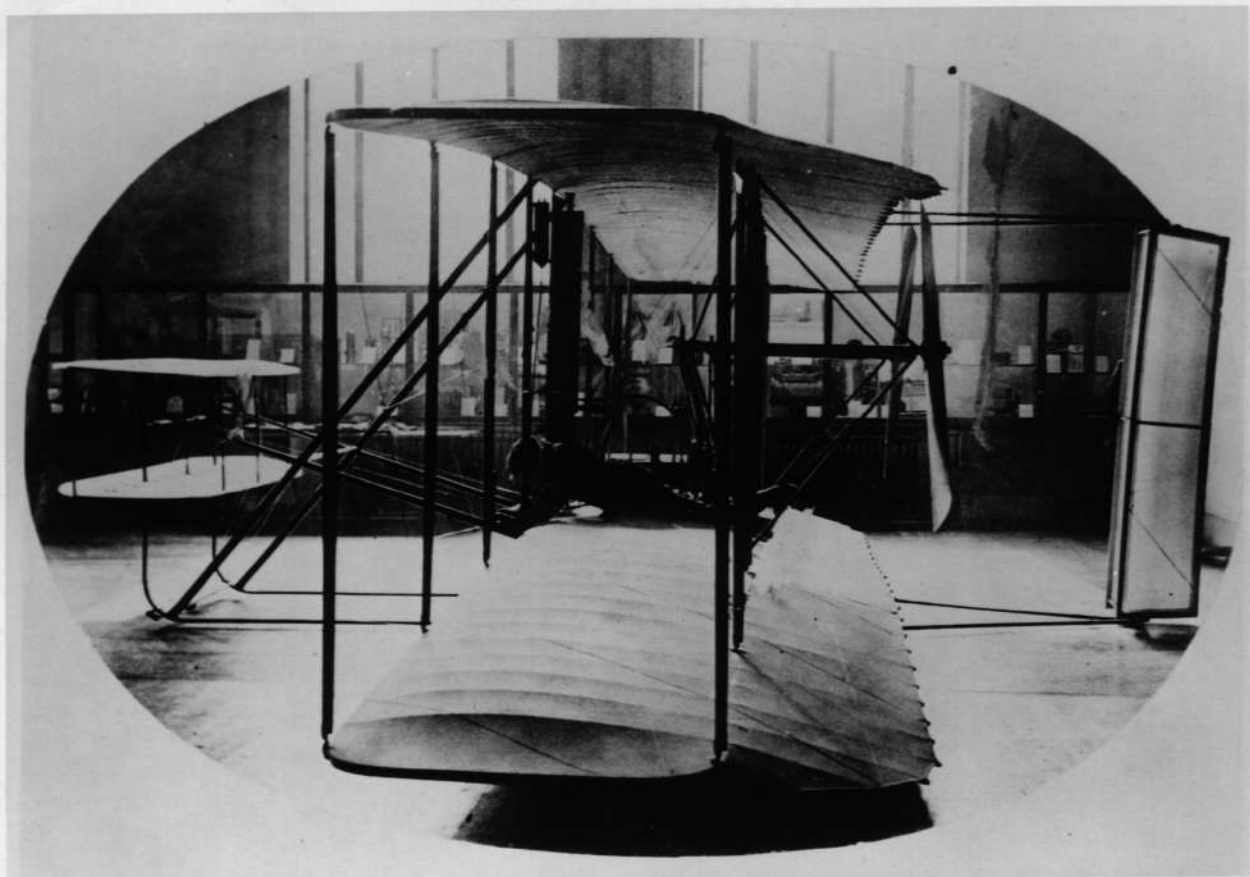


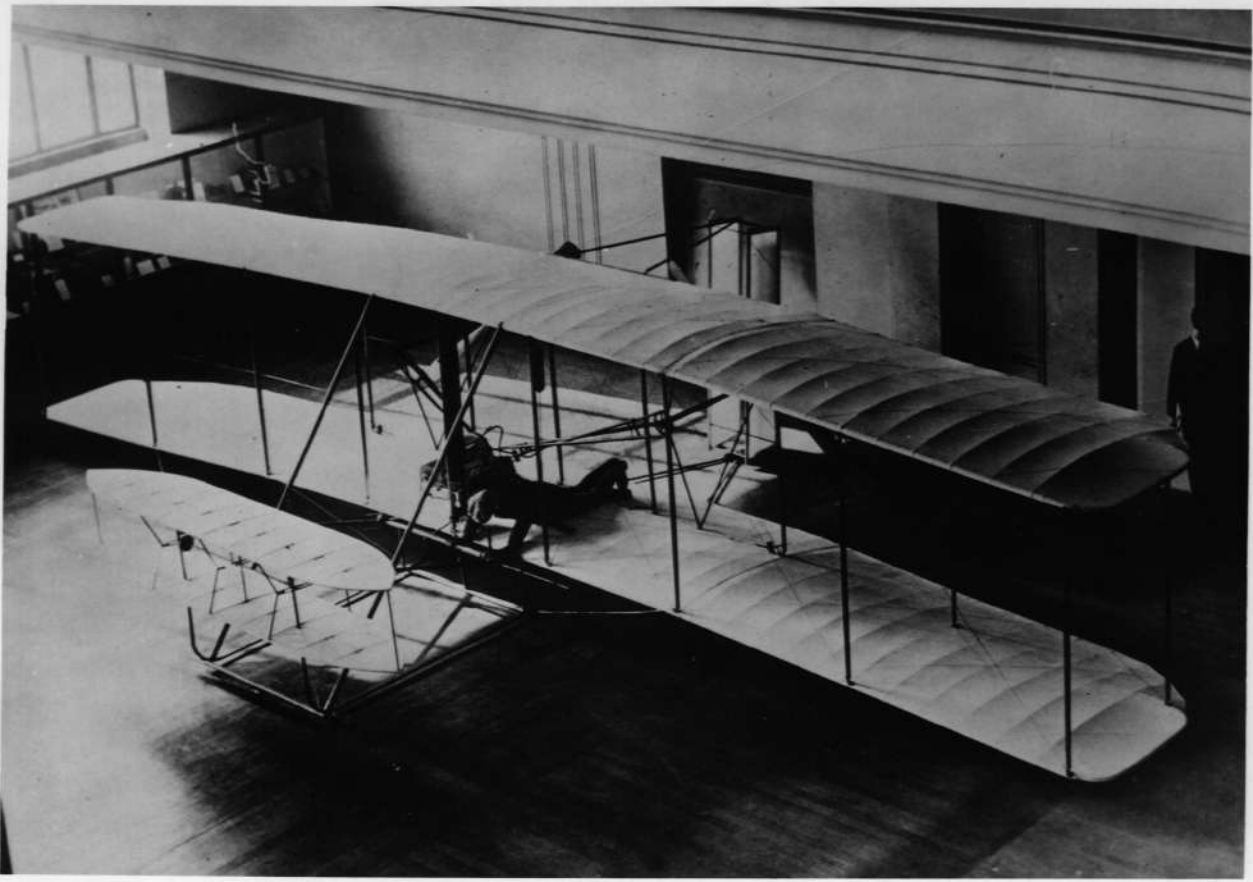


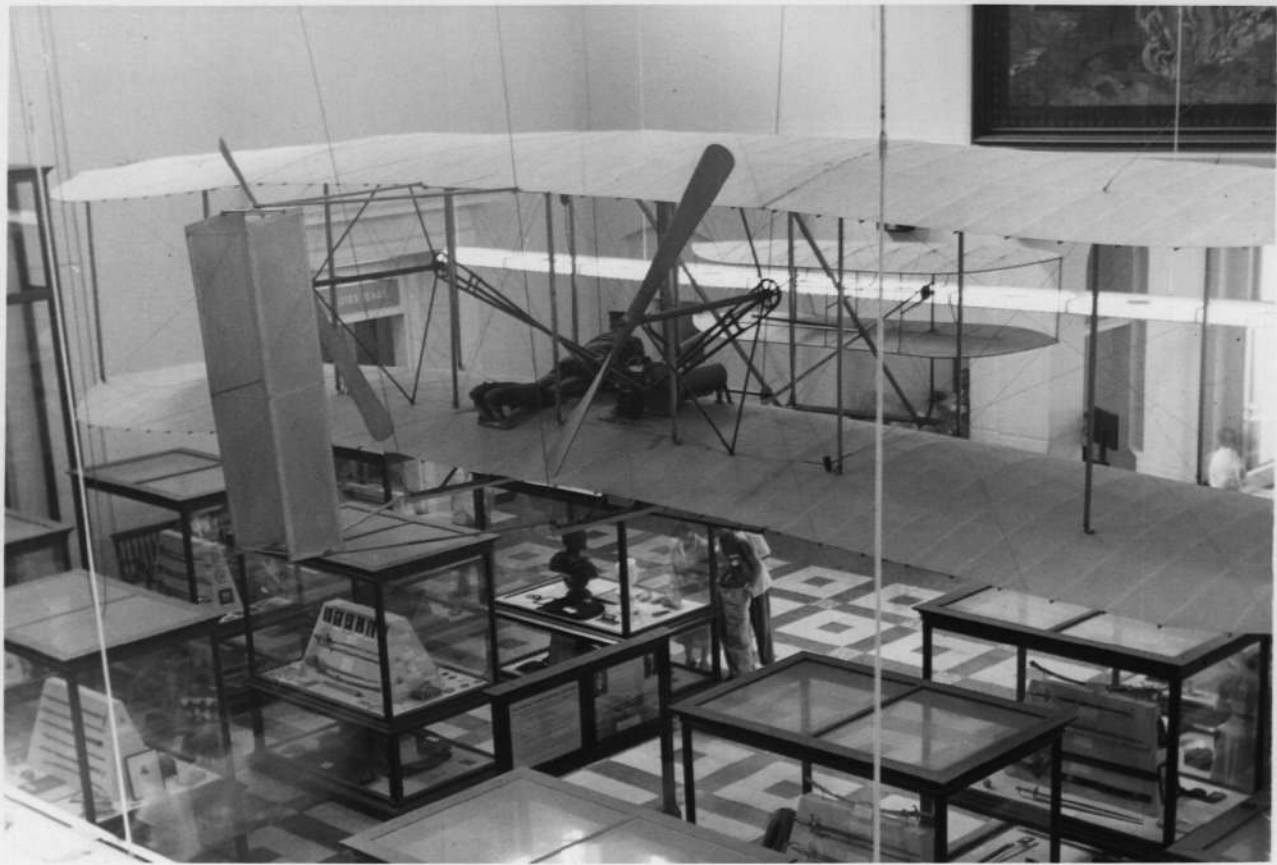


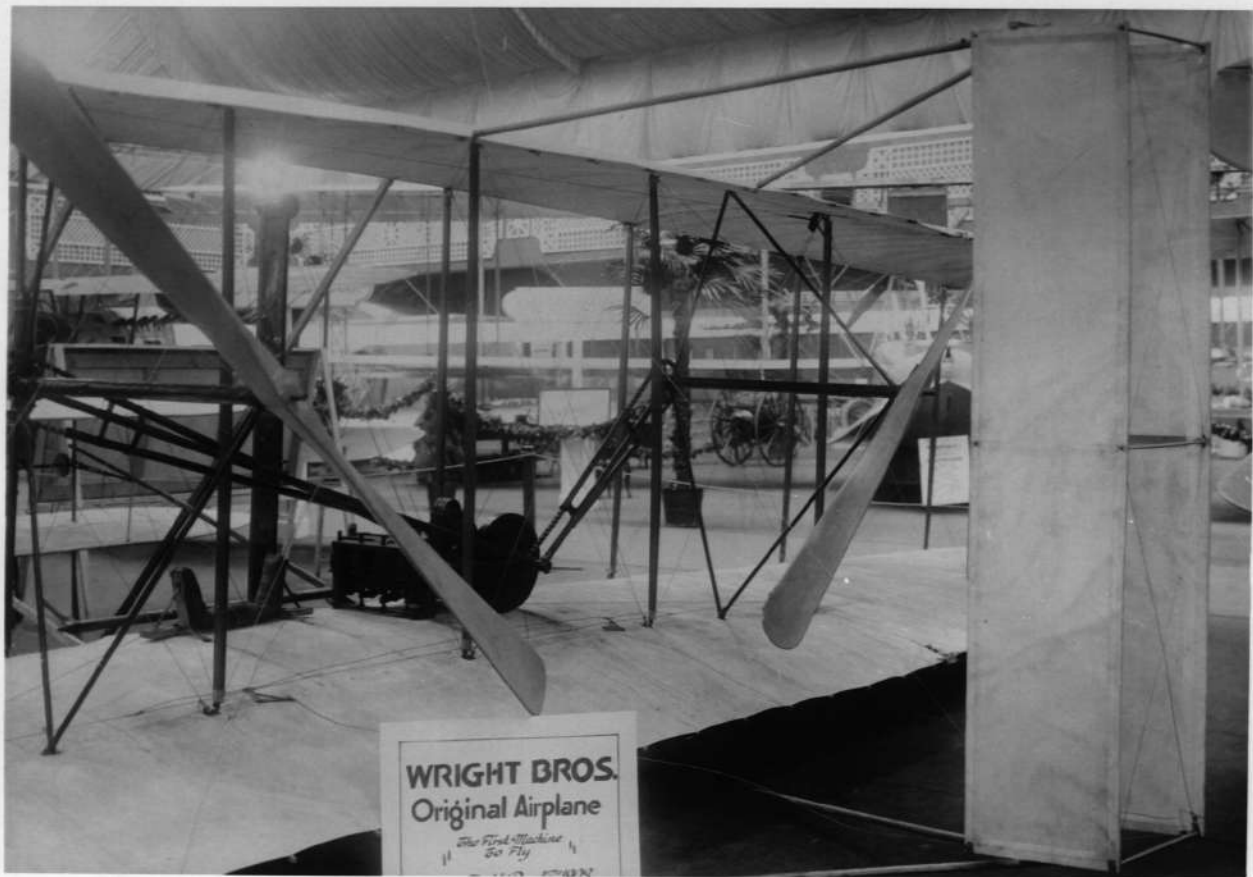


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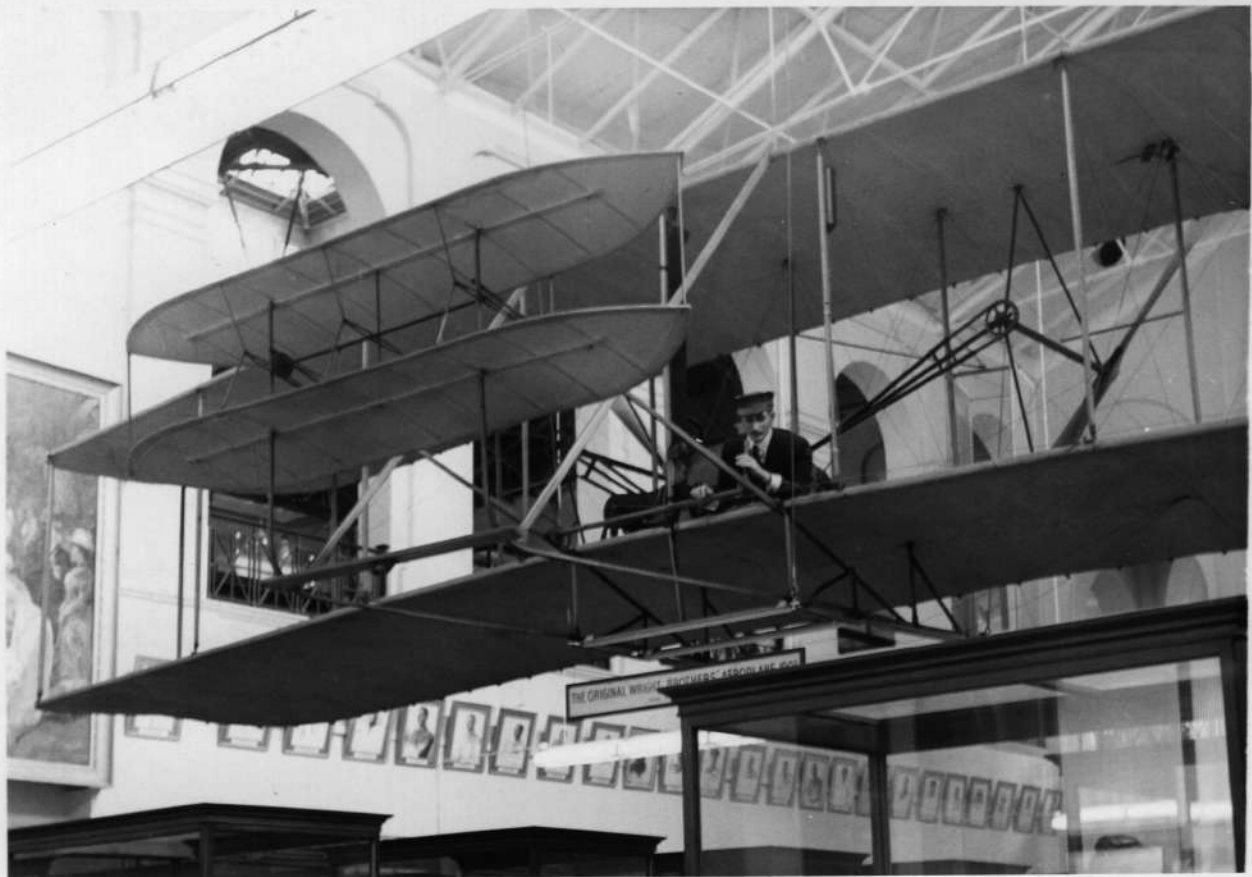


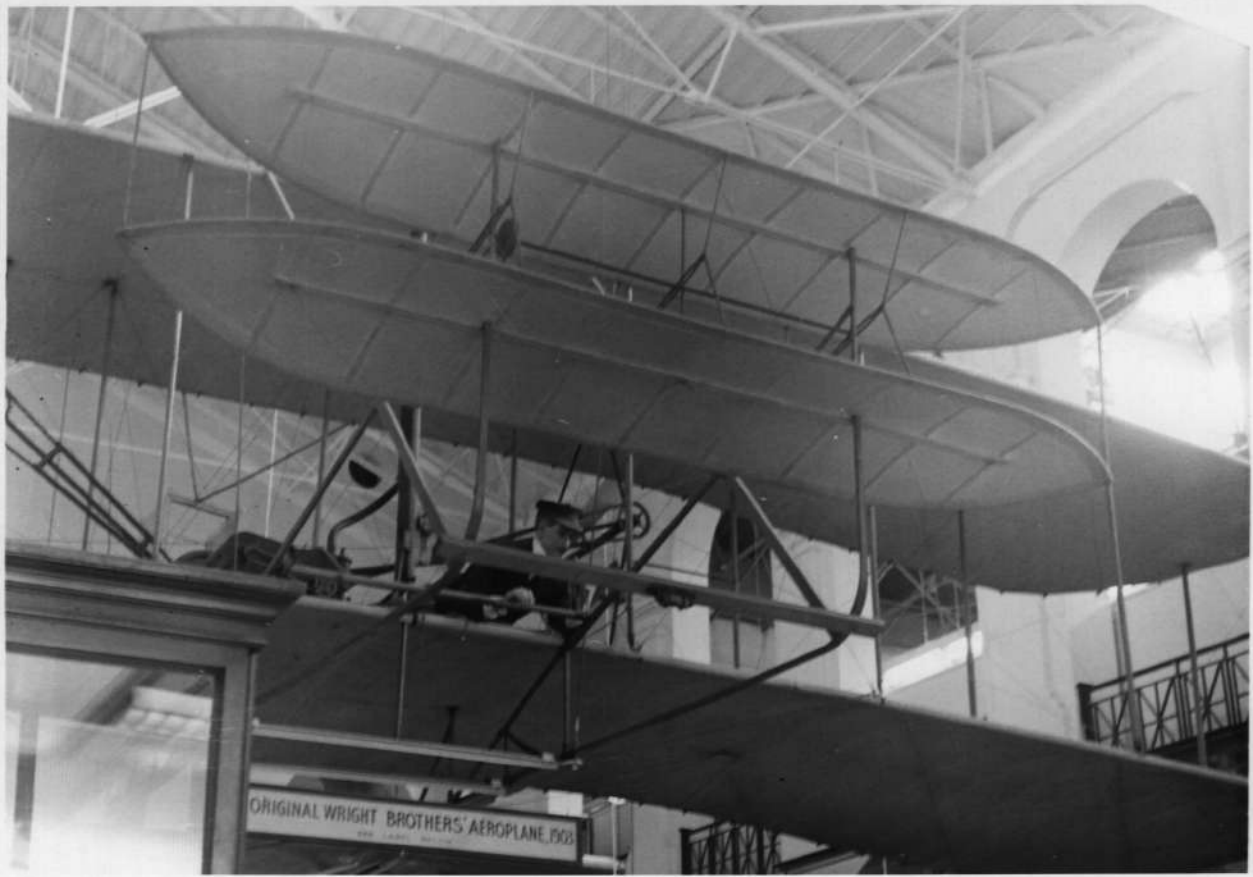


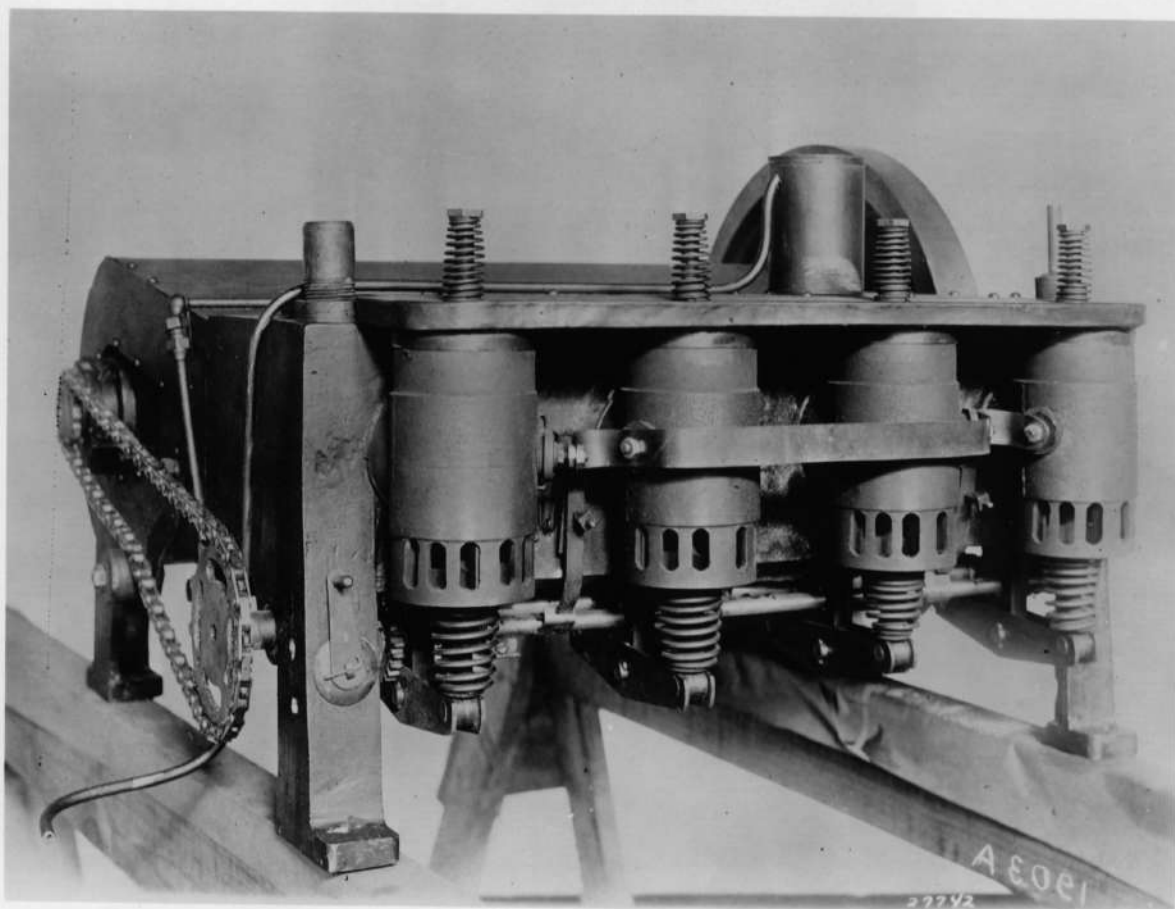


WRIGHT BROS.
Original Airplane

*The First Machine
For Fly*





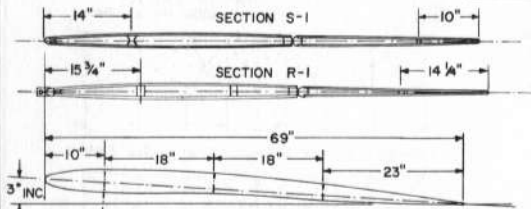


GENERAL SPECIFICATIONS

WEIGHT EMPTY	1725 lbs
USEFUL LOAD	595 "
GROSS WEIGHT	2320 "
ENDURANCE AT CRUISE 63mph	6 hrs
WING AREA (AILERONS EXCLUDED)	430 sq. ft.
AREA OF AILERONS (4)	64.6 sq. ft.
WING LOADING	5.86 lbs/sq. ft.
POWER LOADING	16.86 " " "
TOP SPEED	90 mph

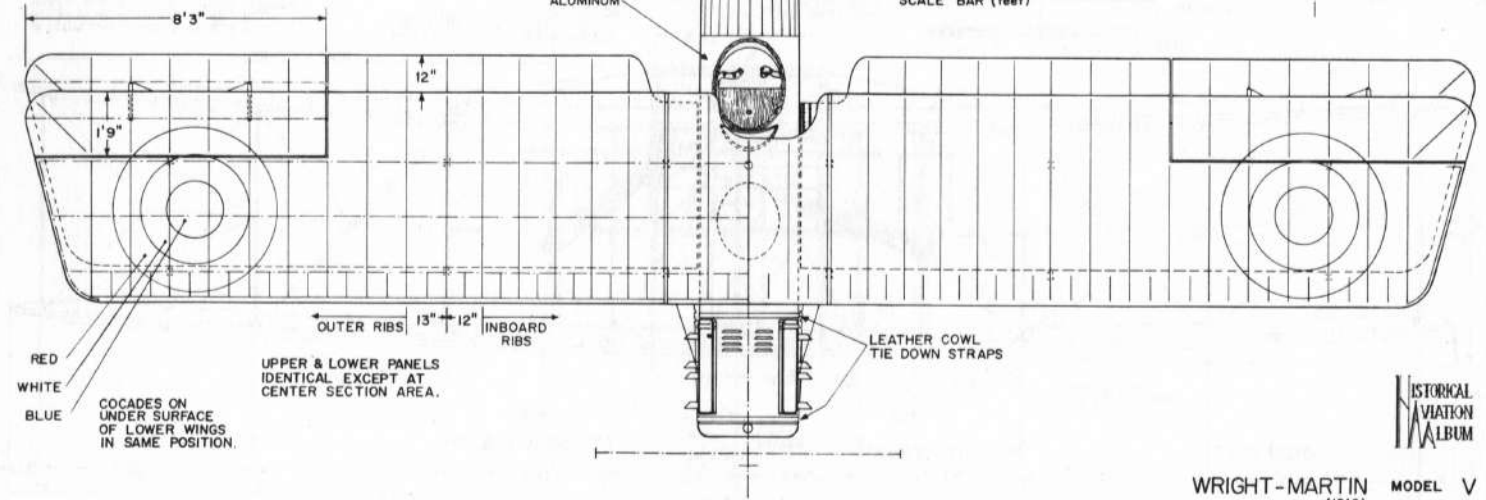
MAIN CONSTRUCTION,
ASH, SPRUCE & POPLAR,
LINEN COVERED & DOPED

SECTIONS BELOW, TWICE SCALE



"VOUGHT AIRFOIL"
(MODIFIED R A F - 15)

3-SPAR WING CELLULE, CENTER SPAR (FALSE) NON-BEARING



HISTORICAL
AVIATION
ALBUM

WRIGHT-MARTIN MODEL V
(1916)

SCALE: 1:48

PLATE I DRAWN BY: PAUL R. MATT © 1965

