LOCKHEED's P·3 ORION

by Bob Pukala & Fred Roos

When Lockheed tendered their proposal in answer to CNO's Type Specification 146, they based their design on their L-188 Electra Airliner. The only significant change to the L-188 external configuration was the removal of seven feet of forward fuselage, the modification not only reducing weight but significantly improving flying qualities. The first seven P3V-1's and the YP3V-1 prototype participated in NPE (Navy Preliminary Examination), BIS (Board of Inspection and Survey) and NWE (Navy Weapons Evaluation) assessments through 16 June 1962 and was cleared for squadron use soon after.

As VP-8 became the first P-3 equipped squadron in the Navy during July of 1962 it was the beginning of a long and efficient career for what has turned out to be the world's most successful land-based anti-submarine weapon system. Their P-3A's were the first of 157 produced. Since then an additional 144 P-3B's and well in excess of 200 P-3C's and F's have joined (or will join) their predecessors over the oceans of the world, serving not only the USN but for Australia, New Zealand, Norway, Spain, Iran, Canada and Japan.

Externally all P-3's are virtually identical, the big changes and improvements being realized in equipment and capability. The P-3A, which saw a production run of 157 realized, was powered by four Allison T56-A-10W turboprops. During its production the 'A' experienced what was to become commonplace in the life of all Orions, retrofit and update, in order to keep the aircraft as capable as possible during its life. The A's original avionics systems were upgraded with the 'Deltic' installation which greatly improved the Orion's original tactical capabilities. Introduced on the production line in the first P-3A-50-LO, the 110th P-3, most of this new equipment was retrofitted to earlier A's. The 134th aircraft was the first with a factory installed APU and earlier aircraft were again so modified.

In mid-1965 production switched from the A to the P-3B and the engine was changed to the -14. Providing considerably more power, and consequently performance, any surviving P-3A's were re-engined during aircraft rework periods at the Alameda NARF. B avionics were the same as the 'Deltic' configuration introduced on the A, and a Bullpup missile guidance system was provided. This was eventually retrofitted to most P-3A's. 124 B's were accepted by the USN with a further 20 going to Australia, New Zealand and Norway.

When the YP-3C took to the air in September 1968, a significant leap forward in the prosecution of anti-submarine warfare was made. Its integrated ASW avionics had been conceived by NADC-Johnsville in the early sixties and a system vehicle was at hand.

The P-3C's "A-NEW" avionics system which is cored by a UNIVAC ASQ-114 digital computer can accept, correlate and display to an appropriate crew station data concerning navigation, sea conditions, detection of surface/subsurface contacts, prepared attack sequence, optimum approach, and can also store all data for future reference or debriefing.

Operationally the Orion is a remarkable aircraft. Possessing the ability to dash to a target area at speeds in excess of 400 knots and then loiter at only 180 knots over the contact area, it can also operate most efficiently on only two engines, saving fuel and thereby increasing range or loiter time.

More than five years after the P-3C deliveries began, an improved -3C rolled off the line. Called the P-3C Update 1, it incorporated even greater system capabilities. The computer memory capacity increased seven times, from 65000 to 450000 words, added tactical display screens, uses new computer language and added the new OMEGA nav system which was able to produce the most accurate heading and position information possible.

Update-2 aircraft incorporate a Texas Instrument Forward Looking Infra-Red (FLIR) detection system and a Sonobuoy Reference System (SRS) by Cubic Corp.. This SRS has ten antennae located under the fuselage, wing and horizontal tail. The Update-2 aircraft are capable of utilizing the McDonnell Douglas Harpoon anti-shipping missile and has an improved acoustic tactical tape recorder installed.

The Update-3 aircraft will utilize the advanced acoustic signal processor, Proteus, and a new sosnbuoy comm. link. Addition of these systems necessitates the enlargement of the ECS for adequate cooling.

Although hunting/killing of hostile submarines is the primary mission of the Orion, it can fulfill other functions as well. It may be used for coastal inspection, fishery protection, search and anti-shipping missions using air-to-surface stores such as mines, rockets (Bullpups) and missiles (Harpoons).

Six P-3F aircraft were built for Iran and are essentially the same as the P-3C Orions supplied to the USN.

The latest version of the Orion is the CP-140 Aurora being built for Canada. Selected to replace the ageing Brittania derivative, the CP-107 Argus, the CP-140 was in competition with many aircraft, both available and proposed. Originally known as the CP-3C, the CP-140 has been extensively redesigned to meet Canada's requirements. In addition to the installation of many S-3A systems, the cabin layout has been dramatically altered and is generally accepted as being superior to that of the P-3C. The Aurora is expected to serve with four operational squadrons (Nos. 404, 400, 407 and 415) and No.449 Squadron, a training unit.

<u>P-3 VARIANTS</u> (Other than standard production versions)

1) EP-3A. Converted from P-3A No.149673. Served with NWL, NATC and VX-1.
2) NP-3A. Two aircraft, one the converted YP-3A and the other a former WP-3A from VW-4. NP designation assigned to aircraft with permanent special test duty. Others may exist.
3) RP-3A. P-3A's modified for use with Oceanographic Research Squadron (VXN)-8. Replaced NC-121K's previously assigned.

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4) VP-3A. Previously assigned to VW-4, these are P-3A's fitted out as VIP aircraft and are assigned to CNO, CinCLant, and CinCPac.

5) WP-3A. Modified for use by VW-4. Equipment, for the most part, came from the WC-121N's they replaced. Three of these became VP-3A's while the fourth went to NRL as NP-3A.

6) EP-3B. Two P-3A's modified for electronic surveillance duty. Later updated to EP-3E standard.

7) RP-3D. Another derivative of the P-3 is the RP-3D of the Navy. This modification of a P-3C by the Naval Oceanographic Office is used in various study programs. The three programs which are well known are Projects Magnet, Birdseye and Seascan.

8) WP-3D. The National Oceanic and Atmospheric Administration (NOAA) has two scratch built P-3's designated WP-3D. Primarily weather research and reconnaissance aircraft they replace the older, converted, WP-3A's which operated with Weather Reconnaissance Squadron 4. It differs from the standard P-3 in that it has two additional bubble windows, additional window aft of the pilot's station, wing fittings for seeding agent stores, blister radome aft of nose wheel well and absence of MAD boom on the tail.

9) EP-3E. Ten P-3A's and both EP-3B's modified for use by VQ-1 and VQ-2, replacing EC-121M's.

PHOTO CAPTIONS

1. This is the bird that started it all. Flying for over 20 years, NASA's Earth Survey I began life as the P3V aerodynamic test bed in 1958. Over a year later it flew as the YP3V-1 system prototype. Accepted by the Navy as BuNo 148276 it was later designated YP-3A. In 1969 it was re-registered N927NA as an NP-3A and is based at Johnson Space Center, Houston Texas. Photographed at Wright Patterson AFB in 1974 by Tom Brewer.

2. This P-3A-01-LO is the first production Orion and has spent its career with either NATC or NADC. Photographed at NAF Warminster in 1972 by R. Esposito.

3. This EP-3B, No. 149678, was photographed by H. Nagakubo at NAS Atsugi in 1974. Carrying the radomes associated with the EP-3B configuration, this bob-tailed Orion has Hugh Hefner's 'Bunny' on the tail and a 'smile-face' on the forward fuselage.

4. Some of VQ-2's P-3's appear more conventional in that the MAD boom remained. Assigned 'JQ' tail codes, the squadron did not carry them. A red pennant with a black 'spy' silhouette superimposed was the only marking, other than the aircraft number. A Fred Roos photo.

5. RP-3A, #150500, was modified from a P-3A-20-LO in 1974 and assigned to VXN-8 and 'Project Birdseye'. The 'Arctic Fox' as shown here was preceded by another 'Arctic Fox' in the same unit. A Lock-

heed NC-121K 'Constellation', BuNo 141325, performed in the Arctic Ice Research Program. Prior to its modification to RP-3A standards the aircraft served with VP-68 (Reserve) and carried LW tail codes along with nose numbers of 4 and 1 in squadron service. Photo by Fred Roos.

6. RP-3A, #149667, is another P-3A modification, this time from a -10-LO block aircraft and assigned to VXN-8's 'Project Seascan'. Prior to its modification in 1974 the aircraft saw service with VP-8 as LC/8, LC/7, LC/10 and LC/20, NARDET-Moffett as 8C/2 and when this Naval Air Reserve Detachment was activated as VP-91 (Reserve) in 1971 as PM/2. 'El Coyote' was reported crashed in early 1978. Fred Roos photo.

7. RP-3D, #158227, was production line modified for VXN-8 to use in mapping the earth's magnetic field under code name 'Project Magnet'. All ASW mission avionics was removed and very specialized navigation and processing equipment added. 'Paisanos Dos', as the aircraft was named, set an international closed circuit distance record for turboprop aircraft of 5451 nautical miles in late 1972. Photo by Fred Roos.

8. WP-3A, #149674, was one of four early production P-3A-15-LO's that were modified for VW-4 in 1971-72. Much of this equipment came from the WC-121N's which they replaced. Before modification the aircraft served as LA/2 and LA/30 of VP-5 and after mod as MH/7 and finally MH/1, carrying the name 'Edith' in the storm symbol on the nose. When VW-4 was deactivated in April 1975 'Edith'was redesignated NP-3A and assigned to NRL and special test duty. Photo by F. Roos.

9. A Barbers Point Hawaii based unit, this P-3B-105-LO of VP-1 carries the equivalent of a CAG marking on the vertical tail because of its availability to the Commander, Patrol Wing Two. YB/1 was photographed at Misawa AB on 21 September 1974 by Norm Taylor. The fin tip is dark blue with a gold eagle.

10. In company with C-118's and a C-130 on NAS Agana's (Guam) ramp is a P-3A-45-LO assigned to VP-4's 'Skinny Dragons'. Another PatWing 2 unit from Barbers Point, VP-4 carries the gold forked emblem on a dark blue tip. Photo by R.L. Lawson on 23 September 1966.

11. The 'Mad Foxes' of VP-5 is an east coast unit, operating from NAS Jacksonville, Fla. This P-3C-150-LO, carrying some external store aft of the weapons bay was photographed by J.M. Guhl on 27 February 1974. As can be seen from all our photos, the P-3 is an immaculately maintained aircraft type.

12. Variations on the tail markings for VP-6's 'Blue Sharks' may be found on our sketch pages but here we see one of their P-3B-95-LO Orions visiting NAS Moffett Field in August of 1975. Based at Barbers Point this P-3 has a medium blue fin tip with six white stars and band, medium blue and white bands aft of the radome, and medium blue/white/dark blue shark with rainbow over shark. Photo by P. Mancus.

13. P-3A-30-LO, No.150607, of VP-8's 'Tigers' in February of 1972 as LC/82. This much traveled P-3A started service as RP/34 of VP-31 before being passed along to VP-6 as PC/5, VP-22 and back to VP-31 before joining VP-8. After service with VP-8, 150607 went to VXN-8 as JB/607. In 1976 she went to VP-92 (Reserve) as LY/1 and named 'Spirit of Quincy'. VP-8's badge is carried on both sides of the nose, Tigers head on blue and gold arrow on the tail, and small submarine silhouette on the nose gear door. The squadron badge consists yellow, black and white tiger (red tongue) breaking black sub in half against white cloud/blue sky, gold badge outline and banner with PATRON 8 in black. VP-8 was the first fleet squadron to use the Orion when it was so equipped in July 1962 at Patuxent River. It remained there for 11 years when it moved to Brunswick Maine and P-3B re-equipment in 1976.

14. NAS Moffett Field was home to this P-3B-65-LO of VP-9's 'Golden Eagles'. Photographed by Fred Roos in late 1972 this Orion is moving off the ramp for take-off. #152732 has since been sent to VP-8 and has served with the Tigers since 1976. VP-9 re-equipped with P-3C's. The large badge on the tail is a blue field outlined black with a tan/gray/black/gold/white eagle hurling a gold lightning bolt while standing on a white cloud.

15. P-3B-70-LO, #152750, has always been assigned to VP-10's 'Red Lancers' and based at NAS Brunswick Maine. Nose number 7 is the latest carried as she has been numbered 5, 30, and 10 in the past. VP-10 flew the SP-2E as a part of FAW-3 until P-3A's arrived in late 1965. B's became standard equipment in late 1966. Markings are simple and consist of a black edged white tail band with a red lance tip. Pennant on the nose is green/gold/green/gold/red (from outer edge to center). Fred Roos photo.

16. As with many P-3's this aircraft has seen service with several squadrons. A P-3B-90-LO, #153450 has seen duty with VP-26 as LK/37, VP-30 as LL/16 (most recent) and VP-11 as shown here. The 'Pegasus' on the tail is white (black edged & highlights), golden tan wings over a blue lightning bolt. Pennant on the nose is dark blue, red and gold. Photo by Fred Roos.

17. Although now a component of VP-92 (Reserve) #151370, a P-3A-40-LO, once served with VP-8 as LC/8, and initially with the VP-16 'Eagles' as shown here. This was another Neptune (SP-2E) squadron that equipped with the Orion in the 1960's. Based at NAS Jacksonville, the aircraft carried the squadron badge on both fuselage sides while the tail had a black/white/gold eagle on a red stripe. Fred Roos photo.

18. Another a/c of one of PatWing 2's squadrons, VP-17, is seen landing at NAS Atsugi in May 1975. #152150 has since passed to Reserve VP-65 at Pt. Mugu (the fate of many P-3A's). The 'White Lightnings' of VP-17 carried just that on the vertical tail along with a red/white/red fin tip. Colors of the rainbow device are red, gold, yellow, dark blue and medium blue (from back). Photo by H. Nagakubo.

19. All you St. Louis readers will be glad to know that VP-19 is known as the 'Big Red' and # 159514 is one of the latest P-3C's to be built. Markings consist of a red/white/red fin tip and gold lightning bolt shaded red. Photo by F. Roos.

20. After initial assignment to VP-48 as SF/6 #154596 came to VP-22's 'Blue Geese', was coded QA/6 and operates as such from Barbers Point. Still another SP-2E squadron, VP-22 has a medium blue fin tip, winged goose and engine inlets. Nose number and tail code are lightly shaded with white. Photo by Fred Roos.

21. VP-23 was one of the last squadrons to give up the Neptune for the Orion, waiting until the spring of 1970 to equip with the P-3B. They received most of their aircraft from VP-24, when they upgraded to the P-3C. VP-23 operated LJ/2 after it had seen service with VP-56 as LQ/23 and VP-26 as LK/31. The same pennant colors as noted on the VP-10 Orion but size is different. Squadron badge is on both fuselage sides and the 'Sea Hawk' on the tail is white, gold and black. Photo by F. Roos.

22. VP-24's 'Batmen' is the only unit to operate this P-3C-120-LO, #152761, as a squadron component. As illustrated, markings are simple, yet effective. The vertical tail has a black bat ringed by six (two above, four below) stylized red stars. Squadron badge is carried on both fuselage sides. Photo by Fred Roos.

23. #152761 is a P-3B-75-LO assigned to VP-26 at Brunswick Maine. It has operated as LK/5 since mid-1976 and was LK/6 and 8 before that. First delivered to VP-10 as LD/12 in 1969 this Orion was not VP-26 marked until 1974. Along with forward fuselage displayed badges the tail shows a dark blue diamond and yellow-gold trident. Photo by Fred Roos.

24. This photo and the next two are included to show the gestation of markings for the Sea Hawks of VP-30. This P-3A-40-LO was photographed by D. Ostrowski on 15 August 1964. Carrying only the tail code the aircraft is finished in the earlier patrol plane scheme of white and engine gray.

25. Over ten years later Peter Mancus found this P-3A-45 of VP-30 on the flight line at Moffett Field. The overall scheme has been changed to the more familiar gray and white and beside the tail code, a red fin tip is augmented by a red lightning bolt and black submarine silhouette.

26. In 1977 Fred Roos photographed this P-3C-110-LO at Moffett Field. The tail emblem, now more elaborate, consists of a sea hawk feeding a sub to her brood of chicks, in black, red and white. #156511 has always serv d with VP-30.

27. In two of the preceding photographs tails of VP-31's 'Black Lightnings' are seen. This is a full shot of a P-3C-125-LO on the Moffett Field ramp in 1971 by Fred Roos. Markings consist of nothing more than a dark blue diamond and a gold lamp.

28. Lockheed Aircraft is the source of this inflight shot of one of VP-40's P-3B-95-LO Orions. The 'Fighting Marlins' are based at Moffett Field. Tail marlin is medium blue, gold and white. Fred Roos collection.

29. VP-44's 'Golden Pelicans' operate from Brunswick Maine as part of Patrol Wing 5. #152180, a P-3A-60-LO, was photographed by Jim Sullivan in 1976 at NAS Patuxent River. Note the bicentennial "Don't Tread On Me" flag on the fuselage side.

30. Patrol Wing 11, based at Jacksonville, is the home for this VP-45 P-3C-140-LO. Duane Kasulka got this shot on 29 June 1974. Besides the red and white dart on the nose, the pelican on the tail is in black outline on gray with gold beak and yellow/red torpedoes under wings.

31. The 'Grey Knights' of VP-46 operate their Orions over the Pacific and one of their P-3B-75-LO's is shown landing at NAS Atsugi in May of 1975. Photographed by H. Nagakubo, the unit's insignia is a medium gray (with dark gray detail) knight's helmet with red plume.

32. Based with VP-46 at Moffett Field are the 'Golden Swordsmen' of VP-47. This P-3C, also photographed by H. Nagakubo, shows the weapon bay door location/detail and obviously the red/white/blue carryover from the previous year's bicentennial celebration on the nose. The fin tip is gold, edged in black while the badge is red and blue outlined in white with a gold/white/black eagle head. The entire badge is superimposed on a gold anchor and sword (crossed).

33. Another P-3C, this time from VP-48 carries red, white and blue markings on the tail and fuselage (edging the radome). Before equipping with Orions in 1966, the 'Boomerangers' operated SP-5B Marlins, with one such aircraft carrying a sharkmouth while deployed to the Philippines. A Fred Roos photo.

34. One of the earliest users of the P-3 were the 'Woodpeckers' of VP-49. This and 35 show the great change in markings from their first A's to their later C's. Paul Stevens found the P-3A-30-LO taxiing out for take-off while finished in the early scheme. Fred Roos' shot illustrates a later P-3C-115-LO with a fierce (?) woodpecker (dark blue, red, yellow, white and black) perched on a black and white gloved arm. Woody never looked that mean on the screen.

36. VP-50's 'Blue Dragons' are typical of the P-3 units. Their markings styles change periodically and one is illustrated here. The arrowhead device on the nose is medium blue and white with a black A. The tail tip is white and medium blue, edged with a darker blue. The band is the same medium blue and dark blue with a white ellipse highlighting a medium and dark blue dragon with white and black details with red tongue. A Fred Roos photo.

37. The last front line squadron to be illustrated is VP-56. This P-3C-115-LO of the 'Dragons' was shot on the MoANG ramp by F. Roos. The dragon is black and white with a red tongue.

38. Also photographed in St. Louis by Fred is this Reserve Squadron (VP-62) P-3A-30-LO. Besides the squadron badge, the arrowhead device on the tail is medium blue and gold. This Glenview based aircraft was parked on the Rockwell ramp.

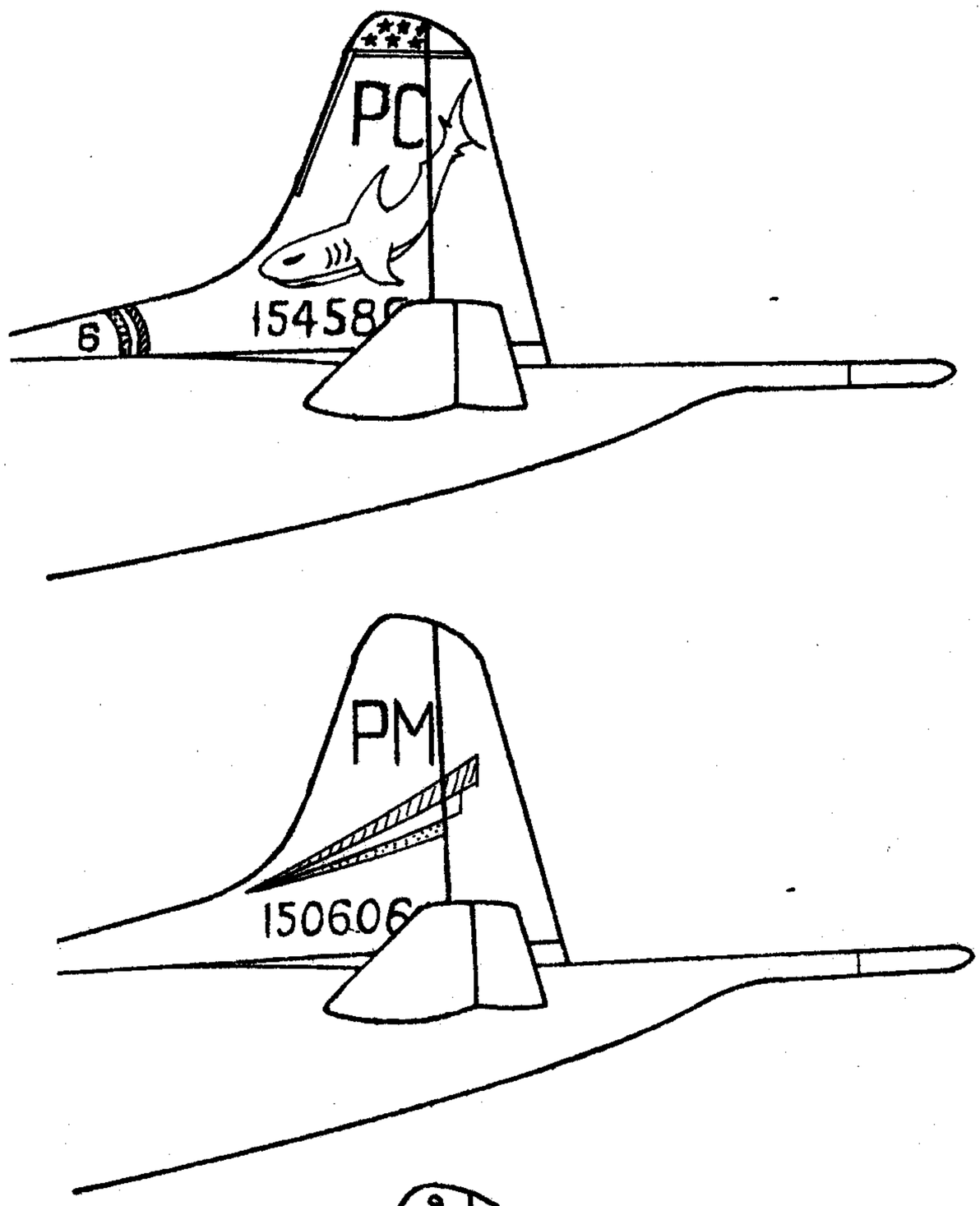
39. VP-65, another Reserve unit, is based at Jacksonville. Dark blue and white are the predominant colors being used on the nose stripe (aft of the radome), chevron, fin tip, and tail device. The wings on the figure are gold. A Fred Roos photo.

40. Obviously a unit from the Philadelphia area by virtue of the red and white liberty bell on the tail, VP-66's reservists operate their P-3A's from NAS Willow Grove. The bell is surrounded by thirteen blue stars. A Fred Roos photo.

41. A Pax River reserve squadron, VP-68 was commissioned in 1970. The black eagle silhouette is superimposed on a red and yellow cross. Photo by Fred Roos.

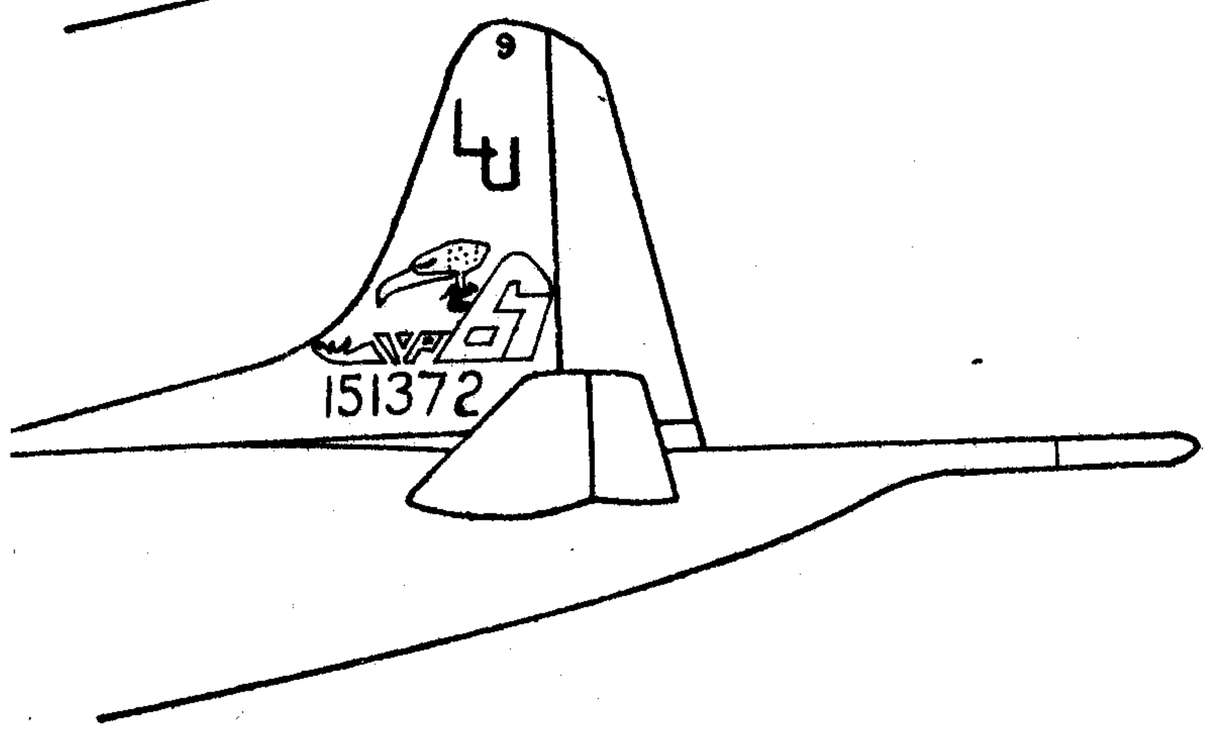
42. Flying from Detroit Michigan, VP-93's Weekend Warriors also operate P-3A's. Along with the squadron badge on the forward fuselage, tail markings consist of a medium blue band and chevron, three white stars and two thin red stripes. Photograph by Fred Roos.

VP-6, P-3B-100-LO, BuNo 154586
MEDIUM BLUE-FIN TIP & SHARK BODY
WHITE-STARS, BAND & SHARK BELLY w/DETAILS
RED WHITE & BLUE-FILLET DEVICE
TAIL CODE BLACK, SHADED WHITE



VP-91 P-3A-30-LO BuNo 150606
RED WHITE & BLUE (from top) TAIL DESIGN

VP-64 P-3A-40-LO BuNo 151372
STYLIZED VULTURE AND SQUADRON NO. ON VERTICAL TAIL
"VP-64" IS BLACK WITH WHITE EDGES/DETAILS
EXTENDED FROM "V" IS ORANGE TALON
EXTENDED FROM "6" IS VULTURE'S HEAD
WHITE HEAD, BLACK NECK & DETAILS,
ORANGE BEAK
TAIL CODE SHADED WHITE (LEFT EDGES)




PROJECT
MAGNET
OGRAPHIC FFICE

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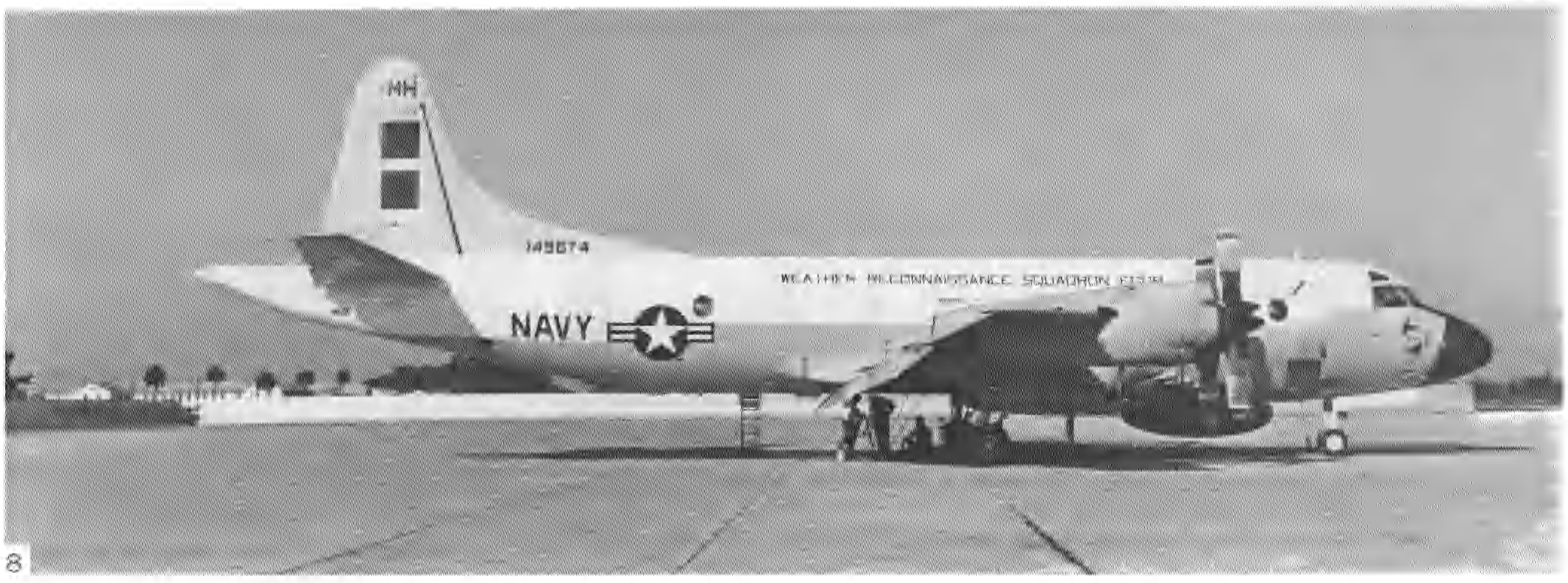
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NAVY

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YB
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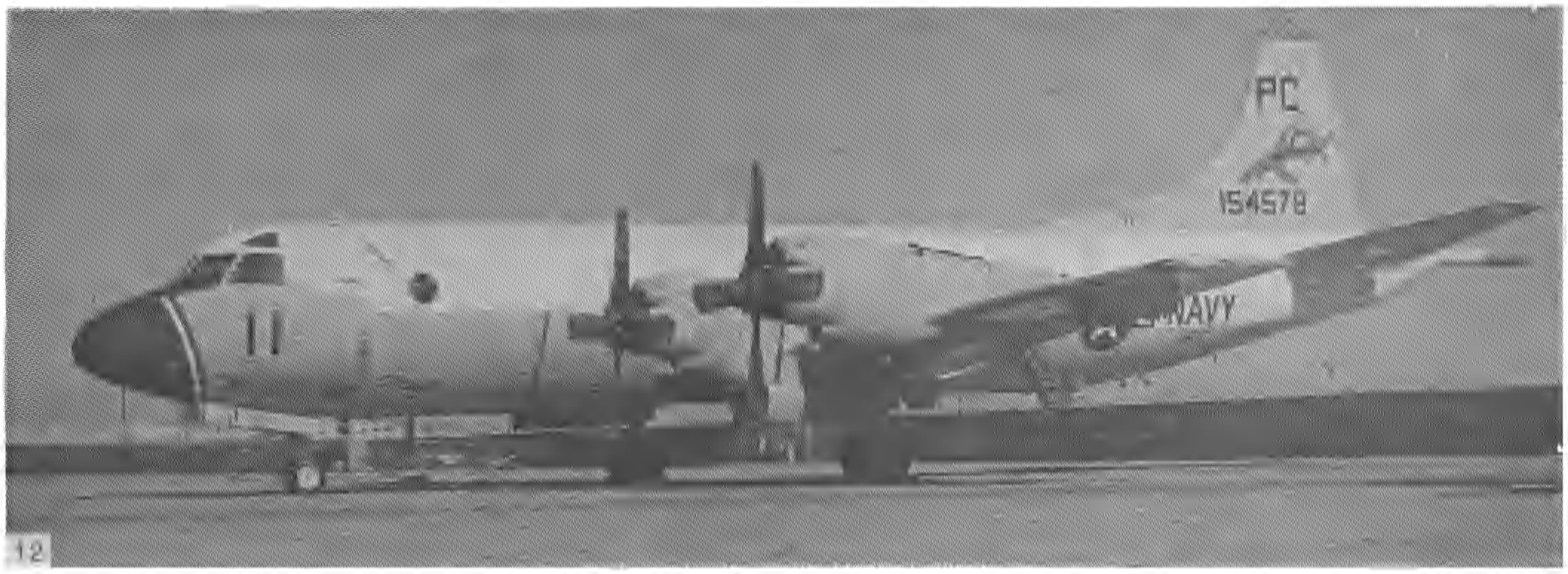

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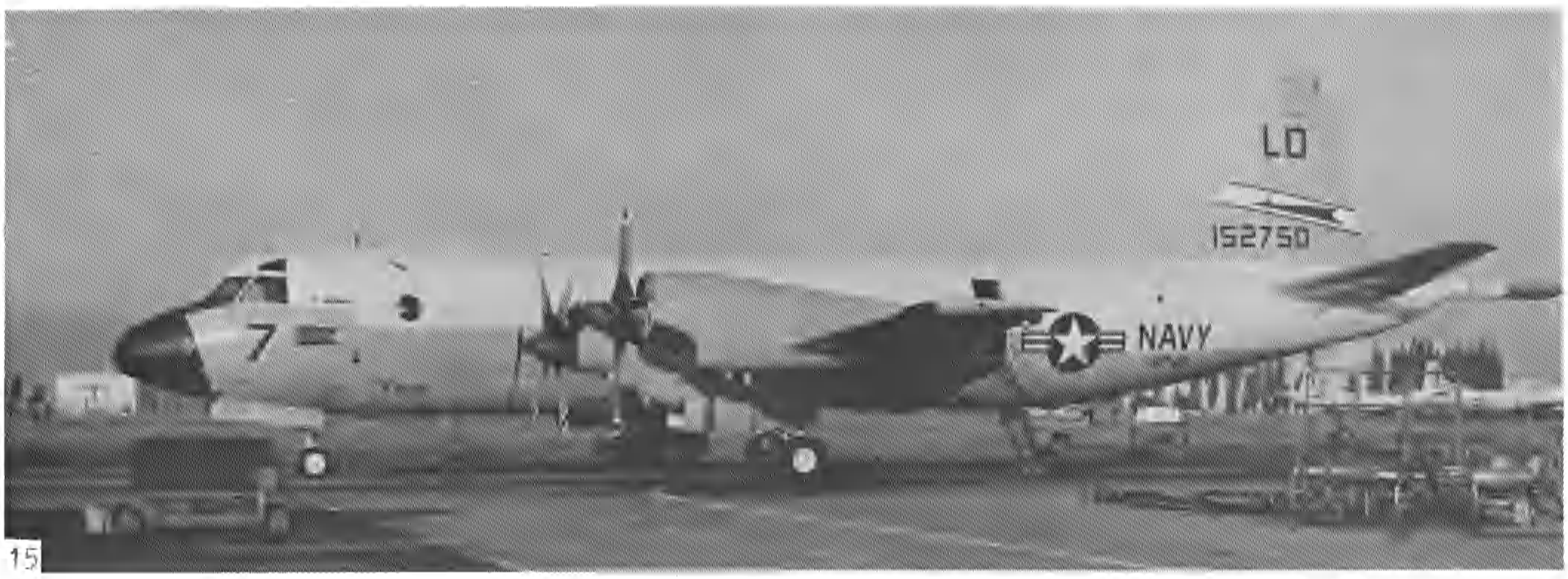

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