PROFILE

Martin Mariner

Editors

Nico Braas

Srecko Bradic

The Martin Mariner story
From XPBM-1 to PBM-5

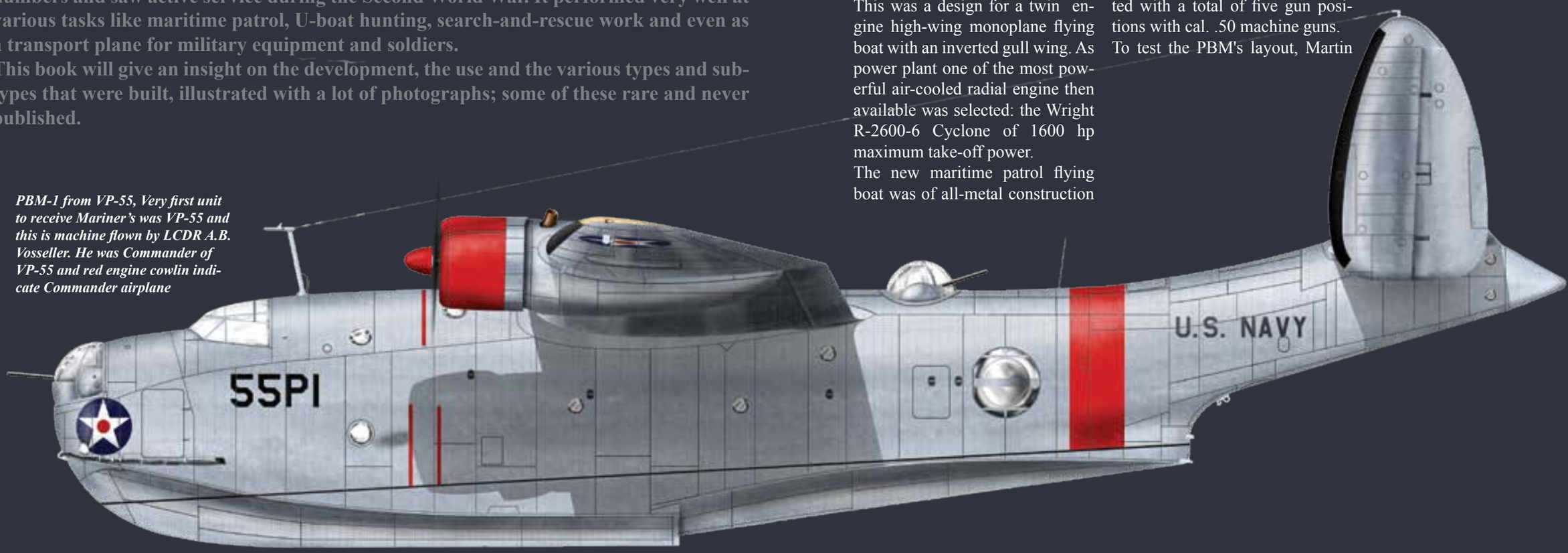
Introduction

The famous PBY Catalina flying boat has earned from the date it became operational (and that was already in 1936!) a reputation for its durability, reliability and performances that lasted even for years after the end of the Second World War in 1945. It was built in large numbers and saw action on both the Atlantic and Pacific areas in a number of roles.

Soon a more modern successor was designed and mass produced, but this type, the Martin PBM Mariner, gained for some obscure reasons much less fame than the Catalina.

This story will give the Mariner a little more credit on its side since it was far from a mediocre aircraft as sometimes stated. Just like the Catalina it was produced in large numbers and saw active service during the Second World War. It performed very well at various tasks like maritime patrol, U-boat hunting, search-and-rescue work and even as a transport plane for military equipment and soldiers.

This book will give an insight on the development, the use and the various types and subtypes that were built, illustrated with a lot of photographs; some of these rare and never published.



PBM-1 from VP-55, Very first unit to receive Mariner's was VP-55 and this is machine flown by LCDR A.B. Vosseller. He was Commander of VP-55 and red engine cowlin indicate Commander airplane

Early development and flying

The XPBM-1 prototype ashore on its beaching wheels photographed alongside its small 'sistership'. We can see that the wing floats could be retracted inwards

Recognizing that the venerable PBY Catalina flying boat had to be replaced by a more modern type, the Glenn Martin company started in 1937 the design of the Model 162.

This was a design for a twin engine high-wing monoplane flying boat with an inverted gull wing. As power plant one of the most powerful air-cooled radial engine then available was selected: the Wright R-2600-6 Cyclone of 1600 hp maximum take-off power.

The new maritime patrol flying boat was of all-metal construction with only, as usual at that time, all control surfaces covered with fabric. It had a central two-step hull and two stabilizing floats in the wings that were fully retractable. As defensive armament it was fitted with a total of five gun positions with cal. .50 machine guns.

To test the PBM's layout, Martin built a ⅜ scale flying model designated as the Martin 162A. It was fitted with a 120 hp Martin-built four-cylinder inverted in-line Chevrolet 4-333 engine buried amidships in the fuselage and

The Marin Model 162A 'Tadpole Clipper' 3/8 flying scale model for the Mariner. Tests supplied very valuable information. Although it looks to have two engines, the engine cowlings were just dummies. the engine was housed in the fuselage centre and drove the propellers with belts

A PBM-1 from VP-56 with early style U.S. markings

belt-driving two propellers fitted in wing nacelles. It only carried a pilot and was flown for the first time in December 1937 carrying the civil registration NX19168. It was not only flight tested but also extensively wind-tunnel tested. The flying model proved to be very useful. After the test program was completed it was donated to the Smitsonian Institution, but some years ago it was transferred to the Baltimore Museum of Industry and fully restored.

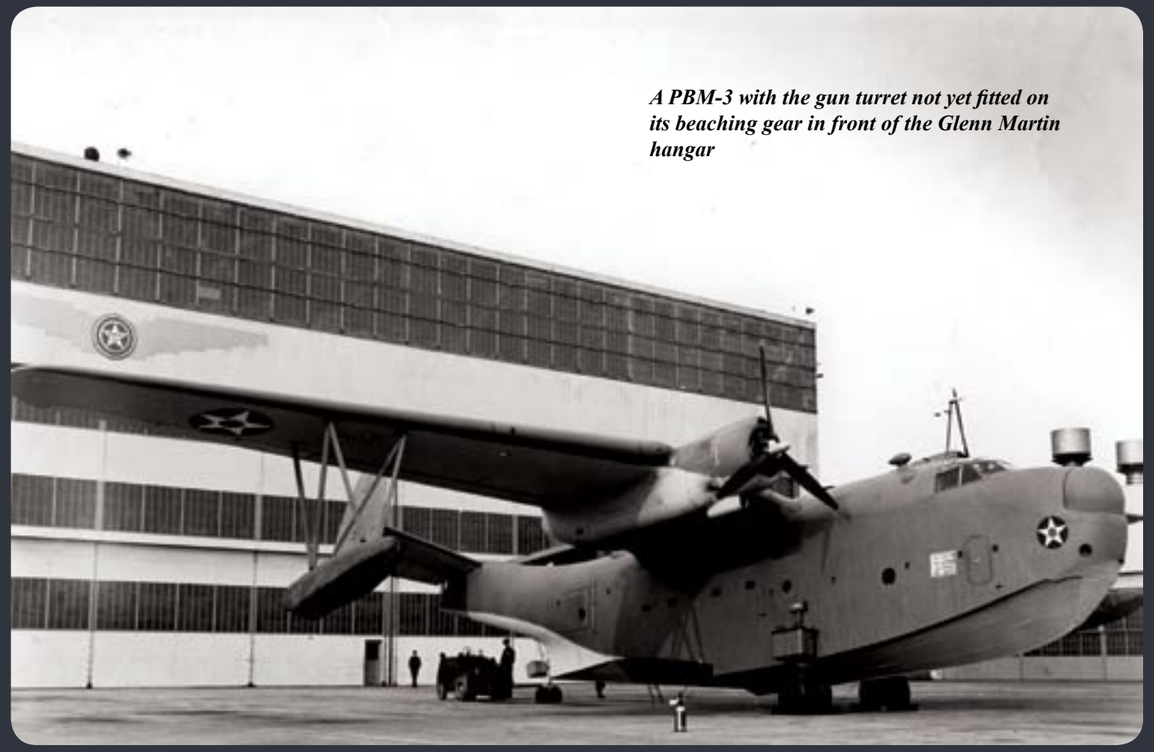
It was unofficially named 'Tadpole Clipper' and had a length of 8.68 m, a wingspan of 13.23 m and a height of 3.63 m. Loaded weight was 1279 kg.

Already before the Model 162A scale model was flown, Martin received on 30 June 1937 an order for a single prototype with U.S. Navy type designation XPBM-1. This was soon followed by an initial production order for 21 PBM-1 evaluation aircraft on 28 December 1937.

The XPBM-1, with BuAer registration no. 0796, made its first flight on 18 February 1939. Its engines were fitted with three-bladed propellers and initially it flew without any armament but with dummy turrets. Already during the early flight testing tail flutter was encountered. To solve this the tail was redesigned where the original flat horizontal tail surfaces were replaced by a new tail with a distinctive dihedral V-shape. The vertical tail sections remained their original perpendicular position which gave the Mariner its final distinctive shape. After the modifications were found to be satisfactory during the flight program, the XPBM-1 was used for armament trials during the war period under the designation XPBM-1A.

Into production and service

A beautiful shot of PBM-1 BuAer No. 1263 from VP-55 being hoisted aboard U.S. Navy vessel AV-5. Note blister on the fuselage side with a cal. .50 machine gun protruding!



A PBM-3 with the gun turret not yet fitted on its beaching gear in front of the Glenn Martin hangar

The first PBM-1 Mariners entered service on 1 September 1940 with Patrol Squadron Fifty-Five (VP-55) of the U.S. Navy. The PBM-1 was, just like the XPBM-1 prototype, fitted with retractable wing stabilizer floats that were hinged inboard, like the Catalina. VP-55 used the PBM-1's to carry out neutrality patrol over the Atlantic and was not only based on U.S. shores but they also operated from Iceland. After the Japanese attack on Pearl Harbour the U.S.A. became directly involved in the Second World War and most PBM-1's were fitted with bombs and depth charges. The PBM-1 Mariner scored its first kill on 30 June 1942 when it sunk the German submarine U-158 near Bermuda. The PBM-1 was flown by Lt. Richard E. Schreder and was operated by VP-74 squadron (which was earlier known asVP-55). It was the first submarine sunk by a U.S. Navy seaplane, the third by a U.S. Navy aircraft and the fifth scored by U.S. forces. This was not the last one and over the next war years, the Mariner would score more U-boat kills!

The next version was the PBM-2 with increased fuel capacity. With a capacity of 4815 U.S gallons (18,227 litres) it had almost doubled the original fuel capacity of the PBM-1 of 2700 U.S. gallons (or 10,220 litres). The PBM-2 also had a strengthened airframe structure and attachments for catapult launches. Only one prototype XPBM-2 was built from a standard PBM-1 (BuAer no. 1247) but it was never ordered for series production. The single XPBM-2 prototype was assigned for a short period to VP-56, but ended at the NAMC (National Air Material Command) at the U.S. Navy yard at Philadelphia. It was stricken off charge on 30 June 1944.

The PBM-3 (Model 162B) had fixed floats of an improved and larger type and had the fuselage three feet (91.4 cm) longer than that of the PBM-1. Advantage was that the extra space in the wings no longer needed for the wing floats could be used for extra fuel. Martin proposed even a PBM-3 version fitted with extra saddle tanks alongside the hull, but these tanks were never used. The PBM-3 was fitted with more powerful R-2600-12 engines giving 1,700 hp take-off power. Even with the tail of the original XPBM-1 changes from straight to V-shaped, there still were minor tail flutter problems under some flying conditions. To cure this, Martin test pilot Sam Shannon proposed the use of small vortex airfoil sections on top and below the horizontal tails and anchored in the vertical tail sections. Shannon received a Martin company award for this, and the device became known as the 'Shannon vortex airfoil'.

Although the first PBM-3's rolled out by Martin retained the three-bladed propeller, production quickly moved to a four-bladed propeller, which became standard. Some PBM-3's were also fitted with engine cooling fans.

The PBM-3 was built in various versions:

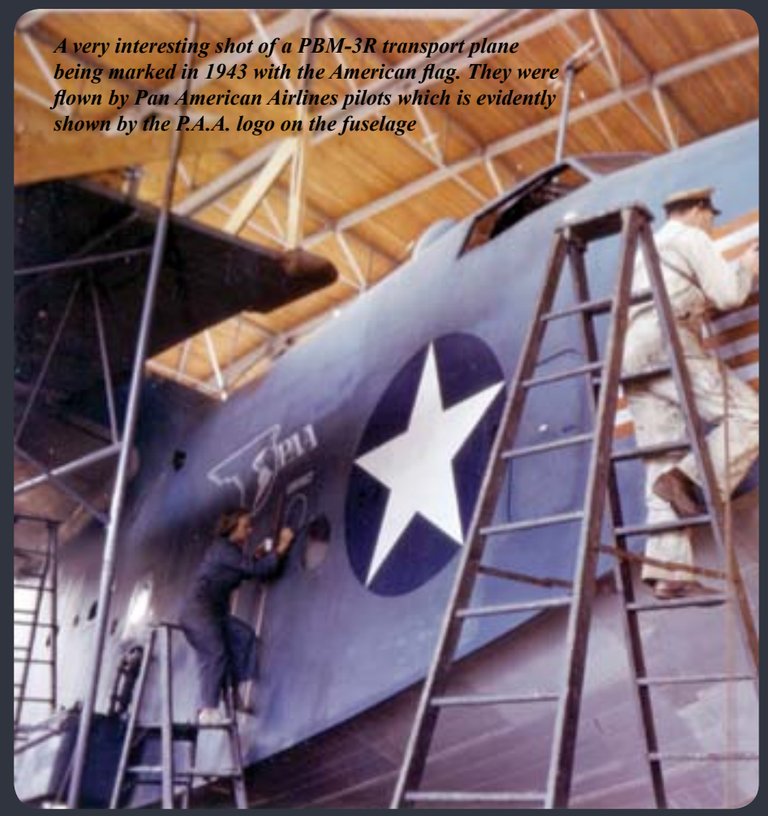
PBM-3B for the R.A.F. as Mariner GR.1A, but later returned to the U.S. Navy

PBM-3C (Model 162C) was an improved patrol version with twin .50 in machine guns in the nose and dorsal turrets, and single guns in tail turret and waist positions. It had an AN/APS-15 radar in a radome behind the cockpit.

PBM-3D (Model 162D) Patrol bomber version with increased power (two 1,900 hp R-2600-22s) and increased armament (twin 0.50 in machine guns in nose, dorsal and tail turrets, plus two waist guns).

PBM-3R (Model 162B) Unarmed transport version of PBM-3. Eigh-

A PBM-3 image 'photoshopped' by Martin's photo laboratory with two fuselage mounted extra saddle tanks. They were never used....



A very interesting shot of a PBM-3R transport plane being marked in 1943 with the American flag. They were flown by Pan American Airlines pilots which is evidently shown by the P.A.A. logo on the fuselage

A PBM-5S with radar equipment from VP-202. The picture was taken in 1943 at Pensacola and shows the Mariner being readied for flight with the anchor almost fully inside

Production numbers of all types:

Model 162A	1	flying 3/8 scale model NX19168
XPBM-1	1	Initial prototype
PBM-1	21	Initial production machine
XPBM-2	1	Long-range catapult launch experiment
PBM-3	32	Fixed floats, improved engines & armament
PBM-3C	274	AN/APS-15 radar, improved armour & armament
PBM-3D	259	More armour & armament
XPBM-3E	1	Prototype for PBM-3C
PBM-3R	18	Transport, 31 more converted from PBM-3's
PBM-3S	94	Stripped-down antisubmarine version
PBM-4	-	not built; order for 180 cancelled
PBM-5	628	Improved engines and JATO capability
XPBM-5A	1	prototype for amphibious variant
PBM-5A	36	Amphibious variant
Total	1,366	

teen were build new and an additional 31 were converted from the PBM-3PBM-3.

PBM-3S (Model 162C) A stripped down anti-submarine aircraft with reduced armament (2× fixed 0.50 in machine guns in nose, single machine gun in port waist position and single gun in tail turret) and increased range.

With in total 677 machines built in all versions it was widely used during the war years for various tasks

The PBM-4 (Model 162E) was a proposed version with two 2,700 hp Wright R-3350-8 engines that was never built and a contract for 180 aircraft from 1941 was cancelled.

The last Mariner version built was the PBM-5, that was again supplied as various sub-versions.

PBM-5 (Model 162F) Basic version with 2100 hp Pratt & Whitney R-2800 engines.

PBM-5A (Model 162G) Amphibian version of PBM-5, with retractable nosewheel undercarriage. Although the wheel equipment added some 1900 kg extra weight, it was fitted with the same 2100 hp R-2800 engines as the flying boat version.

PBM-5E Variant of PBM-5 with improved radar.

PBM-5S Lightened anti-submarine version of PBM-5.

PBM-5S2 Improved anti-submarine aircraft with revised radar installation; used in the Korean War.

The PBM-5 was supplied to the U.S. Navy from August 1944 on. but a large number was built after the end of the war.

The last of the PBM-5 production models, BuAer no. 98616, was re-built as the Martin Model 237 XP5M-1 Marlin prototype. The Marlin was the final successor of the Mariner that went into service at the U.S. Navy and Coast Guard in 1951. It was the last operational flying boat from the U.S.Navy.

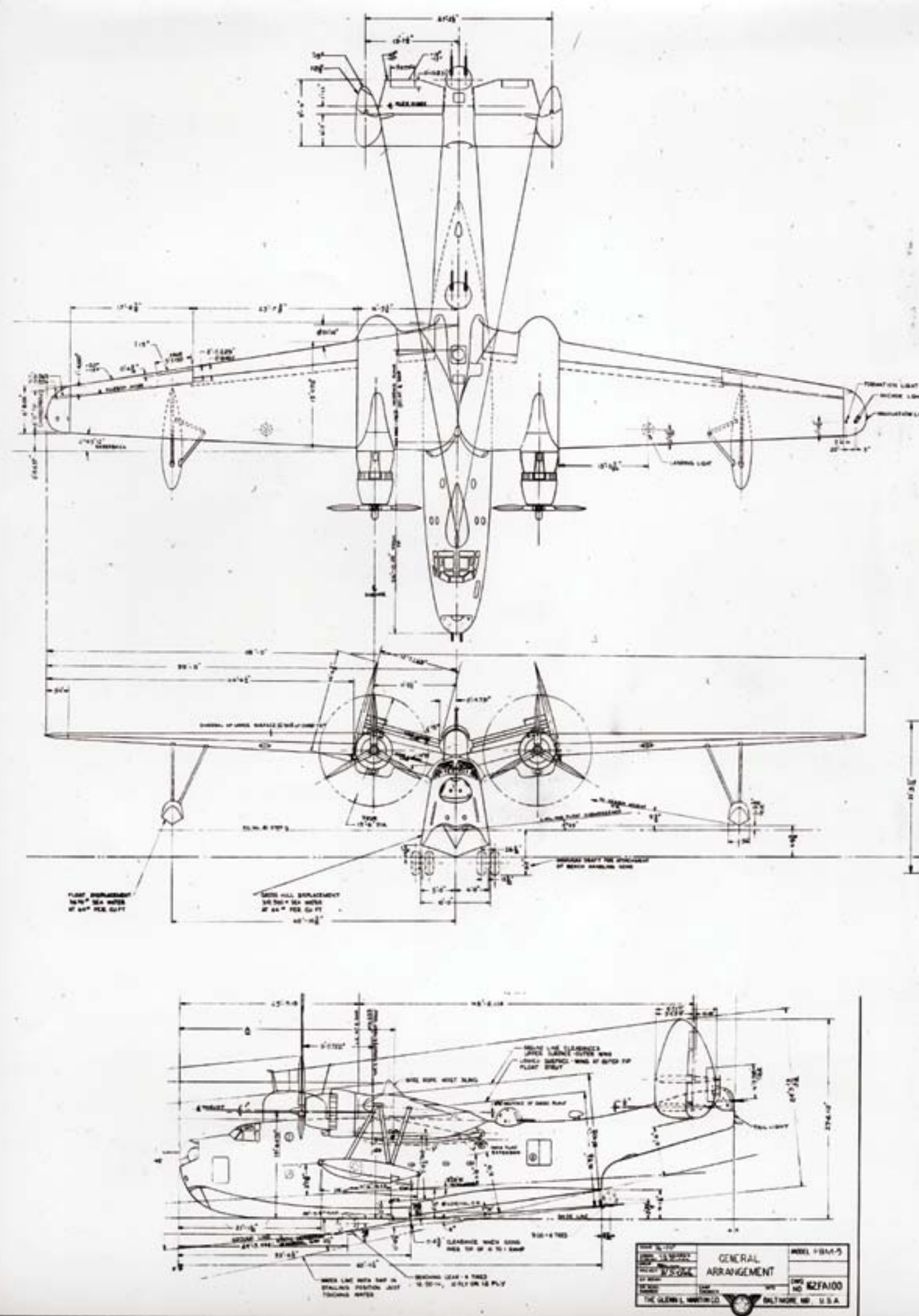
This is how the Mariners were used in the large Pacific area: it operated from an aircraft tender housing two Mariners. In this case they are PBM-3's in non-specular U.S. Navy blue.

Known BuAer serial numbers for U.S Navy mariners:

XPBM-1: 0796
PBM-1: 246, 1248-1266
XPBM-2: 1247
PBM-3C: 6506-6754,01650- 01673
PBM-3D: 45205-45274, 45277-45404, 48124, 48164-48223
XPBM-3E: 6456
PBM-3R: 6455, 6457-6504
PBM-3S: 01674-01728, 48125-48163
PBM-5: 45405-45444, 59000-59348, 84590-84789, 85136-85160, 98602-98616
XPBM-5A: 59349
PBM-5A: 122067-122086, 122468-122471, 122602-122613

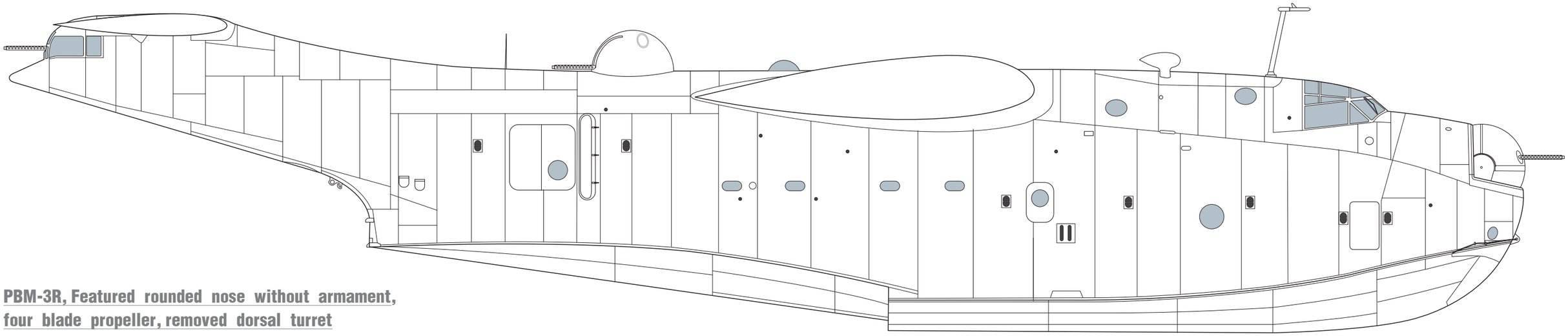
The U.S Navy registration numbers were assigned from 1921 by the U.S. Bureau of Aeronautics. They were abbreviated as 'BuAer No.' or even shorter as 'BuNo'.

A PBM-3D on the launching ramp at Norfolk. The photo was taken in 1945 and shows the Mariner in three tone colours dark blue/very light blue and white

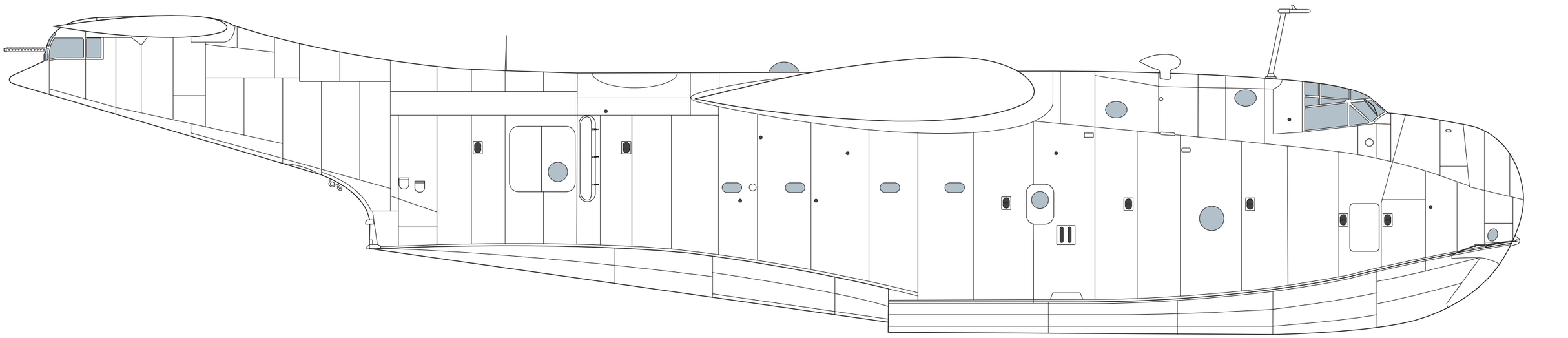


PBM-3 drawings

Initial version of the PBM-3, sharp fuselage end, old type of search systems, three blade propellers

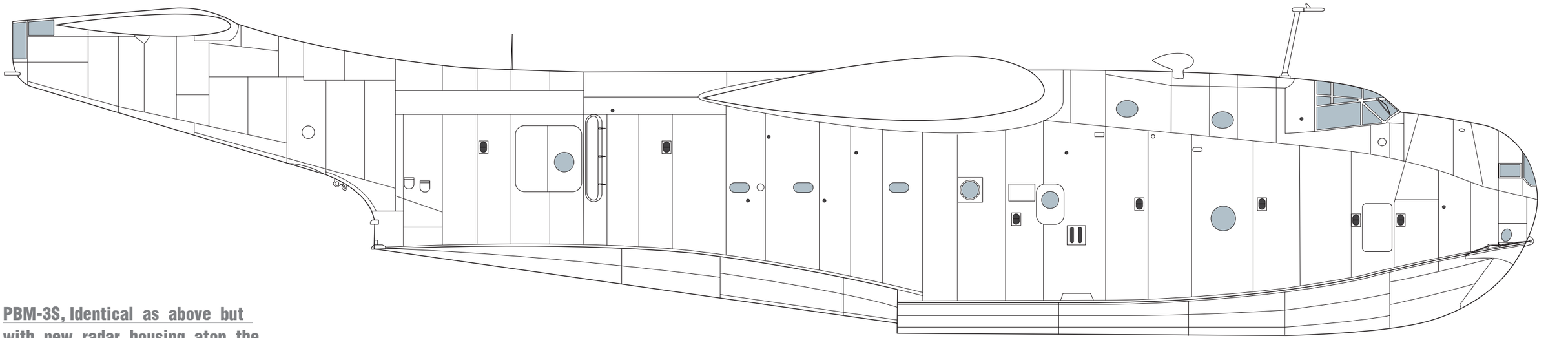


PBM-3R, Featured rounded nose without armament, four blade propeller, removed dorsal turret

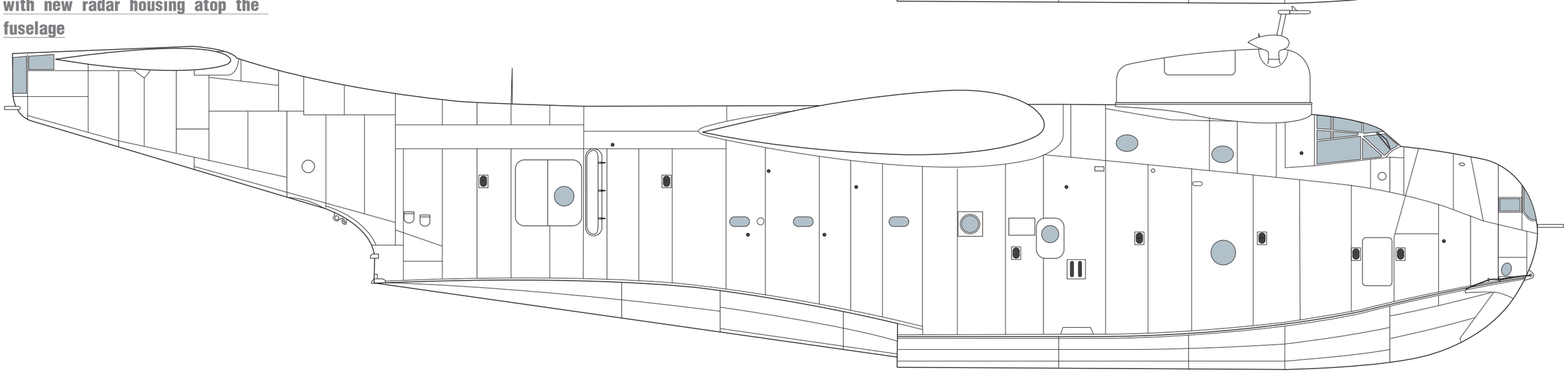


PBM-3 drawings

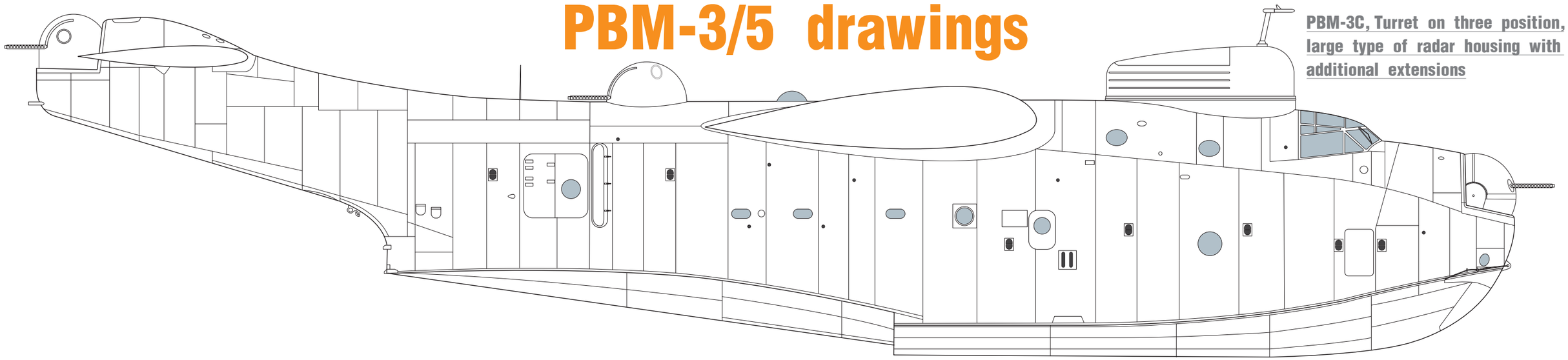
PBM-3S, Redesigned rear fuselage and old electronic systems



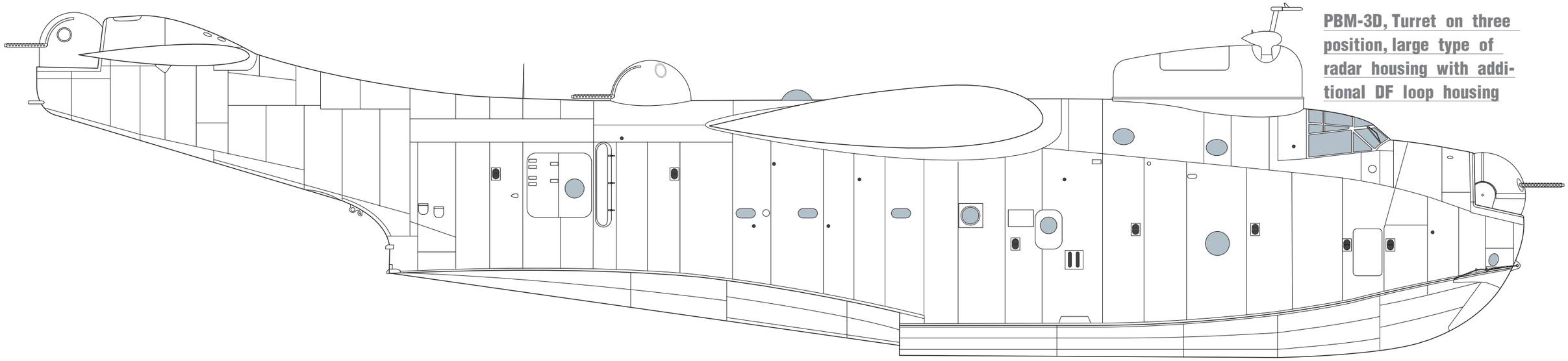
PBM-3S, Identical as above but with new radar housing atop the fuselage



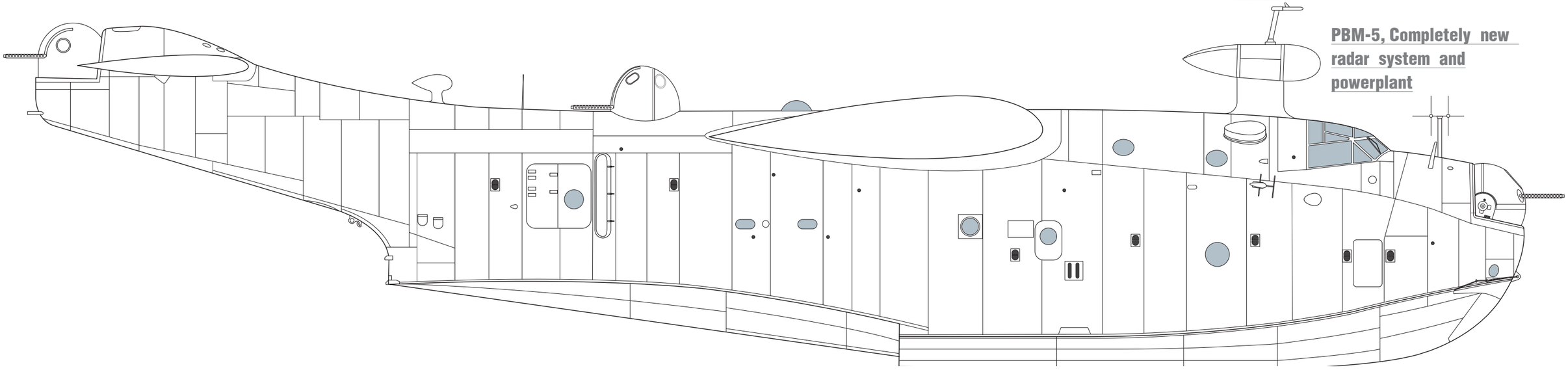
PBM-3/5 drawings



PBM-3C, Turret on three position, large type of radar housing with additional extensions



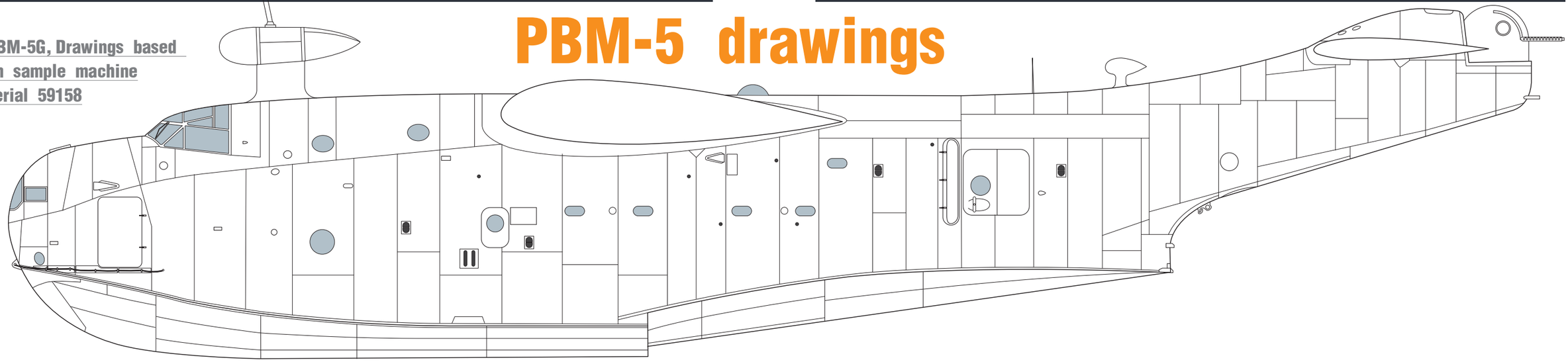
PBM-3D, Turret on three position, large type of radar housing with additional DF loop housing



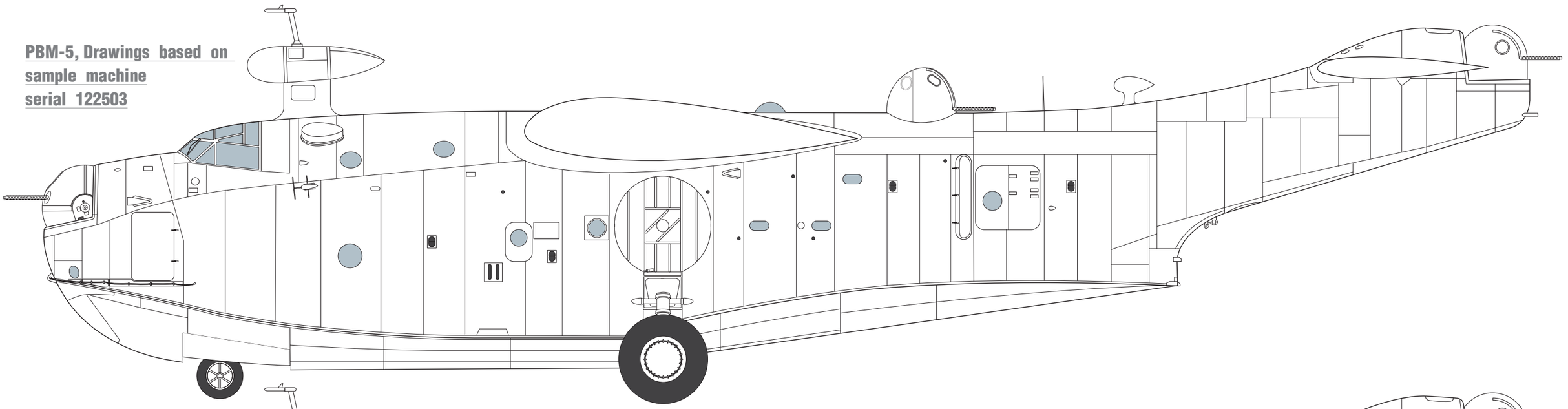
PBM-5, Completely new radar system and powerplant

PBM-5 drawings

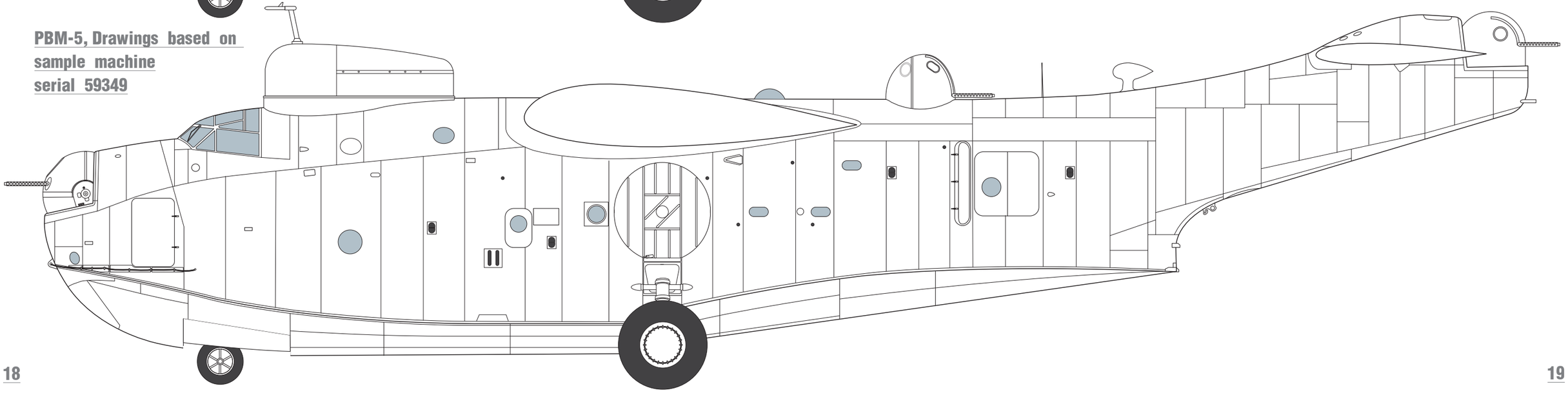
PBM-5G, Drawings based on sample machine serial 59158

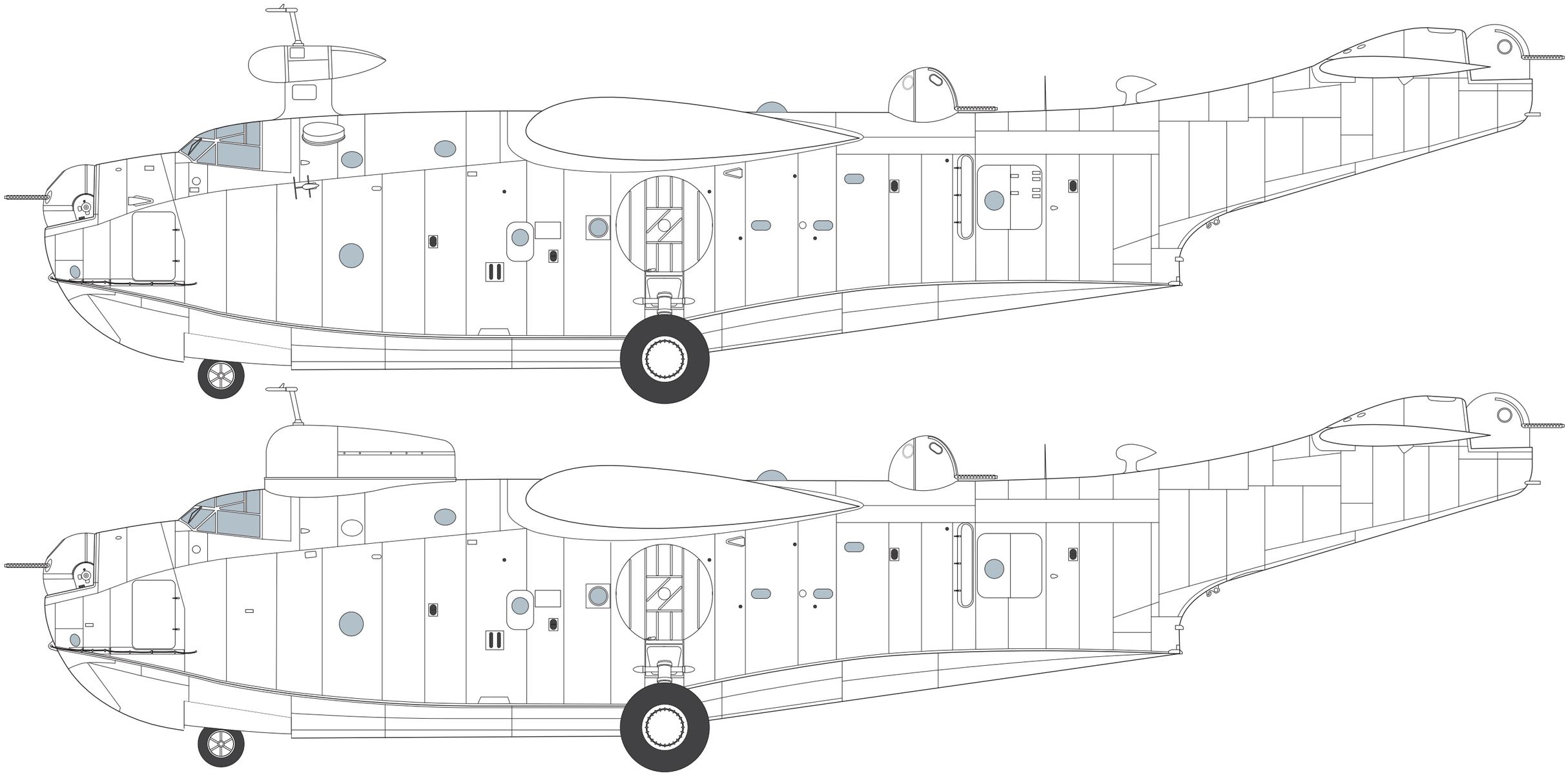


PBM-5, Drawings based on sample machine serial 122503

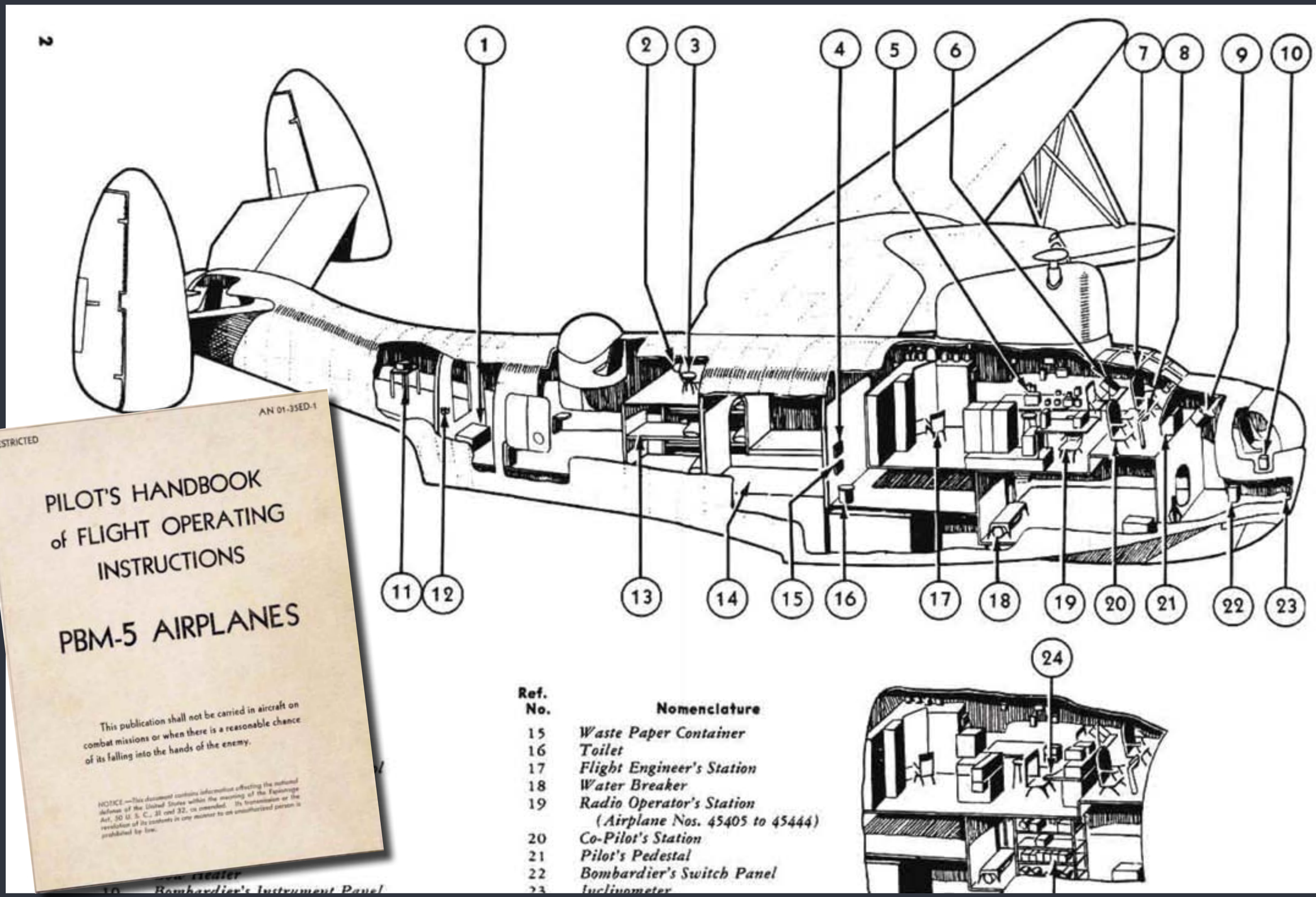


PBM-5, Drawings based on sample machine serial 59349





Manual extracts



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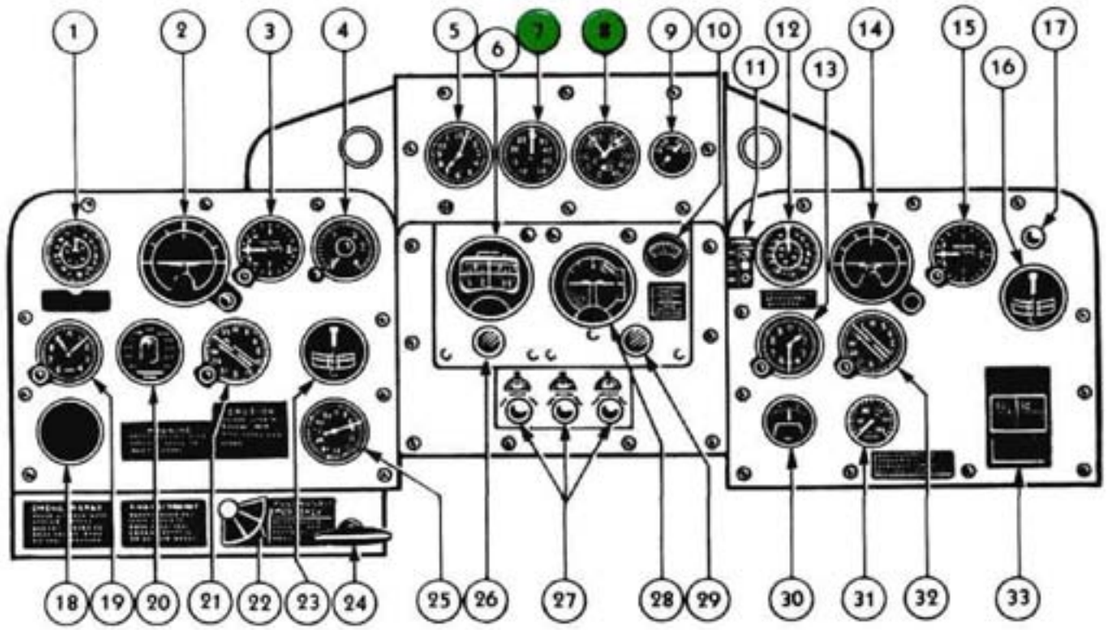
PILOT'S HANDBOOK
of FLIGHT OPERATING
INSTRUCTIONS

PBM-5 AIRPLANES

This publication shall not be carried in aircraft on combat missions or when there is a reasonable chance of its falling into the hands of the enemy.

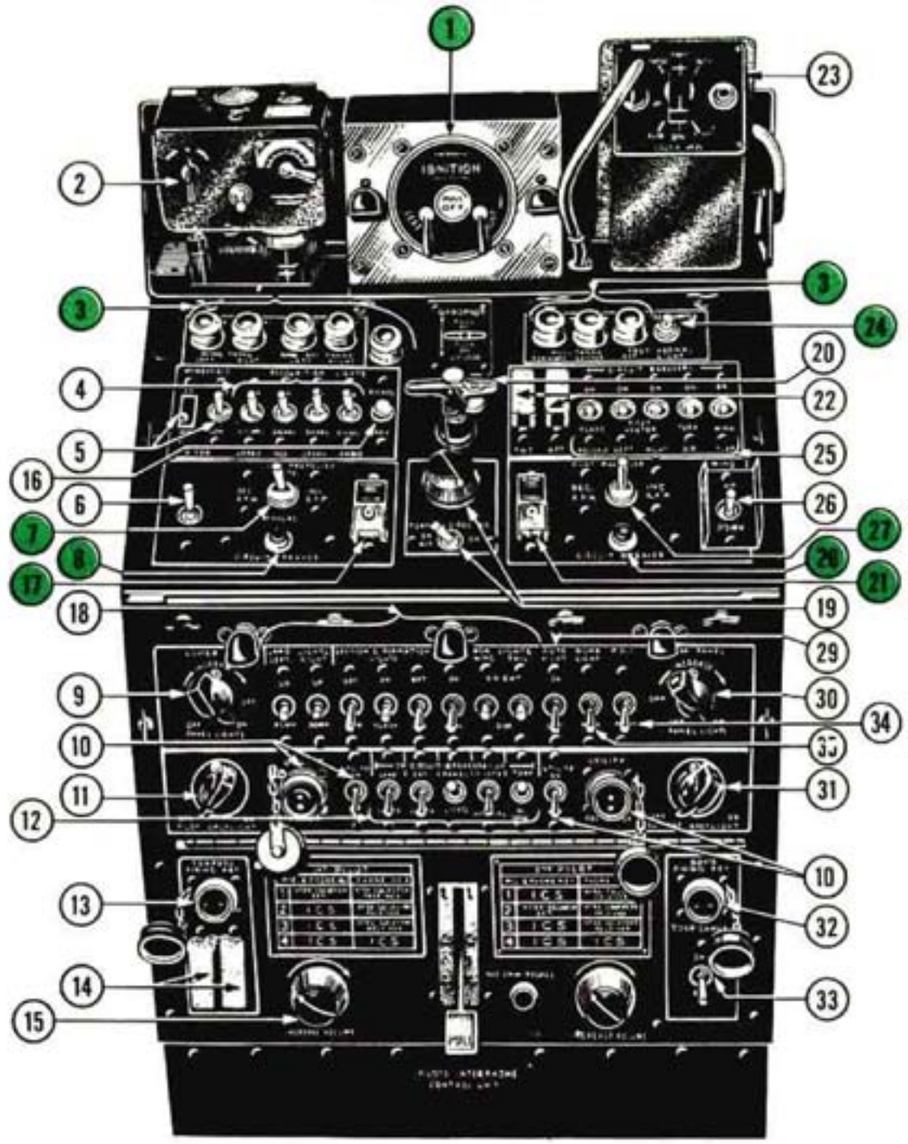
NOTICE.—This document contains information affecting the national defense of the United States within the meaning of the Espionage Act, 50 U. S. C., 31 and 32, as amended. Its transmission or the revelation of its contents in any manner to an unauthorized person is prohibited by law.

Ref. No.	Nomenclature
15	*Waste Paper Container*
16	*Toilet*
17	*Flight Engineer's Station*
18	*Water Breaker*
19	*Radio Operator's Station (Airplane Nos. 45405 to 45444)*
20	*Co-Pilot's Station*
21	*Pilot's Pedestal*
22	*Bombardier's Switch Panel*
23	*Inclinometer*



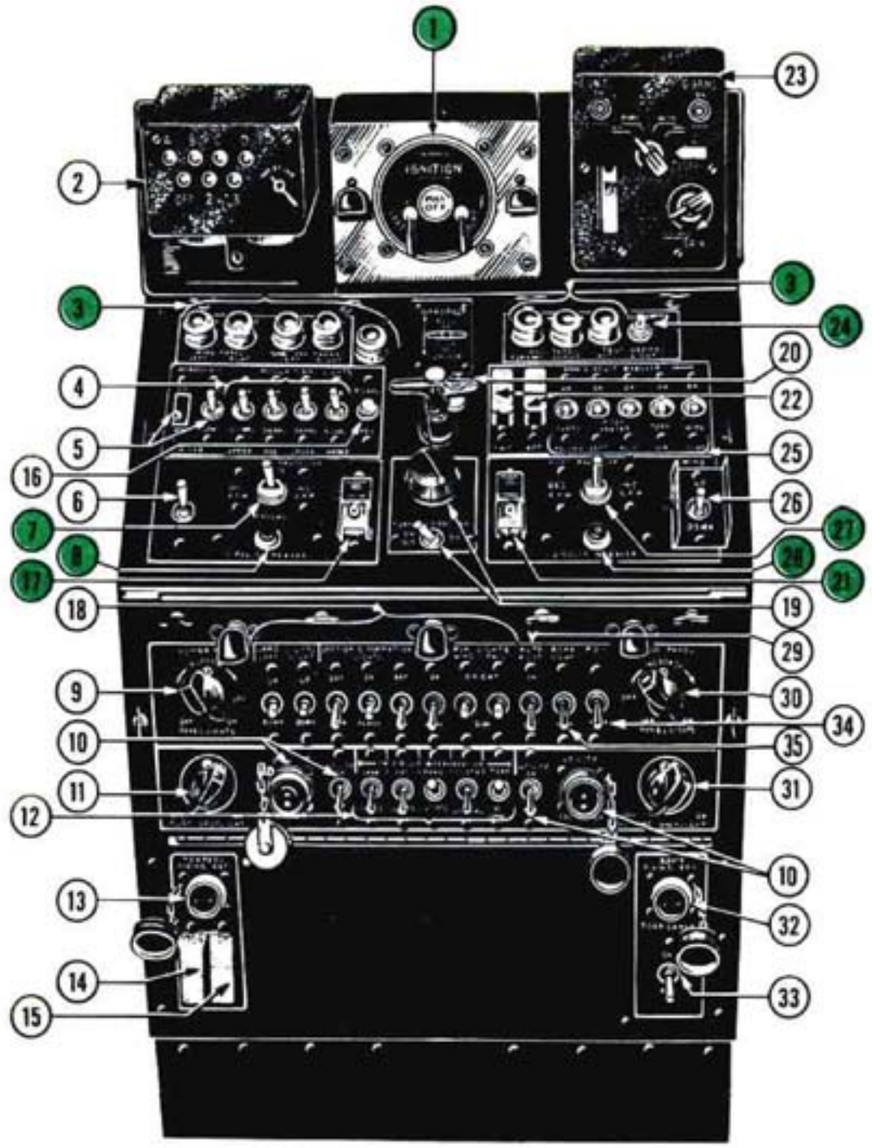
Ref. No.	Nomenclature	Ref. No.	Nomenclature
1	*Airspeed Indicator*	18	*Blind Landing Indicator*
2	*Gyro Horizon*	19	*Altimeter*
3	*Rate of Climb Indicator*	20	*Radio Altimeter Limit Switch*
4	*Radio Altimeter Indicator*	21	*Remote Reading Compass Indicator*
5	*Clock*	22	*Manual Bomb Bay Door Selector*
6	*Gyro Compass*	23	*Turn and Bank Indicator*
7	*Dual Manifold Pressure Gage*	24	*Manual Bomb Bay Jettison Control*
8	*Dual Tachometer and Synchroscope Indicator*	25	*Radio Compass Indicator (Airplane No. 9000 and subsequent)*
9	*Wing Flap Position Indicator*		
10	*Vacuum Gage*	26	*Auto Pilot Caging Switch*
11	*Radio Altimeter Indicator Lights*	27	*Servo Speed Control Valves*
12	*Airspeed Indicator*	28	*Auto Pilot Artificial Horizon*
13	*Altimeter*	29	*Auto Pilot Caging Knob*
14	*Gyro Horizon*	30	*Electric Air Temperature Indicator*
15	*Rate of Climb Indicator*	31	*Oil Pressure Gage*
16	*Turn and Bank Indicator*	32	*Remote Reading Compass Indicator*
17	*Marker Beacon Indicator*	33	*Mark 9 Compass*

Figure 15 — Pilot's Instrument Panel



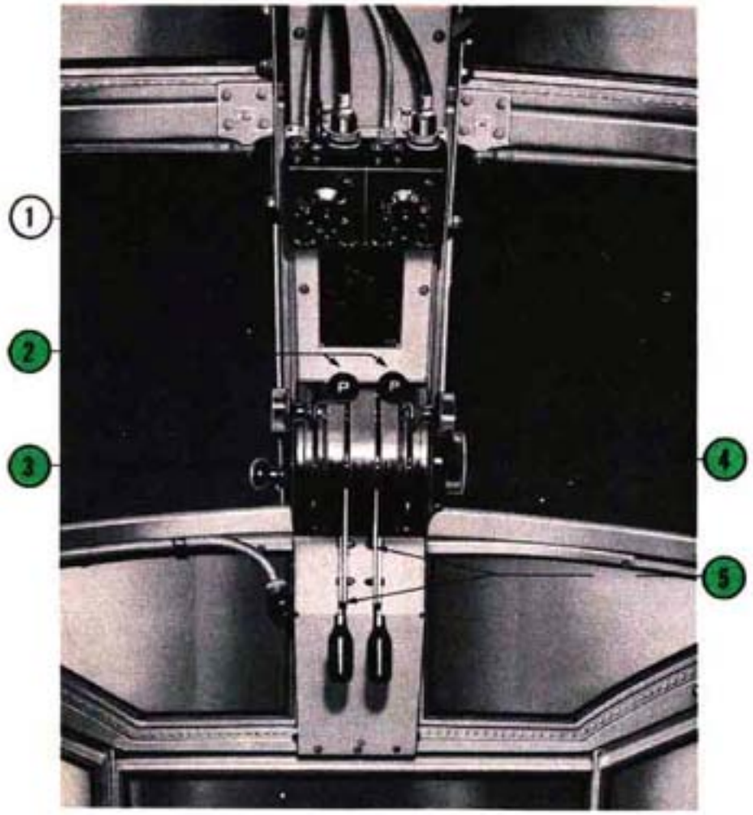
Ref. No.	Nomenclature	Ref. No.	Nomenclature
1	*Ignition Switches*	19	*Torpedo Director Switch and Rheostat*
2	*ATA Control*	20	*Automatic Pilot Lock*
3	*Fuel Level Warning Lights*	21	*R.H. Propeller Feather Switch*
4	*Recognition Light Switches*	22	*Flare Release Switches*
5	*Windshield Wiper Switches*	23	*Beam Filter Control*
6	*Pilot's Radio Power Switch*	24	*Fuel Level Warning Light Test Switch*
7	*L.H. Propeller Selector Switch*	25	*Circuit Breaker Switches*
8	*L.H. Propeller Circuit Breaker Button*	26	*Wing Flap Control Switch*
9	*Lower Panel Light Switch and Rheostat*	27	*R.H. Propeller Selector Switch*
10	*Utility Receptacle and Switch*	28	*R.H. Propeller Circuit Breaker Button*
11	*Pilot's Fluorescent Light Switch*	29	*Automatic Pilot Switch*
12	*Circuit Breaker Switches*	30	*Co-Pilot's Fluorescent Light Switch*
13	*Torpedo Firing Key Receptacle*	31	*Co-Pilot's Spotlight Switch and Rheostat*
14	*Torpedo Release Switches*	32	*Bomb Firing Key Receptacle*
15	*Pilot's Interphone Control Box*	33	*Torpedo Camera Switch*
16	*Recognition Light Signal Key*	34	*P. D. I. Switch*
17	*L.H. Propeller Feather Switch*	35	*Bomb Sight Switch*
18	*Exterior Lighting Switches*		

Figure 16 — Pilot's Pedestal (Airplanes Nos. 45405 to 45444)

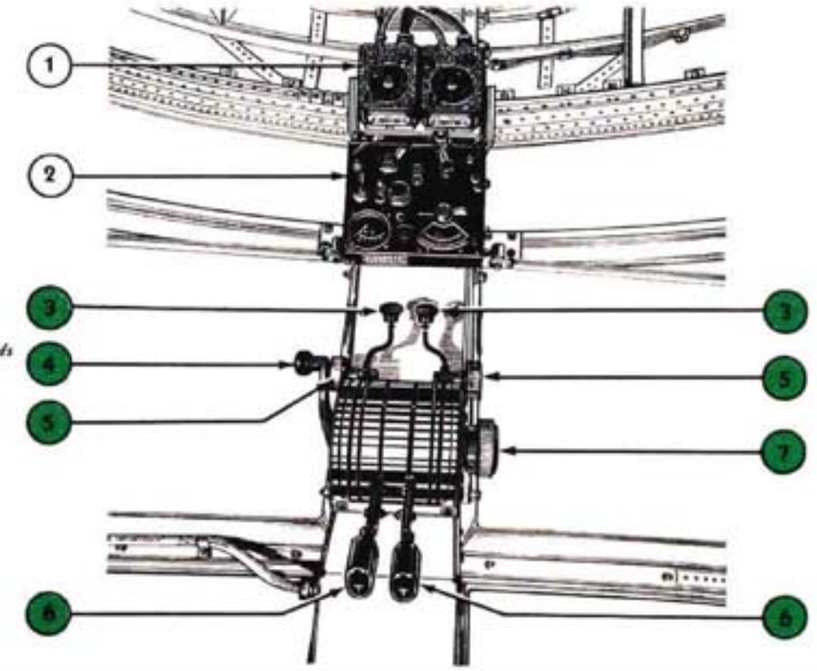


Ref. No.	Nomenclature
1	*Ignition Switches*
2	*Intersquadron Transmitter Control*
3	*Fuel Level Warning Lights*
4	*Recognition Light Switches*
5	*Windshield Wiper Switches*
6	*Pilot's Radio Power Switch*
7	*L.H. Propeller Selector Switch*
8	*L.H. Propeller Circuit Breaker Button*
9	*Lower Panel Light Switch and Rheostat*
10	*Utility Receptacle and Switch*
11	*Pilot's Fluorescent Light Switch*
12	*Circuit Breaker Switches*
13	*Torpedo Firing Key Receptacle*
14	*Left Torpedo Release Switch*
15	*Right Torpedo Release Switch*
16	*Recognition Light Signal Key*
17	*L.H. Propeller Feather Switch*
18	*Exterior Lighting Switches*
19	*Torpedo Director Switch and Rheostat*
20	*Automatic Pilot Lock*
21	*R.H. Propeller Feather Switch*
22	*Flare Release Switches*
23	*AN/APX-2 Control*
24	*Fuel Level Warning Light Test Switch*
25	*Circuit Breaker Switches*
26	*Wing Flap Control Switch*
27	*R.H. Propeller Selector Switch*
28	*R.H. Propeller Circuit Breaker Button*
29	*Automatic Pilot Switch*
30	*Upper Panel Light Switch and Rheostat*
31	*Co-Pilot's Fluorescent Light Switch*
32	*Bomb Firing Key Receptacle*
33	*Torpedo Camera Switch*
34	*P.D.I. Switch*
35	*Bomb Sight Switch*

Figure 17 — Pilot's Pedestal (Airplane No. 59000 and Subsequent)



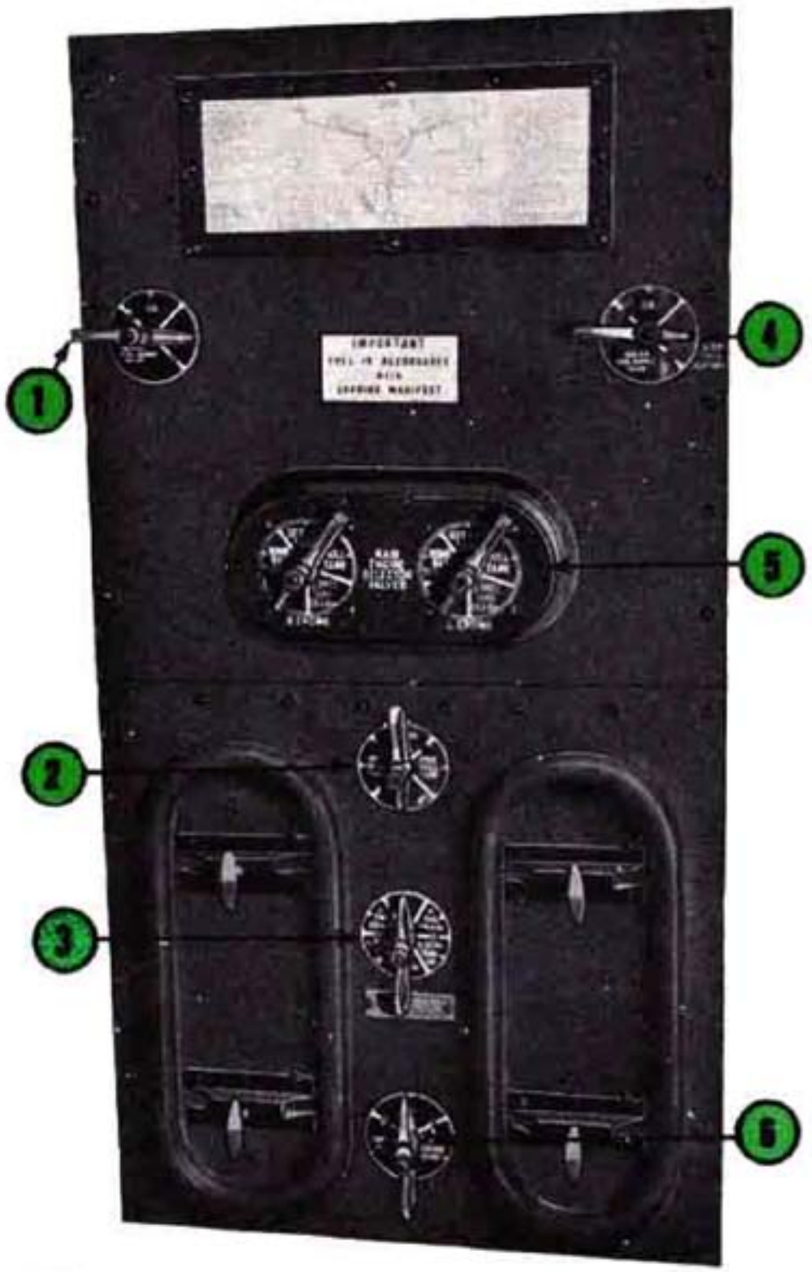
Ref. No.	Nomenclature
1	*ARA Controls*
2	*Propeller Governor Controls*
3	*Friction Release Clutch*
4	*Friction Adjustment Knob*
5	*Throttle Control Levers*



Ref. No.	Nomenclature
1	*AN/ARC-5 Remote Control Heads*
2	*SCR-269-G Control Box*
3	*Propeller Governor Control*
4	*Friction Release Clutch*
5	*Governor Adjustment Knob*
6	*Throttle Control Lever*
7	*Friction Adjustment Knob*

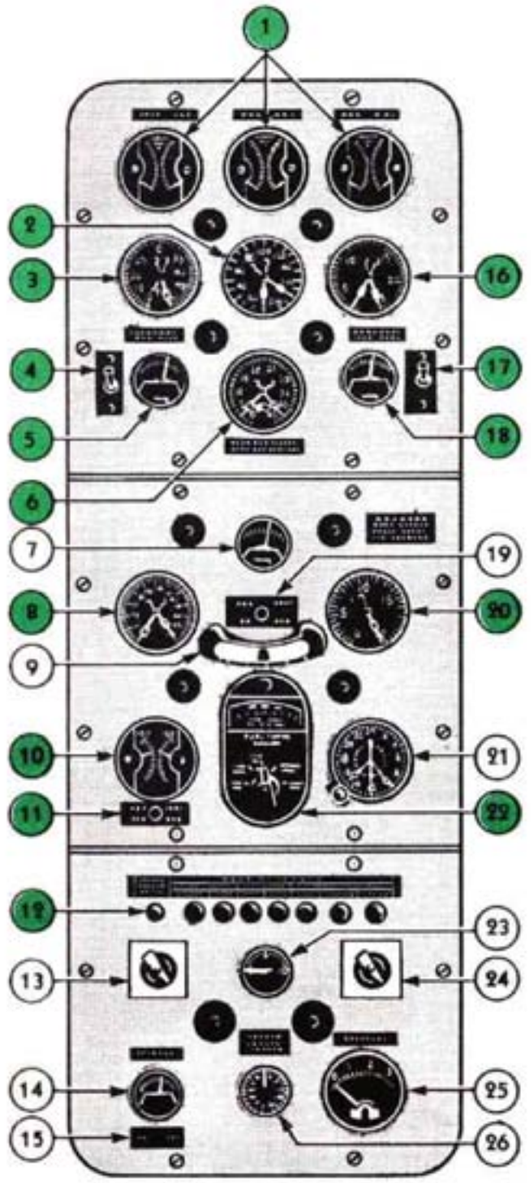
Figure 23

Pilot's Overhead Controls (Airplane No. 59000 and Subsequent)



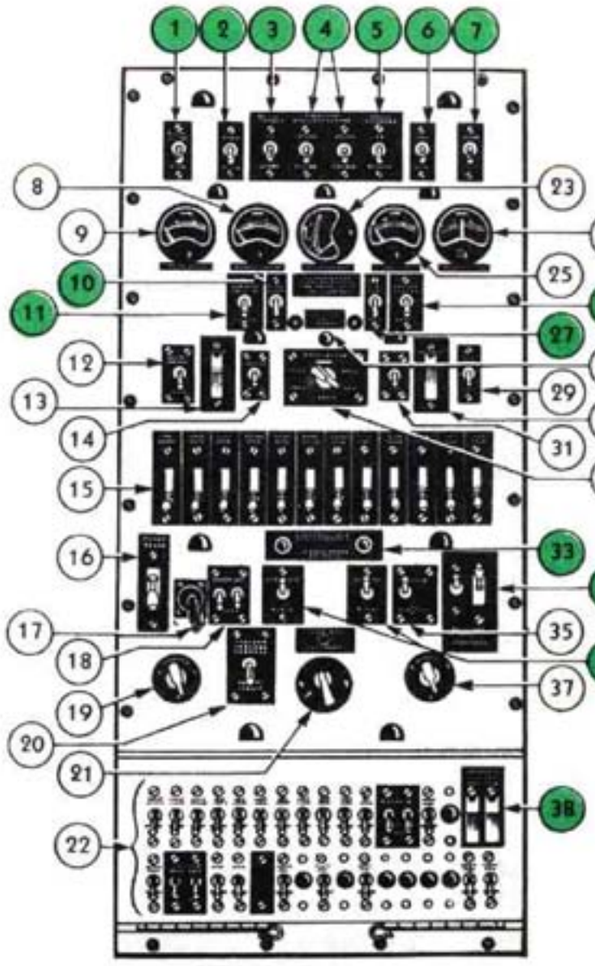
Ref. No.	Nomenclature
1	*Heater Fuel Supply Valve*
2	*Hull Tank Selector Valve*
3	*Strainer and Wing Tank Sump Drain Valve*
4	*Auxiliary Power Plant Fuel Supply Valve*
5	*Main Engine Selector Valves*
6	*Crossover Valve*

Figure 26 — Fuel System Controls



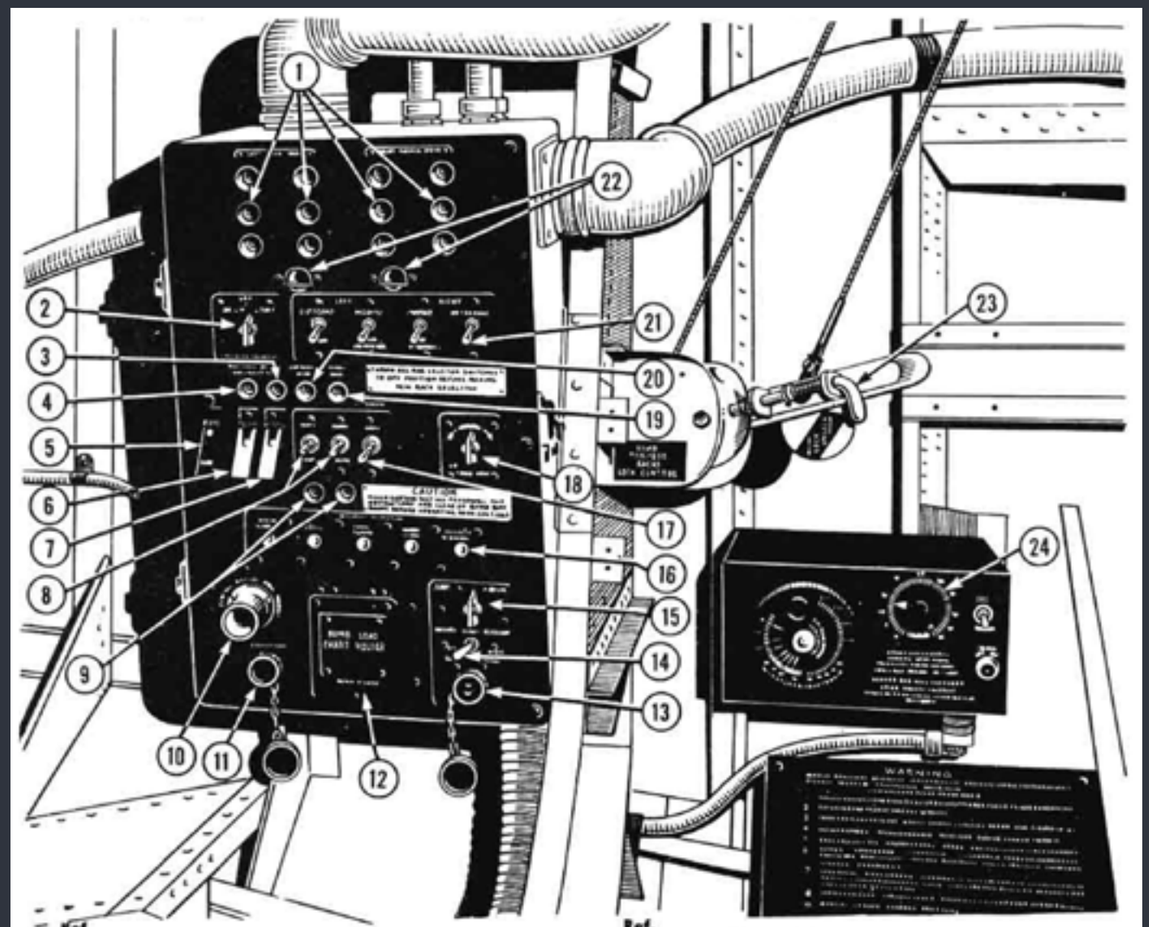
Ref. No.	Nomenclature
1	*Dual Cylinder Head Temperature Indicator*
2	*Dual Oil Pressure Gage*
3	*Dual Manifold Pressure Gage*
4	*Left Engine Oil Temperature Thermometer Switch*
5	*Left Engine Oil Temperature Thermometer*
6	*Dual Tachometer Indicator With Synchroscope*
7	*Outside Air Thermometer*
8	*Dual Horsepower BMEP Indicator*
9	*Inclinometer*
10	*Carburetor Air Temperature Gage*
11	*Carburetor Air Temperature Gage Switch*
12	*Fuel Low Level Warning Lights and Test Button*
13	*Panel Light Rheostat*
14	*Auxiliary Power Plant Oil Temperature Gage*
15	*Auxiliary Power Plant Oil Temperature Gage Switch*
16	*Dual Fuel Pressure Gage*
17	*Right Engine Oil Temperature Thermometer Switch*
18	*Right Engine Oil Temperature Thermometer*
19	*Outside Air Thermometer Switch*
20	*Dual Fuel Flowmeter Indicator*
21	*Clock*
22	*Fuel Level Gage*
23	*De-Icer Pressure Gage*
24	*Panel Lights Rheostat*
25	*Auxiliary Power Plant Cylinder Head Temperature Gage*
26	*Auxiliary Power Plant Oil Pressure Indicator*

Figure 27 — Flight Engineer's Instrument Panel



Ref. No.	Nomenclature
1	*Left Engine Starter Switch*
2	*Left Engine Primer Switch*
3	*Left Engine Oil Dilution Switch*
4	*Service Tank Fuel Booster Pump Switches*
5	*Right Engine Oil Dilution Switch*
6	*Right Engine Primer Switch*
7	*Right Engine Starter Switch*
8	*Left Generator Ammeter*
9	*Auxiliary Generator Ammeter*
10	*Left Cowl Flap Switch*
11	*Left Oil Cooler Flap Switch*
12	*Auxiliary Generator Switch*
13	*Left Generator Field Switch*
14	*Left Generator Switch*
15	*Main Bus Circuit Breaker Switches*
16	*Power Radio Switch (On Airplane No. 59000 and subsequent only)*
17	*Utility Receptacle*
18	*Utility Receptacle and Propeller De-Icer Switches*
19	*Anti-Icer Rheostat*
20	*Inverter Selector Switch (On Airplane No. 59000 and subsequent only)*
21	*Auxiliary Power Plant Ignition Switch*
22	*Circuit Breaker Switches*
23	*Voltmeter*
24	*Battery Ammeter*
25	*Right Generator Ammeter*
26	*Right Oil Cooler Flap Switch*
27	*Right Cowl Flap Switch*
28	*Power on Warning Light*
29	*Power Battery Switch*
30	*Right Generator Field Switch*
31	*Right Generator Switch*
32	*Voltmeter Selector Switch*
33	*Fuel Transfer Pump Warning Lights*
34	*Propeller Power Switches*
35	*Inverter Switch (On Airplanes Nos. 45405 to 45444 only)*
36	*Left and Right Wing Tank Switches*

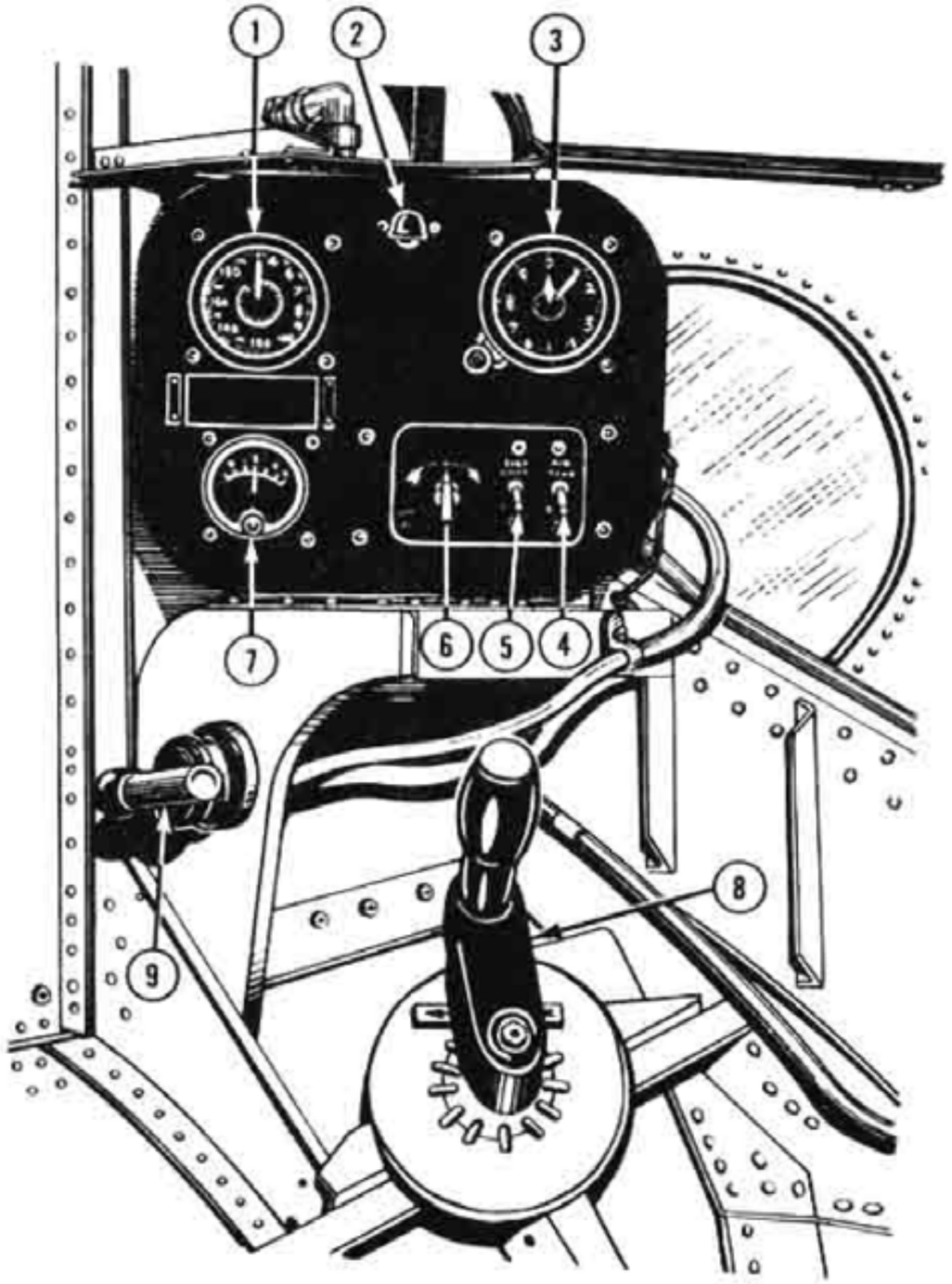
Figure 28 — Flight Engineer's Switch Panel



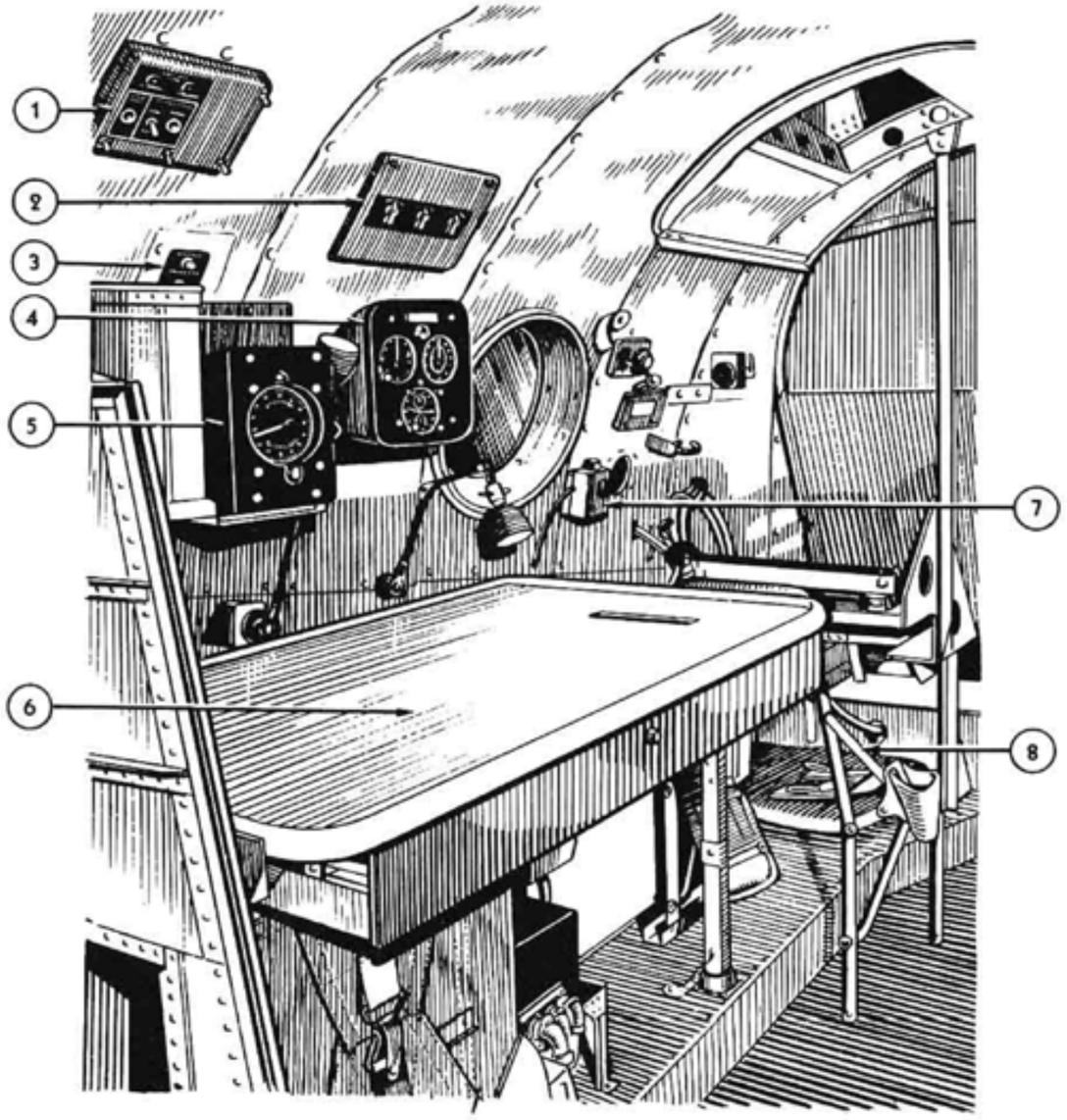
Ref. No.	Nomenclature
1	*Bomb Indicator Lights*
2	*Indicator Light Switch*
*3	*Automatic Bomb Release Switch Indicator Light*
4	*Manual Switch Indicator Light*
5	*Master Switch*
6	*Bomb Manual Switch*
*7	*Automatic Bomb Release Switch*
8	*Left and Right Bomb Bay Door Switches*
9	*Bomb Bay Door Indicator Lights—Open Position*
10	*Emergency Salvo Release Button*
11	*Firing Key Receptacle*
12	*Spare Lamp Container*
13	*Utility Receptacle*
14	*Utility Receptacle Switch*
15	*Bomb Fusing Switch*
16	*Circuit Breakers*
*17	*Stabilizer Power Switch*
18	*Panel Light Rheostat*
19	*Right Bomb Bay Door Indicator*
20	*Left Bomb Bay Door Indicator Light—Closed Position*
21	*Bomb Rail Selector Switches*
22	*Panel Lights*
23	*Bomb and Torpedo Rack Lock Handle*
24	*Intervalometer*

* *Not used on PBM-5*

Figure 46 — Bomber's Switch Panel



Ref. No.	Nomenclature
1	*Airspeed Indicator*



Ref. No.	Nomenclature	Ref. No.	Nomenclature
1	*ABK Fuse Box*	5	*Gyro Fluxgate Master Indicator*
2	*Navigator's Junction Box*	6	*Navigator's Table*
3	*Gyro Fluxgate Compass Caging Switch*	7	*Radar Operator's Station Box*
4	*Navigator's Instrument Panel*	8	*Radar Operator's Seat*

Figure 51 — Navigator's Station

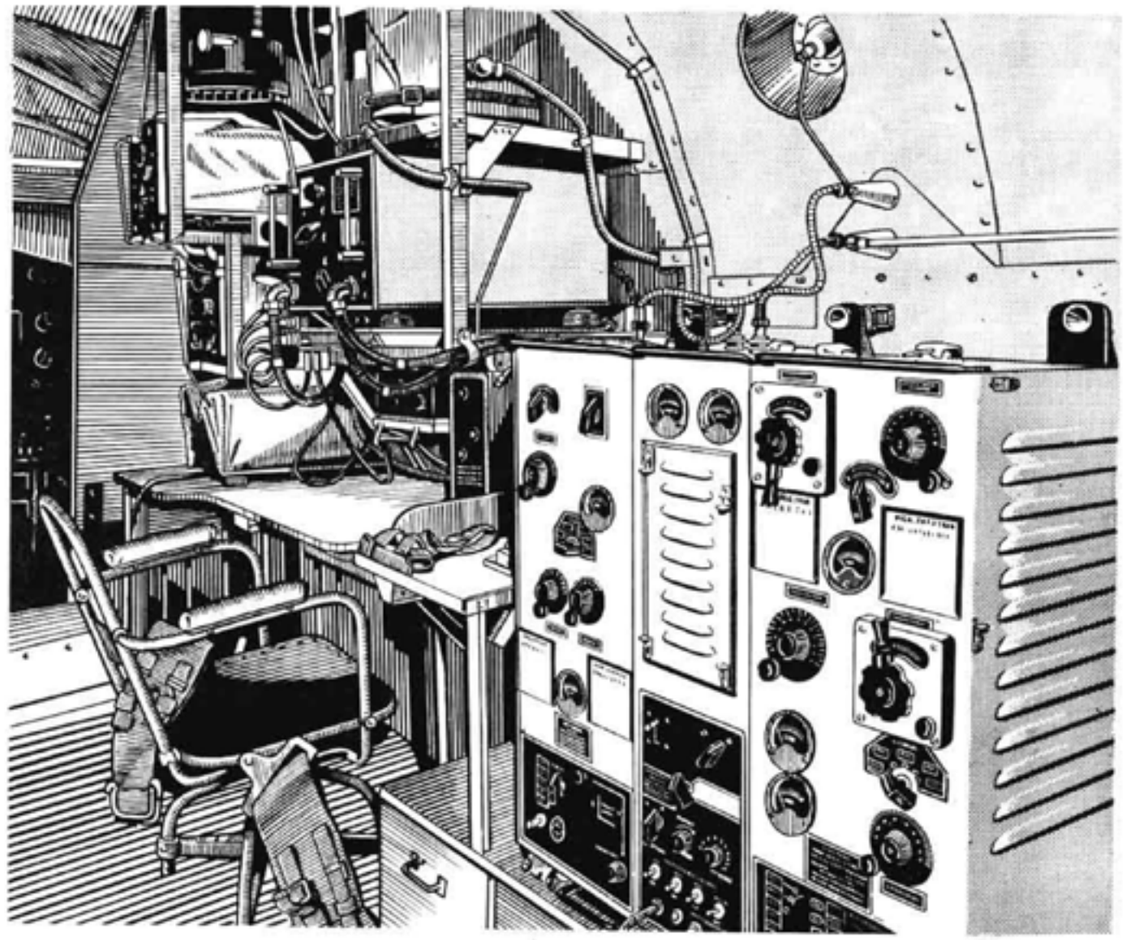
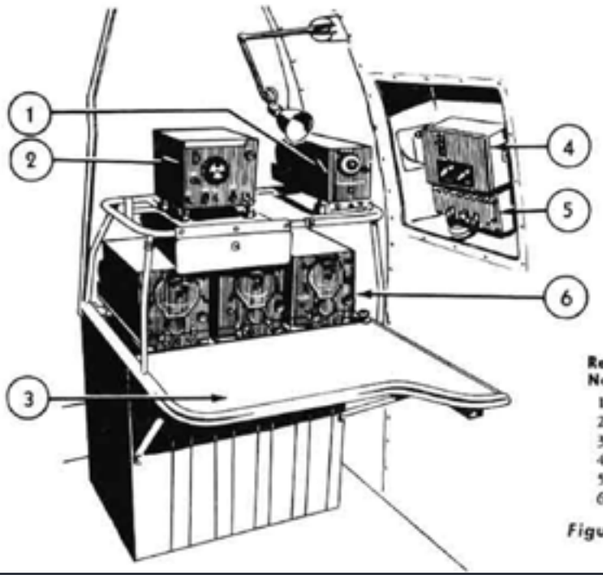
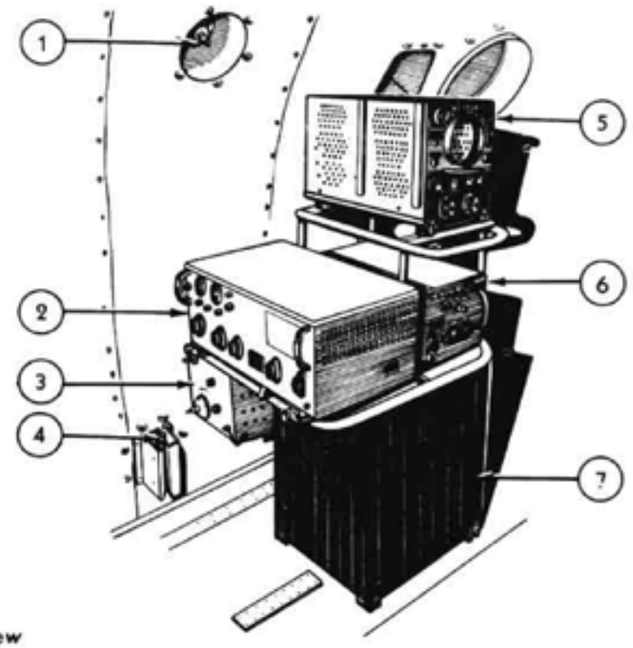


Figure 53 — Radio Operator's Station (Airplane Nos. 45405 to 45444)



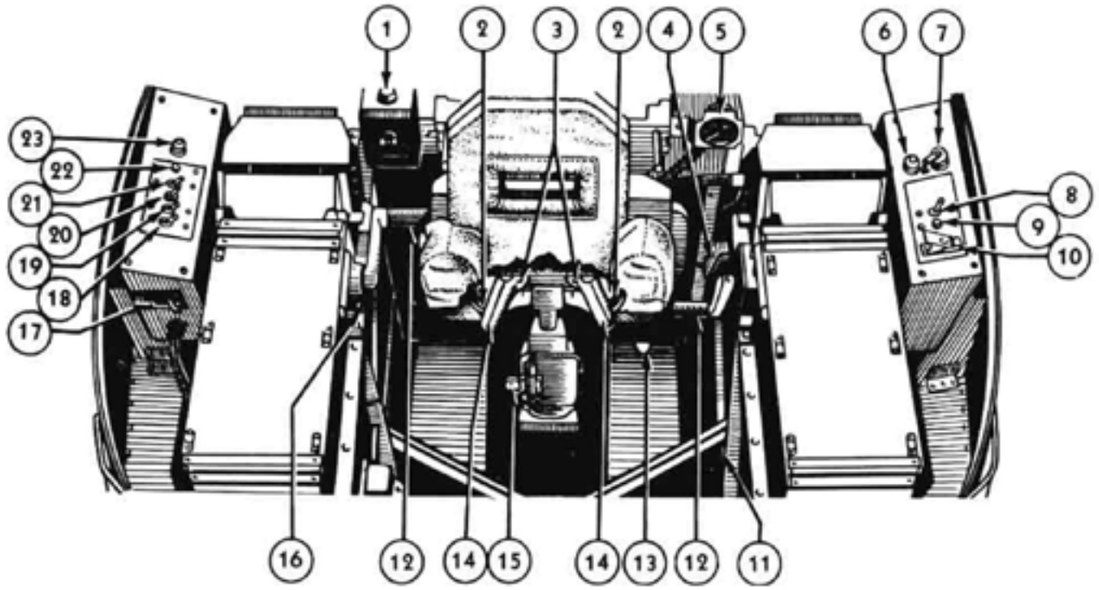
Ref. No.	Nomenclature
1	*ARC-5 VHF Receiver*
2	*LM10 Frequency Meter*
3	*Radio Operator's Table*
4	*Radio Operator's Rheostat and Switch Box*
5	*A1A-2 Interphone Control Box*
6	*RAX Receivers (High-Medium-Low Frequencies)*

Figure 54 — Radio Operator's Station—Forward View (Airplane No. 59000 and Subsequent)



Ref. No.	Nomenclature
1	*Liaison Transmitter Lead-In Insulator*
2	*ATC Transmitter*
3	*ATC Transmitter Loading Coil*
4	*Antenna Change-Over Switch*
5	*Loran Indicator*
6	*Loran Receiver*
7	*Mounting Cabinet and Spare Parts Locker*

Figure 55 — Radio Operator's Station—Aft View (Airplane No. 59000 and Subsequent)



Ref. No.	Nomenclature	Ref. No.	Nomenclature	Ref. No.	Nomenclature
1	*Interphone Box*	9	*Booster Circuit Breaker*	17	*Pump Switch*
2	*Action Switches*	10	*"Gun" and "Sight" Switch*	18	*Dome Light Switch*
3	*Microphone Switches*	11	*Elevation Clutch Lever*	19	*Charger Switch*
4	*Foot Pedal Stowage Handle*	12	*Manual Drive Handles*	20	*Camera Switch*
5	*High Pressure Gage*	13	*Foot Trigger*	21	*Main Power Switch*
6	*Red Warning Light*	14	*Control Handles*	22	*Main Power Circuit Breaker*
7	*Utility Receptacle*	15	*Low Pressure Gage*	23	*Power Indicating Light*
8	*Utility Receptacle Switch*	16	*Azimuth Clutch Handle*		

Figure 59 — Turret Controls—250SH-3

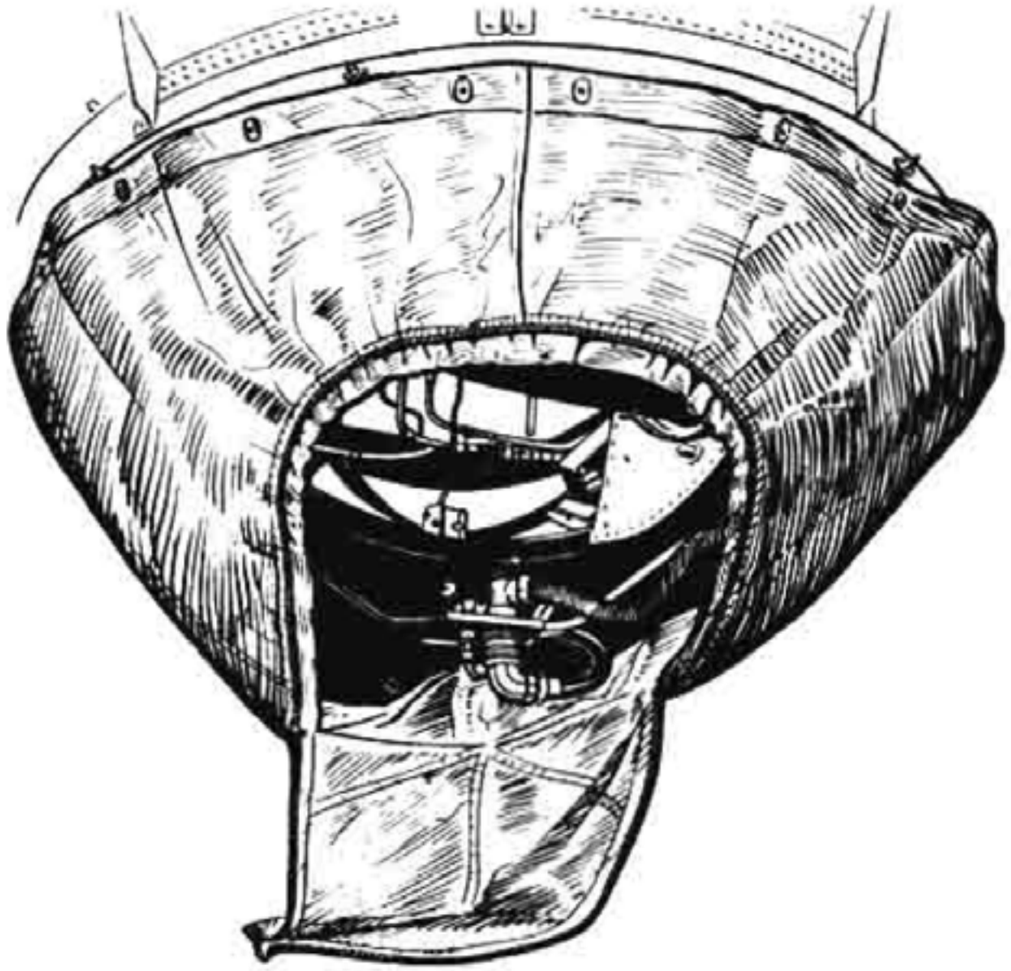


Figure 57 — Entrance to Bow Turret

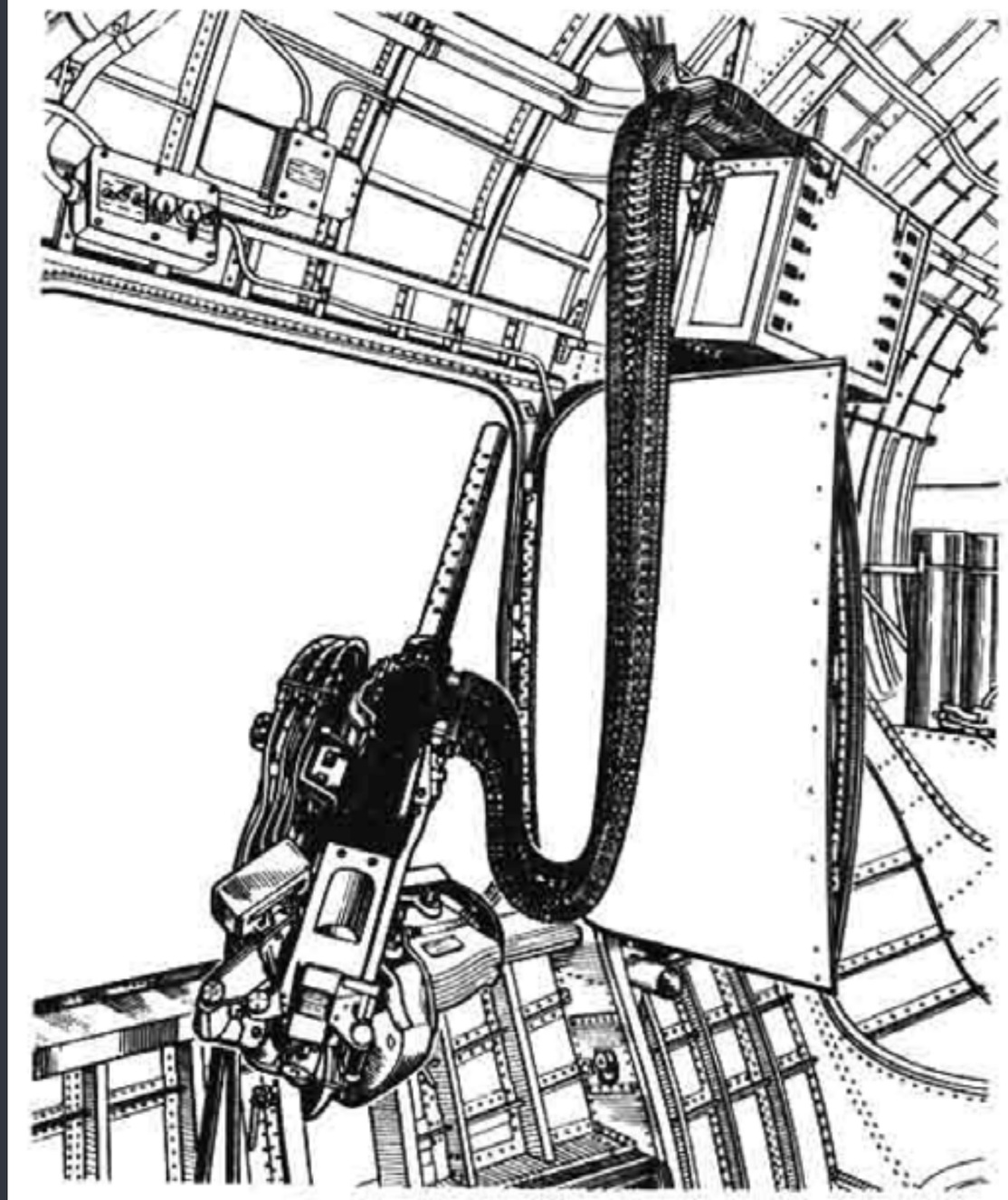
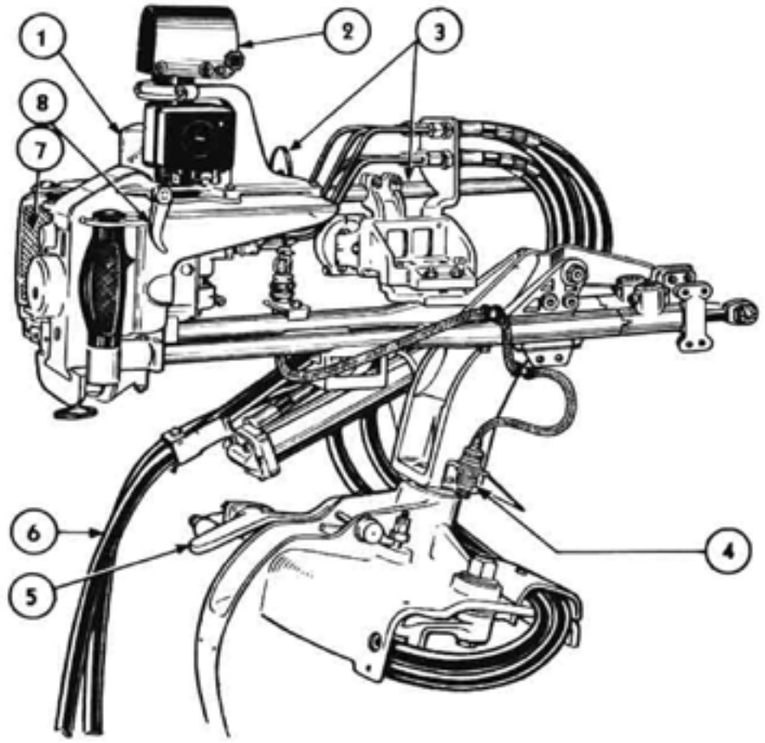
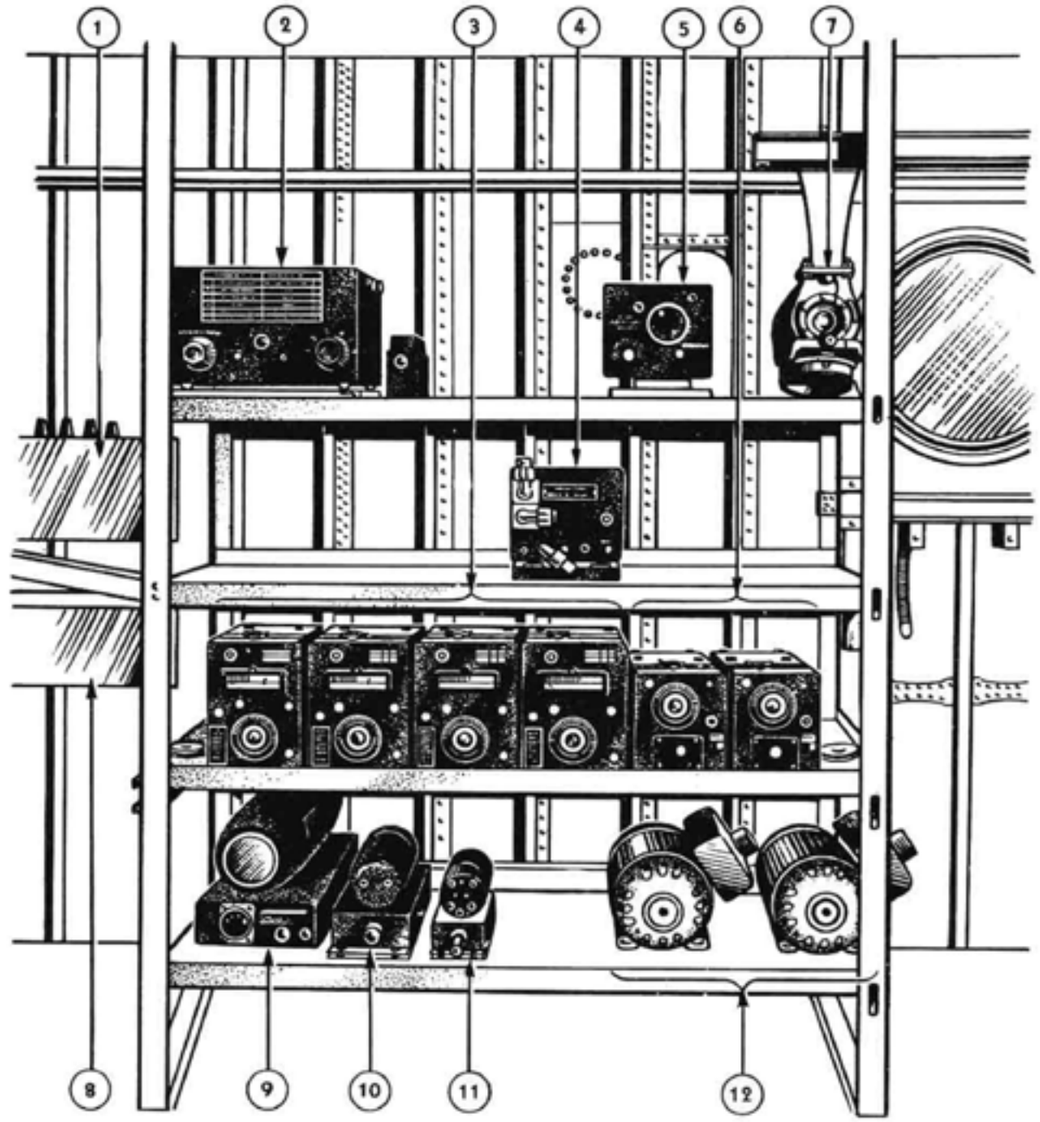


Figure 64 — Waist Gun Installed



Ref. No.	Nomenclature
1	*Dump Valve Control*
2	*Mark 9 Gun Sight*
3	*Auxiliary Ring and Post Sight*
4	*Gun Sight Plug*
5	*Lock Lever*
6	*Hydraulic Pressure and Return Lines*
7	*Elevation and Azimuth Control Handle*
8	*Trigger*

Figure 65 — Side Waist Gun Mount



Ref. No.	Nomenclature
1	*Radio Compass and Inverter Junction Box*
2	*Radio Compass Amplifier*
3	*Intersquadron Transmitters (AN/ARC-5)*
4	*Marker Beacon Receiver (AN/ARN-8)*
5	*Liaison Transmitter Oscillator (ATC)*
6	*Intersquadron Transmitters (AN/ARC-5)*
7	*Torpedo Director*
8	*Interphone Junction Box*
9	*ATC Dynamotor*
10	*Interphone Dynamotors*
11	*Interphone Dynamotors*
12	*AC Inverters*

Figure 71 — Radio Rack in Galley Compartment

Into battle

A large overview at Norfolk showing a mixed population of all-white PBM-3S and 3-tone PBM-3D's

The PBM-1 and PBM-3 went into service at the U.S. Navy, initially to defend the U.S. neutrality, but after the attack on Pearl Harbour they were at war! Alongside the PBY Catalina it served at a large number of United States Navy operational squadrons:
ATU-1, ATU-10, VPB-2, VR-8, VR-10, VR-21, VP-16, VP-17, VPB-20, VP-21, VP-40, VP-46, VP-47, VP-55 (later VP-74), VP-56, VP-200, VP-203, VP-204, VP-205, VP-207, VP-208, VP-209, VP-210, VP-213, VP-214, VP-892 and United States Coast Guard.
It was used for ocean patrol in general, but the Mariner soon gained fame in U-boat hunting and killing. First U-boat kill was, as we have already seen earlier, on 30 June 1942 when a PBM-1 of VP-74 sunk the German U-158.
There were more to follow over the war years:
-17 May 1943:
Two PBM-3C's flown by Lt. Hoyland Davis and H.C. Carey sunk U-128 near the coast of Brazil. Both Mariners were from VP-74 and were during this action assisted by two U.S. Navy destroyers.
-15 July 1943:
U-159 was sunk in the Caribbean south of Haiti by a PBM-3S flown by lt. R.S. Mayo of VP-32.
-19 July 1943:
Near Florianopolis, Brazil a PBM-3C flown by Lt. R.S. Whitcomb of VP-74 sunk U-513.
-26 July 1943:
East of Jamaica in the Caribbean PBM-3C of VP-32 flown by Lt. R.W. Rawson sunk U-759
-28 July 1943:
U-359 sunk south of Puerto Rico by a PBM-3S of VP-32. No further details.
-31 July 1943:
U-199 sunk near Rio de Janeiro, Brazil by a PBM-3S flown by Lt.

Busy work on an all-white PBM-3S!

PBM-3S ashore at the Norfolk launching ramp. We can here clearly see the Shannon vortex airfoils mounted on the tail

William F. Smith of VP-74. Brazilian aircraft assisted during this operation.
-3 August 1943:
Lt. Clifford C. Cox of VP-205 sunk U-572 during a night mission with a PBM-3S north of the Netherlands New Guinea. Although sinking was claimed, the plane and its crew never returned and were missed in action.
-6 August 1943:
U-615 was attacked and finally sunk north of Aruba (Dutch West Indies) by a group of seven Mariners from VP-204 and VP-205 assisted by other aircraft from VB-130 and the U.S. Army Air Force. It must have been a very fierce battle since one pilot was shot down and another killed!
-27 September 1943:
U-161 was sunk near Bahia, Brazil by a PBM-3C of VP-74. No further details.

Total score in the Caribbean was ten U-boats with a double victory of a PBM-3C carrying the name Nickel Boat on 17 May 1943 and 19 July 1943. By the end of World War II, PBM Mariners sank in total twelve U-Boats.
For these offensive missions the Mariners were fitted with bombs and depth charges
The PBM-1 could carry a total

PMB-3R transport variant BuAer No. 6477. It was unarmed

An early PBM-3 in flight that was not fitted with the characteristic radar dome of the later types

A PBM-3S from VP-202 being boarded by its crew. It gives good details of the tail turret with twin cal .50 machine guns

Another nice in-flight shot of PBM-3 no. 36

of up to 900 kilograms (2,000 pounds) of bombs or depth charges in bomb bays that were fitted in the engine nacelles. The bomb bay doors looked liked landing gear doors but the PBM-1 was strictly a flying boat, lacking undercarriage and requiring that beaching gear be attached to be brought up on land. Torpedo racks could be fitted under the wings inboard of the engine nacelles, and other stores apparently could be carried in the inboard position as well. The more powerful PBM-3's could carry a total store of 3600 kg (8000 lbs).

PBM's were also intensively used for various missions in the Pacific War, operating from bases at Saipan, Okinawa, Iwo Jima and the South West Pacific.

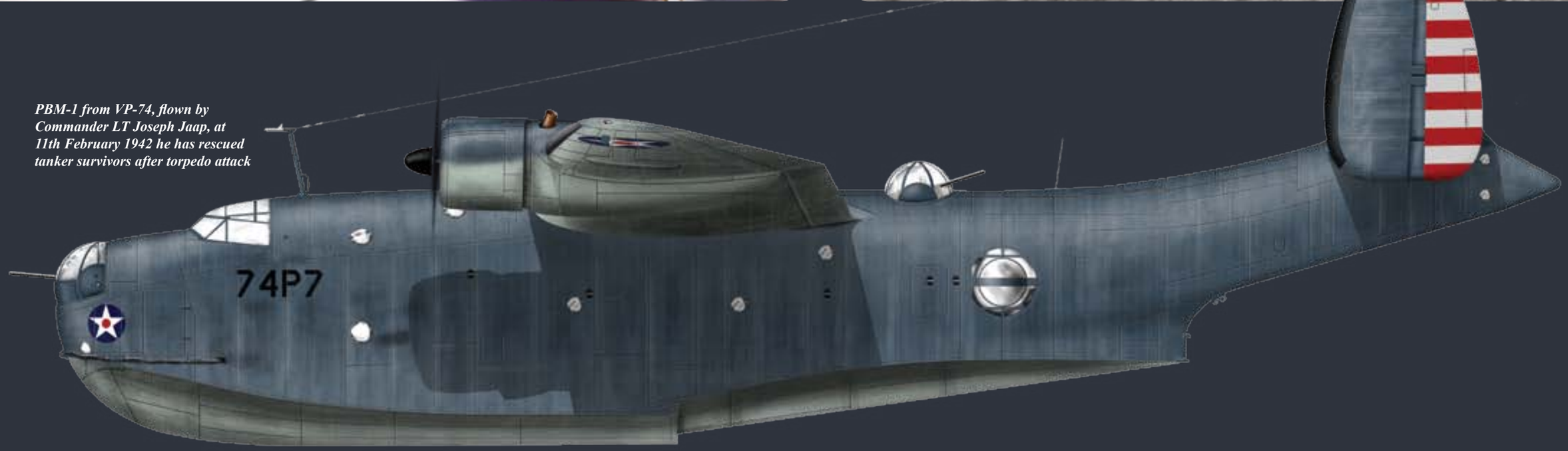
The PBM-3D was able to participate in the invasion of Saipan in the spring of 1944. After Saipan's capture, the island became the primary U.S. Navy seaplane base in the region, which Mariners and other flying boats operating from there participating in many later island campaigns. The Mariners did their valuable tasks mostly alongside the PBY Catalina, the type they were ever supposed to replace. In spite of the fact that the PBY has always received the most attention, it must be said that the Mariner was definitely superior over the Catalina in flight performances! War losses were great, but quite normal when compared with other types, bearing in mind they had to operate under all kinds of weather conditions that were sometimes risky and dangerous!

In September 1944 the last Mariner version, the PBM-5, became operational. They had a longer range and additional equipment and soon began to replace worn-out PBM-3's.

The United States Coast Guard acquired 27 Martin PBM-3 aircraft during the first half of 1943. In late 1944, the service acquired 41 PBM-5 models and more were delivered in the latter half of 1945.

Maybe not of the best quality, but a very interesting shot showing the tail of one of the R.A.F. PBM-3M Mariners. The R.A.F. used them as 'Mariner I' for six weeks only before they were returned to the U.S. Navy!

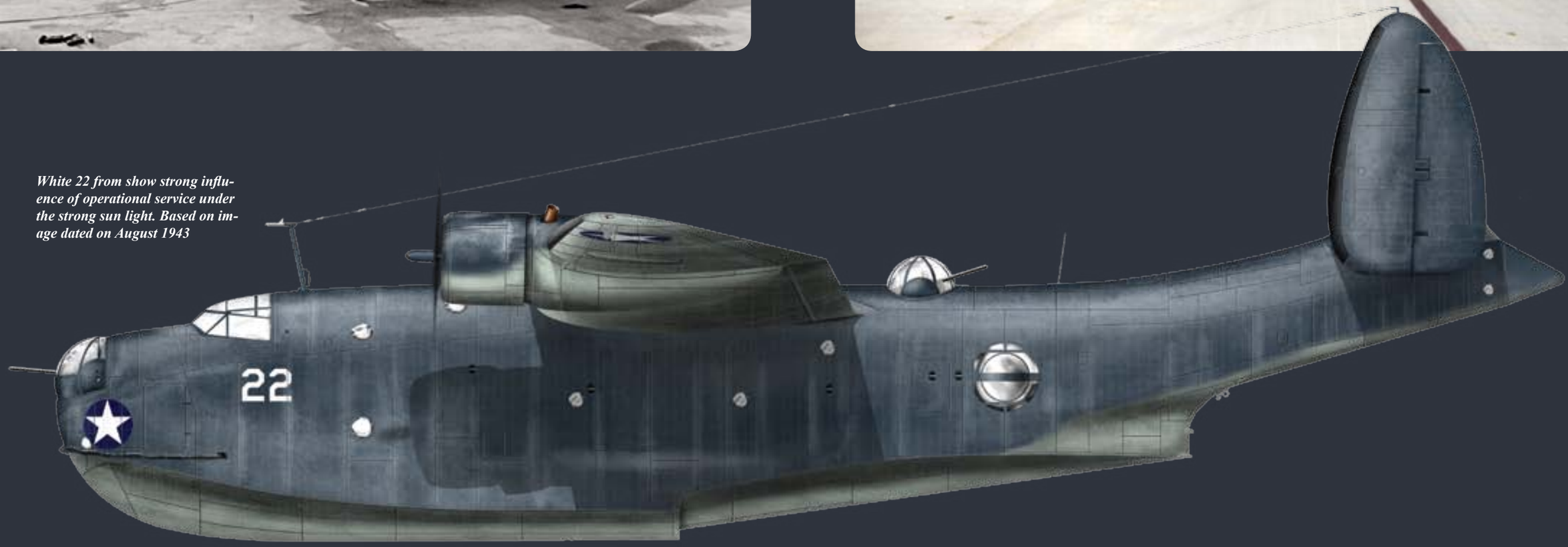
Tail-end of a PBM-3S. It did not always carry a tail gun as we see



PBM-1 from VP-74, flown by Commander LT Joseph Jaap, at 11th February 1942 he has rescued tanker survivors after torpedo attack

PBM-3C's in 1943 at the launching ramp of VP-207 at San Juan

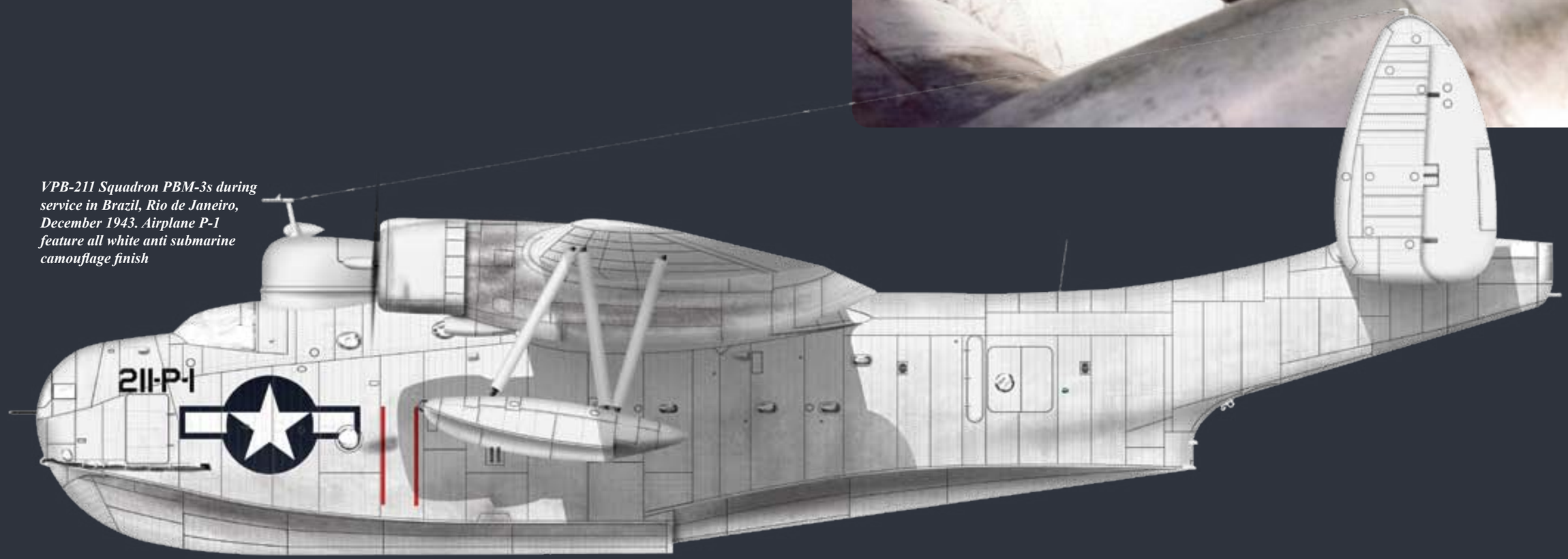
PBM-3's 'on the move' at Norfolk!



White 22 from show strong influence of operational service under the strong sun light. Based on image dated on August 1943

Rear-end view of a PBM-3S at the Norfolk ramp in 1945

Work on the radar housing of a PBM-3S in 1945 at Norfolk



VPB-211 Squadron PBM-3s during service in Brazil, Rio de Janeiro, December 1943. Airplane P-1 feature all white anti submarine camouflage finish

The Shannon vortex airfoil

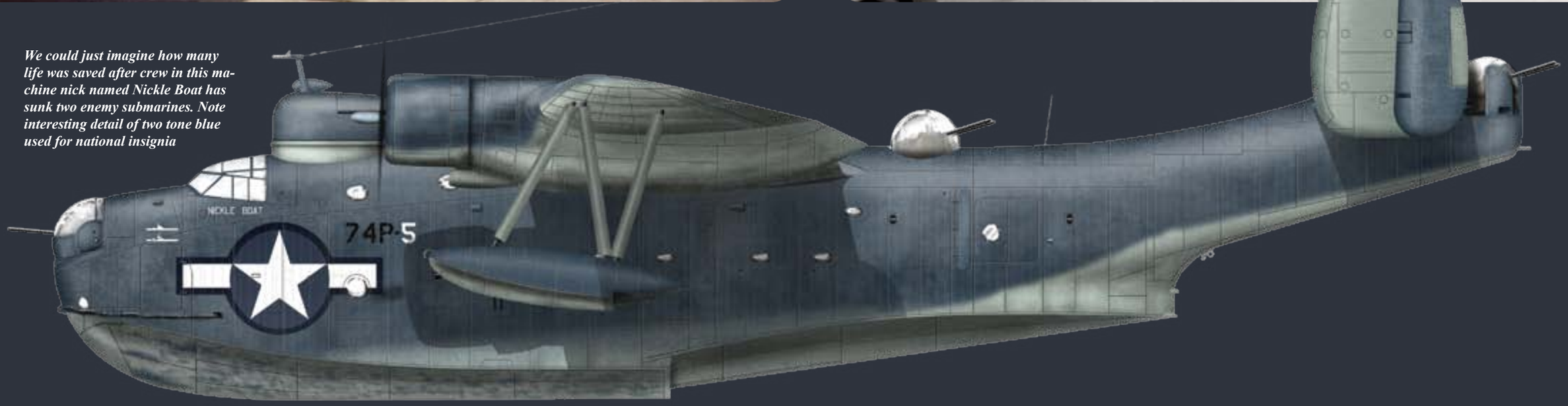
From the onset of flight testing the XPBM-1 had tail flutter problems. This was later remedied on the PBM-1 first production Mariners by setting the horizontal tailplanes at a marked dihedral giving the Mariner its characteristic 'V-tail'. However, under certain flight conditions the Mariner still had tail flutter problems. To solve this once and for all one of the Martin test pilots, Ellis 'Sam' Shannon designed a practical solution. This consisted of four airfoil sections mounted over and under the horizontal stabilizer and on the vertical fin. It proved to be so effective that Shannon was awarded the 'Order of the Purple Martin', the highest honour given by the Glenn Martin Company to an employee in the field of scientific accomplishment. Further his solution became known as the 'Shannon Vortex Airfoil'

The Shannon vortex airfoils were fitted/retrofitted on all PBM-3 and PBM-5 types.

Shannon (1908-1982) left the Glenn Marin Company in February 1943 to join Consolidated Vultee as a test pilot. Here he flew exiting experimental types like the XF-81 mixed power fighter and the XF-92A and XF2Y-1 Sea Dart delta jet planes. In fact he was the first U.S. pilot flying a delta jet in the XF-92A! However, he also test flew other Convair types like the B-32 Dominator, the R4Y Privateer and the Model 240 airliner.

Norfolk 1945: a PBM-3S being washed down from corrosive salt water remains

A row of PBM-3C's with early war style U.S. markings during engine maintenance

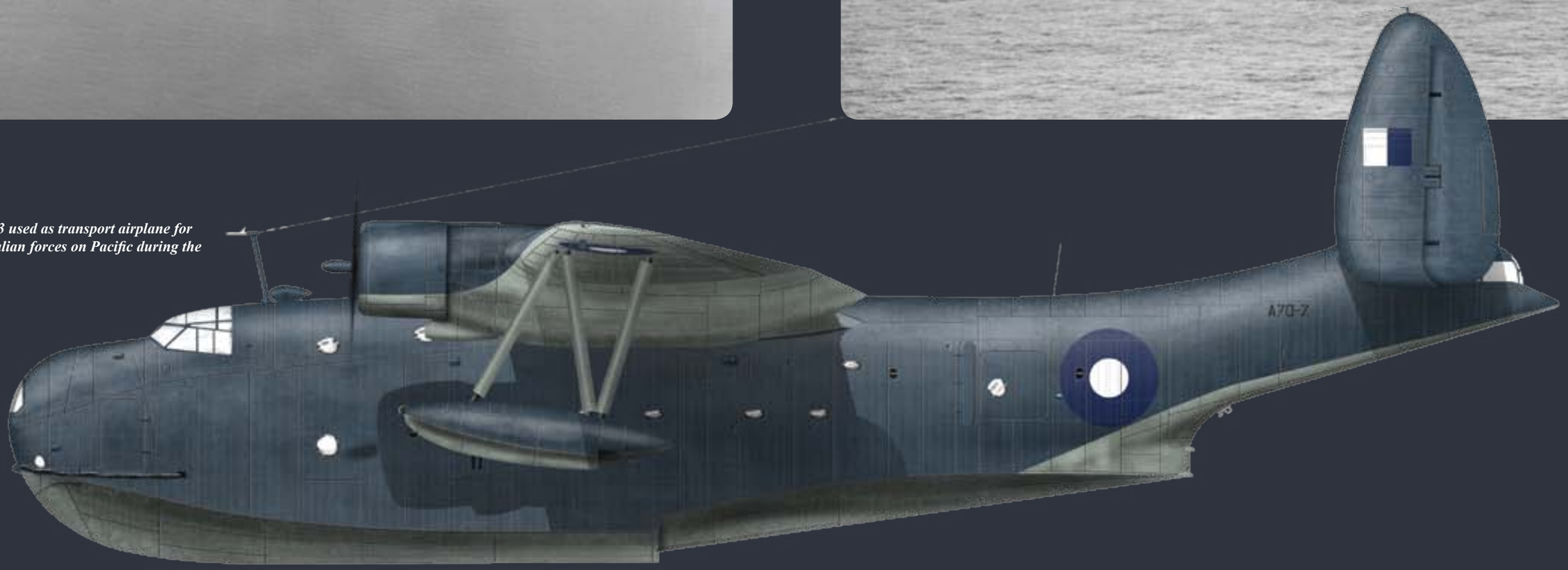


We could just imagine how many life was saved after crew in this machine nick named Nickle Boat has sunk two enemy submarines. Note interesting detail of two tone blue used for national insignia

In flight image of a PBM-3C with fully operational armament

A shot of PBM-3S no. 45243 in action. Note half-opened hatch at rear fuselage

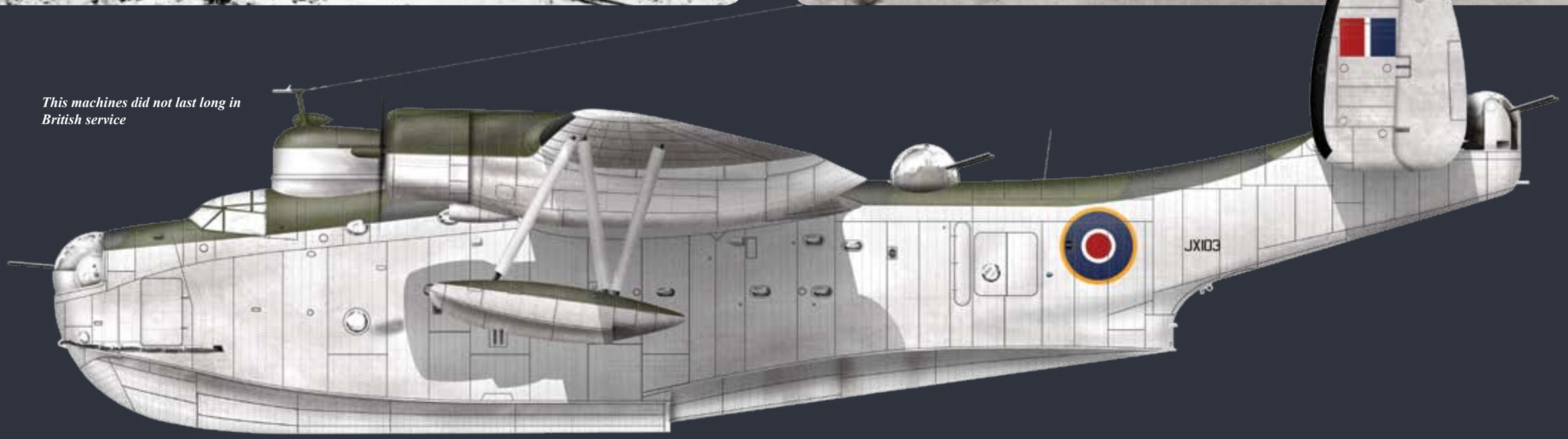
PBM-3 used as transport airplane for Australian forces on Pacific during the WW2.



PBM-3D's most likely at a Pacific island station with temporary tents

PBM-3 early version in flight

This machines did not last long in British service



After the war

Ten PBM-5's were still in service in 1955, although all were gone from the active Coast Guard inventory by 1958 (when the last example was released from CGAS San Diego and returned to the U.S. Navy). These flying boats became the backbone of the long-range aerial search and rescue efforts of the Coast Guard in the early post-war years until supplanted by the P5M Marlin and the HU-16 Albatross in the mid-1950s.

PBM's continued in service with the U.S. Navy following the end of World War II, flying long patrol missions during the Korean War. It continued in front line use until replaced by its direct development, the P5M Marlin, with the last USN squadron equipped with the PBM, Patrol Squadron Fifty (VP-50), retiring them in July 1956.

Also in peace time there were aircraft losses and the Mariner was no exception on this point. Over the period 1947-1956 26 PBM-5's were lost in various accidents under various conditions including a number of PBM-5A amphibians. The PBM-5A's were soon phased out by the U.S. Navy and stored in the desert of Arizona. One of these is now on exhibit in the Pima Air Museum; most of the remaining PBM-5A's were purchased by the Netherlands where they had a very troublesome and unlucky career as we shall see later on!

An early PBM-3 still fitted with dummy gun turrets during lift off

An unmarked and unarmed PBM-3 on its beaching gear

A PBM-3R transport mariner during a rocket-assisted take-off

Engine maintenance on a PBM-3S at Norfolk

Float installation on a PBM-3; Norfolk 1945

Civil Mariners

After the war a number of Mariners were phased out and some were offered for sale for civil use. In 1946 Naviera Colombiana started with two Mariners commercial flying from remote locations that could only be reached over the water. They were PBM-5's BuAer no. 85143 and 59160 that eventually flew with Colombian civil registrations C-56X and C-57X. They were flown until 1951 until the engines were worn out and left in the jungle after they were riddled with bullets

Another two PBM-5's were for some time used in 1948 for the transport of fresh seafood from the Caribbean by a company with the very suggestive name 'The Flying Lobster Air Lines'. They were BuAer nos. 84671 and 84659 with civil registrations NL67903 and NL67904.

In Portugal the company ARTOP (Aero-Topográfica) started in the late fifties a passenger line with two PMB-5's. BuAer nos. 59144 and 45409. They received the civil registrations CS-THA and CS-THB and were used for transport of passengers between Portugal and Madeira. They had capacity for up to30 passengers. One crashed in November 1958 and was never traced back; the other was flown until it became unserviceable and not any longer airworthy. In general it can be said that the civil Mariners were no real commercial success. In spite of their very low acquisition price as war surplus they had two very thirsty engines that consumed not only large quantities of fuel and oil, but also a lot of maintenance time by highly skilled technicians!

A PBM-3C on the move; Norfolk 1945

PBM-3S from VP-211 in flight

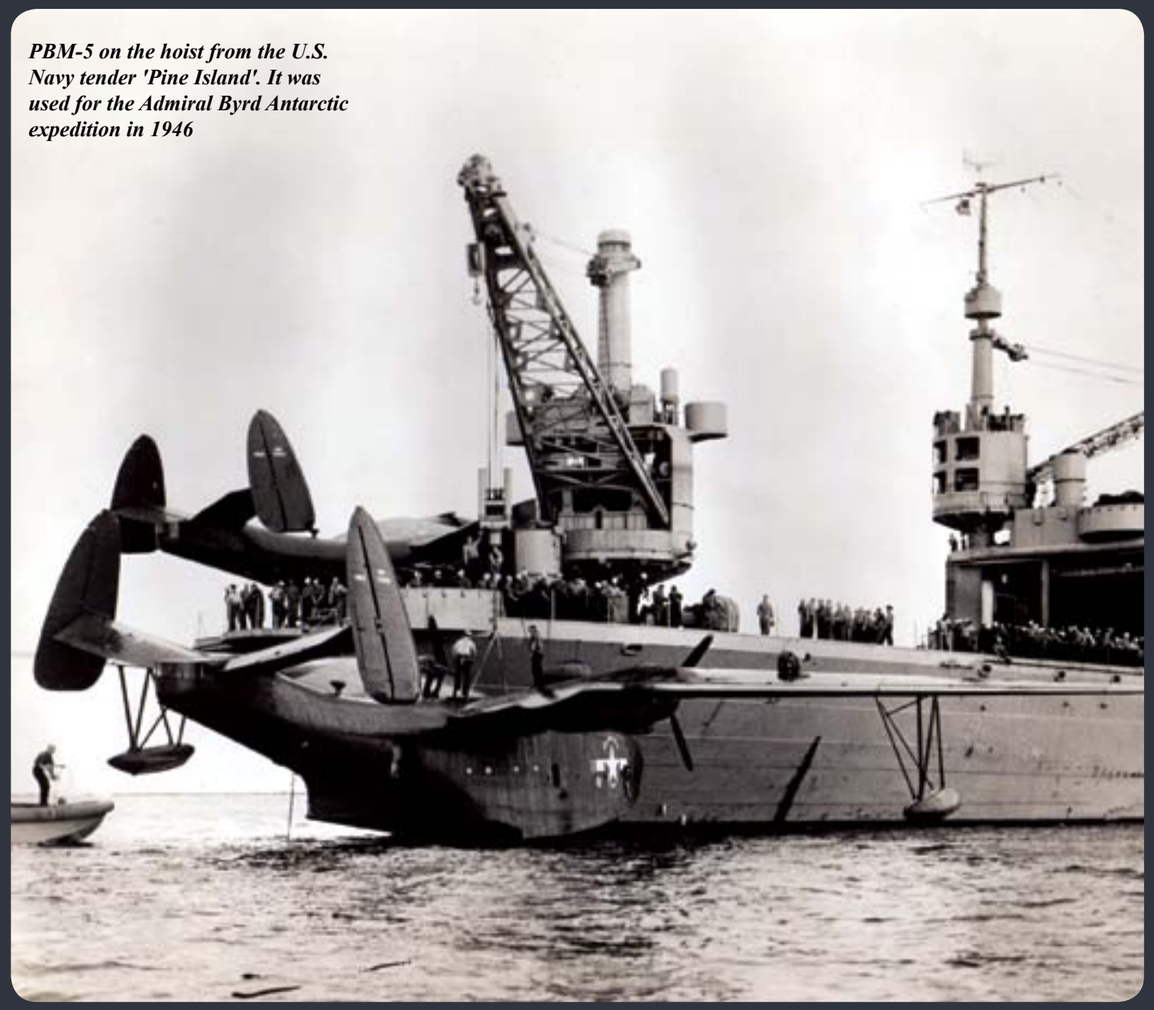
PBM-3D leaving the launching ramp; Norfolk 1945

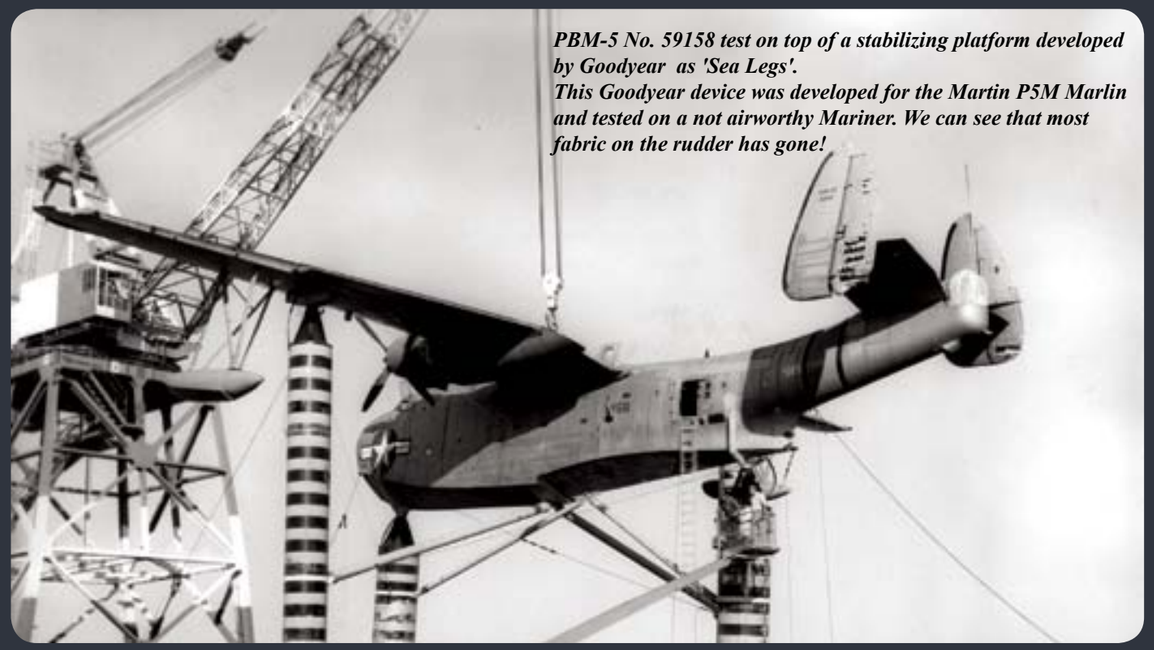
PBM-5 BuAer No. 98615, still without any operational markings on its beaching gear

PBM-5 RATO-start at San Diego Bay

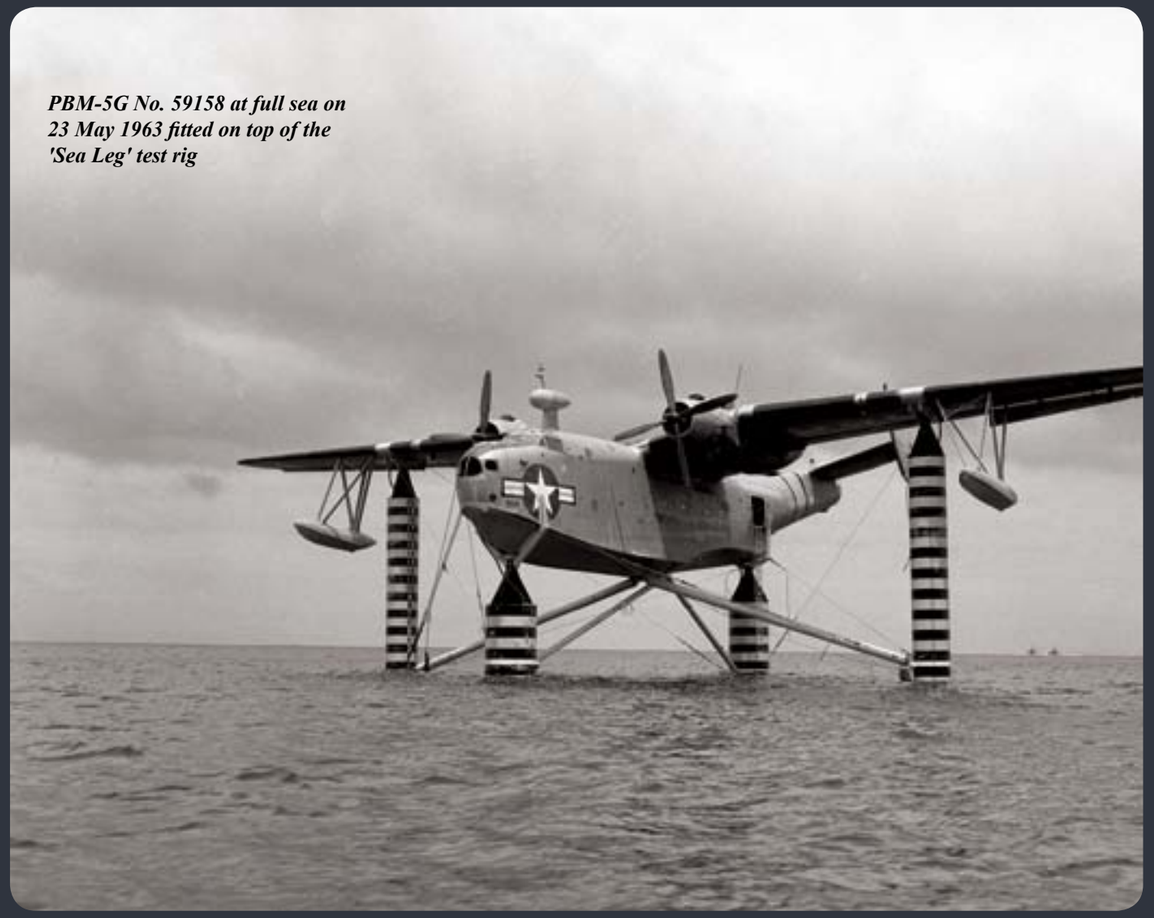
'On the Double'; the crew of Coast Guard Mariner PBM-5G no.4736 in a hurry

PBM-5 on the hoist from the U.S. Navy tender 'Pine Island'. It was used for the Admiral Byrd Antarctic expedition in 1946



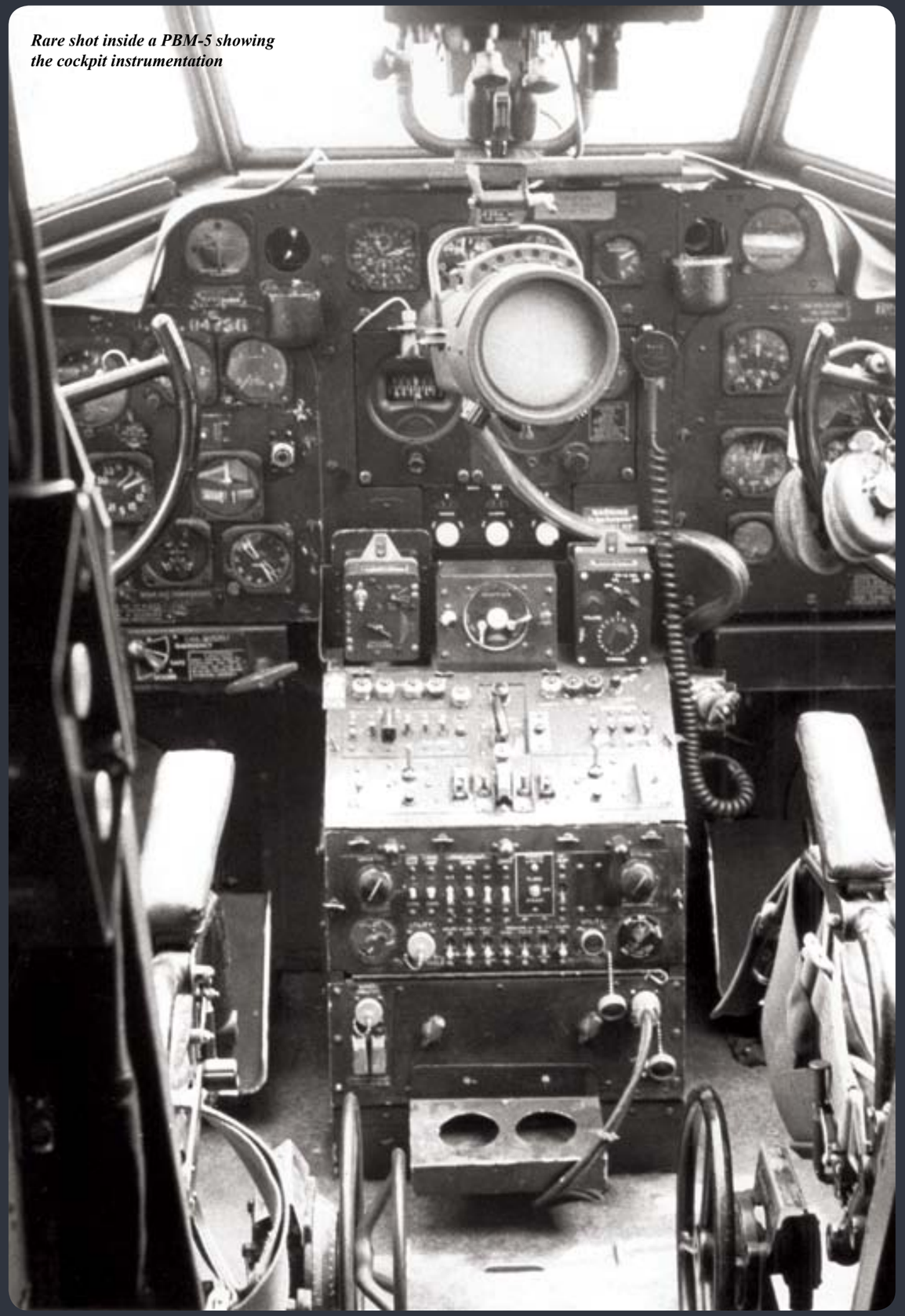


PBM-5 No. 59158 test on top of a stabilizing platform developed by Goodyear as 'Sea Legs'.
This Goodyear device was developed for the Martin P5M Marlin and tested on a not airworthy Mariner. We can see that most fabric on the rudder has gone!



PBM-5G No. 59158 at full sea on 23 May 1963 fitted on top of the 'Sea Leg' test rig

Engine maintenance at full sea of a PBM-5



Rare shot inside a PBM-5 showing the cockpit instrumentation

Foreign users

Argentina:

The Argentinean Navy purchased eight ex-U.S. Navy PBM-5 Mariners that were used over the period 1954-1962. They carried the military registrations 2-P-21, 2-P-22, 5-P-23, 5-P-24, 5-P-25, 5-P-26, 5-P-27, 5-P-28. Later they were all re-registered as 2-P-201, 2-P-202, 2-P-203, 2-P-204, 2-P-205, 2-P-206 and 2-P-207 except 2-P-21 that was written off at an earlier stage. Also 2-P-22 was lost in an engine fire before the re-registration. A small number of these machines were unarmed transport planes, but most of these were fully armed and equipped with a radar installation.

Australia:

A further 12 ex-U.S. Navy PBM-3's were transferred to the Royal Australian Air Force for transporting troops and cargo as a replacement for the British Sunderland flying boat. They carried the following registrations: A70-1 (Bu.6512); A70-2 (Bu.6528), A70-3 (Bu.6546), A70-4 (Bu.6549), A70-5 (Bu.6566), A70-6 (Bu.6526), A70-7 (Bu.6506), A70-8 (Bu.6565), A70-9 (Bu.6575), A70-10 (Bu.6522), A70-11 (Bu.6664) and A70-12 (Bu.6538). They arrived in late 1943 and were used by No. 41 Sqn until 1946. They were all sold as scrap, except A70-6 that was sold was war surplus to a local farmer who removed wings and engines to use it for grain storage. It was later scrapped. Also A70-8 was sold to a civilian who transferred the hull into a mobile home. Later the front fuselage section including the cockpit was donated to the Aviation Museum of Western Australia, who restored it and put it on display as the only remains of this aircraft in Australia. It is currently located at the RAAF Association Museum at Bull Creek with the name 'Ancient Mariner' painted on the left side.

A very nice colour shot of a U.S. Coast Guard PBM-5 on its beaching gear

Great Britain:

The British Royal Air Force acquired 32 Mariners PBM-3B's that received the R.A.F. serial numbers JX100 to JX131. In the U.K. they were designated as 'Mariner I'. The Mariners JX121,JX122, JX125, JX127, JX129 and JX131 were returned to U.S. Navy without being used. JX101 was already lost earlier when it sank near the Canadian coast. The remaining 25 Mariners were operated by No. 524 Sq based at Oban in Scotland under command of No. 15 Group Coastal Command. They had them only 6 weeks over the period October-December 1943 before they were returned to the United States. For coastal patrol duties No. 524 was re-equipped with the Vickers Wellington XIII.

The Netherlands:

During and after the war the Dutch Marineluchtvaartdienst MLD had

A PBM-5S of VP-47 during 1953 at Okinawa, Japan. Flight crew were Lt. JG E.L. Gulin and Ens. D.F. Bell

A very nice colour shot of a U.S. Coast Guard PBM-5 on its beaching gear

First flight of the Mariner XPBM-5A amphibian BuAer No. 59349

Navy crew posing before their PBM-5A

PBM-5A no. 122603 at Patuxent River Naval Air Station. It was one of the Mariner purchased later by the Dutch MLD where it became no.16-307

a number of Catalina's amphibians that needed to be replaced in the mid fifties. The choice was very limited since very little amphibian aircraft types were in production by that time. One option was the Grumman Albatros, but this type was not suitable since it was too small and without armament. The possibility was investigated to produce a new type in the Netherlands, based on a Dornier design (the Do-P318 or 'Do-28') but this met serious financial problems.

After much hesitation it was finally decided to obtain seventeen U.S. Navy surplus PBM-5A's from the inventory stored in the desert at Litchfield, Arizona. It was an arbitrary choice and, retrospectively, also a very unhappy one. As surplus aircraft they had to be fully refurbished into airworthy condition. However, this was not the only problem. The amphibian PBM-5A had an empty weight that was 1900 kg higher than the PBM-5 flying boat version without any compensation of more engine power. That implied the PMB-5A'a had to fly at a higher power output and needed more extensive maintenance since the engines wore out much faster. The fitting of additional wheels also meant that the centre of gravity was changed, with all its consequences on flying behaviour. In spite of these shortcomings the PBM-5A went into service at the military base at Biak, Netherlands New Guinea at no. 8 and no. 321 Sq. The Mariners were delivered in two batches, the first of eight was delivered between November 28, 1955 and October 8, 1956, the second of nine between March 7, 1957 and September 17, 1957. They carried the military registrations 16-300 to 16-316. Eleven remaining aircraft received later the new serial numbers 100-110). The MLD Mariners had the following ex BuAer nos.:

16-300 = 122075, 16-301 = 122081, 16-302 = 122085, 16-303 = 122608, 16-304 = 122070, 16-305 = 122072, 16-306 = 122084, 16-307 = 122603, 16-308 = 122078, 16-309 = 122611, 16-310 = 122602, 16-311 = 122613, 16-

No. 2-P-21 was the first PBM-3 for the Argentinean navy. The three-bladed props are evident. All other Argentinean Mariners had 4-bladed props

Argentinean PBM-3 no. 2-P-21 was lost on 5 December 1956 after being torn from its moorings during a heavy storm. It was blown onto the beach and ended upside down. There were no casualties but the flying boat was a total loss

Argentinean 2-P-22 at Trinidad U.S. Naval Air Station after being damaged by a fire. Fire was caused by a back-fire of a newly installed engine during start up! The plane was damaged beyond repair and scrapped

312 = 122470, 16-313 = 122079, 16-314 = 122604,
16-315 = 122882, 16-316 = 122086
The MLD Mariner period was marred by accidents and especially maintenance problems. Due to the limited capabilities at the MLD main base at Biak, the Mariners had to be ferried to and from the Netherlands for major overhauls. This meant a flight of over 13,000 km each way. After five fatal accidents - two of them during the long transit flights to and from New Guinea - the confidence in the aircraft eroded quickly. One further Mariner was sunk in a non-fatal accident in the Netherlands (no.16-305; BuAer No.122072).
No.16-303 was the former U.S.Navy BuAer No. 122608. This aircraft was destroyed on 20

Formation of three Argentinean PBM-3's with 2-P-201 at the foreground. Other planes in the formation were 2-P-203 and 2-P-204

August 20 1958 in a fatal crash at Abadan (Iran) killing all six occupants on board.
The end came when 16-316 crashed in Boruku Bay (New Guinea) with heavy loss of life on January 15, 1960. All remaining Mariners were grounded and they were officially withdrawn from use on 3 March 1960 and subsequently scrapped in New Guinea.
Of the two remaining in the Netherlands one (16-307) ended its life as a training hull for the Rotterdam Airport Fire Brigade, while the Technical University at Delft obtained some Mariner parts as interesting engineering examples.

Uruguay:

The naval air service of Uruguay purchased in 1956 three ex-U.S. Navy PBM-5S Mariners with the following registrations:
A-810 (BuAer no.84719), A-811 (BuAer no. 59255) and A-812 (BuAer no. 59256).
It seems Uruguay had already requested for Mariners during the war years, but apparently the U.S. Navy needed these too much! After many years they finally got what they wanted. Even better; since their original request was for the PBM-3 and they finally received the much improved PBM-5! They were used until 1964 and after decommission they were all three scrapped in the United States.

Another nice shot of the formation of three Argentinean PBM-3's

Martin Mariner I with R.A.F. serial number JX107 of 524 Sqn RAF at Oban; 1943. They were only used for six weeks before being returned to the U.S. Navy.
(Collection Edwin Hoogschagen)

Not a very bright and sharp photo, but it is one of the very rare shots showing the MLD PBM-5A with its late 100-series registration. Picture shows no.108.
(Collection Edwin Hoogschagen)

One of the PBM-3S Mariners operated by the R.A.A.F.; no A70-3

A-810 is one of the three PBM-5's from the Uruguayan navy

Technical details:

Specifications PBM-1, -3 and -5A

	PBM-1	PBM-3	PBM-5A
Engine	2Wright R-2600-12	2xWright R-2600-A5B	2xP&W R-2800-34
Power	1700 hp	1700 hp	2500 hp
Dimensions:			
-Length	23.50 m	24.33 m	24.28 m
-Wingspan	35.97 m	35.97 m	35.97 m
-height	8.38 m	8.38 m	8.38 m
Wing area	131 m2	131 m2	131 m2
Weights:			
-Empty	15,048 kg	15,050 kg	16,478 kg
-Loaded	25,425 kg	26,300 kg	27,352 kg
Performances:			
Max. Speed	330 km/h (sea level)	340 km/h (sea level)	322 km/h (sea level)
Serv. ceiling	6040 m	6035 m	6000 m
Range	4800 km	3605 km	4667 km
Crew:	7	7	7

Armament:

Armament

Guns: 8 .50 in (12.7 mm) M2 Browning machine guns (two each in nose, dorsal and tail turrets, one each in blisters amidships)

Bombs: 4,000 lb (1,800 kg) of bombs or depth charges or 2 Mark 13 torpedoes

However, armament could vary on each version and some versions used for transport only were unarmed.

Incidents and accidents

PBM-5S no. R677 with guns fitted

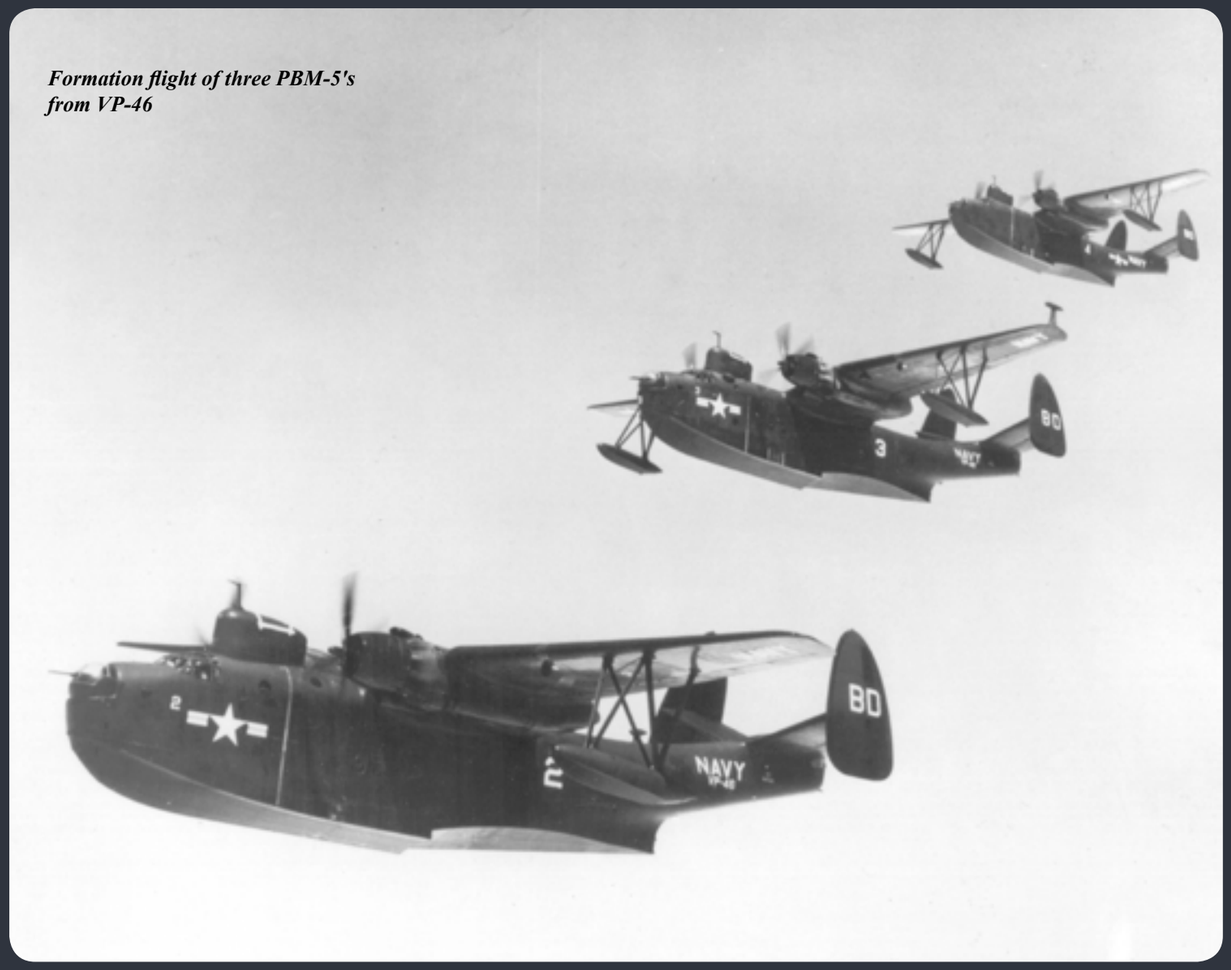
-On 1 November 1941 a PBM-1 crashed into a mountain near Reykjavik, Iceland

-On 30 November 1944, a U.S. Navy PBM-5 crashed into Mount Tamalpais in northern California killing eight naval aviators and naval aircrew men. The aircraft had taken off from Naval Air Station Alameda and was part of a larger flight headed for Hawaii when it developed engine trouble shortly after takeoff.

-United States Navy PBM-5 (BuAer No. 59225) from VB2 ATU-3 based at Naval Air Station Banana River, Florida was reported to have been destroyed in a mid-air explosion in December 1945 off the coast of Florida near The Bahamas while searching for the missing TBF Avengers of Flight 19 from Naval Air Station Fort Lauderdale, Florida. in the infamous 'Bermuda Triangle'. The Mariner with a crew of 11 was flown by Lt. jg Walter George Jeffery with Lt. jg Harrie Grimes Cone as co-pilot. The cause of this mysterious in-flight accident was never found, nor were any remains of the plane and its crew.

-A U.S. Navy PBM-5 crashed on Thurston Island, Antarctica on 30 December 1946 while supporting Operation Highjump.

-On 30 August 1958 MLD PBM-5A no. 16-303 crashed at Abadan, Iran after a very troublesome flight from Biak, Netherlands New Guin-



Formation flight of three PBM-5's from VP-46

An unarmed PBM-5G, No. 84728, from the U.S. Coast Guard at San Francisco

ea with constant power failure of one engine. It was underway to the Netherlands for major overhaul.

--On 9 November 1958, an Aero-Topográfica (ARTOP) PBM-5 (registration CS-THB) disappeared on a scheduled passenger flight from Cabo Ruivo, Lisbon, Portugal to Funchal Airport, Funchal, Madeira. The last radio transmission from the aircraft (when it was about 13°W) was: "I am forced to land immediately." No trace has ever been found of the aircraft, its six crew or 30 passengers. CS-THB was ex-U.S. Navy BuAer. no. 45409 built in 1944 and later converted to a passenger plane.

-On 17 December 1959 the Dutch MLD PMB-5A no. 16-302 (at that time re-registered as '102') sank after a heavy landing in the water at Paripi Bay, Netherlands New Guinea. Local Papua fishermen managed to rescue three of the crew members, but five died in this accident.

-On 15 January 1960 MLD PBM-5A Mariner 16-316 crashed at Buruka Bay, Netherlands New Guinea killing all crew members. After this accident all MLD PBM-5A's were grounded and scrapped.

Remark: this is just a selection of accidents and not meant to be complete!

A PBM-5 being boarded at sea. It is BuAer No. 84712

PBM-5 being hoisted by a crane from a U.S. Navy aircraft tender

Survivors

-United States Navy PBM-5A BuAer no. 122071 is the only surviving Mariner. It is on loan from the National Air and Space Museum in Washington, D.C. and is currently on display at the Pima Air & Space Museum in Tucson, Arizona. Operated by the USN between 1948 and 1956, it is painted in the markings of Transport Squadron 21 (VR-21) and coded RZ 051 of the early 1950s.

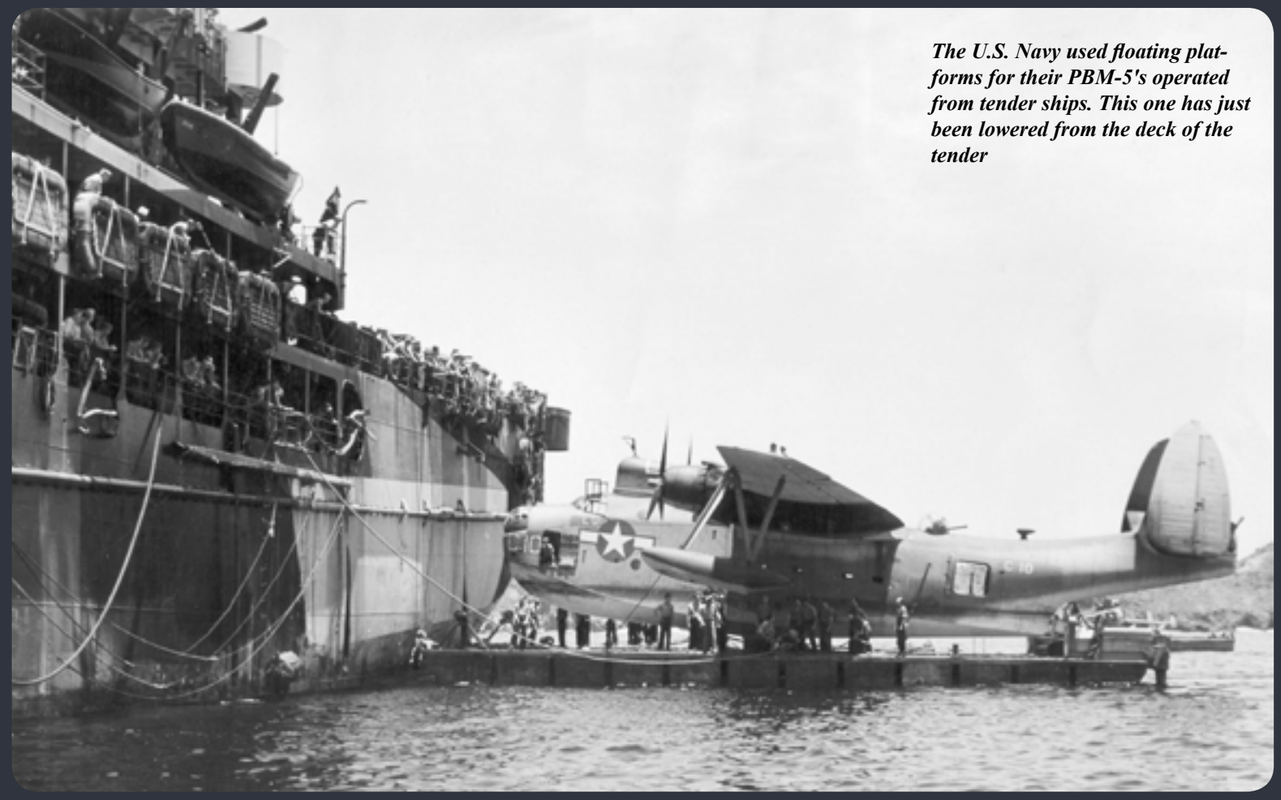
-Although only one complete Mariner aircraft exists, another aircraft (PBM-5 59172) lies upside down under Lake Washington. It crashed on 6 May 1949, and after a number unsuccessful attempts to recover the wreck over the following decades it is now used as a training site for divers.

-The nose section of PBM-3 BuAer no. 6565/ex-R.A.A.F. A70-8 is now on display at the RAAF Association Museum at Bull Creek in Australia

Credits

We would like to thank the following persons for their very kind cooperation to have this book completed: Stan Piet (GLMMAM Archive Director), Mark Nankivil, Gerald Balzer, Edwin Hoogschagen and Prudent Staal and Scott Hochstein.

Gallery



The U.S. Navy used floating platforms for their PBM-5's operated from tender ships. This one has just been lowered from the deck of the tender

This view gives an excellent overview how the PBM-5's operated from the floating platforms

A radar equipped PBM-5 in flight showing late war finish and markings

PBM-5 ashore on a rainy day

The PBM-5 BuAer No.59225 from VB2 ATU-3 that was lost in a mid-air explosion in December 1945 while searching for the 'Flight 18' Avengers that were lost in the Bermuda Triangle

RATO start of a PBM-5S from the U.S. Coast Guard

An all U.S Navy dark blue PBM-5 in 1949 taking off from San Diego bay with RATO assistance

PBM-5 from VP-47 carrying registration 'BA-8' at Kaneohe near Honolulu in 1949

A group of three PBM-5's at Kaneohe, Hawaii

U.S. Coast Guard PBM-5G No. 84728 at the Coast Guard Air Station San Francisco

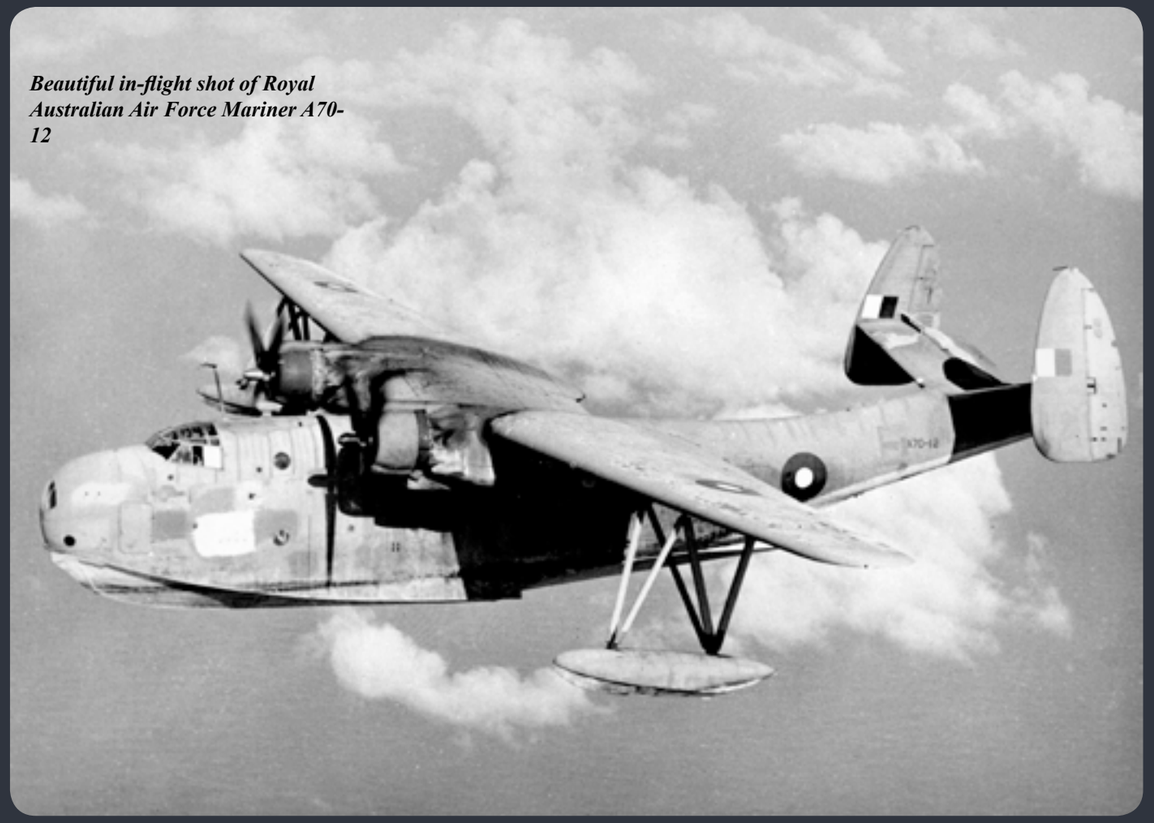
Side view of the first amphibian PBM-5A no.59349

PBM-5A no. 122071 stored in the desert of Arizona at Litchfield Park. It is now on display inside the Pima Air Museum in its original U.S. Navy colours

For take off four RATO rocket bottles could be mounted on both sides of the rear fuselage. Ship is 1st PBM-5A no. 59349

U.S. Navy PBM-5A amphibian with the nose turret and other armament removed. It is BuAer No. 122081. It became later MLD no. 16-301

No. 122071 photographed in 1989 when it was still under restoration at the Pima Air Museum. (Photo Scott Hochstein)



Beautiful in-flight shot of Royal Australian Air Force Mariner A70-12

MLD PBM-5A no. 16-306 photographed at Biak, Netherlands New Guinea.
(Collection Prudent Staal)

This is how the last MLD Mariner, no. 16-316, arrived at the Aviolanda works at Papendrecht in the Netherlands. It still has its U.S. Navy all-over dark blue colour scheme. It was later re-sprayed in MLD very light grey and fitted with gun turrets.
(Collection Edwin Hoogschagen)

One of the few civil Mariners: a PBM-5R passenger version operated by ARTOP between Portugal and Madeira. ARTOP had two in their fleet: CS-THA and CS-THB. We see one of these at Funchal Bay, Madeira