

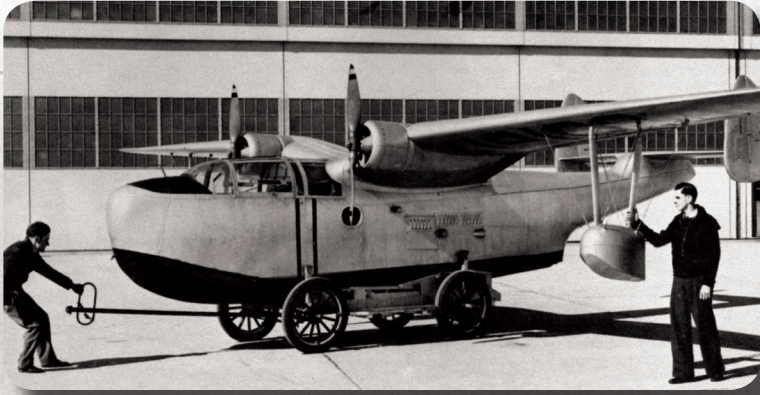
PBM-5G U.S. Coast Guard

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



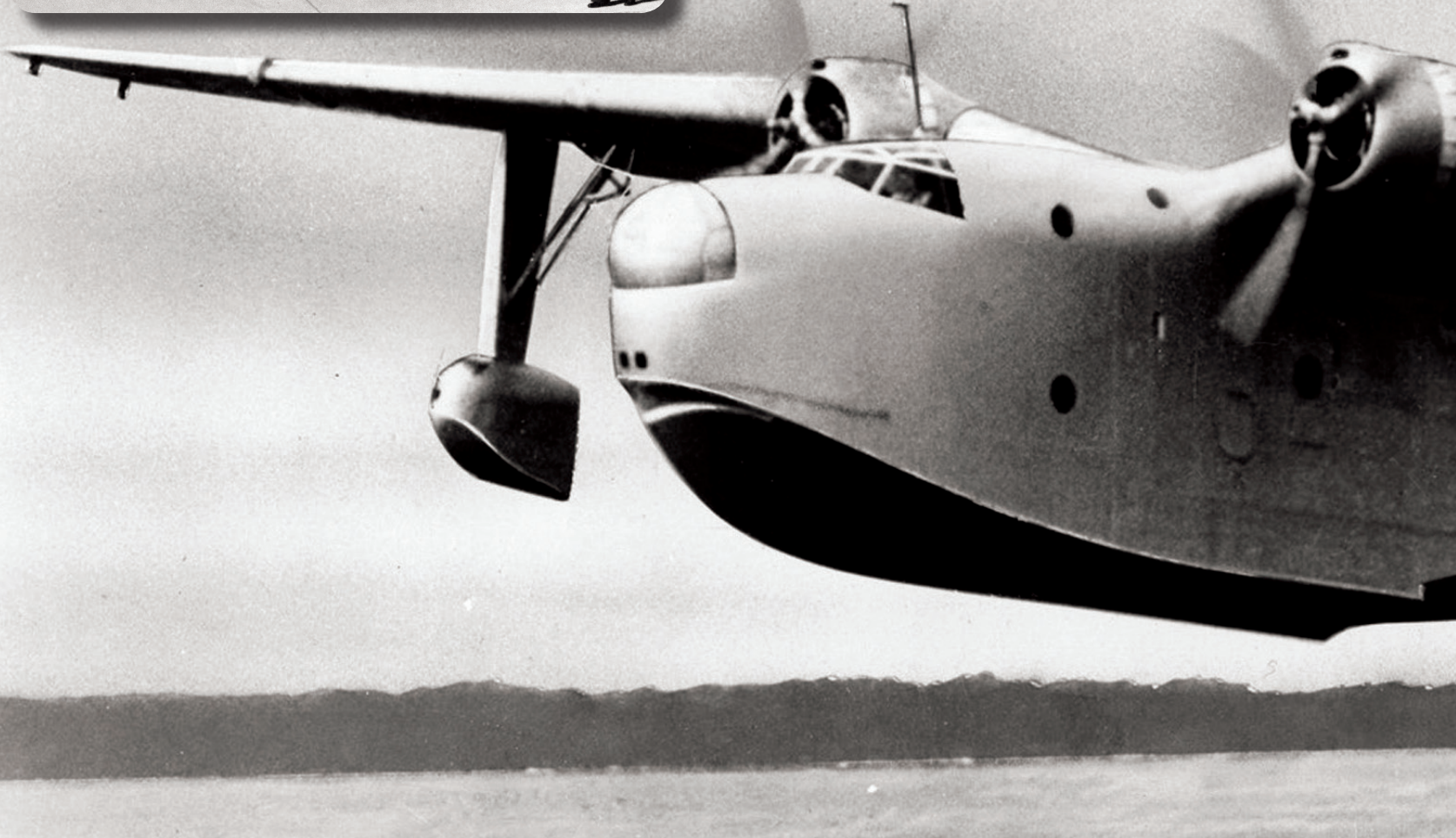
The Martin Mariner story

From XPBM-1 to PBM-5



Tadpole Clipper

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



The famous PBY Catalina flying boat has earned 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 introduced in 1936 and built in large numbers and saw action on both the Atlantic and Pacific areas in a number of roles.

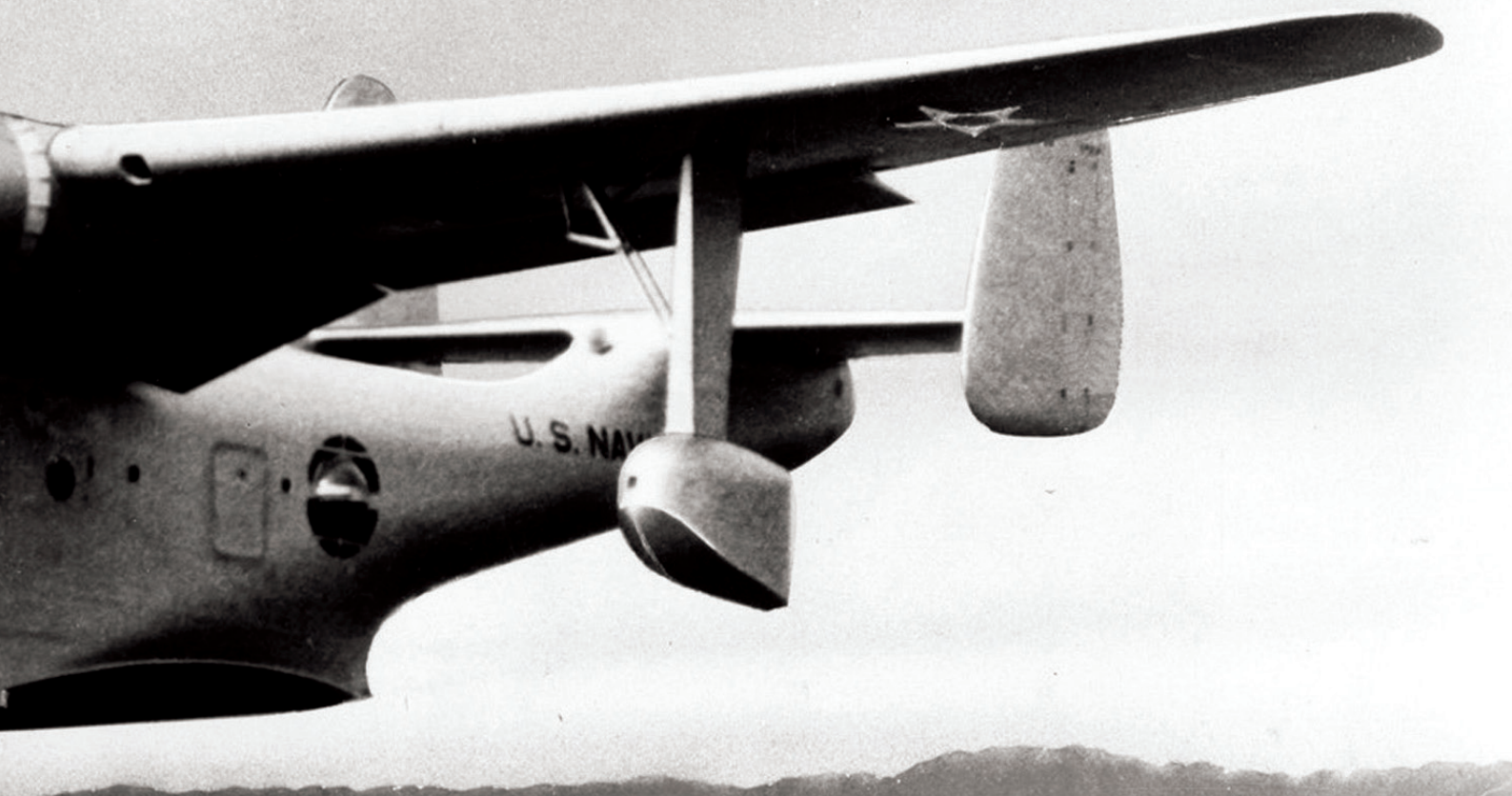
Soon a more modern successor was designed and mass produced, but this type, the Martin PBM Mariner, gained for some obscure reasons much less fame than the Catalina.

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 sub-types that were built, illustrated with a lot of photographs; some of these rare and never published.

XPBM-1

First flight of the XPBM-1 on 18 February 1939 without any guns fitted and with the original flat horizontal tail.



VP-56

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



Early development and flying

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

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 se-

lected: the Wright R-2600-6 Cyclone of 1600 hp maximum take-off power.

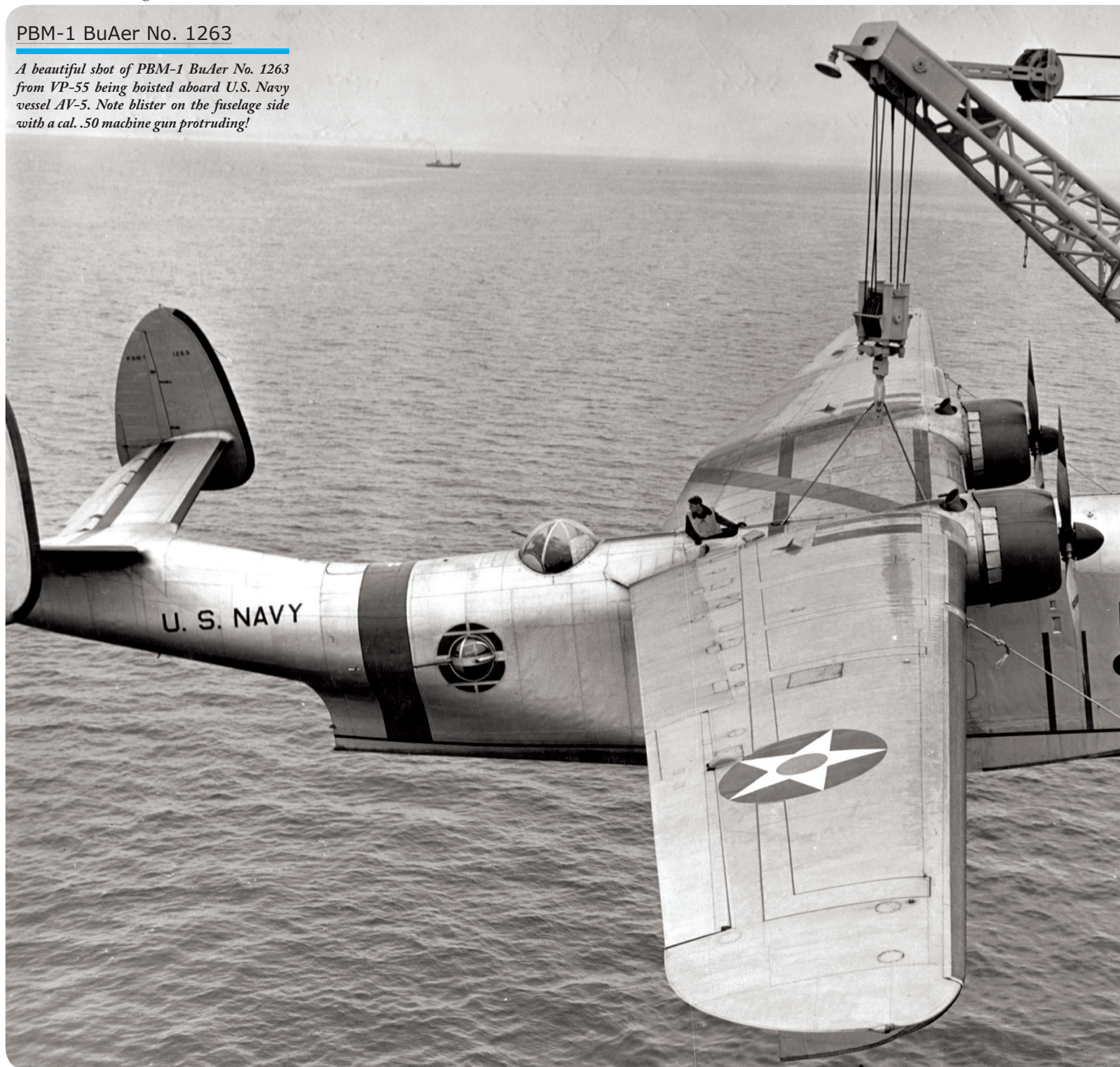
The new maritime patrol flying boat was of all-metal construction with only, as usual at that time, all control surfaces covered with fabric. It had a central two-step hull and two stabilizing floats in the wings that were fully retractable. For self defence it was fitted with a total of five gun positions with 0.50 cal. machine guns.

To test the PBM's layout, Martin built a $\frac{3}{8}$ 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 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 Smithsonian Institution, but some years ago it was transferred

PBM-1 BuAer No. 1263

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!



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.

On June 30th 1937, already before the Model 162A scale model was flown, Martin received 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 evalua-



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 and 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	



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 Martin Company in February 1943 to join Consolidated Vultee as a test pilot. Here he flew exciting 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.

