FlyPast Scrutinizes the history of...

The Consolidated Catalina

Above *Consolidated Catalina I AH550 'DA-L' of the RAF's 210 Squadron. This aircraft flew with the unit from April 1941.* ALL KEY

Below right *A small number of Catalinas flew with the Japan Maritime Self-Defence Force's 91 Squadron in the 1950s.*

Although mostly remembered as an amphibious aircraft that rescued numerous downed airmen and sailors from the sea, returning them safely to land, the earliest versions of the Catalina were flying boats – able to operate from the water alone.

The important task of air-sea rescue was one of many successfully carried out by Catalina crews. The aircraft also played a significant role in countering the U-boat threat in the Atlantic, while PBYs gave the first airborne alert of the approaching enemy carrier force at Midway, and shadowed the German warship *Bismarck* in the North Atlantic.

The XP3Y-1 prototype flew for the first time on March 21, 1935. Powered by two 825hp (615kW) Pratt & Whitney Twin Wasp radials, it beat a Douglas design for a US Navy order, entering service as the PBY-1 in October 1936. An initial order of 60 was delivered, followed by 50 PBY-2s, 66 PBY-3s and 32 PBY-4s (all with slight modifications and/or engine upgrades) between 1936 and 1939.

The outbreak of war in Europe led

Consolidated to step up production as demand increased. With Britain, Canada, the Dutch East Indies and Australia all placing orders, the Catalina went on to become the most widely used flying boat of the war. In British service the name 'Catalina' became widely accepted. With the threat of war looming, the US Navy put in further orders, and the USAAF also introduced the type, designating it OA-10/OA-10A.

On November 22, 1939, four years after the initial prototype, the first amphibious version of the Catalina design flew. The PBY-5A had a retractable tricycle undercarriage allowing it to operate from both land and sea. These models, and their sub-variants, accounted for nearly three-quarters of all production, and the type served on all fronts. By the time the definitive PBY-5 and 5A were in service, its Twin Wasps had been upgraded to deliver 1,200hp each.

Two Victoria Crosses were awarded to Catalina/Canso pilots for pressing home attacks on U-boats in the face of heavy fire. It is thought that around 40 German submarines were destroyed by PBYs, including U-199, which was sunk by a Brazilian Catalina on July 31, 1943. The so-called 'Black Cats' of the Royal Australian Air Force used the aircraft as night raiders, laying mines in Japanese-held waters, sometimes flying as low as 200ft in the dark.

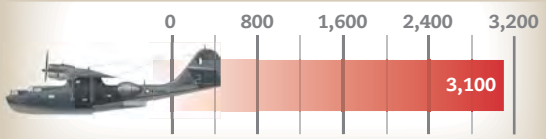
The final version of the Catalina was the PBY-6A, which had larger tail surfaces among other modifications. A total of 175 were built, including the 21 transferred to the Soviet Navy.

After the war, most of the older flying boats were withdrawn, but many of the amphibians remained in service throughout the world, both in military and civilian hands. Some were used as transports and for aerial fire-fighting, and about a dozen remain airworthy to this day.

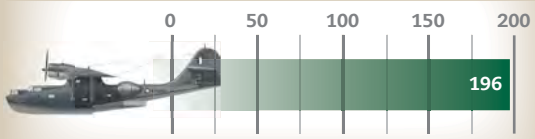
Below
The XPBY-5A was the first amphibious version of the Catalina, and made its debut flight in November 1939.

Consolidated PBY-5A Catalina

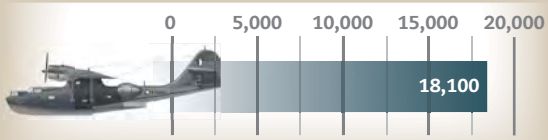
AT A GLANCE: RANGE (miles)

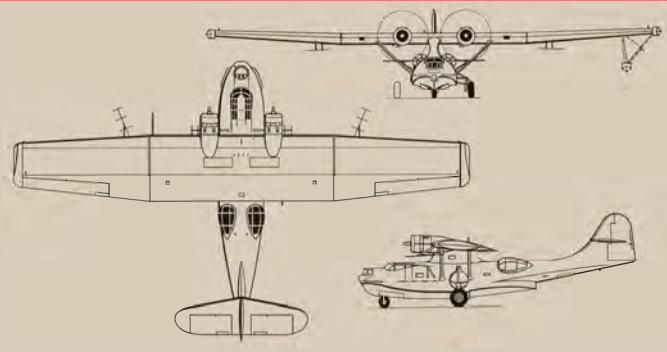


AT A GLANCE: SPEED (mph)



AT A GLANCE: CEILING (feet)





Construction: A total of 3,305 Catalinas were built - 2,550 in the US, 731 in Canada, and 24 in Russia.

First Flight: The prototype first flew on March 21, 1935.

Powerplant: Two 1,200hp (895kW) Pratt & Whitney R-1830-92 Twin Wasp radial engines.

Dimension: Span 104ft 0in (31.7m). Length 63ft 11in. Height 21ft 1in. Wing area 1,400sq ft (130m²).

Weight: Empty 20,910lb (9,485kg). Loaded 35,420lb.

Performance: Max speed 196mph (314km/h). Service ceiling 18,100ft (5,517m). Initial climb rate 690ft per min. Range 3,100miles (4,989km).

Armament: Up to five 0.30in or 0.50in machine guns in nose, blister and waist positions, plus up to 4,000lb bomb load, mines or depth charges.

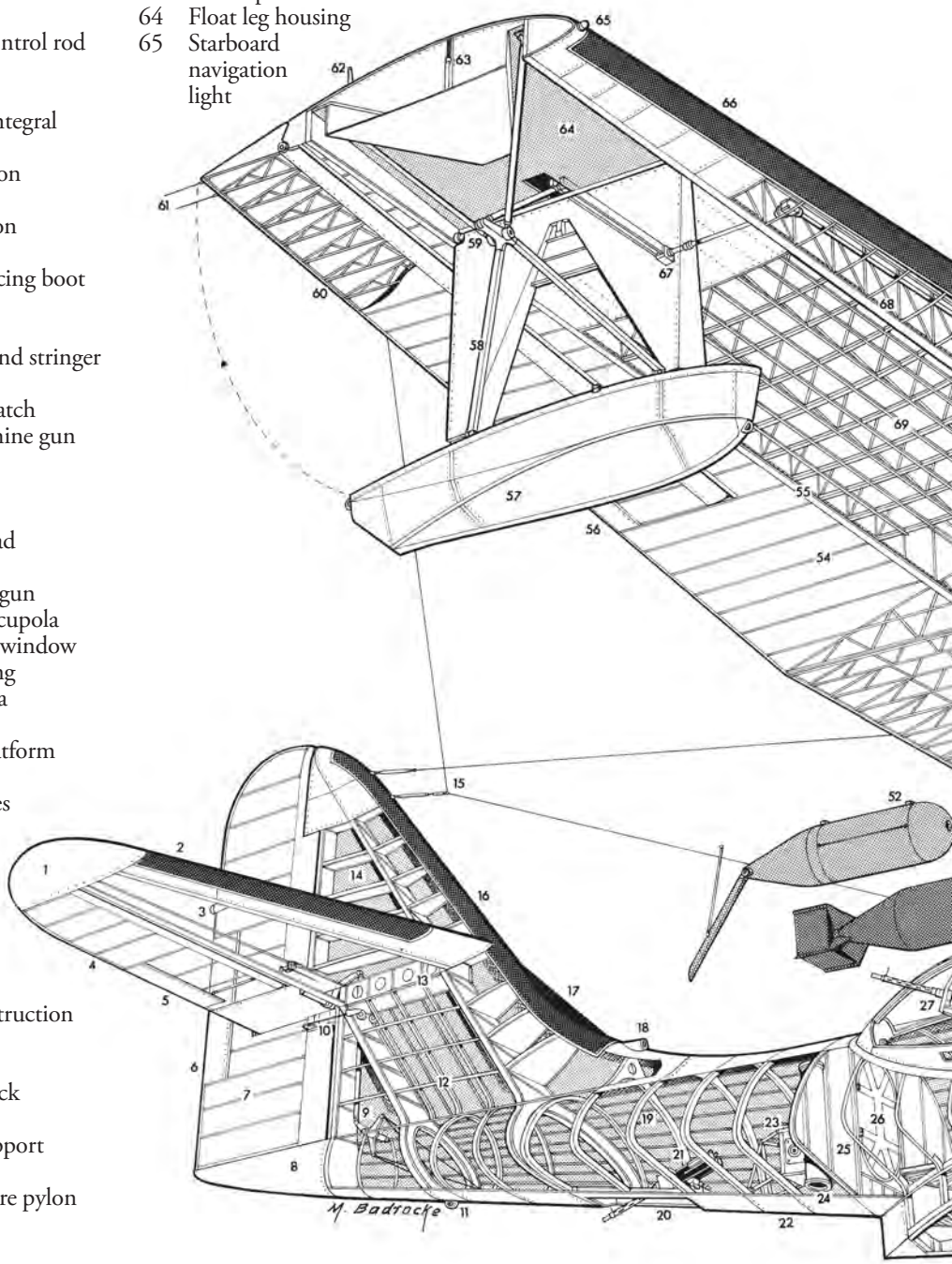
Crew: Up to ten - pilot, co-pilot, bow turret gunner, flight engineer, radio operator, navigator, radar operator, two waist gunners, ventral gunner.

Note: performance and weights varied according to role and configuration.

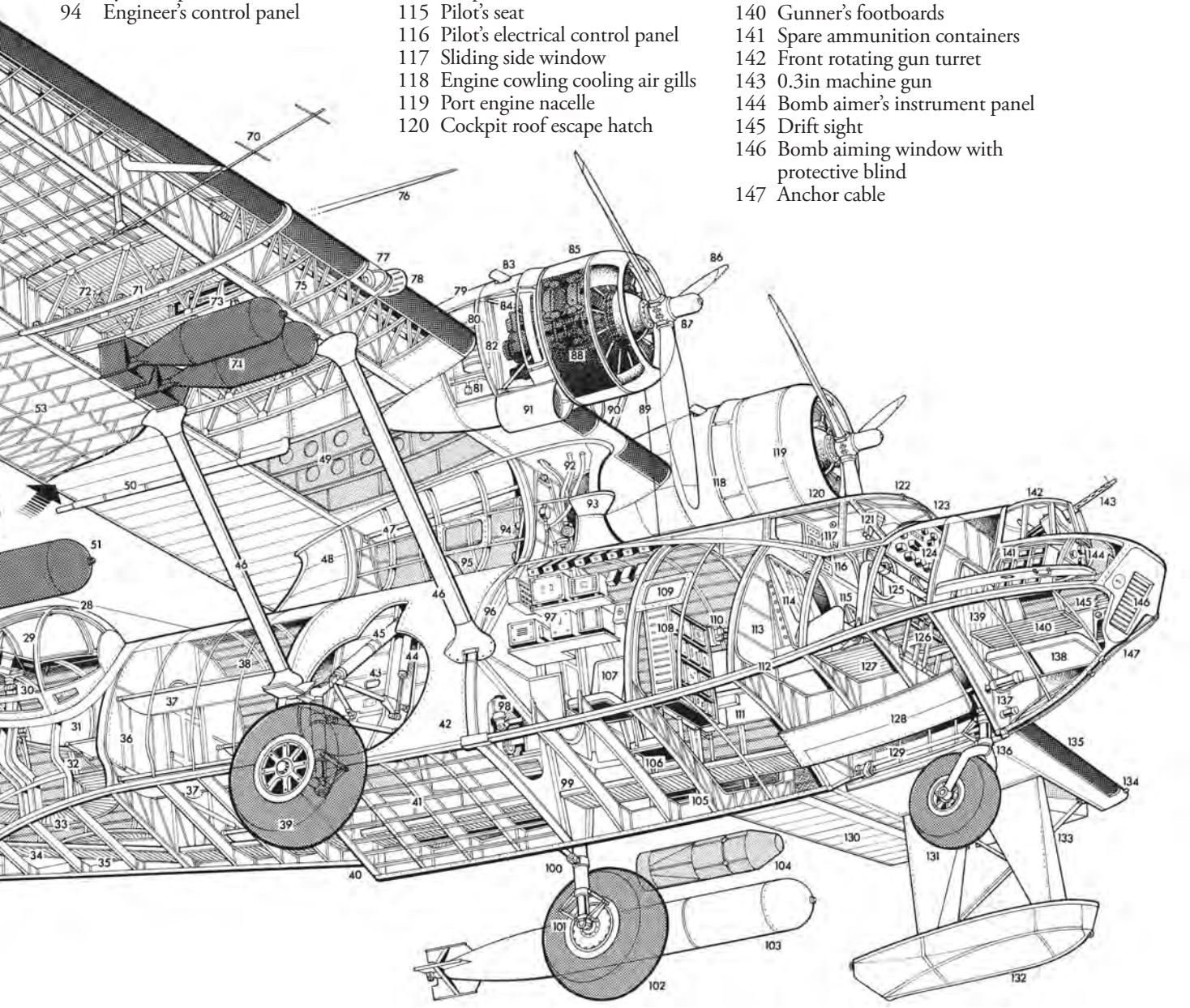
Spotlight

Consolidated PBY-5A Catalina

1 Starboard tailplane
2 Tailplane leading edge de-icing boot
3 Tail navigation light
4 Starboard fabric-covered elevator
5 Elevator tab
6 Rudder trim tab
7 Fabric-covered rudder
8 Tail cone
9 Elevator push-pull control rod
10 Rudder control horn
11 Tail mooring point
12 Lower fin structure integral with tail fuselage
13 Tailplane centre section attachment
14 Upper fin construction
15 Aerial cables
16 Fin leading edge de-icing boot
17 Port tailplane
18 Cooling air intake
19 Rear fuselage frame and stringer construction
20 Ventral tunnel gun hatch
21 0.3in (762mm) machine gun
22 Fuselage skin plating
23 Target towing reel
24 Flare launch tube
25 Rear fuselage bulkhead
26 Bulkhead door
27 0.5in beam machine gun
28. Starboard beam gun cupola
29 Cupola opening side window
30 Flexible gun mounting
31 Port beam gun cupola
32 Gunner's folding seat
33 Semi-circular gun platform
34 Walkway
35 Hull bottom V-frames
36 Wardroom bulkhead
37 Crew rest bunks
38 Wardroom
39 Starboard mainwheel
40 Hull planing bottom step
41 Planing bottom construction
42 Fuselage skin plating
43 Mainwheel housing
44 Hydraulic reaction jack
45 Telescopic leg strut
46 Fore and aft wing support struts
47 Wing mounting centre pylon construction
48 Pylon tail fairing
49 Starboard wing integral fuel tank, capacity 875 US gal (3,312 lit)
50 Fuel jettison pipe
51 1,000lb (454kg) bomb
52 Smoke generator tank
53 Trailing edge ribs
54 Fabric-covered trailing edge
55 Rear spar
56 Aileron trim tab
57 Starboard retractable wing-tip float
58 Float support struts
59 Retraction linkage
60 Fabric-coverage starboard aileron
61 Static discharge wicks
62 Wing-tip aerial mast
63 Float up-lock
64 Float leg housing
65 Starboard navigation light
66 Leading edge de-icing boot
67 Float retracting gear
68 Front spar
69 Wing rib/stringer construction
70 ASV radar aerial
71 Outer wing panel attachment joint
72 Wing lattice ribs
73 Bomb carrier and release unit
74 Two 500lb bombs
75 Leading-edge nose ribs
76 Position of pitot tube on port wing



77 Landing lamp
78 Landing lamp glass shield
79 Starboard engine nacelle fairing
80 Hydraulic accumulator
81 Engine oil tank
82 Fireproof bulkhead
83 Exhaust stub
84 Engine bearer struts
85 Detachable engine cowlings
86 Curtiss Electric three-bladed constant speed propeller, 12ft (3.66m) diameter
87 Propeller hub pitch-change mechanism
88 Pratt & Whitney R-1830-92 Twin Wasp two-row radial engine
89 Aerial cable lead-in
90 D/F loop aerial
91 Oil cooler
92 Control runs through pylon front fairing
93 Pylon step
94 Engineer's control panel
95 Flight engineer's seat
96 Wing mounting fuselage mainframe
97 Radio and radar control units
98 Cabin heater
99 Front cabin walkway
100 Port main undercarriage leg strut
101 Torque scissor links
102 Port mainwheel
103 Mk.13-2 torpedo
104 450lb depth charge
105 Forward fuselage frame construction
106 Navigator's seat
107 Radio/radar operator's seat
108 Radio rack
109 Cabin side window
110 Autopilot servo controller
111 Navigator's chart table
112 Fuselage chine member
113 Cockpit bulkhead
114 Co-pilot's seat
115 Pilot's seat
116 Pilot's electrical control panel
117 Sliding side window
118 Engine cowling cooling air gills
119 Port engine nacelle
120 Cockpit roof escape hatch
121 Overhead throttle and propeller controls
122 Windscreen wipers
123 Curved windscreens
124 Instrument panel
125 Control column yoke and handwheels
126 Rudder panels
127 Cockpit flooring
128 Nose undercarriage hatch doors
129 Nosewheel bay
130 Port aileron
131 Nosewheel
132 Port retractable wing-tip float
133 Float support struts
134 Port navigation lights
135 Leading edge de-icing boot
136 Nosewheel forks
137 Nose undercarriage retraction jack
138 Front gunner/bomb aimer's station
139 Curtained bulkhead
140 Gunner's footboards
141 Spare ammunition containers
142 Front rotating gun turret
143 0.3in machine gun
144 Bomb aimer's instrument panel
145 Drift sight
146 Bomb aiming window with protective blind
147 Anchor cable



803 *PBY-5As were built*

Consolidated **Catalina**

Endurance and Determination

RAF Catalina crews seldom got the praise they deserved for their valour and for carrying our extreme long-range sorties – **Graham Pitchfork** profiles three tenacious pilots

Men Behind the Catalina

Flying long and lonely patrols miles from land and safety, the Catalina provided a welcome sight to convoys, ships and those in distress. Its prodigious endurance meant it could remain airborne for close to an astonishing 30 hours.

Uncomfortable, noisy and slow, with few modern aids and little by way of rest facilities, Catalinas needed a special breed of aircrew to operate them successfully. The great service given by Catalina crews has received too little recognition: the three men whose experiences are recounted below are typical of many.

Former Halton apprentice and RAF College Cranwell flight cadet Percy Hatfield converted to flying-boats and completed a full tour on Saro London biplanes with 202 Squadron. Most of his wartime sorties with 202 were from Gibraltar where he assisted in the destruction of the Italian U-boat *Durbo*.

On his return to Britain in April 1941 he joined 210 Squadron, based at Oban in the northwest of Scotland. The unit had just started to re-equip with Catalinas, and after a handful of conversion sorties Hatfield flew his first convoy escort patrol on April 27.

Two days later, with an experienced Catalina pilot as captain, he flew to Sullom Voe in the Shetlands to refuel before departing for a reconnaissance of the coastline between the ports of Hammerfest and Harstad in the extreme north of Norway. The sortie was flown at very low level and a successful recce completed despite heavy anti-aircraft fire. After a 19-hour flight the Catalina alighted at Sullom Voe before returning to Oban.

The pursuit and sinking of the pocket battleship *Bismarck* is one of the great epics of naval warfare. Germany's most powerful warship left the Baltic on May 18, together with the battle-cruiser *Prinz Eugen*, for a raiding cruise against the convoys of merchant ships crossing the Atlantic.

The Royal Navy had been anticipating such a move and dispatched two powerful forces to counter it.

On May 24, the battleship HMS *Prince of Wales* and battle-cruiser HMS *Hood* intercepted the *Bismarck* between Greenland and Iceland. After a brief engagement, the *Hood* blew up, leaving just three survivors from the 1,418 crew, and *Bismarck* sailed on looking for more prey.

German Admiral Günther Lutjens' tactics to shake off his shadowers finally succeeded in the early hours of May 25. To regain contact, a long-range sweep by Catalinas was

Below
A Catalina of 202 Squadron, seen from another, over the Indian Ocean.

2 *Victoria Crosses were awarded to Catalina/Canso pilots*

SPOT FACT *The design of the wingtip stabiliser floats had been licensed from Saunders-Roe*

Above *Percy Hatfield, second right, with Ensign Rinehart of the US Navy (second left) in a 'staged' briefing after the 'Bismarck' action.*

Below *Catalina I W8406 of 210 Squadron at Oban.*

organised: 210 Squadron was tasked to provide an aircraft and Hatfield and his crew were called to readiness at the operations room in Dungallan House in Oban.

Catalina AH545 from 209 Squadron sighted the *Bismarck* at 10:30 hours on the morning of May 26 and two hours later Hatfield lifted Mk.I W8416 *O-for-Orange* off the water at Oban and set a heading for the battleship's last reported position. Sitting alongside him acting as co-pilot was Ensign Carl Rinehart, a US Navy observer.

Based on the earlier report, Swordfish from HMS *Ark Royal* delivered a torpedo attack, which was unsuccessful. This was fortunate because the navy's target had mistakenly been the British cruiser HMS *Sheffield* – so another strike was ordered which damaged the *Bismarck*'s steering gear, causing her to reduce speed.

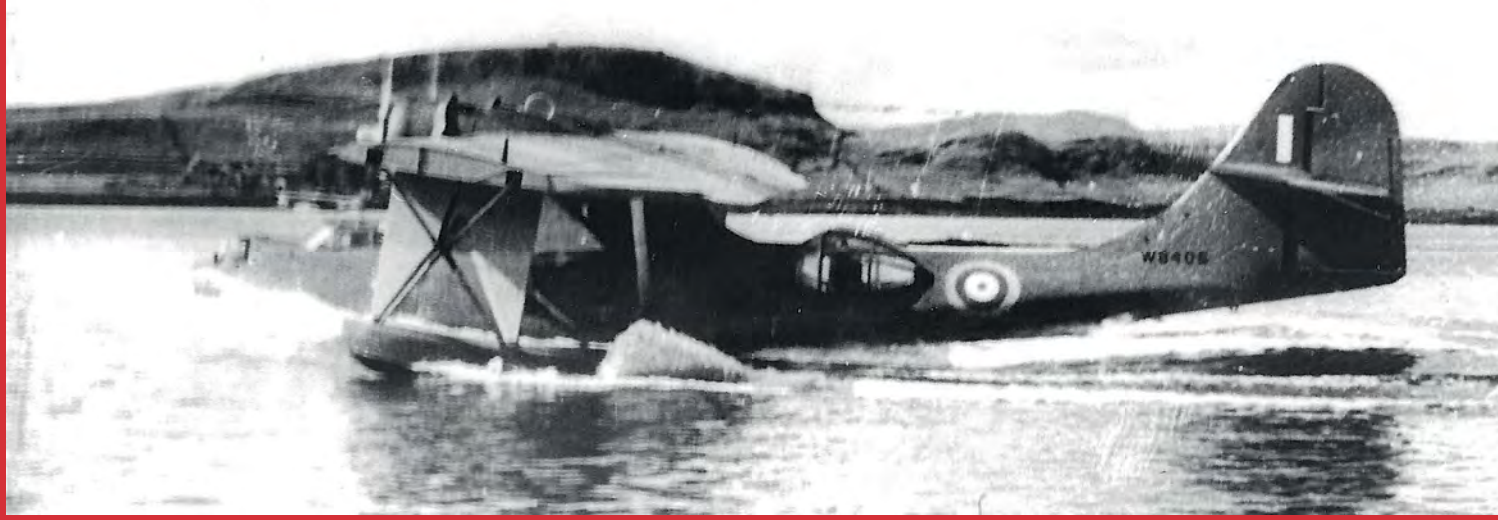
Closing in

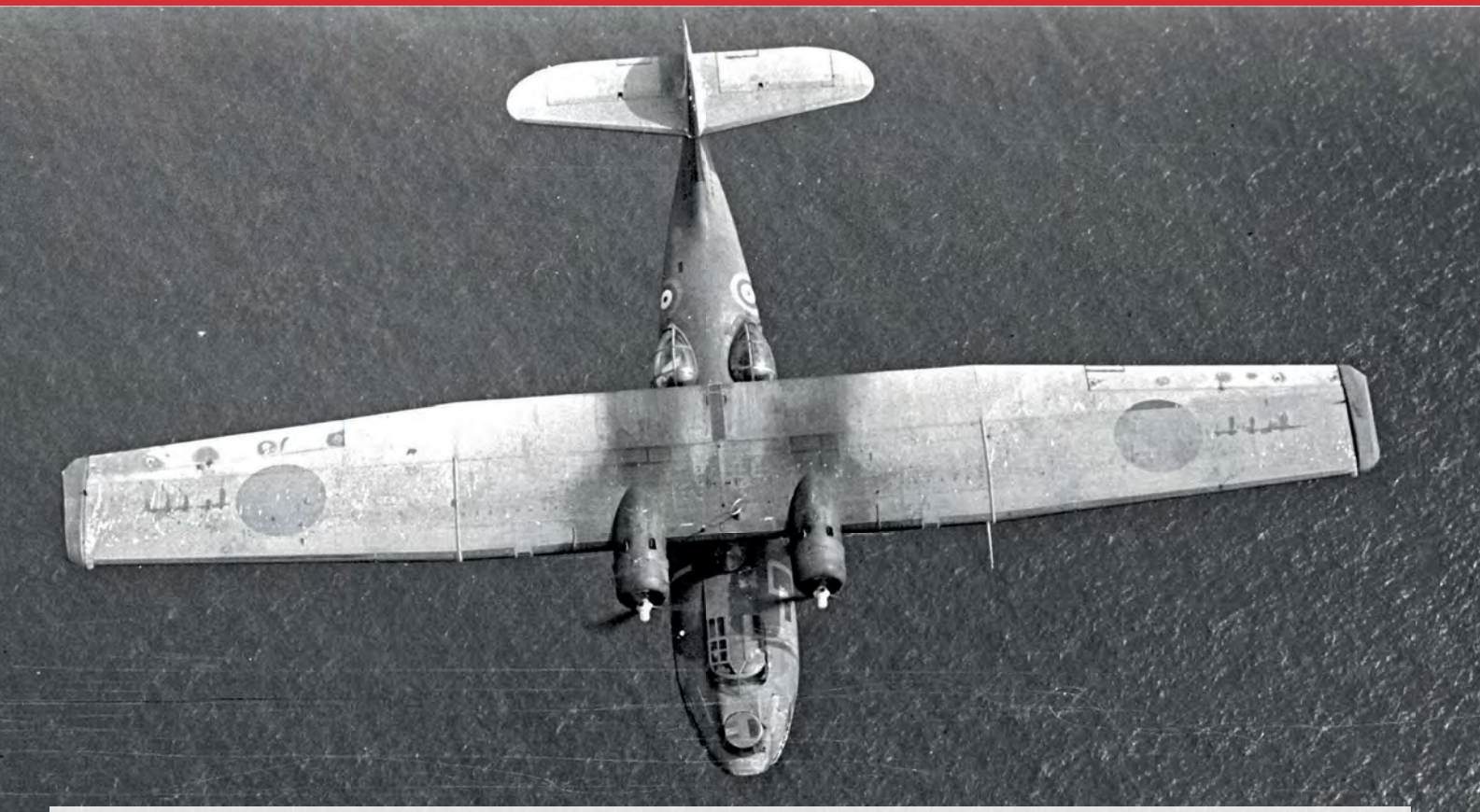
After 12 hours in the air, and accurate plotting by navigator Frank Cadman, the crew of *O-for-Orange* spotted the *Bismarck* and reported her position just before midnight. Hatfield sought some cloud cover and took the Catalina in for a closer look.

On breaking cloud directly above the battleship he was immediately engaged by a dense barrage of multi-coloured tracer and took violent evasive action, which threw LAC Roy Davis, the aircraft's fitter, from his rest bunk seconds before bullet holes appeared across the full length of his bed. Further hits were sustained to the wing and aerial.

Hatfield managed to get clear and took up a shadowing position, remaining to see the gun flashes

"German Admiral Günther Lutjens' tactics to shake off his shadowers finally succeeded in the early hours of May 25. To regain contact, a long-range sweep by Catalinas was organised..."





Above
An unusual overhead view of an RAF Catalina.

which heralded the commencement of the historic and final duel between the *Bismarck* and the Royal Navy. Soon afterwards, Cadman took an astro-fix (a star 'shoot' with a sextant) over the German battleship as it came under fire and, at 03:00, Hatfield turned his damaged Catalina for Oban – but not before he endeavoured to engage an enemy Blohm und Voss flying-boat which had arrived on the scene.

By the time W8416 alighted at Oban, the *Bismarck* was finished. Hatfield and his crew had carved a small piece of history. They had been airborne for almost 27 hours; an endurance record for the Catalina at the time. The following day at Dungallan House, Hatfield and his crew told the *London Illustrated News* of their part in the *Bismarck*'s destruction. Surprisingly, there were no awards for him or his men.

Long patrols

More long patrols followed and 16 to 18-hour flights were routine. On July 27 Hatfield took off to provide escort for an outbound convoy to Gibraltar, 300 miles southwest of Land's End. A U-boat had recently attacked the convoy and, in poor visibility and low cloud, Hatfield spotted a surface craft leaving "a creamy wake and bow wave with a dark object in the centre".

The identity of the vessel was suspect and the Catalina's challenge received no reply. A flare was dropped showing the gradually disappearing wake, which had been very visible on the black surface. Flying at 200ft, Hatfield dropped a flame float followed by two 450lb depth charges on the estimated position. Unfortunately there was no conclusive result so Hatfield resumed his patrol, eventually alighting at Oban after a 25-hour flight.

More long sorties followed including one when Hatfield transported three VIPs to Archangel in northern Russia and returned with a Polish general. Over the next few days he completed two more convoy patrols of more than 20 hours.

During August 1941 Hatfield completed no less than 122 hours of flying, recording another 135 hours in October and November. He was then posted for a rest tour as a test pilot at the Marine Experimental Aircraft Establishment at Helensburgh, just north of Dumbarton, Scotland.

His only reward after his arduous and successful tour was promotion to squadron leader. Later in the war he commanded a Sunderland squadron and was awarded the DFC. He remained in the RAF after the war and commanded 209 Squadron in Singapore, receiving the AFC. Percy Hatfield was killed in a civilian flying accident on July 27, 1965.

Malta lifeline

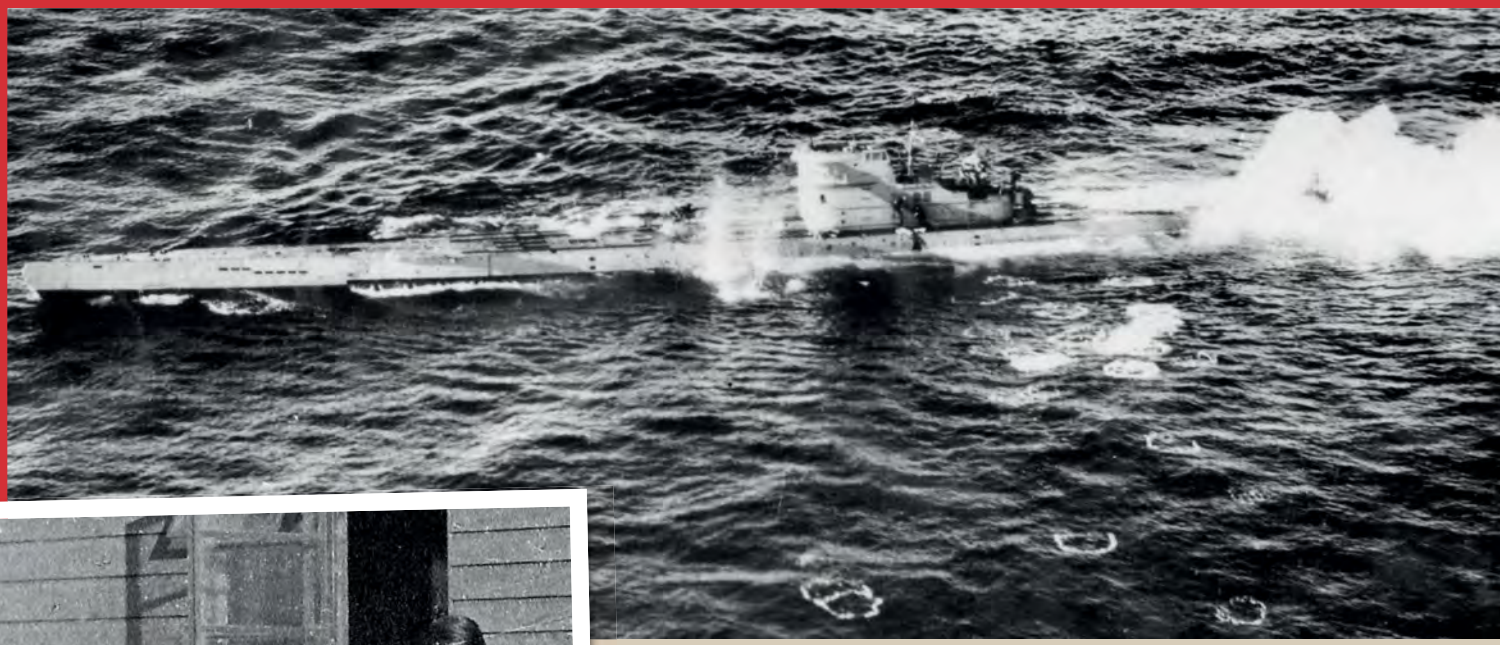
By the time John Stacey flew his first sortie in a Catalina – on March 30, 1941 – he had already accumulated more than 1,000 hours on the Saro London, Supermarine Stranraer and Short Singapore biplane flying-boats. After completing a tour of operations with 240 Squadron he was posted as an instructor to 4 (Coastal) Operational Training Unit at Invergordon in Scotland, piloting a variety of types.

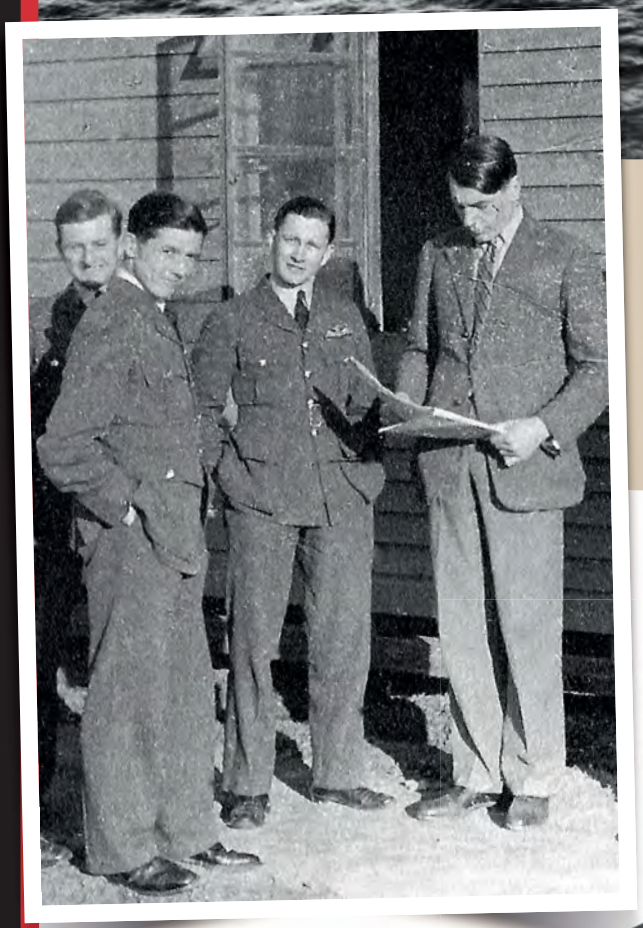
When he was posted to 202 Squadron in the middle of October 1941, Stacey had almost 200 hours on the Catalina. Within a week of his arrival he headed for Gibraltar and on October 26 flew his first convoy escort, a sortie of more than 17 hours.

Also based at Gibraltar was the Royal Navy's Force-H, which had been established to replace French naval power in the Western Mediterranean. In addition to escorting convoys, it also provided escort for aircraft carriers taking Hurricanes and Spitfires to reinforce the beleaguered squadrons on Malta. On November 10, Force-H sailed on Operation Perpetual and headed east with HMS *Ark Royal* carrying

40 *German U-boats were destroyed by Catalinas*

SPOT FACT *An Australian PBY made the first trans-Pacific flight between Australia and Chile in 1951*





"At 15:40 the following day a torpedo fired from U-81 hit *Ark Royal* and the ship had to be abandoned. Stacey took off and carried out a search for the U-boat but nothing was found"

Top
A surfaced U-boat under attack.

Above
John Stacey (centre) with fellow flying-boat pilots.

Right
An informal portrait of Jack Holmes.

21 Hurricanes destined for Malta.

Stacey and his crew took off on the 12th and carried out a sweep ahead of the fleet. After the Hurricanes had been launched, the Catalina headed back for Gibraltar. At 15:40 the following day a torpedo fired from U-81 hit *Ark Royal* and the ship had to be abandoned. Stacey took off and carried out a search for the U-boat but nothing was found.

Indian Ocean searches

After more patrols escorting Force-H and Mediterranean convoys, 202 Squadron headed for Ceylon in April 1942. The Japanese had achieved some spectacular successes in the Far East and one of its very powerful carrier fleets had sailed into the Indian Ocean. Reinforcements, particularly anti-submarine squadrons, were needed urgently and Stacey and his crew left Gibraltar on the 11th bound for Ceylon, refuelling at Aboukir in Egypt, Basra in Iraq and Karachi.

After flying two patrols east of Ceylon, Stacey was sent to the Seychelles, in the Indian Ocean off the East African coast. There was a perceived threat that the Vichy French might provide naval facilities for the Japanese on Madagascar. The island was well situated to provide a base from which an enemy might strike at the main Allied sea routes round the Cape of Good Hope to India and Ceylon, and to the Middle East via the Red Sea.

Stacey flew anti-submarine patrols from the Seychelles, Mombasa in Kenya and Dar es Salaam in Tanganyika, Africa. At the end of July he was promoted to squadron leader and posted as a flight commander to 205 Squadron, which had just reformed at Koggala in Ceylon. The unit immediately began anti-shipping patrols, interspersed with anti-invasion flights and air-sea rescue sorties.

Left
A wartime air-to-air view of an RAF Catalina.

Below left
AVM John Stacey shortly before retiring from the RAF.

Below
A Catalina of 205 Squadron at its mooring.

Fearless captain

On August 26, 1942 Stacey set off to search for survivors of a ship sunk by an enemy submarine, sighting three lifeboats with around 60 passengers. Supplies were dropped and Stacey circled overhead for the next ten hours until a Canadian Catalina relieved him.

Four months later the youthful Stacey – he was 22 – was selected for an unusual bombing raid on Sumatra. The headquarters of 222 Group tasked two Catalinas to carry out a reconnaissance of the airfield on the island of Sabang, off the north coast of Sumatra, before bombing the nearby harbour.

Stacey took off at lunchtime on December 20 to reach his target, 1,000 miles away, at midnight. After completing the recce without incident he climbed to 4,000ft, selected a line of buildings on the wharf and started dive-bombing. Light flak met him as he dropped the four 250-pounders, which his crew saw hit the target. With full power applied, Stacey escaped at low level.

He landed after almost 21 hours in the air from a sortie thought to be the longest bombing raid to date at the time. For this attack and his earlier work, he was awarded the DFC and described in the citation as "a fearless captain".

In January 1943 Stacey headed back to East Africa. German U-boat activity had increased in the Indian Ocean and there was a need to reinforce the anti-submarine capability in the region. He flew from various island bases in the area and from Mombasa; and Durban in South Africa, in conjunction with the South African Air Force.

In June his long period of operational service on the Catalina came to an end and he left to spend six months as an instructor at the Flying-Boat Conversion Unit at Mombasa.

John Stacey returned to operations in March 1944 when he took command of 160 Squadron flying Liberators from Ceylon. He flew some extremely long-range mining and bombing sorties and was awarded the DSO. Remaining in the RAF, he retired in 1976 as an air vice-marshal.

Caught on the surface

By the end of 1942 Jack Holmes was already a Coastal Command veteran, having flown almost continuously since the outbreak of war. His service had taken him to Gibraltar in the south and Murmansk in North Russia. His time flying Catalinas with 210 Squadron had earned him the DFC.

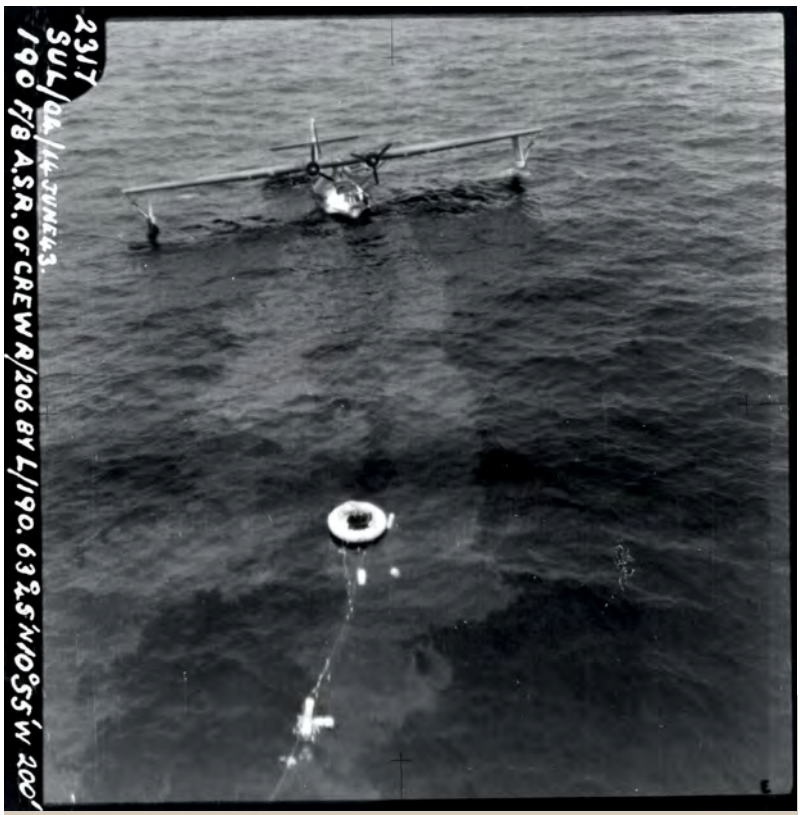
In January 1943 he and his crew returned to Sullom Voe from a detachment to Gibraltar to find the squadron had expanded during their absence. The additional Catalinas were formed into 190 Squadron and Holmes transferred to the new

4 *RAAF Catalina units were used for mine-laying in the southwest Pacific*

SPOT FACT *The Royal Australian Air Force retired the last of its Catalinas in 1952*

Right
Jack Holmes jettisoning fuel as his aircraft drifts down to Thomson's dinghy.

Below
Picking up the Thomson crew after their three-day ordeal.



"With improving weather and the sea moderating, Holmes voiced the possibility there was a chance to land and pick up the Fortress crew"

unit as a flight commander.

On May 30 he and his crew headed for the Faroes-Iceland gap to search for U-boats. They had been on patrol for some hours and Holmes was discussing tactics with the navigator when the second pilot, Fg Off Cecil White, called that he had a surfaced U-boat in sight.

Holmes told him to dive and prepare to attack; the U-boat was clearly going to stay on the surface. Electing to leave White in the left-hand seat, Holmes stood between the two pilots directing the assault.

As White dived, corkscrewing to avoid the submarine's anti-aircraft fire, there was a loud explosion in the front of the hull and smoke and splinters entered the cockpit. On the flight deck, Sgt Wood, was wounded in the head, a splinter hit Holmes' flying boot and White was grazed, but held on to drop the six Mk.XI depth charges. They exploded slightly astern of the U-boat, which stayed on the surface, firing its gun.

The Catalina circled warily. On the run in, its hull had been holed, the starboard engine had been hit and the constant speed unit damaged – and, with no further armament, they could do little but report the action as the submarine submerged.

The engagement had lasted almost an hour before Holmes headed back for Sullom Voe. He landed close to the slipway and taxied straight in as water began to flood through the hole in the Catalina's hull.

Fortress down

Two weeks later, on June 14, Holmes wandered into the operations room and looked at the large wall chart of the North Atlantic. He noticed the ringed symbol for a dinghy somewhere to the west of the Faroes and southeast of Iceland. Aboard this was the crew of Fortress II FA704 shot down two days earlier.

Wg Cdr Ronald Thomson, the CO of 206 Squadron, and his crew of eight had attacked and sunk the U-417. Return fire had disabled three engines of his Fortress and the crew managed to transmit an SOS before he ditched the aircraft.

Thomson climbed onto the port wing and unfolded the dinghy, which had started to inflate; the starboard dinghy must have been damaged as it failed to inflate and was abandoned. Just as the last man was hauled aboard, the Fortress reared up and started to sink, almost taking the crew with it. They had had no time to collect the emergency rations and equipment.

A few hours later a US Navy PBY-5A made an attempt to pick up the crew but crashed while alighting with the loss of all the crew bar one. Coastal Command aircraft kept up a

constant patrol over the dinghy but bad weather prevented any further attempt to land on the sea and pick up the survivors.

Epic rescue

With improving weather and the sea moderating, Holmes voiced the possibility there was a chance to alight and pick up the Fortress crew. After discussing the option with the staff at HQ 19 Group, it was agreed he should make an attempt.

With eight men to pick up, Holmes realised he must keep the weight on his aircraft down. He decided to defuel his Catalina (Mk.IB FP102) to leave just sufficient for the return journey, with a little to spare, and unload the depth charges before seeking a skeleton crew of volunteers.

He took off from Sullom Voe before first light. As the Catalina passed the Faroes, the sea looked angry with white caps forming but conditions started to improve as they headed further north. Approaching the area at 11:00, a Fortress, which was in visual contact with the dinghy, made a series of transmissions enabling the Catalina to make a homing using its Bendix radio compass.

Navigator Fg Off C White suddenly spotted the circling Fortress and the pathetically small dinghy below. Holmes realised the sea conditions would not improve so he decided to attempt a landing.

He rejected the first two approaches before, on the third attempt, he found a swell that was suitable. At this stage, the instruction on fully stalled landings he had received from a US Navy pilot proved invaluable. Holmes put the Catalina down with the nose held high. The aircraft hit a wave with a loud bang and stopped very quickly without any damage.

The crew could not see the dinghy but it suddenly rose on the swell. Holmes commented in his report: "I caught sight of its brave little flag and gradually crabbed over to its position."

Holmes cut the engines and a line was thrown to the survivors before they were brought alongside the flying-boat. Exhausted after spending 3½ days in a dinghy designed for four, the eight men were taken on board and the weakest placed in the bunk as the others sat on the floor.

Alone and silent

Holmes realised the Catalina was far too heavy for take-off so he jettisoned 140 gallons (636 litres) of fuel, leaving just enough to reach the Shetlands. He graphically outlined the almost surreal position he and his crew found themselves in: "With all aboard it was a strange experience, a single flying-boat, alone and silent, floating in the middle of the North Atlantic at 64° north. Luckily the engines started on the button. The swell now seemed like small hills, rolling towards us; it was no cricket pitch.

"At full throttle in fine pitch the Twin Wasp engines screamed like a swarm of their namesakes. We breasted a swell, roared down a valley, up the next long swell, and staggered into the air with relieved cheers all round. It was a moment of exaltation. It would not be a good thing to attempt with, say, two-thirds fuel load and depth charges aboard."

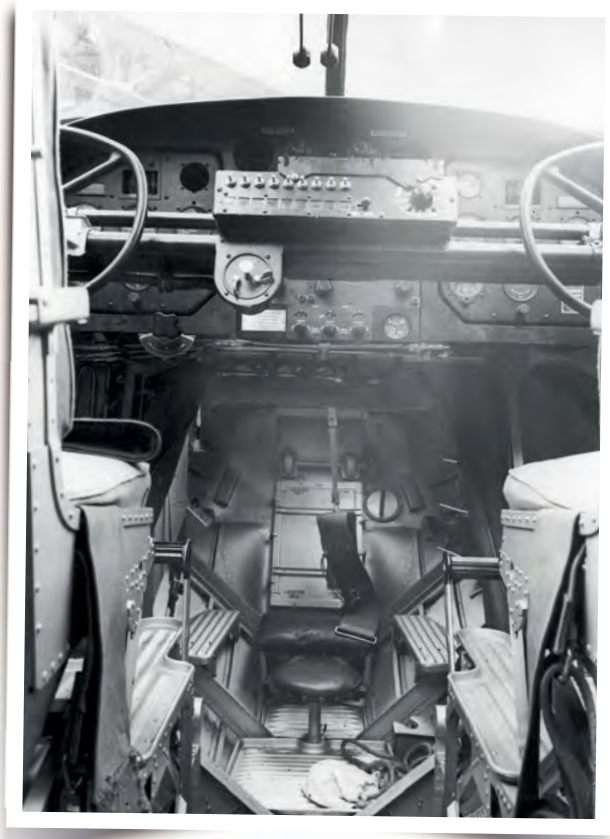
On the long return flight, Holmes was requested to fly on to Invergordon but his fuel state dictated a landing at Sullom Voe. He was also anxious to land the survivors as soon as possible as one of them was in a poor way and needed medical attention.

Six hours after picking up the survivors, the Catalina landed and the Fortress crew were rushed to the sick quarters where they were found to be in remarkable condition and spirits considering their ordeal crammed in an open dinghy.

Holmes was full of praise for Wg Cdr Thomson who had maintained a strict routine in the dinghy and maintained the morale of his crew. Thomson was later awarded the DFC to add to a DSO of a few months earlier. He went on to have a long and successful career in the RAF, retiring as an air vice-marshal.

For his role in this dramatic rescue Holmes was awarded a Bar to his DFC. The citation concluded: "This officer displayed superb airmanship and great determination throughout."

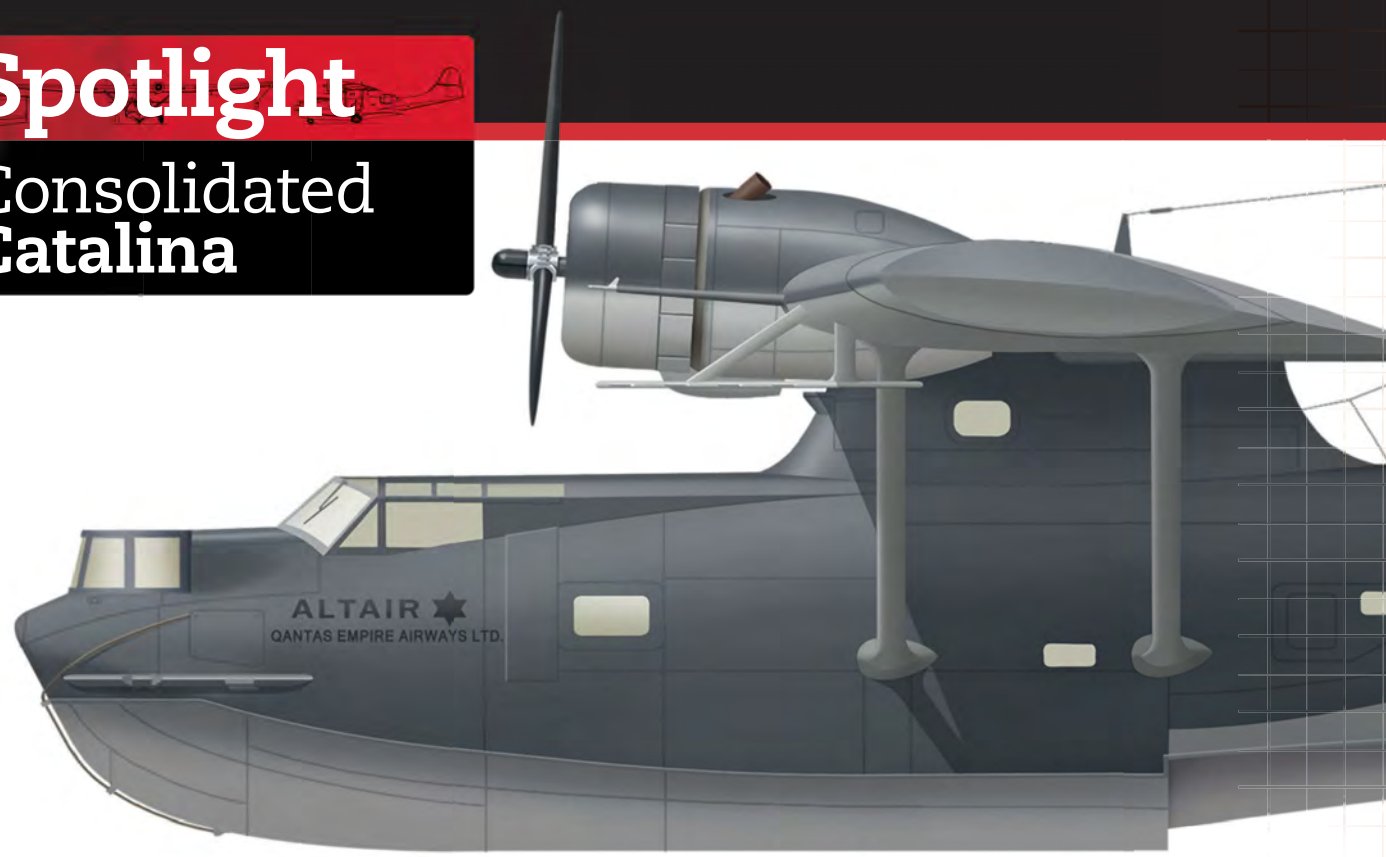
Over the next two months, Holmes flew more anti-U-boat patrols before his second tour came to an end in August 1943. For the rest of the war, he served at the Air Ministry and the RAF Staff College. He remained in the RAF after the war and retired as an air commodore in 1967. ●



Above
Inside the cockpit of a typical RAF Catalina.

Left
A Catalina at 'rest' on the water.

20-hour missions were common for RAAF Catalina mine-laying operations



Up at Sunrise

Ted Williams artwork of a Catalina that flew long distance passenger flights during World War Two

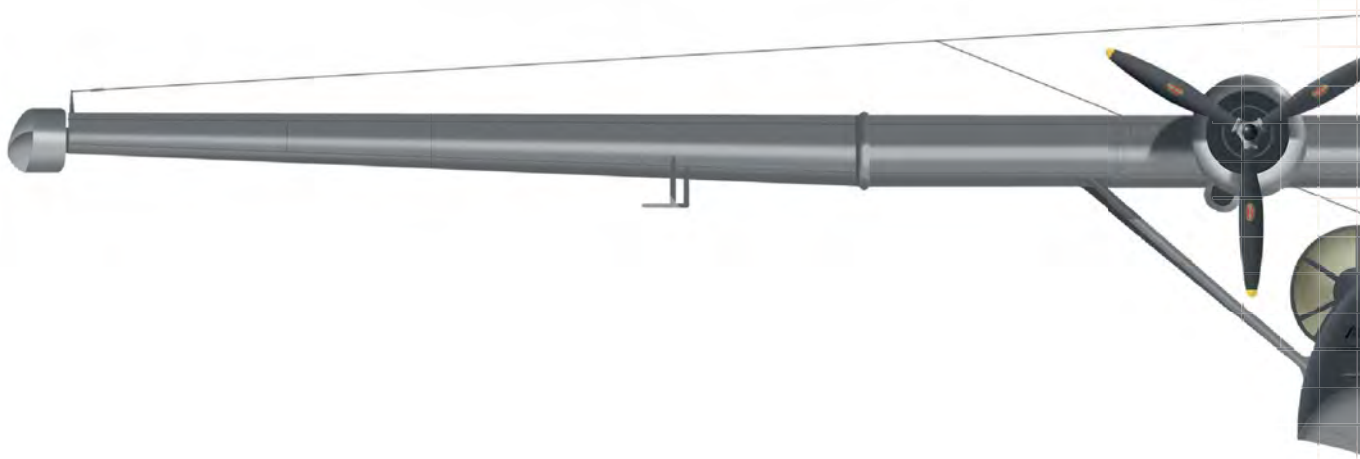
Artwork *Consolidated Catalina Mk.IB FP244 'Altair Star' (G-AGFM), one of the five 'Double Sunrise' aircraft.* TED WILLIAMS-2015

Consolidated Catalinas fulfilled a great many roles during the war – one of the more unusual was as a long-distance airliner and freight carrier, operated by Royal Australian Air Force personnel seconded to Qantas.

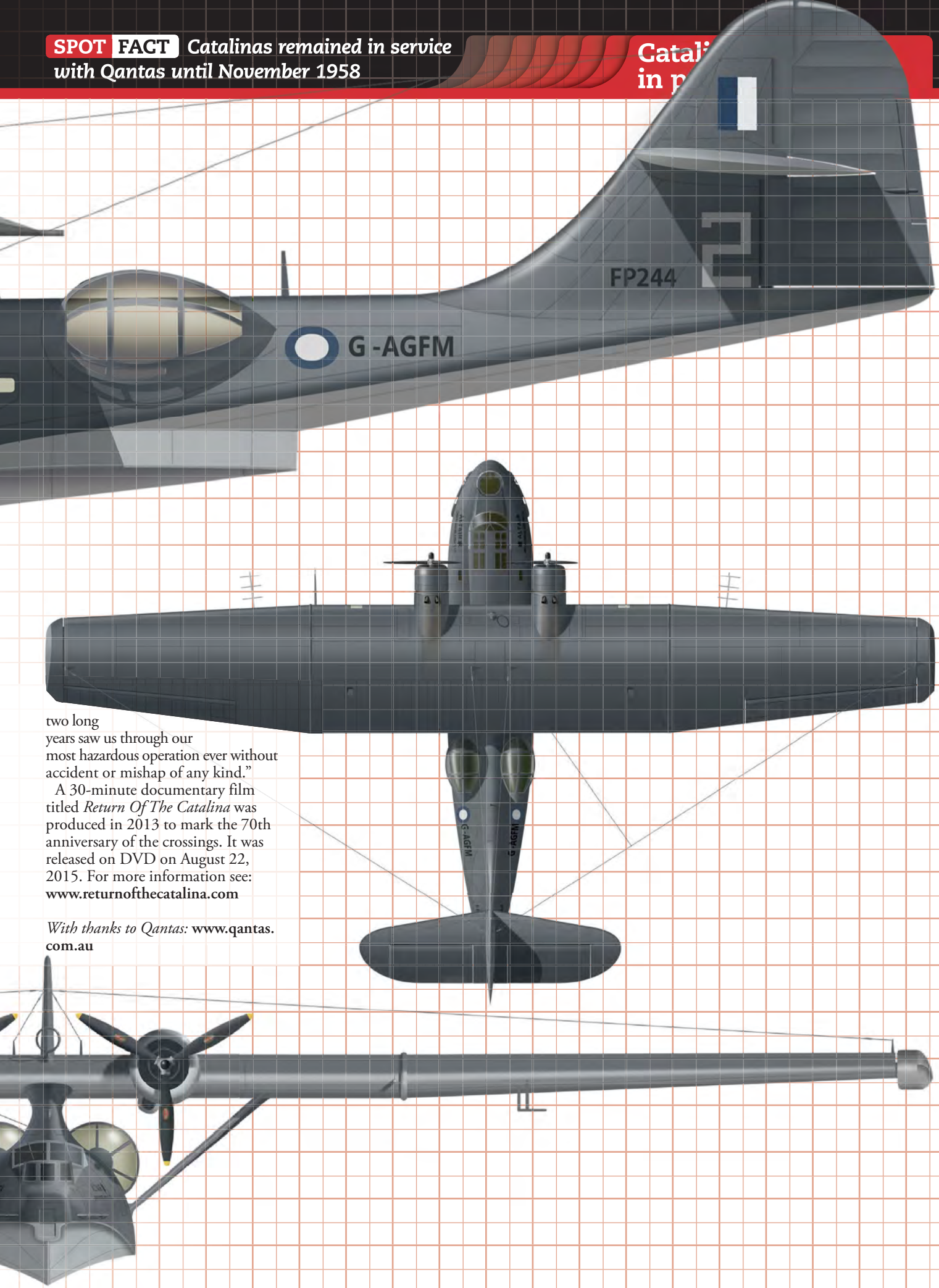
The aim was to re-establish the air link between Australia and England that had been cut by advancing Japanese forces. Regular services from Swan River in Perth to Koggala in Ceylon (now Sri Lanka) were set up. Our subject, Catalina IB FP244 *Altair Star* was one of five aircraft used for this purpose. The others were named *Rigel Star*, *Spica Star*, *Vega Star* and *Antares Star* after the stars used for navigation – celestial route finding was essential for radio silence to be maintained over enemy patrolled waters.

Taking between 27 and 32 hours, the weekly flights crossed occupied territory during darkness. Those aboard could observe the sun coming up twice, leading to the service being nicknamed 'Double Sunrise'. Passengers completing the 4,100 mile journey were even presented with a certificate, proclaiming them to be members of the 'Secret Order of the Double Sunrise'. The flights operated without loss between June 1943 and July 1945.

At the end of the war, all five machines were scuttled at sea under the terms of the lend-lease agreement with the US Government. Qantas founder Wilmot Hudson Fysh described the demise of the aircraft as: "a dismal fate for these splendid boats, which for



Catali… in p…



two long years saw us through our most hazardous operation ever without accident or mishap of any kind."

A 30-minute documentary film titled *Return Of The Catalina* was produced in 2013 to mark the 70th anniversary of the crossings. It was released on DVD on August 22, 2015. For more information see: **www.returnofthecatalina.com**

With thanks to Qantas: **www.qantas.com.au**

271 *successful crossings were made by the 'Double Sunrise' Catalinas*

Turning the Tide

Long-range Catalinas were vital in the vast expanses of the Pacific. **Warren E Thompson** describes action in two very different regions

Catalina in combat

Florida, Iceland, Puerto Rico – within the space of 18 months US Navy patrol squadron VP-1 was based in three very different climes. That was the nature of the work; go where the threat was and engage in long, tedious, patrols with little chance of contacting the submarine enemy while hoping the very presence of a PBY Catalina acted as a deterrent.

While based in Puerto Rico in the mid-war years, VP-1's Lt Samuel C Hair – one of the unit's senior pilots – was detached to Coco Solo, Panama, where the enemy potentially lurked in wait as shipping entered the Panama Canal.

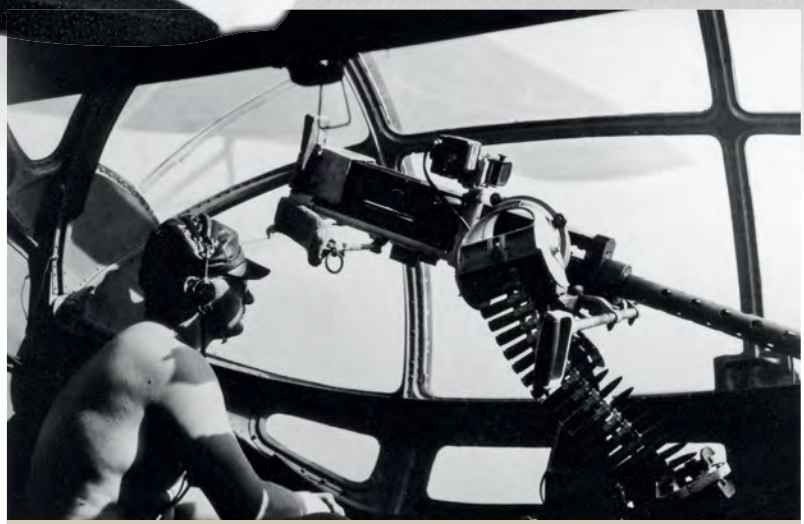
Left
The 'blister' gun position on a PBY at Pensacola in 1942. DAVE MENARD

Below left
Lt Sam Hair piloting a VP-1 PBY, taking off from the Galapagos Islands, Ecuador, in 1943. SAM HAIR

3,305 *Catalinas were built in total*

SPOT FACT *Catalina crews spotted the Japanese fleet approaching Midway Island, beginning the Battle of Midway*

Above
A VP-1 Catalina flying over Panama in 1942. SAM HAIR



Right
A gunner scanning the ocean looking for Japanese shipping off the coast of Guadalcanal in late 1942.
DAVE MENARD

They were fighting against submarines from two nations – Japanese in Pacific waters, German in the Caribbean. All of the PBYs carried 4,000lb of depth charges just in case they happened on an enemy vessel.

Ten pairs of eyes

Lt Hair reminisces about those days guarding both entrances of the Panama Canal as being mostly frustrating work. He said: "The Catalinas carried a crew of ten and that gave us a total of 20 eyes to look for subs, enemy shipping and downed crewmen. I was told during training that the aircraft was designed to keep the pilot's eyes off the instrument panel and allow him to spend most of his flying time looking out. The gauges were all monitored by the flight engineer, which helped keep the pilot's eyeballs focused on the ocean.

"The area patrolled out of Coco Solo during our period there was roughly north as far as Jamaica and from the west coast of Nicaragua. Convoys and single ships approaching the canal from points within this area were given air coverage for varying numbers of hours, depending on the interception distance. The Germans were always a threat in the area as some of the ships were coming through the Panama Canal from the west coast of the US and delivering material to the British.

"The Germans were always a threat in the area as some of the ships were coming through the Panama Canal from the west coast of the US and delivering material to the British"

"The PBYs were fairly well adapted to the mission. Their range was up to 2,000 miles or 15 hours aloft, with a maximum fuel load. The amount of work done by German subs in our area was tremendous.

"In December 1943, one of the ships we were guarding got torpedoed. We could not get there before the submarine had gone under and that was the story most of the time. That U-boat was probably the only one working in our area, but we could not get a fix on his position.

"We did not have enough PBYs to cover the area and the bulk of them

were used in the Pacific. During the first two weeks of December 1943, there were 15 convoy coverages made, covering 38 operational flights or about 300 flying hours.

"Trying to catch the U-boats on the surface was a problem. The ships they hit were any freighters coming out of [the canal zone] as many were from smaller countries hauling produce bound for the US. Very few of these were heading toward Europe.

"We were close on many of the calls, but by the time we were overhead, they had disappeared under the surface. On some occasions, we dropped depth charges in their area, but with no results."

Find the fleet

Meanwhile, in the Pacific, Admiral Isoroku Yamamoto, commander of the Japanese combined fleet, had devised a plan to drive the remaining ships of the US Pacific Fleet into the open so they could be destroyed. By invading Midway, 1,300 miles northwest of the Hawaiian Islands, the Americans would have to commit what few carriers they had to protect the island.

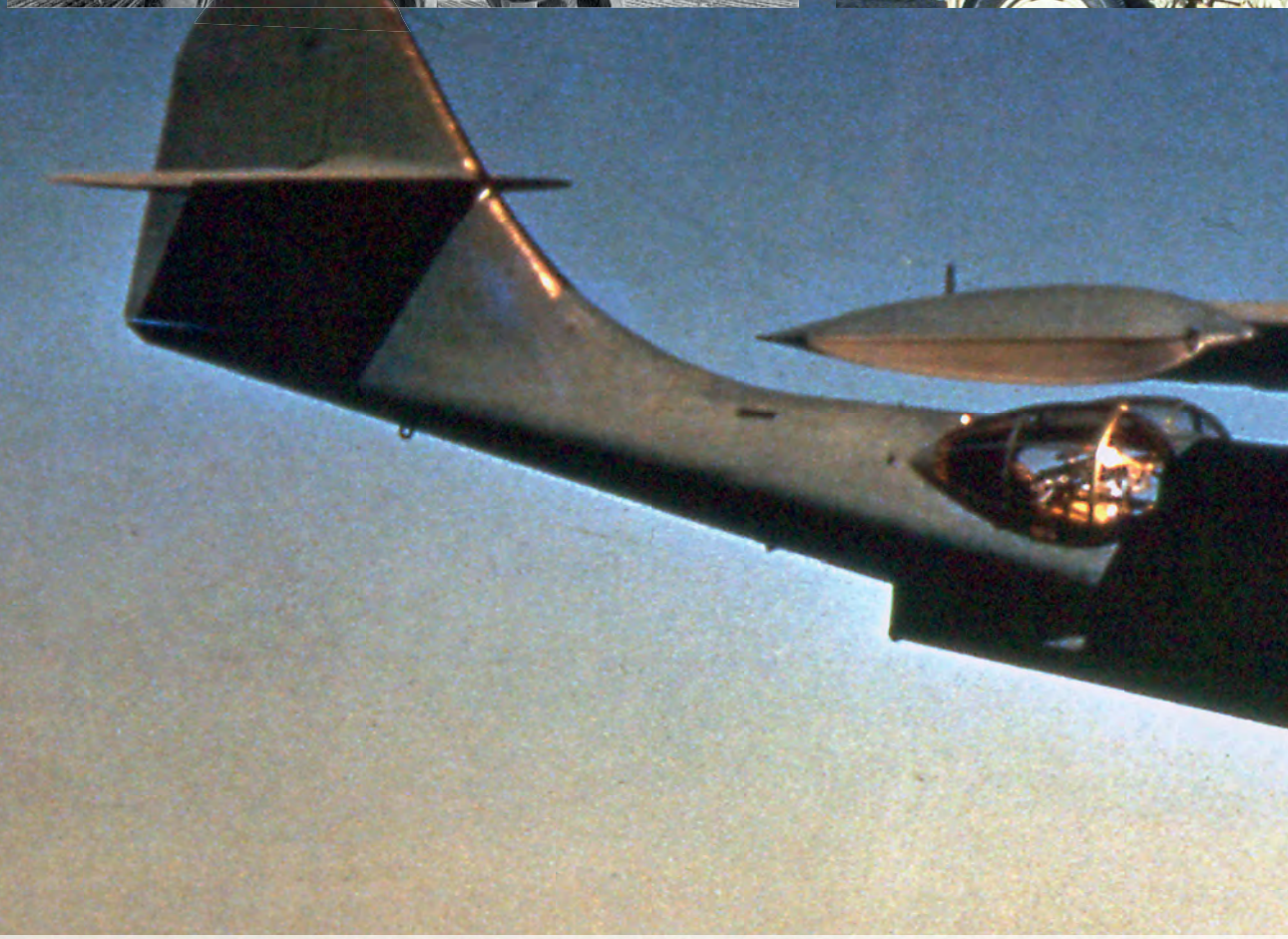
While the raid on Pearl Harbor on December 7, 1941 had

Left
Lt Sam Hair at the controls of his PBY-5 over the east end of the Panama Canal. SAM HAIR

Below
A Catalina of VP-44 ready to embark on a search for the Japanese fleet, Midway, June 3, 1942. TAILHOOK ASSOCIATION

125 *mph was the PBY-5A's typical cruise speed*

SPOT FACT *Catalinas and B-17s were the only US aircraft with effective range in the early years of the Pacific campaign*



Right to left
The crew of a PBY-5A. RICHARD STARINCHAK

An Aleutian-based Catalina loaded with depth charges. RICHARD STARINCHAK

Taking off from the Galápagos Islands, a PBY ready for a long patrol over the eastern part of the Caribbean Sea. SAM HAIR

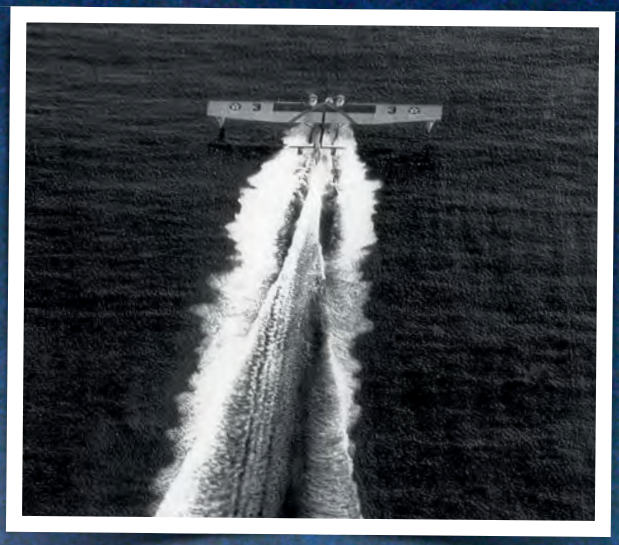
devastated the US Navy, a crucial element of the plan was unfulfilled. None of the carriers had been caught in that attack. Japanese intelligence determined the US had two 'flat tops' left so Yamamoto sailed with four aircraft carriers plus a large fleet of cruisers and battleships.

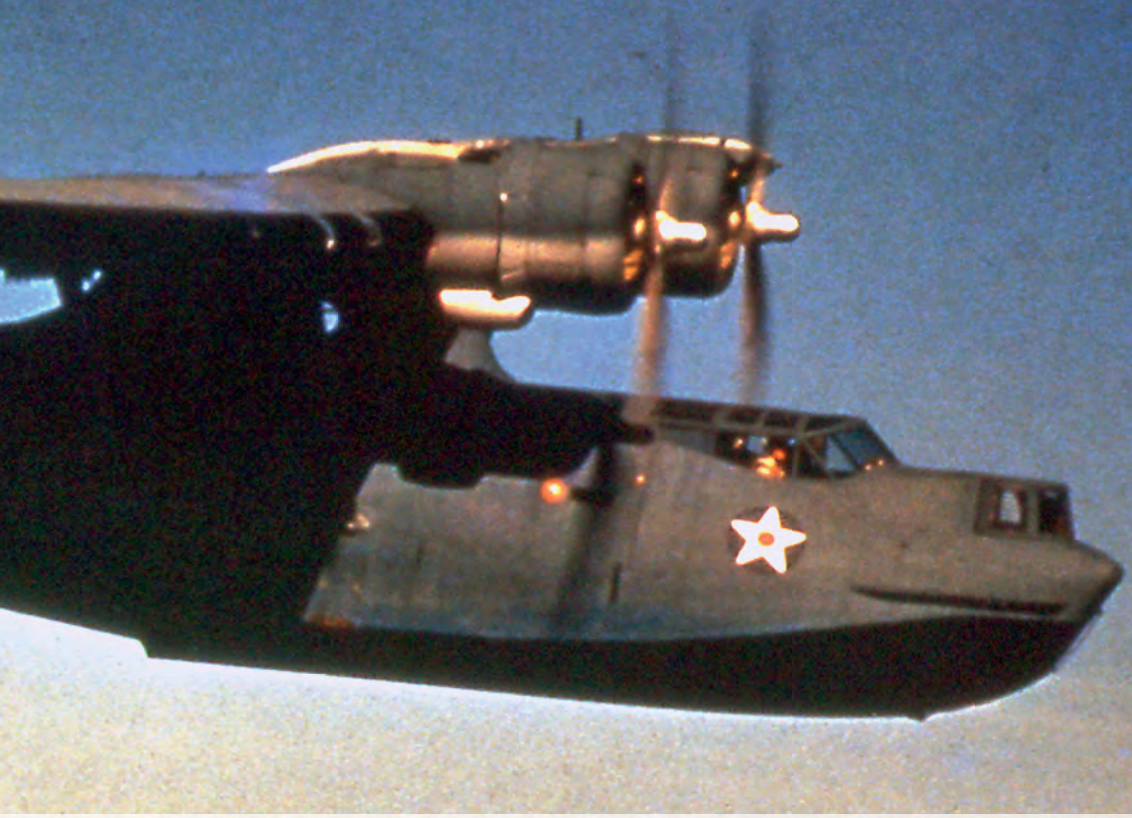
Unbeknown by the Japanese, Admiral Chester Nimitz and his cryptanalysts had broken the JN-25 naval code and in late May 1942 learned of the Japanese plan to take Midway. Admiral Raymond Spruance headed the US response, ordering the carriers USS *Enterprise* and *USS Hornet* to go to Midway. The USS *Yorktown* followed two days later after some quick repairs were made.

With their exceptional endurance, PBY Catalinas were vital to the US fleet as it headed across the Pacific for the confrontation. Providing daily long-range, reconnaissance patrols, the PBYs monitored the Japanese Navy, while risking encountering Mitsubishi *Betty* bombers flying from Wake Island.

On May 30 a Catalina got into a fight with a *Betty* and managed to escape. Later that day, a PBY of VP-23 had a close encounter with two *Bettys* with almost fatal consequences. When it limped back to Eastern Island, groundcrew counted 175 holes in the wings, props, engine and fuselage.

It was very probably not a one-sided fight. During the clash the PBY had unleashed 400 rounds of 0.30 calibre and 300 of 50-cal. Despite that there was no noticeable damage to the *Bettys* as they headed back toward Wake.





At 0300hrs on June 3, the crews of 22 PBYs – ten from VP-44, the remainder from VP-23 – rolled out of their beds and were given orders to find the Japanese fleet. Since arriving on May 23, VP-44 had been flying patrols as far out as 700 miles every day. Operating from Sand Island, part of Midway chain, VP-23 had a fleet of 15 PBY-5As and 14 PBY-5s.

Ensign Jack Reid was in the right position to spot the Japanese armada en route to Midway on June 3. He recalls a mission that forced them to go beyond their range to pull it off: "We began flying an exhausting 700 miles covering a semi-circular area extending from due north through west, to the south of Midway.

"In this area, other PBYs had run into Japanese patrol bombers that were flying from enemy air bases from Wake Island, at the extreme northeastern ends of their searches. These encounters were frequent because the enemy were not flying very far from their home base.

"The previously night, I had 'requisitioned' some blue-nosed 50-cal bullets [for his Catalina's gunners] that the B-17 crews swore would tear apart the Japanese patrol bombers. My navigator and I, Ensign Robert Swan, decided to push the search a little further."

Distant specks

"Suddenly, far out to the west, I spotted some small specks in the distance. I asked my co-pilot to have look see and I added: 'Do you see what I see?' He stared at the sight for a few seconds and said: 'You're damn right I do!' A much larger convoy

Above
A PBY-5 departing Eastern Island on a patrol from Midway. WARREN BODIE

3,443 *miles were flown by the XPBY-1 in May 1936, setting a distance record*

SPOT FACT *'PB' stood for 'Patrol Bomber' and Y was the code given to Consolidated*

Above
A gunner preparing to climb on board a Catalina at Corpus Christi, Texas, for another mission over the Gulf of Mexico.
CONSOLIDATED

of Japanese ships were heading straight for Midway."

It was an impressive looking fleet to a PBY pilot, but it did not contain Admiral Nagumo's group of four carriers. Reid sent a signal: "Sighted main body, bearing 262, distance 700 miles" and back came the order 'Amplify!'

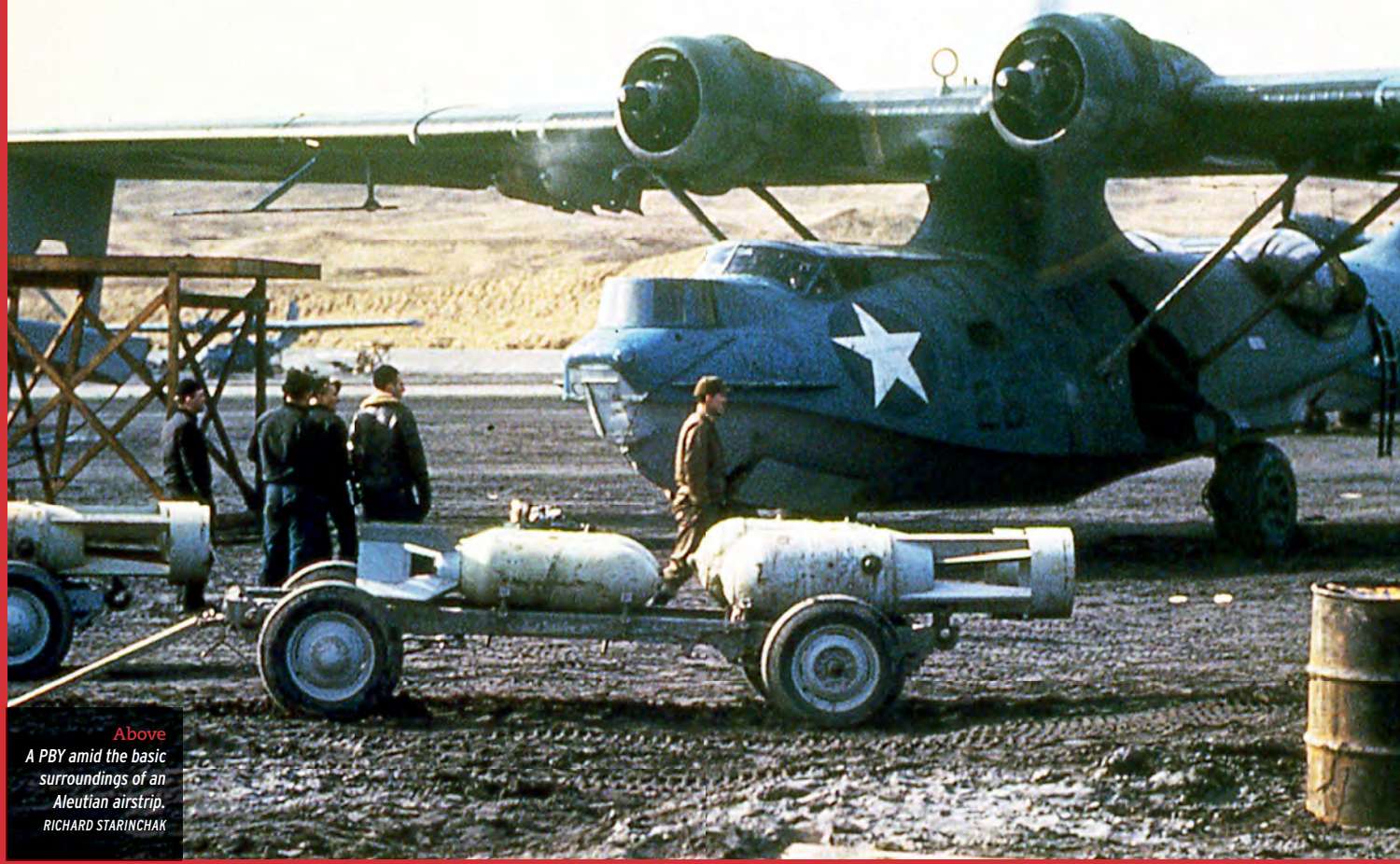
At that, Reid went down low, and as quickly as the Catalina would allow. He assumed this large an armada would also include Mitsubishi 'Zero' fighters that would cut his flying-boat to pieces.

Reid turned the Catalina north and stayed on that course for 15 minutes. He kept his aircraft low and continued for at least 25 miles until he was safely behind the enemy ships. He then flew south and while taking advantage of some rather scarce cloud cover, gained enough altitude to once again spot the naval task force: identifying two small carriers and some other ships. (This force was a different group from the first one Reid had spotted, but he didn't realise that.)

Although they were at the Catalina's maximum range, Reid asked his navigator to see if they had enough fuel to stay airborne a few minutes more. Calculations revealed with careful handling another *three hours* airborne was possible. They kept on station as long as they could and then successfully headed home.

Early on the morning of June 4, PBYs found the main carrier force and the US fleet went into the attack. Although 36 out of 42 torpedo-bombers launched were lost, the strike force was successful as the Japanese carriers *Akagi*, *Hiryu*, *Kaga* and *Soryu* were sunk. The Japanese lost 322 aircraft along with 5,000 sailors. American losses amounted to 147 aircraft and 300 seamen.

Admiral Nimitz had timed his strike to perfection. The Battle of Midway proved the tide could be turned, with the help of the trusty Catalina.



Above
A PBY amid the basic surroundings of an Aleutian airstrip.
RICHARD STARINCHAK