THE CONSOLIDATED PBY CANSO/CATALINA

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The Consolidated PBY[1] Catalina was an American flying boat of the 1930s and 1940s produced by Consolidated Aircraft. It was one of the most widely used multi-role aircraft of World War II. PBYs served with every branch of the U.S. military and in the air forces and navies of many other nations.

Consolidated's first PBY flying-boat prototype made its maiden flight in 1933. Overall, there were 3431 PBYs built, of which 2029 were flying boats (PBY-5 Catalina) and 1402 were amphibians (PBY-5A Canso). More Consolidated PBYs were manufactured than any other type of flying boat or amphibian.

The PBY was originally designed to be a patrol bomber, an aircraft with a long operational range intended to locate and attack enemy transport ships at sea in order to compromise enemy supply lines. With a mind to a potential conflict in the Pacific Ocean, where troops would require resupply over great distances, the U.S. Navy in the 1930s invested millions of dollars in developing long-range flying boats for this purpose. Flying boats had the advantage of not requiring runways, in effect having the entire ocean available for operations.

The Royal Canadian Air Force (RCAF) chose the PBY-5A in 1939 as its replacement for the Supermarine Stranraer.

Early during the Second World War arrangements were made for both the PBY-5 flying boat and the -5A amphibian to be built in Canada. Boeing Aircraft of Canada, Canadian Vickers and Canadair Ltd. built almost 800 PBYs in this country for the RCAF, the Royal Air Force (RAF) and other users.

All 30 Catalina flying boats on strength with the RCAF were struck off strength in 1946 whereas the fleet of 242 Canso amphibians was not retired until 1962.

During World War II, PBYs were used in anti-submarine warfare, patrol bombing, convoy escorts, search and rescue missions (especially air-sea rescue), and cargo transport. The PBY was the most successful aircraft of its kind. No other flying boat was produced in greater numbers. The last active military PBYs were not retired from service until the 1980s. Even today, over seventy years after its first flight, the aircraft continues to fly

[1] The acronym "PBY" is in accordance with the U.S. Navy aircraft designation system of 1922. *PB* representing "Patrol Bomber" and *Y* being the code for the aircraft's manufacturer, Consolidated Aircraft.

in aerial firefighting operations all over the world.

Roles in World War II

PBYs were deployed in practically all of the operational theatres of World War II. The PBY served with distinction and played a prominent and invaluable role in the war against the Japanese. This was especially true during the first year of the war in the Pacific, because the PBY and the Boeing B-17 Flying Fortress were the only two available aircraft with the necessary range.

In a unique engagement, a Catalina of No. 205 Squadron RAF was involved in a dogfight with a Japanese Mitsubishi G3M *Nell* bomber near the Anambas Islands on December 25, 1941, in which the Catalina was shot down.

Anti-submarine warfare

PBYs were the most extensively used anti-submarine warfare (ASW) aircraft in both the Atlantic and Pacific Theatres of the Second World War. They were also used in the Indian Ocean, flying from the Seychelles and from Ceylon. Their duties included escorting convoys to Murmansk. By 1943 U-boats were well-armed with anti-aircraft guns and two Victoria Crosses were won by Catalina pilots pressing home their attacks on U-boats in the face of heavy fire. One was John Cruickshank of the RAF, in 1944, against *U-347*. In the same year Flight Lieutenant David Hornell of the RCAF won the Victoria Cross (posthumously) against *U-1225*.

The above picture, taken from the DND/DHH website, is a montage of F/L Hornell's heroic action.

Catalinas/Cansos participated in the destruction of 40 U-boats.

Maritime patrol

In their role as patrol aircraft, Catalinas participated in some of the most notable engagements of World War II. The aircraft's parasol wing and large waist blisters allowed for a great deal of visibility and, combined with its long range and endurance, made it well suited for the task.

- A Coastal Command Catalina located the German battleship *Bismarck* on May 26, 1941 as she tried to evade Royal Navy forces.
- A flight of Catalinas spotted the Japanese fleet approaching Midway Island, beginning the Battle of Midway.
- An RCAF Canso flown by Squadron Leader L.J. Birchall foiled Japanese plans to destroy the Royal Navy's Indian Ocean fleet on April 4, 1942 when it detected the Japanese carrier

fleet approaching Ceylon (Sri Lanka).

S/L Birchall in the cockpit of his Catalina

Night attack and naval interdiction

Several squadrons of PBY-5As in the Pacific Theatre were specially modified to operate as night convoy raiders. Outfitted with state-of-the-art magnetic anomaly detection gear and painted flat black, these "Black Cats" attacked Japanese supply convoys at night. Catalinas were surprisingly successful in this highly unorthodox role. Between August 1943 and January 1944 Black Cat squadrons had sunk 112,700 tons of merchant shipping, damaged 47,000 tons and damaged 10 Japanese warships.

The Royal Australian Air Force (RAAF) also operated Catalinas as night raiders, with four squadrons mounting mine-laying operations from April 1943 until July 1945 in the southwest Pacific deep into Japanese-held waters, that bottled up ports and shipping routes and kept ships in the deeper waters to become targets for U.S. submarines.

They were the only non-American heavy bombers squadrons operating north of Morotai in 1945. The RAAF Catalinas regularly mounted nuisance night bombing raids on Japanese bases, they earned the motto of *"The First and the Furthest"* as a testimony to their design and endurance. RAAF aircrews developed *'terror bombs'* - essentially empty beer bottles with razor blades inserted into the necks, these produced high pitched screams as they fell and kept Japanese soldiers awake and in fear of their lives.

Search and Rescue

PBYs were employed by every branch of the U.S. military as rescue aircraft. A PBY piloted by Lt. Cmdr. Adrian Marks (USN) rescued 56 sailors from the USS *Indianapolis* after the cruiser was sunk during World War II. PBYs continued to function in this capacity for decades after the end of the war.

Early commercial use

PBYs were also used for commercial air travel. The longest commercial flights (in terms of time aloft) ever made in aviation history were the Qantas flights flown weekly from June 1943 through July 1945 over the Indian Ocean. Qantas offered non-stop service between Perth and Colombo, a distance of 3,592 nm (5,652 km). As the PBY typically cruised at 110 knots, this took from 28–32 hours and was called the "flight of the double sunrise", since the passengers saw two sunrises during their non-stop journey. Because of the possibility of Japanese attack the flight was made in radio silence and had a maximum payload of 1,000 lbs or

three passengers plus 65 kg of armed forces and diplomatic mail.

Post-World War II employment

An Australian PBY made the first trans-Pacific flight across the South Pacific between Australia and Chile in 1946, making numerous stops at islands along the way for refueling, meals, and overnight sleep of its crew.

With the end of the war, all of the flying boat versions of the aircraft (Canso) were quickly retired from the U.S. Navy, but the amphibious version remained in service for some years. The last Catalina in U.S. service was a PBY-6A operating with a Naval Reserve squadron, which was retired from use on January 3, 1957. The PBY subsequently equipped some of the world's smaller armed services, in fairly substantial numbers, into the late 1960s.

The U.S. Air Force's Strategic Air Command had PBYs (designated OA-10s) in service as scouting aircraft from 1946 through 1947.

The Brazilian Air Force flew Catalinas on naval air patrol missions against German submarines starting in 1943. Brazilian flying boats also carried out air mail deliveries. In 1948 a transport squadron was formed and equipped with PBY-5As converted to the role of amphibious transports. The 1st Air Transport Squadron (ETA-1) was based in the port city of Belem and flew Catalinas and C-47s in well-maintained condition until 1982. Catalinas were convenient for supplying military detachments scattered among the Amazon waterways. They reached places where only long-range transport helicopters would dare to go. ETA-1 insignia was a winged turtle with the motto *"Though slowly, I always get there".* Today, the last Brazilian Catalina (a former RCAF aircraft) is displayed at the Airspace Museum (MUSAL), in Rio de Janeiro.

Jacques-Yves Cousteau used a PBY-6A (N101CS) as part of his diving expeditions. His second son, Philippe, was killed while attempting a water landing in the Tagus River near Lisbon, Portugal, June 28, 1979.

Of the few dozen remaining airworthy Catalinas, the majority of them are in use today as aerial firefighting planes.

Catalina Fire Fighting

China Airlines, the official airline of the Republic of China (Taiwan) was founded with two PBY amphibious flying boats.

Catalina affair

The Catalina Affair is the name given to a Cold War incident in which a Swedish Air Force PBY Catalina was

shot down by Soviet fighters over the Baltic Sea in June 1952 while investigating the earlier crash of a Swedish Douglas DC-3.

Variants

a. XP3Y-1: Prototype Model 28 flying boat later re-designated XBPY-1, one built (USN Bureau No. 9459). Later fitted with a 48-foot diameter ring to sweep magnetic sea mines. A 550-HP Ranger engine drove a generator to produce a magnetic field.
b. XBPY-1: Prototype version of the Model 28 for the U. S. Navy, a re-engined XP3Y-1 with two 900hp R-1830-64 engines, one built.
c. PBY-1 (Model 28-1): Initial production variant with two 900hp R-1830-64 engines, 60 built.
d. PBY-2 (Model 28-2): Equipment changes and improved performance, 50 built.
e. PBY-3 (Model 28-3): Powered by two 1,000hp R-1830-66 engines, 66 built.
f. PBY-4 (Model 28-4): Powered by two 1,050hp R-1830-72 engines, 33 built (including one initial as a XBPY-4 which later became the XBPY-5A).
g. PBY-5 (Model 28-5): Either two 1200hp R-1830-82 or -92 engines and provision for extra fuel tanks, 683 built (plus one built at New Orleans), some aircraft to the RAF as the Catalina IVA and one to the U. S. Coast Guard. The PBY-5 was also built in the Soviet Union as the GST.
h. XPBY-5: One PBY-4 converted into an amphibian and first flown in November 1939.
i. PBY-5A (Model 28-5A): Amphibious version of the PBY-5 with two 1,200hp R-1830-92 engines, first batch (of 124) had one 0.3in bow gun the remainder had two bow guns. 803 built including diversions to the U. S. Army Air Corps, the RAF (as the Catalina IIIA) and one to the U. S. Coast Guard.
j. PBY-6A: Amphibious version with two 1,200hp R-1830-92 engines and a taller fin and rudder. Radar scanner fitted above cockpit and two 0.5 in nose guns. 175 built including 21 transferred to the Soviet Navy.
k. PBY-6AG: One PBY-6A used by the U. S. Coast Guard as a staff transport.
l. PB2B-1: Boeing Canada built version of the PBY-5, 165 built, most supplied to the RAF and the Royal New Zealand Air Force (RNZAF) as the Catalina IVB.
m. PB2B-2: Boeing Canada built version of the PBY-5 but having a taller fin of the PBN-1, 67 built, most supplied to the RAF as the Catalina VI.
n. PBN-1: Naval Aircraft Factory built version of the PBY-5 with major modification including a

2 ft bow extension, re-designed wingtip floats and tail surfaces and a revised electrical system. 155 built for delivery to the RAF as the Catalina V although 138 were loaned to the Soviet Navy

o. PBV-1A: Canadian Vickers built version of the PBY-5A, 380 built including 150 to the RCAF as the Canso-A, and the rest to the USAAF as the OA-10A.
p. OA-10: USAAF designation for PBY-5A, 105 built. 58 aircraft survivors re-designated A-10 in 1948.
q. OA-10A: USAAF designation of Canadian Vickers-built version of the PBV-1, 230 built. Survivors re-designated A-10A in 1948. Three additional aircraft from Navy in 1949 as A-10As.
r. OA-10B: USAAF designation of PBY-6A, 75 built. Re-designated A-10B in 1948.
s. Catalina I: Direct purchase aircraft for the RAF, same as the PBY-5 with six 0.303in guns (one in bow, four in waist blisters and one aft of the hull step) and powered by two 1200hp R-1830-S1C3-G engines, 109 built.
t. Catalina IA: Operated by the RCAF as the Canso, 14 built.
u. Catalina IB: Lend-lease PBY-5Bs for the RAF, 225 aircraft built.
v. Catalina II: Equipment changes, six built.
w. Catalina IIA: Vickers-Canada built Catalina II for the RAF, 50 built.
x. Catalina IIIA: Former U.S. Navy PBY-5As used by the RAF on the North Atlantic Ferry Service, 12 aircraft.
y. Catalina IVA: Lend-lease PBY-5s for the RAF, 93 aircraft.
z. Catalina IVB: Lend-lease PB2B-1s for the RAF, some to the RAAF.
aa. Catalina VI: Lend-lease PB2B-2s for the RAF, some to the RAAF.
bb. GST: Soviet built version of the PBY-5 ("Gydro Samoliot Transportnyi").

General characteristics

- **Crew:** 8 — pilot, co-pilot, bow turret gunner, flight mechanic, radioman, navigator and two waist gunners
- **Length:** 63 ft 10 7/16 in (19.46 m)
- **Wingspan:** 104 ft 0 in (31.70 m)
- **Height:** 21 ft 1 in (6.15 m)
- **Empty weight:** 20,910 lb (9,485 kg)
- **Max takeoff weight:** 35,420 lb (16,066 kg)
- **Powerplant:** 2× Pratt & Whitney R-1830-92 Twin Wasp radial engines, 1,200 hp each

Performance

- **Maximum speed:** 196 mph (314 km/h)
- **Cruise speed:** 125 mph (201 km/h)
- **Range:** 2,520 mi (4,030 km)
- **Service ceiling:** 15,800 ft (4,000 m)
- **Rate of climb:** 1,000 ft/min (5.1 m/s)

Armament

- 3× .30 cal (7.62 mm) machine guns (two in nose turret, one in ventral hatch at tail)
- 2× .50 cal (12.7 mm) machine guns (one in each waist blister)
- 4,000 lb (1,814 kg) of bombs or depth charges, torpedo racks were also available

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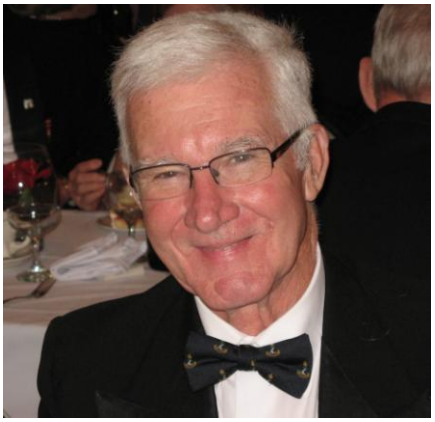

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