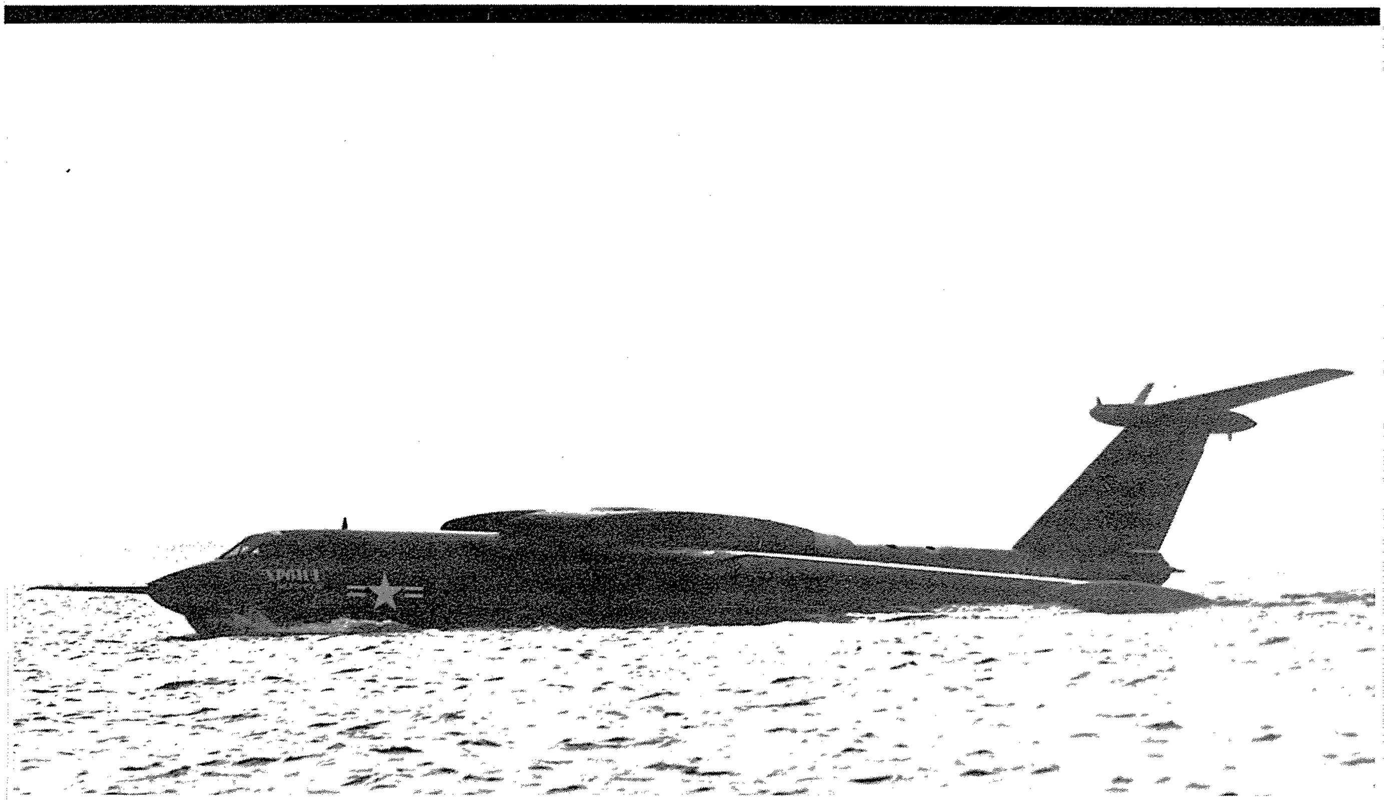
POSEIDON'S GIANT

The Story of the Martin P6M SeaMaster

by Francis J. Allen



"Come now into the Domain of Poseidon a new winged Navy vehicle with unsurpassed dash, illusiveness and lethal power. . . ."

Those were the words which were part of the introduction of the certificate which was given to the Naval aviators who had qualified in the Martin P6M *SeaMaster*. It was the idea of using the realm of Poseidon more effectively that led the U.S. Navy to develop a group of highly innovative aircraft during the late 1940s and 1950s. The most innovative of this group were, without doubt, the Convair XF2Y-1 *Sea Dart* and the Martin P6M *SeaMaster*. Both of these aircraft were powered by turbojets and both incorporated highly imaginative concepts in their hull/fuselage design. The similarity, however, ended with those concepts. The *Sea Dart* had a fuselage/wing combination that aided buoyancy, while the *SeaMaster* was a conventional flying boat. It should also be noted that the *Sea Dart* was only an experimental seaplane, whereas the *SeaMaster* was an operational Navy flying boat.

Even at rest the *SeaMaster* looked as though it was about to leap off the surface of the sea. Here the XP6M-1 makes its way over the bay using the special taxiing method. (the National Archives, No. 80-G-680780)

INTRODUCTION

With a stroke of his pen, as a historian might say, President Truman, by signing the National Security Act on 18 September 1947, put *Finished* to the first act of a drama which saw the Air Force emerge as a major and independent player on the national security stage. It was with the birth of an independent Air Force, coming as it did with a drastic reduction in appropriations earmarked for the three armed services which drastically increased the tension between the different branches of the military for what monies that were available. In the tug-of-war that was to develop, the U.S. Air Force, in order to strengthen its case for the money earmarked for aircraft development and procurement, went so far as to adopt the extreme position that no other service would need fixed-wing aircraft since the Air Force would be there to control the skies. Fueling this interservice struggle was a congressional attitude which looked favorably upon the notion that atomic weapons were the cheapest and the most expedient means of keeping the peace. In turn this newly found method of peace-keeping was seen as a determining factor in regulating the size and makeup of the armed services themselves. This view, of how to keep the peace, of necessity favored the Air Force.

The Navy, through its spokesmen, protested the monopolization of atomic weapons and, by implication, the means of delivering them by the Air Force. This infighting boiled over in the fall of 1949 during hearings held by the Armed Services Committee. The Air Force, and in particular the Strategic Air Command, then headed by General Curtiss LeMay, was able to score more points before the committee with the result that the Navy lost its super carrier, while the Air Force retained its fleet of B-36 bombers. A new tactic was needed if the Navy was to realize its plans to develop its own agenda in Naval aviation. It was then with an awareness of how the U.S. Air Force was thinking as well as an eagerness to retain both the aircraft carrier and their attendant aircraft that the Naval planners decided to use the rationale of mine-laying/reconnaissance as the reason-to-exist for building and deploying a force of jet-powered flying boats.

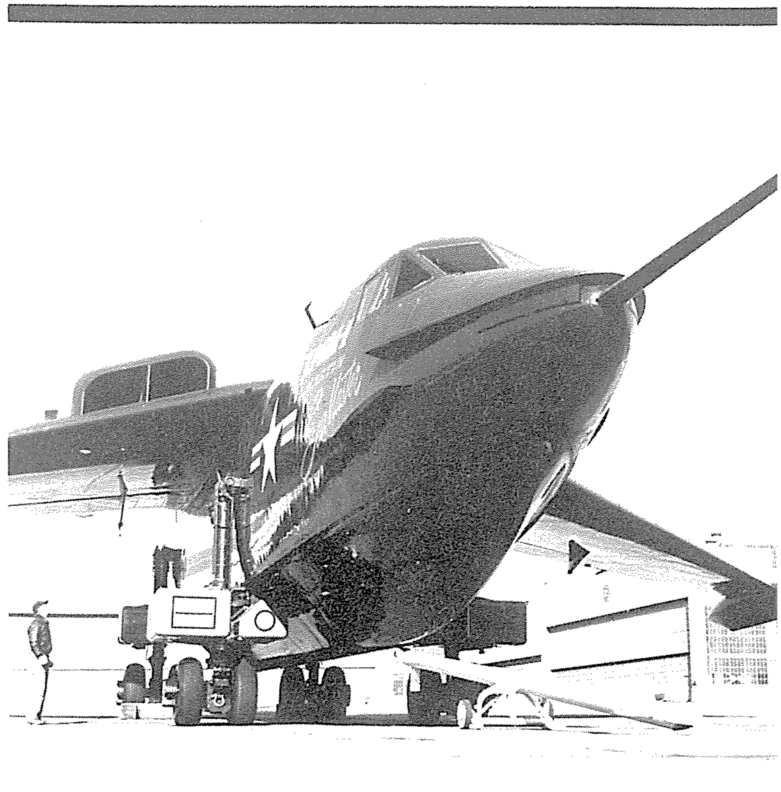
The role of mine-laying/reconnaissance was advanced as the reason to build the *SeaMaster* aircraft since it could be reasonably argued that due to the geography of the Soviet Union its Naval forces were open to attack by means of a high-speed, mine-laying aircraft, since each of the four Soviet fleets would be forced by their location to make the trip to their respective operating areas, the Atlantic and Pacific Oceans, by way of predictable routes. These routes, the Navy argued, if attacked by the Seaplane Stricking Force, operating in small units supplied by mobile units, i.e., submarines and surface vessels, could then be counted upon to bottle up the surface warships and submarines of the Soviet Union at strategic choke points within these predictable transit routes.

The Bureau of Aeronautics had found enough merit in the concept of the Seaplane Stricking Force to issue an operational requirement to the aircraft manufacturers in April of 1951.

DEVELOPMENT OF THE SEAMASTER

On July 30, 1951, 12 aircraft manufacturers were invited by the U.S. Navy to submit design proposals for a high-speed, water-based, mine-laying aircraft with an additional capability for long-range reconnaissance. Of all the companies which responded, the Martin Company of Baltimore, Maryland, was the final choice of the Navy. This was a reasonable selection since Martin had a long history of work experience with flying boats in general and several of the features of the proposed aircraft in particular. The features with which Martin were familiar included the high-flying 'T' type tail and the rotary weapons storage/delivery door which had been developed and tested by Martin for the XB-51.

With a view to achieving the required performance standards, jet engines and a hull design which exhibited a low enough drag coefficient, very close to the better landplane forms were also chosen. Hydrodynamic as well as aerodynamic properties of the proposed seaplane dictated an extremely slender shape of the hull and wing configuration. This finely shaped aircraft, by reason of the required flight envelope, had to possess a remarkably strong and rigid structure. The extraordinary strength was necessary in order to defeat aeroelastic deformations of the entire aircraft structures. Conventional control surfaces would become ineffective if a weak surrounding structure would be deformed by the stress imposed upon it by high-speed, low-level flight.



Details of the beaching gear which had been designed for the *SeaMaster* can be seen to good advantage in this photograph.
(Courtesy of the National Archives, No. 80-G-709338)

Skin thickness on both the hull and the wings had to be calculated with extreme care to obtain the needed thickness which would in turn impart the rigidity that the designers were looking for. The skin in turn was attached to heavy frame members which were spaced at short intervals from each other. In order to give their creation the sparkling performance that the airframe was thought capable of, Martin's engineers at first chose turbo-ramjet compound engines then being developed by the Curtiss-Wright Company. This was later dropped in favor of more conventional turbojet engines, as will be related later.

FORWARD MOVEMENT

A letter of intent for the initial phase of the XP6M program was issued to Martin on June 18, 1952. Under contract No. 53-455-c, two experimental flying boats and one static test article were purchased. This was on October 31, 1952. As it was designed the *SeaMaster* was to be capable of weathering rough water with waves six to eight feet in height. The structural requirements of the design were formidable. Not only would the aircraft be subjected to air speeds of 700 mph, while making a weapons delivery at low altitude with a novel delivery method but the hull and the rotary bomb door's integrity would of necessity have to remain intact at takeoff and landing speeds of around 173 mph. This responsibility for the design of what would become the *SeaMaster* was given to Mr. George Trimble who at that time headed the advanced design department at Martin. Many problems were to confront the engineers as they worked to meet the design requirements. The solution adopted for the bomb door was a pneumatic seal around the periphery of the mine compartment to maintain the hull's air and seaworthiness. Another solution adopted, this time to solve the question of powerplants for the aircraft, was not as effective. The first units installed were the Allison J71-A-4s with afterburners.

The first part of 1955 was spent in the static testing of the prototype. Testing revealed a severe problem with overheating and cracking of the fuselage skin in the area adjoining the inboard engines, resulting from lighting-off the inboard engine afterburners. Although the damaged areas were repaired, restrictions on the use of the inboard afterburners had to be placed on the flight operations of the XP6M-1 as that portion of the flight testing developed. That was not to be the only area of concern for those assigned to the *SeaMaster* project, as many more problems were to arise during the early part of the test program. These would range from a flooding mine bay, which resulted in the aircraft drawing three more additional feet of water, to microscopic holes in the wing's fuel tank sealer.

The Allison J71s were yet another area of concern. They had been modified for the *SeaMaster* but they were not really what was needed for working in a saltwater environment and as a consequence they were always under close scrutiny.

In addition to all of the problems which appeared during the early testing of the XP6M-1, the flight crew found, once actual flight testing began, that they had more than their share of tasks to perform, especially during takeoff. Besides the normal routine the crew had to light the afterburners after having gotten the aircraft to 23 miles per hour. This, many times, would take two or three attempts. On many occasions only one of the two engines would stay in the afterburner. Once the XP6M had gotten on the step the crew had to: 1) retract the forward chine slats; 2) close the engine alternate air doors, which often triggered a loss of afterburners; 3) shut off the hydroflaps while lowering the flaps to takeoff setting.

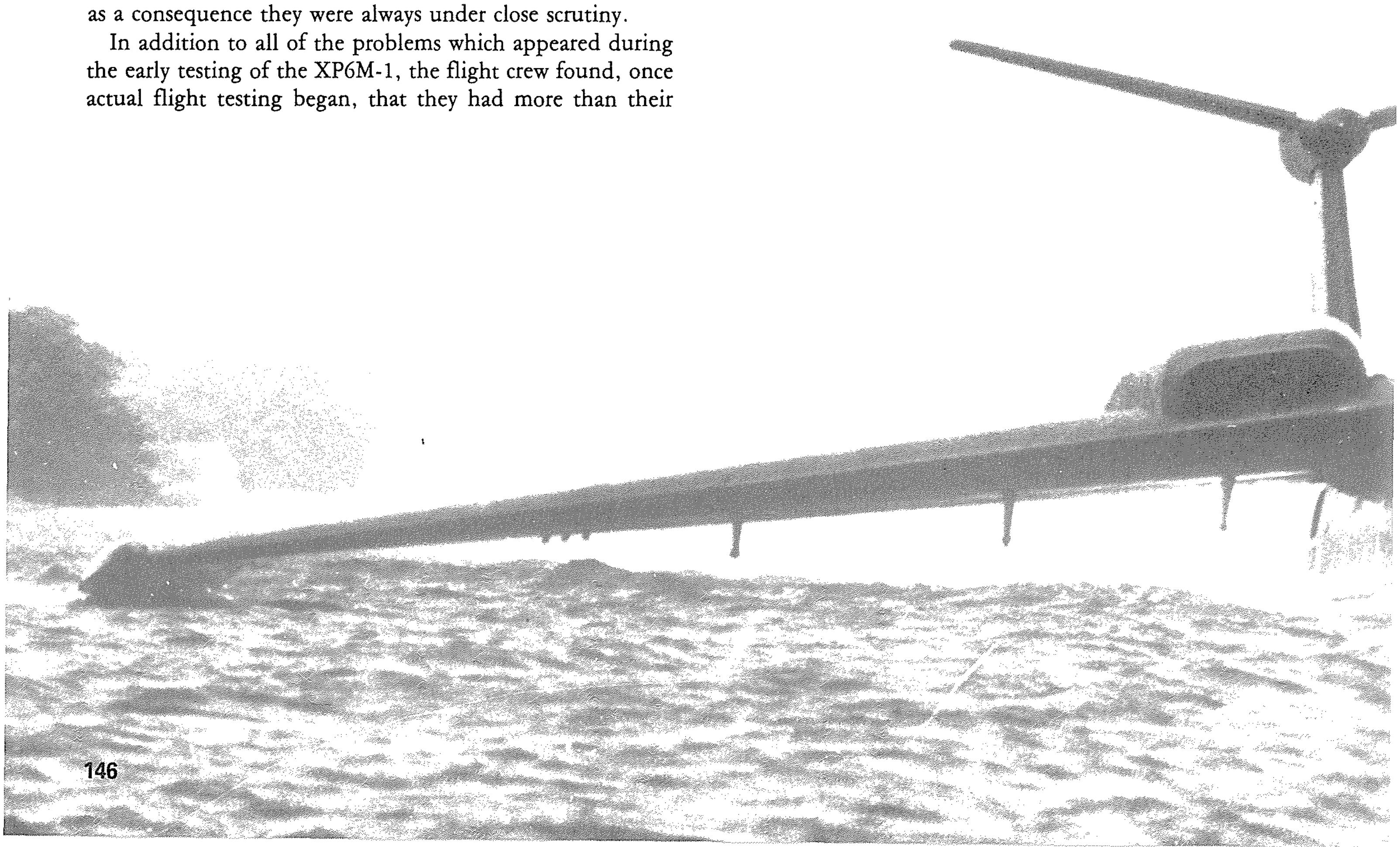
FIRST FLIGHT

The first flight of the first XP6M-1 was flown at Middle River, Maryland, July 14, 1955, crewed by George A. Rodney and Morris Bernhard as pilot and assistant pilot, Herbert Scudder as flight engineer and H.B. Coulon as flight test engineer. This event had been preceded by the aircraft rollout seven months before that same year.

Even with the before-mentioned shortcomings the performance of the first P6M was promising enough to warrant even further work, but before the test program had progressed much more the Navy committed itself to an expanded program by contracting for a test article which had been deleted for contract No. 53-455-c plus six more aircraft. These had now been designated YP6M-1 test and demonstration craft. This was formalized in contract No. 55-535-c which was issued on January 28, 1955, just 24 days after the *SeaMaster* rollout and a little over six months before the first flight.

By September of 1955 the flight test program was well under way. The *SeaMaster* had by then made 12 flights

The *SeaMaster* is seen here gathering speed for takeoff.
(Courtesy of the National Archives, No. 80-G-681030)

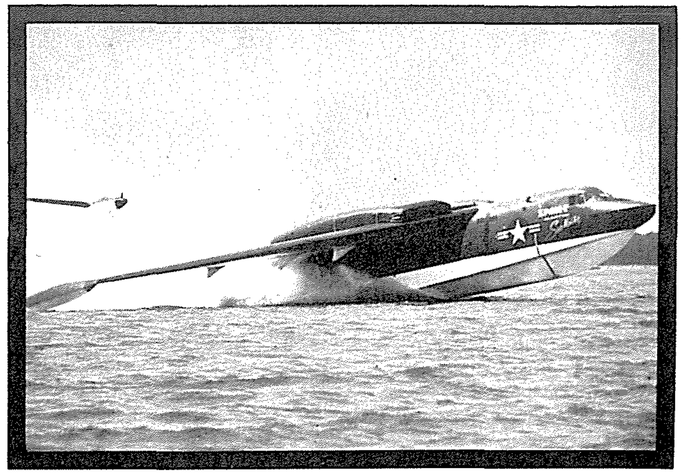


amounting to 25 hours in the air. The Navy's confidence in the *SeaMaster* had grown to such a degree that in the late fall of that year the *SeaMaster* was put through its paces for Admiral Arleigh Burke, Chief of Naval Operations and his guest, Earl Mountbatten, Britain's First Sea Lord.

It was discovered during this period that the P6M's hydrodynamic stability was better than had been predicted by the model tank tests. The hydroflap's effectiveness was also found to be quite good. No problems were encountered with the spray patterns which the flying boat produced while under way. The engine inlets were well clear of the spray even with up to three-foot waves. The only major problem was the temperature effect of the two inboard engines, in the afterburner, on the aft hull/skin area. As mentioned earlier this was of great concern to the Navy, but Martin claimed that the problem was not serious.

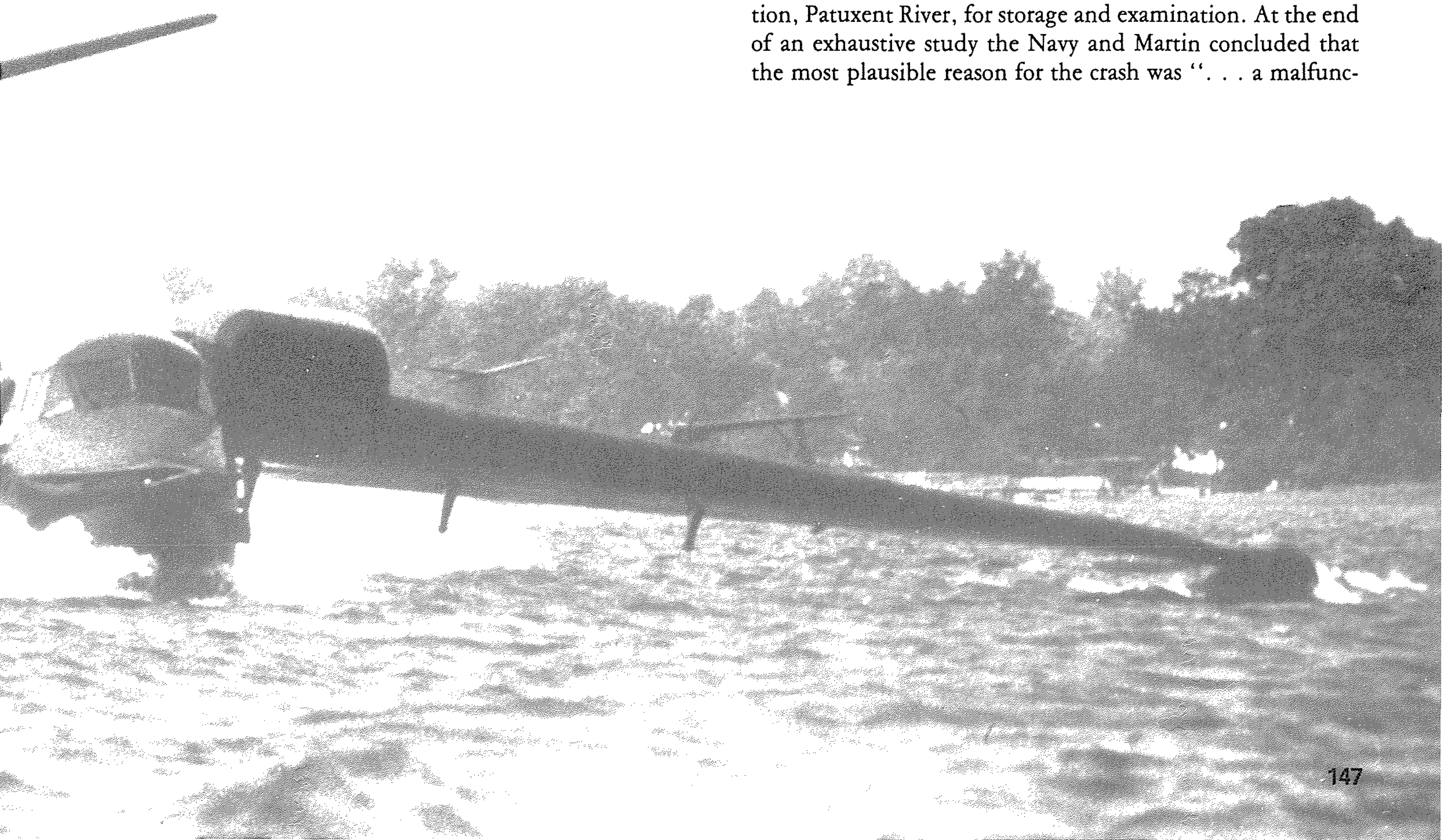
As the testing schedule progressed into the fall of 1955, the U.S. Air Force was reportedly taking a look at the Martin *SeaMaster*. General Thomas D. White, the Vice-Chief of Staff of the Air Force, had remarked, ". . . the water-based bomber [should] take its place alongside other Air Force airplanes and missiles." This possibility presumably stemmed from the fanciful belief that atomic energy would power the next stage in aircraft development. The Air Force had the backing of the Secretary of Defense, but with the prerogatives of the Navy being defended by the service's secretary Charles S. Thomas, and with the need to contain interservice warfare, the matter was dropped and forgotten. The focus of all dramatically shifted from the fantasy of interservice politics to hard reality when on a winter afternoon in early December, the first *SeaMaster* crashed.

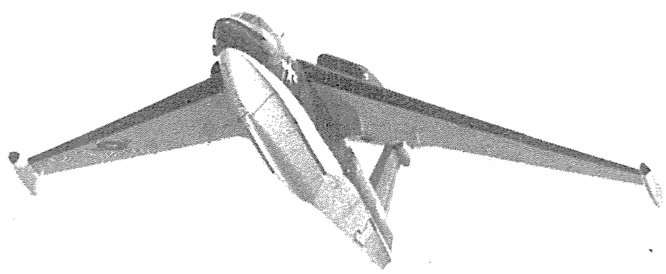
December 7th was again to be a bad day in Naval history; however, now the year was 1955. On that day the first XP6M-1 crashed into the Potomac River, near the junction with the St. Marys River. Four men were killed: Maurice Bernhard, Martin's test pilot; Herbert Scudder, flight engineer; James Hentschel, flight engineer; and Lt. Cdr. Victor Utgoff, the branch head of the Naval Air Test Command, Patuxent River. Eyewitness accounts of the crash enabled the Navy and Martin to conclude that the breakup of the *SeaMaster* took place over a distance of about 3,000 feet, at an altitude of from 6,000 to 3,000 feet and in an estimated five to 10 seconds. The breakup occurred at 13:37 hours; seconds later the *SeaMaster* impacted on the surface of the Potomac River some six miles off Point Lookout, Maryland. The salvage operation that followed recovered about 80 percent of the aircraft.



As the XP6M-1 gathers speed for its takeoff the tail is almost hidden by water spray. (Courtesy of the National Archives, No. 80-G-679543)

The remains of the XP6M were brought to Naval Air Station, Patuxent River, for storage and examination. At the end of an exhaustive study the Navy and Martin concluded that the most plausible reason for the crash was ". . . a malfunc-





The clean lines of the *SeaMaster*'s hull can be seen in this photograph. (Courtesy of the National Archives, No. 80-G-709609)

tion occurring in the control system, a runaway of a primary actuator, which caused a violent pitchdown with an estimated force of negative 9.0 gs. The resulting stress was so severe that the engines separated from the aircraft. . . .'' The wings were bent completely down with their undersides touching the fuselage. When the wings finally broke off, the violence of the break was such that pieces of the wings were found embedded in each other. It was believed, due to the testimony of Rick Cotton, the pilot of the chase plane, that with the prevailing weather conditions the pilot of the XP6M became disoriented, and his violent corrective maneuvers induced the violent pitch-down which ended in the death of the crew and the loss of the first *SeaMaster*. While the investigation was taking place the testing of the second prototype was delayed. After a brief pause to modify the second XP6M-1, which included the installation of ejection seats, the program continued on its course.

The second XP6M-1 (BuNo 138822) flew for the first time on May 18, 1956, piloted by George Rodney and Robert S. Turner, copilot. George Spartage and Dominic Pedicone were also on this flight as engineers. This aircraft had completed its taxi trials begun on May 9, 1956, before it had first taken to the air. It was necessary for this second *SeaMaster* to pick up where the first aircraft had left off. In order for that to happen the minelaying and navigational systems had to be removed. The testing schedule now returned to some form of normalcy. The Navy for its part announced its intention to order a production version of the *SeaMaster* for a total price of $102,163,427. On August 29, 1956, the Navy confirmed that intention with contract No. 57-161-c, which called for the delivery of 24 P6M-2 *SeaMasters*. At that time the estimated cost of each aircraft plus spares and support was $7,938,000. The U.S. Navy, in the person of Vice Admiral Thomas S. Combs, listed the advantages of the production aircraft before the Symington Senate Subcommittee as: 1) capacity to drop nuclear or other bombs; 2) mobility; 3) cooperation with carrier task forces; 4) mining operations; and 5) freedom from support installations.

It was just as the Navy was getting ready to buy all of these advantages, however, that disaster struck for a second time in the *SeaMaster* program. Just 28 days short of a year from the date of the first crash, the second XP6M-1 (BuNo 138822) was destroyed near Odessa, Delaware, at 15:36 on November 9, 1956. The all-Martin crew consisted of R.S. Turner as pilot; W.E. Cunningham as copilot; W.L. Compton as flight engineer; and T.M. Kenney, also as flight engineer. All ejected from the stricken aircraft and parachuted safely to the ground.

The subsequent inquiry into the accident, conducted by both the Navy and the Martin company, found the fault to be an overloaded tailplane jack. The overloaded condition resulted from a modification to the horizontal tail which had been done as a part of the tail shake test. This caused the aircraft, which the pilot was trying to recover from a shallow, full-power dive from 25,000 feet to 21,000 feet at Mach 0.9, to enter a tight loop. As it neared the ground the XP6M-1 exploded and crashed setting some corn and barley fields on fire. An arithmetic mistake had been made while processing the original wind tunnel hinge moment data; the hydraulic actuators for the *SeaMaster*'s control system had as a result been designed larger than need be.

The result of all these mistakes was that the control system was overpowered, and this in spite of the fact the data had been checked and rechecked by the Navy, NACA, industry and by a number of universities. However, since no inherent fault of the *SeaMaster* was to blame for the accident, the program was allowed to resume its forward direction. As the investigation of the second crash went forward so too did the construction of the six YP6M-1s and the 18 (reduced from 24) P6M-2s.

The reduction of production *SeaMasters* was covered by the first termination notice (TN-1) which was dated June 21, 1957. The planning for the eventual production schedule continued even during the halt in the flight test program. As a part of that planning, Flight Refueling Inc. of Baltimore, Maryland, was contracted with at this time by Martin to develop a prototype probe and drogue aerial refueling equipment for the P6M. All of the equipment was to be housed in and on the rotary weapons door with a fuel transfer capacity of 10,000 gallons. The contract was signed in August of 1957. This period of investigation and soul searching ended with a far-ranging improvement program. This program included a severe structural test program which resulted in modifications being made to the tail junction as well as a new escape system tested on the Supersonic Naval Ordnance Research Track by Beech Aircraft. At this same time, Aeronca Manufacturing Corporation was contracted to design and build a prototype of a mobile beaching dolly.

The flight test schedule resumed with the first flight of the first YP6M-1 (BuNo 143822) on January 20, 1958. The flight lasted one hour and 55 minutes and took place over the Chesapeake Bay. Martin's engineers had taken the time provided by the testing halt to correct some of the problem areas discovered in the X-craft. These redesign measures were as follows: 1) a change to the front configuration of the engine nacelles in order to improve the engineering performance, by making it possible to obtain a more uniform distribution of the air across the engine compressor faces; 2) canting the two wing-top engine nacelles outward in order to eliminate afterbody fuselage heating; and 3) the addition of an extra tail fin fairing at the top of the fin to reduce inflight drag. All this was in addition to a new crew escape system developed by the people at Beech Aircraft. Aircraft weight also was on the rise going from 160,000 pounds to 171,000 pounds.

The first of the YP6M-1s was to be retained by Martin for full program testing, while the next five seaplanes would be initially tested at Baltimore before being turned over to Naval test personnel at the Naval Air Test Center, Patuxent River, Maryland. Although the testing was accelerated with the delivery of the YP6M-1 aircraft the continued developmental delays, design changes and production schedule slippages kept hurting the entire program. The *SeaMaster* program was quickly becoming prohibitively expensive. Testing detected further structural and hydrodynamic problems which resulted in still more delays and expenses. All of this kept pushing back the date for the introduction of the *SeaMaster* into fleet service, and with the advent of new weapons systems the acceptance of the P6M became increasingly unlikely. Confirmation of the fear came on November 24, 1958, when the Navy Department canceled 10 more P6M-2 *SeaMasters* in a second termination notice (TN-2) for contract No. 57-161-c. This reduced the program to six YP6M-1s and eight P6M-2s.

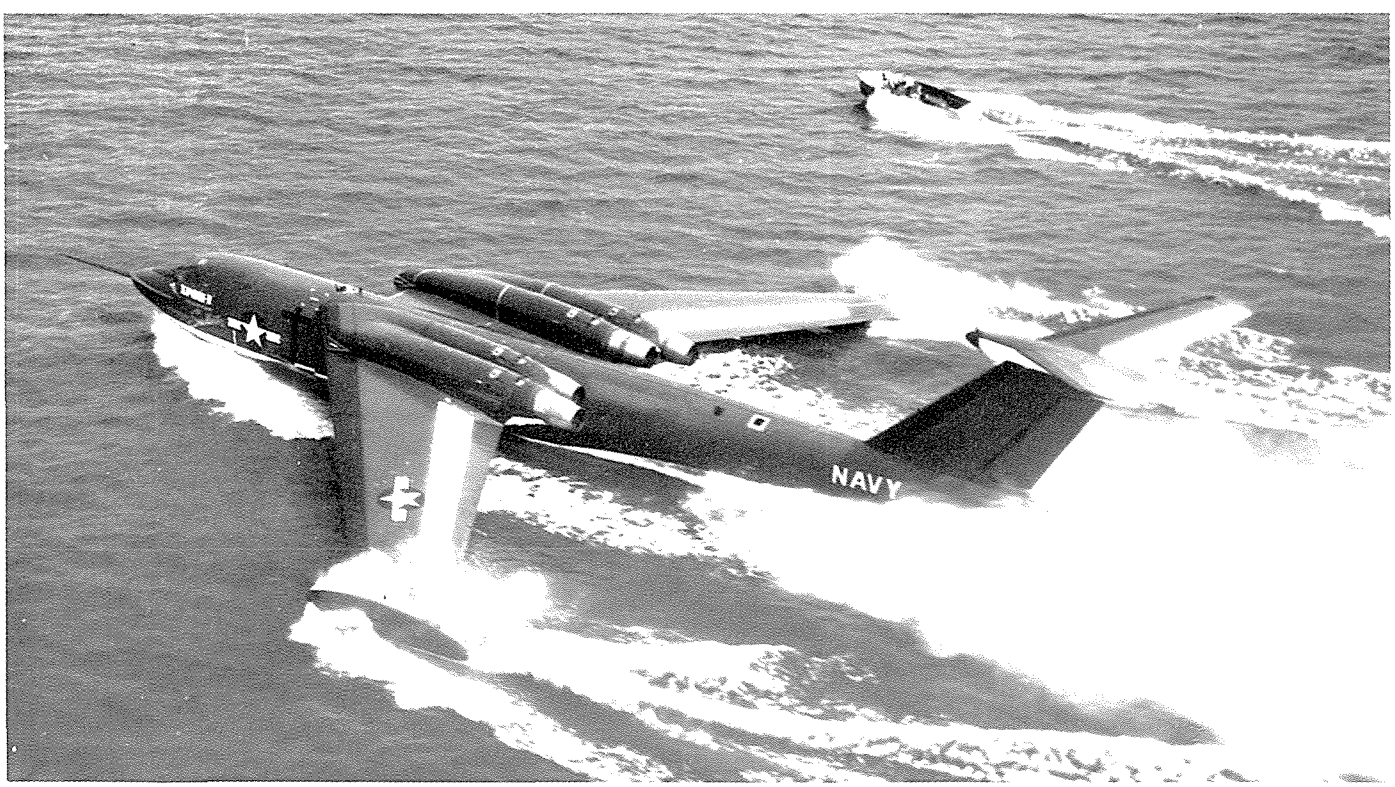
On February 17, 1959, the first flight of the first production P6M-2 was made. But even with this success the *SeaMaster* program was again reduced still further when on March 9, 1959, all of the YP6M-1s' work was eliminated with TN-1 for contract No. 55-535-c. The Navy, however, was still planning to commission a single squadron of eight P6M-2s for the purpose of evaluating their operational potential. Delays and expenses in the program had by this time escalated beyond the Navy's willingness to support them. This in turn made the case for such an operational unit much weaker.

As the *SeaMaster* moves through the water it is paced by a motorboat for the purpose of taking photographs.
(Courtesy of the National Archives, No. 80-G-698251)

Besides this the appropriateness of an offensively oriented seaplane came into strong question with the introduction of new weapons systems into the Navy inventory and with the dramatic rise in the program costs. On August 24, 1959, the last act of our drama took place when the final and complete termination of contract Nos. 55-535-c (TN-2) and 57-161-c (TN-3) were issued. This was done, in the language of the document, for the convenience of the government. When the end finally came the *SeaMaster* program could claim 496.2 hours flown by the YP6M-1s and 103.6 hours flown for the P6M-2s.

PHYSICAL DESCRIPTION

The P6M *SeaMaster* was a turbojet-powered flying boat and although there were three changes in its designation all three variants were essentially the same in their basic dimensions. These were a wingspan of 102 feet, seven inches giving a wing area of 1,900 square feet; a sweepback at one-quarter chord of 40 degrees, using Section NACA 63A311 at the root and 63A306 at the tip; the thickness ratio and camber resulted from the demands of transonic flight. The XP6M-1 had a wing aspect ratio of 5.0. Length was 134 feet, three inches and a height of 33 feet, nine inches. Wing loading was from 87.81 pounds per square foot to 88.21 pounds per square foot depending on the mission requirements. The hull featured a high length-to-beam ratio, while the swept shoulder-mounted wings ended with fixed plastic stabilizing floats at the outer ends. Three different types of turbojets were mounted on the upper surface of those wings during the lifetime of the *SeaMaster* program. The XP6M-1 had the Allison J71-A-4 with an afterburner, while the YP6M-1 carried four Allison J71-A-6 also with an afterburner. The P6M-2 was powered by the 17,500-pound static thrust Pratt & Whitney J75-P-2s which eliminated the need for reheat. In the XP6M-1 and YP6M-1 designs the boxlike structure which

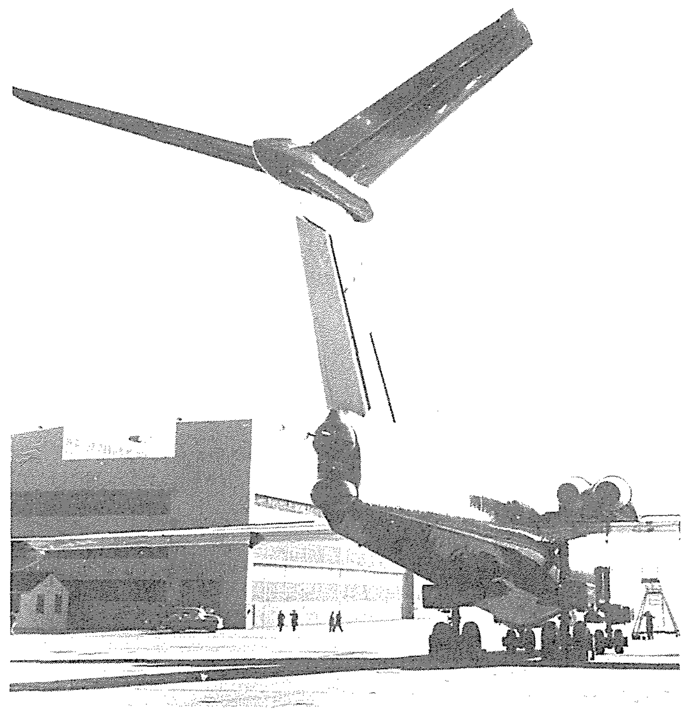


housed the engines was canted outward by five degrees. This was done to reduce the effect of the hot jet gases on the fuselage. On the P6M-2 the change of engines required that the air intakes be revised and made broadside to the air stream, while the jet pipes were toed sharply outward. At this same time the anhedral was also eliminated from the wing in order to smooth out water operation by keeping the wingtip floats over the surface of the water. Fuel storage comprised two tanks in the forward hull containing 1,625 gallons, two tanks in the aft hull for another 1,675 gallons and the entire wing torsion box as an integral fuel tank which accommodated 7,720 gallons. Oil capacity was 31 gallons.

For directional control Martin used a 'T' type all-flying tail. Lateral control was by means of spoiler-type ailerons and single-slotted flaps being used in conjunction with leading-edge automatic slats to provide high lift and stall control. The flight crew would consist of a pilot, a copilot, a navigator/minelayer, a radio operator and a defensive armament operator. The *SeaMaster*'s weapons delivery system hinged on a rotary door which was incorporated as part of the bottom of the hull. The rotary weapons door rotated on a fore and aft axis. In order to make the seal between the rotary door and the hull watertight, which involved closing a gap of several inches between the weapons door and the fuselage, B.F. Goodrich developed a rubber seal which was fastened to the bottom of a series of metal fingers. When the actuating tube was inflated it levered the fingers to press the seal against the door. When the upper tube was inflated it levered the fingers again but this time to retract the seal. This system was in general successful, because it provided positive closure as it compensated for any distortions of either the hull or of the door. Even if air pressure should be lost in the tubes the seal itself would remain tight under water pressure.

The mines or photographic equipment were to be mounted on the door itself. The aircraft could carry the following: 27 No. 154, M120 (T9E8) Photoflash; 28 Mk36 Mod. 1 mines; 15 Mk25-2 Mod. 2 mines; 36 Mk50 mines; 15 Mk52 Mod. 0, 1, 2, 3, 4, 5, 6 mines; eight Mk39 mines; 15 Mk19 Mod. 2 mines; five Mk10 Mod. 9 mines; two Mk91 bombs for 3,500 pounds or one Mk28 bomb for 1,800 pounds. The weight for the mines varied from 504 pounds for the Mk50 and the Mk19 to 2,030 pounds total for the Mk25-2. Defensive fire power was provided by two 20mm cannons in an Aero X-23B barbett with 1,000 rounds. The *SeaMaster* was built to ". . . live in the water. . . ." The engines could be changed by means of access provided by the hinged tops to the engine nacelles, while the weapons could also be replenished at sea through an overhead access hatch in the mine compartment.

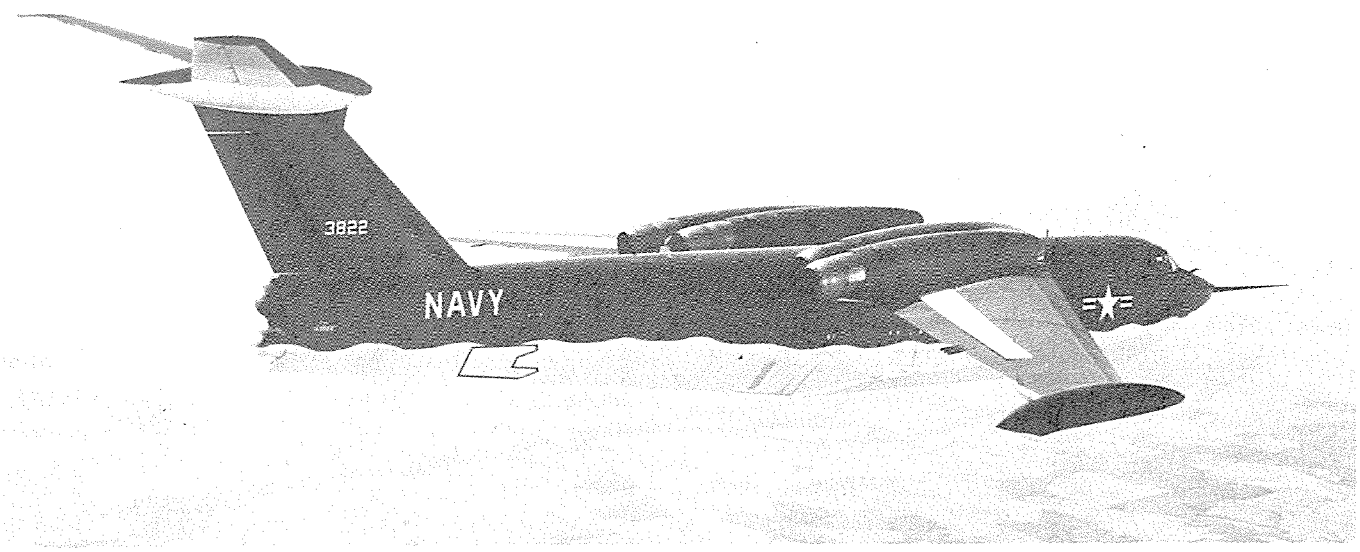
The electronics fit on the *SeaMaster* was to be the following: military VOR(TACAN), AN/ARN-21; UHF communications, AN/ARC-27A; HF communications, AN/ARC-38; intercommunications system, AN/AIC-5B; UHF direction finder, AN/ARA-25; radar altimeter, AN/APA-22; radar identification set, AN/APX-6B; coder group, AN/APA-89; ECM tail warning receiver, AN/ALQ-2; chaff dispenser, C.F.E.; Aero X-23A armament control system; radar navigation system, AN/APN-66; search radar, AN/ASB-1; auto astro compass, KS-50; plus a short-range course-and-fix computer.



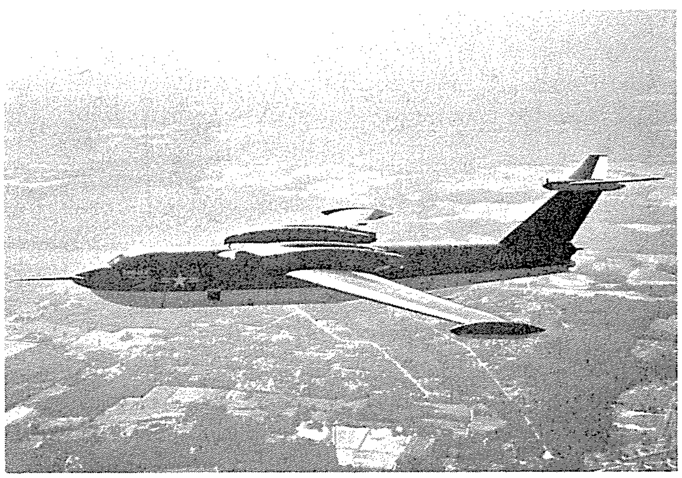
The XP6M-1 tail stinger and radome.
(Courtesy of the National Archives, No. 80-G-709336)

The rollout of the *SeaMaster*. (the National Archives, No. 80-G-709342)

The weights for the YP6M-1 were: empty and basic weights of 84,685 pounds and 86,765 pounds respectively, design loaded and combat weight were 140,000 pounds and 147,609 pounds. Maximum takeoff weights were 160,000 pounds from rough water and 190,000 pounds from sheltered water. Maximum takeoff weight jumped to 188,000 pounds for the P6M-2. As the weight of the *SeaMaster* increased the ability to move that weight also improved. The XP6M-1, powered with the Allison J71-A-4 with a maximum thrust of 13,000 pounds static thrust each, could reach a top speed of 639 miles per hour. The P6M-2, powered by four Pratt & Whitney J75-P-2s rated at 17,500 pounds static thrust, was able to reach 723 miles per hour. Some performance figures for the YP6M-1 on a basic mining mission make for interesting reading when compared to the performance figures for the high-altitude reconnaissance mission. The reconnaissance mission figures are cited in parentheses. Takeoff weight would be 167,011 pounds (166,985 pounds). Top speed was to be 645 miles per hour at 5,000 feet for both mission profiles. The combat range varied from 1,385 nautical miles for mining to 2,385 nautical miles for the reconnaissance mission. Average



At first the hot exhaust from the engines affected the fuselage skin but later this was corrected by canting the engines out away from the fuselage. (Courtesy of the National Archives, No. 83-111)



The *SeaMaster* is seen here over the Maryland countryside. (Courtesy of the National Archives, No. 80-G-698248)

speed for the combat mission was 539 miles per hour. Combat cruising altitude was from 32,500 feet to 43,500 feet for any mission profile. Combat radius varied from 585 nautical miles to 1,225 nautical miles depending upon the equipment and/or ordnance carried. The YP6M-1 had the ability to climb to 20,000 feet in 8.2 minutes and to 30,000 feet in 17 minutes with a rate-of-climb of 3,050 feet per minute.

IMPRESSIONS OF THE SEAMASTER

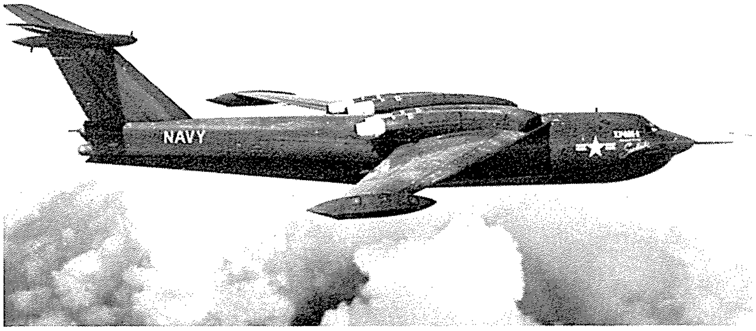
Commander William L. Murphy, USN (Ret.), writing for the *Naval Aviation News* in 1981, recalled what it was like to fly the Martin P6M *SeaMaster* in a vivid account that 22 years had failed to dim. Bill Murphy had just been assigned to assist Lt. Jim Campbell, the Armament Test P6M Project Officer, on the *SeaMaster* project. Lt. Campbell's job was to wring out any problems which might be found in the *Seamaster*'s navigation and weapons systems.

In order to be better prepared for the arrival of the *SeaMaster* at the Naval Air Test Center, Patuxent River, Maryland, later in 1959 several Navy test pilots participated in the Martin Company's test program. Commander Murphy went to the Strawberry Point test facility located near Baltimore, Maryland. His first impression while walking out to the aircraft was its sheer size. While it was resting on its special beaching vehicle the P6M stood 37 feet high at the 'T' tail and 16 feet at the cockpit. The 102-foot, 7-inch wingspan loomed monstrous compared with just about any other aircraft in the Navy's inventory. Bill Murphy had flown the PB4Y-2 *Privateer* during his patrol squadron days. The *Privateer* was a big aircraft, tipping the scales at some 65,000 pounds but the *SeaMaster* was bigger still with the exception of one area: the crew. Whereas the *Privateer* required a crew of 10, the *SeaMaster* could be serviced by a crew of only four. Commander Murphy recalled that the P6Ms were highly instrumented including telemetering equipment which would transmit information to the ground station for immediate evaluation of the flight's progress.

Access to the interior was gained by way of a hatch on the port side of the aircraft's fuselage. Just inside a folding anchor was secured to the bulkhead. Immediately aft of the hatch were the two crew stations, while forward of the hatch was the cockpit. This story should now be continued using Commander Murphy's words.

"After starting the J71s we left the parking ramp. For ground operations the P6M employed a unique beaching cradle which made taxiing very similar to that experienced in an airplane with conventional landing gear. Hydraulic hoses connected the brakes of the beaching vehicle to the aircraft controls. After power was added to start rolling, idle rpm was sufficient to keep the big plane moving.

"Once over the ramp and into the water of Middle River, the beaching vehicle was released, and the *SeaMaster* became a true seaplane. The combination speed brakes used in flight and hydroflaps for use at slow speeds in water made directional control while waterborne much simpler than in seaplanes I had flown before. The hydroflaps could be used



The XP6M-1 was originally painted in all all navy blue paint scheme. (Courtesy of the National Archives, No. 80-G-680781)

simultaneously to slow the airplane or individually for directional control.

"In contrast to the high position of the cockpit when on the ramp, I felt like we were submerged when we were on the water, although the cockpit was still about six feet above the water.

"The crash boats had swept the area and we were cleared for takeoff. The afterburner circuits were armed, the airplane turned into the wind, and Bob [Robert Turner, chief experimental test pilot for the Martin Company] pushed on all four throttles. My job was to monitor the power and put the flaps down at 80 knots.

"As power was applied, the P6M was an impressive sight to see. The jet blast threw up a cloud of spray that completely hid the huge 'T' tail, the nose of the airplane rose, and the wingtip floats cut through the water. However, none of this was visible from the cockpit—it happened about 65 feet behind us. As 'hump' speed was reached, about 80 knots, the nose came back over, and I put the flaps down. At 145 knots we broke free of the water.

"Although I later had several opportunities to control the airplane on the water at these speeds, I never ceased to be impressed. Doing 145 knots on a nice smooth concrete runway is one thing—145 knots on choppy water is another.

"As we headed out towards the test area, the Atlantic of Assateague Island, I had an opportunity to get the feel of the *SeaMaster*. The hydraulically powered controls, while not as light as a fighter, were not unduly heavy. Control response was remarkably quick for such a big airplane.

"The instrument panel was conveniently laid out, with engine instruments grouped together between the pilot's and copilot's flight instruments. On the overhead, the fuel control panel switches were so arranged that white lines showed the path of fuel from the tanks to the engines. Lights, radios, air conditioning and similar switches were distributed between the pilot's and copilot's console panels. The ejection seat was comfortable and there was plenty of leg room for even a tall person like me.

"The one big discrepancy that I noticed was the poor visibility during turns. Although better than most transport airplanes, the P6M-1 *SeaMaster* was a little shy on windshield area for a tactical airplane. This discrepancy was recognized by the Martin Company and the P6M-2 version of the *SeaMaster* had large plexiglass areas overhead, giving visibility similar to jet fighters.

"Once in the test area, a Martin test pilot in a Grumman F-11F chase plane joined us. His job would be to observe the rotation of the mine bay door and watch the dropping of the 30,000 pounds of mines. Contact was made with 'Adrift Base,' Armament Test Base Radio, and clearance to drop the stores was received.

"A high-speed, low-level pass over the area showed that it was clear to drop the mines. Actually they were inert stores, but with the exact weight, shape, size and center of gravity of the actual weapons that they simulated. At a speed of about 500 miles per hour the mine bay door was rotated. A slight vibration could be felt throughout the airplane but not any more than expected.

"'Mines away!'

"The door rotated shut. It was a good drop. All of the mines fell cleanly away just as they were supposed to fall. High air speeds at low levels can give disturbing airflow patterns around airplanes, which cause trouble in the separation of droppable stores. This successful drop was quite a milestone.

"Another successful flight, which checked an important data point off the long list that any new airplane must complete started out very unpretentiously, and ended undramatically.

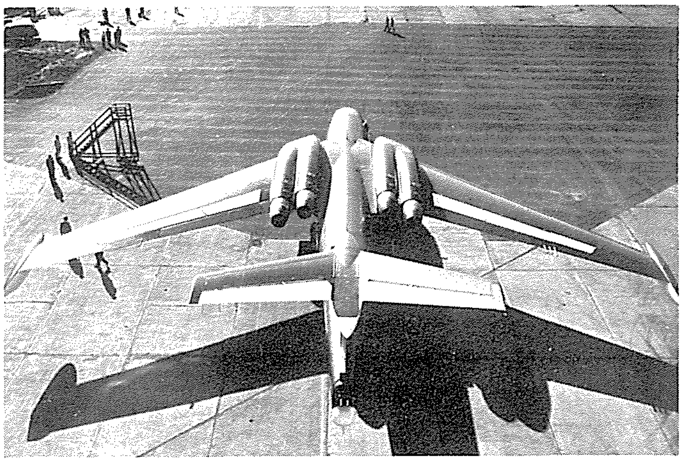
"Although the sky was clear, the surface visibility as we taxied out was about three miles. When we arrived in the seaplane area it was obvious that we would have to wait for an increase in visibility to comply with the stringent weather restrictions that the test operations were under. In order to conserve fuel Bob Turner secured the engines. An auxiliary power unit in the aft end of the airplane was remotely turned on to provide power for the radios. As we sat, weather cocked into the wind, gently bobbing up and down, one of Martin's crash boats came alongside to offer us some coffee and doughnuts. Now this is the way to live! A coffee break in the middle of the Chesapeake Bay. I could learn to like it.

"The visibility finally came up to the necessary five miles. Bob fired up the J71s and within minutes we were airborne. A quick turnaround and we were in a position for an approach for an overload high-gross-weight landing at 165,000 pounds. This could put a lot of strain on important structural members. Seconds later, we were coming to a stop on the water as uneventfully as a duck returning to a mill pond.

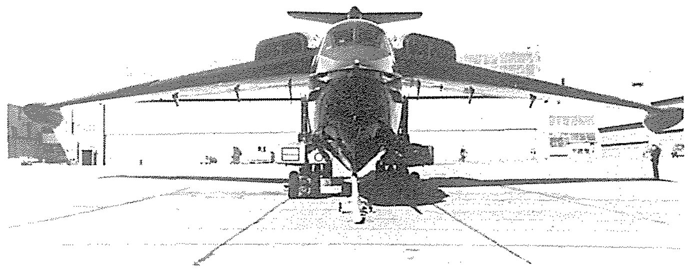
"The visibility had gone back down and Bob decided to return to the hangar. After almost four hours in the airplane we taxied back up the ramp at Strawberry Point.

"On another flight, while on a high-speed taxi run, to get the feel of the water-handling characteristics, I suddenly realized that looming up almost directly ahead of me were two large poles. We had been in the same area of the bay only a few days before and it had been clear. Some fisherman had apparently stuck two poles into the bottom, about 50 feet apart, to mark his traps. Extending about 10 feet out of the water, they were probably a little too high to go under the wings. I shoved in on the rudder to try to turn but, at 130 knots on the water, we veered only a few degrees. To cut back on the power would have been unwise, because we could not have stopped before reaching the poles and we would have only settled lower in the water and hit both poles for sure.

"Right between the poles! Apparently we had missed



A purposable configuration as seen from above, as the *SeaMaster* awaits its next set of trials. (Courtesy of the Smithsonian Institution, No. 83-112)



A form was used for the hull/fuselage of the *SeaMaster* in order to produce the best possible combination of aerodynamic and hydrodynamic properties. (Courtesy of the Smithsonian Institution, No. 83-110)

them—or so I thought at the time. Later, on the ramp, the evidence was plain—a long scratch from the leading to the trailing edge of the right wing about 30 feet outboard of the fuselage. There was a small hole in the leading edge of the wing.

"I remember other days in other seaplanes—hours spent circling or tied to a buoy, waiting to be pulled up the ramp by a beaching crew with their equipment. By comparison, the process of getting the *SeaMaster* out of the water onto the parking apron when a flight was over was simple. Although the *SeaMaster* was designed to 'live' in the water and not require beaching for long periods, the test airplanes were normally taken out of the water each day. As the ramp area was approached, the pilot spotted his beaching vehicle, moored nearby so he could taxi right into it. A hook on the underside of the airplane tripped a cable, and the vehicle clamped onto the airplane. A flight crew member attached the hydraulic lines and the *SeaMaster* taxied up the ramp under its own power.

"Although it was the latest and the best of a long line of Navy seaplanes, the P6M *SeaMaster* lost out to advancing technology—Polaris missiles and nuclear-powered submarines, A3J *Vigilantes* and F4H *Phantom* IIs and budgetary constraints. Modern weapons are expensive and the funding level demanded hard decisions. Something had to go. There are a lot of people who are sorry that it was the P6M *SeaMaster*."

CONCLUSION

The *SeaMaster* program was canceled for a number of reasons. In the forefront was the problem which has plagued the aircraft industry ever since man first ventured into the air, i.e., cost escalation. This cost escalation came during a time of reduced funding by the U.S. Congress, and while the price tag of all of the other military and Naval programs was also on the rise. The increasing price was at the same time coupled with increasing doubts as to whether a flying boat would be the best and most economical means of sewing mines and of performing reconnaissance missions. Of the $470 million programmed for the project, $400 million had been spent. The Navy estimated that savings of $72 million would result from the cancellation of the project and the scrapping of the stock of aircraft and equipment. As of August 21, 1959, the date of the cancellation, this stock of aircraft comprised four production P6M-2s, three of which had been accepted by the Navy: two P6M-2s which were in final assembly and also four of the six YP6M-1s which were partly dismantled. A fifth aircraft had been destroyed in static testing. The support facilities included the planned conversion of an LSD (landing ship dock) for the *SeaMaster*. This was canceled. Also ramps and hangars at Harvey Point, North Carolina, were placed in the Navy's war installations reserve on inactive status.

The *SeaMaster* program did not go down without a fight. E.T. Michael, the regional director of the United Auto Workers, sent telegrams to the Secretary of Defense, Neil H. McElroy and to Fred A. Bantz, the Under Secretary of the Navy. Mr. Michael maintained, in his telegrams, that continuation of the program would prevent a waste of money, save jobs and vindicate the great confidence that the Navy had placed in the project from the very first. Protests were also heard from Rep. Carl Vinson, the chairman of the House Armed Services Committee, and from Senator Bacall of Maryland. Both members of Congress contacted William B. Franke, the Secretary of the Navy, to try to apply pressure to have the *SeaMaster* program reinstated. Much was made by all of the proponents of the P6M program of the seven years and $400 million that had already been spent on its development.

However, the reasonableness of the cancellation prevailed. It held firm and with a total of 535 hours and 56 minutes of logged flight time the accomplishments and potentials of the P6M *SeaMaster* were consigned to the history books.

POSTSCRIPT

As a historical footnote it should be recorded that the only pure jet flying boat believed to have attained service status was the Beriev Be-10. It was powered by two Lyulka AL-7PB turbojets, each rated at 14,300 pounds of thrust. The Be-10 was manufactured in limited numbers during the early 1960s for the maritime patrol and reconnaissance role. It is believed that it had an empty and gross weight of some 53,000 pounds and 90,000 pounds respectively. Its operational radius was probably in the order of 300 miles with a normal weapons load of 4,400 pounds and a dash speed allegedly approaching 578 miles per hour.