PROFILE PUBLICATIONS

The Lockheed P2V Neptune

NUMBER 204

P-2E Neptune of Royal Australian Air Force; serial A89-302.

P-2E Neptune in later R.A.A.F. scheme; serial A89-307.

Australia.

Portugal.

P-2E Neptune of Portuguese Air Force.

Netherlands.

P-2H Neptune of No. 320 Squadron,
Royal Netherlands Naval Air Service,
based at Valkenburg.

No. 320 Sqn., Royal Netherlands Naval Air Service.

P-2H Neptune of Maritime Air Command, Royal Canadian Air Force.

ANIMO LIBERO DIRIGIMUR

The Lockheed P2V Neptune

by Holmes G. Anderson

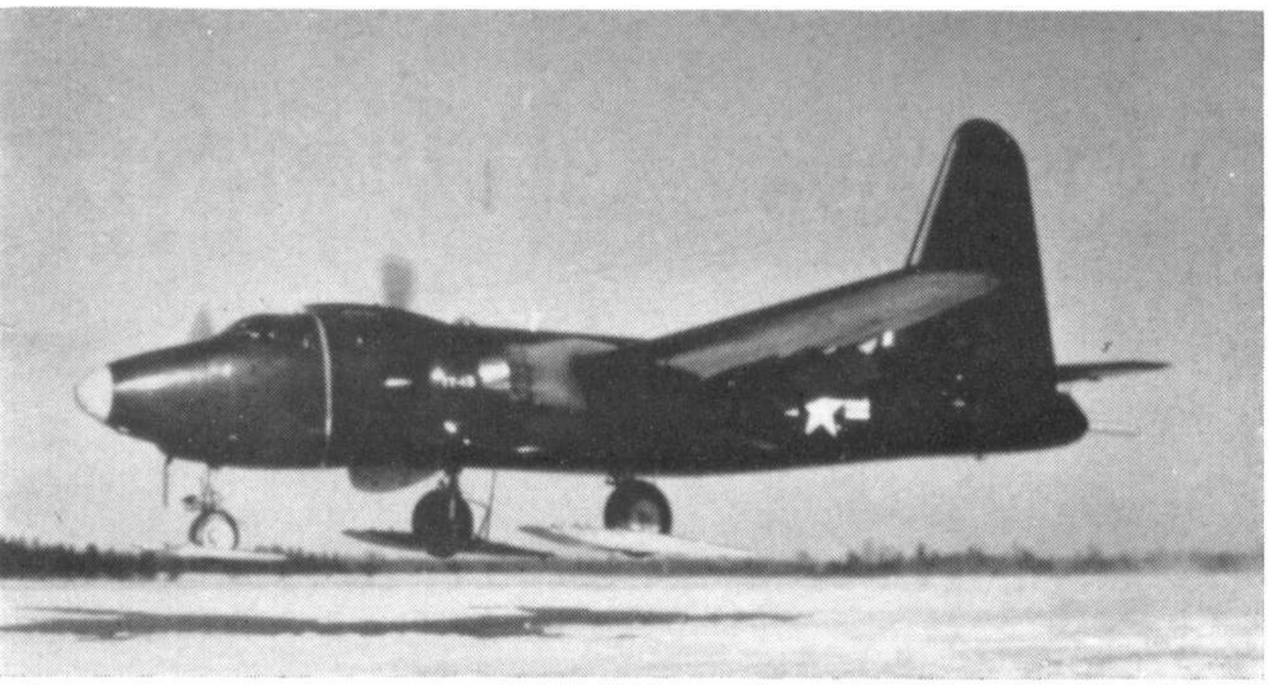
Fine flying study of U.S. Navy P2V-5, BuNo 124875. (Photo: via E. J. Bulban)

Three airplanes kept Lockheed in business during the lean days after World War II; these were the F-80 Shooting Star, the Constellation and the P2V Neptune.

The Neptune was named after the mythical sea god, and it was a portentous choice, as the P2V proved itself to be a true master of flight over the sea. Lockheed had pioneered the development of the land-based patrol bomber when the British introduced the Lockheed Model 414-40 Hudson I for sea patrol. The Model 414-40 was essentially a Model 14 transport with provisions for a Boulton Paul gun turret. Hudson I deliveries began early in 1939, and it was the first aircraft to capture a submarine from the air.

Lockheed "stretched" the Model 14 by adding five feet to produce the Model 18 Lodestar. These versions culminated in the PV-1 Ventura, which by the end of the war was one of the most sophisticated and advanced search and anti-submarine aircraft. In addition to U.S. Navy orders, the British placed a $30 million contract for the PV-1 Ventura. At this time Jack Wassal, Vega's Chief Engineer, added 135 sq. ft. of additional wing area to carry the load and came up with the PV2 Harpoon in March 1944. The new wing added a ton of useful load with a sacrifice of only 6 m.p.h. in maximum speed with the same engines.

Ground view of the ski-equipped P2V-2N (P2V-79). (Photo: Lockheed via Bulban).

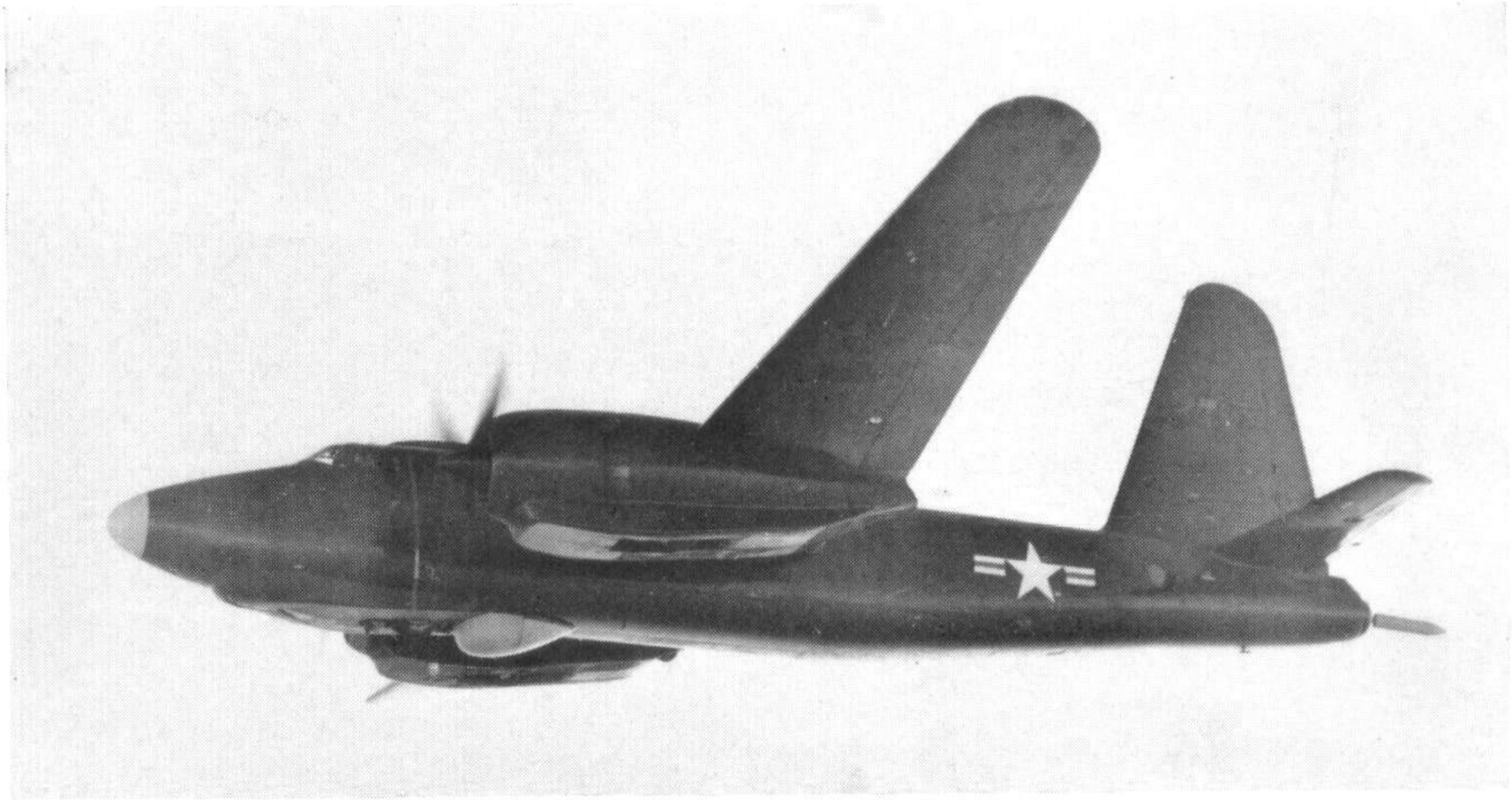


By 1943 it was apparent that the Pacific war needed a bigger, more powerful land-based patrol bomber. It was from experience in building patrol bombers during the war that Lockheed knew the Navy's requirements: long range; slow landing speed; great armament load. Mac V. F. Short, vice-president—engineering for Lockheed's subsidiary Viga—signed Jack Wassal as Project Engineer. (Jack Wassal later became California Division Director of Engineering.) Although the preliminary design of the Neptune was begun in 1942, war production on the Ventura and Harpoon prevented Wassal and his Vega engineering crew from spending their time on the unproven P2V design. The picture changed in the middle of 1944 when the Navy awarded Contract No. 3297 for two experimental and 13 service-test P2V patrol bombers shortly before V-E Day. On 17th May 1945, Test Pilots Joe Towle and Harold Johnson accomplished the first flight in the XP2V-1 Neptune (Bu Air No. 48237) prototype at Burbank, California. Performance and manoeuvrability proved to be excellent.

Lockheed's President, Robert Gross, characterized the Neptune as an airplane with some "stretch" to it. This proved to be an understatement because the basic design advanced through more than nine major versions including the P2V Kai turbo-prop model built under license as the GK210A in Japan by the Kawasaki Gifu Plant. Between 1944 and 1957 the Navy had placed a total of 24 orders with a dollar volume, including spares, of $750 million for Neptunes from the XP2V-1 to the P2V-7. Neptunes serve around the world with the U.S. Navy and Air Force, and under the flags of the Royal Air Force, the Royal Canadian Air Force, Royal Netherlands Naval Air Force, Royal Australian Air Force, and Japanese Maritime Self-Defence Force; and with the naval air services of France, Brazil and Portugal.

XP2V-1 (PROTOTYPE LOCKHEED MODEL 26)

The original XP2V-1 Neptune was powered by two Wright Cyclone R-3350-8 engines providing 2,300 h.p. at 2,800 r.p.m. for take-off, and a normal rated maximum of 2,100 h.p. at 2,400 r.p.m. in low blower



Flying view of the ski-equipped P2V-2N (P2V-79). (Photo: Lockheed via Bulban)

from sea level to 2,500 ft. In high blower from 2,500 to 13,600 ft. it produced a normal rated power of 1,800 h.p. The prototype weighed 32,651 lbs. empty and grossed at 54,526 lbs.

Defensive armament aboard the XP2V-1 consisted of six 50-cal. machine guns with 446 r.p.g. in pairs of 50's in nose, dorsal and tail turret, and mounted four 11·75-in. "Tiny Tim" rockets and 16 standard five in. HVAR in racks under the wings. This was an offensive load of 8,000 lbs. including provisions for mounting either four 2,000 lb. bombs, eight 1,000 lb. bombs, 16 500 lb. bombs, 12 325 lb. depth charges, or two 2,165 lb. aviation torpedoes.

A crew of seven consisted of a pilot, co-pilot, radio operator, bombardier-navigator-nose turret operator, radio counter measure-radar operator, dorsal turret gunner and tail turret gunner.

Extra protection was gained for the self-sealing fuel tanks by employing a nylon plastic shell. The "Varicam Tail", a mechanical device for varying the curvature (camber) of the horizontal tail surface, was another new development. This facilitated trimming the plane in flight to allow for shifts in weight and the plane's centre of gravity, without requiring power-operated controls.

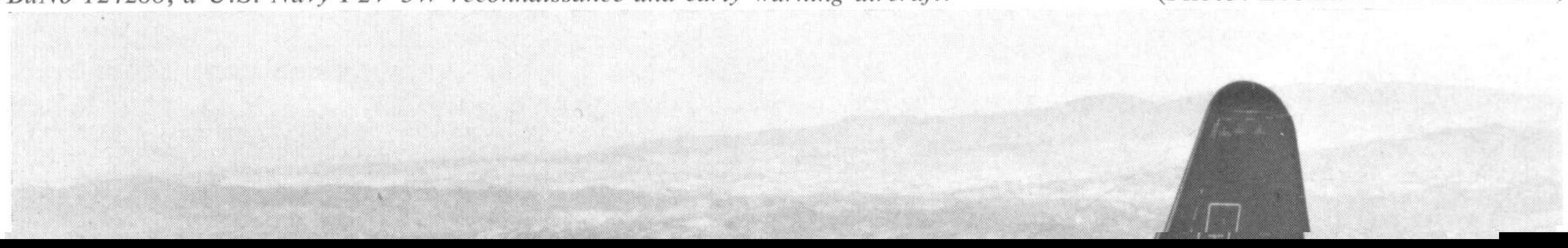
A mid-wing monoplane with tricycle landing gear, the Neptune was characterized by a large single fin and rudder. Some pilots referred to this large tail unit as a "real barn door" and it took a strong leg to move it; but things really happened when you kicked it! The top of the fin is 28½ feet from the ground. The fuselage is 75 feet long, the wing spread is 100 feet, and the wing surface is 935 square feet, giving a wing load of 63 lb./sq. ft.

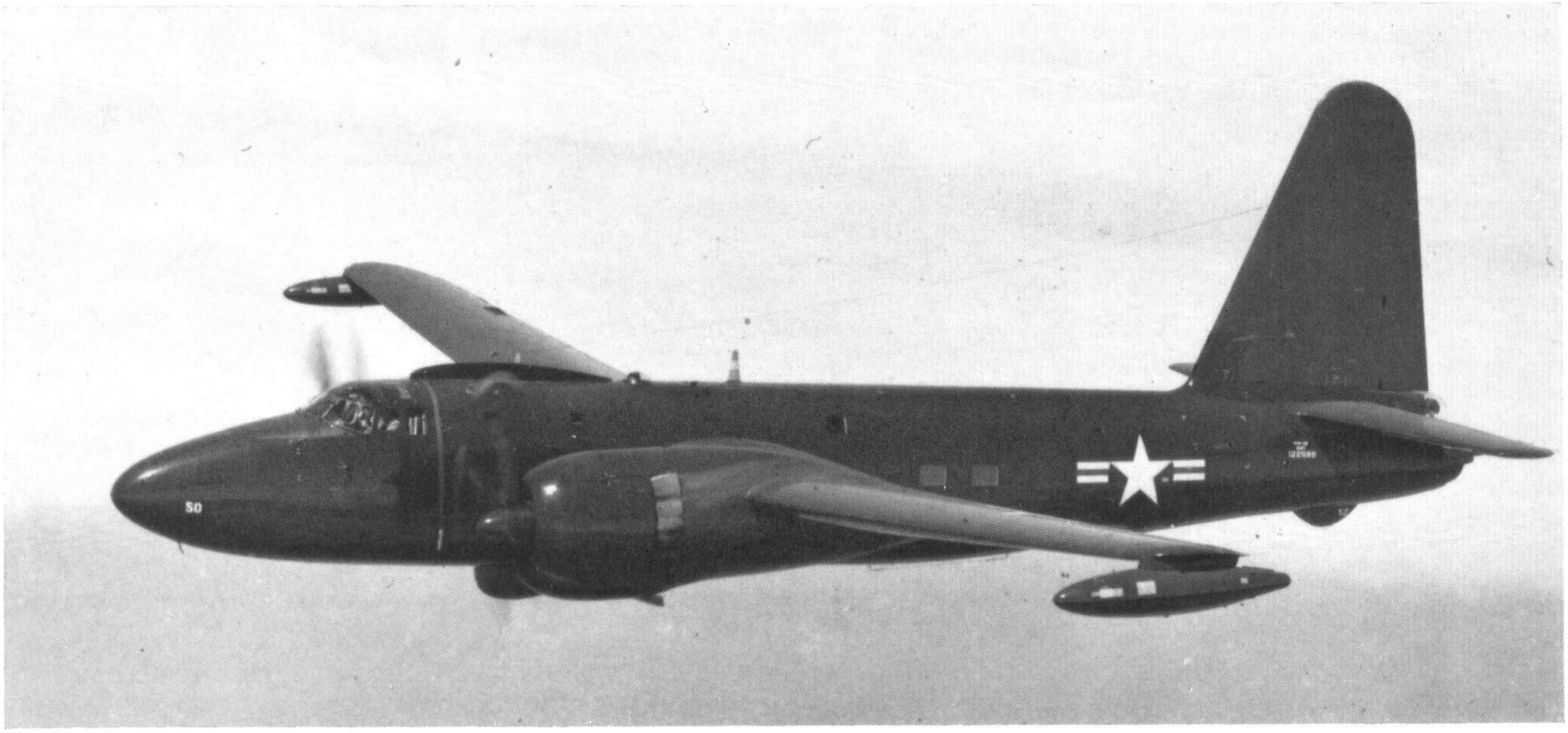
The prototypes were put through an extensive flight test programme in the summer and autumn months of 1945. During tests, the second prototype lost the entire fin leading edge when it was torn from the aircraft during a maximum-yaw-test, but managed to land safely with a buckled bomb bay door and strained fuselage panels. After completion of the test flights in the spring of 1946, the prototype XP2V-1 was delivered to the Navy in July 1946.

FOUR MEN, ONE KANGAROO

When World War II ended, the Air Force found itself with several hundred Boeing B-29 bombers in the Marianas and all kinds of old long distance records just waiting to be broken. The mighty B-29's were setting all kinds of records and their champion was Col. C. S. Irvine and his crew of the famed "Pacusan Dreamboat" (*Profile* No. 101, page 13).

BuNo 124288, a U.S. Navy P2V-3W reconnaissance and early warning aircraft. (Photo: Lockheed via the author)





The combat transport version of the Neptune was designated P2V-3Z. (Photo: Lockheed via the author)

The "Dreamboat's" World's Distance Record was 7,916 miles from Guam to Washington, D.C.

This gave the Navy a motive for a long distance record and a new P2V-1, the third production model (Bu Air No. 89082), was dubbed "Truculent Turtle." The "Turtle", with an empty weight of 29,240 lbs. and a maximum gross weight of 85,240 lbs., differed from the number one production model (Bu Air No. 89080) where weight had already grown to 33,720 lbs. empty and maximum gross of 61,153 lbs.

The "Turtle" was especially modified by the removal of all armament and combat equipment and the installation of fuel tanks in every available space. The "Truculent Turtle" was really just a flying gas tank with two 400 gal. tip tanks, 1,542 gal. outer wing panel tanks, 1,460 gal. centre section, 848 gal. in the nose, 2,132 gal. in the bomb bay, 2,082 gal. in the aft fuselage and 128 gal. in the dump chute, giving a total capacity of 8,592 gal. The fuel lines connecting all these tanks were estimated to hold another 140 gal. for a grand total of 8,732 gal. of fuel. The oil supply included 320 gal. in tanks plus 50 gal. in the supply system for a total of 370 gal.

Robert A. Bailey, Project Engineer for the record attempt, later became California Division Chief Advanced Systems Research Engineer. Art Veereck of Engineering Experimental modified the plan. John Marquarth, later head of trainer flight test in the California Division, supervised the flight test programme. Stanley Beltz did most of the test flying.

The plan was for the record flight to start at Perth on the far western coast of Australia and to cross the Pacific and the U.S.A. to Washington, D.C.

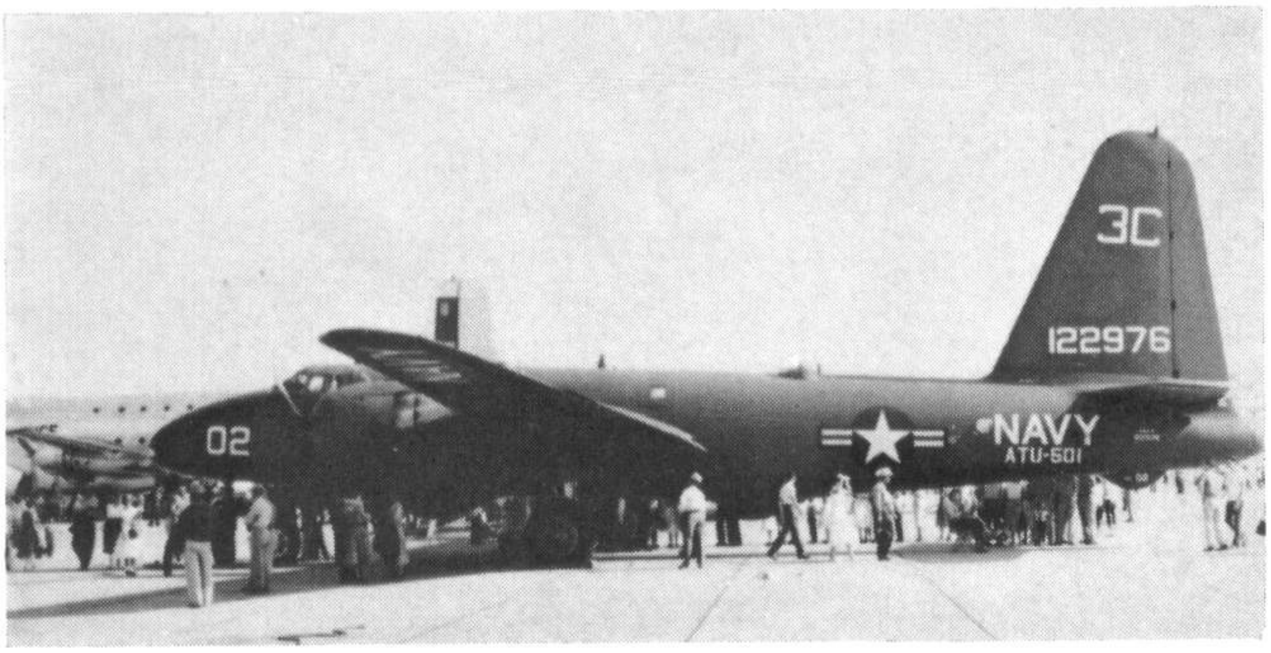
In the early morning hours of 29th September 1946, the "Truculent Turtle" was waiting on the Royal Australian Air Force base at Perth. Every effort possible to eliminate weight had been worked out by the Navy and Lockheed personnel, including removal of the two starters after starting the engines to eliminate another precious 120 pounds. However, Commander Thomas D. Davies added 100 lbs. to the plane's manifest when he decided that Joey, a nine month old kangaroo, and his bail of feed would go along with the three Naval officers.

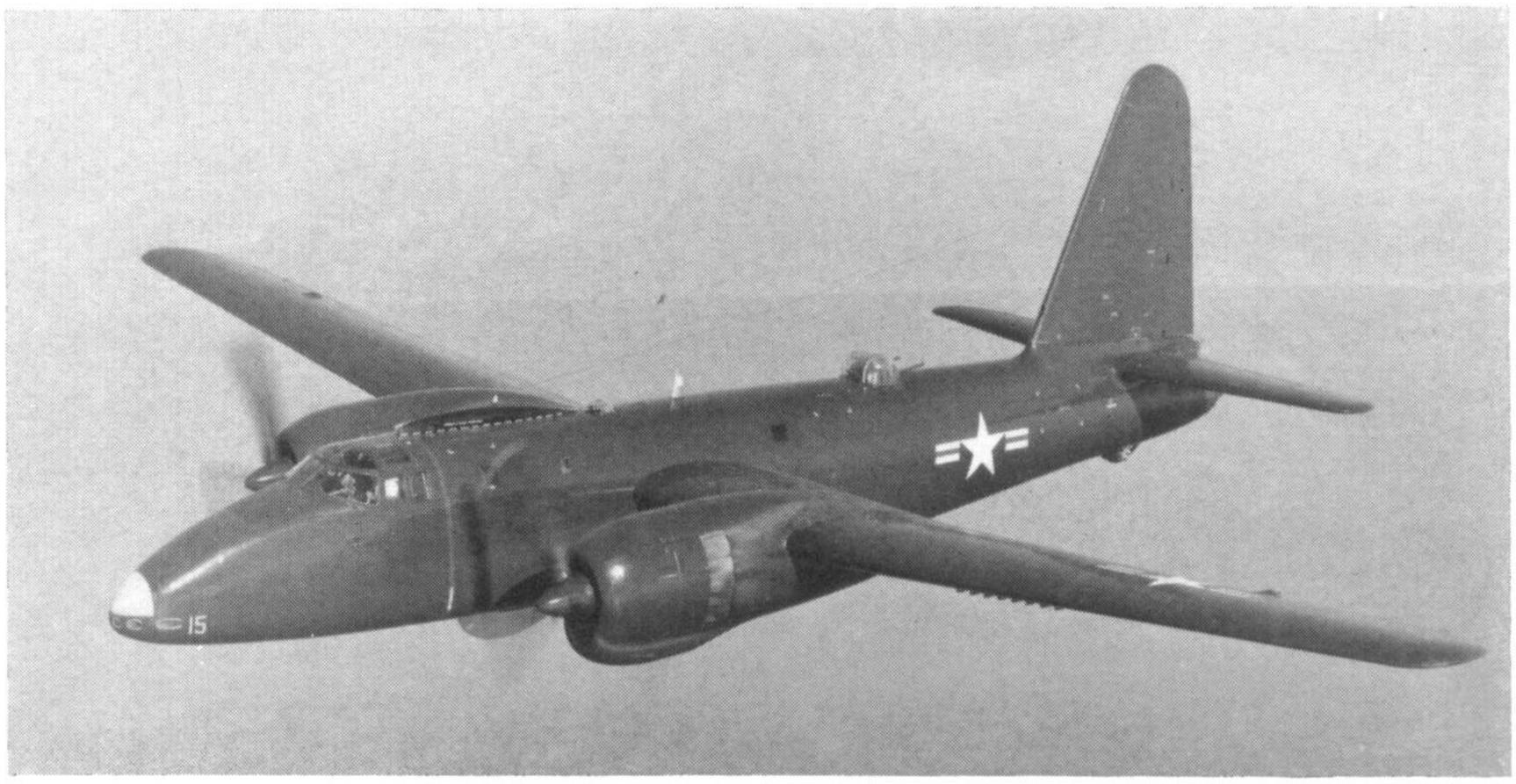
The take-off was made on a 6,000 ft. runway and the plane was airborne with ease after a run of 4,720 ft. The plane was allowed to attain a speed of 20 knots above the speed necessary for take-off as an additional safety feature. The four 1,000 lb. thrust 12 sec. JATO units were started near the end of the run to enable the P2V to gain altitude rapidly. The wheels were nearly up by the time the jets had finished firing.

Torquemeters made it possible for the pilot, Commander Davies, to operate at or near maximum engine efficiency. Fuel was used from the fuselage tanks so as to retain the beneficial bending movement effects of the tip tanks at the high gross weights existing during the early portions of the flight. The tip tanks were dropped as soon as feasible to further contribute to an aerodynamically "clean" aircraft. Single engine operating was not used because the safety factor in case of engine failure was considered more important than the fuel that could have been saved.

Personnel were considered by providing as far as possible a normal existence. The plane was equipped with washing, shaving and sleeping facilities and food equal to a normal diet prepared with hot plate facilities. No "anti-sleep" tablets or any drugs were used, and no fatigue troubles were experienced, even though the last 25 hours of the flight were flown at 17,000 ft.

A P2V-3 Neptune of ATU-501 at Reese Air Force Base in 1958.
(Photo: Mitch Mayborn)





The P2V-3 was a most versatile aircraft, and missions included anti-submarine and surface vessel patrol and bombing, rocket attack, torpedo attack, medium altitude and mast-level bombing, and photo-reconnaissance.
(Photo: Lockheed via the author)

The "Turtle" droned across Australia and the Coral Sea to Midway and then flew 3,120 miles to the coast of California. Here Commander Eugene P. Rankin, one of the "Turtle's" crew, had quite a time convincing a sceptical lady traffic controller that they had flown all the way from Australia. She just would not believe the Commander. He finally had to tell her to get in touch with the Navy in Alameda.

Unfortunately, nature intervened to prevent the P2V from reaching its goal because of headwinds, icing and other adverse weather conditions. However, the Turtle reached Columbus, Ohio. Averaging 204 m.p.h., it covered 11,326 statute miles non-stop in 55 hours 17 minutes, and in so doing, it set a new record for non-stop long distance flying as well as weight lifting record for twin engine aircraft. Jubilation was high at Lockheed. The Navy then showed that its faith in the "Turtle" from Perth was stronger than ever, by placing a $16 million order for more Neptunes.

The "Turtle" was equipped with emergency fuel releasing equipment, a 10 in. aluminium pipe carried on rollers within the fuselage. Extended, it was coupled to a three way valve leading to nose, bomb bay, and aft fuselage tanks. The "Turtle" could dump 800 gal. in the first 20 seconds, 5,200 gal. in six minutes.

In 1967, the Neptune "Truculent Turtle" is very well preserved behind a fence and on three concrete pedestals at Norfolk, Virginia, with the Turtle insignia still visible on its nose.

P2V-2 (MODEL 126)

The P2V-2 (Model 126) was powered by two Wright R-3350-24W engines of 2,500 h.p. at 2,900 r.p.m. for take-off dry and 2,800 h.p. using water injection. The second production order, for 151 P2V-2 placed on 16th December 1944, was cut by 100 aircraft at the end of the war. The Navy later ordered an additional 30 aircraft making a total of 81 P2V-2 built in all.

This model was equipped with a new Hamilton Standard propeller with three blades (instead of four as on the P2V-1) and electric de-icing in place of alcohol.

One of the most notable features of the P2V-4 "Snorkel Snipper" was the design of the tip-tanks; as well as fuel, these streamlined housings were developed to carry electronic equipment.
(Photo: Lockheed via the author)

The Brazilian Air Force received fourteen P2V-5's. Operated from Salvador Air Base, these aircraft are serialled from 7000 to 7013. These two views illustrate 7011 "Giant Petrel"; each aircraft has an individual name. (Photos: M. R. V. Carneiro)

First flight of the prototype XP2V-2 was on 7th January 1947 with the production P2V-2 following four months later on 20th May 1947. The major configuration change in the -2 model was the mounting of six AN-M2 (Type E) 20 mm. cannon in the nose. The first 24 P2V-2 were equipped with the MK-3 tail turret containing two ·50 cal. machine guns. The additional armament and heating equipment in the P2V-2 forced the weight up, reducing the rate of climb, but the added power of the new engines decreased the take-off distance and improved the top speed by 15 m.p.h. An elongated solid nose replaced the bombardier's nose and housed search radar and a variety of tactical radar as well as revised armament. The new nose added $2\frac{1}{2}$ feet to the length of the plane.

It was about this time that Lockheed test pilot Stanley Beltz put the P2V through a strenuous 10 day test programme at Patuxent. In addition to slow-rolling the Neptune on a single engine, Beltz flew the bomber at 385 m.p.h., and pulled out of a dive at 2·9 G, exceeding the Navy requirements of 344 m.p.h. at 2·67 G. Beltz also flew it at 65 m.p.h. with good control. Loaded to its designed operating weight of 45,000 lb., dive tests were run and it required 45 degrees dive to exceed maximum allowable speed with bomb bay doors open. Pull outs of 2·8G were made at the maximum operating weight of 58,000 lb.

Extreme stalls with nearly full power, violent yaws, landing at 50,000 lbs. gross, and landings with both engines cut completed the tests.

One of the first operations performed by the P2V-2 Neptune was an aerial mapping programme of south-western Alaska. This was the first time this area had been mapped since 1929 when it was accomplished by using Navy Loening OL-8 amphibians. (In 1929, detachment VP-4 was commanded by L. Cdr. Arthur W. Radford—later Admiral and commander of the Pacific Fleet.) The P2V-2N (MCR P2V-79) Polar Bear Version was fitted with 16 foot aluminium skids as well as conventional wheels in order to operate in the Arctic regions. Retractable in flight, the skis were tucked inside fairings underneath the engine nacelles and at the nose of the aircraft to reduce in-flight drag.

In July 1948 the eighty-first and last P2V-2 was delivered to the Navy.

P2V-3 (MODEL 326)

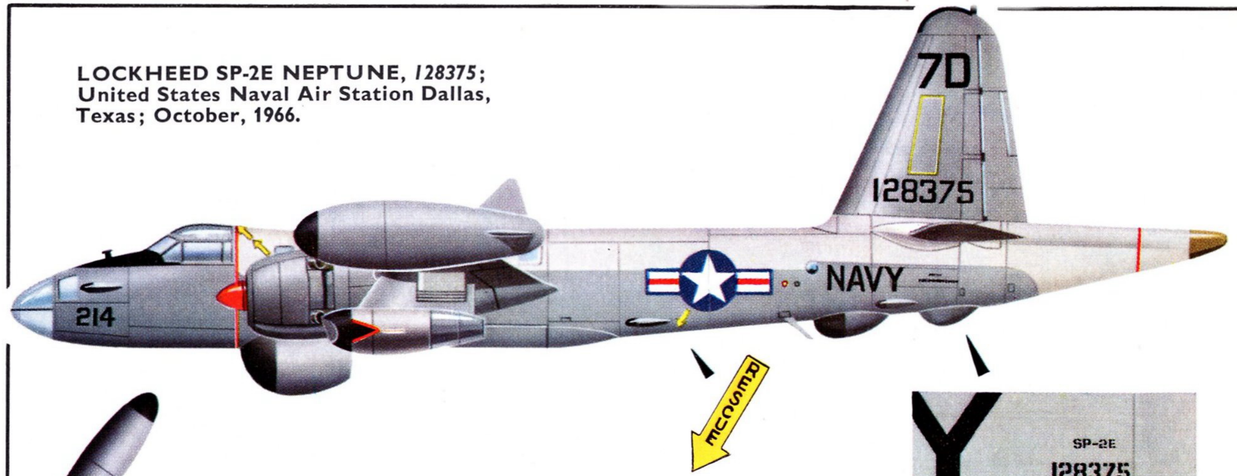
The P2V-3 had more power with the Wright R-3350-26W engine, which developed take-off power of 3,200 h.p. at 2,900 r.p.m. using water injection. Dry rating was 2,700 h.p. at 2,900 r.p.m. These engines were also equipped with jet augmention exhaust stacks.

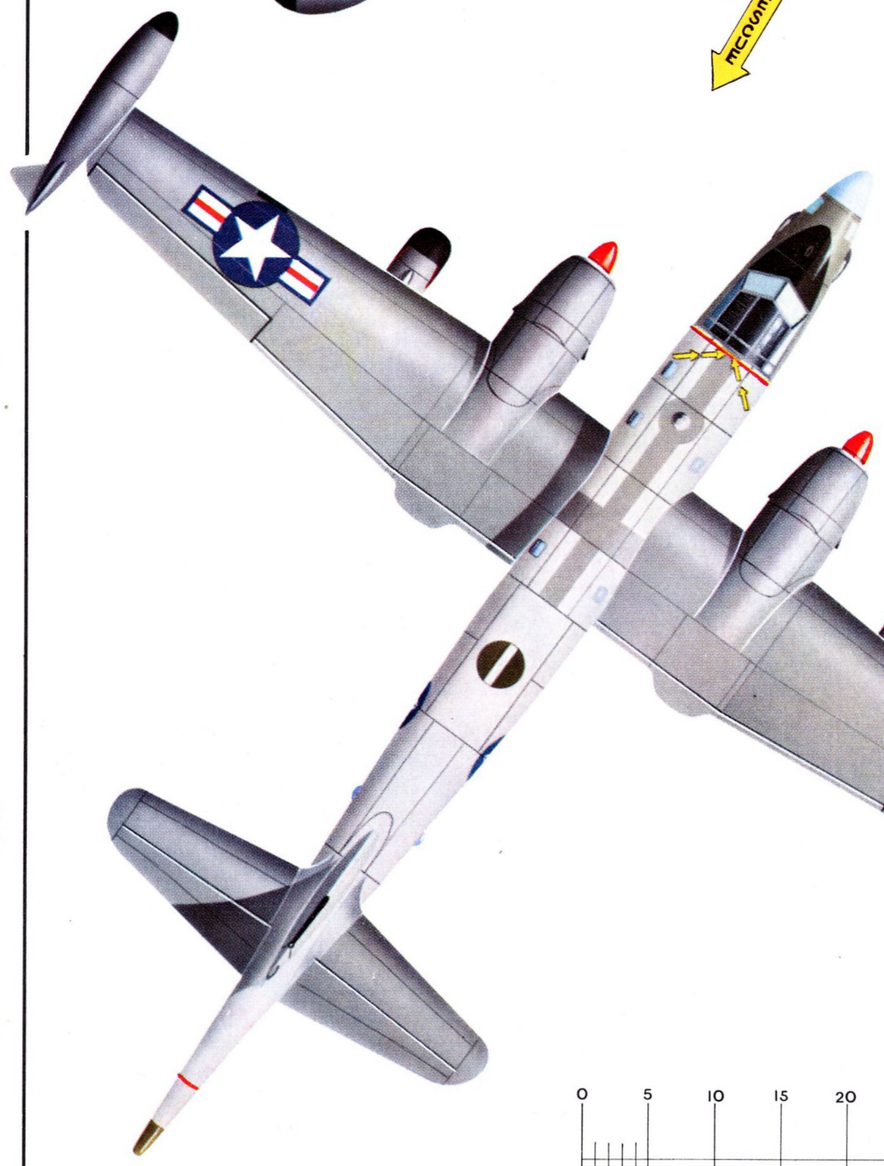
Lockheed received a contract for 30 P2V-3W, two special P2V-3Z versions, 11 P2V-3C and 40 standard combat versions for a total of 83. The P2V-3W were equipped for anti-submarine operations and mounted APS-20 search radar in a huge radome beneath the forward fuselage. The first flight was on 12th August 1949.

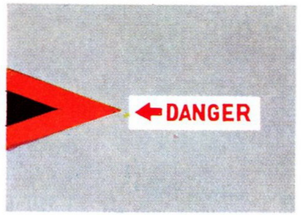
Two P2V-3 were converted to P2V-3Z, as an armed

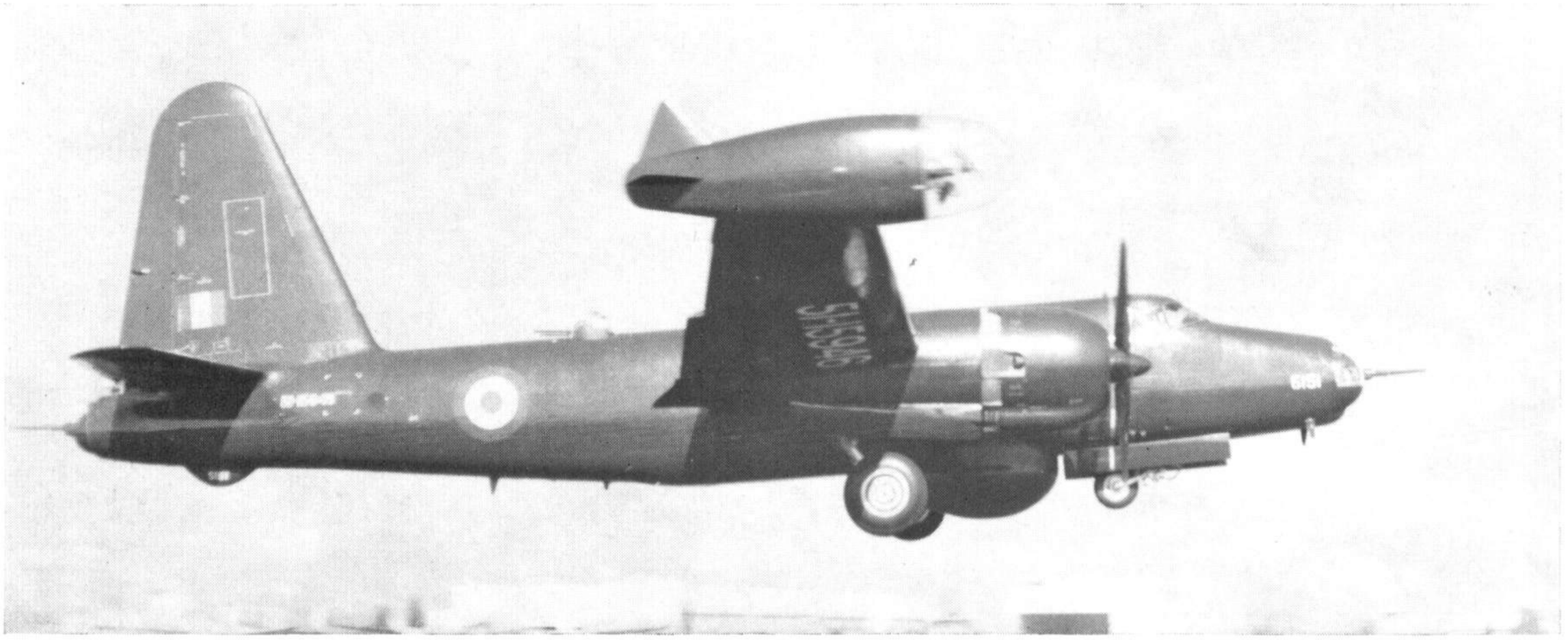
A P2V-5F of U.S. Navy Patrol Squadron VP-5.

LOCKHEED SP-2E NEPTUNE, *128375*; United States Naval Air Station Dallas, Texas; October, 1966.









One of the Royal Navy's P2V-5's photographed at Lockheed's Burbank, California, plant during manufacturer's trials.
(Photo: Lockheed via the author)

transport stationed at N.A.S. Anacostia. These aircraft were equipped with heavy armour plate throughout to serve as special mission transports for the Secretary of Navy, the Chief of Naval Operations or other VIP personnel visiting combat zones.

Nine P2V-3 were later converted to P2V-3C for carrier-launched operations with the installation of eight 1,000 lb. thrust RATO cylinders on the aft fuselage.

CARRIER TESTS

The *U.S.S. Coral Sea* was steaming at 28 knots into a 4 knot wind giving a head wind of approximately 37 m.p.h. to assist take-off on the 17th April 1948 when then Cdr. Tom Davis, past master of P2V operations, opened the throttles of his P2V-3C and thundered down the deck. When he was abreast the island he unleashed the 8,000 lb. thrust RATO bottles (giving 1,600 additional horsepower) and the Neptune left the deck with room to spare. Behind him came L. Cdr. John P. Wheatly in a sister ship.

From the deck of the *U.S.S. Coral Sea* off the Coast of Virginia on 7th March 1949 a P2V-3C made a RATO-assisted take-off with a maximum fuel load and a simulated bomb load of 10,000 lbs. The plane grossed 74,000 lbs. at take-off, by far the heaviest aircraft ever launched from a carrier. The patrol bomber then flew 2,000 miles to Muroc, California; dropped the bomb load; and turned and flew 2,000 miles back to its base at the Naval Air Test Center, Patuxent River, Maryland.

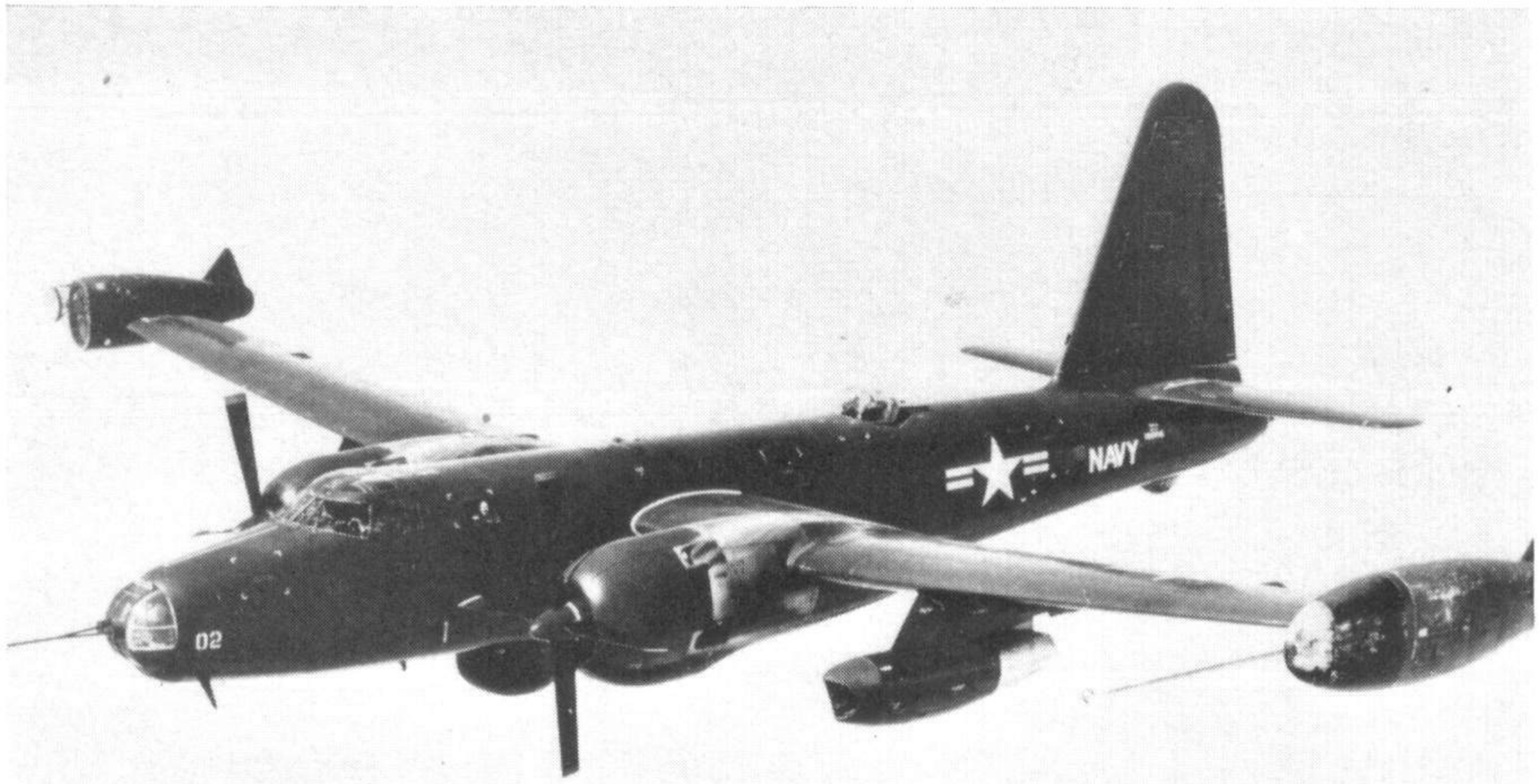
Later on, from the deck of the *U.S.S. Franklin D. Roosevelt* off the coast, a P2V-3C Neptune took off for another distance flight. The Neptune flew across the Gulf of Mexico to the Panama Canal and then flew north to Moffett NAS at San Francisco, California for a total of 5,156 miles from its carrier.

P2V-4 (MODEL 426)

On 14th November 1949 the first model P2V-4

Magnificent cloudscape background for a U.S. Navy P2V-5 photographed by Mitch Mayborn.

The P2V-6 is distinguished from earlier variants by the J-34 jet pods outboard of the main engines.
(Photo: U.S.N. official via Bulban)



(Model 426) "Snorkel Snipper" made its first flight. This aircraft was powered by two Wright R3350-30W Turbo-Compound engines developing 3,750 h.p. with a low specific fuel consumption of only 0·39 lb./h.p./hr. This installation gave the P2V-4 an increased 20 per cent. reduced take-off run and an improved rate of climb.

The P2V-4 got the name "Snorkel Snipper" because it was designed to meet the snorkel-type submarine threat. It carried radio sonobuoys to drop in search of submarines. Lockheed engineers duplicated the outer wing tanks, fuselage and tip tanks from the "Turtle", giving the P2V-4 a range of 5,935 miles carrying full combat equipment and a 10,000 lb. bomb load. The gross weight was raised from 54,000 to 67,500 lb. The Navy awarded Lockheed a contract for 52 aircraft.

The new P2V-4 started off the production line before the Wright Turbo-Compound engines were available so they left the factory with Wright R-3350-26W engines. The new -30W engines became available early in 1951 and by November all P2V-4's in service mounted the new engine.

P2V-5 (MODEL 526)

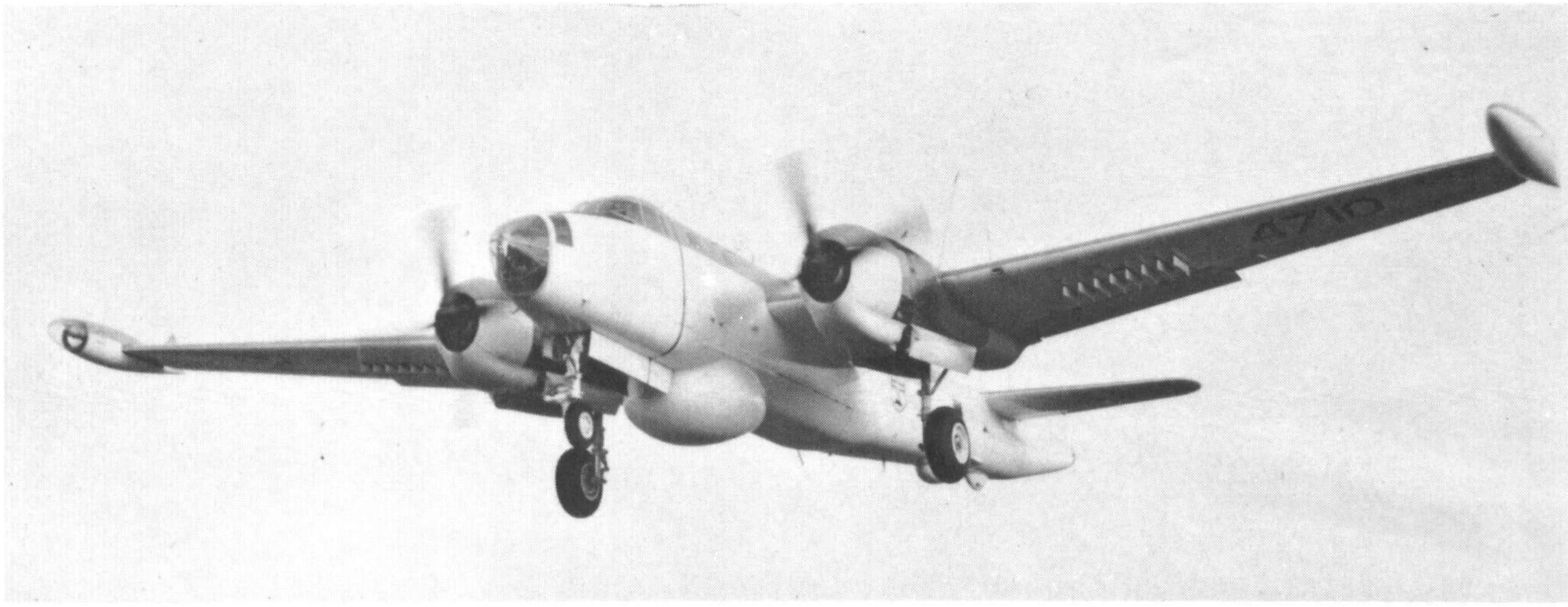
For the first time the engine was not the determining factor in the model change; the P2V-5 (Model 426) was powered with the same Wright R3350-30W engine as the -4. The big difference in the -5 was the switch from fixed to flexible armament in the nose. The battery of six 20 mm. guns in the nose were replaced in favour of the more flexible twin 20 mm. power operated nose turret. Because of the Korean War more P2V-5 were built than any other version of the Neptune, a total of 424 being built from September 1949 until March 1951. The first P2V-5 (Bu No. 124865) made its maiden flight on 29th December 1950.

Some distinguishing features incorporated in the Neptune during the P2V-5 production were the centre-mounted tip tanks, the slightly raised flight deck, and the larger windshield panels for improved vision. The new wing tip tank required 2,300 manhours to design it. This tank was centre-mounted, teardrop in shape, and finned. It provided improved lateral stability and fell clear when dropped. Radar and searchlights as well as fuel were installed in the larger tanks.

The P2V-5 was extensively modified during its development. The nose turret was replaced with a clear glass observation position and the tail turret was replaced by a long stinger that housed the MAD (Magnetic Anomaly Detection) system.

The P2V-5 was later modified by deleting the ventral turret and installing two 3,400 lb. Westinghouse J34-WE-34 or -36 turbojets under the outer

One of VP-26's P2V-5 Neptunes during a visit to Canada —note unusual superimposition of R.C.A.F. insignia on the U.S. star marking.



The Netherlands operated twelve P2V-5's which were later passed to Portugal; this illustration shows one in service with the Portuguese Air Force. (Photo: G. H. Kamphuis)

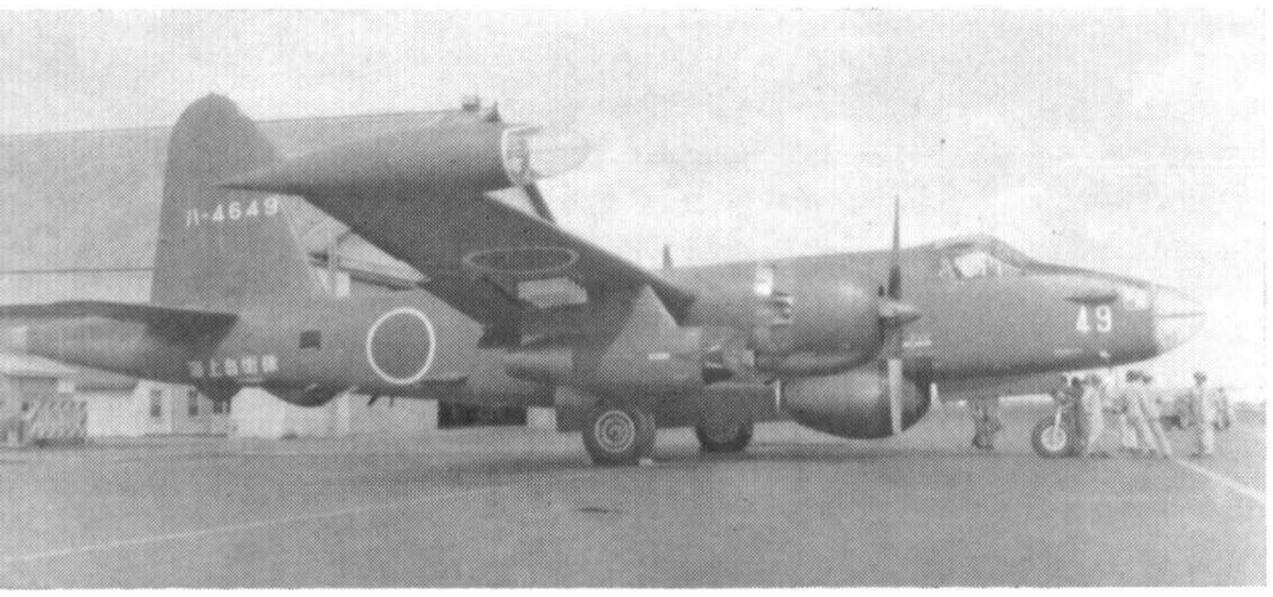
wings. The turbojets not only improved take-off but increased top speed "dash-over-target" performance.

Lockheed subcontracted 51 per cent. of the production to other companies. The empennage went to Chance Vought, and the outer wing panels to Temco Aircraft Corp., both of Dallas, Texas. Kaiser-Fraser Aircraft Division, in Oakland, California built the waist fuselage section and Solar Aircraft Co.'s San Diego plant made the engine nacelles entirely of stainless steel. Solar claimed the stainless steel was not only stronger but saved 175 lbs. weight per nacelle.

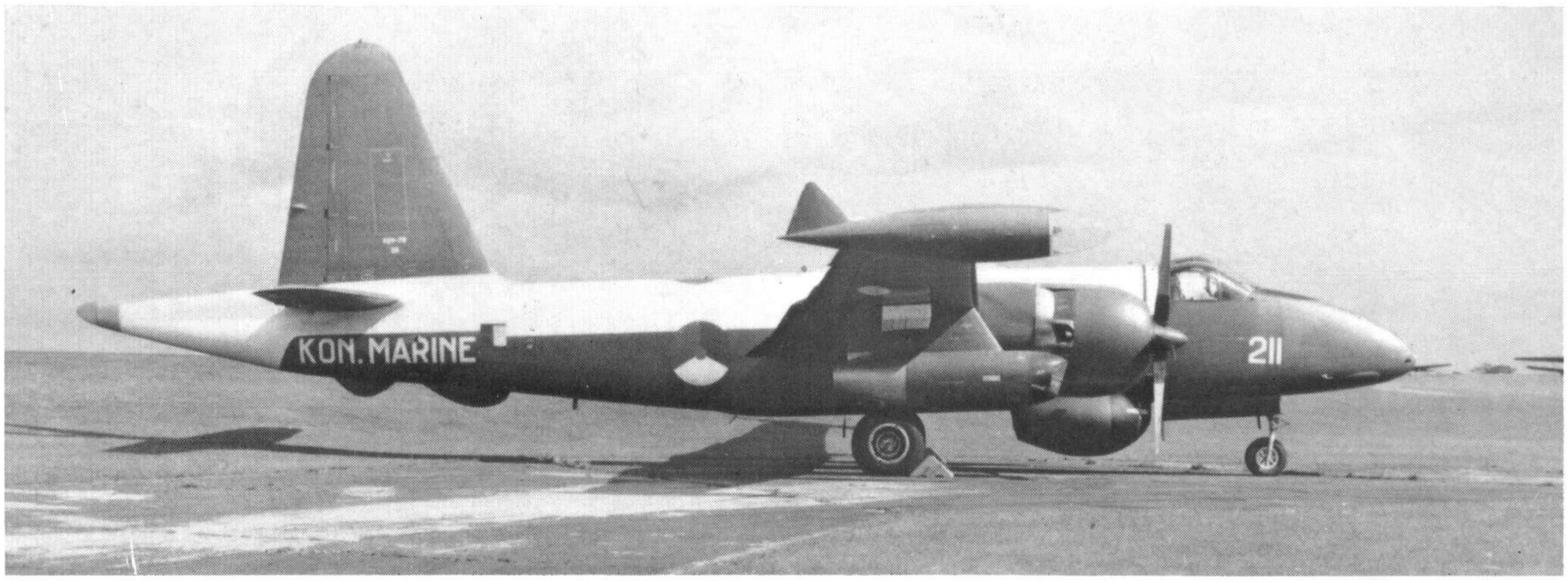
The R.A.F. Coastal Command received 52 P2V-5 under MDAP in 1952; the first British Neptune squadron to be formed was No. 217. These aircraft were operated for four years, then 12 were transferred to the Royal Netherlands Naval Air Service. Later these went to the Portuguese Air Force. Six were transferred to the Argentine Navy; fourteen others went to the Brazilian Air Force, and twelve P2V-5's were delivered to the Royal Australian Air Force.

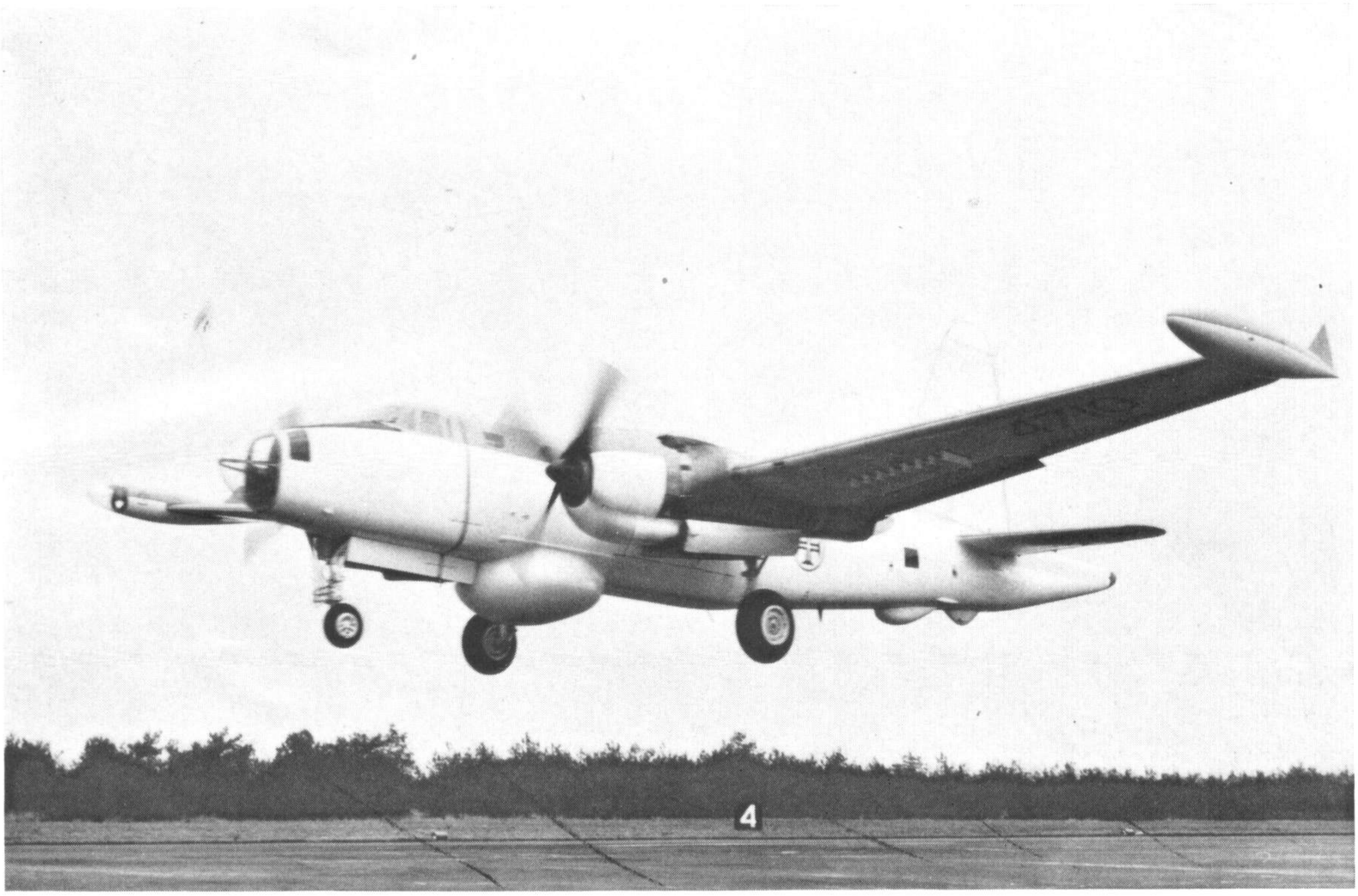
P2V-6 (MODEL 626)

The P2V-6 was basically the same aircraft as the P2V-5 with further refinements in the electronic equipment to include mine laying and anti-submarine warfare equipment. The most noticable change was a larger nose and a smaller radome. Production started in October 1952 and ended in November 1953 with 83 being built in this time. France received 26 aircraft of this batch. Some P2V-6B (MP-2F) were modified to carry two Fairchild Petrol AUM-N-2 missiles. This was a standard Navy airborne torpedo with a jettisonable airframe and V44 turbojet powerplant. Other Neptune designated YU-8 were modified to carry the Ragon Firebird KDA (VSAF Q-2A). Some P2V-6 were used as trainers and designated TP-2F; later this designation was changed to P-2G.



One of the Royal Netherland Navy's immaculate P2V-7B's; and (above) *a Kawasaki-built P2V-7 of Japan's Maritime Self-Defence Force.* (Photos: via R. Ward, D. Menard)





Flying study of a Portuguese Neptune. (Photo: G. H. Kamphuis)

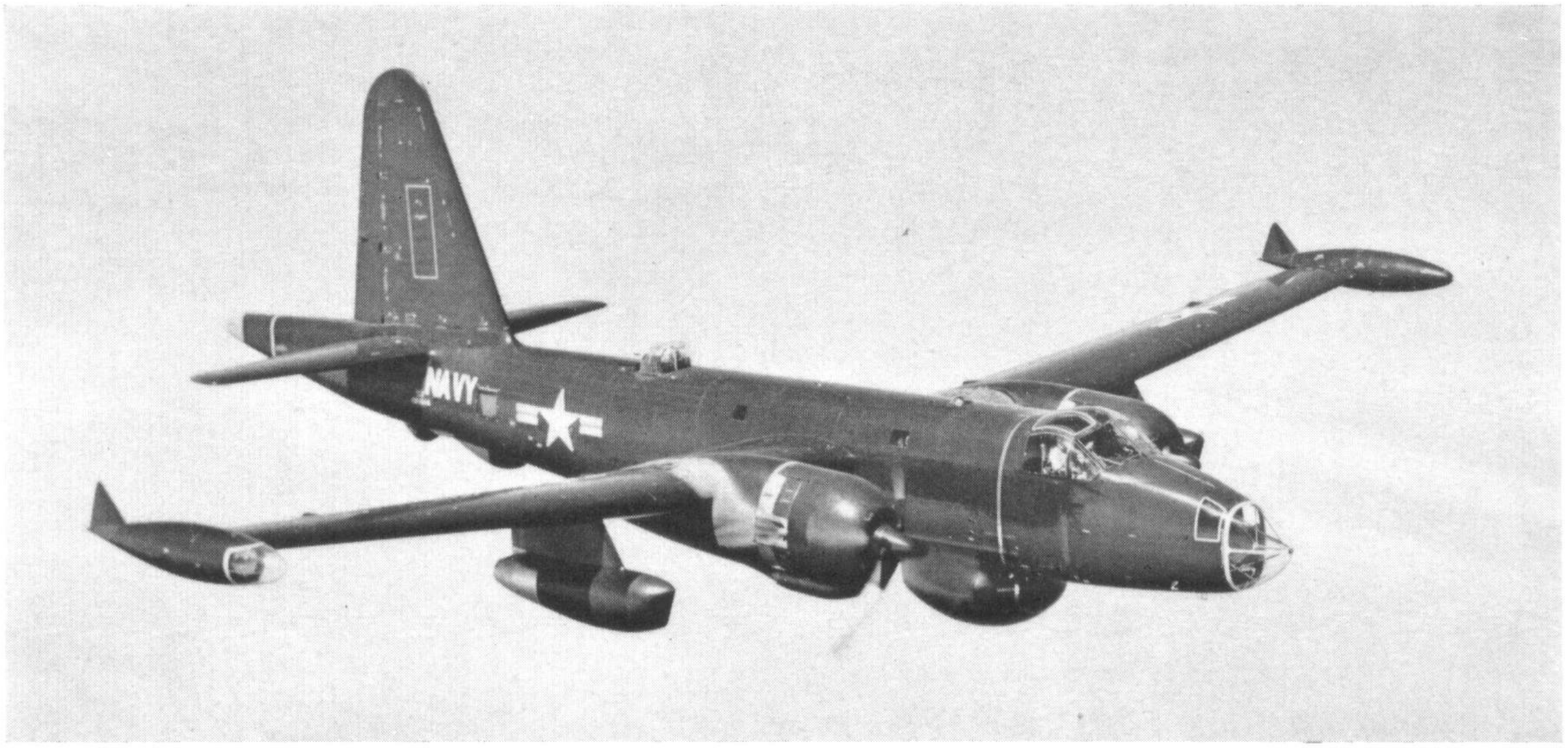
P2V-7 (MODEL 726)

On 26th April 1954 the P2V-7 (SP-2H) made its first flight powered by two 3,500 h.p. Wright R-3350-32W Turbo Compound engines plus two Westinghouse J-34 turbojets (3,400 lb., 1,540 kg. s.t.).

The cockpit canopy had a very distinctive bulge for increased all-round view and the fuselage was lengthened. The wing-tip tanks were redesigned, being smaller and more streamlined. Thirty three P2V-7 were supplied to France to equip France's *Aéronavale Flotilles* 23F, 25F and 28F.

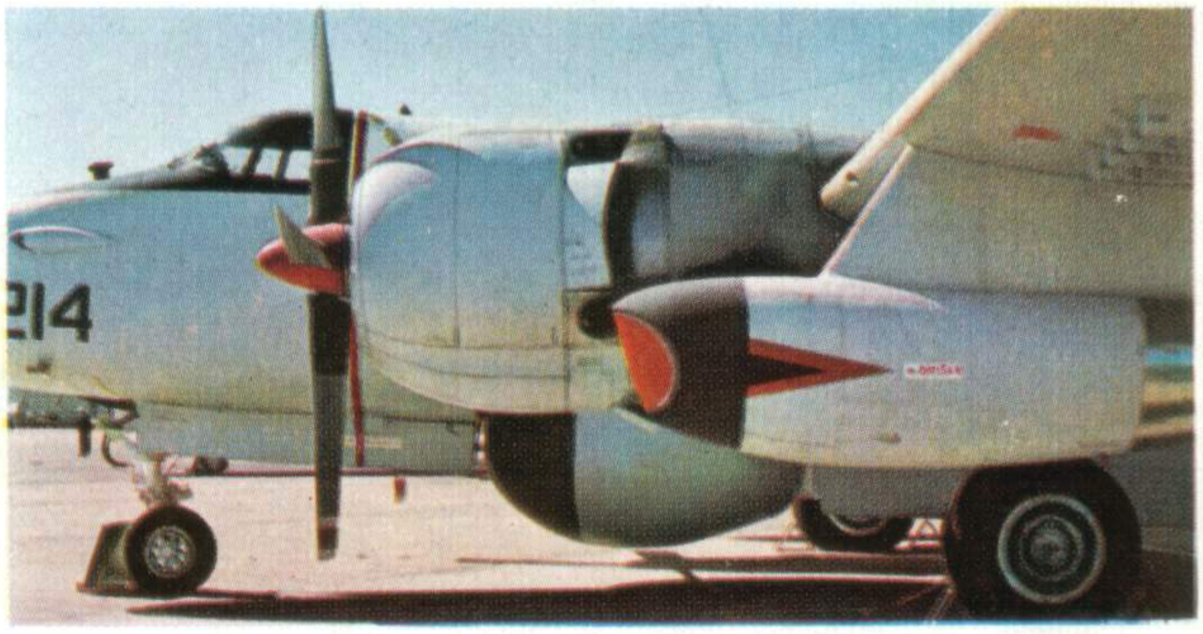
Sixteen Lockheed P2V-7 Neptunes were built for the Japanese Maritime Self-Defence Force.

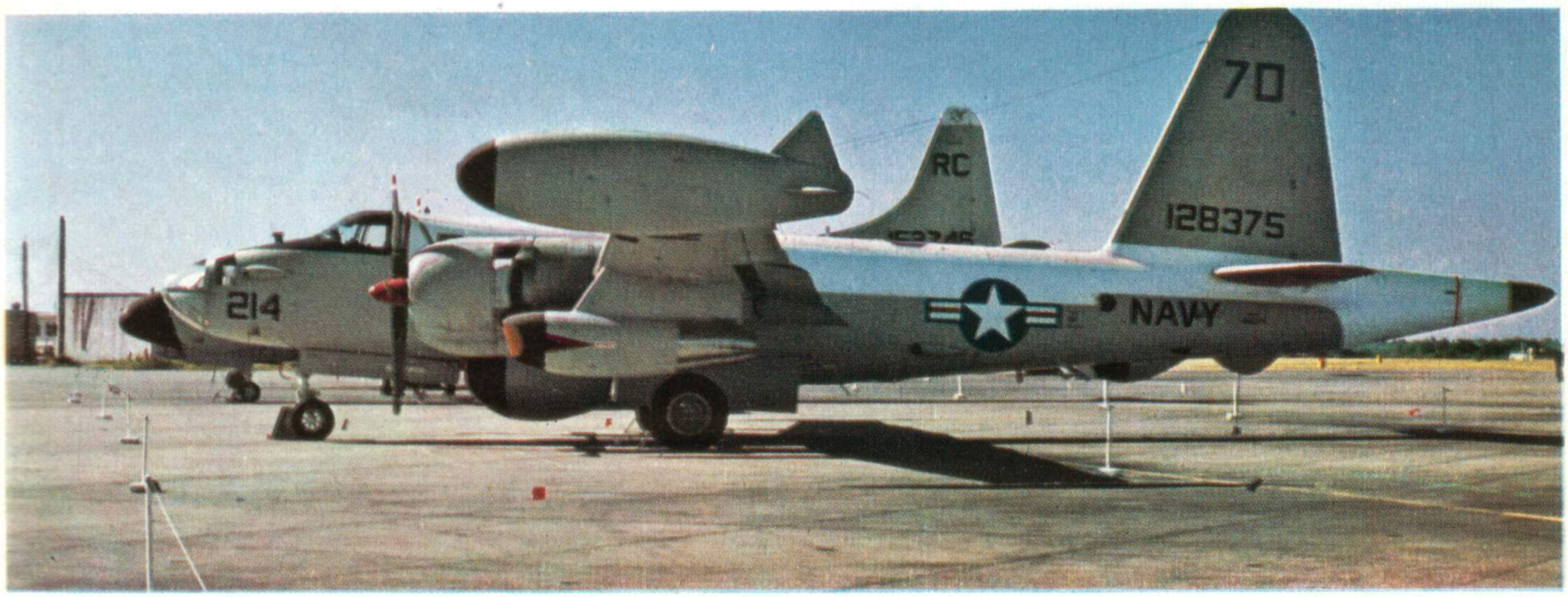
P2V-7's were delivered to three Escadrilles *of the French* Aéronavale; *this aircraft served with 25F.* (Photo: S. Peltz)



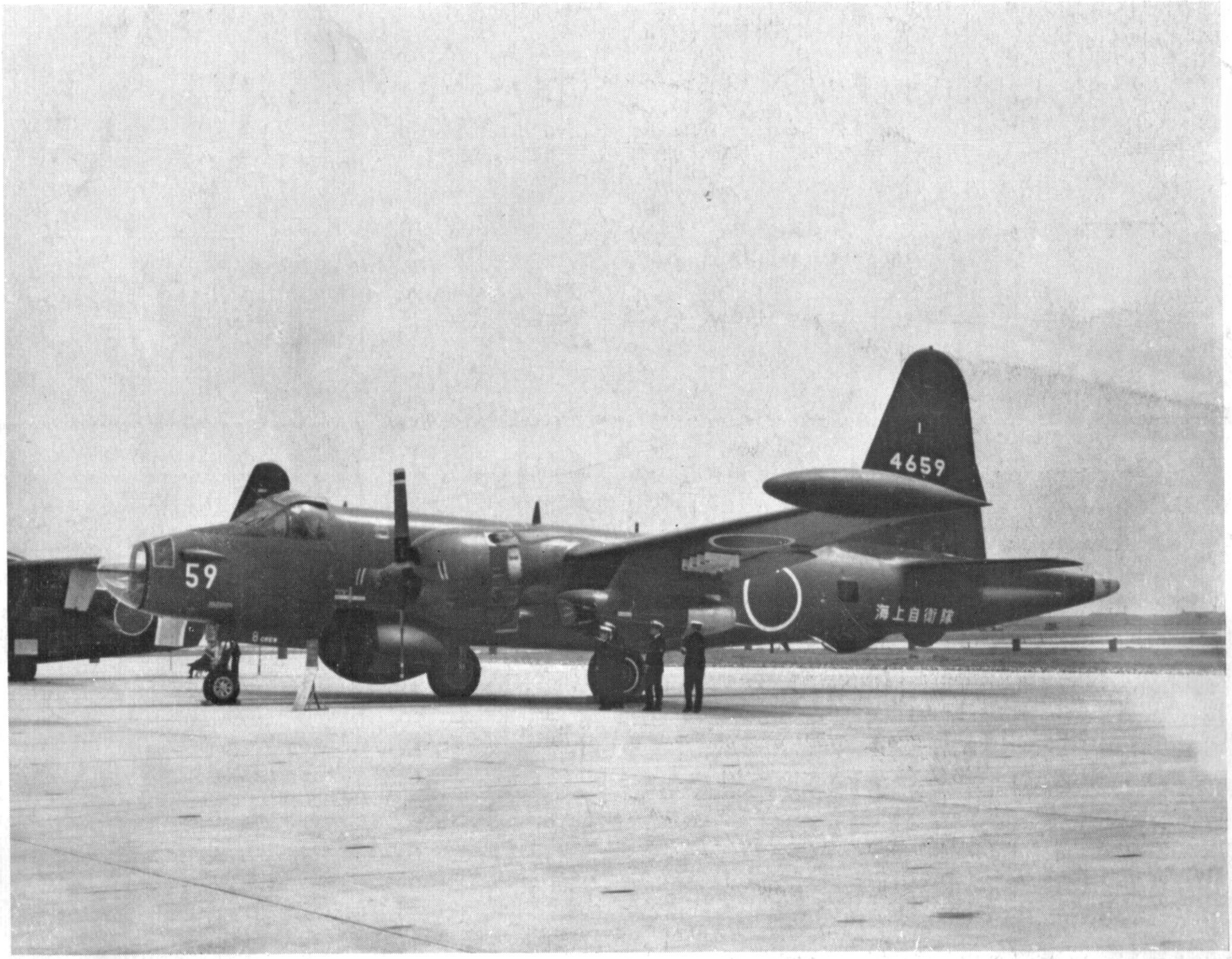
Despite the many bulges and pods added to the original design, the P2V-7 retains a sleek and pleasing appearance—every inch a professional killer. (Photo: Lockheed via Bulban).

Flying study of a Dutch Neptune. (Photo: Steven Peltz)





Top: A Neptune P2V-5 of No. 320 Squadron, R.Neth.N.A.F. *Top right:* SP2E, BuNo 128336, photographed at Love Field, Dallas, Texas; in May 1966, this P2V-6 was flown on electronic test programme without tail cone. *Top left:* the rather faded finery of P2V-5, BuNo 128352 of VC-3. *Centre right and left, and bottom:* details of the subject of the five-aspect painting on pages 8 and 9. *(Photographs: Air Britain; the author; John Hopkins; the author).*



Study of a Japanese Neptune. (Photo: Steven Peltz)

NEPTUNE CONSTRUCTION DETAILS

Fuselage: Semi-monocoque, all metal structure. *Wings:* Cantilever mid-wing all metal construction with NACA 2419 modified airfoil with maximum thickness at 38% cord. In case of ditching wings are designed to give temporary flotation. Empty bomb-bay and/or wing tip fuel tanks add buoyancy. The centre section is continuous through the fuselage and the entire bomb-bay load is carried by the wing. Ailerons are conventional except for spring tabs that at high speeds function as servo tabs, reducing operation forces.

Spoilers are installed in the upper surface of the outer wing panel just inboard of the aileron. Modified Fowler high lift type wing flaps are mounted on circular arc tracks inboard of ailerons. Maximum flap depression is 32°. Ailerons droop 10° when flaps are lowered. All control surfaces are internal aerodynamic balanced. Thermal-edge de-icing is incorporated in wing leading edges. *Tail Unit:* All aluminium alloy cantilever tail unit incorporates interchangeable elevators, "Varicam" (variable camber), a movable trimming surface between fixed tail and elevator which is electrically and hydraulically controlled. Fin and stabilizer leading edges are thermally heated. The elevators are balanced and both have trim tabs. The rudder also has a trim balanced tab. *Landing Gear:* The aircraft is equipped with a hydraulic actuated electrically controlled, nosewheel steering, tricycle landing gear. Dual hydraulically operated brakes are provided on each main gear.

LOCKHEED P2V SPECIFICATIONS

Item	XP2V-1	P2V-1	P2V-2	P2V-3	P2V-4	P2V-5	P2V-6	P2V-7	P2V-Kai
First Delivery	1945	1946	1947	1948	1949	1950	1952	1953	1966
Engines (2) Wright R-3350	-8	-8A	-24W	-26W	-30W	-30W	-30W	-32W	General Electric T64-GE-10 Turboprops (2)
Engines (2) Jet Westinghouse J34-WE ...	—	—	—	—	—	—	—	-36	IHI J3-IHI-7C Turbojets (2)
Takeoff Power, h.p. ...	2,300	2,300	2,800	3,200	3,750	3,750	3,750	4,000	2,850 s.h.p.
Fuel, gal.	3,350	3,350	3,350	3,350	4,210	4,700	4,700	4,700	—
Span, ft. ins.	100	100	100	100	101	103 10	104	103 10	103 10
Length, ft. ins.	75 4	75 6	78 3	77 11	77 11	81 7	89 10	91 8	91 8
Height, ft. ins.	29 4	28 1	28 1	28 1	28 1	28 1	28 1	28 1	28 1
Empty Weight, lb.	32,651	33,720	33,962	34,875	42,021	41,754	42,818	43,011	—
Design Gross, lb.	45,000	45,000	54,000	54,000	54,000	67,500	67,500	70,000	—
Maximum Gross, lb. ...	54,527	61,153	63,078	64,100	74,129	76,152	78,020	80,000	75,500
Maximum Speed, m.p.h. ...	289	302	320	338	352	341	328	364	—
Service Ceiling, ft.	23,200	27,000	26,000	28,000	31,000	29,000	27,000	33,000	—
Rate-of-Climb, f.p.m. ...	1,120	1,050	810	1,060	2,620	1,640	1,150	1,525	—
Range, miles	4,210	4,130	3,980	3,935	4,200	4,750	4,600	4,350	—
Crew, No.	8	8	7	7	8	9	9	9	10
Quantity produced ...	2	15	81	83	52	424	83	359*	68 (on order)

(* 311 Lockheed, 48 Kawasaki)

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