

List of ships of the Imperial Japanese Navy II

Aircraft Carriers

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Chapter 1

加賀赤城蒼龍飛龍

1.1 Japanese aircraft carrier *Kaga*

Kaga (加賀) was an aircraft carrier of the Imperial Japanese Navy (IJN), the third to enter service, named after the former *Kaga Province* in present-day *Ishikawa Prefecture*. Originally intended to be one of two *Tosa*-class battleships, *Kaga* was converted under the terms of the *Washington Naval Treaty* to an aircraft carrier as the replacement for the battlecruiser *Amagi*, which had been damaged during the 1923 *Great Kanto earthquake*. *Kaga* was rebuilt in 1933–35, increasing her top speed, improving her exhaust systems, and adapting her flight decks to more modern, heavier aircraft.

The ship figured prominently in the development of the IJN's carrier striking force doctrine, which grouped carriers together to give greater mass and concentration to their air power. A revolutionary strategic concept at the time, the employment of the doctrine was crucial in enabling Japan to attain its initial strategic goals during the first six months of the *Pacific War*.

Kaga's aircraft first supported Japanese troops in China during the *Shanghai Incident* of 1932 and participated in the *Second Sino-Japanese War* in the late 1930s. With other carriers, she took part in the *Pearl Harbor raid* in December 1941 and the *invasion of Rabaul* in the Southwest Pacific in January 1942. The following month her aircraft participated in a *combined carrier airstrike* on *Darwin, Australia*, helping secure the *conquest of the Dutch East Indies* by Japanese forces. She missed the *Indian Ocean raid* in April as she had to return to Japan for permanent repairs after hitting a reef in February.

Following repairs, *Kaga* rejoined the *1st Air Fleet* for the *Battle of Midway* in June 1942. After bombarding American forces on *Midway Atoll*, *Kaga* and three other IJN carriers were attacked by American aircraft from *Midway* and the carriers *Enterprise*, *Hornet*, and *Yorktown*. *Dive bombers* from *Enterprise* severely damaged *Kaga*; when it became obvious she could not be saved, she was *scuttled* by Japanese *destroyers* to prevent her from falling into enemy hands. The loss of four large attack carriers, including *Kaga* at *Midway* was a crucial setback for Japan, and contributed significantly to that nation's ultimate defeat. In 1999, debris from *Kaga* including a

large section of the hull was located on the ocean floor at coordinates *28°38'34"N 176°29'16"W* / *28.64278°N 176.48778°W* Coordinates: *28°38'34"N 176°29'16"W* / *28.64278°N 176.48778°W* at a depth in excess of 5,000 meters (16,404 ft); 350 miles (560 km) northwest of *Midway Island*.*[3] The main part of the carrier's wreck has not yet been found.

1.1.1 Design and construction

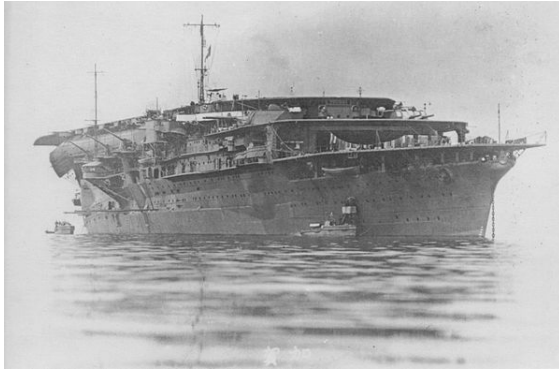
See also: *Tosa-class battleship*

Kaga was laid down as a *Tosa-class* battleship, and was launched on 17 November 1921 at the *Kawasaki Heavy Industries* shipyard in *Kobe*. On 5 February 1922 both *Tosa*-class ships were canceled and scheduled to be *scrapped* under the terms of the *Washington Naval Treaty*.*[4]

The Treaty authorized conversion of two battleship or battlecruiser hulls into aircraft carriers of up to 33,000 long tons (34,000 t) standard displacement. The incomplete battlecruisers *Amagi* and *Akagi* were initially selected, but the *Great Kantō Earthquake* of 1923 damaged *Amagi*'s hull beyond economically feasible repair, and *Kaga* was selected as her replacement. The formal decision to convert *Kaga* to an aircraft carrier was issued 13 December 1923, but no work took place until 1925 as new plans were drafted and earthquake damage to the *Yokosuka Naval Arsenal* was repaired. She was officially commissioned on 31 March 1928, but this signified only the beginning of sea trials. She joined the *Combined Fleet* (*Rengō Kantai*) on 30 November 1929 as the IJN's third carrier to enter service, after *Hōshō* (1922) and *Akagi* (1927).*[5]

Kaga was completed with a length of 238.5 meters (782 ft 6 in) overall. She had a *beam* of 31.67 meters (103 ft 11 in) and a draft at full load of 7.92 meters (26 ft 0 in). She displaced 26,900 long tons (27,300 t) at standard load, and 33,693 long tons (34,234 t) at full load, nearly 6,000 long tons (6,100 t) less than her designed displacement as a battleship.*[6] Her complement totaled 1340 crewmembers.*[7]

Flight deck arrangements



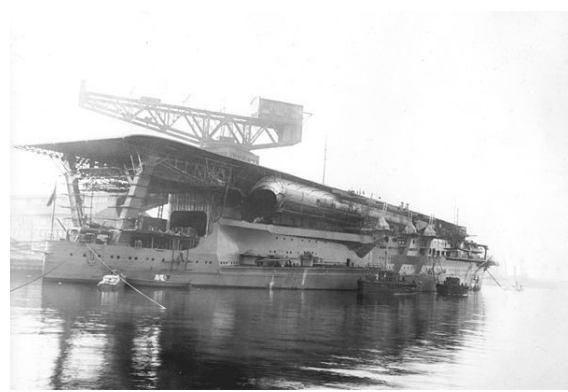
Kaga as completed, with all three flight decks visible

Kaga, like *Akagi*, was completed with three superimposed flight decks, the only carriers ever to be designed so. The British carriers converted from “large light cruisers”, *HMS Glorious*, *HMS Courageous*, and *HMS Furious*, each had two flight decks, but there is no evidence that the Japanese copied the British model. It is more likely that it was a case of convergent evolution to improve launch and recovery cycle flexibility by allowing simultaneous launch and recovery of aircraft.*[8] *Kaga*'s main flight deck was 171.2 meters (561 ft 8 in) long, her middle flight deck was only about 15 meters (49 ft 3 in) long and started in front of the bridge, and her lower flight deck was approximately 55 meters (180 ft 5 in) long. The utility of her middle flight deck was questionable as it was so short that only some of the lightly loaded aircraft could use it, even in an era when the aircraft were much lighter and smaller than they were during World War II.*[9] At any rate the ever-increasing growth in aircraft performance, size and weight during the 1930s meant that even the bottom flight deck was no longer able to accommodate the take-off roll required for the new generations of aircraft being fielded and it was plated over when the ship was modernized in the mid-1930s.*[10] *Kaga*'s main flight deck was completely flat until a conning tower was added during the modernization.*[11]

As completed, the ship had two main hangar decks and a third auxiliary hangar with a total capacity of 60 aircraft. The hangars opened onto the middle and lower flight decks to allow aircraft to take off directly from the hangars while landing operations were in progress on the main flight deck above. No catapults were fitted.*[12] Her forward aircraft lift was offset to starboard and 10.67 by 15.85 meters (35.0 by 52.0 ft) in size. Her aft lift was on the centerline and 12.8 by 9.15 meters (42 ft 0 in by 30 ft 0 in). Her arresting gear was a French transverse system as used on their aircraft carrier *Béarn* and known as the Model Fju (*Fju shiki*) in the Japanese service.*[13]

As originally completed, *Kaga* carried an air group of 28 Mitsubishi B1M3 torpedo bombers, 16 Nakajima A1N fighters and 16 Mitsubishi 2MR reconnaissance aircraft.*[6]*[Note 1]

Armament and armor



Kaga's fitting-out in 1928. This stern view shows the long funnel extending aft below the flight deck, and three 8-inch (200 mm) guns in casemates.

Kaga was armed with ten 20 cm/50 3rd Year Type guns: one twin-gun Model B turret on each side of the middle flight deck and six in casemates aft. They fired 110-kilogram (240 lb) projectiles at a rate of three to six rounds per minute with a muzzle velocity of 870 m/s (2,900 ft/s); at 25°, they had a maximum range between 22,600 and 24,000 m (24,700 and 26,200 yd). The Model B turrets were nominally capable of 70° elevation to provide additional anti-aircraft (AA) fire, but in practice the maximum elevation was only 55°. The slow rate of fire and the fixed 5° loading angle minimized any real anti-aircraft capability.*[14]*[15] This heavy gun armament was provided in case she was surprised by enemy cruisers and forced to give battle, but her large and vulnerable flight deck, hangars, and other features made her more of a target in any surface action than a fighting warship. Carrier doctrine was still evolving at this time and the impracticability of carriers engaging in gun duels had not yet been realized.*[16]*[Note 2]

She was given an anti-aircraft armament of six twin 12-centimeter (4.7 in) 45-caliber 10th Year Type Model A2 gun mounts fitted on sponsons below the level of the funnels, where they could not fire across the flight deck, three mounts per side.*[17] These guns fired 20.3-kilogram (45 lb) projectiles at a muzzle velocity of 825–830 m/s (2,707–2,723 ft/s); at 45° this provided a maximum range of 16,000 meters (17,000 yd), and they had a maximum ceiling of 10,000 meters (33,000 ft) at 75° elevation. Their effective rate of fire was 6 to 8 rounds per minute.*[18]*[19] She had two Type 89 directors to control her 20 cm guns and two Type 91 manually powered anti-aircraft directors (*Kōshaki*) to control her 12 cm guns.*[20]

Kaga's waterline armored belt was reduced from 280 to 152 mm (11.0 to 6.0 in) during her reconstruction and the upper part of her torpedo bulge was given 127 mm (5.0 in) of armor. Her deck armor was also reduced from 102 to 38 mm (4.0 to 1.5 in).*[13]

Propulsion

When *Kaga* was being designed the problem of how to deal with exhaust gases in carrier operations had not been resolved. The swiveling funnels of *Hōshō* had not proved successful and wind-tunnel testing had not provided an answer. As a result, *Akagi* and *Kaga* were given different exhaust systems to evaluate in real-world conditions. *Kaga*'s funnel gases were collected in a pair of long horizontal ducts which discharged at the rear of each side of the flight deck, in spite of predictions by a number of prominent naval architects that they would not keep the hot gases away from the flight deck. The predictions proved to be correct, not least because *Kaga* was slower than the *Akagi* which allowed the gases to rise and interfere with landing operations. Another drawback was that the heat of the gases made the crew's quarters located on the side of the ship by the funnels almost uninhabitable.*[13]

Kaga was completed with four Kawasaki Brown-Curtis geared turbines with a total of 91,000 shaft horsepower (68,000 kW) on four shafts. As a battleship her expected speed had been 26.5 knots (49.1 km/h; 30.5 mph), but the reduction in displacement from 39,900 to 33,693 long tons (40,540 to 34,234 t) allowed this to increase to 27.5 knots (50.9 km/h; 31.6 mph), as demonstrated on her sea trials on 15 September 1928. She had twelve Kampon Type B (Ro) boilers with a working pressure of 20 kg/cm² (2,000 kPa; 280 psi), although only eight were oil-fired. The other four used a mix of oil and coal. She carried 8,000 long tons (8,128 t) of fuel oil and 1,700 long tons (1,727 t) of coal to give her a range of 8,000 nautical miles (15,000 km; 9,200 mi) at 14 knots (26 km/h; 16 mph).*[13]

1.1.2 Early service and development of carrier doctrine

See also: [January 28 Incident](#)

On 1 December 1931 *Kaga* was assigned as the flag-



Kaga conducting air operations in 1930. On the upper deck are Mitsubishi B1M torpedo bombers preparing for takeoff. Nakajima A1N Type 3 fighters are parked on the lower deck forward.

ship of the First Carrier Division under the command of Rear Admiral Takayoshi Katō.*[21] The First Carrier Division, along with *Hōshō*, departed for Chinese waters on 29 January 1932 to support Imperial Japanese Army troops during the Shanghai Incident as part of the IJN's 3rd Fleet.*[22]*[Note 3] The B1M3s carried by *Kaga* and *Hōshō* were the main bombers used during the brief combat over Shanghai.*[23]

Kaga's aircraft, operating from both the carrier and a temporary base at Kunda Airfield in Shanghai, flew missions in support of Japanese ground forces throughout February 1932. During one of these missions three of *Kaga*'s Nakajima A1N2 fighters, including one piloted by future ace Toshio Kuroiwa, escorting three Mitsubishi B1M3 torpedo bombers, scored the IJN's first air-to-air combat victory on 22 February when they shot down a Boeing P-12 flown by an American volunteer pilot.*[21]*[24]*[Note 4] *Kaga* returned to home waters upon the declaration of the cease-fire on 3 March and resumed fleet training with the rest of the Combined Fleet.*[21]

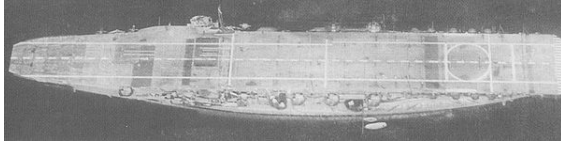
At this time, the IJN's developing carrier doctrine was still in its earliest stages. *Kaga* and the IJN's other carriers were initially given roles as tactical force multipliers supporting the fleet's battleships in the IJN's "decisive battle" doctrine. In this role, *Kaga*'s aircraft were to attack enemy battleships with bombs and torpedoes. Aerial strikes against enemy carriers were later, beginning around 1932–1933, deemed of equal importance in order to establish air superiority during the initial stages of battle. The essential component in this strategy was that the Japanese carrier aircraft must be able to strike first with a massed, preventive aerial attack. As a result, in fleet training exercises the carriers began to operate together in front of or with the main battle line. The new strategy emphasized maximum speed from both the carriers and the aircraft they carried as well as larger aircraft with greater range. Thus, longer flight decks on the carriers were required in order to handle the newer, heavier aircraft which were entering service.*[25]

Kaga was soon judged inferior to *Akagi* because of her slower speed, smaller flight deck (64 feet (19.5 m) shorter), and problematic funnel arrangement. Because of *Kaga*'s perceived limitations, she was given priority over *Akagi* for modernization.*[26] *Kaga* was relegated to reserve status on 20 October 1933 to begin a second major reconstruction, with an official start date of 25 June 1934.*[22]

1.1.3 Reconstruction

During her second reconstruction *Kaga*'s two lower flight decks were converted into hangars and, along with the main flight deck, were extended to the bow. This increased the flight deck length to 248.55 meters (815 ft 5 in) and raised aircraft capacity to 90 (72 operational and

18 in storage).^[27] A third elevator forward, 11.5 by 12 meters (37 ft 9 in × 39 ft 4 in), serviced the extended hangars.^[6] Bomb and **torpedo** elevators were modified to deliver their munitions directly to the flight deck. Her arrester gear was replaced by a Japanese-designed Type 1 system. A small starboard island superstructure was also installed.^[12]



Kaga after reconstruction showing the new, full-length flight deck above the wide battleship hull.

Her power plant was completely replaced as were her propellers. New Kampon multi-stage geared turbines were fitted that increased her power from 91,000 to 127,400 shp (67,859 to 95,002 kW) during trials. Each had a high-pressure, a low-pressure, and a cruising turbine coupled to a single shaft. Her boilers were replaced by eight improved oil-burning models of the Kampon Type B (Ro) with a working pressure of 22 kg/cm² (2,157 kPa; 313 psi) at a temperature of 300 °C (572 °F). The hull was lengthened by 10.3 meters (33 ft 10 in) at the stern to reduce drag and she was given another torpedo bulge above the side armor abreast the upper part of the existing bulge to increase her beam and lower her center of gravity as a result of lessons learned from the **Tomozuru Incident** in early 1934. This raised her standard displacement significantly, from 26,900 to 38,200 long tons (27,332 to 38,813 t). The extra power and the extra displacement roughly offset each other and her speed increased by less than a knot, up to 28.34 knots (52.49 km/h; 32.61 mph) on trials. Her fuel storage was increased to 7,500 long tons (7,620 t) of **fuel oil** which increased her endurance to 10,000 nmi (18,520 km; 11,510 mi) at 16 knots (30 km/h; 18 mph). The lengthy funnel ducting was replaced by a single downturned starboard funnel modeled on that used by the *Akagi* with a water-cooling system for the exhaust gasses and a cover that could be raised to allow the exhaust gasses to escape if the ship developed a severe list and the mouth of the funnel touched the sea. The space freed up by the removal of the funnel ducts was divided into two decks and converted into living quarters for the expanded air group.^[28] The carrier's complement increased to 1708 crewmembers.^[29]

The two twin turrets on the middle flight deck were removed and four new 20 cm/50 3rd Year Type No. 1 guns in casemates were added forward. Her 12 cm anti-aircraft guns were replaced by eight 12.7-centimeter (5.0 in)/40 Type 89 guns in twin mounts. They fired 23.45-kilogram (51.7 lb) projectiles at a rate between 8 and 14 rounds per minute at a **muzzle velocity** of 700–725 m/s (2,300–2,380 ft/s); at 45°, this provided a maximum range of 14,800 meters (16,200 yd), and a maximum ceiling of 9,400 meters (30,800 ft).^[30]^[31] Their spon-

sons were raised one deck to allow them some measure of cross-deck fire. Eleven twin **25 mm Type 96** gun mounts were added, also on sponsons. They fired .25-kilogram (0.55 lb) projectiles at a **muzzle velocity** of 900 m/s (3,000 ft/s); at 50°, this provided a maximum range of 7,500 meters (8,202 yd), and an effective ceiling of 5,500 meters (18,000 ft). The maximum effective rate of fire was only between 110 and 120 rounds per minute due to the frequent need to change the fifteen-round magazines.^[32]^[33] Six 6.5-millimeter (0.26 in) **Type 11** machine guns were also carried.^[28] Six Type 95 directors were fitted to control the new 25 mm guns, but *Kaga* retained her outdated Type 91 anti-aircraft directors.^[29]

Several major weaknesses in *Kaga*'s design were not rectified. *Kaga*'s aviation fuel tanks were incorporated directly into the structure of the carrier, meaning that shocks to the ship, such as those caused by bomb or shell hits, would be transmitted directly to the tanks, resulting in cracks or leaks. Also, the fully enclosed structure of the new hangar decks made fire suppression difficult, at least in part because fuel vapors could accumulate in the hangars. Adding to the danger was the requirement from the Japanese carrier doctrine that aircraft be serviced, fueled, and armed whenever possible on the hangar decks rather than on the flight deck. In addition, the carrier's hangar and flight decks carried little armor protection. Furthermore, there was no redundancy in the ship's fire-extinguishing systems. These weaknesses would later be crucial factors in the loss of the ship.^[34]

1.1.4 Sino-Japanese War

See also: **Second Sino-Japanese War**

Kaga returned to service in 1935 and was assigned to the **Second Carrier Division**. The carrier embarked a new set of aircraft, including 16 **Nakajima A2N** Type 90 fighters, 16 **Aichi D1A** Type 94 dive bombers, and 28 **Mitsubishi B2M** Type 89 torpedo bombers.^[35]

The renewal of hostilities with China at the **Marco Polo Bridge** in July 1937 found *Kaga* in home waters. The ship's fighter squadron completed training at **Omura, Nagasaki** then helped escort ships taking army reinforcements from Japan to China. On 15 August, along with *Hōshō* and *Ryūjō*, the ship took station in the **East China Sea** as part of the 3rd Fleet and began supporting Japanese military operations along the central China coast around Shanghai and further inland.^[36]^[37]

Kaga aircraft fought their first battle on 16 August 1937 when six Type 90 fighters engaged four Chinese aircraft over **Kiangwan**, shooting down three without loss. Between 17 August and 7 September, *Kaga*'s Type 90 and two **Mitsubishi A5M** Type 96 fighters, which joined the carrier on 22 August, engaged Chinese aircraft on several more occasions. *Kaga*'s fighter pilots claimed to have



Kaga conducts air operations in 1937. On deck are Nakajima A2N, Aichi D1A, and Mitsubishi B2M aircraft.

shot down 10 Chinese aircraft in these encounters without loss.*[38]*[Note 5] On 17 August twelve of the carrier's bombers attacked **Hangchow** without fighter escort and 11 of them were shot down by Chinese fighters.*[39] Beginning on 15 September, six Type 90 and six Type 96 fighters, 18 dive bombers, and 18 torpedo bombers were temporarily deployed to Kunda Airfield from the ship to support land operations.*[40]

On 26 September the carrier went to **Sasebo** for repositioning. At Sasebo, the carrier received new replacement aircraft including 32 **Yokosuka B4Y** Type 96 carrier attack planes (torpedo bombers), 16 **Aichi D1A2** Type 96 carrier bombers (dive bombers), and 16 more Type 96 fighters. Several **Nakajima A4N** Type 95 fighter aircraft augmented the carrier's fighter group at an unspecified later date.*[40]

Kaga returned to the front in early October 1937, and except for two brief trips to Sasebo, remained off China until December 1938. Using **Taiwan** (then part of the **Empire of Japan**) as its base, the carrier steamed 29,048 nautical miles (53,797 km; 33,428 mi) supporting military operations from the **South** and East China Seas. During that time, *Kaga* bombers supported army operations by attacking enemy railroad bridges, airfields, and transportation vehicles. The carrier's fighter pilots claimed to have destroyed at least 17 Chinese aircraft in aerial combat while losing five aircraft themselves. On 12 December 1937 *Kaga* aircraft participated in the **Panay incident**.*[41]*[Note 6]

Kaga entered the shipyard on 15 December 1938, where her arrester gear was replaced by a Type 3 system and her bridge was modernized. The flight deck and hangar areas were enlarged, increasing the carrier's aircraft capacity. The ship was completely overhauled from 15 November 1939 to 15 November 1940 before returning to active service. In the meantime, a new generation of aircraft had entered service and *Kaga* embarked 12 **Mitsubishi A5M** fighters, 24 **Aichi D1A** dive bombers and 36 **Yokosuka**

B4Y torpedo bombers. Another 18 aircraft were carried in crates as spares.*[22]*[42]*[Note 7]

The Japanese carriers' experiences off China had helped further develop the IJN's carrier doctrine. One lesson learned in China was the importance of concentration and mass in projecting naval air power ashore. Therefore, in April 1941 the IJN formed the **First Air Fleet** to combine all of its fleet carriers under a single command. On 10 April 1941 *Kaga* was assigned to the First Carrier Division with *Akagi* as part of the new carrier fleet, which also included the Second and **Fifth** carrier divisions. The IJN centered its doctrine on air strikes that combined the air groups within carrier divisions, rather than each individual carrier. When more than one carrier division was operating together, the divisions' air groups were combined with each other. This doctrine of combined, massed, carrier air attack groups was the most advanced of its kind of all the world's navies. The IJN, however, remained concerned that concentrating all of its carriers together would render them vulnerable to being wiped out all at once by a massive enemy air or surface strike. Thus, the IJN developed a compromise solution in which the fleet carriers would operate closely together within their carrier divisions but the divisions themselves would operate in loose rectangular formations, with approximately 7,000 metres (7,700 yd) separating the carriers from each other.*[43]*[Note 8]

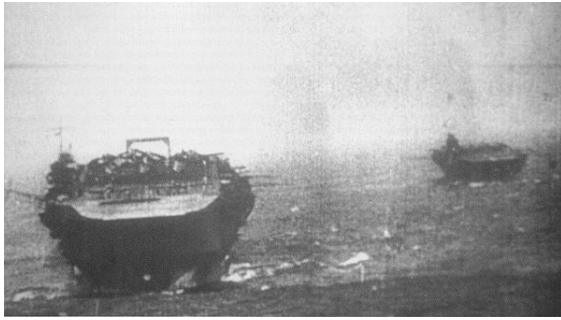
Although the concentration of so many fleet carriers into a single unit was a new and revolutionary offensive strategic concept, the First Air Fleet suffered from several defensive deficiencies which gave it, in **Mark Peattie's** words, a "'glass jaw': it could throw a punch but couldn't take one."*[44] Japanese carrier anti-aircraft guns and associated fire control systems had several design and configuration deficiencies which limited their effectiveness. The IJN's fleet **combat air patrol** (CAP) consisted of too few fighter aircraft and was hampered by an inadequate early warning system, including a lack of **radar**. Poor radio communications with the fighter aircraft inhibited effective command and control of the CAP. The carriers' escorting warships were deployed as visual scouts in a ring at long range, not as close anti-aircraft escorts, as they lacked training, doctrine, and sufficient anti-aircraft guns. These deficiencies would eventually doom *Kaga* and other First Air Fleet carriers.*[45]

1.1.5 World War II

Pearl Harbor

For more details on this topic, see **Attack on Pearl Harbor**.

In November 1941 the IJN's Combined Fleet, under **Isoroku Yamamoto**, prepared to participate in Japan's initiation of a formal war with the United States by conducting a preemptive strike against the **United States Navy's Pacific Fleet** base at **Pearl Harbor**, Hawaii. On 17



Kaga (foreground), with Zuikaku (background), heads towards Pearl Harbor sometime between 26 November and 7 December 1941.

November *Kaga*, under the command of Captain Jisaku Okada, ^[Note 9] loaded 100 torpedoes at Saeki Bay, Hiroshima; these torpedoes were specially designed for use in the shallow waters of the Pearl Harbor anchorage. On 19 November, *Kaga* and the rest of the Combined Fleet's mobile strike force (*Kido Butai*), under Chuichi Nagumo and including six fleet carriers from the First, Second, and Fifth Carrier Divisions, assembled in Hitokappu Bay at Etorofu Island. The fleet departed Etorofu on 26 November and followed a course across the north-central Pacific to avoid commercial shipping lanes. ^[46]^[Note 10]

For the attack on Pearl Harbor, *Kaga* carried a total of 18 Mitsubishi A6M Zero fighters, 27 Nakajima B5N torpedo bombers and 27 Aichi D3A ^[Note 11] dive bombers, plus three crated aircraft of each type for the operation. During the morning of 7 December 1941 *Kaga* aircraft participated in both First Air Fleet strikes launched against Oahu from a position 230 nautical miles (430 km) north of the island. In the first strike of 213 total aircraft, 26 *Kaga* B5N carrier attack bombers attacked the American ships at anchor with bombs and torpedoes, escorted by nine Zeros. In the second strike of 170 aircraft, 26 *Kaga* D3A dive bombers targeted the airfield at Ford Island in the middle of the harbor while nine Zeros provided escort and attacked aircraft on the ground. A total of five B5N, four Zeros and six D3A from the ship were lost during the two strikes, along with their aircrews, a total of 31 personnel. ^[47] *Kaga*'s bomber and torpedo crews claimed hits on the battleships *Nevada*, *Oklahoma*, *Arizona*, *California*, *West Virginia*, and *Maryland*. ^[48] The ship's fighter pilots claimed to have shot down one US aircraft and destroyed 20 on the ground. ^[49]^[Note 12] Upon completion of the attack, the First and Fifth Carrier divisions, including *Kaga*, returned immediately to Japan. ^[46]^[Note 13]

Pacific conquest

See also: Pacific War

In January 1942, together with the rest of the First and Fifth Carrier Division carriers and staging out of

Truk (now Chuuk) in Micronesia, *Kaga* supported the invasion of Rabaul in the Bismarck Islands. *Kaga* provided 27 bomb-carrying B5N and 9 Zeros for the initial airstrike on Rabaul on 20 January 1942, during which one B5N was shot down by anti-aircraft fire. ^[Note 14] The First Carrier Division attacked Allied positions at nearby Kavieng the following day, of which *Kaga* contributed nine Zeros and sixteen D3As. On the 22nd *Kaga*'s D3As and Zeros again attacked Rabaul and two dive bombers had to make emergency landings, but the crews were rescued. *Kaga* returned to Truk on 25 January and Rabaul and Kavieng were successfully occupied by Japanese forces by February. ^[50]

On 9 February *Kaga* hit a reef at Palau after she had unsuccessfully sortied against American carrier forces attacking the Marshall Islands on 1 February. The damage reduced the carrier's speed to 18 knots. ^[46]^[Note 15] After temporary repairs, she continued to the Timor Sea, where on 19 February 1942 she, with the other carriers of the First and Second Carrier Divisions, launched air strikes against Darwin, Australia from a point 100 nautical miles (190 km) southeast of the easternmost tip of Timor. *Kaga* contributed 27 B5Ns (carrying bombs), 18 D3A, and 9 Zeros to the attack, which caught the defenders by surprise. Eight ships were sunk, including the destroyer *Peary*, and fourteen more were damaged, at a cost of only one of *Kaga*'s B5Ns. In March 1942, *Kaga*, based out of Staring-baai, helped cover the invasion of Java, although her only contribution appears to have been aircraft for the 5 March 1942 airstrike on Tjilatjap. In that attack *Kaga* contributed 27 bomb-carrying B5N escorted by nine Zeros. The attacking aircraft bombed merchant ships in the harbor, sinking eight of them, and attacked anti-aircraft batteries and a warehouse without loss. Most of the Allied forces in the Dutch East Indies surrendered to the Japanese later in March. *Kaga* was unable to participate in the Indian Ocean raid in April because of the damage she had received in February. Instead, she sailed for Sasebo on 15 March for repairs, entering drydock on 27 March. The repairs were completed on 4 May. ^[51]^[Note 16]

Battle of Midway

For more details on this topic, see Battle of Midway.

Midway raid Concerned by the US carrier strikes in the Doolittle, Marshall Islands, and Lae-Salamaua raids, Yamamoto determined to force the US Navy into a showdown to eliminate the American carrier threat. Yamamoto decided to invade and occupy Midway Island, which he was sure would draw out the American carrier forces to battle. The Midway invasion was codenamed by the Japanese as Operation MI. ^[53]

In support of MI, on 27 May 1942, *Kaga* departed the



Lieutenant Shōichi Ogawa led *Kaga*'s dive bomber group in the attack on Midway Island. Ogawa was fatally wounded later the same day when *Kaga* was hit by American dive bombers.*[52]

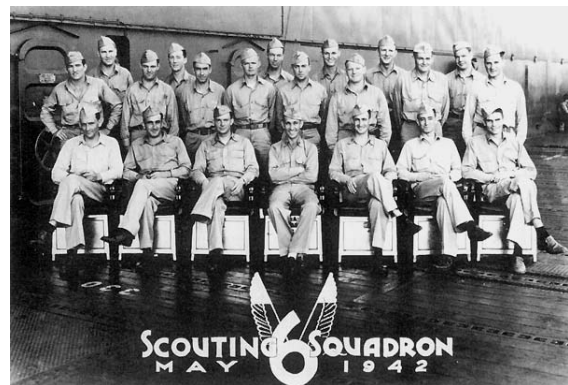
Inland Sea with the Combined Fleet on her final mission, in the company of carriers *Akagi*, *Hiryū*, and *Sōryū* which constituted the First and Second Carrier Divisions. Her aircraft complement was 27 Zeros, 20 D3As, and 27 B5Ns.*[54]*[Note 17] With the fleet positioned 250 nautical miles (460 km) northwest of Midway Island at dawn on 4 June 1942, *Kaga* contributed eighteen D3As, commanded by Lieutenant Shōichi Ogawa, escorted by nine Zeros to the strike against the island. The carrier's B5Ns were armed with torpedoes and kept ready in case enemy ships were discovered during the Midway raid. One each of the D3As and Zeros was shot down by AA fire over Midway, and another four D3As were damaged. *Kaga*'s Zero pilots claimed to have shot down 12 US aircraft over Midway Island. One *Kaga* B5N was launched to augment the fleet's reconnaissance of the surrounding ocean.*[Note 18] The carrier also put up two Zeros on CAP.*[49]*[55] Another five Zeros reinforced her CAP at 07:00 and the seven fighters helped to defend the Kido Butai from the first US air attackers from Midway Island at 07:10. Unknown to the Japanese, the US Navy had divined the Japanese *MI* plan from signals intelligence and had prepared an ambush using its three available carriers, positioned northeast of Midway.*[56]

At 07:15 Admiral Nagumo ordered the B5Ns still on *Kaga* and *Akagi* rearmed with bombs for another attack on Midway itself. This process was limited by the number of ordnance carts used to handle the bombs and torpedoes and the limited number of ordnance elevators. Thus, the torpedoes could not be struck below until after all the bombs were moved up from their magazine, assembled and mounted on the aircraft. This process normally took about an hour and a half; more time would be required to bring the aircraft up to the flight deck and warm up and launch the strike group. Around 07:40 Nagumo re-

versed his order when he received a message that American carriers had been spotted.*[57] At 07:30 *Kaga* recovered three of her CAP.*[58]

Sinking *Kaga*'s four remaining CAP fighters were in the process of landing when 16 Marine SBD Dauntless dive-bombers from Midway, led by Lofton R. Henderson, attacked *Hiryū* around 07:55 without result.*[59] Five Zeros were launched at 08:15 and three intercepted a dozen Midway-based United States Army B-17 Flying Fortresses attempting to bomb the three other carriers from 20,000 feet (6,100 m), but only limited damage was inflicted on the heavy bombers, although their attacks all missed. Five D3As also joined the CAP around this time. Another trio of Zeros were launched at 08:30. *Kaga* began landing her returning Midway strike force aboard around 08:35 and was finished by 08:50; one Zero pilot died after crash-landing his aircraft.*[60]*[Note 19]

The five Zeros launched at 08:15 were recovered aboard at 09:10 and replaced by six more Zeros launched at 09:20. They intercepted the first US carrier aircraft to attack, TBD Devastator torpedo-bombers of VT-8 from the US carrier *Hornet* at 09:22, and shot down all 15, leaving only a single survivor, George H. Gay, Jr., treading water. Shortly thereafter, 14 Devastators from VT-6 from the US carrier *Enterprise*, led by Eugene E. Lindsey, were spotted. They tried to sandwich *Kaga*, but the CAP, reinforced by another six Zeros launched by *Kaga* at 10:00, shot down all but four of the Devastators, and the carrier dodged the torpedoes.*[61]



Dive bomber pilots from *Enterprise* who helped fatally damage *Kaga* on 4 June. Ensign John Q. Roberts, who was shot down and killed by *Kaga*'s anti-aircraft guns, is standing at the far left of the photo. The bomb that killed *Kaga*'s senior officers on the bridge may have been dropped by Ensign James C. Dexter, standing third from the right.*[62]

Soon after the torpedo plane attacks, American carrier dive bombers arrived over the Japanese carriers almost undetected and began their dives. At 10:22, 25 SBD Dauntless dive-bombers from *Enterprise*, led by C. Wade McClusky, hit *Kaga* with one 1,000-pound (450 kg) bomb and at least three 500-pound (230 kg) bombs. The first landed near her rear elevator and set the berthing

compartments on fire, and the next bomb hit the forward elevator and penetrated the upper hangar, setting off explosions and fires among the armed and fueled planes on her hangar deck. Captain Okada and most of the ship's senior officers were killed by the third bomb, which hit the bridge.*[Note 20] The 1000-pound bomb hit amidships and penetrated the flight deck to explode on the upper hangar. The explosions ruptured the ship's avgas lines, damaged both her port and starboard fire mains and the emergency generator powering her fire pumps, as well as knocking out the carbon dioxide fire suppression system.*[63] Fueled by the avgas pouring onto the hangar deck, the fires detonated the 80,000 pounds (36,000 kg) of bombs and torpedoes strewn across the hangar deck in a series of catastrophic multiple fuel-air explosions that blew out the hangar sides.*[64] At nearly the same time, dive bombers hit and fatally damaged *Akagi* and *Sōryū*.*[65]*[Note 21]

Unable to contain her fires, *Kaga*'s survivors were taken off by the destroyers *Hagikaze* and *Maikaze* between 14:00 and 17:00.*[Note 22] Around 19:25 she was scuttled by two torpedoes from *Hagikaze* and sank stern-first at position 30°20'N 179°17'W / 30.333°N 179.283°W.*[66] Ensign Takeshi Maeda, an injured *Kaga* B5N aircrew member rescued by *Hagikaze*, described the scene: “My comrade carried me up to the deck so I could see the last moments of our beloved carrier, which was nearby. Even though I was in pain tears started to run down my cheeks, and everyone around me was crying; it was a very sad sight.”*[67]

The carrier's crew suffered 811 fatalities, mainly among the aircraft mechanics and armorers stationed on the hangar decks and the ship's engineers, many of whom were trapped below in the boiler and engine rooms by uncontrolled fires raging on the decks above them. Twenty-one of the ship's aviators were killed.*[68]*[Note 23] The loss of *Kaga* and the three other IJN carriers at Midway (*Hiryū* was also sunk during the battle), with their aircraft and veteran pilots, was a crucial strategic defeat for Japan and contributed significantly to Japan's ultimate defeat in the war.*[69]

1.1.6 Wreck survey

In May 1999, the Nauticos Corporation, in partnership with the US Navy, discovered some wreckage from *Kaga*.*[70] They employed the research vessel *Melville* during a survey of a fleet exercise area with the US Navy's recently modified SEAMAP acoustic imaging system. A follow-on search by the USNS *Sumner* in September 1999 located the wreckage and took photos of it.*[71] The wreckage included a 50-foot (15 m) long section of hangar bulkhead, two 25 mm anti-aircraft gun tubs, and a landing light array. The artifacts were at a depth of 17,000 feet (5,200 m).*[72]

1.1.7 Notes

- [1] Hata, p. 24, gives the carrier's initial aircraft complement as 12 Type 3 fighters (plus three crated spares), six reconnaissance aircraft (with two spares), and 18 torpedo bombers (six spares).
- [2] The United States Navy did much the same with the provision of four twin 8-inch (203 mm) gun turrets on their *Lexington*-class carriers. See Gardiner and Grey, p. 110.
- [3] The 3rd Fleet at this time was commanded by Vice Admiral Kichisaburō Nomura (Hata, p. 299). Fighter pilot and future ace Isamu Mochizuki served in the carrier's fighter group sometime between 1929 and 1932 (Hata, p. 342).



Ikuta, Kuroiwa, and Takeo pose in front of a Nakajima A1N2 Type 3 fighter aircraft.

In addition to Petty Officer 3rd Class Kuroiwa, the *Kaga* fighter pilots involved in the shootdown were Lieutenant Nokiji Ikuta and Seaman 1st Class Kazuo Takeo (see photo). Lieutenant Kotani, the leader of the flight of three torpedo bombers, was killed in the engagement. The American pilot was Robert Short. Sakaida, p. 97, states that Short was killed in the engagement. The *Kaga* aircrews received a special commendation from the 3rd Fleet commander, Vice Admiral Kichisaburō Nomura, for their actions. (Peattie, pp. 50–51; Hata, pp. 24, 299) Future ace Mitsugu Mori served in *Kaga*'s fighter unit during this time. (Hata, p. 347)

- [5] Lieutenant Chikamasa Igarashi led the six fighters in the 16 August engagement. Also participating in that engagement was future ace Akio Matsuba. The other engagements included: 17 August, when four Type 90s under Warrant Officer Toyoda shot down two Chinese aircraft over Kiangwan; 4 September, two Type 96 fighters under Lieutenant Tadashi Nakajima shot down three Curtiss Hawks; 7 September, three Type 90s under Igarashi shot down five aircraft over T'ai Hu, with Igarashi claiming three of that number. (Hata, pp. 25–26, 263)
- [6] Six *Kaga* fighters were assigned to land bases near Shanghai and Nanking between 9 December 1937 and 15 January 1938. Nine fighters were temporarily based out of Nanking from 3 March through 4 April 1938. *Kaga*'s fighter group at this time included future aces Jirō Chōno, Osamu Kudō, Yoshio Fukui, Watari Handa, Masaichi Kondō, Hatsuō Hidaka, Kiichi Oda, Satoru Ono, and Chitoshi Isozaki. (Hata, pp. 28, 322, 346, 353, 361, 366,

368) The US Navy decrypted an IJN message which reportedly indicated that the attack on the *Panay* and other neutral ships in the Yangtze River had been knowingly and deliberately planned by an air officer on *Kaga*. (Toland, p. 49)

- [7] Hata, p. 27, gives *Kaga*'s aircraft complement after overhaul as 12 fighters with four spares, 18 dive bombers with six spares, and 48 torpedo bombers with 16 spares.
- [8] According to Parshall and Tully, pp. 86–87, the Japanese would not usually launch their entire carrier air groups into a single massed attack. Instead, each carrier would launch a “deckload strike” of all its aircraft that could be spotted at one time on each flight deck. Subsequent attack waves consisted of the next deckload of aircraft. Thus, 1st Air Fleet air attacks would often consist of at least two, massed waves of aircraft. Peattie (p. 152) and Jisaburō Ozawa (Goldstein, pp. 78–80) emphasize that the First Air Fleet was *not* the IJN's primary strategic striking force. The IJN still considered the First Air Fleet an integral component in the Combined Fleet's decisive battle task force centered on battleships.
- [9] Okada was born in Ishikawa Prefecture in 1893. He entered the IJN in 1911 and joined the air service in 1922. (Goldstein; Masataka Chihaya, p. 295)
- [10] The voyage to Hawaii encountered heavy seas, peaking in intensity on 3 December. On this day *Kaga* suffered its first war casualty when a crewmember was swept away by a wave and lost. (Werneth, p. 107)
- [11] The Allied reporting name for these aircraft were “Zeke”, “Kate” and “Val” respectively.



- [12] Lieutenant Ichirō Kitajima briefs his B5N crews on the carrier deck about the attack plan the day before the raid on Pearl Harbor.

Fourteen of the B5N in the first wave carried bombs and the other 12 torpedoes. A 15th bomb-carrying B5N aborted due to engine trouble. The bomb-carrying B5Ns were commanded by Lieutenant Commander Takahashi Hashiguchi and the torpedo-armed planes by Lieutenant Ichirō Kitajima (see photo). One B5N crewmember, Yasuji Inoue, was seriously injured by a bullet which shattered his chin. (Werneth, pp. 109, 138, 276) Five torpedo planes and two Zeros were lost in the first wave and two Zeros and the six dive bombers in the second wave (Werneth, p. 111). Future fighter ace Akira Yamamoto participated in the first strike wave and claimed to have shot

down a small civilian aircraft over Oahu and destroyed six aircraft on the ground. Yamamoto was a member of *Kaga*'s CAP at Midway and survived the battle. Future ace Kiyonobu Suzuki participated in the second strike. Suzuki was also at Midway and survived. (Hata, pp. 295, 345) *Kaga*'s fighter group was led by Yoshio Shiga who unsuccessfully tried to be the first airborne in the first strike but was beaten by *Akagi*'s fighter group leader. (Toland, p. 205)

- [13] The Second Carrier Division with *Hiryū* and *Soryū* was diverted to support the invasion of Wake Island.
- [14] The B5N lost in the raid was crewed by Tatsuyasu Sugihara, Katsuo Yamamoto, and Yoichi Tanaka, who were killed. They were the first Japanese casualties in the invasion of Rabaul. (Werneth, pp. 115, 140)
- [15] Takeshi Maeda, a B5N crewmember on *Kaga*, states that the carrier grounded at Staring Bay in March, not at Palau in February. The discrepancy is not explained in the sources. (Werneth, p. 116)
- [16] While *Kaga* was in drydock on 18 April, 12 Zeros from the carrier's air group based at Kisarazu Air Field participated in the failed counterattack against the US carrier forces which had launched the Doolittle raid bombers. The attack group, including 29 land bombers and 12 Zeros from the 26th Air Flotilla in addition to the *Kaga* fighters, flew east for 600 nautical miles (1,110 km) before turning back after being unable to locate the American carriers, which had already departed the area (Hata, p. 148). Fighter ace Masaaki Shimakawa joined the carrier's fighter unit around this time (Sakaïda, p. 130). After the Indian Ocean raid, *Kaga* was used for limited air operations training by all the First Air Fleet air units in May as the other carriers were in the shipyard for refitting. (Parshall and Tully, p. 88)
- [17] Nine of the Zeros were intended to be stationed on Midway after the invasion and belonged to the 6th Air Group. Two of the D3As were in crates and were either replacements for *Sōryū* or also members of the 6th Air Group. (Parshall and Tully, p. 451)
- [18] Twenty-five total US aircraft were lost over Midway during the air raid. (Willmott, p. 380) The reconnaissance B5N was commanded by Ensign Haruo Yoshino and covered the search leg south-southeast from the Kido Butai to the west of Midway and over Kure Atoll. The aircraft did not sight any enemy ships and landed back on *Kaga* minutes before the ship was hit by dive bombers. (Werneth, p. 140)
- [19] The Zero pilot who died upon landing was Yukuo Tanaka. (Parshall and Tully, p. 196)
- [20] In addition to Okada, the hit on the bridge likely killed executive officer Captain Masao Kawaguchi, chief gunnery officer Lieutenant Commander Toyosaburō Miyano, navigator Commander Ichiji Monden, and communications officer Lieutenant Commander Hidekazu Takahashi. (Parshall and Tully, p. 235) The ship's maintenance officer, Commander Torao Yamazaki, was killed by the first bomb to hit. (Parshall and Tully, p. 234) At the time of McClusky's attack, *Kaga* likely had two or three Zeros on

the flight deck preparing to take off for CAP duty. (Parshall and Tully, p. 231) *Kaga* anti-aircraft gunners shot down one of the dive bombers, piloted by J. Q. Roberts and the sixth to attack. This was the only dive bomber shot down by any of the Japanese carriers' anti-aircraft gunners this day (Parshall and Tully, p. 234). McClusky's bombers totalled 28 aircraft, but three split off to attack *Akagi*. (Lundstrom, pp. 360–361)

- [21] *USS Nautilus* fired four torpedoes at the carrier; one mis-fired, two others missed, and one hit the burning *Kaga* around 14:05, but it was a dud. (Parshall and Tully, pp. 302–03) The torpedo that hit broke in two and the war-head portion sank. The remaining, floating half was later used as a life preserver by several *Kaga* survivors. (Willmott, p. 427)
- [22] Parshall and Tully (p. 337) state that the two destroyers rescued over 700 of the carrier's crew. Since the carrier reportedly had a complement of 1708 (Parshall and Tully, p. 467), there should have been around 900 survivors, but the discrepancy in the numbers is not explained by the sources.
- [23] Peattie, p. 338, states that eight *Kaga* airmen were killed in the air and 13 died aboard the ship. Of the 15 *Kaga* CAP Zeros airborne at the time the carrier was hit, five were destroyed in aerial combat and the remainder were recovered by *Hiryū*. Two subsequently participated in the second *Hiryū* airstrike on *Yorktown* while four others augmented the remaining carrier's CAP. All 10 pilots survived (Parshall and Tully, pp. 502–503; Lundstrom, pp. 351, 414). The two *Kaga* fighter pilots who joined the attack on *Yorktown* were Akira Yamamoto and Makoto Bandō. (Parshall and Tully, p. 290) Four of the five pilots in the downed *Kaga* CAP Zeros were killed. (Lundstrom, p. 363) *Kaga*'s surviving crewmembers were restricted incommunicado to an airbase in Kyūshū for one to two months after returning to Japan, to help conceal word of the Midway defeat from the Japanese public. (Werneth, p. 156) Many of the survivors were then transferred back to frontline units without being allowed to contact family. Some of the injured were quarantined in hospitals for almost a year. (Parshall and Tully, pp. 386–87)

1.1.8 Footnotes

- [1] Parshall and Tully, p. 535
- [2] Campbell, pp. 185–187
- [3] Nauticos
- [4] Gardiner and Gray, p. 232; Jentschura, p. 35
- [5] Lengerer, p. 128
- [6] Lengerer, p. 129
- [7] Jentschura, p. 42
- [8] Brown, p. 2
- [9] Lengerer, pp. 130, 134
- [10] Lengerer, pp. 130, 136
- [11] Peattie, pp. 54–55
- [12] Ireland, pp. 102–03
- [13] Lengerer, p. 134
- [14] “Japanese 20 cm/50 (7.9”) 3rd Year Type No. 1” . navweaps.com. 19 April 2007. Retrieved 11 October 2009.
- [15] Campbell, p. 187
- [16] Peattie, pp. 53, 55
- [17] Lengerer, p. 131
- [18] “Japan 12 cm/45 (4.7”) 10th Year Type” . navweaps.com. 28 December 2008. Retrieved 11 October 2009.
- [19] Campbell, p. 194
- [20] Parshall and Tully, pp. 140, 467
- [21] Hata, p. 24
- [22] Lengerer, p. 172
- [23] Peattie, p. 37
- [24] Peattie, pp. 50–51
- [25] Peattie, pp. 72–76; Stille, p. 13; Goldstein (Jisaburō Ozawa), pp. 76–78
- [26] Peattie, pp. 55–56
- [27] Peattie, p. 56
- [28] Lengerer, p. 137
- [29] Parshall and Tully, p. 467
- [30] “Japan 12.7 cm/40 (5”) Type 88 12.7 cm/40 (5”) Type 89” . navweaps.com. 3 December 2008. Retrieved 11 October 2009.
- [31] Campbell, pp. 192–93
- [32] “Japan 25 mm/60 (1”) Type 96 Model 1” . navweaps.com. 4 March 2009. Retrieved 11 October 2009.
- [33] Campbell, p. 200
- [34] Peattie, pp. 65, 70, 159; Stille, pp. 15–16; Willmott, p. 415; Parshall and Tully, p. 245
- [35] Hata, pp. 24–25
- [36] Peattie, pp. 103–04
- [37] Hata, p. 25
- [38] Hata, pp. 25–26
- [39] Howarth, p. 213
- [40] Hata, p. 26
- [41] Hata, pp. 26–27; Werneth, p. 160; Toland, p. 49
- [42] Hata, p. 27

- [43] Parshall and Tully, pp. 82, 86, 137–138, and 416; Peattie, pp. 124–25, 147–53; Tully; Stille, pp. 13–14
- [44] Peattie, p. 159
- [45] Parshall and Tully, pp. 85 and 136–145; Peattie, pp. 155–59; Stille, pp. 14–15, 50–51
- [46] Tully
- [47] Lengerer, p. 174; Stille, p. 19; Werneth, p. 111; Evans and Fuchida, p. 54
- [48] Lengerer, p. 175
- [49] Hata, p. 28
- [50] Lengerer, pp. 175–76; Werneth, p. 140
- [51] Lengerer, pp. 176–77, 305–07; Tully; Werneth, p. 140; Gill, p. 590
- [52] Cressman, p. 104; Parshall and Tully, p. 281.
- [53] Stille, p. 22
- [54] Parshall and Tully, pp. 450–51
- [55] Parshall and Tully, pp. 126, 515; Evans and Fuchida, p. 138; Lundstrom, pp. 330–331
- [56] Parshall and Tully, pp. 151, 154; Stille, p. 59
- [57] Parshall and Tully, pp. 156–59
- [58] Parshall and Tully, p. 508
- [59] Parshall and Tully, p. 180
- [60] Parshall and Tully, pp. 196, 199
- [61] Parshall and Tully, pp. 213–14; Stille, p. 62
- [62] Cressman, p. 103.
- [63] Parshall and Tully, pp. 228, 234–36, 248–50; Stille, pp. 62–63
- [64] Parshall and Tully, pp. 255–56; Willmott, pp. 426–27
- [65] Stille, p. 63
- [66] Parshall and Tully, p. 338; Tully; Werneth, p. 142
- [67] Werneth, p. 121
- [68] Parshall and Tully, p. 476
- [69] Fuchida and Okumiya, p. 231
- [70] “IJN Carrier Wreckage- Identification Analysis” . Nauticos Corporation. Retrieved 2 May 2010.
- [71] “Navy and Industry Collaborate for Historical Find” . Nauticos Corporation. 20 February 2001. Retrieved 21 May 2010.
- [72] Parshall and Tully, pp. 491–93

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1.1.10 External links

- [Kaga](#), World War II Database

1.2 Japanese aircraft carrier Akagi

Akagi (Japanese: 赤城, “Red Castle”) was an aircraft carrier of the Imperial Japanese Navy (IJN), named after Mount Akagi in present-day Gunma Prefecture. Though she was laid down as an *Amagi*-class battlecruiser, *Akagi* was converted to an aircraft carrier while still under construction to comply with the terms of the Washington Naval Treaty. The ship was rebuilt from 1935 to 1938 with her original three flight decks consolidated into a single enlarged flight deck and an island superstructure. The second Japanese aircraft carrier to enter service, and the first large or “fleet” carrier, *Akagi* figured prominently in the development of the IJN's revolutionary carrier striking force doctrine that grouped carriers together, concentrating their air power. This doctrine enabled Japan to attain its strategic goals during the early stages of the Pacific War from December 1941 until mid-1942.

Akagi 's aircraft served in the Second Sino-Japanese War in the late 1930s. Upon the formation of the First Air Fleet or *Kido Butai* (Striking Force) in early 1941, she became its flagship, and remained so for the duration of her service. With other fleet carriers, she took part in the Attack on Pearl Harbor in December 1941 and the invasion of Rabaul in the Southwest Pacific in January 1942. The following month, her aircraft bombed Darwin, Australia, and assisted in the conquest of the Dutch East Indies. In March and April 1942, *Akagi* 's aircraft helped sink a British heavy cruiser and an Australian destroyer in the Indian Ocean Raid.

After a brief refit, *Akagi* and three other fleet carriers of the *Kido Butai* participated in the Battle of Midway in June 1942. After bombarding American forces on the atoll, *Akagi* and the other carriers were attacked by aircraft from Midway and the carriers *Enterprise*, *Hornet*, and *Yorktown*. Dive bombers from *Enterprise* severely damaged *Akagi*. When it became obvious she could not be saved, she was scuttled by Japanese destroyers to prevent her from falling into enemy hands. The loss of *Akagi* and three other IJN carriers at Midway was a crucial strategic defeat for Japan and contributed significantly to the Allies' ultimate victory in the Pacific.

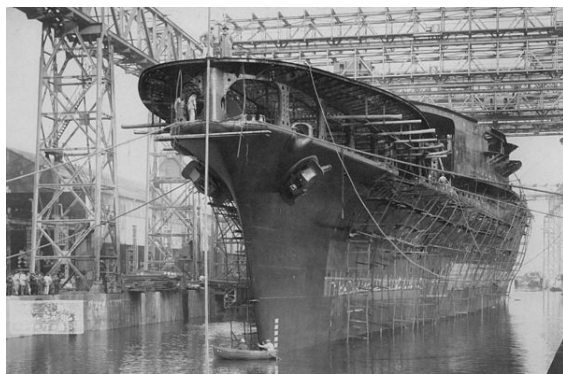
1.2.1 Design

Construction and launch

See also: [Amagi-class battlecruiser](#)

Akagi was laid down as an *Amagi*-class battlecruiser at Kure, Japan, on 6 December 1920. The ship was named after Mount Akagi, following the Japanese ship-naming conventions for battlecruisers.*[1] Construction was halted, however, when Japan signed the Washington Naval Treaty on 6 February 1922. The treaty placed restrictions on the construction of battleships and battle-

cruisers although it authorized conversion of two battleship or battlecruiser hulls under construction into aircraft carriers of up to 33,000 long tons (34,000 t) displacement. The IJN had decided, following the launch of its first aircraft carrier, *Hōshō*, to construct two larger, faster carriers for operations with major fleet units. The incomplete hulls of *Amagi* and *Akagi* were thus selected for completion as the two large carriers under the 1924 fleet construction program.*[2]*[3] ¥24.7 million was originally budgeted to complete *Akagi* as a battlecruiser and an estimated ¥8 million had been expended when construction stopped in February 1922. Shortly thereafter, the Diet approved an additional ¥90 million to complete *Akagi* and *Amagi* as carriers.*[4]



Akagi after its launch at Kure, 6 April 1925

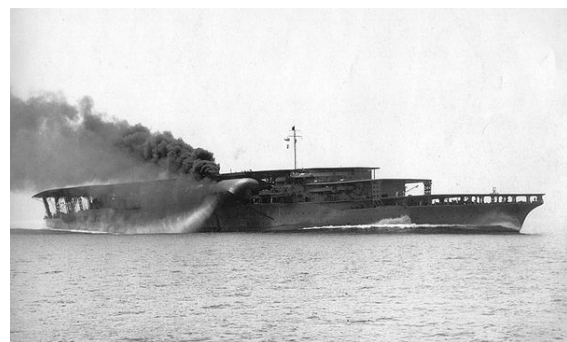
Construction of *Akagi* as an aircraft carrier began on 19 November 1923. *Amagi*'s hull was damaged beyond economically feasible repair in the Great Kantō Earthquake of 1 September 1923 and was broken up and scrapped. *Akagi*, the only remaining member of her class, was launched as a carrier on 22 April 1925 and commissioned at Kure Naval Arsenal on 25 March 1927, although trials continued through November 1927. She was the second carrier to enter service with the IJN, after *Hōshō* and before *Kaga* (which replaced *Amagi*).*[2]*[5]

Since *Akagi* was initially conceived as a battlecruiser, the prevailing ship naming conventions dictated that she (like her sister ships) be named after a mountain. *Akagi* came from Mount Akagi, a dormant volcano in the Kantō region (the name literally means “red castle”). After she was redesignated as an aircraft carrier, her mountain name remained, in contrast to ships like *Sōryū* that were originally built as aircraft carriers, which were named after flying creatures. Her name was previously given to the *Maya*-class gunboat *Akagi*.*[6]

Akagi was completed at a length of 261.21 meters (857 ft 0 in) overall. She had a beam of 31 meters (101 ft 8 in) and, at deep load, a draft of 8.08 meters (26 ft 6 in). She displaced 26,900 long tons (27,300 t) at standard load, and 34,364 long tons (34,920 t) at full load, nearly 7,000 long tons (7,100 t) less than her designed displacement as a battlecruiser.*[7] Her complement totaled 1,600 crewmembers.*[8]

Flight deck arrangements

Akagi and *Kaga* were completed with three superimposed flight decks, the only carriers ever to be designed so. The British carriers converted from “large light cruisers”, *HMS Glorious*, *HMS Courageous*, and *HMS Furious*, each had two flight decks, but there is no evidence that the Japanese copied the British model. It is more likely that it was a case of convergent evolution to improve launch and recovery cycle flexibility by allowing simultaneous launch and recovery of aircraft.*[9] *Akagi*'s main flight deck was 190.2 meters (624 ft 0 in) long, her middle flight deck (beginning right in front of the bridge) was only 15 meters (49 ft 3 in) long and her lower flight deck was 55.02 meters (180 ft 6 in) long. The utility of her middle flight deck was questionable as it was so short that only some lightly loaded aircraft could use it, even in an era when the aircraft were much lighter and smaller than during World War II.*[10] The upper flight deck sloped slightly from amidships toward the bow and toward the stern to assist landings and takeoffs for the underpowered aircraft of that time.*[11]



Akagi on trials off the coast of Iyo, 17 June 1927, with all three flight decks visible

As completed, the ship had two main hangar decks and a third auxiliary hangar, giving a total capacity of 60 aircraft. The third and lowest hangar deck was only used for storing disassembled aircraft. The two main hangars opened onto the middle and lower flight decks to allow aircraft to take off directly from the hangars while landing operations were in progress on the main flight deck above. The upper and middle hangar areas totaled about 80,375 square feet (7,467.1 m²), the lower hangar about 8,515 square feet (791.1 m²). No catapults were fitted. Her forward aircraft lift was offset to starboard and 11.8 by 13 meters (38 ft 9 in × 42 ft 8 in) in size. Her aft lift was on the centerline and 12.8 by 8.4 meters (42 ft 0 in × 27 ft 7 in). The aft elevator serviced the upper flight deck and all three hangar decks. Her arresting gear was an unsatisfactory British longitudinal system used on the carrier *Furious* that relied on friction between the arrester hook and the cables. The Japanese were well aware of this system's flaws, as it was already in use on their first carrier, *Hōshō*, but had no alternatives available when *Akagi* was completed. It was replaced during the ship's

refit in 1931 with a Japanese-designed transverse cable system with six wires and that was replaced in turn before *Akagi* began her modernization in 1935 by the Kure Model 4 type (Kure shiki 4 gata). There was no island superstructure when the carrier was completed; the carrier was commanded from a space below the forward end of the upper flight deck.*[10]*[12] The ship carried approximately 150,000 US gallons (570,000 l) of aviation fuel for her embarked aircraft.*[13]

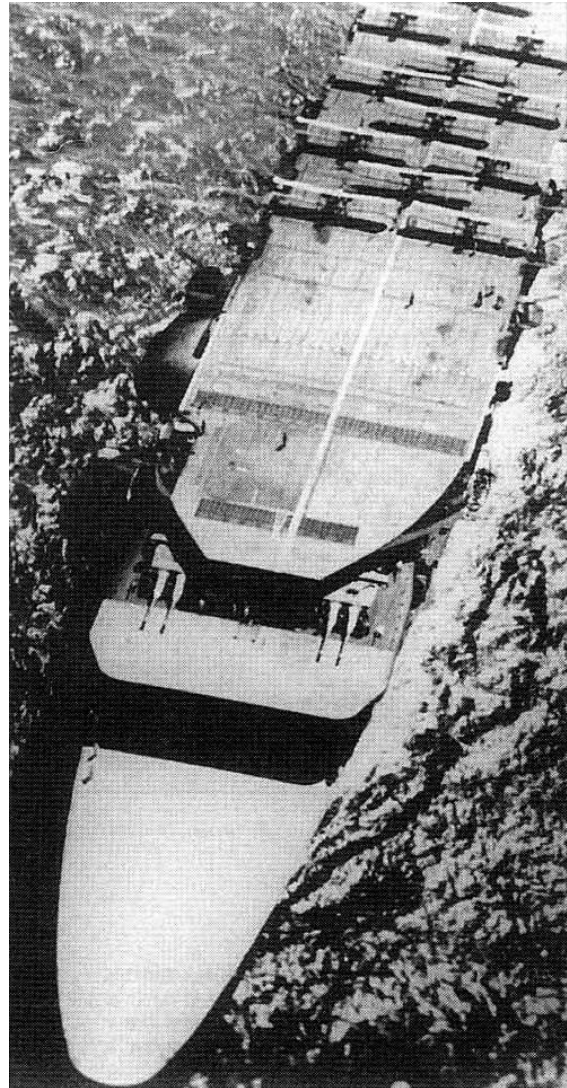
As originally completed, *Akagi* carried an air group of 28 Mitsubishi B1M3 torpedo bombers, 16 Nakajima A1N fighters and 16 Mitsubishi 2MR reconnaissance aircraft.*[7]

Armament and armor

Akagi was armed with ten 50-caliber 20 cm 3rd Year Type No. 1 guns, six in casemates aft and the rest in two twin gun turrets, one on each side of the middle flight deck. They fired 110-kilogram (240 lb) projectiles at a rate of 3–6 rounds per minute with a muzzle velocity of 870 m/s (2,900 ft/s); at 25°, this provided a maximum range between 22,600 and 24,000 meters (24,700 and 26,200 yd). The turrets were nominally capable of 70° elevation to provide additional anti-aircraft fire, but in practice the maximum elevation was only 55°. The slow rate of fire and the fixed 5° loading angle minimized any real anti-aircraft capability.*[14] This heavy gun armament was provided in case she was surprised by enemy cruisers and forced to give battle, but her large and vulnerable flight deck, hangars, and superstructure made her more of a target in any surface action than a fighting warship. Carrier doctrine was still evolving at this time and the impracticality of carriers engaging in gun duels had not yet been realized.*[15]*[Note 1]

The ship carried dedicated anti-aircraft armament of six twin 45-caliber 12 cm 10th Year Type gun mounts fitted on sponsons below the level of the funnels, where they could not fire across the flight deck, three mounts per side.*[17] These guns fired 20.3-kilogram (45 lb) projectiles at a muzzle velocity of 825–830 m/s (2,710–2,720 ft/s); at 45°, this provided a maximum range of 16,000 meters (17,000 yd), and they had a maximum ceiling of 10,000 meters (11,000 yd) at 75° elevation. Their effective rate of fire was 6–8 rounds per minute.*[18]

Akagi 's waterline armored belt was reduced from 254 to 152 mm (10 to 6 in) and placed lower on the ship than originally designed. The upper part of her torpedo bulge was given 102 mm (4 in) of armor. Her deck armor was also reduced from 96 to 79 mm (3.8 to 3.1 in).*[19] The modifications improved the ship's stability by helping compensate for the increased topside weight of the double hangar deck.*[11]



Akagi underway in 1929 with aircraft on the upper flight deck and two gun turrets on the middle flight deck

Propulsion

In *Akagi* 's predecessor, *Hōshō*, the hot exhaust gases vented by swivelling funnels posed a danger to the ship, and wind-tunnel testing had not suggested any solutions. *Akagi* and *Kaga* were given different solutions to evaluate in real-world conditions. *Akagi* was given two funnels on the starboard side. The larger, forward funnel was angled 30° below horizontal with its mouth facing the sea, and the smaller one exhausted vertically a little past the edge of the flight deck. The forward funnel was fitted with a water-cooling system to reduce the turbulence caused by hot exhaust gases and a cover that could be raised to allow the exhaust gases to escape if the ship developed a severe list and the mouth of the funnel touched the sea. *Kaga* adopted a version of this configuration when she was modernized during the mid-1930s.*[20]

Akagi was completed with four Gihon geared steam turbine sets, each driving one propeller shaft, that produced

a total of 131,000 shaft horsepower (98,000 kW). Steam for these turbines was provided by nineteen Type B Kampon boilers with a working pressure of 20 kg/cm² (1,961 kPa; 284 psi). Some boilers were oil-fired, and the others used a mix of fuel oil and coal. As a battlecruiser, she was expected to achieve 28.5 knots (52.8 km/h; 32.8 mph), but the reduction in displacement from 41,200 to 34,000 long tons (41,900 to 34,500 t) increased her maximum speed to 32.5 knots (60.2 km/h; 37.4 mph), which was reached during her sea trials on 17 June 1927. She carried 3,900 long tons (4,000 t) of fuel oil and 2,100 long tons (2,100 t) of coal that gave her a range of 8,000 nautical miles (15,000 km; 9,200 mi) at 14 knots (26 km/h; 16 mph).*[21]

1.2.2 Early service



A stern view of Akagi off Osaka on 15 October 1934. On deck are Mitsubishi B1M and B2M bombers

Akagi joined the Combined Fleet in August 1927 and was assigned to the First Carrier Division upon its formation on 1 April 1928, serving as the division's flagship under Rear Admiral Sankichi Takahashi. The carrier's early career was uneventful, consisting of various training exercises. From 10 December 1928 to 1 November 1929, the ship was captained by Isoroku Yamamoto, future commander of the Combined Fleet. *[22]

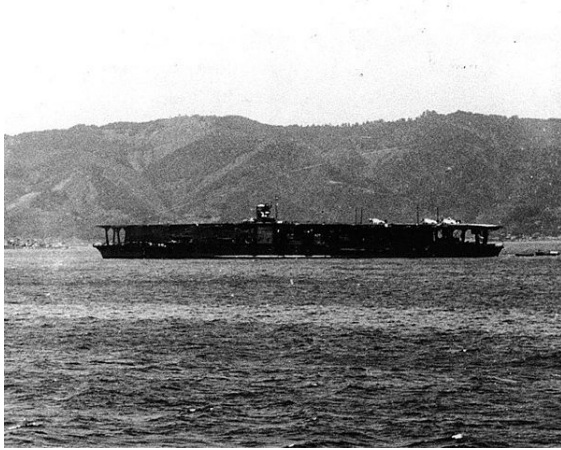
Akagi was reduced to second-class reserve status on 1 December 1931 in preparation for a short refit in which her arresting gear was replaced and her radio and ventilation systems were overhauled and improved. After completion of the refit, Akagi became a first-class reserve ship in December 1932. On 25 April 1933, she resumed active service and joined the Second Carrier Division and participated in that year's Special Fleet Maneuvers. *[23]

At this time, the IJN's carrier doctrine was still in its early stages. Akagi and the IJN's other carriers were initially given roles as tactical force multipliers supporting the fleet's battleships in the IJN's "decisive battle" doctrine. In this role, Akagi's aircraft were to attack enemy battleships with bombs and torpedoes. Aerial strikes against enemy carriers were later (beginning around 1932–1933) deemed of equal importance, with the goal of establishing air superiority during the initial stages of battle. The essential component in this strategy was that the Japanese carrier aircraft must be able to strike first with a massed, preemptive aerial attack. In fleet training exercises, the carriers began to operate together in front of or with the main battle line. The new strategy emphasized maximum speed from both the carriers and the aircraft they carried as well as larger aircraft with greater range. Thus, longer flight decks on the carriers were required in order to handle the newer, heavier aircraft which were entering service. *[24] As a result, on 15 November 1935 Akagi was placed in third-class reserve to begin an extensive modernization at Sasebo Naval Arsenal. *[25]

1.2.3 Reconstruction

Akagi's modernization involved far less work than that of Kaga, but took three times as long due to financial difficulties related to the Great Depression. *[26] The ship's three flight decks were judged too small to handle the larger and heavier aircraft then coming into service. *[27] As a result, the middle and lower flight decks were eliminated in favor of two enclosed hangar decks that extended almost the full length of the ship. The upper and middle hangar areas' total space increased to about 93,000 square feet (8,600 m²); the lower hangar remained the same size. *[8] The upper flight deck was extended to the bow, increasing its length to 249.17 meters (817 ft 6 in) and raising aircraft capacity to 86 (61 operational and 25 in storage). A third elevator midships, 11.8 by 13 meters (38 ft 9 in × 42 ft 8 in) in size, was added. Her arrester gear was replaced by a Japanese-designed, hydraulic, Type 1 system with 9 wires. *[8] *[28] The modernization added an island superstructure on the port side of the ship, which was an unusual arrangement; the only other carrier to share this feature was a contemporary, the Hiryū. The port side was chosen as an experiment to see if that side was better for flight operations by moving the island away from the ship's exhaust outlets. *[27] The new flight deck inclined slightly fore and aft from a point about three-eighths of the way aft. *[29]

Akagi's speed was already satisfactory and the only changes to her machinery were the replacement of the mixed coal/oil-fired boilers with modern oil-fired units and the improvement of the ventilation arrangements. Although the engine horsepower increased from 131,200 to 133,000, her speed declined slightly from 32.5 to 31.2 knots (60.2 to 57.8 km/h; 37.4 to 35.9 mph) on trials because of the increase in her displacement to 41,300 long



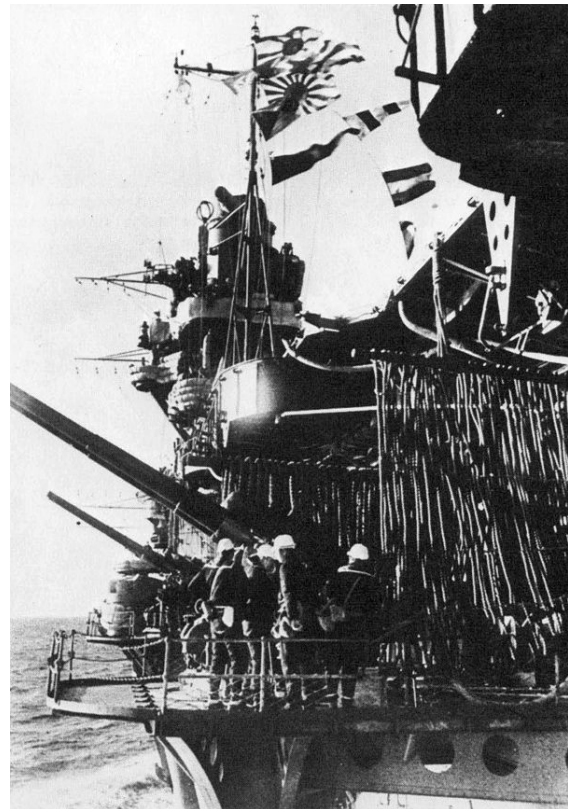
Akagi at Sukumo, Kōchi, in April 1939 with her new, single deck flight platform and island superstructure

tons (42,000 t). Her bunkering was increased to 7,500 long tons (7,600 t) of **fuel oil** which increased her endurance to 10,000 nautical miles (18,520 km; 11,510 mi) at 16 knots (30 km/h; 18 mph). The rear vertical funnel was changed to match the forward funnel and incorporated into the same casing.*[28]*[30]

The two twin turrets on the middle flight deck were removed and fourteen twin **25 mm (1 in) Type 96** gun mounts were added on sponsons.*[31] They fired .25-kilogram (0.55 lb) projectiles at a **muzzle velocity** of 900 m/s (3,000 ft/s); at 50°, this provided a maximum range of 7,500 m (8,200 yd), and an effective ceiling of 5,500 m (18,000 ft). The maximum effective rate of fire was only between 110–120 rounds per minute due to the frequent need to change the 15-round magazines.*[32] Six Type 95 directors were fitted to control the new 25 mm guns and two new Type 94 anti-aircraft directors replaced the outdated Type 91s. After the modernization, *Akagi* carried one Type 89 director for the 20 cm (7.9 in) guns; it is uncertain how many were carried before then.*[8] The ship's crew increased to 2,000 after the reconstruction.*[33]

The ship's anti-aircraft guns were grouped amidships and placed relatively low on the hull. Thus, the guns could not be brought to bear directly forward or aft. Also, the island blocked the forward arcs of the port battery. As a result, the ship was vulnerable to attack by dive bombers. The ship's 12 cm 10th Year Type guns were scheduled to be replaced by more modern 12.7 cm (5.0 in) Type 89 mounts in 1942. The anti-aircraft sponsons were to be raised one deck to allow them some measure of cross-deck fire as was done during *Kaga*'s modernization. However, the ship was lost in combat before the upgrade could take place.*[34]

Several major weaknesses in *Akagi*'s design were not rectified. *Akagi*'s aviation fuel tanks were incorporated directly into the structure of the carrier, meaning that shocks to the ship, such as those caused by bomb or shell



Port-side anti-aircraft gun sponsons in Akagi, showing their low-mounted position on the hull, which greatly restricted their arc of fire.

hits, would be transmitted directly to the tanks, resulting in cracks or leaks. Also, the fully enclosed structure of the new hangar decks made firefighting difficult, at least in part because fuel vapors could accumulate in the hangars. Adding to the danger was the requirement of the Japanese carrier doctrine that aircraft be serviced, fueled, and armed whenever possible on the hangar decks rather than on the flight deck. Furthermore, the carrier's hangar and flight decks carried little armor protection, and there was no redundancy in the ship's fire-extinguishing systems. These weaknesses would later be crucial factors in the loss of the ship.*[35]

1.2.4 Lead-up to World War II

Akagi's modernization was completed on 31 August 1938. She was reclassified as a first reserve ship on 15 November, but did not rejoin the First Carrier Division until the following month. In her new configuration, the carrier embarked 12 **Mitsubishi A5M** Type 96 “Claude” fighters with 4 disassembled spares, 19 **Aichi D1A** “Susie” dive bombers with 5 spares, and 35 **Yokosuka B4Y** “Jean” horizontal/torpedo bombers with 16 spares.*[36] She sailed for southern Chinese waters on 30 January 1939 and supported ground operations there, including attacks on **Guilin** and **Liuzhou**, until 19 February, when she returned to Japan. *Akagi* sup-

ported operations in central China between 27 March and 2 April 1940. She was reclassified as a special purpose ship (*Tokubetse Ilomokan*) on 15 November 1940, while she was being overhauled.*[37]*[38]



Akagi in the summer of 1941

The Japanese experiences off China had helped further develop the IJN's carrier doctrine. One lesson learned in China was the importance of concentration and mass in projecting naval air power ashore. Therefore, in April 1941, the IJN formed the **First Air Fleet**, or *Kido Butai*, to combine all of its fleet carriers under a single command. On 10 April, *Akagi* and *Kaga* were assigned to the First Carrier Division as part of the new carrier fleet, which also included the Second (with carriers *Hiryū* and *Sōryū*), and **Fifth** (with *Shōkaku* and *Zuikaku*) carrier divisions. The IJN centered its doctrine on air strikes that combined the air groups of entire carrier divisions, rather than individual carriers. When multiple carrier divisions were operating together, the divisions' air groups were combined. This doctrine of combined, massed, carrier-based air attack groups was the most advanced of its kind in the world. The IJN, however, remained concerned that concentrating all of its carriers together would render them vulnerable to being wiped out all at once by a massive enemy air or surface strike. Thus, the IJN developed a compromise solution in which the fleet carriers would operate closely together within their carrier divisions but the divisions themselves would operate in loose rectangular formations, with approximately 7,000 meters (7,700 yd) separating each carrier.*[39]

The Japanese doctrine held that entire carrier air groups should not be launched in a single massed attack. Instead, each carrier would launch a "deckload strike" of all its aircraft that could be spotted at one time on each flight deck. Subsequent attack waves consisted of the next deckload of aircraft. Thus, First Air Fleet air attacks would often consist of at least two massed waves of aircraft. The First Air Fleet was *not* considered to be the IJN's primary strategic striking force. The IJN still considered the First Air Fleet an integral component in the Combined Fleet's *Kantai Kessen* or "decisive battle" task force centered on battleships.*[40]*[41]*[42] *Akagi* was designated as the flagship for the First Air Fleet, a role the ship retained until her sinking 14 months later.*[43]

Although the concentration of so many fleet carriers into a single unit was a new and revolutionary offensive strategic concept, the First Air Fleet suffered from several defensive deficiencies that gave it, in **Mark Peattie's** words, a "'glass jaw': it could throw a punch but couldn't take one."*[44] Japanese carrier anti-aircraft guns and associated fire-control systems had several design and configuration deficiencies that limited their effectiveness. Also, the IJN's fleet **combat air patrol** (CAP) consisted of too few fighter aircraft and was hampered by an inadequate early warning system, including lack of **radar**. In addition, poor radio communications with the fighter aircraft inhibited effective command and control of the CAP. Furthermore, the carriers' escorting warships were not trained or deployed to provide close anti-aircraft support. These deficiencies, combined with the shipboard weaknesses previously detailed, would eventually doom *Akagi* and other First Air Fleet carriers.*[45]

1.2.5 World War II

Pearl Harbor and subsequent operations



A6M2 Zero fighters prepare to launch from Akagi as part of the second wave during the attack on Pearl Harbor

Main article: **Attack on Pearl Harbor**

Commanded by Captain **Kiichi Hasegawa**, *Akagi* was Vice Admiral **Chūichi Nagumo's** flagship for the striking force for the **attack on Pearl Harbor***[37] that attempted to cripple the **United States Pacific Fleet**. *Akagi* and the other five carriers, from a position 230 nautical miles (430 km; 260 mi) north of **Oahu**, launched two waves of aircraft on the morning of 7 December 1941. In the first wave, 27 **Nakajima B5N** "Kate" torpedo bombers from *Akagi* torpedoed the battleships *Oklahoma*, *West Virginia*, and *California* while 9 of the ship's **Mitsubishi A6M Zeros** attacked the air base at **Hickam Field**. In the second wave, 18 **Aichi D3A** "Val" dive bombers from the carrier targeted the battleships *Maryland* and *Pennsylvania*, the light cruiser *Raleigh*, the destroyer *Shaw*, and the fleet oiler *Neosho* while nine "Zeros" attacked various American airfields. One of the carrier's Zeros was shot down by American anti-aircraft guns

during the first wave attack, killing its pilot.*[46]*[Note 2]

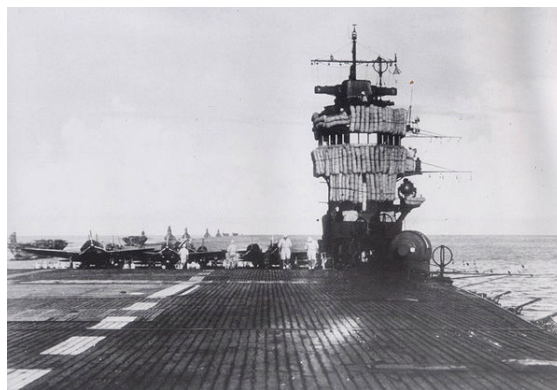
In January 1942, together with the rest of the First and Fifth Carrier Divisions, *Akagi* supported the invasion of Rabaul in the Bismarck Archipelago, as the Japanese moved to secure their southern defensive perimeter against attacks from Australia. She provided 20 B5Ns and 9 Zeros for the initial airstrike on Rabaul on 20 January 1942. The First Carrier Division attacked Allied positions at nearby Kavieng the following day, of which *Akagi* contributed 9 A6M Zeros and 18 D3As. On the 22nd, *Akagi*'s D3As and Zeros again attacked Rabaul before returning to Truk on 27 January.*[48] The Second Carrier Division, with *Sōryū* and *Hiryū*, had been detached to support the invasion of Wake Island on 23 December 1941 and did not reunite with the rest of the carrier mobile striking force until February 1942.*[49]

Akagi, along with *Kaga* and the carrier *Zuikaku*, sortied in search of American naval forces raiding the Marshall Islands on 1 February 1942, before being recalled. On 7 February *Akagi* and the carriers of the First and Second Carrier Divisions were ordered south to the Timor Sea where, on 19 February, from a point 100 nautical miles (190 km; 120 mi) southeast of the easternmost tip of Timor, they launched air strikes against Darwin, Australia, in an attempt to destroy its port and airfield facilities to prevent any interference with the invasion of Java. *Akagi* contributed 18 B5Ns, 18 D3As, and 9 Zeros to the attack, which caught the defenders by surprise. Eight ships were sunk, including the American destroyer *Peary*, and fourteen more were damaged. None of the carrier's aircraft were lost in the attack and the attack was effective in preventing Darwin from contributing to the Allied defense of Java. On 1 March, the American oiler *Pecos* was sunk by D3As from *Sōryū* and *Akagi*. Later that same day the American destroyer *Edsall* was attacked and sunk by D3As from *Akagi* and *Sōryū*, in combination with gunfire from two battleships and two heavy cruisers of the escort force. *Akagi* and her consorts covered the invasion of Java, although her main contribution appears to have been providing 18 “Kates” and 9 “Zeros” for the 5 March air strike on Tjilatjap. This group was very successful, sinking eight ships in the harbor there and none of *Akagi*'s aircraft were lost. Most of the Allied forces in the Dutch East Indies surrendered to the Japanese later in March. The *Kido Butai* then sailed for Staring Bay on Celebes Island to refuel and recuperate.

Indian Ocean raid

Main article: Indian Ocean raid

On 26 March, *Akagi* set sail for the Indian Ocean raid with the rest of the *Kido Butai*. The Japanese intent was to defeat the British Eastern Fleet and destroy British airpower in the region in order to secure the flank of their operations in Burma.*[50] On 5 April 1942, *Akagi* launched 17 B5Ns and 9 Zeros in an air strike



Akagi leaving Celebes Island for the attack on Colombo, 26 March 1942. In the background are other carriers and battle-ships of the carrier striking force. Rolled futon mattresses have been lashed to the island to provide extra protection from enemy attack.

against Colombo, Ceylon, which damaged the port facilities. None of the aircraft were lost and the Zero pilots claimed to have shot down a dozen of the defending British fighters. Later that day, 17 D3As from *Akagi* helped to sink the British heavy cruisers *Cornwall* and *Dorsetshire*. On 9 April, she attacked Trincomalee with 18 B5Ns, escorted by 6 Zeros which claimed to have shot down 5 Hawker Hurricane fighters (only two of which can be confirmed from Allied records) without loss to themselves. Meanwhile a floatplane from the battleship *Haruna* spotted the small aircraft carrier *Hermes*, escorted by the Australian destroyer *Vampire*, and every available D3A was launched to attack the ships. *Akagi* contributed 17 dive bombers and they helped to sink both ships; they also spotted the oil tanker RFA *Athelstone*, escorted by the corvette *Hollyhock*, as well and sank both without loss. During the day's actions, the carrier narrowly escaped damage when nine British Bristol Blenheim bombers from Ceylon penetrated the CAP and dropped their bombs from 11,000 feet (3,400 m), just missing the carrier and the heavy cruiser *Tone*.*[51] Four of the Blenheims were subsequently shot down by CAP fighters and one was shot down by aircraft from the carriers' returning air strike.*[52] After the raid, the carrier mobile striking force returned to Japan to refit and replenish.*[53]

On 19 April 1942, while near Taiwan during the transit to Japan, *Akagi*, *Sōryū*, and *Hiryū* were sent in pursuit of the American carriers *Hornet* and *Enterprise*, which had launched the Doolittle Raid. They found only empty ocean, however, for the American carriers had immediately departed the area to return to Hawaii. *Akagi* and the other carriers shortly abandoned the chase and dropped anchor at Hashirajima anchorage on 22 April.*[54] On 25 April, Captain Taijiro Aoki relieved Hasegawa as skipper of the carrier.*[55] Having been engaged in constant operations for four and a half months, the ship, along with the other three carriers of the First and Second Car-

rier Divisions, was hurriedly refitted and replenished in preparation for the Combined Fleet's next major operation, scheduled to begin one month hence.*[56] The Fifth Carrier Division, with *Shōkaku* and *Zuikaku*, had been detached in mid-April to support *Operation Mo*, resulting in the *Battle of the Coral Sea*. While at Hashirajima, *Akagi*'s air group was based ashore in *Kagoshima* and conducted flight and weapons training with the other First Air Fleet carrier units.*[57]

Midway

Main article: *Battle of Midway*

Concerned by the US carrier strikes in the Marshall Is-



First Air Fleet commander Vice Admiral Chūichi Nagumo, for whom *Akagi* served as flagship from Pearl Harbor to Midway

lands, *Lae-Salamaua*, and the Doolittle raids, Yamamoto determined to force the US Navy into a showdown to eliminate the American carrier threat. He decided to invade and occupy *Midway Island*, which he was sure would draw out the American carrier forces to battle. The Japanese codenamed the Midway invasion *Operation MI*.*[58]

On 25 May 1942, *Akagi* set out with the Combined Fleet's carrier striking force in the company of carriers *Kaga*, *Hiryū*, and *Sōryū*, which constituted the First and Second Carrier Divisions, for the attack on *Midway Island*. Once again, Nagumo flew his flag on *Akagi*. Because of damage and losses suffered during the *Battle of the Coral Sea*, the Fifth Carrier Division with carriers *Shōkaku* and *Zuikaku* was absent from the operation. *Akagi*'s aircraft complement consisted of 24 Zeros, 18 D3As, and 18 B5Ns.*[59]*[Note 3]

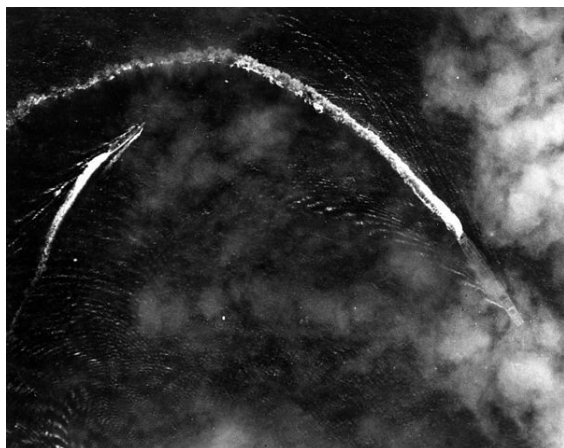
With the fleet positioned 250 nautical miles (460 km;

290 mi) northwest of Midway Island at dawn (04:45 local time) on 4 June 1942, *Akagi*'s portion of the 108-plane combined air raid was a strike on the airfield on Eastern Island with 18 dive bombers escorted by nine Zeros. The carrier's B5Ns were armed with torpedoes and kept ready in case enemy ships were discovered during the Midway operation. The only loss during the raid from *Akagi*'s air group was one Zero shot down by AA fire and three damaged; four dive bombers were damaged, of which one could not be repaired.*[61] Unbeknownst to the Japanese, the US Navy had discovered the Japanese *MI* plan by breaking the Japanese cipher and had prepared an ambush using its three available carriers, positioned northeast of Midway.*[62]

One of *Akagi*'s torpedo bombers was launched to augment the search for any American ships that might be in the area.*[Note 4] The carrier contributed three Zeros to the total of 11 assigned to the initial combat air patrol over the four carriers. By 07:00, the carrier had 11 fighters with the CAP which helped to defend the *Kido Butai* from the first US attackers from Midway Island at 07:10.*[64]

At this time, Nagumo's carriers were attacked by six US Navy *Grumman TBF Avengers* from *Torpedo Squadron 8* (VT-8) and four *United States Army Air Forces* (USAAF) *B-26 Marauders*, all carrying torpedoes. The Avengers went after *Hiryū* while the Marauders attacked *Akagi*. The 30 CAP Zeroes in the air at this time, including the 11 from *Akagi*, immediately attacked the American aircraft, shooting down five of the Avengers and two of the B-26s. One of *Akagi*'s Zeroes, however, was shot down by defensive fire from the B-26s. Several of the Marauders dropped their torpedoes, but all missed. One, piloted by Lieutenant *James Muri*, strafed *Akagi* after dropping its torpedo, killing two men. Another, either attempting a suicide ramming, unflyable due to battle damage, or because of an incapacitated pilot, narrowly missed crashing into *Akagi*'s bridge, where Nagumo was standing, before it cartwheeled into the sea.*[65]

At 07:15, Admiral Nagumo ordered the B5Ns on *Kaga* and *Akagi* rearmed with bombs for another attack on Midway itself. This process was limited by the number of ordnance carts (used to handle the bombs and torpedoes) and ordnance elevators, preventing torpedoes from being struck below until after all the bombs were moved up from their *magazine*, assembled, and mounted on the aircraft. This process normally took about an hour and a half; more time would be required to bring the aircraft up to the flight deck, warm up and launch the strike group. Around 07:40, Nagumo reversed his order when he received a message from one of his scout aircraft that American warships had been spotted.*[66] Three of *Akagi*'s CAP Zeroes landed aboard the carrier at 07:36.*[67] At 07:40, her lone scout returned, having sighted nothing.*[68]*[Note 5]



Akagi (right, partially obscured by clouds) takes evasive action during an aerial attack by US B-17s shortly after 08:00 on 4 June 1942. The trailing ship at left is probably the carrier's plane guard destroyer, Nowaki. The photograph was taken from one of the attacking B-17s. [70]

Sinking At 07:55, the next American strike from Midway arrived in the form of 16 Marine SBD-2 Dauntless dive bombers of VMSB-241 under Major Lofton R. Henderson. [Note 6] *Akagi* 's three remaining CAP fighters were among the nine still aloft that attacked Henderson's planes, shooting down six of them as they executed a fruitless glide bombing attack on *Hiryū*. [72] At roughly the same time, the Japanese carriers were attacked by 12 USAAF B-17 Flying Fortresses, bombing from 20,000 feet (6,100 m). The high altitude of the B-17s gave the Japanese captains enough time to anticipate where the bombs would land and successfully maneuver their ships out of the impact area. Four B-17s attacked *Akagi*, but missed with all their bombs. [73]

Akagi reinforced the CAP with launches of three Zeros at 08:08 and four at 08:32. [74] These fresh Zeros helped defeat the next American air strike from Midway, 11 Vought SB2U Vindicator from VMSB-241, which attacked the battleship *Haruna* starting around 08:30. Three of the Vindicators were shot down, and *Haruna* escaped damage. [75] Although all the American air strikes had thus far caused negligible damage, they kept the Japanese carrier forces off-balance as Nagumo endeavored to prepare a response to news, received at 08:20, of the sighting of American carrier forces to his north-east. [76]

Akagi began recovering her Midway strike force at 08:37 and finished shortly after 09:00. [77] The landed aircraft were quickly struck below, while the carriers' crews began preparations to spot aircraft for the strike against the American carrier forces. The preparations, however, were interrupted at 09:18 when the first American carrier aircraft to attack were sighted. These consisted of 15 Douglas TBD Devastator torpedo bombers of VT-8, led by John C. Waldron from the carrier *Hornet*. The six air-borne *Akagi* CAP Zeroes joined the other 15 CAP fight-

ers currently aloft in destroying Waldron's planes. All 15 of the American planes were shot down as they attempted a torpedo attack on *Soryū*, leaving one surviving aviator treading water. [78]

Shortly afterwards 14 Devastators from VT-6 from the carrier *Enterprise*, led by Eugene E. Lindsey, attacked. Lindsey's aircraft tried to sandwich *Kaga*, but the CAP, reinforced by an additional eight Zeros launched by *Akagi* at 09:33 and 09:40, shot down all but four of the Devastators, and *Kaga* dodged the torpedoes. Defensive fire from the Devastators shot down one of *Akagi* 's Zeros. [79] [80] [Note 7]



A group photo of the American dive bomber pilots of VB-6 from Enterprise, three of whom fatally damaged Akagi. Richard Best is sitting in the center of the front row. The other two who attacked Akagi with Best were Edwin J. Kroeger (standing, eighth from the left) and Frederick T. Weber (standing, sixth from the right). [82]

Minutes after the torpedo plane attacks, American carrier-based dive bombers arrived over the Japanese carriers almost undetected and began their dives. It was at this time, around 10:20, that in the words of Jonathan Parshall and Anthony Tully, the "Japanese air defenses would finally and catastrophically fail." [83] Twenty-eight dive bombers from *Enterprise*, led by C. Wade McClusky, began an attack on *Kaga*, hitting her with at least four bombs. At the last minute, one of McClusky's elements of three bombers from VB-6, led by squadron commander Richard Best who deduced *Kaga* to be fatally damaged, broke off and dove simultaneously on *Akagi*. At approximately 10:26, the three bombers hit her with one 1,000-pound (450 kg) bomb and just missed with two others. The first near-miss landed 5–10 m (16–33 ft) to port, near her island. The third bomb just missed the flight deck and plunged into the water next to the stern. The second bomb, likely dropped by Best, landed at the aft edge of the middle elevator and detonated in the upper hangar. This hit set off explosions among the fully armed and fueled B5N torpedo bombers that were being prepared for an air strike against the American carriers, starting large fires. [84] [Note 8]

At 10:29, Captain Aoki ordered the ship's magazines

flooded. The forward magazines were promptly flooded, but not the aft magazines because of valve damage, likely caused by the near miss aft. The ship's main water pump appears to have been damaged, greatly hindering fire fighting efforts. On the upper hangar deck, at 10:32 damage control teams attempted to control the spreading fires by employing the one-shot CO2 fire-suppression system. Whether the system functioned or not is unclear, but the burning aviation fuel proved impossible to control, and serious fires began to advance deeper into the interior of the ship. At 10:40, additional damage caused by the rear near-miss made itself known when the ship's rudder jammed 30 degrees to starboard during an evasive maneuver.*[87]

Shortly thereafter, the fires broke through the flight deck and heat and smoke made the ship's bridge unusable. At 10:46, Admiral Nagumo transferred his flag to the light cruiser *Nagara*.*[Note 9] *Akagi* stopped dead in the water at 13:50 and her crew, except for Captain Taijiro Aoki and damage-control personnel, was evacuated. She burned through the night but did not sink as her crew fought a losing battle against the spreading fires.*[90]*[Note 10] The damage-control teams and Captain Aoki were evacuated.*[94]*[Note 11]

At 04:50 on 5 June, Yamamoto ordered *Akagi* scuttled, saying to his staff, "I was once the captain of *Akagi*, and it is with heartfelt regret that I must now order that she be sunk."*[8] Destroyers *Arashi*, *Hagikaze*, *Maikaze*, and *Nowaki* each fired one torpedo into the carrier and she sank, bow first, at 05:20 at 30°30'N 178°40'W / 30.500°N 178.667°W Coordinates: 30°30'N 178°40'W / 30.500°N 178.667°W. Two hundred and sixty-seven men of the ship's crew were lost, the fewest of any of the Japanese fleet carriers lost in the battle.*[8]*[Note 12] The loss of *Akagi* and the three other IJN carriers at Midway, comprising two thirds of Japan's total number of fleet carriers and the experienced core of the First Air Fleet, was a crucial strategic defeat for Japan and contributed significantly to Japan's ultimate defeat in the war.*[97] In an effort to conceal the defeat, *Akagi* was not immediately removed from the Navy's registry of ships, instead being listed as "unmanned" before finally being struck from the registry on 25 September 1942.*[98]

1.2.6 Notes

- [1] The United States Navy did much the same with the provision of four twin 8-inch (203 mm) gun turrets on their *Lexington*-class carriers.*[16]

In preparation for the attack, the ship was anchored at Ariake Bay, Kyushu beginning in September 1941 while its aircraft were based at Kagoshima to train with the other 1st Air Fleet air units for the Pearl Harbor operation. Once preparations and training were completed, *Akagi* assembled with the rest of the First Air Fleet at Hitokappu Bay in the Kuril Islands on 22 November 1941. The ships departed on 26 November 1941 for Hawaii.



Crewmembers gather on the flight deck of *Akagi* at Hitokappu Bay, Kuriles in November 1941 prior to the attack on Pearl Harbor. The other carriers in the background are, from left to right: *Kaga*, *Shōkaku*, *Zuikaku*, *Hiryū*, and *Sōryū*.

In addition to the aircraft which participated in the raid, three of the carrier's Zero fighters were assigned to the CAP. One of the carrier's Zero fighters attacked a Boeing B-17 Flying Fortress heavy bomber that had just arrived from the mainland, setting it on fire as it landed at Hickam, killing one of its crew. A crewman in one of the torpedo bombers was severely wounded and died after returning to *Akagi*.*[47]

- [3] Six of the Zeros were intended to be stationed on Midway after the invasion and belonged to the 6th Air Group. At least three of these six aircraft were used for combat operations by the carrier's crew during the resulting battle.*[60]
- [4] *Akagi*'s torpedo-bomber scout plane was assigned a search line of 181 degrees from the mobile striking force out to 300 nautical miles.*[63]
- [5] This recorded return time for *Akagi*'s scout aircraft is odd since all the other carrier striking force scout planes had been assigned 600-mile search patterns and would not return for another one and a half to two hours.*[69]
- [6] To this day there is much confusion about VMSB-241 at Midway. At that time, the squadron was in transition from the obsolete SB2U Vindicator to the modern SBD-2 Dauntless and flew both aircraft during the battle.*[71]
- [7] At 10:15, a torpedo bomber had departed the carrier on a scouting mission, but turned back, for unknown reasons, shortly thereafter. The aircraft was recovered by *Hiryū* and took part in that carrier's second strike against Yorktown.*[81]
- [8] American carrier dive bomber doctrine dictated that when two squadrons were presented with two priority targets, in this case *Kaga* and *Akagi*, the first squadron on scene was to attack the more distant target, in this case, *Akagi*. Apparently unfamiliar with this doctrine, McClusky led his squadron, the first to arrive, at *Kaga*. Best, following the doctrine, also initially went after *Kaga*. Only after seeing McClusky's squadron smash *Kaga* did Best decide to take his element after *Akagi*.*[85] Shortly before the dive bomber attack, *Akagi* had recovered five of its CAP Zeros. One Zero relaunched soon afterwards at 10:25, just as Best's bombers were entering their dives on his ship. The other recently landed Zeroes had probably already been

- taken to the hangar deck. There may have been two or three other Zeroes spotted on the flight deck when the ship was hit by Best's bomb.*[64]*[86]
- [9] Nagumo and his staff were forced to evacuate through the forward windows of the bridge by rope. Nagumo's chief of staff, Rear Admiral Ryūnosuke Kusaka, badly sprained both ankles and was burned during the evacuation.*[88] At 11:00, seven of *Akagi's* airborne CAP Zeros were recovered by *Hiryū* just after she had launched her first strike against the US carriers.*[89]
- [10] Destroyers *Arashi* and *Nowaki* were directed to stand by the carrier throughout the rest of the day and through the night as she burned uncontrollably. After *Kaga* sank, *Hagikaze* and *Maikaze* joined *Akagi's* escorts.*[91] The carrier's engines, for unknown reasons, restarted around 12:30 and slowly moved the ship, still with a jammed rudder, in a large circle to starboard until they failed again at 13:50. Also, at 13:00, the aft magazines were finally flooded.*[92] A large explosion occurred at 15:00, blowing open the bulkhead overhanging the anchor deck.*[93]
- [11] Aoki refused to abandon ship with the damage control teams at 22:00 and had himself tied to the anchor capstan. Two hours later, the carrier's senior staff, accompanied by Captain Kosaku Ariga, commander of Destroyer Division 4, reboarded the carrier. Ariga, who was senior to Aoki, ordered him to abandon ship. Aoki was the only Japanese fleet carrier commander to survive the battle. He retired from the navy in October 1942 but was recalled to service a year later, and survived the war.*[95]
- [12] Of the ship's fatalities, 115 were engineers, giving that department a 36 per cent casualty rate (the ship had 303 total personnel assigned to engineering), the highest on the carrier. Seven of the carrier's aircrew members were killed, also the fewest of any of the four fleet carriers lost in the battle. Other crewmembers killed included 72 seamen, 68 mechanics, one maintenance man, and five clerks. After returning to Japan, some of the carrier's injured survivors were quarantined in hospitals for almost a year.*[96]
- [12] Peattie, pp. 54–55; Parshall and Tully, pp. 462–63
- [13] Parshall and Tully, p. 477
- [14] Campbell, pp. 185–88
- [15] Peattie, pp. 53, 55
- [16] Gardiner and Gray, p. 110
- [17] Lengerer, p. 131
- [18] Campbell, p. 194
- [19] Lengerer, pp. 128, 130
- [20] Lengerer, pp. 130–31, 137; Peattie, p. 54
- [21] Lengerer, pp. 129, 131
- [22] Tully; Peattie, pp. 72, 323; Hata and Izawa, p. 20; Lengerer, pp. 130, 170–71; Hoyt, pp. 60–63.
- [23] Peattie, pp. 72, 323; Hata and Izawa, p. 20; Lengerer, pp. 130, 170–71
- [24] Peattie, pp. 72–76; Stille, p. 13; Goldstein and Dillon, pp. 76–78
- [25] Lengerer, pp. 130, 170–71
- [26] Parshall and Tully, p. 466
- [27] Parshall and Tully, p. 7
- [28] Lengerer, pp. 137–38
- [29] Watts, pp. 171–72; Jentschura, Jung and Mickel, p. 44
- [30] Watts, pp. 172–73
- [31] Lengerer, p. 139
- [32] Campbell, p. 200
- [33] Jentschura, Jung and Mickel, p. 44
- [34] Parshall and Tully, p. 138
- [35] Peattie, pp. 65, 70, 159; Stille, pp. 15–16; Willmott, p. 415; Parshall and Tully, p. 245
- [36] Hata and Izawa, p. 20
- [37] Lengerer, p. 171
- [38] Hata and Izawa, p. 11
- [39] Lengerer, p. 171; Parshall and Tully, pp. 82, 86, 137–38, and 416; Peattie, pp. 124–25, 147–53; Tully; Stille, pp. 13–14; Prange, *At Dawn We Slept*, pp. 101–06
- [40] Parshall and Tully, pp. 86–87
- [41] Peattie, p. 152
- [42] Goldstein and Dillon, pp. 78–80
- [43] Parshall and Tully, pp. 266–67
- [44] Peattie, p. 159

1.2.7 Footnotes

- [1] Silverstone, p. 325
- [2] Lengerer, p. 128
- [3] Peattie, p. 54; Watts, p. 171; Jentschura, Jung and Mickel, p. 36; Parshall and Tully, pp. 6–7
- [4] Parshall and Tully, pp. 7, 535
- [5] Watts, p. 65; Jentschura, Jung and Mickel, p. 36
- [6] Goldstein, Dillon and Wenger, p. 8
- [7] Lengerer, p. 129
- [8] Parshall and Tully, p. 463
- [9] Brown, p. 2
- [10] Lengerer, p. 130
- [11] Peattie, p. 54

- [45] Parshall and Tully, pp. 85, 136–45; Peattie, pp. 155–59; Stille, pp. 14–15, 50–51
- [46] Lengerer, pp. 172, 174–75; Parshall and Tully, p. 131; Werneth, pp. 16–17, 274; Hata and Izawa, p. 21; Evans and Fuchida, p. 54; Prange, “Dec 7”, p. 265
- [47] Prange, “At Dawn”, pp. 199, 258, 266, 365, 390; Prange, “Dec 7”, pp. 87, 192, 321; Evans and Fuchida, pp. 42–43
- [48] Lengerer, pp. 175–76
- [49] Parshall and Tully, p. 11
- [50] Lengerer, pp. 176–77, 305–07; Gill, p. 590; Dull, pp. 57–58
- [51] Shores, et al., pp. 395, 403–04, 406, 413, 421–26
- [52] Parshall and Tully, pp. 145, 549
- [53] Lengerer, pp. 306, 308–09
- [54] Lengerer, p. 319; Tully; Parshall and Tully, p. 42
- [55] Tully
- [56] Parshall and Tully, p. 12
- [57] Parshall and Tully, pp. 10, 88
- [58] Stille, p. 22
- [59] Parshall and Tully, pp. 3, 10, 450
- [60] Parshall and Tully, pp. 90, 149
- [61] Parshall and Tully, pp. 112, 129, 204; Werneth, p. 20
- [62] Parshall and Tully, pp. 151, 154; Stille, p. 59
- [63] Parshall and Tully, pp. 107–11
- [64] Parshall and Tully, p. 500
- [65] Parshall and Tully, pp. 151–52; Lundstrom, p. 337
- [66] Parshall and Tully, pp. 156–59
- [67] Parshall and Tully, pp. 156, 500
- [68] Parshall and Tully, p. 159
- [69] Parshall and Tully, p. 550
- [70] Parshall and Tully, p. 181
- [71] Condon, p. 13
- [72] Parshall and Tully, p. 176
- [73] Parshall and Tully, pp. 178, 180
- [74] Parshall and Tully, p. 508
- [75] Lundstrom, p. 338
- [76] Parshall and Tully, pp. 183–88
- [77] Parshall and Tully, pp. 154–55
- [78] Parshall and Tully, pp. 205–09
- [79] Parshall and Tully, pp. 213–14
- [80] Stille, p. 62
- [81] Parshall and Tully, pp. 265, 522
- [82] Parshall and Tully, p. 239; Cressman, et al., p. 103
- [83] Parshall and Tully, p. 219
- [84] Parshall and Tully, pp. 239–42
- [85] Parshall and Tully, pp. 228, 239
- [86] Werneth, p. 92
- [87] Parshall and Tully, pp. 254–59; Peattie, p. 159; Werneth, p. 24
- [88] Dull, p. 161; Parshall and Tully, p. 260
- [89] Parshall and Tully, pp. 264, 500–01
- [90] Parshall and Tully, pp. 276–78, 299–300
- [91] Parshall and Tully, pp. 267, 339
- [92] Parshall and Tully, pp. 286–88
- [93] Parshall and Tully, pp. 309–10
- [94] Parshall and Tully, pp. 281, 340–41
- [95] Parshall and Tully, pp. 340–41, 569
- [96] Parshall and Tully, pp. 281, 386–87, 417, 476, 561
- [97] Fuchida and Okumiya, p. 231; Parshall and Tully, pp. 419, 421
- [98] Parshall and Tully, p. 388

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1.2.9 External links

- United States Navy photos
- WW2DB: Akagi

1.3 Japanese aircraft carrier Sōryū

Soryu (蒼龍 *Sōryū*, meaning "Blue (or Green) Dragon") was an aircraft carrier built for the Imperial Japanese Navy (IJN) during the mid-1930s. A sister ship, *Hiryū*, was intended to follow *Sōryū*, but *Hiryū*'s design was

heavily modified and she is often considered to be a separate class.*[Note 1] Sōryū's aircraft were employed in operations during the Second Sino-Japanese War in the late 1930s and supported the Japanese invasion of French Indochina in mid-1940. During the first months of the Pacific War, she took part in the attack on Pearl Harbor, the Battle of Wake Island, and supported the conquest of the Dutch East Indies. In February 1942, her aircraft bombed Darwin, Australia, and she continued on to assist in the Dutch East Indies campaign. In April, Sōryū's aircraft helped sink two British heavy cruisers and several merchant ships during the Indian Ocean raid.

After a brief refit, Sōryū and three other carriers of the First Air Fleet (*Kido Butai*) participated in the Battle of Midway in June 1942. After bombarding American forces on Midway Atoll, the carriers were attacked by aircraft from the island and the carriers *Enterprise*, *Hornet*, and *Yorktown*. Dive bombers from *Yorktown* crippled Sōryū and set her afire. She could not be salvaged and was ordered to be scuttled so as to allow her attendant destroyers to be released for further operations. She sank with the loss of 711 officers and enlisted men of the 1,103 aboard. The loss of Sōryū and three other IJN carriers at Midway was a crucial strategic defeat for Japan and contributed significantly to the Allies' ultimate victory in the Pacific.

1.3.1 Design

Sōryū was one of two large carriers approved for construction under the Imperial Japanese Navy's 1931–32 Supplementary Program (the other being her near sister *Hiryū*). In contrast to some earlier Japanese carriers, such as *Akagi* and *Kaga*, which were conversions of battlecruiser and battleship hulls respectively, Sōryū was designed from the keel up as an aircraft carrier and incorporated lessons learned from the light carrier *Ryūjō*.*[3]

The ship had a length of 227.5 meters (746 ft 5 in) overall, a beam of 21.3 meters (69 ft 11 in) and a draft of 7.6 meters (24 ft 11 in). She displaced 16,200 tonnes (15,900 long tons) at standard load and 19,100 tonnes (18,800 long tons) at normal load. Her crew consisted of 1,100 officers and enlisted men.*[4]

Machinery

Sōryū was fitted with four geared steam turbine sets with a total of 152,000 shaft horsepower (113,000 kW), each driving one propeller shaft, using steam provided by eight Kampon water-tube boilers.*[4] The turbines and boilers were the same as those used in the *Mogami*-class cruisers. The ship's power and slim, cruiser-type hull, with a length-to-beam ratio of 10:1, gave her a speed of 34.5 knots (63.9 km/h; 39.7 mph)*[5] and made her the fastest carrier in the world at the time of her commissioning.*[6] Sōryū carried 3,710 metric tons (3,650 long tons)

of fuel oil, which gave her a range of 7,750 nautical miles (14,350 km; 8,920 mi) at 18 knots (33 km/h; 21 mph). The boiler uptakes were trunked together to the ship's starboard side amidships and exhausted just below flight deck level through two funnels curved downwards.*[7]



Sōryū on her speed trials, November 1937

Flight deck and hangars

The carrier's 216.9-meter (711 ft 7 in) flight deck was 26 meters (85 ft 4 in) wide and overhung her superstructure at both ends, supported by pairs of pillars.*[7] Sōryū's island was built on a starboard-side extension that protruded beyond the side of the hull so that it did not encroach on the width of the flight deck. Nine transverse arrestor wires were installed on the flight deck and could stop a 6,000 kg (13,000 lb) aircraft. The flight deck was only 12.8 meters (42 ft 0 in) above the waterline and the ship's designers kept this distance low by reducing the height of the hangars.*[8] The upper hangar was 171.3 by 18.3 metres (562 by 60 ft) and had an approximate height of 4.6 meters (15 ft 1 in); the lower was 142.3 by 18.3 metres (467 by 60 ft) and had an approximate height of 4.3 meters (14 ft 1 in). Together they had an approximate total area of 5,736 square metres (61,742 sq ft).*[7] This caused problems in handling aircraft because the wings of a Nakajima B5N "Kate" torpedo bomber could neither be spread nor folded in the upper hangar.*[9]

Aircraft were transported between the hangars and the flight deck by three elevators, the forward one abreast the island on the centerline and the other two offset to starboard.*[10] The forward platform measured 16 by 11.5 meters (52 ft 6 in × 37 ft 9 in), the middle one 11.5 by 12 meters (37 ft 9 in × 39 ft 4 in), and the rear 11.8 by 10 meters (38 ft 9 in × 32 ft 10 in).*[7] They were capable of transferring aircraft weighing up to 5,000 kilograms (11,000 lb).*[8] Sōryū had an aviation gasoline (avgas) capacity of 570,000 liters (130,000 imp gal; 150,000 U.S. gal) for her planned aircraft capacity of sixty-three plus nine spares.*[10]

Armament

Sōryū's primary anti-aircraft (AA) armament consisted of six twin-gun mounts equipped with 40-caliber 12.7-centimeter Type 89 dual-purpose guns mounted on projecting sponsons, three on either side of the carrier's hull.*[9] The guns had a range of 14,700 meters (16,100 yd), and a ceiling of 9,440 meters (30,970 ft) at an elevation of +90 degrees. Their maximum rate of fire was fourteen rounds a minute, but their sustained rate of fire was around eight rounds per minute.*[11] The ship was equipped with two Type 94 fire-control directors to control the 12.7-centimeter (5.0 in) guns, one for each side of the ship,*[12] although the starboard director on the island could control all of the Type 89 guns.*[9]

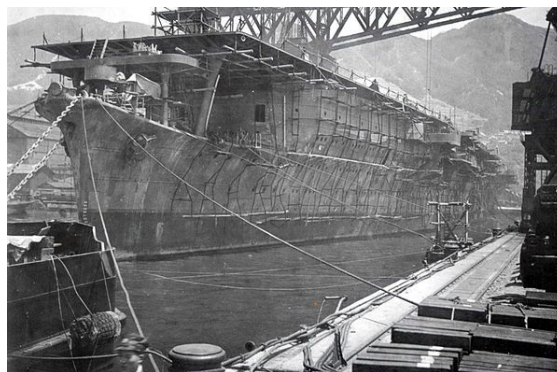
The ship's light AA armament consisted of fourteen twin-gun mounts for license-built Hotchkiss 25 mm (1 in) Type 96 AA guns. Three of these were sited on a platform just below the forward end of the flight deck.*[9] The gun was the standard Japanese light AA weapon during World War II, but it suffered from severe design shortcomings that rendered it largely ineffective. According to historian Mark Stille, the weapon had many faults including an inability to “handle high-speed targets because it could not be trained or elevated fast enough by either hand or power, its sights were inadequate for high-speed targets, it possessed excessive vibration and muzzle blast”.*[13] These guns had an effective range of 1,500–3,000 meters (1,600–3,300 yd), and a ceiling of 5,500 meters (18,000 ft) at an elevation of +85 degrees. The effective rate of fire was only between 110 and 120 rounds per minute because of the frequent need to change the 15-round magazines.*[14] The Type 96 guns were controlled by five Type 95 directors, two on each side and one in the bow.*[12]

Armor

To save weight, *Sōryū* was minimally armored; her waterline belt of 41 millimeters (1.6 in) of Ducol steel only protected the machinery spaces and the magazines. Comparable figures for *Hiryū* were 90 millimeters (3.5 in) over the machinery spaces and the avgas storage tanks increasing to 150 millimeters (5.9 in) over the magazines. *Sōryū*'s waterline belt was backed by an internal anti-splinter bulkhead. The ship's deck was only 25 mm thick over the machinery spaces and 55 millimeters (2.2 in) thick over the magazines and avgas storage tanks.*[8]

1.3.2 Construction and service

Following the Japanese ship-naming conventions for aircraft carriers, *Sōryū* was named “Blue (or Green) Dragon”.*[15] The ship was laid down at the Kure Naval Arsenal on 20 November 1934, launched on 21 December 1935 and commissioned on 29 January 1937.*[16]



Sōryū fitting out at Kure Naval Arsenal, early 1937

She was assigned to the Second Carrier Division after commissioning. Her air group was intended to consist of eighteen Mitsubishi A5M (“Claude”) monoplane fighters, twenty-seven Aichi D1A2 (“Susie”) Type 96 dive bombers, and twelve Yokosuka B4Y (“Jean”) Type 96 torpedo bombers, but the A5Ms were in short supply and Nakajima A4N1 biplanes were issued instead. On 25 April 1938, nine A4Ns, eighteen D1A2s, and nine B4Ys transferred to Nanking to support forces advancing up the Yangtze River. The air group advanced with the successful Japanese offensive, despite the commitment by the Chinese of 150 aircraft of the Soviet Volunteer Group; it was transferred to Wuhu in early June and then to Anqing. Little is known of its operations there, but its primary role during this time was air defense. One fighter pilot of the group was killed after he shot down a Chinese aircraft. Leaving a few fighters and their pilots behind to serve as the nucleus of a new fighter unit, the air group returned to *Sōryū* on 10 July. The ship supported operations over Canton in September, but her aircraft saw no aerial combat. She returned home in December and spent most of the next year and a half training.*[17]

In September–October 1940, the ship was based at Hainan Island to support the Japanese invasion of French Indochina. In February 1941, *Sōryū* moved to Taiwan to reinforce the blockade of Southern China.*[18] Two months later, the 2nd Carrier Division was assigned to the First Air Fleet, or *Kido Butai*, on 10 April.*[19] *Sōryū*'s air group was detached in mid-July and transferred to Hainan Island to support the occupation of southern Indochina.*[18] *Sōryū* returned to Japan on 7 August and became flagship of the 2nd Division. She was relieved of that role on 22 September as she began a short refit that was completed on 24 October. The ship arrived at Kagoshima two days later and she resumed her former role as flagship of the Division.*[19]

Pearl Harbor and subsequent operations

Main article: Attack on Pearl Harbor

In November 1941 the IJN's Combined Fleet, under Admiral Isoroku Yamamoto, prepared to participate in



D3A dive bombers preparing to take off; Sōryū is in the background

Japan's initiation of war with the United States by conducting a preemptive strike against the US Navy's Pacific Fleet base at Pearl Harbor, Hawaii. On 22 November, Sōryū, commanded by Captain Ryusaku Yanagimoto, and the rest of the *Kido Butai* under Vice Admiral Chuichi Nagumo, including six fleet carriers from the First, Second, and Fifth Carrier Divisions, assembled in Hitokappu Bay at Etorofu Island. The fleet departed Etorofu on 26 November^[18] and followed a course across the north-central Pacific to avoid commercial shipping lanes.^[20] At this time Sōryū embarked twenty-seven Mitsubishi A6M Zero fighters, eighteen Aichi D3A “Val” dive bombers, and eighteen Nakajima B5N torpedo bombers. From a position 230 nautical miles (430 km; 260 mi) north of Oahu, Sōryū and the other five carriers launched two waves of aircraft on the morning of 8 December 1941.^[21]^[Note 2]

In the first wave, eight of Sōryū's B5Ns were supposed to attack the aircraft carriers that normally berthed on the northwest side of Ford Island, but none were in Pearl Harbor that day; six B5Ns attacked the ships that were present, torpedoing the target ship *Utah*, causing her to capsize, and the elderly light cruiser *Raleigh*, damaging it. Two of the B5N pilots diverted to their secondary target, ships berthed alongside “1010 Pier”, where the fleet flagship was usually moored. That battleship was in drydock and its position was occupied by the light cruiser *Helena* and the minelayer *Oglala*. One torpedo passed underneath *Oglala* and struck *Helena* in one of her engine rooms; the other pilot rejected these targets and attacked the battleship *California*. Her other ten B5Ns were tasked to drop 800-kilogram (1,800 lb) armor-piercing bombs on the battleships berthed on the southeast side of Ford Island (“Battleship Row”) and may have scored one or two hits on them.^[22] Her eight A6M Zeros strafed parked aircraft at Marine Corps Air Station Ewa, claiming twenty-seven aircraft destroyed in addition to five aircraft shot down.^[18]

Sōryū's second wave consisted of nine A6M Zeros and

seventeen D3As.^[23] The former attacked Naval Air Station Kaneohe Bay, losing one Zero to American anti-aircraft guns. On the return trip, the Zero pilots claimed to have shot down two American aircraft while losing two of their own.^[18] The D3As attacked various ships in Pearl Harbor, but it is not possible to identify which aircraft attacked which ship.^[24] Two of them were shot down during the attack.^[25]

While returning to Japan, Vice Admiral Chuichi Nagumo, commander of the First Air Fleet, ordered that Sōryū and Hiryū be detached on 16 December to attack the defenders of Wake Island who had already defeated the first Japanese attack on the island.^[19] The two carriers reached the vicinity of the island on 21 December and launched twenty-nine D3As and two B2Ns, escorted by eighteen Zeros, to attack ground targets. They encountered no aerial opposition and launched thirty-five B5Ns and six A6M Zeros the following day. They were intercepted by the two surviving Grumman F4F Wildcat fighters of Marine Fighter Squadron VMF-211. The Wildcats shot down two B5Ns before they were shot down themselves by the Zeros. The garrison surrendered the next day after Japanese troops were landed.^[26]

The carriers arrived at Kure on 29 December. They were assigned to the Southern Force on 8 January 1942 and departed four days later for the Dutch East Indies. The ships supported the invasion of the Palau Islands and the Battle of Ambon,^[19] attacking Allied positions on the island on 23 January with fifty-four aircraft. Four days later the carriers detached eighteen Zeros and nine D3As to operate from land bases in support of Japanese operations in the Battle of Borneo. On 30 January they destroyed two aircraft on the ground and shot down a Qantas Short Empire flying boat flying to Surabaya to pick up refugees.^[27]

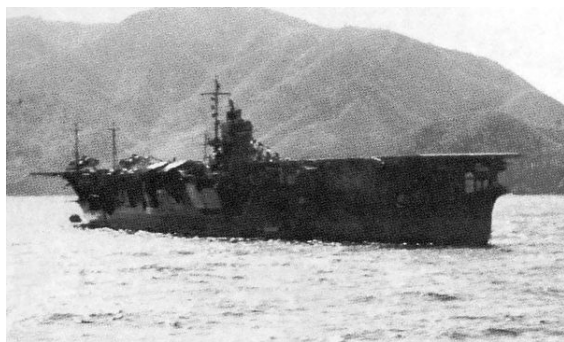
Sōryū and Hiryū arrived at Palau on 28 January and waited for the arrival of the carriers *Kaga* and *Akagi*. All four carriers departed Palau on 15 February and launched air strikes against Darwin, Australia, four days later. Sōryū contributed eighteen B5Ns, eighteen D3As, and nine Zeros to the attack while flying Combat Air Patrols (CAP) over the carriers. Her aircraft attacked the ships in port and its facilities, sinking or setting on fire eight ships and causing three others to be beached lest they sink. The Zeros destroyed a single Consolidated PBY Catalina flying boat; one D3A was lost. The Japanese aircraft spotted a ship on the return trip but had expended all their ordnance and had to be rearmed and refueled before they could attack the vessel. Several hours later, nine of Sōryū's D3As located and bombed an American supply ship of 3,200 gross register tons (GRT), the *Don Isidro*, hitting her five times but failing to sink her.^[28] Sōryū and the other carriers arrived at Staring Bay on Celebes Island on 21 February to resupply and rest before departing four days later to support the invasion of Java.^[19] On 1 March 1942, the ship's D3As damaged the destroyer USS *Edsall* badly enough for her to be caught

and sunk by Japanese cruisers. Later that day the dive bombers sank the oil tanker *USS Pecos*. The four carriers launched an airstrike of 180 aircraft against *Tjilatjeap* on 5 March, sinking five small ships, damaging another nine badly enough that they had to be scuttled, and set the town on fire. Two days later they attacked *Christmas Island* before returning to Staring Bay on 11 March* [19] to resupply and train for the impending *Indian Ocean raid*. This raid was intended to secure newly conquered Burma, Malaya, and the Dutch East Indies against Allied attack by destroying base facilities and forces in the eastern Indian Ocean.* [29]

Indian Ocean raid

Main article: *Indian Ocean raid*

On 26 March 1942, the five carriers of the First Air



Sōryū at anchor in the Kurile Islands, shortly before the start of the Pacific War

Fleet departed from Staring Bay; they were spotted by a Catalina about 350 nautical miles (650 km; 400 mi) southeast of *Ceylon* on the morning of 4 April. Nagumo closed to within 120 nautical miles (220 km; 140 mi) of *Colombo* before launching an airstrike the next morning. *Sōryū* contributed eighteen B3Ns and nine Zeros to the force. The pilots of the latter aircraft claimed to have shot down a single *Fairey Fulmar* of 806 Naval Air Squadron, plus seven other fighters while losing one of their own. The D3As and B3Ns inflicted some damage to the port facilities, but a day's warning had allowed most of the shipping in the harbor to be evacuated. Later that morning the British heavy cruisers *Cornwall* and *Dorsetshire* were spotted and *Sōryū* launched eighteen D3As. They were the first to attack and claimed to have made fourteen hits on the two ships, sinking both in combination with the dive bombers from the other carriers.* [30]

On 9 April, *Sōryū* contributed eighteen B5Ns, escorted by nine Zeros, to the attack on *Trincomalee*. Her B5Ns were the first to bomb the port and her fighters did not encounter any British fighters. Meanwhile a floatplane from the battleship *Haruna* spotted the small aircraft carrier *Hermes*, escorted by the Australian destroyer *Vampire*, and every available D3A was launched to attack the ships. *Sōryū* contributed eighteen dive bombers, but they ar-

rived too late and instead found three other ships further north. They sank the oil tanker *British Sergeant* and the Norwegian cargo ship *Norviken* before they were attacked by eight Fulmars of 803 and 806 Naval Air Squadrons. The Royal Navy pilots claimed three D3As shot down for the loss of a pair of Fulmars; the Japanese actually lost four D3As with another five damaged. While this was going on, *Akagi* narrowly escaped damage when nine British *Bristol Blenheim* bombers from Ceylon penetrated the CAP and dropped their bombs from 11,000 feet (3,400 m). *Sōryū* had six Zeros aloft, along with fourteen more from the other carriers, and they collectively accounted for five of the British bombers for the loss of one of *Hiryū*'s Zeros. After launching the D3As that sank *Hermes* and the other ships, the First Air Fleet reversed course and headed southeast for the *Malacca Strait* before recovering their aircraft; they then proceeded to Japan.* [31]

On 19 April, while transiting the *Bashi Straits* between Taiwan and *Luzon* en route to Japan, *Akagi*, *Sōryū*, and *Hiryū* were sent in pursuit of the American carriers *Hornet* and *Enterprise*, which had launched the *Doolittle Raid* against Tokyo. They found only empty ocean, for the American carriers had immediately departed the area to return to Hawaii. The carriers quickly abandoned the chase and dropped anchor at *Hashirajima* anchorage on 22 April. Having been engaged in constant operations for four and a half months, *Sōryū*, along with the other three carriers of the First and Second Carrier Divisions, was hurriedly refitted and replenished in preparation for the *Combined Fleet's* next major operation, scheduled to begin one month hence.* [32] While at Hashirajima, *Sōryū*'s air group was based ashore at nearby Kasanohara, near Kagoshima, and conducted flight and weapons training with the other First Air Fleet carrier units.* [33]

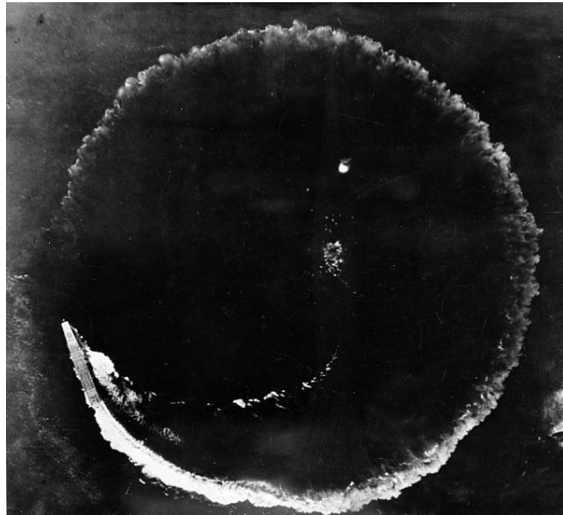
Midway

Main article: *Battle of Midway*

Concerned by the US carrier strikes in the Marshall Islands, *Lae-Salamaua*, and the Doolittle raids, Yamamoto was determined to force the US Navy into a showdown to eliminate the American carrier threat. He decided to invade and occupy *Midway Island*, an action that he was sure would draw out the American carriers. The Japanese codenamed the Midway invasion Operation *MI*.* [34]

On 25 May 1942, *Sōryū* set out with the Combined Fleet's carrier striking force in the company of *Kaga*, *Akagi*, and *Hiryū*, which constituted the First and Second Carrier Divisions, for the attack on Midway Island. Her aircraft complement consisted of eighteen Zeros, sixteen D3As, eighteen B5Ns, and two prototypes of the new *Yokosuka D4Y* dive bomber. Also aboard were three A6M Zeros of the 6th *Kōkūtai* intended as a portion of the aerial garrison for Midway.* [35]

With the fleet positioned 250 nautical miles (460 km; 290 mi) northwest of Midway at dawn (04:45 local time) on



Sōryū circling on the morning of 4 June to evade attacks by B-17s

4 June 1942, *Sōryū*'s part in the 108-plane combined air raid was a strike on the airfield on Eastern Island with eighteen torpedo bombers escorted by nine Zeros. The air group suffered heavily during the attack; a single B5N was shot down en route to the island, another was shot down by AA fire, two were forced to ditch near destroyers on the trip back and four were damaged beyond repair.*[36] The Japanese did not know that the US Navy had discovered their *MI* plan by breaking their cipher, and had prepared an ambush using its three available carriers, positioned northeast of Midway.*[37]

The carrier also contributed 3 Zeros to the total of eleven assigned to the initial CAP over the four carriers. By 07:00 the carrier had six fighters with the CAP that helped to defend the *Kido Butai* from the first US attackers from Midway Island at 07:10.*[38] At this time, Nagumo's carriers were attacked by six US Navy Grumman TBF Avengers from Torpedo Squadron 8 (VT-8) and four United States Army Air Corps (USAAC) Martin B-26 Marauders, all carrying torpedoes. The Avengers went after *Hiryū* while the Marauders attacked *Akagi*. The thirty CAP Zeros in the air at this time, including the six from *Sōryū*, immediately attacked the American airplanes, shooting down five of the Avengers and two of the B-26s. The surviving aircraft dropped their torpedoes, but all missed. *Sōryū* launched three more Zeros to reinforce the CAP, at 07:10.*[39]

At 07:15 Admiral Nagumo ordered the B5Ns on *Kaga* and *Akagi* rearmed with bombs for another attack on Midway itself. This process was limited by the number of ordnance carts (used to handle the bombs and torpedoes) and ordnance elevators, preventing torpedoes from being struck below until after all the bombs were moved up from their magazine, assembled, and mounted on the aircraft. The process normally took about an hour and a half; more time would be required to bring the aircraft up to the flight deck, and to warm up and launch the strike group. Around 07:40 Nagumo reversed his or-

der when he received a message from one of his scout aircraft that American warships had been spotted. Depleted of ammunition, the first six of *Sōryū*'s CAP Zeros landed aboard the carrier at 07:30.*[40]

At 07:55, the next American strike from Midway arrived in the form of sixteen Douglas SBD Dauntless dive bombers of Marine Scout Bomber Squadron (VMSB-241) under Major Lofton R. Henderson.*[Note 3] *Sōryū*'s three CAP fighters were among the nine still aloft that attacked Henderson's planes, shooting down six of them as they executed a fruitless glide-bombing attack on *Hiryū*. At roughly the same time, a dozen USAAC Boeing B-17 Flying Fortresses attacked the Japanese carriers, bombing from 20,000 feet (6,100 m). The high altitude of the B-17s gave the Japanese captains enough time to anticipate where the bombs would land and successfully maneuver their ships out of the impact area. Four B-17s attacked *Sōryū*, but they all missed.*[42]

The CAP defeated the next American air strike from Midway, shooting down three of the eleven Vought SB2U Vindicator dive bombers from VMSB-241, which attacked the battleship *Haruna* unsuccessfully, starting at around 08:30.*[43] Although all the American air strikes had thus far caused negligible damage, they kept the Japanese carrier forces off-balance as Nagumo endeavored to prepare a response to news, received at 08:20, of the sighting of American carrier forces to his northeast. Around 08:30 *Sōryū* launched one of her D4Ys on a mission to confirm the location of the American carriers.*[44]

Sōryū began recovering her Midway strike force at around 08:40 and finished shortly by 09:10.*[45] The landed aircraft were quickly struck below, while the carriers' crews began preparations to spot aircraft for the strike against the American carrier forces. The preparations were interrupted at 09:18 when the first American carrier aircraft to attack were sighted. These consisted of fifteen Douglas TBD Devastator torpedo bombers of VT-8, led by Lieutenant Commander John C. Waldron from the *Hornet*. The three airborne CAP Zeros were landing aboard at 09:30 when the Americans unsuccessfully attempted a torpedo attack on *Sōryū*, but three of the morning's escort fighters were still airborne and joined the eighteen CAP fighters in destroying Waldron's planes. All of the American planes were shot down, leaving one surviving aviator treading water.*[46]

Shortly afterwards, fourteen Devastators from Torpedo Squadron 6 (VT-6) from the *Enterprise*, led by Lieutenant Commander Eugene E. Lindsey, attacked. Lindsey's aircraft tried to sandwich *Kaga*, but the CAP, reinforced by three more Zeros launched by *Sōryū* at 09:45, shot down all but four of the Devastators, and *Kaga* dodged the torpedoes. *Sōryū* launched another trio of CAP Zeros at 10:00 and another three at 10:15 after Torpedo Squadron 3 (VT-3) from *Yorktown* was spotted. A Wildcat escorting VT-3 shot down one of her Zeros.*[47]

While VT-3 was still attacking *Hiryū*, American dive bombers arrived over the Japanese carriers almost undetected and began their dives. It was at this time, around 10:20, that in the words of Jonathan Parshall and Anthony Tully, the “Japanese air defenses would finally and catastrophically fail”.^[48] At 10:25, *Sōryū* was attacked by thirteen Dauntlesses from **Bombing Squadron 2 (VB-2)** from the *Yorktown*. The carrier received three direct hits from 454 kg (1000 lb) bombs: one penetrated to the lower hangar deck **amidships**, and the other two exploded in the upper hangar deck fore and aft. The hangars contained armed and fueled aircraft preparing for the upcoming strike, resulting in secondary explosions and rupturing the steam pipes in the boiler rooms. Within a very short time the fires on the ship were out of control. At 10:40 AM she stopped and her crew was ordered to abandon ship five minutes later. The destroyers *Isokaze* and *Hamakaze* rescued the survivors. *Sōryū* was still afloat and showed no signs of beginning to sink by early evening, so *Isokaze* was ordered to scuttle her with torpedoes so as to allow the destroyers to be used for possible operations that night. The destroyer reported at 19:15 that *Sōryū* had sunk^[49] at position **30°38′N 179°13′W / 30.633°N 179.217°W**Coordinates: **30°38′N 179°13′W / 30.633°N 179.217°W**.^[4] Losses were 711 crew of her complement of 1,103, including Captain Yanagimoto, who chose to remain on board. This was the highest mortality percentage of all the Japanese carriers lost at Midway, due largely to the devastation in both hangar decks.^[50]

The loss of *Sōryū* and the three other IJN carriers at Midway, comprising two thirds of Japan's total number of fleet carriers and the experienced core of the First Air Fleet, was a crucial strategic defeat and contributed significantly to the ultimate Allied victory. In an effort to conceal the defeat, the ship was not immediately removed from the Navy's registry of ships, awaiting a “suitable opportunity”^[51] before finally being struck from the registry on 10 August 1942.^[19]

1.3.3 Notes

- [1] While some sources show *Sōryū* and *Hiryū* as members of the same ship class, despite their differences,^[1] this article follows those sources that treat them as related designs of separate classes.^[2]
- [2] **Japan Standard Time** is 19 hours ahead of **Hawaiian Standard Time**, so in Japan, the **attack on Pearl Harbor** happened on 8 December.
- [3] To this day there is much confusion about VMSB-241 at Midway. At that time the squadron was in transition from the obsolete SB2U Vindicator to the modern SBD-2 Dauntless and flew both aircraft during the battle.^[41]

1.3.4 Footnotes

- [1] Chesneau 1995, pp. 165–66; Parshall & Tully, pp. 470–76

- [2] Brown 1977, pp. 18–21; Chesneau 1980, p. 181
- [3] Chesneau 1995, p. 165
- [4] Jentschura, Jung & Mickel, p. 47
- [5] Brown 1977, pp. 18–19
- [6] Parshall & Tully, p. 9
- [7] Peattie, p. 239
- [8] Brown 1977, p. 18
- [9] Brown 1977, p. 19
- [10] Chesneau 1995, p. 166
- [11] Campbell, pp. 192–93
- [12] Parshall & Tully, p. 143
- [13] Stille 2007, p. 51
- [14] Campbell, p. 200
- [15] Silverstone, p. 337
- [16] Peattie, pp. 237, 239
- [17] Hata, Izawa & Shores, pp. 150–51; Hooton, p. 15
- [18] Hata, Izawa & Shores, p. 151
- [19] Tully
- [20] Polmar & Genda, p. 162
- [21] Brown 2009, pp. 116–17
- [22] Zimm, pp. 159–60, 164, 168
- [23] Polmar & Genda, p. 166
- [24] Brown 2009, pp. 118–19
- [25] Polmar & Genda, p. 173
- [26] Shores, Cull & Izawa, Vol. I, p. 161
- [27] Shores, Cull & Izawa, Vol. I, pp. 226, 229, 231
- [28] Shores, Cull & Izawa, Vol. II, pp. 176–82
- [29] Shores, Cull & Izawa, Vol. II, pp. 307, 327, 392–93
- [30] Shores, Cull & Izawa, Vol. II, pp. 393–95, 399, 404–06
- [31] Shores, Cull & Izawa, Vol. II, pp. 413, 421–23, 426–29
- [32] Parshall & Tully, p. 12
- [33] Parshall & Tully, pp. 10, 42, 88
- [34] Stille 2007, p. 22
- [35] Parshall & Tully, pp. 3, 90
- [36] Parshall & Tully, pp. 126, 129, 204
- [37] Parshall and Tully, pp. 151, 154; Stille, p. 59
- [38] Parshall & Tully, p. 505
- [39] Parshall & Tully, pp. 151–52, 505; Lundstrom, p. 337

- [40] Parshall & Tully, pp. 156–59, 505
- [41] Condon, p. 13
- [42] Parshall & Tully, pp. 176, 178, 180
- [43] Lundstrom, p. 338
- [44] Parshall & Tully, pp. 183–89
- [45] Parshall & Tully, pp. 154–55
- [46] Parshall & Tully, pp. 205–09
- [47] Parshall & Tully, pp. 213–14, 221, 224, 505
- [48] Parshall & Tully, p. 219
- [49] Parshall & Tully, pp. 236–38, 250–52, 261, 321, 332, 334–36
- [50] Parshall & Tully, p. 336
- [51] Parshall & Tully, pp. 387–88, 419, 421

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1.3.7 External links

- Japanese warships —Sōryū
- World War II DataBase: Sōryū
- US Navy photos of Sōryū

1.4 Japanese aircraft carrier *Hiryū*

Hiryū (飛龍, “Flying Dragon”) was an aircraft carrier built for the Imperial Japanese Navy (IJN) during the 1930s. The only ship of her class, she was built to a modified *Sōryū* design.*[Note 1] Her aircraft supported the Japanese invasion of French Indochina in mid-1940. During the first month of the Pacific War, she took part in the attack on Pearl Harbor and the Battle of Wake Island. The ship supported the conquest of the Dutch East Indies in January 1942. The following month, her aircraft bombed Darwin, Australia, and continued to assist in the Dutch East Indies campaign. In April, *Hiryū*'s aircraft helped sink two British heavy cruisers and several merchant ships during the Indian Ocean raid.

After a brief refit, *Hiryū* and three other fleet carriers of the First Air Fleet (*Kido Butai*) participated in the Battle of Midway in June 1942. After bombarding American forces on the atoll, the carriers were attacked by aircraft from Midway and the carriers USS *Enterprise*, *Hornet*, and *Yorktown*. Dive bombers from *Yorktown* and *Enterprise* crippled *Hiryū* and set her afire. She was scuttled the following day after it became clear that she could not be salvaged. The loss of *Hiryū* and three other IJN carriers at Midway was a crucial strategic defeat for Japan and contributed significantly to the Allies' ultimate victory in the Pacific.

1.4.1 Design

Hiryū was one of two large carriers approved for construction under the 1931–32 Supplementary Program. Originally designed as the sister ship of *Sōryū*, her design was enlarged and modified in light of the Tomozuru and Fourth Fleet Incidents in 1934–35 that revealed many IJN ships were top-heavy, unstable and structurally weak. Her foremast was raised and her hull strengthened. Other changes involved increasing her beam, displacement, and armor protection.*[3]

The ship had a length of 227.4 meters (746 ft 1 in) overall, a beam of 22.3 meters (73 ft 2 in) and a draft of 7.8 meters (25 ft 7 in). She displaced 17,600 metric tons (17,300 long tons) at standard load and 20,570 metric tons (20,250 long tons) at normal load. Her crew consisted of 1,100 officers and enlisted men.*[4]

Machinery

Hiryū was fitted with four geared steam turbine sets with a total of 153,000 shaft horsepower (114,000 kW), each driving one propeller shaft, using steam provided by eight Kampon water-tube boilers.*[4] The turbines and boilers were the same as those used in the *Mogami*-class cruisers. The ship's power and slim, cruiser-type hull with a length-to-beam ratio of 10:1 gave her a speed of 34.3 knots (63.5 km/h; 39.5 mph)*[5] and made her the

fastest carrier in the world at the time of her commissioning.*[6] *Hiryū* carried 4,500 metric tons (4,400 long tons) of fuel oil which gave her a range of 10,330 nautical miles (19,130 km; 11,890 mi) at 18 knots (33 km/h; 21 mph). The boiler uptakes were trunked to the ship's starboard side amidships and exhausted just below flight deck level through two funnels curved downward.*[7]

Flight deck and hangars

The carrier's 216.9-meter (711 ft 7 in) flight deck was 27.0 meters (88 ft 6 in) wide and overhung her superstructure at both ends, supported by pairs of pillars.*[7] *Hiryū* was one of only two carriers ever built whose island was on the port side of the ship (*Akagi* was the other). It was also positioned further to the rear and encroached on the width of the flight deck, unlike *Sōryū*. Nine transverse arrestor wires were installed on the flight deck that could stop a 6,000-kilogram (13,000 lb) aircraft. One group of three wires was positioned further forward to allow the ship to land aircraft over the bow, although this was never done in practice. The flight deck was only 12.8 meters (42 ft) above the waterline and the ship's designers kept this figure low by reducing the height of the hangars.*[8] The upper hangar was 171.3 by 18.3 meters (562 by 60 ft) and had an approximate height of 4.6 meters (15 ft); the lower was 142.3 by 18.3 meters (467 by 60 ft) and had an approximate height of 4.3 meters (14 ft). Together they had an approximate total area of 5,736 square meters (61,740 sq ft).*[7] This caused problems in handling aircraft because the wings of a Nakajima B5N “Kate” torpedo bomber could neither be spread nor folded in the upper hangar.*[9]

Aircraft were transported between the hangars and the flight deck by three elevators, the forward one abreast the island on the centerline and the other two offset to starboard.*[3] The forward platform measured 16.0 by 13.0 meters (52.5 ft × 42.75 ft), the middle one 13.0 by 12.0 meters (42.75 ft × 39.3 ft), and the rear 11.8 by 13.0 meters (38.7 ft × 42.8 ft).*[7] They were capable of transferring aircraft weighing up to 5,000 kilograms (11,000 lb).*[8] *Hiryū* had a designed aircraft capacity of 64, plus nine spares.*[3]

Armament

Hiryū's primary anti-aircraft (AA) armament consisted of six twin-gun mounts equipped with 40-caliber 12.7-centimeter Type 89 dual-purpose guns mounted on projecting sponsons, three on either side of the carrier's hull.*[9] When firing at surface targets, the guns had a range of 14,700 meters (16,100 yd); they had a maximum ceiling of 9,440 meters (30,970 ft) at their maximum elevation of +90 degrees. Their maximum rate of fire was 14 rounds a minute, but their sustained rate of fire was approximately eight rounds per minute.*[10] The ship was

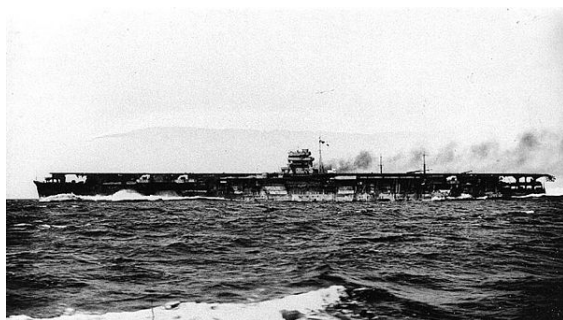
equipped with two Type 94 fire-control directors to control the 12.7-centimeter (5.0 in) guns, one for each side of the ship;*[11] the starboard-side director was on top of the island and the other director was positioned below flight deck level on the port side.*[12]

The ship's light AA armament consisted of seven triple and five twin-gun mounts for license-built Hotchkiss 25 mm Type 96 AA guns. Two of the triple mounts were sited on a platform just below the forward end of the flight deck.*[13] The gun was the standard Japanese light AA gun during World War II, but it suffered from severe design shortcomings that rendered it largely ineffective. According to historian Mark Stille, the weapon had many faults including an inability to “handle high-speed targets because it could not be trained or elevated fast enough by either hand or power, its sights were inadequate for high-speed targets, it possessed excessive vibration and muzzle blast, and its magazines were too small to maintain high rates of fire”.*[14] These 25-millimeter (1 in) guns had an effective range of 1,500–3,000 meters (1,600–3,300 yd), and an effective ceiling of 5,500 meters (18,000 ft) at an elevation of +85 degrees. The maximum effective rate of fire was only between 110 and 120 rounds per minute because of the frequent need to change the fifteen-round magazines.*[15] The Type 96 guns were controlled by five Type 95 directors, two on each side and one in the bow.*[11]

Armor

Hiryū had a waterline belt with a maximum thickness of 150 millimeters (5.9 in) over the magazines that reduced to 90 millimeters (3.5 in) over the machinery spaces and the avgas storage tanks. It was backed by an internal anti-splinter bulkhead. The ship's deck was 25 millimeters (0.98 in) thick over the machinery spaces and 55 millimeters (2.2 in) thick over the magazines and avgas storage tanks.*[12]

1.4.2 Construction and service



Hiryū running her speed trials, 28 April 1939

Following the Japanese ship-naming conventions for aircraft carriers, *Hiryū* was named “Flying Dragon”.*[16]

The ship was laid down at the Yokosuka Naval Arsenal on 8 July 1936, launched on 16 November 1937 and commissioned on 5 July 1939.*[17] She was assigned to the Second Carrier Division on 15 November. In September 1940, the ship's air group was transferred to Hainan Island to support the Japanese invasion of French Indochina. In February 1941, *Hiryū* supported the blockade of Southern China.*[18] Two months later, the 2nd Carrier Division, commanded by Rear Admiral Tamon Yamaguchi, was assigned to the First Air Fleet, or *Kido Butai*, on 10 April.*[19] *Hiryū* returned to Japan on 7 August and began a short refit that was completed on 15 September. She became flagship of the Second Division from 22 September to 26 October while *Sōryū* was refitting.*[19]

Pearl Harbor and subsequent operations

Main article: [Attack on Pearl Harbor](#)

In November 1941, the IJN's Combined Fleet, commanded by Admiral Isoroku Yamamoto, prepared to participate in Japan's initiation of a formal war with the United States by conducting a preemptive strike against the United States Navy's Pacific Fleet base at Pearl Harbor, Hawaii. On 22 November, *Hiryū*, commanded by Captain Tomeo Kaku, and the rest of the *Kido Butai*, under Vice Admiral Chuichi Nagumo and including six fleet carriers from the First, Second, and Fifth Carrier Divisions, assembled in Hitokappu Bay at Etorofu Island. The fleet departed Etorofu on 26 November*[18] and followed a course across the north-central Pacific to avoid commercial shipping lanes.*[20] Now the flagship of the Second Carrier Division, the ship embarked 24 Mitsubishi A6M Zero fighters, 18 Aichi D3A “Val” dive bombers, and 18 Nakajima B5N “Kate” torpedo bombers. From a position 230 nmi (430 km; 260 mi) north of Oahu, *Hiryū* and the other five carriers launched two waves of aircraft on the morning of 8 December 1941.*[21]*[22]*[Note 2]

In the first wave, 8 B5N torpedo bombers were supposed to attack the aircraft carriers that normally berthed on the northwest side of Ford Island, but none were in Pearl Harbor that day; 4 of the B5N pilots diverted to their secondary target, ships berthed alongside “1010 Pier” where the fleet flagship was usually moored. That ship, the battleship *Pennsylvania*, was in drydock and its position was occupied by the light cruiser *Helena* and the minelayer *Oglala*; all four torpedoes missed. The other four pilots attacked the battleships *West Virginia* and *Oklahoma*. The remaining 10 B5Ns were tasked to drop 800-kilogram (1,800 lb) armor-piercing bombs on the battleships berthed on the southeast side of Ford Island (“Battleship Row”) and may have scored one or two hits on them,*[23] in addition to causing a magazine explosion aboard the battleship *Arizona* that sank her with heavy loss of life. The 6 A6M Zeros strafed

parked aircraft at **Marine Corps Air Station Ewa** (MCAS Ewa),*[24] claiming 22 aircraft destroyed.*[18]

The second wave consisted of 9 A6M Zeros and 18 D3As, one of each aborting with mechanical problems.*[22] The former strafed **Naval Air Station Kaneohe Bay** before moving on to attack **Bellows Army Airfield**. They strafed the airfield, and shot down two Curtiss P-40 fighters attempting to take off when the Zeros arrived and a Boeing B-17 Flying Fortress heavy bomber that had earlier diverted from **Hickam Army Airfield**, and also destroyed a **Stinson O-49** observation aircraft*[25] on the ground for the loss of one of their own.*[18] The fighters with remaining ammunition expended it strafing MCAS Ewa, the rendezvous point for the second-wave fighters.*[26] The D3As attacked various ships in Pearl Harbor, but it is not possible to identify which aircraft attacked which ship.*[27] Two D3As from *Hiryū* were lost during the attack, one shot down by **Second Lieutenant George Welch**.*[28]

While returning to Japan after the attack, Vice Admiral **Chūichi Nagumo**, commander of the First Air Fleet, ordered that *Sōryū* and *Hiryū* be detached on 16 December to attack the defenders of **Wake Island** who had already defeated the first Japanese attack on the island.*[19] The two carriers reached the vicinity of the island on 21 December and launched 29 D3As and 2 B2Ns, escorted by 18 Zeros, to attack ground targets. They encountered no aerial opposition and launched 35 B5Ns and 6 A6M Zeros the following day. They were intercepted by the 2 surviving **Grumman F4F Wildcat** fighters of **Marine Fighter Squadron VMF-211**. The Wildcats shot down 2 B5Ns*[29] before they were shot down by **PO3c Isao Towara**.*[18] The garrison surrendered the next day after Japanese troops were landed.*[29]

The carriers arrived at **Kure** on 29 December. They were assigned to the Southern Force on 8 January 1942 and departed four days later for the **Dutch East Indies**. The ships supported the invasion of the **Palau Islands** and the **Battle of Ambon**,*[19] attacking Allied positions on the island on 23 January with 54 aircraft. Four days later the carriers detached 18 Zeros and 9 D3As to operate from land bases in support of Japanese operations in the **Battle of Borneo**.*[30] *Hiryū* and *Sōryū* arrived at Palau on 28 January and waited for the arrival of the carriers *Kaga* and *Akagi*. All four carriers departed Palau on 15 February and launched air strikes against **Darwin, Australia**, four days later. *Hiryū* contributed 18 B5Ns, 18 D3As, and 9 Zeros to the attack. Her aircraft attacked the ships in port and its facilities, sinking or setting on fire three ships and damaging two others. The Zeros destroyed 1 P-40E as it was taking off, 2 **Consolidated PBY Catalina** seaplanes on the water, and a Zero was forced to crash land after being damaged by a P-40E of the **United States Army Air Corps (USAAC) 33rd Pursuit Squadron**.*[31]

Hiryū and the other carriers arrived at **Staring Bay** on **Celebes Island** on 21 February to resupply and rest be-

fore departing four days later to support the invasion of Java.*[19] On 1 March 1942, the ship's D3As damaged the destroyer **USS Edsall** badly enough for her to be caught and sunk by Japanese cruisers. Later that day the dive bombers sank the oil tanker **USS Pecos**. The four carriers launched an airstrike of 180 aircraft against **Tjilatjap** on 5 March and set the town on fire, sinking five small ships, and damaging nine others that later had to be scuttled.*[32] Two days later, they attacked **Christmas Island** and *Hiryū*'s aircraft sank the Dutch freighter *Poelau Bras* before returning to Staring Bay on 11 March*[19] to resupply and train for the impending **Indian Ocean raid**. This raid was intended to secure newly conquered Burma, Malaya, and the Dutch East Indies against any Allied attack by destroying base facilities and forces in the eastern Indian Ocean.*[33]

Indian Ocean raid

Main article: **Indian Ocean raid**

On 26 March, the five carriers of the First Air Fleet departed from Staring Bay; they were spotted by a Catalina about 350 nautical miles (650 km; 400 mi) southeast of **Ceylon** on the morning of 4 April. Six of *Hiryū*'s Zeros were on **Combat Air Patrol** (CAP) and helped to shoot it down. Nagumo closed to within 120 nautical miles (220 km; 140 mi) of **Columbo** before launching an airstrike the next morning. *Hiryū* contributed 18 B3Ns and 9 Zeros to the force; the latter encountered a flight of 6 **Fairey Swordfish** torpedo bombers from **788 Naval Air Squadron** en route and shot them all down without loss. The Japanese aircraft encountered defending **Hawker Hurricane** fighters from **Nos. 30 and 258 Squadrons RAF** over **Ratmalana** airfield and *Hiryū*'s fighters claimed to have shot down 11 with 3 Zeros damaged, although the fighters from the other carriers also made claims. British losses were 21 Hurricanes shot down and 2 more forced to crash land. The D3As and B3Ns inflicted some damage to the port facilities, but a day's warning had allowed much of the shipping in the harbor to be evacuated. The British were attempting to find Nagumo's ships all morning and *Hiryū*'s Zeros on CAP over the fleet helped to shoot down an **RAF Catalina**, shot down a **Fairey Albacore** torpedo bomber and drove off another from the carrier *Indomitable*. Later that morning the British heavy cruisers *Cornwall* and *Dorsetshire* were spotted and *Hiryū* launched 18 D3As. They sank both ships in combination with the dive bombers from the other carriers.*[34]

On the morning of 9 April, *Hiryū*'s CAP shot down another Catalina attempting to locate the fleet and, later that morning, contributed 18 B5Ns, escorted by 6 Zeros, to the attack on **Trincomalee**. The fighters engaged **261 Squadron RAF**, claiming to have shot down two with two more shared with fighters from the other carriers. British losses were only eight fighters, but the Japanese pilots claimed a total of 49 aircraft shot down when the

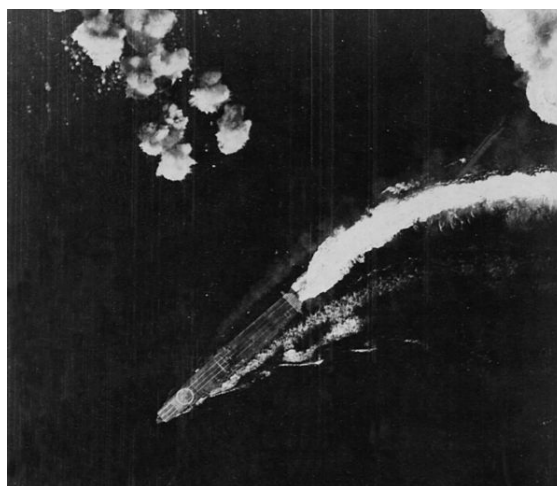
RAF only had 16 Hurricanes in the fight. The British pilots shot down one of *Hiryū*'s B5Ns and forced another to crash land while they were bombing the port. Meanwhile, a floatplane from the battleship *Haruna* spotted the small aircraft carrier *Hermes*, escorted by the destroyer *HMAS Vampire*, and every available D3A was launched to attack the ships, escorted by nine Zeros. *Hiryū* contributed 18 dive bombers and 3 fighters, but they arrived too late to assist in sinking them and found two other ships further north. They sank the freighter RFA *Athelstone* and her escorting corvette, *Hollyhock*. While this was going on, *Akagi* narrowly escaped damage when 9 British Bristol Blenheim bombers from Ceylon penetrated the CAP and dropped their bombs from 11,000 feet (3,400 m). *Hiryū* had eight Zeros aloft, along with 12 more from the other carriers, and collectively they accounted for 5 of the British bombers for the loss of 1 of *Hiryū*'s Zeros. The Blenheims ran into the D3As from *Shōkaku*, escorted by *Hiryū*'s Zeros, on their way back home and lost one more bomber to the Japanese aircraft. The dive bombers claimed to have shot down two Blenheims in conjunction with the Zeros, which claimed one on their own, for the loss of one Zero shot down by the bombers' gunners and one D3A damaged. After launching the dive bombers that sank *Hermes* and the other ships, the First Air Fleet reversed course and headed southeast for the Malacca Strait and Japan.*[35]

On 19 April, while transiting the Bashi Straits between Taiwan and Luzon en route to Japan, *Hiryū*, *Sōryū*, and *Akagi* were sent in pursuit of the American carriers *Hornet* and *Enterprise*, which had launched the Doolittle Raid against Tokyo. They found only empty ocean, as the American carriers had immediately departed the area to return to Hawaii. The carriers quickly abandoned the chase and dropped anchor at Hashirajima anchorage on 22 April. Having been engaged in constant operations for four and a half months, the ship, along with the other three carriers of the First and Second Carrier Divisions, was hurriedly refitted and replenished in preparation for the Combined Fleet's next major operation, scheduled to begin one month hence.*[36] While at Hashirajima, *Hiryū*'s air group was based ashore at Tomitaka Airfield, near Saiki, Ōita, and conducted flight and weapons training with the other First Air Fleet carrier units.*[37]

Midway

Main article: Battle of Midway

Concerned by the US carrier strikes in the Marshall Islands, Lae-Salamaua, and the Doolittle raids, Yamamoto was determined to force the US Navy into a showdown to eliminate the American carrier threat. He decided to invade and occupy Midway Atoll, which he was sure would draw out the American carriers to defend it. The Japanese codenamed the Midway invasion Operation MI.*[38] Unknown to the Japanese, the US Navy had divined the Japanese plan by breaking its JN-25 code and



Hiryū circling to avoid a B-17 attack on the morning of 4 June

had prepared an ambush using its three available carriers, positioned northeast of Midway.*[39]

On 25 May 1942, *Hiryū* set out with the Combined Fleet's carrier striking force in the company of *Kaga*, *Akagi*, and *Sōryū*, which constituted the First and Second Carrier Divisions, for the attack on Midway. Her aircraft complement consisted of 18 Zeros, 18 D3As, and 18 B5Ns. Also aboard were 3 A6Ms of the 6th *Kōkūtai* intended as the aerial garrison for Midway.*[40] With the fleet positioned 250 nmi (460 km; 290 mi) northwest of Midway at dawn (04:45 local time) on 4 June 1942, *Hiryū*'s portion of the 108-plane airstrike was an attack on the facilities on Sand Island with 18 torpedo bombers, 1 of which aborted with mechanical problems, escorted by nine Zeros. The air group suffered heavily during the attack: 2 B5Ns were shot down en route to the island, another was shot down by AA fire, 1 was forced to ditch on the trip back, another disappeared on the return trip and 5 were damaged beyond repair.*[41]

The carrier also contributed 3 Zeros to the total of 11 assigned to the initial CAP over the four carriers. By 07:05, the carrier had 6 fighters with the CAP which helped to defend the *Kido Butai* from the first US attackers from Midway Island at 07:10.*[42] At this time, Nagumo's carriers were attacked by 6 US Navy Grumman TBF Avengers from Torpedo Squadron 8 (VT-8) and 4 US-AAC Martin B-26 Marauders, all carrying torpedoes. The Avengers went after *Hiryū* while the Marauders attacked *Akagi*. The 30 CAP Zeros in the air at this time, including the 6 from *Hiryū*, immediately attacked the American airplanes, shooting down 5 of the Avengers and 2 of the B-26s. The Avengers shot down 1 of *Hiryū*'s Zeros. The surviving aircraft dropped their torpedoes, but all missed.*[43]

At 07:15, Nagumo ordered the B5Ns on *Kaga* and *Akagi* rearmed with bombs for another attack on Midway itself. This process was slowed by the number of ordnance carts used to handle the bombs and torpedoes and

the limited number of ordnance elevators. This meant that the torpedoes could not be struck below until after all the bombs were moved up from their magazine, assembled and mounted on the aircraft. This process normally took about an hour and a half; more time would be required to bring the aircraft up to the flight deck, and to warm up and launch the strike group. Around 07:40, he reversed his order when he received a message from one of his scout aircraft that American warships had been spotted. Depleted of ammunition, two of *Hiryū*'s CAP Zeros landed aboard the carrier at 07:40.*[44]

At 07:55, the next American strike from Midway arrived in the form of 16 Marine Douglas SBD Dauntless dive bombers of Marine Scout Bomber Squadron (VMSB-241) under Major Lofton R. Henderson.*[Note 3] *Hiryū*'s 3 CAP fighters were among the 9 still aloft that attacked Henderson's planes, shooting down 6 of them as they executed a fruitless glide bombing attack on *Hiryū*. In return, the gunner of one of the Dauntlesses shot down one of *Hiryū*'s Zeros. At roughly the same time, the Japanese carriers were attacked by 12 USAAC B-17s, bombing from 20,000 feet (6,100 m). The high altitude of the B-17s gave the Japanese captains enough time to anticipate where the bombs would land, and they successfully maneuvered out of the impact area. Four B-17s attacked *Hiryū*, but missed with all their bombs.*[46]

Hiryū reinforced the CAP with launches of 3 more Zeros at 08:25.*[47] These fresh Zeros helped defeat the next American air strike from Midway, 11 Vought SB2U Vindicator dive bombers from VMSB-241, which attacked the battleship *Haruna* starting around 08:30. *Haruna* escaped damage and 3 of the Vindicators were shot down.*[48] Although all the American air strikes had thus far caused negligible damage, they kept the Japanese carrier forces off-balance as Nagumo endeavored to prepare a response to news, received at 08:20, of the sighting of American carrier forces to his northeast.*[49]

Hiryū began recovering her Midway strike force at around 09:00 and finished shortly by 09:10.*[50] The landed aircraft were quickly struck below, while the carriers' crews began preparations to spot aircraft for the strike against the American carrier forces. The preparations were interrupted at 09:18, when the first American carrier aircraft to attack were sighted. These consisted of 15 Douglas TBD Devastator torpedo bombers of VT-8, led by Lieutenant Commander John C. Waldron from the *Hornet*. They attempted a torpedo attack on *Soryū*, but all of the American planes were shot down by the 18 CAP fighters, leaving one surviving aviator treading water.*[51]

Shortly afterwards, 14 Devastators from Torpedo Squadron 6 (VT-6) from *Enterprise*, led by Lieutenant Commander Eugene E. Lindsey, attacked. Lindsey's aircraft tried to sandwich *Kaga*, but the CAP, reinforced by 4 additional Zeros launched by *Hiryū* at 09:37, shot down all but 4 of the Devastators, and *Kaga* dodged the

torpedoes. *Hiryū* launched another trio of CAP Zeros at 10:13 after Torpedo Squadron 3 (VT-3) from *Yorktown* was spotted. Two of her Zeros were shot down by Wildcats escorting VT-3 and another was forced to ditch.*[52]

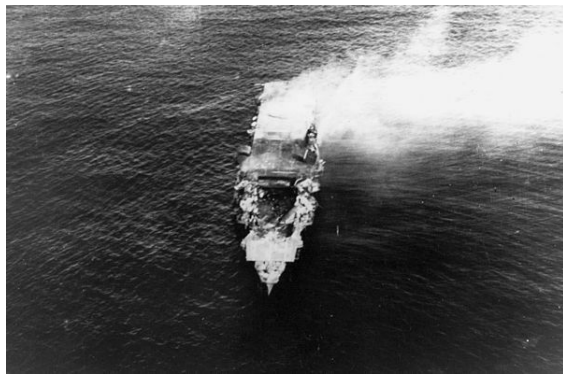


One of the two torpedo hits made by *Hiryū*'s aircraft on *Yorktown*

While VT-3 was still attacking *Hiryū*, American dive bombers arrived over the Japanese carriers almost undetected and began their dives. It was at this time, around 10:20, that in the words of Jonathan Parshall and Anthony Tully, the "Japanese air defenses would finally and catastrophically fail."*[53] Three American dive bomber squadrons now attacked the three other carriers and set each of them on fire.*[54] *Hiryū* was untouched and proceeded to launch 18 D3As, escorted by 6 Zeros, at 10:54 and a second wave of 10 B5Ns, escorted by 6 Zeros, at 13:30 against the American carrier *Yorktown*. En route, the Zeros engaged a group of *Enterprise*'s Dauntlesses that they had spotted. They failed to shoot down any of the dive bombers who damaged two of the Zeros, one of which was forced to ditch near a destroyer. American radar detected the incoming Japanese dive bombers at 11:52 and vectored *Yorktown*'s CAP of 20 Wildcats against them. The Wildcats shot down three of the remaining Zeros for the loss of one of their own and engaged the D3As. Only seven of the dive bombers survived long enough to make their attack on *Yorktown* and two of those were shot down by flak during their dive, but they made three direct hits and two near misses that badly damaged the carrier and set her on fire.*[55]

The Americans had managed to extinguish her fires by 14:00 and *Yorktown* was making 19 knots (35 km/h; 22 mph) by 14:30 when the second group of Japanese aircraft was approaching. They had been detected by the ship's radar at 13:55, but the CAP was held back until they got closer. Six Wildcats were on CAP duty and four were vectored toward the attacking aircraft while the other two were retained to cover the take off of the 10 Wildcats fueling on deck. The Japanese were jumped at 14:38 by two Wildcats which shot down one torpedo bomber before they were both shot down by the escort-

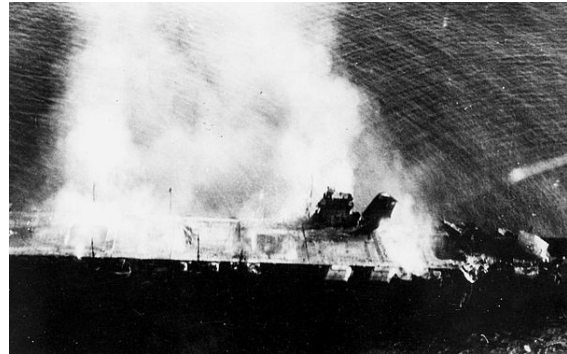
ing Zeros. Two Zeros were shot down later for the loss of one Wildcat. Two more B5Ns were shot down before they could drop their torpedoes and three afterwards, but none of these aircraft hit the carrier. The last four torpedo bombers scored two hits (one B5N had its torpedo-release gear fail) on *Yorktown* that damaged three boilers and knocked out all electrical power so that she could not pump fuel oil to starboard to counteract her six degree list to port. Seventeen minutes later, after the list increased to 23 degrees, the crew was ordered to abandon ship. Of the four Zeros and five B5Ns that returned to *Hiryū*, only one Zero and three dive bombers were still flight-worthy.* [56]



Hiryū abandoned, but still afloat, after a scuttling attempt after the Battle of Midway.

Yamaguchi radioed his intention to Nagumo at 16:30 to launch a third strike against the American carriers at dusk (approximately 18:00), but Nagumo ordered the fleet to withdraw to the west. Unbeknownst to the Japanese, *Enterprise* and *Hornet* had already launched airstrikes well before then. *Enterprise* launched a total of 26 Dauntlesses at 15:25 using her own aircraft plus those from *Yorktown* that had been forced to recover aboard her after *Yorktown* was damaged, and *Hornet* launched 16 more of her own Dauntlesses at 16:00. At this point in the battle, *Hiryū* had only 4 air-worthy dive-bombers and 5 torpedo-planes left. She also retained 19 of her own fighters on board as well as a further 13 Zeros on CAP (a composite force of survivors from the other carriers). At 16:45, *Enterprise*'s dive bombers spotted the Japanese carrier and began to maneuver for good attacking position while reducing altitude. At 16:56, just as the first Dauntlesses were beginning their dives, Nagumo ordered a change in course to 120 degrees, possibly to prepare to recover his reconnaissance floatplanes, that threw off the aim of the leading SBDs. The Japanese did not even spot the Americans until 17:01. The CAP shot down two of the American aircraft in their dives and another after it was forced to abort its dive when some of *Yorktown*'s SBDs passed in front of it starting their own dives. *Hiryū* was struck by four 1,000-pound (450 kg) bombs, three on the forward flight deck and one on the forward elevator. The explosions started fires among the aircraft on the hangar deck. The forward half of the flight deck collapsed into the hangar while part of the elevator was hurled against the ship's

bridge. The fires were severe enough that the remaining American aircraft attacked the other ships escorting *Hiryū*, albeit without effect, deeming further attacks on the carrier as a waste of time because she was aflame from stem to stern. Beginning at 17:42, two groups of B-17s attempted to attack the Japanese ships without success, although one bomber strafed *Hiryū*'s flight deck, killing several anti-aircraft gunners.* [57]



The abandoned and burning Hiryū photographed by an airplane from the Hōshō.

Although *Hiryū*'s propulsion was not affected, the fires could not be brought under control. At 21:23, her engines stopped, and at 23:58 a major explosion rocked the ship. The order to abandon ship was given at 03:15, and the survivors were taken off by the destroyers *Kazagumo* and *Makigumo*. Yamaguchi and Kaku decided to remain on board as *Hiryū* was torpedoed at 05:10 by *Makigumo* as the ship could not be salvaged. One torpedo missed and the other struck near the bow without the typical plume of water, although the detonation was quite visible. Around 07:00, one of *Hōshō*'s aircraft discovered *Hiryū* still afloat and not in any visible danger of sinking. The aviators could also see crewmen aboard the carrier, men who had not received word to abandon ship. They finally launched some of the carrier's boats and abandoned ship themselves around 09:00. Thirty-nine men made it into the ship's cutter only moments before *Hiryū* sank around 09:12, taking the bodies of 389 men with her. The cutter drifted for 14 days before being discovered by a Catalina and rescued by the seaplane tender *USS Ballard*. Four men died of their wounds or exposure before being picked up and a fifth died that night.* [58]

The loss of *Hiryū* and the three other IJN carriers at Midway, comprising two thirds of Japan's total number of fleet carriers and the experienced core of the First Air Fleet, was a crucial strategic defeat for Japan and contributed significantly to Japan's ultimate defeat in the war. In an effort to conceal the defeat, the ship was not immediately removed from the Navy's registry of ships, instead being listed as "unmanned" before finally being struck from the registry on 25 September 1942.* [59]

The IJN selected a modified version of the *Hiryū* design for mass production to replace the carriers lost at the Battle of Midway. Of a planned program of 16 ships of the

Unryū class, only six were laid down and three were commissioned before the end of the war.*[60]

1.4.3 Notes

- [1] Many sources show *Sōryū* and *Hiryū* as members of the same ship class despite their differences.*[1] This article follows those sources that treat them as related designs of separate classes.*[2]
- [2] Japan Standard Time is 19 hours ahead of Hawaiian Standard Time, so in Japan, the attack on Pearl Harbor happened on 8 December.
- [3] To this day there is much confusion about VMSB-241 at Midway. At that time the squadron was in transition from the obsolete SB2U Vindicator to the modern SBD-2 Dauntless and flew both aircraft during the battle.*[45]

1.4.4 Footnotes

- [1] Chesneau 1995, pp. 165–66; Parshall & Tully, pp. 470–76
- [2] Brown 1977, pp. 18–21; Chesneau 1980, p. 181
- [3] Chesneau 1995, p. 166
- [4] Jentschura, Jung & Mickel, p. 47
- [5] Brown 1977, pp. 18–19
- [6] Parshall & Tully, p. 9
- [7] Peattie, p. 241
- [8] Brown 1977, p. 18
- [9] Brown 1977, p. 19
- [10] Campbell, pp. 192–93
- [11] Parshall & Tully, p. 143
- [12] Brown 1977, p. 20
- [13] Brown 1977, p. 21
- [14] Stille 2007, p. 51
- [15] Campbell, p. 200
- [16] Silverstone, p. 329
- [17] Peattie, pp. 239, 241
- [18] Hata, Izawa & Shores, p. 131
- [19] Tully
- [20] Polmar & Genda, p. 162
- [21] Brown 2009, pp. 116–17
- [22] Stille 2011, p. 25
- [23] Zimm, pp. 159–60, 164, 168
- [24] Stille 2011, pp. 49, 51

- [25] Stille 2011, pp. 64–65
- [26] Stille 2011, p. 65
- [27] Brown 2009, pp. 118–19
- [28] Stille 2011, pp. 66, 70
- [29] Shores, Cull & Izawa, Vol. I, p. 161
- [30] Shores, Cull & Izawa, Vol. I, pp. 226, 229
- [31] Shores, Cull & Izawa, Vol. II, pp. 176–82
- [32] Shores, Cull & Izawa, Vol. II, pp. 307, 327
- [33] Shores, Cull & Izawa, Vol. II, pp. 392–93
- [34] Shores, Cull & Izawa, Vol. II, pp. 393–406
- [35] Shores, Cull & Izawa, Vol. II, pp. 413, 421–23, 426–29
- [36] Parshall & Tully, p. 12
- [37] Parshall & Tully, pp. 10, 42, 88
- [38] Stille 2007, p. 22
- [39] Parshall & Tully, pp. 151, 154; Stille 2007, p. 59
- [40] Parshall & Tully, pp. 3, 90
- [41] Parshall & Tully, pp. 112, 126, 129, 204
- [42] Parshall & Tully, pp. 503–04
- [43] Parshall & Tully, pp. 151–52, 503–04; Lundstrom, p. 337
- [44] Parshall & Tully, pp. 156–59, 503–04
- [45] Condon, p. 13
- [46] Parshall & Tully, pp. 176, 178, 180
- [47] Parshall & Tully, p. 504
- [48] Lundstrom, p. 338
- [49] Parshall & Tully, pp. 183–89
- [50] Parshall & Tully, pp. 154–55
- [51] Parshall & Tully, pp. 205–09
- [52] Parshall & Tully, pp. 213–14, 221, 224, 504
- [53] Parshall & Tully, p. 219
- [54] Brown 2009, p. 153
- [55] Parshall & Tully, pp. 262–63, 290, 292–96, 504
- [56] Parshall & Tully, pp. 311–12, 314–16, 318
- [57] Parshall & Tully, pp. 318–329
- [58] Parshall & Tully, pp. 341, 343, 349–52, 355, 357, 359
- [59] Parshall & Tully, pp. 387–88, 419, 421
- [60] Lengerer, pp. 104–06

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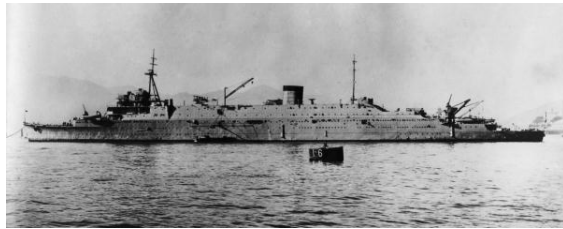
1.4.6 External links

- WW2DB: Hiryu
- Dutch Maritime Disasters in the Dutch East Indies, 1941–1942

Chapter 2

龍鳳大鳳

2.1 Japanese aircraft carrier Ryūhō



Japanese submarine depot ship Taigei off Kure in 1935.

Ryūhō (龍鳳, “Dragon phoenix”) was a light aircraft carrier of the Imperial Japanese Navy. She was converted from the submarine tender **Taigei** (大鯨, “Great Whale”), which had been used in the Second Sino-Japanese War. * [2] One of the least successful of the light aircraft carrier conversions due to its small size, slow speed and weak construction, during World War II, **Ryūhō** was used primarily as an aircraft transport and for training purposes, although she was also involved in a number of combat missions, including the First Battle of the Philippine Sea. * [3]

2.1.1 Background

The London Naval Treaty imposed limitations on new construction of major capital warships for the major world powers. The Imperial Japanese Navy responded in part by the construction of auxiliary vessels, such as fleet oilers and submarine tenders, designed so that they could be converted quickly into aircraft carriers in time of conflict. **Taigei** was ordered as part of the 1st Naval Armaments Supplement Programme of 1932.

2.1.2 Design

Although **Taigei** was designed from the onset for possible later conversion to an aircraft carrier, the design proved to have many shortcomings. The basic design of the hull suffered from a high freeboard with a shallow draught,

which resulted in poor stability. Although extensive use of electric arc welding on the hull speeded construction time and was considered highly innovative for the time, lack of experience with this technique led to many weak welds, and the ship suffered from frequent cracks. Inadequate sectioning into waterproof compartments below her waterline, combined with the weak construction of her hull, also made the ship vulnerable in combat situations. * [4] The new vessel was also plagued by the poor performance of its diesel engines, which gave only half the output expected.

Conversion of **Taigei** into an aircraft carrier entailed adding a 185.0 x 23.0 meter flight deck. Two 13.6 x 12.0 meter elevators connected the flight deck to the hangar deck below. During the conversion, the problematic diesel engines were replaced by Kampon turbine engines of the same design as was used in the **Kagero**-class destroyer. While greatly improving on engine performance and reliability, the more powerful engines were not powerful enough to overcome the increased displacement and side bulges in the hull of the modified design, and speed was decreased by two knots. * [4] Her flight wing theoretically consisted of 31 aircraft, typically a mixture of Mitsubishi A6M “Zero” fighters, Aichi D3A “Val” and Yokosuka D4Y “Judy” dive bombers, and Nakajima B5N “Kate” torpedo bombers; however, her small size limited her usefulness in combat operations. In August 1944, her flight deck was lengthened to 198.1 meters, but the number of aircraft embarked could only be increased to 36.

2.1.3 Operational history

As the submarine tender **Taigei**

Taigei was laid down at Yokosuka Naval Arsenal on 12 April 1933, and was launched on 16 November 1933. * [2] Construction was rushed by plans to have Emperor Hirohito attend the launching ceremony and due to inexperience with the electric arc welding method, portions of the hull warped during construction. Immediately after the launching ceremony, **Taigei** was returned to the dry dock for repairs and modifications, which involved replacement of damaged sections by the traditional rivet

construction method.

Formally commissioned on 31 March 1934, *Taipei* was soon damaged by a typhoon in what was later called the "Fourth Fleet Incident". Seawater ingress from faulty waterproof doors shorted the electric system, disabling her steering and the waves from the typhoon cracked a number of the welds in her hull. Further repairs at Yokosuka Naval Arsenal were scheduled for early 1936, but were delayed by the February 26 Incident. It was not until September 1938 that *Taipei* was deemed fully operational, and assigned to its design role as flagship of a submarine squadron.

From 1938-1940, *Taipei* performed normal operations in both northern and southern waters off Japan, with her primary mission being to support submarine operations off the coast of China from her home port of Kure in the Second Sino-Japanese War. She was reassigned from the IJN 1st Fleet to the IJN 6th Fleet on 15 November 1940 and was based at Kwajalein Atoll from 10 April 1941. Shortly before the start of hostilities in the Pacific War, *Taipei* was ordered back to Japan for conversion into a light aircraft carrier, arriving at Kure on 4 December 1941.

The conversion work began on 20 December 1941 at Yokosuka Naval Arsenal, and was originally scheduled to be completed within three months; however, numerous problems and issues arose, and the conversion work was not completed until 30 November 1942. She gained the distinction of being the only major warship damaged in the Doolittle Raid on 18 April 1942. She received one direct hit from a 500 lb (227 kg) bomb on the bow, plus several small incendiary bomb hits, with seven casualties among her crew.*[5] As an aircraft carrier, the vessel was renamed *Ryūhō*

As the aircraft carrier *Ryūhō*

On 30 November 1942, with conversion and repairs complete, *Ryūhō* was officially assigned to the IJN 3rd Fleet. On her first mission on 11 December 1942, under the command of Captain Yoshio Kamei, she was sent to the Japanese naval base at Truk escorted by the destroyer *Tokitsukaze*. Her normal aircraft complement consisted of 15 Mitsubishi A6M "Zero" fighters and 16 Aichi D3A "Val" dive bombers, but for this mission, she was carrying 20 light bombers with their pilots and crews on a ferry mission. However, at 9:10 AM on 12 December, she was hit by a single torpedo on the starboard side from the USN submarine *USS Drum* (SS-228) near Hachijojima, and was immediately forced to return to Yokosuka for emergency repairs, and was remained out of operation until early 1943.*[5]

On 19 March 1943 *Ryūhō* began a series of uneventful aircraft ferry missions to occupied islands in the South Pacific. On 11 June 1943, *Ryūhō* embarked the marooned survivors of the air group of the *Hiyō*, which had

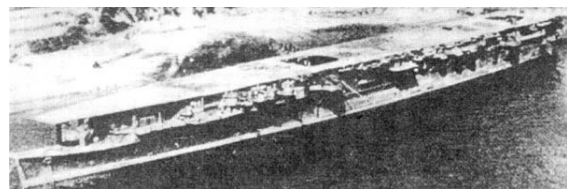
been damaged by an American submarine. She was subsequently assigned to the Second Carrier Division of the IJN 3rd Fleet, accompanying the *Unyō* and *Chūyō* to Truk and back, and remaining based in the Seto Inland Sea for training missions.*[5]

In October 1943, *Ryūhō* was sent on another aircraft ferry mission to Singapore, returning to Kure on 5 November 1943. On 25 November, she departed with *Hiyō* and escorts on a long circular patrol and training mission, sailing to Manila, then to Singapore, then to Tarakan, then Palau, then Truk, then Saipan, and finally returning to Kure on 2 January 1944.*[5]

After two more uneventful patrol and training missions between Japan and the Marianas Islands, *Ryūhō* was sent to the Japanese anchorage at Tawi Tawi in May 1944 to join the Combined Fleet. From there, she sailed with the Combined Fleet to participate in the First Battle of the Philippine Sea. On 19 June, she launched an air strike against Task Force 58, but scored no hits; nearly all of *Ryūhō's* aircraft were shot down by the swarms of American F6F Hellcat fighters and the anti-aircraft guns of the American fleet. At 6:10 pm on 20 June, as part of "Force B" (with *Hiyō*, *Junyō*, *Nagato*, *Mogami* and eight destroyers), *Ryūhō* was attacked by four TBF Avenger torpedo bombers from *USS Enterprise* (CV-6), which were loaded with 500 lb bombs. She suffered only slight damage from near misses.*[5]

Ryūhō engaged in several more patrol and training missions near Japan. On 25 October 1944, with *Kaiyō*, *Ryūhō* set sail from Sasebo Naval District on another aircraft ferry mission to Keelung, Taiwan. They were escorted by the destroyers *Momi*, *Ume* and *Momo*. They returned to Kure on 2 November. From 7 November to 15 November, *Ryūhō* briefly flew the flag of the Commander of the Mobile Fleet, Admiral Jisaburō Ozawa.*[5]

Final mission On 31 December 1944, *Ryūhō* sailed for Taiwan with a load of 58 *Ohka* kamikaze planes. Accompanying her were nine empty oil tankers bound for Singapore, and the destroyers *Hamakaze*, *Isokaze*, *Yukikaze*, *Shigure* and *Hatakaze*.



Light aircraft carrier Ryūhō photographed by US Navy aircraft at Kure in September 1945, showing damage to elevators.

Upon reaching Taiwan and unloading her cargo, *Ryūhō* was among the targets of a major series of American carrier-based air raids all over the island. Twelve TBF Avengers attacked her but none scored a hit, and *Ryūhō's* gunners shot down one of them. *Ryūhō* departed for

Japan on 2 January 1945 escorted by *Isokaze*; when she arrived at Kure on 18 January, *Ryūhō* also gained the distinction of being the last Japanese aircraft carrier to venture outside the home waters of Japan.* [5]

Ryūhō was attacked by Task Force 58 aircraft on 19 March near Kure, suffering hits by three 500 lb bombs and two 5.5-inch rockets. The damage was severe: the flight deck bulged upward between the two elevators, the No. 1 boiler was punctured by a bomb fragment, the stern settled two meters into the water, and a raging fire broke out. Twenty crewmen were killed and 30 were wounded.* [5] Upon returning to Kure on 1 April, *Ryūhō* was considered to be a total loss. Moored as an abandoned hulk off of *Etajima*, she was attacked by USN aircraft again on 24 July and 28 July. She was struck from the navy list on 30 November 1945* [5] and scrapped in 1946.

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2.1.5 External links

- Nishida, Hiroshi. “Materials of IJN” . *Imperial Japanese Navy*.
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2.1.6 Notes

- [1] In the official document of IJN, *Ryūhō*-class aircraft carrier does not exist. *Ryūhō* belongs to *Shōhō*-class aircraft carriers.
- [2] Jentsura, Hansgeorg (1976). *Warships of the Imperial Japanese Navy, 1869–1945*. Naval Institute Press. ISBN 0-87021-893-X. page 50
- [3] Stille, Mark (2005). *Imperial Japanese Aircraft Carriers 1921–1945*. Osprey Publishing. ISBN 1-84176-853-7. page 24, 33
- [4] Chesneau, Roger, ed. (1980). *Conway's All the World's Fighting Ships 1922–1946*. Greenwich, UK: Conway Maritime Press. ISBN 0-85177-146-7. page 181
- [5] Tully, Anthony P. “IJN Ryūhō: Tabular Record of Movement (Combinedfleet.com)”.

2.2 Japanese aircraft carrier Taihō

Taihō (大鳳) was an aircraft carrier of the Imperial Japanese Navy during World War II. Possessing heavy belt armor and featuring an armored flight deck (a first for any Japanese carrier), she represented a major departure in Japanese carrier design and was expected to not only survive multiple bomb, torpedo or shell hits but also continue fighting effectively. Her name means “Great Phoenix”.

Built by Kawasaki at Kobe, she was laid down on 10 July 1941, launched almost two years later on 7 April 1943 and finally commissioned on 7 March 1944. She sank on 19 June 1944 during the Battle of the Philippine Sea after suffering a single torpedo hit from the American submarine USS *Albacore*, due to explosions resulting from design flaws and poor damage control.

2.2.1 Design

Taihō was approved for construction in the 1939 4th Supplementary Programme. Her design was that of a modified *Shōkaku*. Under the Modified Fleet Replenishment Program of 1942, *Taihō* was to be the first of a new generation of Japanese aircraft carriers, which would include *Taihō*, 15 of a modified *Hiryū*-class (which turned into the *Unryū*-class) and five of an improved *Taiho* design.* [2]

Hull

Taiho's waterline belt armor varied between 55 mm (2.2 in) abreast the machinery to 152 mm (6 in) around the magazines. The armor below the waterline was designed to withstand a 300 kg (660 lb) charge. Internal torpedo protection comprised a 40 mm (1.6 in) anti-splinter steel bulkhead, 3 m (9 ft 10 in) inboard of the outer plating.

The weight of *Taiho*'s armor immersed her hull so deeply that her lower hangar deck was barely above the load **waterline** and the bottoms of her two elevator wells (which formed the roofs of her fore and aft aviation fuel tanks) were actually below the waterline. This latter fact would play an important role in her subsequent destruction during the **Battle of the Philippine Sea**.

Taihō's aviation fuel tanks were only partially protected with armor, as naval designers opted earlier to devote greater protection to their carriers' bomb and torpedo magazines. The empty air spaces around the aviation fuel tanks turned out to be the ship's downfall; after which all Japanese carriers had theirs filled with concrete to protect against splinters and shock damage, although it was poor damage control that ultimately sank *Taiho*.

To improve seakeeping and airflow over the forward end of the deck, *Taihō*'s bow was plated up to flight deck level, giving her a similar appearance to British *Illustrious* class aircraft carriers.

Machinery

Taihō's eight oil-fired Kampon RO Go boilers were capable of generating 160,000 **shp** (120,000 kW). Her four Kampon steam turbines were each geared to separate propeller shafts. She had a top speed of 33.3 **kn** (61.7 **km/h**; 38.3 **mph**). *Taihō*'s maximum fuel oil stowage of 5,700 short tons (5,200 t) gave her a radius of 10,000 **nmi** (19,000 **km**; 12,000 **mi**) at 18 **kn** (33 **km/h**; 21 **mph**).^[3]

Taihō had two rudders positioned along the longitudinal center-line of the ship: a semi-balanced main rudder (so-called because a portion of the rudder comes before the hinged axis and therefore requires less force to turn) located astern and an unbalanced auxiliary rudder forward of the main rudder. Both were turned via electrohydraulically powered steering gears, but the auxiliary rudder could also be turned via a diesel engine in the event the primary steering gear was damaged.^[4]

Flight Deck

Taihō was the first Japanese aircraft carrier to feature an **armored flight deck**, designed to withstand multiple 500 kg (1,100 lb) bomb hits with minimal damage. The armor varied slightly in thickness between 75–80 mm (3.0–3.1 in) and formed a protective lid over an enclosed upper hangar whose sides and ends were unarmored. The floor of the upper hangar was also unarmored but the lower hangar deck had 32 mm (1.3 in) plating.^[5] *Taihō*'s flight deck, measuring 257 m (843 ft 2 in) long and 30 m (98 ft 5 in) wide, had the largest total area of any Japanese carrier until the completion of *Shinano* and was offset 2 m (6 ft 7 in) to port to compensate for the weight of her island structure.^[6] Unlike all pre-war Japanese carriers, *Taihō*'s flight deck was not wooden-planked. Rather, the steel deck was covered with a newly developed latex coat-

ing approximately 6 mm (0.24 in) thick. This offered several advantages over wood: it was cheaper, it saved weight, it required fewer man-hours to apply and it was less likely to interfere with air operations in the event of minor damage. On the negative side, the material had only mediocre anti-skid qualities and tended to become brittle and crack over time.^[7]

Fourteen hydraulically operated arrester wires were distributed transversely across the flight deck between the fore and aft elevators. *Taihō* also had three hydraulically powered crash barriers, designed to abruptly stop any plane failing to catch an arrester wire upon landing. Two were located abreast the island and one was set at the bow.^[8] *Taihō* was equipped with two large 100 long tons (100 t) armored elevators, capable of transferring aircraft weighing up to 7.5 long tons (7.6 t) between decks. The elevators were widely spaced apart, with one at the far aft end of the ship and one forward of the island. It was originally desired to install a third elevator amidship, but because of wartime urgency this was deleted from the final design, thus saving both time and material. The elevators were roughly pentagonal in shape, with the aft elevator measuring 14 m (45 ft 11 in) long and 14 m (45 ft 11 in) wide. The forward elevator was slightly smaller in width. It took approximately 15 seconds to raise an aircraft from the lower hangar deck to the flight deck and the same to lower one.^[9]

Hangars

Taihō's upper and lower hangars were approximately 150 m (492 ft 2 in) long and 5 m (16 ft 5 in) high. The upper hangar was 1 m (3 ft 3 in) wider than the lower. Fighters were normally stowed in the middle and forward sections of the upper hangar and were raised to flight deck level using the bow elevator to facilitate more rapid handling. Dive bombers occupied the remaining upper hangar spaces with torpedo bombers stowed in the lower hangar. With greater all-up weights and longer take-off runs than the fighters, these planes were brought up to the flight deck using the aft elevator where they could then be spotted as far astern as possible.^[6]

As a fire safety precaution, the carrier's two hangars were divided into sections (five on the upper and four on the lower), separated by fire-proofed fabric curtains. The curtains were intended to limit the supply of air to and delay the spread of any fire breaking out on the hangar decks. Further protection against fire was supplied by a foam spray system fed by two rows of pipes and nozzles running along the walls and ends of the hangars. The lower hangar could also be flooded with carbon dioxide where the likelihood of fuel vapor build-up was greatest.^[10]

Taiho's original design specified installation of two catapults on her forward bow for power-assisted take-offs. However, as the Imperial Japanese Navy had not devel-

oped a workable catapult for carrier decks by the time of *Taiho*'s construction, these were eventually deleted from the requirements. The IJN instead opted to use rocket-assisted take-off gear (RATOG) when necessary. This consisted of two solid-propellant (cordite) rockets attached to either side of a plane's fuselage. Generating 700 kgf (1,500 lbf) of thrust for three seconds, they were able to get an aircraft airborne in a much shorter distance than normally required.*[11]

On *Taihō*'s port side, abreast the aft elevator, stood a collapsible crane with a 4 long tons (4.1 t) lifting capacity. When not in use, it could be folded and lowered below flight deck level through an opening in the deck, thus eliminating a potentially hazardous obstruction during air operations.*[6]

Taihō's single large funnel, built into the island, was angled 26° from the vertical to starboard and carried the ship's exhaust gases well clear of the flight deck. This arrangement, atypical of most Japanese carriers, was similar to that successfully employed on *Junyō* and *Hiyō* and would later be repeated on *Shinano*.*[1]

Three Type 96 searchlights were positioned along the outer edges of the flight deck: two on the port side and one to starboard, just aft of the island. Like the collapsible crane, these could be lowered below flight deck level to prevent interference with normal flight activity. A fourth searchlight was mounted to the starboard side of the carrier's island on a projecting sponson.*[12]

Armament

Taiho's armament comprised 12 of the brand-new 100 mm (3.9 in)/65 caliber Type 98 anti-aircraft guns arranged in six twin-gun turrets: three on the port side and three to starboard. The guns were electro-hydraulically powered; however, in the event of a power failure they could function manually at reduced effectiveness. Operated by a crew of 11, the average firing rate was 15 rounds per minute with a maximum effective horizontal range of 14 km (7.6 nmi; 8.7 mi) and a maximum effective vertical range of 11 km (5.9 nmi; 6.8 mi).*[13]

In addition, *Taihō* carried 17 triple-mount 25 mm (1 in) anti-aircraft cannons (51 barrels total). Sixteen of these were mounted on sponsons just below flight deck level: eight to port, six to starboard and two at the stern. The 17th unit was positioned on the flight deck, just ahead of the island. The triple-mounts were electrically powered (though manual operation was possible) and normally required a crew of nine. They had a practical firing rate of 110–120 rounds per minute and a maximum effective range of 3 km (1.6 nmi; 1.9 mi). The 25 mm (1 in) Type 96 cannon was the Japanese Navy's standard small-caliber anti-aircraft weapon from 1936 through the end of the war in 1945 and was an adaptation of a French design.*[14]

Taihō had two Type 94 triaxially stabilized fire control directors, one mounted on the flight deck ahead of the island and one amidships on the port side, just below flight deck level. These controlled the 100 mm (3.9 in) gun turrets and were electro-hydraulically powered.*[15] The 25 mm (1 in) triple-mount cannons were controlled by seven Type 95 fire control units, each of which could direct the fire of two or three mounts.*[16]

Radar

Taihō's original design made no provisions for radar installation as the Imperial Japanese Navy did not possess any shipborne surface, fire control or air search radar at the war's outset in September 1939. Not until January 1941, when a Japanese naval technical mission arrived in Germany, did the IJN learn that European nations were using pulsed radar for combat purposes. In August that same year, the Navy Ministry initiated a crash plan to speed up radar development, resulting in (among others) the Type 21 and Type 13 air search radars.*[8]

Prior to completion in 1944, *Taihō* was fitted with two Type 21 air search radars, one mounted atop the island on the anti-aircraft control platform and one on the lower bridge deck at the aft end of the island. She also had one Type 13 air search set installed with an antenna mounted on the signal mast above the bridge. The Type 21 had a maximum effective range of 80 nmi (150 km; 92 mi) while the Type 13 had a range of 54 nmi (100 km; 62 mi)*[17]

Aircraft

Taihō's planned air complement varied considerably throughout her design and construction. Initially, it was envisioned she would carry 126 aircraft (with 30 of these in reserve). Later, this was pared down to 64, raised again to 78 and finally reduced to 53. One reason for the discrepancy in numbers was (in sharp contrast to the United States) the Imperial Japanese Navy's lack of insistence that its carrier planes have the smallest possible folded wingspan (many designs' folded only near the tips, while the wings of the *Yokosuka D4Y* Suisei dive-bomber did not fold at all). Her aircraft capacity was also changed based on previous wartime experience and the fact that *Taihō* was expected to carry larger newer-model carrier planes still under development at the time of her construction: 24 *Mitsubishi A7M2 Reppu* "Sam" fighters, 25 *Aichi B7A2 Ryusei* "Grace" torpedo bombers and four *Nakajima C6N1 Saiun* "Myrt" reconnaissance planes. As none of these types were available at the time of her commissioning, *Taihō* went to sea with older-model aircraft.*[18]

Prior to 13 June 1944, *Taihō* carried 65 aircraft: 22 *Mitsubishi A6M5 Reisen* (Zero) fighters, 22 *Yokosuka D4Y1 Suisei* "Judy" dive bombers (of which four were the

D4Y1-C reconnaissance types), three Aichi D3A2 “Val” dive bombers and 18 Nakajima B6N2 *Tenzan* “Jill” torpedo bombers. By 19 June 1944, however, the day the Battle of the Philippine Sea took place, she had already lost nine aircraft due to various causes and had just 56 planes remaining for actual combat.*[19]

2.2.2 Service history

Battle of the Philippine Sea

Taihō was formally commissioned on 7 March 1944. Following several weeks of service trials in Japan's Inland Sea, she was deployed to Singapore, arriving there on 5 April. *Taihō* was then moved to Lingga Roads, a naval anchorage off Sumatra, where she joined veteran carriers *Shōkaku* and *Zuikaku* in the First Carrier Division, First Mobile Force. All three carriers engaged in working up new air groups by practicing launch and recovery operations and acting as targets for mock aerial attacks staged from Singapore airfields by their own planes.*[20] On 15 April, Vice-Admiral Jisaburo Ozawa officially transferred his flag from *Shokaku* to *Taihō* to take advantage of the carrier's extensive command facilities. Shortly thereafter, the First Mobile Force departed Lingga and arrived on 14 May at Tawi-Tawi off Borneo, where the fleet could directly refuel with unrefined Tarakan Island crude oil and await execution of the planned Kantai Kessen (“decisive battle”) known as Operation A-GO.*[21]

When American carrier strikes against the Marianas indicated an invasion of Saipan was imminent, the Japanese Combined Fleet staff initiated Operation A-GO on 11 June. *Taihō* and the rest of Ozawa's First Mobile Force departed Tawi-Tawi on 13 June, threading their way through the Philippine Islands and setting course for Saipan to attack American carrier forces operating in the vicinity.*[21]

Fate On 19 June 1944, *Taihō* was one of nine Japanese aircraft carriers involved in the Battle of the Philippine Sea. At 07:45 that morning, she was turned into the wind to launch her contribution (16 Zeros, 17 “Judy”s and nine “Jill”s) to Ozawa's second attack wave. As *Taihō*'s planes circled overhead to form up, American submarine USS *Albacore*, which had spotted Ozawa's carriers earlier that morning, reached an ideal attack position and fired a spread of six torpedoes at the carrier. One of *Taihō*'s strike pilots, Warrant Officer Sakio Komatsu, saw the torpedo wakes, broke formation and deliberately dove his plane into the path of one torpedo; the weapon detonated short of its target*[22] and four of the remaining five missed. The sixth torpedo, however, found its mark and the resulting explosion holed the carrier's hull on the starboard side, just ahead of the island. The impact also fractured the aviation fuel tanks and jammed the forward elevator between the flight deck and upper hangar deck.

With the ship down 5 ft (1.5 m) by the bows due to flooding, the forward elevator pit filled with a mixture of seawater, fuel oil and aviation gasoline. *Taiho*'s captain marginally reduced her speed by a knot and a half to slow the ingress of seawater into the hull where the torpedo had struck. As no fires had started, Vice-Admiral Ozawa ordered that the open elevator well be planked over by a flight deck damage control party in order to allow resumption of normal flight operations. By 09:20, using wooden benches and tables from the petty officers' and sailors' mess rooms, this task was completed.*[23] Ozawa proceeded to launch two more waves of aircraft.*[23]

Meanwhile, leaking aviation gasoline accumulating in the forward elevator pit began vaporising and soon permeated the upper and lower hangar decks. The danger this posed to the ship was readily apparent to the damage control crews but, whether through inadequate training, lack of practice (only three months had passed since the ship's commissioning) or general incompetence, their response to it proved fatally ineffectual. Efforts to pump out the damaged elevator well were bungled and no one thought to try and cover the increasingly lethal mixture with foam from the hangar's fire suppression system.*[24]

Because *Taihō*'s hangars were completely enclosed, mechanical ventilation was the only means of exhausting fouled air and replacing it with fresh. Ventilation duct gates were opened on either side of hangar sections No. 1 and No. 2 and, for a time, the carrier's aft elevator was lowered to try and increase the draught. But even this failed to have any appreciable effect and, in any case, air operations were resumed about noon, requiring the elevator to be periodically raised as aircraft were brought up to the flight deck. In desperation, damage control parties used hammers to smash out the glass in the ship's portholes.*[24]

Sinking *Taihō*'s chief damage control officer eventually ordered the ship's general ventilation system switched to full capacity and, where possible, all doors and hatches opened to try and rid the ship of fumes. Unfortunately, this simply resulted in saturation of areas previously unexposed to the vapors and increased the chances of accidental or spontaneous ignition.*[23]*[24] About 14:30 that afternoon, 6½ hours after the initial torpedo hit, *Taihō* was jolted by a severe explosion. A senior staff officer on the bridge saw the flight deck heave up. The sides blew out. *Taihō* dropped out of formation and began to settle in the water, clearly doomed. Though Admiral Ozawa wanted to go down with the ship, his staff prevailed on him to survive and to shift his quarters to the cruiser *Haguro*. Taking the Emperor's portrait, Ozawa transferred to *Haguro* by destroyer. After he left, *Taihō* was torn by a second thunderous explosion and sank stern first at 16:28, carrying down 1,650 officers and men out of a complement of 2,150.*[23]*[25]*[26]

She sank at coordinates 12°05'N 138°12'E / 12.083°N

138.200°E.

2.2.3 See also

- List by death toll of ships sunk by submarines

2.2.4 References

- [1] Gardiner and Chesneau (1980), p.183
- [2] Reynolds (1968), p.61
- [3] Ahlberg/Lengerer, p.5
- [4] Ahlberg/Lengerer, p.6
- [5] Brown, p.29
- [6] Ahlberg/Lengerer, p.12
- [7] Ahlberg/Lengerer, p.74
- [8] Ahlberg/Lengerer, p.23
- [9] Ahlberg/Lengerer, p.13
- [10] Brown, p.6
- [11] Ahlberg/Lengerer, p.14
- [12] Ahlberg/Lengerer, p.62
- [13] Ahlberg/Lengerer, p.49
- [14] Ahlberg/Lengerer, p.53
- [15] Ahlberg/Lengerer, p.58
- [16] Ahlberg/Lengerer, p.61
- [17] Friedman, p.207
- [18] Ahlberg/Lengerer, p.32
- [19] Ahlberg/Lengerer, p.48
- [20] Evans, p.304
- [21] Ahlberg/Lengerer, p.84
- [22] Reynolds (1968), p.192
- [23] "Albacore". *Dictionary of American Naval Fighting Ships*. Navy Department, Naval History & Heritage Command. Retrieved 6 March 2009.
- [24] Ahlberg/Lengerer, p.91
- [25] Ahlberg/Lengerer, p.93
- [26] Dull, p.320

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2.2.6 External links

- “IJN Taiho: Tabular Record of Movement” . Parshall, Jon; Bob Hackett, Sander Kingsepp, & Allyn Nevitt. Retrieved 22 May 2010.
- Japanese Warships – Taihō

Chapter 3

龍驤鳳翔

3.1 Japanese aircraft carrier Hōshō

For the 19th-century Japanese naval vessel, see [Japanese warship Hōshō](#).

Hōshō (鳳翔, literally "phoenix in flight") was the world's first commissioned ship that was designed and built as an aircraft carrier,*[Note 1] and the first aircraft carrier of the Imperial Japanese Navy (IJN). Commissioned in 1922, the ship was used for testing carrier aircraft operations equipment, techniques, such as take-offs and landings, and carrier aircraft operational methods and tactics. The ship provided valuable lessons and experience for the IJN in early carrier air operations. *Hōshō*'s superstructure and other obstructions to the flight deck were removed in 1924 on the advice of experienced aircrews.

Hōshō and her aircraft group participated in the [Shanghai Incident](#) in 1932 and in the opening stages of the [Sino-Japanese War](#) in late 1937. During those two conflicts, the carrier's aircraft supported Imperial Japanese Army ground operations and engaged in aerial combat with aircraft of the [Nationalist Chinese Air Force](#). The small size of the ship and her assigned airgroups (usually around 15 aircraft) limited the effectiveness of her contributions to combat operations. As a result, the carrier was placed in [reserve](#) after her return to Japan from China and she became a training carrier in 1939.

During [World War II](#), *Hōshō* participated in the [Battle of Midway](#) in June 1942 in a secondary role. After the battle, the carrier resumed her training role in Japanese home waters for the duration of the conflict and survived the war with only minor damage from air attacks. She was used as a repatriation transport after the war, making nine trips to bring some 40,000 Japanese soldiers and civilians to Japan from overseas locations. *Hōshō* was [scrapped](#) in Japan beginning in 1946.

3.1.1 Design and description

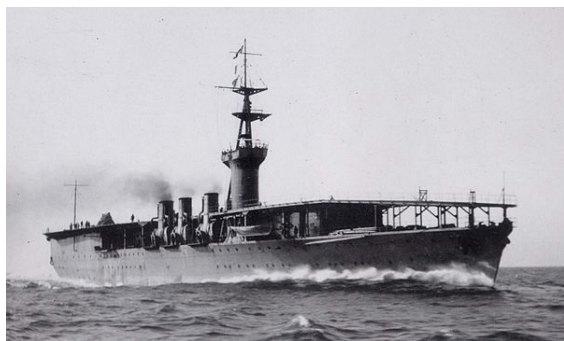
Construction of a [seaplane carrier](#) was authorized by the Japanese government in its "eight-six" fleet pro-

gram of 1918.*[1] A planned sister ship, named *Shokaku*, was cancelled in 1922 before any construction started.*[2]*[Note 2] *Hōshō* was the second warship, after the British *HMS Hermes*, to be designed from the keel up as an aircraft carrier, but was launched and completed earlier than *Hermes*.*[3]

Hōshō was planned as a seaplane carrier like the British *HMS Campania* with a forward [flying-off deck](#), 32 aircraft, four low-angle 14-centimeter (5.5 in) guns, and four [anti-aircraft](#) (AA) guns. The plan was revised after reports were received from Japanese observers with the [Royal Navy](#) in Europe about the desirability to be able to land aircraft on the ship. The new requirements were modeled on *HMS Furious* after she received her rear flight deck in 1918. The ship was to be capable of 30 [knots](#) (56 km/h; 35 mph) and fitted with a forward flight deck, [superstructure](#) and [funnels](#) amidships, and a large hangar aft. Shortly thereafter based on observations of landing trials on *Furious* and *HMS Argus*, the world's first [flush-decked aircraft carrier](#), *Hōshō*'s flight deck design was revised in April 1919. The superstructure was removed and the funnels were moved to one side to create an unobstructed, full-length flight deck, and the ship was reclassified as an aircraft carrier. The ship's hull was based on that of a large cruiser and she was given a small island. Her three funnels were mounted on the [starboard](#) side and swiveled to lie horizontal during flight operations. *Hōshō*'s designed speed was reduced to 25 knots (46 km/h; 29 mph), based on British experiences during [World War I](#).*[4]

General characteristics

Hōshō was completed with an overall length of 168.25 meters (552 ft 0 in). She had a beam of 17.98 meters (59 ft 0 in) and a mean draft of 6.17 meters (20 ft 3 in). The ship displaced 7,470 long tons (7,590 t) at [standard load](#), and 9,494 long tons (9,646 t) at normal load. Her crew totaled 512 officers and men.*[5] The ship was almost completely unarmored.*[6]



Hōshō conducts full power trials near Tateyama, Japan on 4 December 1922.

Propulsion

Hōshō had two Parsons geared turbine sets with a total of 30,000 shaft horsepower (22,000 kW) driving two propeller shafts. Eight Kampon Type B water-tube boilers with a working pressure of 18.3 kg/cm² (1,790 kPa; 260 psi) and a temperature of 138 °C (280 °F) provided steam to the turbines, although only four were oil-fired. The other four used a mix of oil and coal. The ship's designed speed was 25 knots, but she made 26.66 knots (49.37 km/h; 30.68 mph) from 31,117 shaft horsepower (23,204 kW) on her sea trials on 30 November 1922. She carried 2,700 long tons (2,700 t) of fuel oil and 940 long tons (960 t) of coal, an extraordinary total for such a small ship, to give her a range of 8,680 nautical miles (16,080 km; 9,990 mi) at 12 knots (22 km/h; 14 mph).^[7]

To reduce rolling and increase stability for aircraft operations, a gyro stabilizer produced by the American Sperry Gyroscope Company was installed. The installation initially proved unreliable as the Japanese technicians were badly trained by Sperry, but eventually the system proved its worth as the technicians gained experience.^[7]

Flight deck arrangements



A view of the underside of Hōshō's narrow flight deck looking from the forecastle forward. Photographed in October 1945.

Hōshō's flight deck was 168.25 meters (552 ft 0 in) long and 22.62 meters (74 ft 3 in) wide. The forward end

sloped down at an angle of -5° to help aircraft accelerate during takeoff. A small island was mounted well forward on the starboard side and contained the ship's bridge and air operations control center. The island was fitted with a small tripod mast intended to mount the ship's fire-control system. Fifteen different types of landing equipment were evaluated before the British longitudinal wire system was adopted. Low landing speeds of the time meant that aircraft had little difficulty in stopping, but their light weight made them vulnerable to wind gusts that could blow them over the side of the carrier, and the longitudinal wires helped to prevent that. Forward of the island was a collapsible crane for loading aircraft into the forward hangar.^{[8][9]}

The flight deck, unlike those on Royal Navy carriers, was superimposed on the ship's hull rather than constructed as a strength deck supporting the carrier's hull structure.^[6] A system of lights and mirrors along the flight deck assisted pilots in landing on the carrier.^[2]

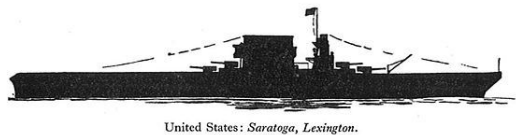
Hōshō was the only Japanese aircraft carrier with two hangars. The forward hangar was 67.2 by 9.5 meters (220 ft 6 in by 31 ft 2 in) and only one deck in height as it was intended to house nine small aircraft, such as fighters. The two-story rear hangar measured 16.5 by 14 meters (54 ft 2 in by 45 ft 11 in) at the forward end and 29.4 by 12 meters (96 ft 5 in by 39 ft 4 in) at the rear end. It was designed to house six large aircraft, such as torpedo bombers, as well as six reserve aircraft. Each hangar was served by an aircraft elevator. The forward elevator was 10.35 by 7.86 meters (34.0 by 25.8 ft) and the aft elevator measured 13.71 by 6.34 meters (45 ft 0 in by 20 ft 10 in).^[10]

Air group

Hōshō had a normal capacity of fifteen aircraft, subject to the limitations of her hangars. She was first commissioned with an air group of nine Mitsubishi 1MF (Type 10) fighters and three to six Mitsubishi B1M3 (Type 13) torpedo bombers. In 1928, the fighters were replaced by the A1N1 (Type 3). Three years later the air group consisted of Nakajima A2N (Type 90) fighters and Mitsubishi B2M (Type 89) torpedo bombers. In 1938 Nakajima A4N (Type 95) fighters and Yokosuka B3Y (Type 92) bombers flew from the ship. In 1940 the air group was modernized with Mitsubishi A5M (Type 96) "Claude" fighters and Yokosuka B4Y1 (Type 96) "Jean" bombers.^{[11][12]}

Armament

Hōshō was armed with four 50-caliber 14 cm/50 3rd Year Type guns, two on each side. The two forward guns had a firing arc of 150°, including straight ahead, while the rear guns could fire 120° on either side.^[13] They fired 38-kilogram (84 lb) projectiles at a rate of six to ten

United States: *Saratoga*, *Lexington*.Great Britain: *Courageous*, *Glorious*.Japan: *Hoshō*.Great Britain: *Furious*.Japan: *Akagi*.

Hōshō (middle) compared with other aircraft carriers constructed during the same time period

rounds per minute with a muzzle velocity of about 850 m/s (2,800 ft/s); at 35°, they had a maximum range of 19,750 m (21,600 yd).^[14] A heavy gun armament was provided for *Hōshō*; as carrier doctrine was just evolving at this time, the impracticability of carriers engaging in gun duels had not yet been realized. Her large flight deck and lack of armor made her a vulnerable target in surface battles.^[15]^[Note 3]

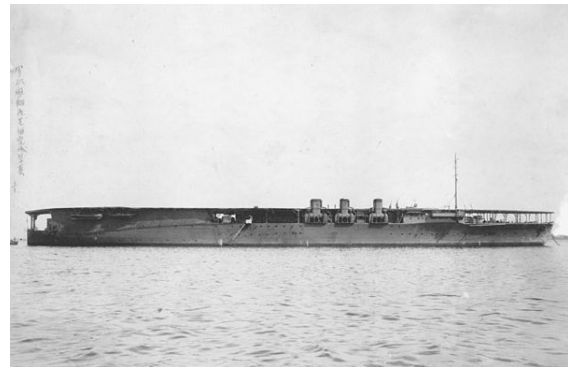
A pair of 40-caliber 8 cm/40 3rd Year Type guns on disappearing mounts provided *Hōshō*'s only anti-aircraft defense. They were positioned on the flight deck, just forward of the rear elevator. These guns fired 5.67–5.99-kilogram (12.5–13.2 lb) projectiles at a muzzle velocity of about 680 m/s (2,231 ft/s); at 45°, this provided a maximum range of 10,800 meters (11,800 yd), and they had a maximum ceiling of 7,200 meters (23,600 ft) at 75° elevation. Their effective rate of fire was 13 to 20 rounds per minute.^[16]

3.1.2 Service

Early career

Hōshō's keel was laid down by the Asano Shipbuilding Company in Tsurumi-ku, Yokohama, on 16 December 1920. She was launched on 13 November 1921 and towed to Yokosuka Naval Arsenal for completion on 10 January 1922. *Hōshō* was delayed by repeated design changes and late deliveries of equipment, pushing the commissioning date from March to 27 Decem-

ber 1922. She was commissioned lacking much of her aviation equipment, and did not begin landing trials until 22 February 1923. The first landings were made by British pilots under contract, who were quickly replaced by Japanese pilots trained by the British Aviation Mission.^[17]^[Note 4]



Hōshō in 1924 after her island was removed

After *Hōshō* was commissioned, experienced aircrews requested changes, and the ship was modified by the Yokosuka Navy Arsenal from 6 June to 20 August 1924. The island, tripod mast, and aircraft crane were removed since they partially obstructed the flight deck and obscured pilot visibility. The forward part of the flight deck was made horizontal, and the 8 cm AA guns were moved forward, close to the position of the former island and out of the way of landing operations.^[18]^[Note 5] After the island was removed, the carrier's flight operations were controlled from a platform extending from the side of the flight deck, a design that would be repeated in subsequent Japanese aircraft carriers.^[19] The ship was then assigned to the 1st Fleet until 15 November 1924.

Hōshō was fitted with a net used as a crash barrier aft of the forward elevator between 10 March and 2 July 1925. The barrier was intended to prevent landing aircraft from colliding with aircraft preparing to take off, and stop them from falling into the open elevator well. The barrier was hydraulically operated and could be erected in three seconds.^[20]

As the first of her kind, *Hōshō* provided valuable experience and insight into carrier air operations for the IJN. The ship was used for testing aircraft and equipment, particularly various types of arresting gear and optical landing aids. The lessons learned influenced the design and construction of *Ryūjō* and the subsequent conversions of *Akagi* and *Kaga* into aircraft carriers. *Hōshō* was actively used to develop carrier operational methods and tactics for the IJN during the 1920s. She was assigned to the First Carrier Division with *Akagi* on 1 April 1928. During the 1930s *Hōshō* was fitted with three different types of transverse arresting gear for trials.^[21]^[22]^[Note 6]



Hōshō conducts air operations around the time of the Shanghai incident.

Shanghai

Along with *Kaga*, *Hōshō* was assigned to the First Carrier Division and sent to China during the **Shanghai Incident** that began in January 1932. Operating with the **Third Fleet**, *Hōshō* arrived at the mouth of the **Yangtze River** on 1 February. Her aircraft participated in the IJN's first aerial combat on 5 February when three fighters, escorting two attack aircraft, were engaged by nine Chinese fighters; one Chinese fighter was damaged. * [Note 7] Two days later, the two carriers sent some of their aircraft to Kunda Airfield where they flew ground attack missions in support of the **Imperial Japanese Army**. Between 23 and 26 February, *Kaga* and *Hōshō* bombers attacked Chinese airfields at **Hangzhou** and **Suzhou**, destroying a number of Chinese aircraft on the ground. On 26 February, six fighters from *Hōshō*, escorting nine attack aircraft from *Kaga* on one of the bombing raids, shot down two of five Chinese fighters that engaged them. The First Carrier Division rejoined the Combined Fleet on 20 March, after a ceasefire had been declared on 3 March. * [11] * [23] * [Note 8]

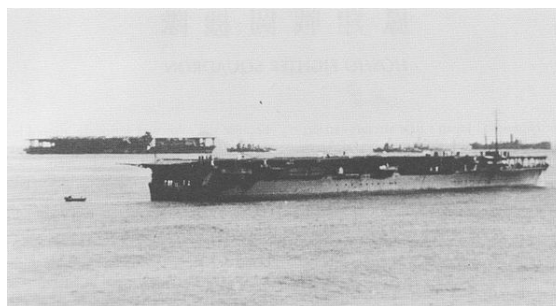
Fourth Fleet Incident

Hōshō participated in the Combined Fleet Maneuvers of 1935 where she was attached to the **IJN Fourth Fleet**. The fleet was caught out in a **typhoon** on 23 September. The carrier and a number of other Japanese ships were badly damaged in what was referred to as the "**Fourth Fleet Incident**." * [24] The ship's forward flight deck collapsed and part had to be cut away before the carrier could proceed to **Yokosuka** for repairs. The Fourth Fleet Incident and the **Tomozuru Incident** of 1934, in which a top-heavy **torpedo boat** capsized in heavy weather, caused the Japanese command to investigate the stability of all their ships, resulting in a number of design changes to improve stability and increase hull strength.

While the *Hōshō* was at the dockyard between 22 November 1935 and 31 March 1936, her stability was improved; the forward flight deck's supports were reinforced and increased in number; the ship's AA guns, aircraft crane and upper deck aviation fuel tanks were removed; the funnels were fixed in the horizontal position with their mouths angled slightly downwards; the front sides of *Hōshō*'s for-

ward hangar and bridge were reinforced; and the ship's hull was reinforced in the vicinity of her rear hangar to increase her longitudinal strength. At full load, her **metacentric height** after these changes was 1.11 meters (3 ft 8 in). Six twin 13.2 mm **Type 93 Hotchkiss machine guns** were also fitted. * [21] * [Note 9]

Sino-Japanese War



Hōshō (foreground) with Kaga (left background) around the time of the Sino-Japanese War

During the Sino-Japanese War, *Hōshō* returned to the Third Fleet and supported land operations of the army in China around August or October 1937 with *Ryūjō*, later joined by *Kaga*. * [Note 10] *Hōshō*'s air unit began flying ground support missions in the **Shanghai** area on 16 July. Three of the ship's **Nakajima A2N** fighters engaged two **Martin B-10** heavy bombers on 25 July, shooting down one of them. * [25]

The ship departed on 1 September to refuel, but did not return to the Shanghai area. Accompanied by *Ryūjō*, she sailed to the South China coast and began operations against Chinese forces near Canton on 21 September. On that day, *Hōshō* contributed six fighters to escort bombers attacking airfields at Tienho and Paiyun. They claimed six enemy aircraft shot down, but the range proved to be too long. Five of the fighters ran out of fuel and had to **ditch** in the sea, although the aircrews were rescued. *Hōshō* and *Ryūjō* bombers continued with almost daily attack missions until the end of September. * [26] * [Note 11] *Hōshō* and *Ryūjō* returned to the Shanghai area on 3 October and *Hōshō*'s aircraft were temporarily transferred to Kunda airfield to support ground operations. On 17 October, *Hōshō* transferred all of her aircraft to *Ryūjō* and returned to Japan. * [27]

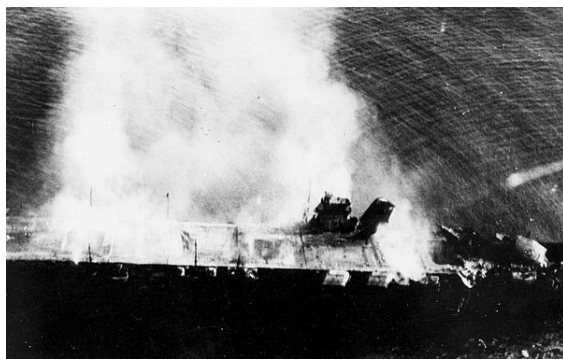
Hōshō was placed in **reserve** on 1 December 1937. * [28] Her aircraft elevators were enlarged in 1939: the forward elevator to 12.8 by 8.5 meters (42 by 28 ft) and the rear elevator to 13.7 by 7 meters (45 by 23 ft). * [29] On 12 August 1939 *Hōshō* was deemed useful as a training carrier and, in critical battles, as a platform for **A4N1 (Type 95)** fighters and **B4Y1 (Type 96)** torpedo bombers, for as long as those planes remained serviceable. A later investigation determined on 23 December 1940 that she could not operate the latest aircraft types like the **Mitsubishi A6M**

Zero, the Aichi D3A “Val”, or the Nakajima B5N “Kate” in combat.*[30] Also, the small size of the carrier's air-group limited the ship's potential value to the fleet in any future conflicts.*[31]

World War II

Pearl Harbor and Midway *Hōshō* began the Pacific War in the Third Carrier Division assigned to the 1st Fleet under Vice Admiral Shirō Takasu. The carrier, captained by Karou Umetani, was tasked along with *Zuihō* to provide air support, including scouting, anti-submarine patrols, and combat air patrol for the Combined Fleet's “Main Body” battle-line of six battleships: *Nagato*, *Mutsu*, *Fusō*, *Yamashiro*, *Ise*, and *Hyūga*.*[32] With the Main Body, *Hōshō* sortied from the Inland Sea on 7 December 1941 to provide distant cover for the carrier forces under Chūichi Nagumo which were attacking Pearl Harbor. The battleship force turned back 300 nautical miles (556 km) east of Japan, but *Hōshō* became separated on 10 December due to radio silence restrictions while conducting anti-submarine air operations. The carrier was located by scout aircraft the next day 500 nautical miles (926 km) east of the Main Body and returned to port at Kure on 12 December.*[33]

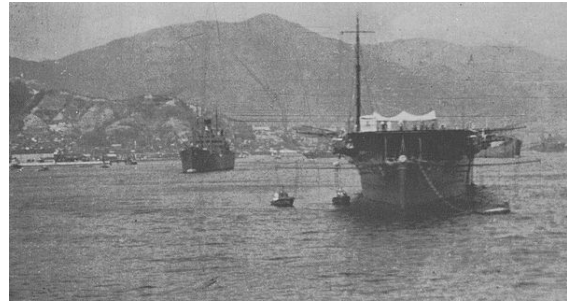
*[Note 12]



Hiryū on 5 June 1942 during the Battle of Midway, photographed from a Hōshō aircraft

On 29 May 1942, *Hōshō* sortied from Japan with the rest of the fleet for the operation which resulted in the Battle of Midway, providing modest air protection, scouting, and anti-submarine support for the Main Body, now consisting of the battleships *Yamato*, *Nagato*, and *Mutsu*.*[34] Her aircraft complement for the operation consisted of eight obsolete Yokosuka B4Y carrier attack aircraft (torpedo bombers).*[35]*[Note 13]

With the Main Body trailing 300 nautical miles (556 km) behind the carrier striking force, *Hōshō* missed the major portion of the battle in which Nagumo's four fleet carriers were ambushed and fatally damaged by US carrier aircraft on 4 June. The next day, *Hōshō* aircraft helped guide the remnants of Nagumo's force to a rendezvous with the Main Body. Around the same time, one of *Hōshō*'s



Hōshō in port in Japan in June 1942 upon its return from Midway

aircraft, crewed by pilot Shigeo Nakamura and observer Kiyoshi Ōniwa, discovered the burning, sinking *Hiryū*. Photographs of the abandoned carrier taken by Ōniwa have been described as “among the most dramatic of the war in the Pacific”.*[36]*[37] With the battle lost, a significant strategic defeat for Japan, the carrier returned to Japan with the rest of the fleet, arriving at the Hashirajima anchorage on 14 June.*[38]*[Note 14]

Training ship After her return to Japan, *Hōshō* was transferred to the Third Fleet, unofficially assigned to the training fleet (later called the Mobile Force Training Force), and officially assigned in October. She conducted flight training in the Inland Sea for aircraft that flew in from shore bases, since no aircraft were based on board *Hōshō*. On 15 January 1943, the 50th Air Flotilla was created for carrier aircrew training and both *Hōshō* and *Ryūhō* were assigned to the new unit. The two ships provided carrier landing training and served as target ships for torpedo training. In January 1944, *Hōshō* was reassigned to the 12th Air Fleet, then to the Combined Fleet, but continued to perform the same mission of training fleet carrier pilots in the Inland Sea. In this role, *Hōshō* shuttled back and forth between Kure and the Western Inland Sea, spending equal amounts of time at each location.*[39]



Hōshō with her extended and widened flight deck, photographed in October 1945

In order to service new and larger aircraft like the Nakajima B6N “Jill” torpedo bomber and the Yokosuka D4Y “Judy” dive bomber, the flight deck was extended over 6 meters (19 ft 8 in) at each end to a total length of 180.8 meters (593 ft 2 in) from 27 March to 26 April 1944. *Hōshō* also received new arresting gear and a new crash barrier. The additional weight high up in

the ship adversely affected her stability and she was restricted from operations in bad weather lest she capsize. At some point during the war the ship's 14 cm guns were removed and she received about twenty 25-millimeter Type 96 autocannons in single mounts.*[40] They fired .25-kilogram (0.55 lb) projectiles at a muzzle velocity of 900 m/s (3,000 ft/s); at 50°, this provided a maximum range of 7,500 meters (8,202 yd), and an effective ceiling of 5,500 meters (18,000 ft). The 15-round magazines needed to be changed frequently, and the maximum effective rate of fire was only between 110 and 120 rounds per minute.*[41]

After the modifications, *Hōshō* continued to provide training to navy pilots in the Inland Sea, including acting as a target ship for torpedo training.*[42] At 05:30 on 19 March 1945, possibly while berthed at Kure, the carrier was caught in an air raid by carrier aircraft from the United States Task Force 58. *Hōshō*'s flight deck was damaged by three bomb hits which killed six crewmen. Emergency repairs were made and her captain was ordered to keep her in readiness on 10 April. However, this order was revoked two days later and the carrier became a “4th reserve ship” with most of her crew transferred elsewhere. *Hōshō* was taken out of reserve as a “special guard ship” on 1 June and many of her crew were transferred back. During this time, the ship remained moored and camouflaged off Nishinomishima at Kure.*[12]*[43]*[Note 15]

Hōshō was slightly damaged by a single bomb or aerial rocket hit when the Allies attacked Kure again in July 1945. Information is scarce on the extent of the ship's involvement in the action, but it appears the carrier's participation was minimal, as it embarked no aircraft at the time.*[12] *Hōshō* was repaired within 15 days, but the termination of hostilities in September 1945 found the carrier still docked at Kure.*[28]*[Note 16]

3.1.3 Post-war



Hōshō at Kure, Japan, in October 1945 shortly before departing on a repatriation mission

After the war, *Hōshō* served as a repatriation transport to retrieve Japanese servicemen and civilians stationed over-

seas and return them to Japan. In October and November 1945, accompanied by the cruiser *Kashima*, she carried 700 passengers from *Wotje Atoll*, 311 from *Jaluit Atoll*, and an undocumented number from *Enewetak Atoll* to *Uraga, Kanagawa*.*[42]

In December 1945, *Hōshō*'s overhanging flight deck at the bow was cut off and her hangars were modified to carry more passengers. Thereafter, she undertook more repatriation missions beginning with one to *Wewak* on 5 January 1946 and subsequent trips to China. In total, the carrier made nine repatriation trips before 15 August 1946 and transported about 40,000 passengers.*[12]*[44]

Hōshō was transferred to the Ministry of the Interior on 31 August for disposal. She was scrapped in Osaka from 2 September 1946 to 1 May 1947 by the Kyōwa Shipbuilding Company.*[12]

3.1.4 Notes

- [1] *HMS Argus* pre-dated *Hōshō* and had a long landing deck, but was designed and initially built as an ocean liner. The first purpose-designed aircraft carrier to be laid down was *HMS Hermes* in 1918 but she was completed after *Hōshō*.
- [2] Howarth (p. 148), Gardiner, and Gray (p. 240) and Jentschura, Jung, and Mickel (p. 41) state that *Hōshō* was initially laid down as a tanker named *Hiryū*. According to Milanovich, (pp. 10–11), this is only partially correct at best. The ship was ordered as one of six Special Ships (*Tokumukan*) as part of the “eight-six” fleet program; the other five ships were completed as oil tankers.
- [3] The United States Navy did much the same with the provision of four twin 8-inch (203 mm) gun turrets on their *Lexington*-class carriers. (Gardiner and Grey, p. 110).
- [4] Prados (p. 36) states that Lieutenant Shunichi Kira made the first landing on *Hōshō*, on 16 March 1923.
- [5] Another reason for removal of the island was that the navy found that it was too small to be of effective use in controlling air operations or conning the ship (Watts, p. 169).
- [6] Fighter pilot and future ace Isamu Mochizuki served in *Hōshō*'s fighter unit sometime between 1926 and 1932 (Hata and Yasuho, p. 342).
- [7] Hata and Yasuho (p. 17) state that two carrier attack planes (bombers) commanded by Lieutenant Nagamoto Hirabayashi, escorted by three fighters led by Lieutenant Shigehachirō Tokoro, engaged the nine Chinese fighters over the “Shingū area.” Hata and Yasuho explain that although the results were not verified, one Chinese aircraft was damaged and its pilot injured and forced to land. The aircraft took off again piloted by its other crew member and subsequently crashed, killing the pilot.
- [8] Peattie (p. 51) also describes a mission, without providing a date, in which six A1N2 fighters from *Hōshō*, escorting nine bombers from the same ship, engaged five Chinese aircraft and shot down three of them. Takijirō Ōnishi was

the Third Fleet air officer who planned and coordinated the 26 February raid.

- [9] From 1936 until sometime between 1937 and 1939 the carrier was commanded by *Ryūnosuke Kusaka* (Parshall and Tully, p. 15). Fighter pilot and future ace *Kiichi Oda* served in *Hōshō's* fighter unit sometime between November 1932 and August 1937 (Hata and Yasuho, p. 346).
- [10] The three carriers carried a total of 90 aircraft to the conflict in China, including 15 from *Hōshō*, 27 on *Ryūjō*, and the rest with *Kaga* (Howarth, p. 212).
- [11] According to Hata and Yasuho (p. 295), on 27 September during an air raid on Canton, *Hōshō* fighter pilot and future ace *Akira Yamamoto* singlehandedly engaged two Chinese Curtis Hawks and shot down one of them.
- [12] Fighter pilot and future ace *Shigetaka Ōmori* was assigned to *Hōshō's* fighter unit from the war's outbreak until May 1942 (Hata and Yasuho, p. 303). The carrier lost contact with the Main Body because it launched aircraft near dusk to investigate a submarine sighting. The aircraft returned after dark and landed safely after the carrier turned on its lights. In order to recover the aircraft, however, the carrier and three accompanying destroyers had to steam east and therefore lost sight of the Main Body in the darkness (Tully). There does not appear to have been any US or other enemy submarines in Japanese waters at this time (Ugaki, p. 50).
- [13] Commanding the carrier's air group was Lieutenant Yoshiaki Irikiin. The carrier's plane guard for the operation was destroyer *Yūkaze* (Parshall and Tully, p. 453). The B4Y bombers were later (late 1942) designated "Jean" by the Americans. *Yūkaze* served as the carrier's plane guard for the duration of the Pacific War (Tully and Nevitt). Willmott (p. 458) states that *Hōshō's* airgroup at Midway also included nine Mitsubishi A5M Type 96 fighters. *Matome Ugaki*, in his diary, mentions only that *Hōshō* had six Type 96 bombers, but then states that *Zuihō* had nine fighters (Ugaki, p. 144).
- [14] *Hōshō* aircraft also helped locate and guide other Japanese warships to rendezvous during and after the battle, including the cruiser *Japanese cruiser Sendai (2)*. Ōniwa reported seeing survivors left behind on *Hiryū* so the destroyer *Tanikaze* was sent to unsuccessfully search for the wrecked carrier. Some of the abandoned *Hiryū* survivors were later captured by the Americans after their ship sank (Parshall and Tully, p. 359).
- [15] Tully states that records, both Japanese and Allied, are unclear on the carrier's location during the 19 March airstrikes. The ship may not have been at Kure at the time, instead in the Inland Sea conducting training or possibly in Hiroshima Bay.
- [16] Tully states that on 26 July 1945 the ship relocated to Moji, Japan, but does not specify on which date the carrier returned to Kure.
- [2] Watts, p. 169
- [3] Evans and Peattie, pp. 181–182
- [4] Milanovich, pp. 9, 11
- [5] Milanovich, pp. 22–23
- [6] Evans and Peattie, p. 323
- [7] Milanovich, p. 15
- [8] Milanovich, p. 13
- [9] Evans and Peattie, p. 315
- [10] Milanovich, pp. 13, 15, 22
- [11] Hata and Yasuho, p. 17
- [12] Milanovich, p. 22
- [13] Milanovich, p. 14
- [14] Campbell, p. 190
- [15] Peattie, pp. 53, 55
- [16] Campbell, p. 198
- [17] Milanovich, pp. 11, 15–16
- [18] Milanovich, pp. 17, 21
- [19] Peattie, p. 53
- [20] Milanovich, pp. 17, 21; Peattie, p. 53
- [21] Milanovich, pp. 20–21
- [22] Watts, p. 169; Evans and Peattie, p. 315; Parshall and Tully, p. 7; Peattie, p. 229.
- [23] Peattie, pp. 50–51
- [24] Evans and Peattie, p. 243
- [25] Hata and Yasuho, pp. 17–18
- [26] Hata and Yasuho, p. 18
- [27] Hata and Yasuho, pp. 17–19
- [28] Hata and Yasuho, p. 19
- [29] Milanovich, p. 20
- [30] Milanovich, p. 21
- [31] Parshall and Tully, p. 418
- [32] Goldstein, pp. 259, 284; Tully; Evans and Peattie, p. 586; Hata and Yasuho, p. 19
- [33] Ugaki, pp. 50–51; Tully
- [34] Willmott, p. 110; Ugaki, p. 130; Parshall and Tully, p. 49; Nevitt
- [35] Parshall and Tully, p. 453
- [36] Parshall and Tully, pp. 270, 355–56, 358
- [37] Willmott, p. 496

3.1.5 Footnotes

- [1] Milanovich, pp. 10–11; Evans and Peattie, p. 180

- [38] Parshall and Tully, pp. 385–393; Tully
- [39] Hata and Yasuho, p. 66; Tully
- [40] Milanovich, pp. 21–23
- [41] Campbell, p. 200
- [42] Tully
- [43] Tully; Hata and Yasuho, p. 19
- [44] Watts, p. 171

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3.1.7 External links

- Naval Historical Center Images of the *Hōshō*

3.2 Japanese aircraft carrier Ryūjō

For other ships of the same name, see Ryūjō.

Ryūjō (Japanese: 龍驤 “prancing dragon”) was a light aircraft carrier built for the Imperial Japanese Navy (IJN) during the early 1930s. Small and lightly built in an attempt to exploit a loophole in the Washington Naval Treaty of 1922, she proved to be top-heavy and only marginally stable and was back in the shipyard for modifications to address those issues within a year of completion. With her stability improved, *Ryūjō* returned to service and was employed in operations during the Second Sino-Japanese War. During World War II, she provided air support for operations in the Philippines, Malaya, and the Dutch East Indies, where her aircraft participated in the Second Battle of the Java Sea. During the Indian Ocean raid in April 1942, the carrier attacked British merchant shipping with both her guns and her aircraft. *Ryūjō* next participated in the Battle of the Aleutian Islands in June. She was sunk by American carrier aircraft at the Battle of the Eastern Solomons on 24 August 1942.

3.2.1 Design

Ryūjō was planned as a light carrier of around 8,000 metric tons (7,900 long tons) standard displacement ^[1] to exploit a loophole in the *Washington Naval Treaty* of 1922 that carriers under 10,000 long tons (10,000 t) standard displacement were not regarded as “aircraft carriers” ^[2] While *Ryūjō* was under construction, Article Three of the *London Naval Treaty* of 1930 closed the above-mentioned loophole; consequently, *Ryūjō* was the only light aircraft carrier of her type to be completed by Japan. ^[3]

Ryūjō had a length of 179.9 meters (590 ft 3 in) overall. ^[1] She had a beam of 20.32 meters (66 ft 8 in) and a draft of 5.56 meters (18 ft 3 in). She displaced 8,000 metric tons (7,900 long tons) at standard load and 10,150 metric tons (9,990 long tons) at normal load. Her crew consisted of 600 officers and enlisted men. ^[4]



Bow view of *Ryūjō*, 1933

To keep *Ryūjō*'s weight to 8,000 metric tons, her hull was lightly built and no armor could be provided, although some protective plating was added abreast the machinery spaces and magazines. She was also designed with only a single hangar, which would have left her with an extremely low profile (there being just 4.6 meters (15 ft 1 in) of freeboard amidships and 3.0 meters (9 ft 10 in) aft). Between the time the carrier was laid down in 1929 and launched in 1931, however, the Navy doubled her aircraft stowage requirement to 48 in order to give her a more capable air group. This necessitated the addition of a second hangar atop the first, raising freeboard

to 14.9 meters (48 ft 11 in). Coupled with the ship's narrow beam, the consequent top-heaviness made her minimally stable in rough seas, despite the fitting of *Sperry* active stabilizers. This was a common flaw amongst many treaty-circumventing Japanese warships of her generation. ^[5]

The *Tomozuru Incident* of 12 March 1934, in which a top-heavy torpedo boat capsized in heavy weather, caused the IJN to investigate the stability of all their ships, resulting in a number of design changes to improve stability and increase hull strength. *Ryūjō*, already known to be only marginally stable, was promptly docked at the *Kure Naval Arsenal* for modifications that strengthened her keel and added ballast and shallow torpedo bulges to improve her stability. Her funnels were moved higher up the side of her hull and curved downward to keep the deck clear of smoke. ^[6]

Shortly afterward, *Ryūjō* was one of many Japanese warships caught in a typhoon on 25 September 1935 while on maneuvers during the “*Fourth Fleet Incident*.” The ship's bridge, flight deck and superstructure were damaged and her hangar was flooded. Her forecastle was raised one deck and her bow was remodeled with more flare to make her less wet forward. ^[6] After these modifications, her beam and draft increased to 20.78 meters (68 ft 2 in) and 7.08 meters (23 ft 3 in) respectively. Her displacement also increased to 10,600 metric tons (10,400 long tons) at standard load and 12,732 metric tons (12,531 long tons) at normal load. Her crew also grew to 924 officers and enlisted men. ^[4]

Machinery

The ship was fitted with two geared steam turbine sets with a total of 65,000 shaft horsepower (48,000 kW), each driving one propeller shaft, using steam provided by six *Kampon* water-tube boilers. *Ryūjō* had a designed speed of 29 knots (54 km/h; 33 mph), but reached 29.5 knots (54.6 km/h; 33.9 mph) during her sea trials from 65,270 shp (48,670 kW). The ship carried 2,490 long tons (2,530 t) of fuel oil, which gave her a range of 10,000 nautical miles (19,000 km; 12,000 mi) at 14 knots (26 km/h; 16 mph). The boiler uptakes were trunked to the ship's starboard side amidships and exhausted horizontally below flight deck level through two small funnels. ^[7]

Flight deck and hangars

Ryūjō was a flush-decked carrier without an island superstructure; her navigating and control bridge was located just under the forward lip of the flight deck in a long glassed-in “greenhouse”. Her superstructure was set back 23.5 meters (77 ft 1 in) from the ship's stem, giving *Ryūjō* a distinctive open bow. Her 156.5-meter (513 ft 5 in) flight deck was 23 meters (75 ft 6 in) wide and ex-

tended well beyond the aft end of her superstructure, supported by a pair of pillars. Six transverse **arrestor wires** were installed on the flight deck and were later modernized in 1936 to stop a 6,000 kg (13,000 lb) aircraft.*[5] The ship's hangars were both 102.4 meters (335 ft 11 in) long and 18.9 meters (62 ft 0 in) wide, and had an approximate area of 3,871 square metres (41,667 sq ft).*[8] Between them, they gave the ship the capacity to store 48 aircraft, although only 37 could be operated at one time.*[5] After the Fourth Fleet Incident, *Ryūjō*'s bridge and the leading edge of the flight deck were rounded off to make them more streamlined. This reduced the length of the flight deck by 2 meters (6 ft 7 in).*[6]

Aircraft were transported between the hangars and the flight deck by two **elevators**; the forward platform measured 15.7 by 11.1 meters (51.5 ft × 36.4 ft) and the rear 10.8 by 8.0 meters (35.4 ft × 26.2 ft).*[8] The small rear elevator became a problem as the IJN progressively fielded larger and more modern carrier aircraft. Of all the aircraft in front-line service in 1941, only the Nakajima B5N “Kate” torpedo bomber would fit, when positioned at an angle with its wings folded. This effectively made *Ryūjō* a single-elevator carrier and considerably hindered transfer of aircraft in and out of the hangars for rearming and refueling during combat operations.*[5]

Armament

As completed, *Ryūjō*'s primary **anti-aircraft (AA)** armament comprised six twin-gun mounts equipped with 40-caliber 12.7-centimeter Type 89 **dual-purpose guns** mounted on projecting **sponsons**, three on either side of the carrier's hull.*[7] When firing at surface targets, the guns had a range of 14,700 meters (16,100 yd); they had a maximum ceiling of 9,440 meters (30,970 ft) at their maximum elevation of +90 degrees. Their maximum rate of fire was 14 rounds a minute, but their sustained rate of fire was around eight rounds per minute.*[9] Twenty-four anti-aircraft (AA) Type 93 13.2 mm **Hotchkiss machine guns** were also fitted, in twin*[7] and quadruple mounts.*[6] Their effective range against aircraft was 700–1,500 meters (770–1,640 yd). The cyclic rate was adjustable between 425 and 475 rounds per minute, but the need to change 30-round **magazines** reduced the effective rate to 250 rounds per minute.*[10]

During the carrier's 1934–36 refit, two of the 12.7-centimeter (5.0 in) mountings were exchanged for two twin-gun mounts for **license-built Hotchkiss 25 mm Type 96 light AA guns**,*[6] resulting in a savings of approximately 60 long tons (61 t) of top-weight that improved the ship's overall stability.*[5] This was the standard Japanese light AA gun during World War II, but it suffered from severe design shortcomings that rendered it a largely ineffective weapon. According to historian Mark Stille, the weapon had many faults including an inability to “handle high-speed targets because it could not be trained or elevated fast enough by either hand or power, its sights

were inadequate for high-speed targets, [and] it possessed excessive vibration and muzzle blast”.*[11] These 25-millimeter (0.98 in) guns had an effective range of 1,500–3,000 meters (1,600–3,300 yd), and an effective ceiling of 5,500 meters (18,000 ft) at an elevation of +85 degrees. The maximum effective rate of fire was only between 110 and 120 rounds per minute because of the frequent need to change the fifteen-round **magazines**.*[12] The machine-guns were replaced during a brief refit in April–May 1942 with six triple-mount 25-millimeter (0.98 in) AA guns.*[6]

3.2.2 Construction and service



Ryūjō during the 1930s with a pair of Aichi D1A2 dive bombers overhead

Following the Japanese ship-naming conventions for aircraft carriers, *Ryūjō* was named “Prancing Dragon”.*[13] The ship was laid down at the Mitsubishi's Yokohama shipyard on 26 November 1929. She was launched on 2 April 1931, towed to Yokosuka Naval Arsenal on 25 April for fitting out, and commissioned on 9 May 1933 with Captain Toshio Matsunaga in command. While training in mid-1933, her initial air group consisted of nine Mitsubishi B1M2 (Type 13) torpedo bombers, plus three spares, and three A1N1 (Type 3) fighters, plus two spares. Matsunaga was relieved by Captain Torao Kuwabara on 20 October. After the Tomozuru Incident, the ship was reconstructed from 26 May to 20 August 1934.*[14]

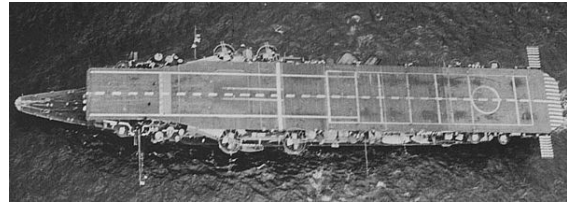
Captain Ichiro Ono assumed command on 15 November 1934 and *Ryūjō* became the flagship of Rear Admiral Hideho Wada's First Carrier Division. The following month the ship was chosen to evaluate dive-bombing tactics using six Nakajima E4N2-C Type 90 reconnaissance aircraft, six Yokosuka B3Y1 Type 92 torpedo bombers, and a dozen A2N1 Type 90 fighters. The reconnaissance aircraft proved to be unsuitable after several months' testing. *Ryūjō* participated in the Combined Fleet Maneuvers of 1935 where she was attached to the IJN Fourth Fleet. The fleet was caught in a typhoon on 25 September and the ship was moderately damaged. *Ryūjō* arrived at Kure on 11 October 1935 for repairs, modifications, and a refit that lasted until 31 May 1936. On 31 October Ono was

relieved by Captain **Shun'ichi Kira**.^[14]

In mid-1936, the ship was used to evaluate a dozen **Aichi D1A** dive bombers and dive-bombing tactics. She also embarked at that time 24 **A4N1** fighters, plus four and eight spare aircraft respectively. In September, *Ryūjō* resumed her role as flagship of First Carrier Division, now commanded by Rear Admiral **Saburō Satō**. Her air group now consisted of a mixture of **B3Y1** torpedo bombers, **D1A1** dive bombers and **A2N** fighters, but her torpedo bombers were transferred after fleet maneuvers in October demonstrated effective dive bombing tactics. Captain **Katsuo Abe** assumed command of the ship on 16 November.^[14]

The First Carrier Division arrived off Shanghai on 13 August 1937 to support operations of the Japanese Army in **China**. Her aircraft complement consisted of 12 **A4N** fighters (plus four spares) and 15 **D1A** dive bombers. The dive bombers attacked targets in and near Shanghai.^[14] The Japanese fighters had their first aerial engagement on 22 August when four **A4Ns** surprised 18 **Nationalist Curtiss Hawk III** fighters and claimed to have shot down six without loss. The following day, four **A4Ns** claimed to have shot down nine Chinese fighters without loss to themselves.^[15] The carriers returned to Sasebo at the beginning of September to resupply before arriving off the South China coast on 21 September to attack Chinese forces near **Canton**.^[14] Nine fighters from *Ryūjō* escorted a raid on the city and claimed six of the defending fighters. While escorting another raid later that same day, the Japanese pilots claimed five aircraft shot down and one probably shot down.^[15] The dive bombers attacked targets near Canton until the ship sailed to the Shanghai area on 3 October. Her air group was flown ashore on 6 October to support Japanese forces near Shanghai and **Nanking**. *Ryūjō* returned home in November and briefly became a training ship before she was assigned to Rear Admiral **Tomoshige Samejima's** **Second Carrier Division**.^[14]

In February 1938 the ship replaced her **A4N** biplanes with nine **Mitsubishi A5M** “Claude” monoplane fighters. The division supported Japanese operations in Southern China in March–April and again in October. Captain **Kiichi Hasegawa** assumed command on 15 November 1939. *Ryūjō* was given a refit that lasted from December 1939 through January 1940 and became a training ship until November when she became the flagship of Rear Admiral **Kakuji Kakuta's** **Third Carrier Division**. Hasegawa was relieved by Captain **Ushie Sugimoto** on 21 June. The ship's air group then consisted of 18 Nakajima **B5N** torpedo bombers and 16 **A5M4** fighters. When the **First Air Fleet** was formed on 10 April 1941, *Ryūjō* became flagship of **Fourth Carrier Division**.^[14]



Overhead view of *Ryūjō* in 1942

World War II

The ship's assignment at the beginning of the **Pacific War** was to support the invasion of the **Philippines**, initially by attacking the American naval base at **Davao, Mindanao** on the morning of 8 December.^[Note 1] Her air group had not changed, but four of each type of aircraft were spares. *Ryūjō* 's initial airstrike consisted of 13 **B5Ns** escorted by nine **A5Ms** with a smaller, follow-on airstrike later in the day by two **B5Ns** and three **A5Ms**. They accomplished little, destroying two **Consolidated PBY seaplanes** on the ground for the loss of one **B5N** and **A5M**. The ship covered the landing at Davao on 20 December and her **B5Ns** attacked a British **oil tanker** south of Davao.^[16] In January 1942 her aircraft supported Japanese operations in the **Malay Peninsula**.^[14]

In mid-February 1942, *Ryūjō* 's aircraft attacked ships evacuating from Singapore, claiming eight ships damaged, three burnt, and four sunk. They also covered convoys carrying troops to Sumatra. The ship was unsuccessfully attacked by several **Bristol Blenheim** light bombers of **No. 84 Squadron RAF** on 14 February. The following day two waves of **B5Ns**, totaling 13 aircraft, attacked the British **heavy cruiser Exeter**, but only managed to damage the ship's **Supermarine Walrus** seaplane. Follow-on attacks later that day were also unsuccessful. Two days later, **B5Ns** destroyed **HNLMS Van Ghent**, a Dutch destroyer that had run aground in the Gaspar Strait and been abandoned on 14 February.^[17] The carrier sailed to **Saigon, French Indochina** the next day and arrived on 20 February. A week later she was assigned to cover the convoy taking troops to **Jakarta, Java**.^[14] Her aircraft participated in the Second Battle of the Java Sea on 1 March and six **B5Ns** sank the American destroyer **Pope** after it had been abandoned by its crew.^[18] Six other **B5Ns** bombed the port of **Semarang**, possibly setting one merchantman on fire.^[14]

Ryūjō arrived in Singapore on 5 March and the ship supported operations in Sumatra and escorted convoys to **Burma** and the **Andaman Islands** for the rest of the month.^[14] On 1 April, while the 1st Air Fleet was starting its raid in the **Indian Ocean**, Malay Force, consisting of *Ryūjō*, six cruisers, and four destroyers, left Burma on a mission to destroy merchant shipping in the **Bay of Bengal**. **B5Ns** damaged one freighter on 5 April before the force split into three groups. *Ryūjō* 's aircraft bombed the small ports of **Cocanada** and **Vizagapatam** on the south-

eastern coast of India the next day, doing little damage, in addition to claiming two ships sunk and six more damaged during the day. The carrier and her escorts, the light cruiser *Yura* and the destroyer *Yugiri* claimed to have sunk three more ships by gunfire. All together, Malay Force sank 19 ships totaling almost 100,000 gross register tons (GRT),* [19] before reuniting on 7 April and arriving at Singapore on 11 April. A week later, her B5Ns were detached for torpedo training and the ship arrived at Kure on 23 April for a brief refit.* [14]

The newly commissioned carrier *Jun'yō* joined Carrier Division 4, under the command of Kakuta, with *Ryūjō* on 3 May 1942. They formed the core of the 2nd Carrier Strike Force, part of the Northern Force, tasked to attack the *Aleutian Islands*, an operation planned to seize several of the islands to provide advance warning in case of an American attack from the Aleutians down the Kurile Islands while the main body of the American fleet was occupied defending Midway. *Ryūjō*'s air group now consisted of 12 A6M2 Zeros and 18 B5Ns,* [20] plus two spares of each type. The ship transferred to Mutsu Bay on 25 May and then to Paramushiro on 1 June before departing the same day for the Aleutians.* [14]

At dawn on 3 June, she launched nine B5Ns, escorted by six Zeros, to attack Dutch Harbor on Unalaska Island. One B5N crashed on takeoff and only six of the B5Ns and all of the Zeros were able to make it through the bad weather, destroying two PBYS and inflicting significant damage on the oil storage tanks and barracks. A second airstrike was launched later in the day to attack a group of destroyers discovered by aircraft from the first attack, but they failed to find the targets. One Zero from *Ryūjō* from the second strike was damaged by a Curtiss P-40 and crash landed on the island of Akutan. The aircraft, later dubbed the *Akutan Zero*, remained largely intact and was later salvaged and test-flown. Another airstrike was launched on the following day by the two carriers that consisted of 15 Zeros, 11 D3As, and 6 B5Ns and successfully bombed Dutch Harbor. Shortly after the aircraft were launched, the Americans attacked the carriers, but failed to inflict any damage. A Martin B-26 Marauder bomber and a PBY were shot down by Zeros, and a Boeing B-17 Flying Fortress bomber was shot down by flak during the attack.* [21]

Ryūjō arrived back at Mutsu Bay on 24 June, but departed for the Aleutians four days later to cover the second reinforcement convoy to Attu and Kiska Islands and remained in the area until 7 July in case of an American counter-attack. She arrived at Kure on 13 July for a refit and was transferred to Carrier Division 2 a day later.* [14]

Battle of the Eastern Solomons Main article: Battle of the Eastern Solomons

The American landings on Guadalcanal and Tulagi on 7 August caught the Japanese by surprise. The next day, *Ryūjō* was transferred to Carrier Division 1 and departed



The disabled Ryūjō (top center) being bombed from high altitude by B-17 bombers on 24 August 1942. The destroyer Amatsukaze (lower left) is moving away from Ryūjō at full speed and the destroyer Tokitsukaze (faintly visible, upper right) is backing away from the bow of Ryūjō in order to evade the B-17s' falling bombs.

for Truk on 16 August together with the other two carriers of the division, *Shōkaku* and *Zuikaku*. Her air group consisted of 24 Zeros and nine B5N2s.* [22] Admiral Isoroku Yamamoto, commander-in-chief of the Combined Fleet, ordered Truk to be bypassed and the fleet refueled at sea after an American carrier was spotted near the Solomon Islands on 21 August.* [23] At 01:45 on 24 August, Vice Admiral Chūichi Nagumo, commander of the Mobile Force, ordered *Ryūjō* and the heavy cruiser *Tone*, escorted by two destroyers, detached to move in advance of the troop convoy bound for Guadalcanal and to attack the Allied air base at Henderson Field if no carriers were spotted. This Detached Force was commanded by Rear Admiral Chūichi Hara in *Tone*.* [24]

Ryūjō launched two small airstrikes, totaling six B5Ns and 15 Zeros, beginning at 12:20 once the Diversionary Force was 200 nautical miles (370 km; 230 mi) north of Lunga Point. Four Grumman F4F Wildcat fighters from Marine Fighter Squadron VMF-223 on combat air patrol (CAP) near Henderson Field spotted the incoming Japanese aircraft around 14:20 and alerted the defenders. Ten more Wildcats from VMF-223 and VMF-212 scrambled, as well as two United States Army Air Corps Bell P-400s from the 67th Fighter Squadron in response. Nine of the Zeros strafed the airfield while the B5Ns bombed it with 60-kilogram (130 lb) bombs to little effect. The Americans claimed to have shot down 19 aircraft, but only three Zeros and three B5Ns were lost, although another B5N was forced to crash-land. Only three Wildcats were shot down in turn.* [25]

Around 14:40, the Detached Force was spotted again by several search aircraft from the carrier USS *Enter-*

prise, although the Japanese ships did not immediately spot the Americans. They launched three Zeros as CAP at 14:55, shortly before two of the searching **Grumman TBF Avenger** torpedo bombers near-missed *Ryūjō* 150 meters (490 ft) astern with four 500-pound (230 kg) bombs three minutes later. Two more Zeros reinforced the CAP shortly after 15:00, just in time to intercept two more searching Avengers, shooting down one. In the meantime, the carrier **USS Saratoga** had launched an airstrike against the Detached Force in the early afternoon that consisted of 31 **Douglas SBD Dauntlesses** and eight Avengers; the long range precluded fighter escort. They sighted the carrier shortly afterward and attacked. They hit *Ryūjō* three times with 1,000-pound (450 kg) bombs and one torpedo; the torpedo hit flooded the starboard engine and boiler rooms. No aircraft from either *Ryūjō* or *Saratoga* were shot down in the attack.* [26]

The bomb hits set the carrier on fire and she took on a list from the flooding caused by the torpedo hit. *Ryūjō* turned north at 14:08, but her list continued to increase although the fires were put out. The progressive flooding disabled her machinery and caused her to stop at 14:20. The order to abandon ship was given at 15:15 and the destroyer *Amatsukaze* moved alongside to rescue the crew. The ships were bombed several times by multiple B-17s without effect before *Ryūjō* capsized about 17:55 at coordinates 06°10'S 160°50'E / 6.167°S 160.833°E Coordinates: 06°10'S 160°50'E / 6.167°S 160.833°E with the loss of 7 officers and 113 crewmen.* [14]

3.2.3 Notes

- [1] Japan Standard Time is 19 hours ahead of Hawaiian Standard Time, so in Japan, the attack on Pearl Harbor happened on 8 December.

3.2.4 Footnotes

- [1] Gardiner & Chesneau, p. 180
- [2] See: Washington Naval Treaty, Chapter II, Part 4, Definitions
- [3] “International Treaty for the Limitation and Reduction of Naval Armament”. 1930. Retrieved 21 June 2013.; See Part 1, Article 3, Paragraph 1.
- [4] Jentschura, Jung and Mickel, p. 45
- [5] Brown 1977, p. 17
- [6] Parshall, Tully & Casse
- [7] Brown 1977, p. 18
- [8] Peattie, p. 235
- [9] Campbell, pp. 192–93
- [10] Campbell, p. 202

- [11] Stille, p. 51
- [12] Campbell, p. 200
- [13] Silverstone, p. 335
- [14] Tully & Casse
- [15] Hata, Izawa & Shores, p. 144
- [16] Shores, Cull & Izawa, Vol. I, pp. 164, 191–92
- [17] Shores, Cull & Izawa, Vol. II, pp. 88, 90, 93, 109, 123–24, 199
- [18] Shores, Cull & Izawa, Vol. II, p. 306
- [19] Shores, Cull & Izawa, Vol. II, pp. 393, 408–11
- [20] Parshall & Tully, pp. 43–46, 459
- [21] Brown 2009, pp. 147–48
- [22] Lundstrom, pp. 92–94
- [23] Brown 2009, p. 169
- [24] Lundstrom, p. 109
- [25] Lundstrom, pp. 116–19
- [26] Lundstrom, pp. 116, 119–22

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3.2.6 External links

- HIJMS Ryujo position and chart on the wrecksite
- United States Navy photos of *Ryūjō*
- Japanese warships – *Ryūjō*

Chapter 4

Shōkaku class 翔鶴瑞鶴

4.1 Japanese aircraft carrier Shōkaku

Shōkaku (Japanese: 翔鶴 “Soaring Crane”) was an aircraft carrier of the Imperial Japanese Navy, the lead ship of her class. Along with her sister ship *Zuikaku*, she took part in several key naval battles during the Pacific War, including the attack on Pearl Harbor, the Battle of the Coral Sea and the Battle of the Santa Cruz Islands before being torpedoed and sunk by an American submarine at the Battle of the Philippine Sea.*[1]

4.1.1 Design

The *Shōkaku*-class carriers were part of the same program that also included the *Yamato*-class battleships. No longer restricted by the provisions of the Washington Naval Treaty, which expired in December 1936, the Imperial Japanese Navy was free to incorporate all those features they deemed most desirable in an aircraft carrier, namely high speed, a long radius of action, heavy protection and a large aircraft capacity. *Shōkaku* was laid down at Yokosuka Dockyard on 12 December 1937, launched on 1 June 1939, and commissioned on 8 August 1941.

With an efficient modern design, a displacement of about 32,000 long tons (33,000 t), and a top speed of 34 kn (63 km/h; 39 mph), *Shōkaku* could carry 70–80 aircraft. Her enhanced protection compared favorably to that of contemporary Allied aircraft carriers and enabled *Shōkaku* to survive serious damage during the battles of the Coral Sea and Santa Cruz.*[2]

Hull

In appearance, *Shōkaku* resembled an enlarged *Hiryū*, though with a 35.3 m (116 ft) longer overall length, 4.6 m (15 ft) wider beam and a larger island. As in *Hiryū*, the forecastle was raised to the level of the upper hangar deck to improve seakeeping. She also had a wider, more rounded and heavily flared bow which kept the flight deck dry in most sea conditions.*[3]

The carrier's forefoot was of the newly developed bulbous

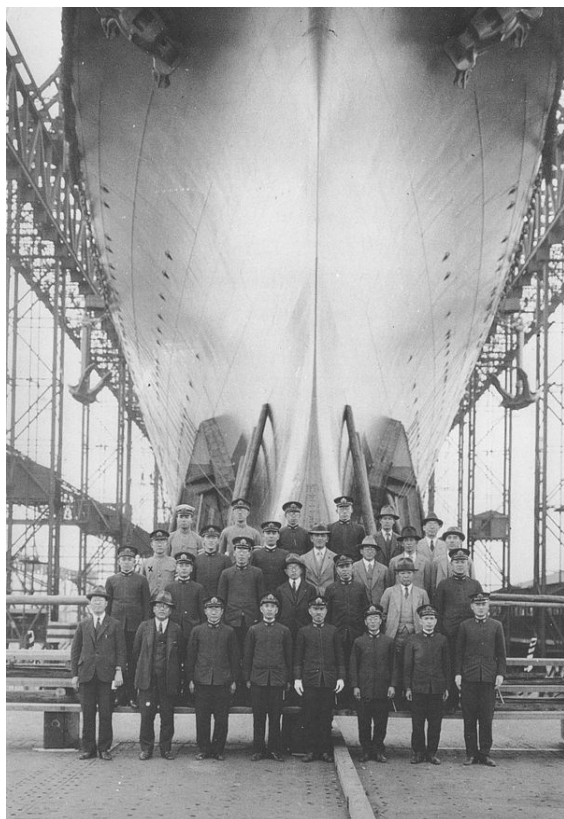
type, sometimes referred to informally as a *Taylor pear*, which served to reduce the hull's underwater drag within a given range of speeds, improving both the ship's speed and endurance. Unlike the larger bulbous forefoots fitted to the battleships *Yamato* and *Musashi*, however, *Shōkaku*'s did not protrude beyond the ship's stem.*[3]

Shōkaku was 10,000 tons heavier than the *Sōryū*-class carriers, mainly due to the extra armor incorporated into the ship's design. Vertical protection consisted of 215 mm (8.5 in) on the main armor deck over the machinery, magazines and aviation fuel tanks while horizontal protection consisted of 215 mm (8.5 in) along the waterline belt abreast the machinery spaces reducing to 150 mm (5.9 in) outboard of the magazines*[3]

Unlike British carriers, whose aviation fuel was stored in separate cylinders or coffer-dams surrounded by seawater, all pre-war Japanese carriers had their aviation fuel tanks built integral with the ship's hull and *Shōkaku* was no exception. The dangers this posed, however, did not become evident until wartime experience demonstrated these were often prone to cracking and leaking as the shocks and stresses of hits or near-misses to the carrier's hull were inevitably transferred to and absorbed by the fuel tanks. Following the debacle at Midway in mid-1942, the empty air spaces around *Shōkaku*'s aviation fuel tanks, normally pumped full of inert carbon dioxide, were instead filled with concrete in an attempt to protect them from possible damage. But this did little to prevent volatile fumes spreading to the hangar decks in the event damage did occur, particularly demonstrated when *Cavalla* torpedoed and sank her. *Shōkaku* normally stowed 150,000 gallons of AvGas for operational use.*[4]

Machinery

The geared turbines installed on *Shōkaku* were essentially the same as those on *Sōryū*, maximum power increasing by 8,000 shp (6,000 kW) to 160,000 shp (120,000 kW). In spite of all the additional armor, greater displacement and a 2.1 m (6.9 ft) increase in draught, *Shōkaku* was able to attain a speed of just over 34.2 kn (63.3 km/h; 39.4 mph) during trials. Maximum fuel bunkering was 4100 tons, giving her a radius of action of 9,700 nmi (18,000 km; 11,200 mi) at 18 kn (33 km/h; 21 mph). Two same-



The twenty-eight chief shipbuilders of the *Shōkaku* pose at the ship's prow prior to launching (30 May 1939).

sized downward-curving funnels on the ship's starboard side, just abaft the island, vented exhaust gases horizontally from the boilers and were sufficiently angled to keep the flight deck free of smoke in most wind conditions.*[5]

Flight Deck & Hangars

Shōkaku's 242 m (794 ft) long wood-planked flight deck ended short of the ship's bow and, just barely, that of the stern. It was supported by four steel pillars forward of the hangar box and by two pillars aft.

The flight deck and both hangars (upper and lower) were serviced by three elevators, the largest being the forward one at 13 m (43 ft) by 16 m (52 ft). All three were capable of transferring aircraft weighing up to 5,000 kg (11,000 lb) and raising or lowering them took approximately 15–20 seconds.*[6]

Shōkaku's nine Type 4 electrically operated arrester wires followed the same standard arrangement as that on *Hiryū*, three forward and six aft. They were capable of stopping a 6,000 kg (13,000 lb) aircraft at speeds of 60–78 knots. A third crash barrier was added and a light collapsible wind-break screen was installed just forward of the island.*[3]

Hangar space was not greatly increased in comparison to the *Sōryū*-class carriers and both *Shōkaku* and *Zuikaku* could each carry just nine more aircraft than *Sōryū*, giv-

ing them a normal operating capacity of seventy-two plus room for twelve in reserve. Unlike on *Sōryū*, the reserve aircraft did not need to be kept in a state of disassembly, however, thereby shortening the time required to make them operational.*[7]

After experimenting with port-side islands on two previous carriers, *Akagi* and *Hiryū*, the IJN opted to build both *Shōkaku* and her sister ship *Zuikaku* with starboard-side islands.*[3]

In September 1942, a Type 21 air-warning radar was installed on *Shōkaku*'s island atop the central fire control director, the first such device to be fitted on any Japanese carrier. The Type 21 had a “mattress” antenna and the initial prototypes were light enough that no major structural modifications were necessary. Later versions, however, were bulkier and required eventual removal of the fifth fire control director in order to accommodate the larger and heavier antenna.*[3]

The presence of this radar however, undoubtedly saved *Shōkaku* one month later at the Battle of the Santa Cruz Islands, when *Shokaku* was bombed by SBD-3 Dauntless dive bombers from *Enterprise*; the early detection of the US strike planes by this radar alerted refuelling crews below deck, giving them time to drain and purge the aviation gasoline lines before they were ruptured by bomb hits, thus saving the ship from the catastrophic avgas fires/explosions that eventually caused most of the carrier sinkings in the Pacific theater.

Armament

Shōkaku's primary air defense consisted of sixteen 127 mm (5.0 in) Type 89 dual-purpose AA guns in twin mountings. These were sited below flight deck level on projecting sponsons with four such paired batteries on either side of the ship's hull, two forward and two aft. Four fire control directors were installed, two on the port side and two to starboard. A fifth fire control director was located atop the carrier's island and could control any or all of the heavy-caliber guns as needed.*[3]

Initially, light AA defense was provided by twelve triple-mount 25 mm (0.98 in) Type 96 AA guns. Further mounts were added in 1943.*[3]

4.1.2 Operational history

Shōkaku and *Zuikaku* formed the Japanese 5th Carrier Division, embarking their aircraft shortly before the Pearl Harbor attack. Each carrier's aircraft complement consisted of 15 Mitsubishi A6M2 “Zero” fighters, 27 Aichi D3A1 “Val” dive bombers, and 27 Nakajima B5N1 or -2 “Kate” torpedo bombers.

Shōkaku and *Zuikaku* joined the *Kido Butai* (“Mobile Unit/Force” , the Combined Fleet's main carrier battle group) and participated in Japan's early wartime naval of-

fensives, including Pearl Harbor and the attack on Rabaul in January 1942.

In the Indian Ocean raid of March–April 1942, aircraft from *Shōkaku*, along with the rest of *Kido Butai*, attacked Colombo, Ceylon on 5 April, sinking two ships in harbor and severely damaging support facilities. The task force also found and sank two Royal Navy heavy cruisers, (*HMS Cornwall* and *Dorsetshire*), on the same day, as well as the aircraft carrier *HMS Hermes* on 9 April off Batticaloa.

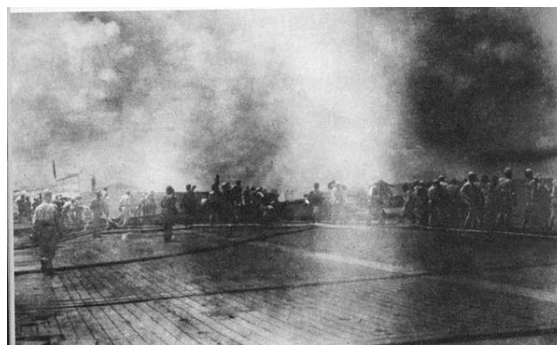
The Fifth Carrier Division was then deployed to Truk to support Operation Mo (the planned capture of Port Moresby in New Guinea). During this operation, *Shōkaku*'s aircraft helped sink the American aircraft carrier *USS Lexington* during the Battle of the Coral Sea but was herself severely damaged on 8 May 1942 by dive bombers from *USS Yorktown* and *Lexington* which scored three bomb hits: one on the carrier's port bow, one to starboard at the forward end of the flight deck and one just abaft the island. Fires broke out but were eventually contained and extinguished. The resulting damage required *Shōkaku* to return to Japan for major repairs.

On the journey back, the carrier shipped so much water through her damaged bow she nearly capsized in heavy seas, maintaining a high rate of speed in order to avoid a cordon of American submarines out hunting for her. She arrived at Kure on 17 May 1942 and entered drydock on 16 June 1942. Repairs were completed within ten days and, a little over two weeks later on 14 July, she was formally reassigned to Striking Force, 3rd Fleet, Carrier Division 1.* [8]

The time required for repairs, combined with the aircraft and aircrew losses incurred by her and *Zuikaku*, kept both carriers from participating in the Battle of Midway.

Following her return to front-line duty, both *Shōkaku* and her sister-ship *Zuikaku*, with the addition of the light carrier *Zuihō*, were redesignated as First Carrier Division and took part in two further battles in 1942: the Battle of the Eastern Solomons, where they damaged *USS Enterprise*, and the Battle of the Santa Cruz Islands, where they crippled *USS Hornet* (*Hornet* was abandoned and later sunk by Japanese destroyers *Makigumo* and *Akigumo*), but *Shokaku* was in turn damaged by dive-bombers of *Enterprise*, which therefore prevented the bombardment of nearby Henderson Field, and once again kept her out of action for months, leaving other Japanese defensive operations in the Pacific lacking sufficient airpower.

At Santa Cruz, on 26 October 1942, *Shōkaku* was again seriously damaged, taking at least three (and possibly as many as six) 1,000-lb. bomb hits from a group of fifteen Douglas SBD-3 dive bombers launched from *Hornet*. With ample warning of the incoming American strike, *Shōkaku*'s aviation fuel mains to the flight deck and hangars had been drained down and she had few aircraft on board at the time of the attack. As a result, no major fires broke out and her seaworthiness was pre-



Shōkaku crewmembers fight fires on the flight deck after being hit by American bombs during the Battle of the Santa Cruz Islands

served. Her flight deck and hangars, however, were left in shambles and she was unable to conduct further air operations during the remainder of the battle.* [6]* [9]

After several months of repairs and training, *Shōkaku*, now under the command of Captain Matsubara Hiroshi, was assigned in May 1943 to a counterattack against the Aleutian Islands, but the operation was cancelled after the Allied victory at Attu. For the rest of 1943, she was based at Truk, then returned to Japan for maintenance late in the year.

4.1.3 Sinking

In 1944, *Shōkaku* was deployed to the Lingga Islands south of Singapore. On 15 June, she departed with the Mobile Fleet for Operation "A-Go", a counterattack against Allied forces in the Mariana Islands. Her strike waves suffered heavy losses from US combat air patrols and anti-aircraft fire, but some survived and returned safely to the carrier. One of her D4Y *Suisei* strike groups, composed of veterans from the Coral Sea and Santa Cruz engagements, broke through and one plane allegedly struck home with a bomb that damaged *USS South Dakota* (BB-57) and caused many casualties, but this group suffered heavy losses themselves. During the Battle of the Philippine Sea, she was struck at 11:22 on 19 June by three (possibly four) torpedoes from the submarine *USS Cavalla* (Commander Herman J. Kessler). As *Shōkaku* had been in the process of refueling and rearming aircraft and was in an extremely vulnerable position, the torpedoes started fires that proved impossible to control. At 12:10, an aerial bomb exploded, detonating aviation fuel vapors which had spread throughout the ship. "Abandon Ship" was ordered, but before the evacuation had progressed very far, *Shōkaku* abruptly took on water forward and sank quickly bow-first at position 11°40'N 137°40'E / 11.667°N 137.667°E, taking 1,272 men with her. The light cruiser *Yahagi* and destroyers *Urakaze*, *Wakatsuki*, and *Hatsuzuki* rescued Captain Matsubara and 570 men.* [1]

4.1.4 Gallery

- Planes from the *Shōkaku* preparing for the attack on Pearl Harbor.
- Nakajima B5N2 “Kate” leaves the *Shōkaku* for Pearl Harbor.

4.1.5 See also

- List by death toll of ships sunk by submarines

4.1.6 Notes

- [1] “Japanese Navy Ships —*Shokaku* (Aircraft Carrier, 1941–1944)”. U.S. Naval Historical Center. 4 June 2000. Retrieved 13 February 2008.
- [2] Stille, p.17
- [3] Brown, p.23
- [4] Brown, p.6
- [5] Brown, p.23-24
- [6] Brown, p.24
- [7] Stille, p.18
- [8] Stille, p.21
- [9] http://www.combinedfleet.com/Akashi_t.htm

4.1.7 Bibliography

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4.1.8 External links

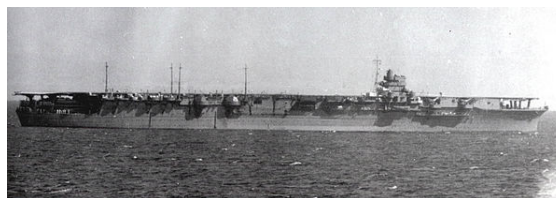
- US Navy photos of *Shokaku*
- Tabular record of movement from combinedfleet.com
- Anthony Tully, Jon Parshall and Richard Wolff, *The Sinking of Shokaku —An Analysis*

4.2 Japanese aircraft carrier *Zuikaku*

Zuikaku (Japanese: 瑞鶴 “Auspicious Crane”) was a *Shōkaku*-class aircraft carrier of the Imperial Japanese Navy. Her complement of aircraft took part in the attack on Pearl Harbor that formally brought the United States into the Pacific War, and she fought in several of the most important naval battles of the war, before being sunk during the Battle of Leyte Gulf.* [1]

One of six carriers to participate in the Pearl Harbor attack, *Zuikaku* was the last of the six to be sunk in the war (four in the Battle of Midway and *Shōkaku* in the Battle of the Philippine Sea).

4.2.1 Service history



Zuikaku in November 1941.

In 1941, *Zuikaku*, under the command of Captain Yokokawa Ichibei, and her sister ship *Shōkaku* comprised Carrier Division 5. On 26 November 1941, she left Hitokappu Bay for the attack on Pearl Harbor as part of the *Kido Butai* (“Mobile Force”). Her aircraft complement consisted of 15 Mitsubishi A6M fighters, 27 Aichi D3A dive bombers, and 27 Nakajima B5N torpedo bombers. On 7 December, she launched two waves of aircraft against American military installations on the island of Oahu. In the first wave, 25 dive bombers attacked Wheeler Army Airfield and five fighters attacked the airbase at Kaneohe. In the second wave, 27 torpedo bombers, armed with bombs, attacked the airbase at Hickam Field and 17 dive bombers targeted the battleships USS *California* and *Maryland* on Battleship Row at Pearl Harbor. *California* later sank, while *Maryland* escaped Pearl Harbor with moderate damage.

Zuikaku 's aircraft also attacked the Australian bases at Rabaul on 20 January 1942 and Lae in New Guinea on

21 January. In April 1942, she took part in the Indian Ocean raid, striking the British naval bases at Colombo and Trincomalee on Ceylon, and sinking the Royal Navy aircraft carrier *HMS Hermes* and the heavy cruisers *HMS Cornwall* and *Dorsetshire*, also with the help of *Shōkaku*.

Battle of the Coral Sea

In May 1942, she was assigned along with *Shōkaku* to support Operation Mo, the invasion of Port Moresby, New Guinea. Alerted by intercepted and decrypted Japanese naval messages, the Americans dispatched the carriers USS *Yorktown* and *Lexington* to stop this operation. On 8 May 1942, during the Battle of the Coral Sea, the main carrier forces located one another and launched maximum-effort raids, which passed each other in the air. Hidden by a rain squall, *Zuikaku* escaped detection, but *Shōkaku* was hit three times by bombs and was unable to launch or recover her aircraft. In return, torpedo and dive bombers from both ships hit *Lexington*, which was later scuttled by torpedoes from an escorting destroyer. *Zuikaku* was undamaged in the battle, but sustained severe losses in aircraft and aircrew. This required her to return to Japan with her sister ship for resupply and aircrew training, and neither carrier was able to take part in the Battle of Midway in June 1942.

Battle for Guadalcanal

In August 1942, commanded by Captain Tameteru Noto, *Zuikaku* was dispatched as part of Carrier Division One along with the repaired *Shōkaku* and the light carrier *Zuihō* to oppose the American offensive in the Solomon Islands. On 24 August 1942, in the Battle of the Eastern Solomons, her aircraft severely damaged the carrier USS *Enterprise*. She was based at Truk for the next few months.

On 26 October 1942, in the Battle of the Santa Cruz Islands, her aircraft again damaged the repaired *Enterprise*, and crippled USS *Hornet* (*Hornet* was abandoned after a failed scuttling attempt and later sunk by Japanese destroyers). However, *Shōkaku* and *Zuihō* were both severely damaged by American air attacks, and *Zuikaku* had to recover their surviving aircraft in addition to her own. Of the 110 aircraft launched by the three Japanese carriers, only 67 returned to *Zuikaku*. She then returned to the home islands via Truk for training and aircraft ferrying duties.

In February 1943, she covered the evacuation of Japanese ground forces from Guadalcanal. In May, she was assigned to a mission to counterattack the American offensive in the Aleutian Islands, but this operation was cancelled after the Allied victory on Attu on 29 May 1943. Later in 1943, under the command of Captain Kikuchi Tomozo, she was again based at Truk and operated against U.S. forces in the Marshall Islands.



Zuikaku cruising toward Hitokappu Bay, Iturup, in November 1941. The carrier *Kaga* is seen in the background.

Battle of the Phillipine Sea

In 1944, she was based at Singapore. In June, she was assigned to Operation A-Go, an attempt to repulse the Allied invasion of the Mariana Islands. On 19 June, in the Battle of the Philippine Sea, *Taihō* and *Shōkaku* were both sunk by American submarines, leaving *Zuikaku*, the only survivor of Carrier Division One, to recover the Division's few remaining aircraft. On 20 June, a bomb hit started a fire in the hangar, but *Zuikaku*'s experienced damage control teams managed to get it under control, and she was able to escape under her own power. After this battle, *Zuikaku* was the only survivor of the six fleet carriers that had launched the attack on Pearl Harbor.

Battle of Cape Engaño

In October 1944, she was the flagship of Admiral Jisaburo Ozawa's decoy Northern Force in Operation *Shō-Gō I*, the Japanese counterattack to the Allied landings on Leyte. On 24 October, as part of Third Carrier Division, she launched aircraft along with the light carriers *Zuihō*, *Chitose*, and *Chiyoda* in an ineffective strike against the U.S. Third Fleet. Several of these aircraft were shot down, and the majority of the surviving aircraft did not return to the carriers, instead landing at Japanese land bases on Luzon. However, some of her aircraft made *kamikaze* attacks and helped sink the light carrier USS *Princeton*; and most of the others were sent to other surviving carriers and air bases, to later sink the escort carrier USS *St. Lo* during the Battle of Samar after again using the new *kamikaze* tactics. The next day, during the Battle of Cape Engaño, she launched her few remaining aircraft for combat air patrol, search, or to join the aircraft already on Luzon. She then came under heavy air attack and was hit by seven torpedoes and nine bombs. With *Zuikaku* listing heavily to port, Ozawa shifted his flag to the light cruiser *Ōyodo*. The order to abandon ship was issued at 13:58 and the naval ensign was lowered. *Zuikaku* rolled over and sank stern-first at 14:14, taking the lives of Rear Admiral (promoted from captain 10 days earlier) Kaizuka Takeo and 842 of the

ship's crew; 862 officers and men were rescued by the destroyers *Wakatsuki* and *Kuwa*.^[1]

4.2.2 Gallery

- Sailors winching up the anchor on the quarter-deck of *Zuikaku*, 26 November 1941.
- A Nakajima B5N2 “Kate” taking off *Zuikaku* to attack Pearl Harbor, 7 December 1941.
- *Zuikaku* (left center) and *Zuiho* (right) under attack by U.S. Navy dive bombers during the Battle off Cape Engaño, 25 October 1944.
- The crew of the sinking *Zuikaku* salute as the flag is lowered on 25 October 1944.
- Banzai! three cheers.

4.2.3 Notes

[1] *Zuikaku* @ www.history.navy.mil

4.2.4 External links

- Tabular record of movement from combinedfleet.com

Coordinates: 19°20′N 125°51′E﻿ / ﻿19.333°N 125.850°E﻿ /

Chapter 5

Zuihō class 瑞鳳祥鳳

5.1 Japanese aircraft carrier Zuihō

Zuihō (瑞鳳, “Auspicious Phoenix” or “Fortunate Phoenix”) was a light aircraft carrier of the Imperial Japanese Navy. Originally laid down as the submarine support ship *Takasaki*, she was renamed and converted while under construction into an aircraft carrier. The ship was completed during the first year of World War II and participated in many operations. *Zuihō* played a secondary role in the Battle of Midway in mid-1942 and did not engage any American aircraft or ships during the battle. The ship participated in the Guadalcanal Campaign during the rest of 1942. She was lightly damaged during the Battle of the Santa Cruz Islands during this campaign and covered the evacuation of Japanese forces from the island in early 1943 after repairs.

Afterwards, her aircraft were disembarked several times in mid- to late-1943 and used from land bases in a number of battles in the South West Pacific. *Zuihō* participated in the Philippine Sea and Leyte Gulf battles in mid-1944. In this last battle, *Zuihō* mainly served as a decoy for the main striking forces and she was finally sunk by American aircraft fulfilling her task. In between engagements, the ship served as a ferry carrier and a training ship.

5.1.1 Design and conversion

The submarine support ship *Takasaki* was laid down on 20 June 1935 at the Yokosuka Naval Arsenal and was designed to be converted to either a fleet oiler or a light aircraft carrier as needed. She was launched on 19 June 1936 and began a lengthy conversion into a carrier while fitting-out. The ship was renamed *Zuihō* during the process which was not completed until 27 December 1940 when she was commissioned.*[1]

After her conversion, *Zuihō* had a length of 205.49 meters (674 ft 2 in) overall. She had a beam of 18.19 meters (59 ft 8 in) and a draft of 6.58 meters (21 ft 7 in). She displaced 11,443 tonnes (11,262 long tons) at standard load. As part of her conversion, her original diesel engines, which had given her a top speed of 29 knots (54 km/h; 33 mph), were replaced by a pair of destroyer-type geared steam turbine sets with a total of

52,000 shaft horsepower (39,000 kW), each driving one propeller. Steam was provided by four water-tube boilers and *Zuihō* now had a maximum speed of 28 knots (52 km/h; 32 mph). The boilers exhausted through a single downturned starboard funnel and she carried 2,600 tonnes (2,600 long tons) of fuel oil that gave her a range of 7,800 nautical miles (14,400 km; 9,000 mi) at a speed of 18 knots (33 km/h; 21 mph).*[2] Her crew numbered 785 officers and men.*[1]

Zuihō's flight deck was 179.98 meters (590 ft 6 in) long and had a maximum width of 23.01 meters (75 ft 6 in). The ship was designed with a single hangar 124.00 meters (406 ft 10 in) long and 17.98 meters (59 ft 0 in) wide.*[3] The hangar was served by two octagonal centerline aircraft elevators. The forward elevator was 13.01 by 11.99 meters (42.67 by 39.33 ft) in size and the smaller rear elevator measured 11.99 by 10.79 meters (39.33 by 35.4 ft). She had arresting gear with six cables, but she was not fitted with an aircraft catapult. *Zuihō* was a flush-deck design and lacked an island superstructure. She was designed to operate 30 aircraft.*[1]

The ship's primary armament consisted of eight 40-caliber 12.7 cm Type 89 anti-aircraft (AA) guns in twin mounts on sponsons along the sides of the hull. *Zuihō* was also initially equipped with four twin 25 mm Type 96 light AA guns, also in sponsons along the sides of the hull. In 1943, her light AA armament was increased to 48 twenty-five mm guns. The following year, an additional twenty 25 mm guns were added in addition to six 28-round AA rocket launchers.*[4]

5.1.2 Service

After commissioning, *Zuihō* remained in Japanese waters until late 1941. Captain Sueo Ōbayashi assumed command on 20 September and *Zuihō* became flagship of the Third Carrier Division ten days later. On 13 October she was briefly assigned to the 11th Air Fleet in Formosa and arrived in Takao the following day. The ship returned to Japan in early November and was given a brief refit later in the month. Together with the carrier *Hōshō* and six battleships, *Zuihō* covered the return of the ships of the 1st Air Fleet as they returned from the Attack on Pearl

Harbor in mid-December.* [5]

On February 1942, the ship ferried Mitsubishi A6M Zero fighters to Davao City, Philippines. *Zuihō* remained in Japanese waters until June when she participated in the Battle of Midway.* [5] She led the Support Fleet and did not engage American carriers directly. Her aircraft complement consisted of six Mitsubishi A5M “Claude” and six Mitsubishi A6M2 “Zero” fighters, and twelve Nakajima B5N2 “Kate” torpedo bombers.* [6] After a brief refit in July–August, the ship was assigned to First Carrier Division with *Shōkaku* and *Zuikaku* on 12 August.* [5]

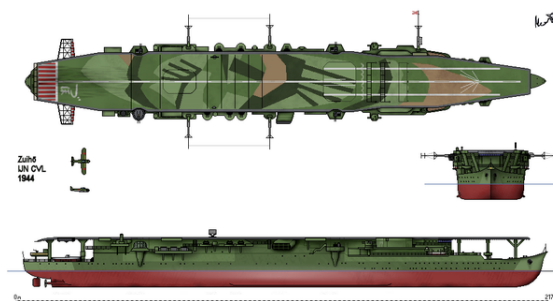
The division sailed to Truk on 1 October to support Japanese forces in the Guadalcanal Campaign and left Truk on 11 October* [5] based on the promise of the Japanese Army to capture Henderson Field on Guadalcanal. At this time, *Zuihō* carried 18 A6Ms and 6 B5Ns. The Japanese and American carrier forces discovered each other in the early morning of 26 October during the Battle of the Santa Cruz Islands and each side launched air strikes. The aircraft passed each other en route and nine of *Zuihō* 's Zeros attacked the aircraft launched by the USS *Enterprise*. They shot down three each Grumman F4F Wildcat fighters and Grumman TBF Avenger torpedo bombers and damaged one more of each type while losing four of their own. Two of *Enterprise* 's Douglas SBD Dauntless dive bombers hit *Zuihō* with 500-pound (230 kg) bombs and damaged her flight deck enough that she could not conduct flight operations although she was not seriously damaged otherwise.* [7] Together with the damaged *Shōkaku*, the ship withdrew from the battle and reached Truk two days later. After temporary repairs, the two carriers returned to Japan in early November and *Zuihō* 's repairs were completed on 16 December. In the meantime, Captain Bunjiro Yamaguchi assumed command.* [5]



A Mitsubishi A6M Zero, painted to represent a section leader's aircraft from the Japanese aircraft carrier *Zuihō* during the Battle of the Bismarck Sea.

The ship left Kure on 17 January 1943 and sailed for Truk with a load of aircraft. Upon arrival she was assigned to the Second Carrier Division to provide cover for the evacuation of Guadalcanal, along with *Jun'yō* and

Zuikaku, later in the month and in early February. *Zuihō* 's fighters were transferred to Wewak, New Guinea in mid-February and then to Kavieng in early March. They were transferred to Rabaul on mid-March to participate in Operation I-Go, a land-based aerial offensive against Allied bases in the Solomon Islands and New Guinea. The fighters returned to Truk on 18 March after claiming 18 Allied aircraft shot down.* [8] *Zuihō* arrived at Sasebo on 9 May and received a brief refit in mid-June. She returned to Truk on 15 July and remained in the area until 5 November when she returned to Yokosuka.* [5] Her air group, 18 Zeros and eight D3As, was briefly deployed to Kavieng in late August – early September before returning to Truk.* [9] By this time, *Zuihō* was assigned to the First Carrier Division with *Shōkaku* and *Zuikaku* and they sailed for Eniwetok Atoll on 18 September for training and to be in position to intercept any attacks by American carriers in the vicinity of Wake Island and the Marshall Islands area. That day the American carriers raided the Gilbert Islands and were gone by the time the Japanese reached Eniwetok on 20 September. Japanese intelligence reports pointed to another American attack in the Wake-Marshall Islands area in mid-October and Admiral Mineichi Koga sortied the Combined Fleet, including the First Carrier Division, on 17 October. They arrived at Eniwetok two days later and waited for reports of American activity until 23 October. They then sailed for Wake Island and then returned to Truk on 26 October without encountering any American ships.* [10]



Three-way view of *Zuihō*

Zuihō 's air group was transferred to Rabaul at the beginning of November, just in time to participate in the Bombing of Rabaul. The fighters claimed to have shot down 25 American aircraft at the cost of 8 of their own; the survivors flew back to Truk where they remained.* [9] On 30 November, *Zuihō*, together with the escort carriers *Chūyō* and *Unyō*, departed Truk for Japan, escorted by four destroyers. The Americans had cracked the Japanese naval codes and positioned several submarines along their route to Yokosuka. *Skate* unsuccessfully attacked *Zuihō* on 30 November, while *Sailfish* torpedoed and sank *Chūyō* five days later with heavy loss of life.* [11] From December to May 1944, *Zuihō* ferried aircraft and supplies to Truk and Guam although she was reassigned to the Third Carrier Division on 29 January,* [5] together with the converted carriers *Chitose*

and *Chiyoda*. Each of the three carriers was intended to be equipped with 21 fighters and 9 torpedo bombers, but this plan was changed on 15 February to a consolidated air group, the 653rd, that controlled the aircraft of all three carriers.*[9] While fully equipped by May with 18 Zero fighters, 45 Zero fighter-bombers, 18 B5Ns, and 9 Nakajima B6N “Jill” torpedo bombers,*[12] the air group’s pilots were largely drawn from the two most recent classes and lacked experience.*[13] The ship sailed for *Tawi-Tawi* on 11 May in the Philippines. The new base was closer to the oil wells in *Borneo* on which the Navy relied and also to the *Palau* and western Caroline Islands where the Japanese expected the next American attack. However, the location lacked an airfield on which to train the green pilots and American submarines were very active in the vicinity which restricted the ships to the anchorage.*[14]

Battle of the Philippine Sea

Main article: [Battle of the Philippine Sea](#)

The *1st Mobile Fleet* was en route to Guimares Island in the central Philippines on 13 June, where they intended to practice carrier operations in an area better protected from submarines, when Vice Admiral Jisaburō Ozawa learned of the American attack on the *Mariana Islands* the previous day. Upon reaching Guimares, the fleet refueled and sortied into the *Philippine Sea* where they spotted Task Force 58 on 18 June. The Americans failed to locate Ozawa’s ships that day and the Japanese turned south to maintain a constant distance between them and the American carriers as Ozawa had decided on launching his air strikes early the following morning. He had deployed his forces in a “T”- shaped formation with the 3rd Carrier Division at the end of the stem, 115 nautical miles (213 km; 132 mi) ahead of the 1st and 2nd Carrier Divisions that formed the crossbar of the “T”. *Zuihō* and her consorts were intended to draw the attentions of the Americans while the other carriers conducted their air strikes without disruption. Sixteen *Aichi E13A floatplanes* were launched by the heavy cruisers accompanying the carriers at 0430 to search for the Americans; the three carriers launched a follow up wave of 13 B5Ns at 0520. The first wave spotted one group of four carriers from Task Force 58 at 0734 and the Japanese carriers launched their aircraft an hour later. This consisted of 43 Zero fighter-bombers and 7 B6Ns, escorted by 14 A6M5 fighters; the carriers retained only three fighters, two fighter-bombers, two B6Ns and two B5Ns for self-defense and later searches. While the air strike was still forming up, the second wave of searchers located Task Force 58’s battleships and the air strike was diverted to attack them. The Americans detected the incoming Japanese aircraft at 0959 and had a total of 199 *Grumman F6F Hellcat* fighters in the air by the time the Japanese aircraft were in range of the American ships.

The defending fighters decimated the Japanese aircraft and only 21 survived. The only damage inflicted was from one A6M2 that hit the battleship *South Dakota* in her superstructure with a single 250-kilogram (550 lb) bomb that wounded 50 crewmen, but did little other damage. Only three Hellcats were lost in the affair, one to a B6N, although the Japanese claimed four victories. Some of the surviving Japanese aircraft landed at Guam while others, including the five surviving B6Ns, returned to their carriers where they claimed one carrier definitely damaged and another probably hit.*[15]

At dusk, the Japanese turned away to the northwest to regroup and to refuel and the Americans turned west to close the distance. Both sides launched aircraft the next day to locate each other; *Zuihō* launched three aircraft at 1200 to search east of the fleet, but they did not discover the Americans. The Americans discovered the retiring Japanese fleet during the afternoon and Vice Admiral Marc Mitscher ordered an air strike launched. While they sank the Japanese carrier *Hiyo* and damaged two others, *Zuihō* was not attacked and successfully disengaged that evening.*[16] By the end of the battle, Air Group 653 was reduced to two Zero fighters, three Zero fighter-bombers and six torpedo bombers.*[17] After reaching Japan on 1 July, the ship remained in Japanese waters until October,*[5] training replacements for her air group.*[18]

Battle of Leyte Gulf

Main article: [Battle of Leyte Gulf](#)

After the Battle of the Philippine Sea, the commander



Zuihō during the Battle of Cape Engano

of the *Combined Fleet*, Admiral Soemu Toyoda, prepared four “victory” plans: *Shō-Gō 1* (捷1号作戦 *Shō ichigō sakusen*) was a major naval operation in the Philippines, while *Shō-Gō 2* was intended to defend Formosa, the *Ryukyu Islands* and southern Kyushu. *Shō-Gō 3* and *Shō-Gō 4* were responses to attacks on *Kyushu-Shikoku-Honshu* and *Hokkaido* respectively.*[19] He activated *Shō-Gō 2* after the Americans attacked the Philip-

piners, Formosa and the Ryukyu Islands beginning on 10 October.*[20] This required the transfer of most of Air Group 652 to Formosa and Luzon to attack the American forces, with only a few aircraft retained for carrier operations.*[18] Most of these aircraft were lost for little gain as the Americans suppressed Japanese defenses in the Philippines, preparatory to the actual invasion.*[21]

On 17 October, Admiral Toyoda alerted the fleet that Shō-Gō 1 was imminent and activated the plan the following day after receiving reports of the landings on Leyte. *Zuihō*'s role in Shō-Gō 1, together with *Chiyoda*, *Chitose* and *Zuikaku* and the rest of the Main Body of the 1st Mobile Fleet, approaching Leyte Gulf from the north, was to serve as decoys to attract attention away from the two other forces approaching from the south and west. All forces were to converge on Leyte Gulf on 25 October and the Main Body left Japan on 20 October. As decoys, the carriers were only provided with a total of 116 aircraft: 52 Zero fighters, 28 Zero fighter-bombers, 7 *Yokosuka D4Y* "Judy" dive bombers, 26 B6N and 4 B5N torpedo bombers. By the morning of 24 October, the Main Body was within range of the northernmost American carriers of Task Force 38 and Admiral Ozawa ordered an air strike launched to attract the attention of the Americans. This accomplished little else as the Japanese aircraft failed to penetrate past the defending fighters; the survivors landed at airfields on Luzon. The Americans were preoccupied dealing with the other Japanese naval forces and defending themselves from air attacks launched from Luzon and Leyte and could not spare any aircraft to search for the Japanese carriers until the afternoon. They finally found them at 1605, but Admiral William Halsey, Jr., commander of Task Force 38, decided that it was too late in the day to mount an effective strike. He did, however, turn all of his ships north to position himself for a dawn attack on the Japanese carriers the next day in what came to be called the Battle of Cape Engaño.*[22]

Aircraft from the light carrier *Independence* were able to track the Japanese ships for most of the night and Halsey ordered an air strike of 60 Hellcat fighters, 65 Helldiver dive bombers and 55 Avenger torpedo bombers launched shortly after dawn in anticipation of locating the Japanese fleet. They spotted them at 0735 and brushed aside the 13 Zeros that the Japanese had retained for self-defense. *Zuihō* attempted to launch her few remaining aircraft, but was hit by a single bomb on her aft flight deck after a number of torpedo-carrying Avengers missed.*[23] The 500-pound (230 kg) bomb started several small fires, lifted the rear elevator, bulged the flight deck, knocked out steering and gave the ship a small list to port. Twenty minutes later, the fires were put out, steering repaired and the list corrected. A second attack an hour later focused on *Chiyoda* and ignored *Zuihō*. The third wave arrived around 1300 and badly damaged the ship. She was hit once by a torpedo and twice by small bombs, although fragments from as many as 67 near misses cut steam pipes

and caused flooding of both engine rooms and one boiler room. *Zuihō* was forced to reduce speed to 12 knots (22 km/h; 14 mph) and flooding increased so that all available hands were ordered to man the pumps at 1410. The ship took on a 13° list to starboard and went dead in the water at 1445 when the port engine room fully flooded. A fourth wave of American aircraft attacked ten minutes later, but only damaged her with splinters from another ten near misses. This was enough to increase her list to 23° and she was ordered abandoned at 1510. *Zuihō* sank at 1526 at position 19°20'N 125°15'E / 19.333°N 125.250°ECoordinates: 19°20'N 125°15'E / 19.333°N 125.250°E with the loss of 7 officers and 208 men. The destroyer *Kuwa* and the battleship *Ise* rescued 58 officers and 701 men between them.*[5]

5.1.3 References

- [1] Peattie, p. 242
- [2] Jentschura, Jung and Mickel, p. 48
- [3] Brown, p. 22
- [4] Jentschura, Jung and Mickel, p. 49
- [5] Tully
- [6] Parshall & Tully, p. 543
- [7] Polmar & Genda, pp. 292–96
- [8] Hata & Izawa, p. 55
- [9] Hata & Izawa, p. 56
- [10] Polmar & Genda, p. 377
- [11] Polmar & Genda, p. 370
- [12] Polmar & Genda, p. 389
- [13] Hata & Izawa, p. 83
- [14] Polamar & Genda, pp. 380–81
- [15] Brown, pp. 258–60
- [16] Brown, pp. 263–65
- [17] Hata & Izawa, pp. 84–85
- [18] Hata & Izawa, p. 85
- [19] Polmar & Genda, p. 415
- [20] Brown 2009, p. 270
- [21] Polmar & Genda, p. 412
- [22] Polmar & Genda, pp. 420, 422, 428
- [23] Polmar & Genda, pp. 429–30

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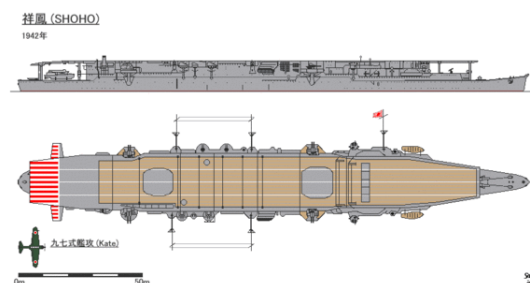
5.1.6 External links

- [Zuihō statistics](#)
- [Zuihō history](#)

5.2 Japanese aircraft carrier Shōhō

Shōhō (Japanese: 祥鳳, “Auspicious Phoenix” or “Happy Phoenix”) was a light aircraft carrier of the Imperial Japanese Navy. Originally built as the submarine support ship *Tsurugizaki* in the late 1930s, she was converted before the Pacific War into an aircraft carrier and renamed. Completed in early 1942, the ship supported the invasion forces in Operation MO, the invasion of Port Moresby, New Guinea, and was sunk by American carrier aircraft on her first combat operation during the Battle of the Coral Sea on 7 May. *Shōhō* was the first Japanese aircraft carrier to be sunk during World War II.

5.2.1 Design, construction and conversion



Schematic of the Shōhō

Shōhō and her sister *Zuihō* were designed to be easily modified as an oil tanker, submarine tender, or aircraft carrier as needed. *Shōhō* was laid down by the Yokosuka Naval Arsenal on 3 December 1934 as the submarine tender *Tsurugizaki*.^[1] She was launched on 1 June 1935 and completed on 15 January 1939. Not long after the ship was initially completed, she began reconstruction as an aircraft carrier in 1941. Her superstructure was removed and replaced by a flight deck with a hangar for her aircraft below. Renamed *Shōhō*, the conversion was finished on 26 January 1942.^[2]

After her conversion, *Shōhō* had a length of 205.5 meters (674 ft 2 in) overall. She had a beam of 18.2 meters (59 ft 8 in) and a draft of 6.58 meters (21 ft 7 in). She displaced 11,443 tonnes (11,262 long tons) at standard load. As part of her conversion, her original diesel engines, which had given her a top speed of 29 knots (54 km/h; 33 mph), were replaced by a pair of destroyer-type geared steam turbine sets with a total of 52,000 shaft horsepower (39,000 kW), each driving one propeller. Steam was provided by four Kampon water-tube boilers and *Shōhō* now had a maximum speed of 28 knots (52 km/h; 32 mph). The boilers exhausted through a single downturned starboard funnel and she carried 2,642 tonnes (2,600 long tons) of fuel oil, giving her a range of 7,800 nautical miles (14,400 km; 9,000 mi) at a speed of 18 knots (33 km/h; 21 mph).^[3] Her crew numbered 785 officers and

men.*[4]

Shōhō's flight deck was 180 meters (590 ft 6 in) long and had a maximum width of 23 meters (75 ft 6 in). The ship was designed with a single hangar 124 meters (406 ft 10 in) long and 18 meters (59 ft) wide.*[5] The hangar was served by two octagonal centerline aircraft elevators. The forward elevator was 13 by 12 meters (42 ft 8 in × 39 ft 4 in) in size and the smaller rear elevator measured 12 by 10.8 meters (39 ft 4 in × 35 ft 5 in). She had arresting gear with six cables, but she was not fitted with an aircraft catapult. *Shōhō* was a flush-deck design and lacked an island superstructure. She was designed to operate 30 aircraft.*[4]

The ship's primary armament consisted of eight 40-caliber 12.7 cm Type 89 anti-aircraft (AA) guns in twin mounts on sponsons along the sides of the hull. *Shōhō* was also initially equipped with four twin 25 mm Type 96 light AA guns, also in sponsons along the sides of the hull.*[2]

5.2.2 Service history

Shōhō was commissioned on 30 November 1941 and Captain Izawa Ishinosuke became her commanding officer. While still fitting-out, the ship was assigned to the Fourth Carrier Division of the 1st Air Fleet on 22 December.*[6] On 4 February 1942, she ferried aircraft to Truk, where she remained until 11 April before returning to Yokosuka.*[6]*[7]

In late April 1942, *Shōhō* was assigned to Operation MO and arrived in Truk on 29 April. The following day, she departed Truk with the cruisers *Aoba*, *Kinugasa*, *Furutaka*, and *Kako* of Cruiser Division 6 under the command of Rear Admiral Aritomo Gotō.*[6] They formed the Main Force of the operation.*[8] Due to aircraft shortages, her aircraft complement consisted of only four obsolete Mitsubishi A5M4 “Claude” and eight modern Mitsubishi A6M2 “Zero” fighters plus six Nakajima B5N2 “Kate” torpedo bombers. Covering the other elements of Operation MO was the Striking Force that consisted of the fleet carriers *Shōkaku* and *Zuikaku*.*[7]

Battle of the Coral Sea

Main article: Battle of the Coral Sea

After covering the landings on Tulagi on 3 May, *Shōhō* headed north to cover the invasion convoy the next day and was not present when aircraft from the American carrier *Yorktown* attacked Japanese shipping at Tulagi. This air strike confirmed that at least one American carrier was in the vicinity, but the Japanese had no idea of its location.*[9] They launched a number of reconnaissance aircraft the following day to search for the Americans, but without result. One Kawanishi H6K “Mavis” flying boat spotted *Yorktown*, but was shot down by one of *Yorktown*'s Grumman F4F Wildcat fighters before she could radio



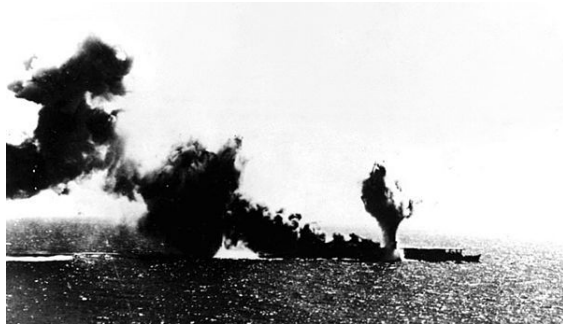
Dramatic shot of the detonation of a 1,000-pound (450 kg) bomb on Shōhō during the Battle of the Coral Sea

a report. US Army Air Force (USAAF) aircraft spotted *Shōhō**[Note 1] southwest of Bougainville Island on 5 May, but she was too far north to be attacked by the American carriers, which were refueling.*[11] That day, Rear Admiral Frank Jack Fletcher received Magic intelligence that placed the three Japanese carriers known to be involved in Operation MO near Bougainville, and predicted 10 May as the date of the invasion. It also predicted airstrikes by the Japanese carriers in support of the invasion several days before 10 May. Based on this information, Fletcher planned to complete refuelling his ships on 6 May and move closer to the eastern tip of New Guinea to be in a position to locate and attack Japanese forces on 7 May.*[12]

Another H6K spotted the Americans during the morning of 6 May and successfully shadowed them until 14:00. The Japanese, however, were unwilling or unable to launch air strikes in poor weather or without updated spot reports.*[13] Both sides believed they knew where the other force was, and expected to fight the next day.*[14] The Japanese were the first to spot the Americans when one aircraft found the oiler *Neosho* escorted by the destroyer *Sims* at 0722, south of the Strike Force. These ships were misidentified as a carrier and a cruiser and the carriers *Shōkaku* and *Zuikaku* launched an airstrike 40 minutes later that sank *Sims* and damaged *Neosho* badly enough that she had to be scuttled a few days later. The American carriers were west of the Strike Force, not south, and they were spotted by other Japanese aircraft shortly after the carriers had launched their attack on *Neosho* and *Sims*.*[15]

American reconnaissance aircraft reported two Japanese heavy cruisers northeast of Misima Island in the Louisiade Archipelago off the eastern tip of New Guinea at 07:35 and two carriers at 08:15. An hour later, Fletcher ordered an airstrike launched, believing that the two carriers reported were *Shōkaku* and *Zuikaku*. *Lexington* and *Yorktown* launched a total of 53 Douglas SBD Dauntless dive bombers and 22 Douglas TBD Devastator torpedo planes escorted by 18 F4F Wildcats. The 0815 report

turned out to be miscoded, as the pilot had intended to report two heavy cruisers, but USAAF aircraft had spotted *Shōhō*, her escorts and the invasion convoy in the meantime. As the latest spot report plotted only 30 nautical miles (56 km; 35 mi) away from the 0815 report, the aircraft en route were diverted to this new target.* [16]



Shōhō hit by a torpedo launched by a *Devastator* from the *Lexington*

Shōhō and the rest of the Main Force were spotted by aircraft from *Lexington* at 10:40. At this time, *Shōhō*'s combat air patrol (CAP) consisted of two A5Ms and one A6M Zero. The Dauntlesses began their attack at 11:10 as the three Japanese fighters attacked them in their dive. None of the dive bombers hit *Shōhō*, which was maneuvering to avoid their bombs; one Dauntless was shot down by the Zero after it had pulled out of its dive and several others were damaged. The carrier launched three more Zeros immediately after this attack to reinforce its CAP. The second wave of Dauntlesses began their attack at 11:18 and they hit *Shōhō* twice with 1,000-pound (450 kg) bombs. These penetrated the ship's flight deck and burst inside her hangars, setting the fuelled and armed aircraft there on fire. A minute later, the *Devastators* began dropping their torpedoes from both sides of the ship. They hit *Shōhō* five times and the damage from the hits knocked out her steering and power. In addition, the hits flooded both engine and boiler rooms. *Yorktown*'s aircraft trailed those from *Lexington*, and the former's Dauntlesses began their attacks at 11:25, hitting *Shōhō* with another eleven 1,000-pound bombs by Japanese accounts and the carrier came to a complete stop. *Yorktown*'s *Devastators* trailed the rest of her aircraft and attacked at 11:29. They claimed ten hits, although Japanese accounts acknowledge only two. As the *Devastators* were exiting the area, they were attacked by the CAP, but the *Wildcats* protecting the torpedo bombers shot down two A5Ms and an A6M Zero. Total American losses to all causes were three Dauntlesses. After his attack, Lieutenant Commander Robert E. Dixon, commander of *Lexington*'s Dive bombers, radioed his famous message to the American carriers: "Scratch one flat top!"* [17]

With *Shōhō* hit by no fewer than 13 bombs and 7 torpedoes, Captain Izawa ordered the ship abandoned at 11:31. She sank four minutes later. Some 300 men successfully abandoned the ship, but they had to wait to be rescued as

Gotō ordered his remaining ships to head north at high speed to avoid any further airstrikes. Around 14:00, he ordered the destroyer *Sazanami* to return to the scene and rescue the survivors.* [18] She found only 203, including Captain Izawa. The rest of her crew of 834 died during the attack or in the water awaiting rescue.* [19] *Shōhō* was the first Japanese aircraft carrier lost during the war.* [20]

5.2.3 Notes

- [1] Her name was mistransliterated by the Americans as *Ryukaku*.* [10]

5.2.4 Footnotes

- [1] Peattie, pp. 241–42
 [2] Jentschura, Jung and Mickel, p. 49
 [3] Jentschura, Jung and Mickel, p. 48
 [4] Peattie, p. 242
 [5] Brown, p. 22
 [6] Tully
 [7] Lundstrom, p. 188
 [8] Stille, p. 32
 [9] Stille, pp. 46, 48
 [10] Lundstrom, p. 181
 [11] Stille, pp. 49, 51
 [12] Lundstrom, p. 179
 [13] Lundstrom, pp. 178, 181–82, 187
 [14] Stille, p. 52
 [15] Lundstrom, pp. 189–91
 [16] Lundstrom, pp. 193, 195–96
 [17] Lundstrom, pp. 198–206
 [18] Lundstrom, p. 205
 [19] Stille, p. 61
 [20] "Battle of the Coral Sea". The Aviation History On-Line Museum. Retrieved 10 January 2012.

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5.2.7 External links

- Japanese Warships-Shoho

Coordinates: 16°07′14.17″S 151°54′47.02″E﻿ / ﻿16.1206028°S 151.9130611°E﻿ /

Chapter 6

Hiyō class 飛鷹隼鷹

6.1 Japanese aircraft carrier Jun'yō

Jun'yō (隼鷹 “Peregrine Falcon”) was a *Hiyō*-class aircraft carrier of the Imperial Japanese Navy. She was laid down at Nagasaki as the passenger liner *Kashiwara Maru* (樫原丸), but was purchased by the Japanese Navy in 1941 and converted to an aircraft carrier. Completed in May 1942, the ship participated in the Aleutian Islands Campaign the following month and in several battles during the Guadalcanal Campaign in late 1942. Her aircraft were disembarked several times and used from land bases in a number of battles in the South West Pacific. *Jun'yō* was torpedoed in November 1943 and spent three months under repair. She was damaged by several bombs during the Battle of the Philippine Sea in mid-1944, but was quickly repaired. Lacking aircraft, she was used as a transport in late 1944 and was torpedoed in December. *Jun'yō* was under repair until March 1945 when the repairs were deemed uneconomical. She was then effectively **hulked** for the rest of the war. The ship was deemed not worth the cost to repair by the Americans after the surrender of Japan in September and she was **broken up** in 1946–47.

6.1.1 Design and description

The ship was ordered as the fast luxury passenger liner *Kashiwara Maru* by *Nippon Yusen Kaisha* (Japan Mail Steamship company) in late 1938. In exchange for a 60% subsidy of her building costs by the Navy Ministry, she was designed to be converted to an aircraft carrier.* [1]

Jun'yō had a length of 219.32 meters (719 ft 7 in) overall. She had a **beam** of 26.7 meters (87 ft 7 in) and a **draft** of 8.15 meters (26 ft 9 in). She **displaced** 24,150 tonnes (23,770 long tons) at **standard load**.* [2] Her crew ranged from 1,187 to 1,224 officers and men.* [3]

The ship was fitted with two Mitsubishi-Curtis geared **steam turbine** sets with a total of 56,250 **shaft horsepower** (41,950 kW), each driving a 5.5-meter (18 ft) propeller. Steam was provided by six Mitsubishi three-drum **water-tube boilers** at a pressure of 40 kg/cm² (3,923 kPa; 569

psi) at a temperature of 420 °C (788 °F). Her machinery, designed for merchant service, was over four times heavier than that of the *Hiryū*. *Jun'yō* had a designed speed of 25.5 **knots** (47.2 km/h; 29.3 mph), but reached 26 knots (48 km/h; 30 mph) during her sea trials. The ship carried 4,100 tonnes (4,000 long tons) of fuel oil which gave her a range of 12,251 **nautical miles** (22,689 km; 14,098 mi) at 18 knots (33 km/h; 21 mph).* [4]

Flight deck arrangements

Jun'yō's **flight deck** was 210.3 meters (690 ft 0 in) long and had a maximum width of 27.3 meters (89 ft 7 in). A large **island** was fitted on the starboard side that was integrated with, for the first time in a Japanese carrier, the ship's **funnel**. This was angled 26° outwards to help keep its exhaust from interfering with flight operations. The ship was designed with two superimposed **hangars**, each approximately 153 meters (502 ft 0 in) long, 15 meters (49 ft 3 in) wide and 5 metres (16 ft 5 in) high. Each hangar could be subdivided by four fire curtains and they were fitted with **fire fighting foam** dispensers on each side. The hangars were served by two square **aircraft elevators** with rounded corners, 14.03 meters (46.0 ft) on each side. The elevators had a maximum capacity of 5,000 kilograms (11,000 lb) and took 15 seconds to go from the lower hangar to the flight deck. *Jun'yō* was fitted with electrically operated Kure type model 4 arresting gear with nine cables. She also mounted two Type 3 **crash barricades**. No **aircraft catapult** was fitted. The ship mounted a **crane** on the port side of the flight deck, just aft of the rear elevator. When collapsed, it was flush with the flight deck.* [5]

The ship's air group was originally intended to consist of 12 Mitsubishi A5M 'Claude' fighters, plus four in storage, 18 Aichi D3A 'Val' dive bombers, plus two in reserve, and 18 Nakajima B5N 'Kate' **torpedo bombers**. This was revised to substitute a dozen Mitsubishi A6M Zero fighters, and three in storage for the A5Ms by the time the ship commissioned in 1942. As a result of the lessons learned from the Battle of Midway in June, the ship's fighter complement was strengthened to 21 Zeros, and the other aircraft reduced to 12 D3As and 9 B5Ns. By the end of the year, six more Zeros replaced an equal number of D3As.

Although it was possible to fit all these aircraft into the hangars, eight or nine were usually stored on the flight deck to reduce cramping below decks.* [6]

Armor, armament and sensors

As a conversion from an ocean liner, it was not possible to add much armor, although the ship had a double hull. Two plates of Ducol steel, each 25 mm (0.98 in) thick, protected the sides of the ship's machinery spaces. The ship's aviation gasoline tanks and magazines were protected by one layer of Ducol steel. In addition, her machinery spaces were further subdivided by transverse and longitudinal bulkheads to limit any flooding.* [7]

The ship's primary armament consisted of a dozen 40-caliber 12.7 cm Type 89 anti-aircraft (AA) guns in twin mounts on sponsons along the sides of the hull. *Jun'yō* was also initially equipped with eight triple 25 mm Type 96 light AA guns, also in sponsons along the sides of the hull. In mid-1943, four more triple mounts were added and another four triple mounts in late 1943–early 1944. Two of these last four mounts were mounted on the stern and the others were placed in front of and behind the island. A dozen single mounts were also added, some of which were portable and could be mounted on tie-down points on the flight deck. After the Battle of the Philippine Sea in June 1944, the ship's anti-aircraft armament was reinforced with three more triple mounts, two twin mounts and 18 single mounts for the 25 mm Type 96 gun. These guns were supplemented by six 28-round AA rocket launchers. In October 1944, *Jun'yō* had a total of 91 25 mm barrels; 57 in 19 triple mounts, four in two twin mounts, and 30 single mounts.* [8]

Two Type 94 high-angle fire-control directors, one on each side of the ship, were fitted to control the Type 89 guns. Each director mounted a 4.5-meter (14 ft 9 in) rangefinder. When *Jun'yō* first commissioned only the rangefinders were fitted and the directors were added later. Four Type 95 directors controlled the 25 mm guns and another pair were added in early 1943. Early warning was provided by two Type 2, Mark 2, Model 1 air search radars. The first of these was mounted on the top of the island in July 1942, shortly after she was completed, and the other was added later in the year. This latter system was fitted on the port side of the hull, outboard of the rear elevator.* [9] A smaller Type 3, Mark 1, Model 3 air search radar was added in 1944.* [10]

6.1.2 Career

Jun'yō's keel was laid down by Mitsubishi Heavy Industries Shipyard, Nagasaki, on 20 March 1939 with the name of *Kashiwara Maru*. The ship was purchased on 10 February 1941 by the Navy Ministry and she was temporarily referred to as No. 1001 Ship (*Dai 1001 bankan*) to keep her conversion secret. She was launched on 26

June 1941 and commissioned on 3 May 1942.* [11]

Upon commissioning, the ship was assigned to the Fourth Carrier Division of the 1st Air Fleet, together with *Ryūjō*, under the command of Rear Admiral Kakuji Kakuta. She was tasked to support Operation AL, an attack planned to seize several Aleutian Islands to provide advance warning in case of an American attack from the Aleutians down the Kurile Islands while the main body of the American fleet was occupied defending Midway. *Jun'yō* carried 18 A6M2 Zeros and 18 D3As for this operation. At dawn on 3 June, she launched nine Zeros and a dozen D3As to attack Dutch Harbor on Unalaska Island. They had to turn back due to bad weather although one PBY Catalina reconnaissance aircraft was shot down by a Zero. A second airstrike was launched later in the day to attack a group of destroyers discovered by aircraft from the first attack, but they failed to find the targets. Another airstrike was launched on the following day by the two carriers that consisted of 15 Zeros, 11 D3As, and 6 B5Ns and successfully bombed Dutch Harbor. As the aircraft from *Jun'yō* were regrouping after the attack, they were attacked by eight Curtiss P-40 fighters that shot down two Zeros and a pair of D3As while losing two of their own. One more D3A got lost and failed to make it back to the carrier. Shortly after the aircraft were launched, the Americans attacked the carriers, but failed to inflict any damage. A Martin B-26 Marauder bomber and a PBY were shot down by Zeros, and a Boeing B-17 Flying Fortress bomber was shot down by flak during the attack.* [12]

Jun'yō had initially been designated as an auxiliary aircraft carrier (*Toketsetsu kokubokan*), but following the loss of four Japanese fleet carriers in the Battle of Midway, she was redesignated as a regular carrier (*Kokubokan*) in July.* [2] Captain Okada Tametsugu assumed command on 20 July 1942. Upon arrival at Truk on 9 October, together with her sister *Hiyō*, the ship was assigned to the Second Carrier Division to begin operations against American forces in the Guadalcanal area as part of the 3rd Fleet.* [13] On 15 October, the two carriers reached the vicinity of Malaita Island in the Solomon Islands and their aircraft discovered a resupply convoy for Guadalcanal that was escorted by the destroyer *Meredith*. The A6M Zeros and D3As from the sisters attacked and sank the destroyer. The next day, they found the small seaplane tender, *McFarland*, in Lunga Roads offloading avgas into barges. Nine D3As attacked, blowing the ship's stern off and destroying the barge. *McFarland* was not sunk, but required months of repairs. The two carriers were intended to play a prominent role in the Japanese effort to retake Guadalcanal Island and were assigned to the Advance Force for this operation. Their aircraft were supposed to provide air cover after the Japanese night attack that retook Henderson Field and then they were to be flown ashore.* [14]

In late October 1942, during the Guadalcanal Campaign, *Jun'yō* took part in the Battle of the Santa Cruz Islands.

At this time, her air group consisted of 18 Zeros, 18 D3As and nine B5Ns. On 05:00 on 26 October 1942, she had launched fourteen Zeros and a few D3As to land at Henderson Field on Guadalcanal, which had been falsely reported by the Imperial Japanese Army as in their hands, but they were greeted by Marine Grumman F4F Wildcats and all were shot down. At 09:30, *Jun'yō* launched another air strike that attacked the carrier *Enterprise*, the battleship *South Dakota* and the light cruiser *San Juan*, scoring hits on the latter two, but with little substantial damage. Three D3As and a B5N were shot down by returning Douglas SBD Dauntless dive bombers. Most of the surviving Japanese aircraft were forced to land on the undamaged *Jun'yō* and Rear Admiral Kakuta launched another air strike at 1415, using six B5Ns from *Shōkaku* and nine D3As from both carriers. Shortly afterwards, more aircraft were launched to attack the American ships, including six B5Ns, six D3As, escorted by six Zeros. All of these aircraft attacked the carrier *Hornet*, which had been badly damaged by the attacks earlier in the day. American damage control measures had been partially successful, but one torpedo hit by a B5N from *Shōkaku* increased her list from 7.5° to 14.5° and near-misses by the dive bombers started enough seams in her plating that her list increased to 18°. The Americans finally ordered the ship abandoned and the last wave of dive bombers hit *Hornet* twice more, but inflicted little further damage.*[15]

In mid-November 1942, *Jun'yō* was tasked to provide air cover for the convoy bringing reinforcements for the Japanese forces on Guadalcanal during the three-day-long Naval Battle of Guadalcanal. The ship had 27 A6M3 Zeros, 12 D3A2s and nine B5N2s for this task. Six of her Zeros were overhead when the convoy was discovered by two SBDs from *Enterprise* and shot down one dive bomber after it had made its spot report. They were unable to protect the convoy against further attacks by aircraft based at Henderson Field; seven transports were sunk and the remaining four transports were damaged before the end of the day. That afternoon, *Enterprise* had been discovered by a searching B5N and *Junyo* launched an air strike with her remaining aircraft, but they failed to locate the American carrier.*[16] In December 1942 – January 1943, the carrier covered several convoys that brought reinforcements to *Wewak*, *New Guinea* and her air group was based there for several days to protect the forces there before returning to Truk on 20 January. The ship then covered the evacuation of forces from Guadalcanal through early February.*[17]

Jun'yō briefly returned to Japan in February before she sailed for Truk on 22 March together with *Hiyō*.*[13] Her air group was detached to Rabaul on 2 April to participate in Operation I-Go, a land-based aerial offensive against Allied bases in the Solomon Islands and *New Guinea*.*[18] The carrier was lightly damaged from bomb splinters on 12 April from an American air attack.*[18] She returned to Japan on 22 May and departed *Yokosuka*

on 10 June with *Hiyō*, but the latter ship was torpedoed that evening. *Hiyō*'s aircraft were split between *Ryūhō* and *Jun'yō**[19] and they reached Truk a few days later. The ship's air group was deployed to *Buin*, *Papua New Guinea* on 2 July in response to the American attack on *Rendova Island* on 30 June. Leaving her aircraft behind, the carrier returned to Japan in late July.*[18]

Jun'yō ferried aircraft to *Singapore* in mid-August and troops and equipment to the *Caroline Islands* the following month. On 5 November 1943 off *Bungo Suido*, en route from Truk to Kure, *Jun'yō* was hit by a torpedo from the submarine *Halibut*. Four men were killed, but the damage was light, other than the disabled rudder. The ship was under repair and refit until 29 February 1944 at Kure.*[13] Meanwhile, her air group had been reconstituted at *Singapore* on 1 November with 24 Zeros, 18 D3As and 9 B5Ns. The aircraft transferred to Truk on 1 December and then to *Kavieng* at the end of December before reaching Rabaul on 25 January 1944; the survivors were back at Truk on 20 February and the air group was disbanded.*[18]

In the meantime, the Japanese Navy had restructured its carrier air groups so that one air group was assigned to one carrier division and *Air Group 652* was assigned to the 2nd Carrier Division with *Hiyō*, *Jun'yō* and *Ryūhō* on 1 March. The air group was last in priority to be rebuilt and only had 30 Model 21 Zeros, 13 Model 52 Zeros and four D3As on hand on 1 April of its authorized 81 fighters, 36 dive bombers and 27 torpedo bombers. The ship conducted training for her aircraft in the Inland Sea until 11 May when she sailed for *Tawi-Tawi* in the *Philippines*.*[20] The new base was closer to the oil wells in *Borneo* on which the Navy relied and also to the *Palau* and western *Caroline Islands* where the Japanese expected the next American attack. However, the location lacked an airfield on which to train the green pilots and American submarines were very active in the vicinity which restricted the ships to the anchorage.*[21]

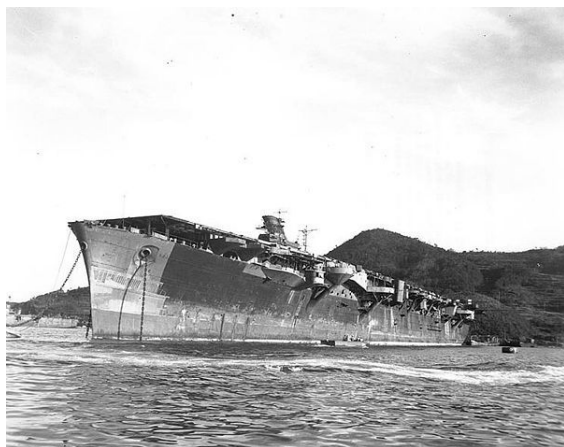
Battle of the Philippine Sea

Main article: *Battle of the Philippine Sea*

The Japanese fleet was en route to *Guimares Island* in the central *Philippines* on 13 June, where they intended to practice carrier operations in an area better protected from submarines, when Vice Admiral *Jisaburō Ozawa* learned of the American attack on the *Mariana Islands* the previous day. Upon reaching *Guimares*, the fleet refuelled and sorted into the *Philippine Sea* where they spotted *Task Force 58* on 18 June. The Americans failed to locate *Ozawa's* ships that day and the Japanese turned south to maintain a constant distance between them and the American carriers as *Ozawa* had decided on launching his air strikes early the following morning. At this time, *Air Group 652* consisted 81 Zeros, 27 D3As, 9 *Yokosuka*

D4Y “Judy” dive bombers and 18 Nakajima B6N “Jill” torpedo bombers, roughly evenly divided among the three ships. The three carriers began launching their first air strike of 26 bomb-carrying A6M2 Zeros, 16 A6M5 Zeros to escort the other aircraft and seven B6Ns at about 09:30. Most of these aircraft were misdirected and failed to find any American ships, although a dozen persisted in their search and found one of the American task groups. Five bomb-carrying Zeros, a B6N and an escort Zero were shot down by the defending fighters and no damage was inflicted on any American ship.* [22]

A second air strike of 27 D3As, nine D4Ys, two B6Ns and 26 escorting Zeros was launched around 11:00, accompanied by at least 18 A6Ms and B6Ns from *Shōkaku* and *Zuikaku*. They had also been given an erroneous spot report and could not find any American ships. The 652nd aircraft headed for airfield at Rota and Guam to refuel while those from the other two carriers headed back to them. Six D4Ys and two Zeros bound for Rota spotted the carriers *Wasp* and *Bunker Hill* en route and failed to inflict any damage on the American ships while losing five D4Ys to anti-aircraft fire. Radar had spotted those aircraft headed for Guam and they were intercepted by 41 Grumman F6F Hellcats. Only one A6M5, one D4Y and seven D3As of the 49 Japanese aircraft survived the encounter and landed.* [23] By the end of the day, Air Group 652 had been reduced to only 38 Zeros, evenly split between bomb-carrying A6M2s and escort A6M5s, and eight B6Ns.* [24]



Jun'yō at anchor at Sasebo, 1945

At dusk, the Japanese turned away to the northwest to regroup and to refuel and the Americans turned west to close the distance. They discovered the retreating Japanese fleet during the afternoon of the following day and Vice Admiral Marc Mitscher ordered an air strike launched.* [25] They discovered the ships of the Second Carrier Division and hit *Jun'yō* with two bombs near her island. The ship was not badly damaged, but the damage did stop flight operations.* [13] Air Group 652 claimed two Grumman F6F Hellcat fighters and nine Grumman TBF Avenger torpedo bombers shot down, but lost 11 air-

craft, plus another three that had to ditch. By the end of the battle, the air group only consisted of 11 A6M5s, 5 A6M2s and 1 B6N and it was disbanded on 10 July. Most of its remaining personnel were assigned to Air Group 653.* [24]

After repairs at Kure, she remained in the Inland Sea without aircraft until 27 October when she was tasked to transport material to Borneo. On 3 November, while en route, she was attacked by the submarine *Pintado* near Makung, but her escorting destroyer, *Akikaze*, deliberately sacrificed herself by intercepting the torpedoes and sank with no survivors. On her return voyage, the ship was unsuccessfully attacked by the submarines *Barb* and *Jallao*. On 25 November, she sailed for Manila via Makung to rendezvous with the battleship *Haruna* and the destroyers *Suzutsuki*, *Fuyutsuki*, and *Maki*. Having loaded 200 survivors of the battleship *Musashi*, *Jun'yō* was attacked by the submarines *Sea Devil*, *Plaice* and *Redfish* early in the morning of 9 December 1944. She was hit by three torpedoes that flooded several compartments and killed 19 men. These give her a 10°–12° list to starboard, but she was able to proceed on one engine. She reached Sasebo the following day and began repairs on 18 December.* [13]

The repairs were abandoned in March 1945 for lack of materials and the ship was moved from the dock to Ebisu Bay, Sasebo on 1 April. Efforts to camouflage the ship began on 23 April and she was reclassified as a guard ship on 20 June. *Jun'yō*'s armament was ordered removed on 5 August and the ship was surrendered to the Allies on 2 September. An American technical team evaluated the ship's condition on 8 October and deemed her a constructive total loss. *Jun'yō* was stricken from the Navy List on 30 November and scrapped between 1 June 1946 and 1 August 1947 by the Sasebo Ship Company.* [26]

6.1.3 Jun'yō's ship bell

Jun'yō's ship's bell was recovered by the U.S. Navy near Saipan, having been separated from the ship by a bomb impact. The bell currently resides at Fordham University's Rose Hill Campus in The Bronx. It was gifted to the school by Admiral Chester W. Nimitz in 1944, “As a Memorial to Our Dear Young Dead of World War II,” according to the associated memorial plaque. It was blessed by Cardinal Spellman, the Roman Catholic Archdiocese of New York, and “[w]as first rung at Fordham by the President of the United States, the Honorable Harry S. Truman on 11 May 1946, the Charter Centenary of the University.”

6.1.4 Footnotes

[1] Lengerer & Rehm-Takahara, pp. 17, 106

[2] Lengerer & Rehm-Takahara, p. 107

- [3] Jentschura, Jung and Mickel, p. 52
- [4] Lengerer & Rehm-Takahara, pp. 189–90
- [5] Lengerer & Rehm-Takahara, pp. 108–14
- [6] Lengerer & Rehm-Takahara, p. 111
- [7] Lengerer & Rehm-Takahara, p. 188
- [8] Lengerer & Rehm-Takahara, pp. 188, 193
- [9] Lengerer & Rehm-Takahara, pp. 188–89, 193
- [10] Stille, p. 23
- [11] Lengerer & Rehm-Takahara, pp. 17, 106–07
- [12] Brown, pp. 144–48
- [13] Tully
- [14] Brown, pp. 178–79
- [15] Brown, pp. 181–86
- [16] Brown, pp. 188–93
- [17] Hata, pp. 62–63
- [18] Hata, p. 63
- [19] Brown, p. 207
- [20] Hata, pp. 63, 80–81
- [21] Palomar & Genda, pp. 380–81
- [22] Brown, pp. 252, 257–61
- [23] Brown, pp. 261–62
- [24] Hata, p. 82
- [25] Brown, pp. 263–64
- [26] Lengerer & Rehm-Takahara, p. 193

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6.1.6 Further reading

- Chesneau, Roger, ed. (1980). *Conway's All the World's Fighting Ships 1922-1946*. Greenwich: Conway Maritime Press. ISBN 0-85177-146-7.

6.1.7 External links

- US Navy photos of *Junyo*
- Battle of Midway: Interrogation of Japanese Prisoners

6.2 Japanese aircraft carrier Hiyō

Hiyō (飛鷹 “Flying Hawk”)*[1] was a *Hiyō*-class aircraft carrier of the Imperial Japanese Navy. Begun as the ocean liner *Izumo Maru* (出雲丸) in 1939, she was purchased by the Navy Ministry in 1941 for conversion to an aircraft carrier. Completed shortly after the Battle of Midway in June 1942, she participated in the Guadalcanal Campaign in October and missed the Battle of the Santa Cruz Islands later that month because of an electrical generator fire. Her aircraft were disembarked several times and used from land bases in a number of battles in the South West Pacific. *Hiyō* was torpedoed in mid-1943 and spent three months under repair. She spent most of the next six months training and ferrying aircraft before returning to combat. She was sunk by a gasoline vapor explosion caused by an American torpedo hit during the Battle of the Philippine Sea in mid-1944.

6.2.1 Design and description

The ship was ordered as the fast luxury passenger liner *Izumo Maru* by *Nippon Yusen Kaisha* (Japan Mail Steamship Company) in late 1938. In exchange for a 60% subsidy of her building costs by the Navy Ministry, she was designed to be converted to an aircraft carrier.*[2]

Hiyō had a length of 220 meters (721 ft 9 in) overall. She had a beam of 26.7 meters (87 ft 7 in) and a draft of 8.15 meters (26 ft 9 in). She displaced 24,150 tonnes (23,770 long tons) at standard load.*[3] Her crew ranged from 1,187 to 1,224 officers and enlisted men.*[4]

The ship was fitted with two Mitsubishi-Curtis geared steam turbine sets with a total of 56,250 shaft horsepower (41,950 kW), each driving a 5.5-meter (18 ft) propeller. Steam was provided by six Kawasaki-La Mont water-tube boilers. Her machinery, designed for merchant service, was over four times heavier than that of the *Hiryū*. *Hiyō* had a designed speed of 25.5 knots (47.2 km/h; 29.3 mph), but during sea trials she reached 25.63 knots (47.47 km/h; 29.49 mph) from 56,630 shp (42,230 kW). The ship carried 4,100 tonnes (4,000 long tons) of fuel oil which gave her a range of 11,700 nautical miles (21,700 km; 13,500 mi) at 18 knots (33 km/h; 21 mph).*[5]

Flight deck arrangements

Hiyō's flight deck was 210.3 meters (690 ft 0 in) long and had a maximum width of 27.3 meters (89 ft 7 in). A large island was fitted on the starboard side that was integrated with, for the first time in a Japanese carrier, the ship's funnel. This was angled 26° outwards to help keep its exhaust from interfering with flight operations. The ship was designed with two superimposed hangars, each approximately 153 meters (502 ft 0 in) long, 15 meters (49 ft 3 in) wide and 5 meters (16 ft 5 in) high. Each hangar could be subdivided by four fire curtains and they were fitted with fire fighting foam dispensers on each side. The hangars were served by two square aircraft elevators with rounded corners, 14.03 meters (46.0 ft) on each side. The elevators had a maximum capacity of 5,000 kilograms (11,000 lb) and took 15 seconds to go from the lower hangar to the flight deck. *Hiyō* was fitted with electrically operated Kure type model 4 arresting gear with nine cables. She also mounted two Type 3 crash barricades. No aircraft catapult was fitted. The ship mounted a crane on the port side of the flight deck, just aft of the rear elevator. When collapsed, it was flush with the flight deck.*[6]

The ship's air group was originally intended to consist of 12 Mitsubishi A5M 'Claude' fighters, plus four in storage, 18 Aichi D3A 'Val' dive bombers, plus two in reserve, and 18 Nakajima B5N 'Kate' torpedo bombers. This was revised to substitute a dozen Mitsubishi A6M Zero fighters, and three in storage for the A5Ms by the time the ship commissioned in 1942. As a result of the lessons learned

from the Battle of Midway in June, the ship's fighter complement was strengthened to 21 Zeros, and the other aircraft reduced to 12 D3As and 9 B5Ns. By the end of the year, six more Zeros replaced an equal number of D3As. Although it was possible to fit all these aircraft into the hangars, eight or nine were usually stored on the flight deck to reduce cramping below decks.*[7]

Armor, armament and sensors

As a conversion from an ocean liner, it was not possible to add much armor, although the ship had a double hull. Two plates of Ducol steel, each 25 mm (0.98 in) thick, protected the sides of the ship's machinery spaces. The ship's aviation gasoline tanks and magazines were protected by one layer of Ducol steel. In addition, her machinery spaces were further subdivided by transverse and longitudinal bulkheads to limit any flooding.*[8]

The ship's primary armament consisted of a dozen 40-caliber 12.7 cm Type 89 anti-aircraft (AA) guns in twin mounts on sponsons along the sides of the hull. *Hiyō* was also initially equipped with eight triple 25 mm Type 96 light AA guns, also in sponsons along the sides of the hull. In early 1943, four more triple mounts were added and another four triple mounts late in the year. Two of these last four mounts were mounted on the stern and the others were placed in front of and behind the island. A dozen single mounts were also added, some of which were portable and could be mounted on tie-down points on the flight deck.*[9]

Two Type 94 high-angle fire-control directors, one on each side of the ship, were fitted to control the Type 89 guns. Each director mounted a 4.5-meter (14 ft 9 in) rangefinder. Four Type 95 directors controlled the 25 mm guns and another pair were added in early 1943. Early warning was provided by two Type 2, Mark 2, Model 1 air search radars. The first of these was mounted on the top of the island shortly before she was completed in July 1942 and the other was added later in the year. This latter system was fitted on the port side of the hull, outboard of the rear elevator.*[10] A smaller Type 3, Mark 1, Model 3 air search radar was added in 1944.*[11]

6.2.2 Service history

Hiyō's keel was laid down by Kawasaki Heavy Industries Shipyard, Kobe, on 30 November 1939 with the name of *Izumo Maru*. The ship was purchased on 10 February 1941 by the Navy Ministry and she was temporarily referred to as No. 1002 Ship (*Dai 1002 bankan*) to keep her conversion secret. She was launched on 24 June 1941 and commissioned on 31 July 1942.*[12]

The ship was assigned to the Second Carrier Division of the 1st Air Fleet after commissioning and became Rear Admiral Kakuji Kakuta's flagship on 12 August. After

spending the next several months *working up*, *Hiyō* arrived at *Truk*, together with her sister *Junyō*, on 9 October to begin operations against American forces in the Guadalcanal area as part of the *3rd Fleet*.^[13] On 15 October, the two carriers reached the vicinity of *Malaita Island* in the *Solomon Islands* and their aircraft discovered a resupply convoy for *Guadalcanal* that was escorted by the destroyer *Meredith*. The A6M Zeros and D3As from the sisters attacked and sank the destroyer. The next day, they found the small seaplane tender, *McFarland*, in *Lunga Roads* offloading avgas into barges. Nine D3As attacked, blowing the ship's stern off and destroying the barge. *McFarland* was not sunk, but required months of repairs. The two carriers were intended to play a prominent role in the Japanese effort to retake Guadalcanal Island and were assigned to the Advance Force for this operation. Their aircraft were supposed to provide air cover after the Japanese night attack that retook *Henderson Field* and then they were to be flown ashore.^[14] A fire in the generator room occurred on 17 October and reduced her top speed to 16 knots (30 km/h; 18 mph) so Admiral Kakuta transferred his flag to *Junyō* while *Hiyō* returned to *Truk* for repairs. Some of her aircraft, however, were also transferred to *Junyō* before she left.^[13]

The remaining aircraft of her air group (16 Zeros and 17 D3As) were flown off for Rabaul on 23 October where they provided air cover for Japanese forces on Guadalcanal. A detachment from the air group was transferred to *Buin*, *Papua New Guinea* on 1 November and participated in the *Naval Battle of Guadalcanal* later in the month. Those aircraft that remained at Rabaul flew back to *Truk* by 11 November, but the *Buin* detachment was ferried back to Japan on 14 December.^[15]

Hiyō spent November in *Truk*, during which time she was twice slightly damaged by American air raids, before returning to Japan in early December where she was rejoined by the rest of her air group. Aside from a brief refit at *Kure* from 26 February to 4 March 1943, the ship was training in the *Inland Sea* until she sailed for *Truk* on 22 March.^[13] Her air group consisted of 27 Zeros and 12 D3As at this time. They were detached from *Hiyō* in early April to participate in *Operation I-Go*, a land-based aerial offensive against Allied bases in the *Solomon Islands* and *New Guinea*.^[16] The carrier was again lightly damaged from bomb splinters on 12 April from an American air attack. After her air group returned, the ship arrived back in Japan on 21 May^[13] in case she was needed to relieve Japanese forces fighting on the *Attu Island*.^[16]

Now the flagship of the Second Carrier Division under Rear Admiral *Munetaka Sakamaki*, *Hiyō* and her sister *Junyō* departed *Yokosuka* on 7 June en route for *Truk*. Later that evening, the ship was torpedoed by the submarine *Trigger* off *Miyakejima*. Hits in the starboard bow and boiler room knocked out all power, but she managed to return to Japan the following day after restoring power.^[13] *Hiyō*'s fighters were flown to *Truk* by 15 July and assigned to the light carrier *Ryūhō*.^[16] The ship was

under repair at *Yokosuka* until 15 September.^[13] On 1 November, *Hiyō*'s air group was reconstituted with 24 Zeros, 18 D3As and 9 B5Ns^[16] and the ship departed Japan for *Singapore* on 24 November. She arrived on 3 December and was almost immediately assigned duties as an aircraft ferry. On 9 December, *Hiyō* left *Singapore* en route for *Truk* with several deliveries on the way. The ship arrived there on 22 December^[13] and disembarked her own air group^[17] before proceeding on to *Saipan* to deliver more aircraft.^[13] The air group was transferred to *Kavieng* and later *Rabaul* to provide air cover for Japanese operations there.^[17]

Hiyō returned to Japan on 1 January 1944 and her air group rejoined her on 2 March, albeit without aircraft. In the meantime, the Japanese Navy had restructured its carrier air groups so that one air group was assigned to one carrier division and *Air Group 652* was assigned to the 2nd Carrier Division with *Hiyō*, *Junyō* and *Ryūhō*. The air group was last in priority to be rebuilt and only had 30 Model 21 Zeros, 13 Model 52 Zeros and four D3As on hand on 1 April of its authorized 81 fighters, 36 dive bombers and 27 torpedo bombers. The ship conducted training for her aircraft in the *Inland Sea* until 11 May when she sailed for *Tawi-Tawi* in the *Philippines*.^[18] The new base was closer to the oil wells in *Borneo* on which the Navy relied and also to the *Palau* and western *Caroline Islands* where the Japanese expected the next American attack. However, the location lacked an airfield on which to train the green pilots and American submarines were very active in the vicinity which restricted the ships to the anchorage.^[19]

Battle of the Philippine Sea

Main article: *Battle of the Philippine Sea*

The Japanese fleet was en route to *Guimares Island* in the central *Philippines* on 13 June, where they intended to practice carrier operations in an area better protected from submarines, when *Vice Admiral Jisaburō Ozawa* learned of the American attack on the *Mariana Islands* the previous day. Upon reaching *Guimares*, the fleet refuelled and sortied into the *Philippine Sea* where they spotted *Task Force 58* on 18 June. The Americans failed to locate *Ozawa's* ships that day and the Japanese turned south to maintain a constant distance between them and the American carriers as *Ozawa* had decided on launching his air strikes early the following morning. At this time, *Air Group 652* consisted of 81 Zeros, 27 D3As, 9 *Yokosuka D4Y* "Judy" dive bombers and 18 *Nakajima B6N* "Jill" torpedo bombers, roughly evenly divided among the three ships. The three carriers began launching their first air strike of 26 bomb-carrying A6M2 Zeros, 16 A6M5 Zeros to escort the other aircraft and seven B6Ns at about 09:30. Most of these aircraft were misdirected and failed to find any American ships, although a dozen persisted in their search and found one of the American task groups.

Five bomb-carrying Zeros, a B6N and an escort Zero were shot down by the defending fighters and no damage was inflicted on any American ship.* [20]

A second air strike of 27 D3As, nine D4Ys, two B6Ns and 26 escorting Zeros was launched around 11:00, accompanied by at least 18 A6Ms and B6Ns from *Shōkaku* and *Zuikaku*. They had also been given an erroneous spot report and could not find any American ships. The 652nd aircraft headed for airfield at *Rota* and *Guam* to refuel while those from the other two carriers headed back to them. Six D4Ys and two Zeros bound for *Rota* spotted the carriers *Wasp* and *Bunker Hill* en route and failed to inflict any damage on the American ships while losing five D4Ys to anti-aircraft fire. Radar had spotted those aircraft headed for *Guam* and they were intercepted by 41 *Grumman F6F Hellcats*. Only one A6M5, one D4Y and seven D3As of the 49 Japanese aircraft survived the encounter and landed.* [21]

At dusk, the Japanese turned away to the northwest to regroup and to refuel and the Americans turned west to close the distance. They discovered the retiring Japanese fleet during the afternoon of the following day and Vice Admiral *Marc Mitscher* ordered an air strike launched.* [22] *Hiyō* was struck by two bombs, one of which detonated above the bridge and killed or wounded virtually everyone there. More seriously, the ship was struck by one torpedo dropped by a *Grumman TBF Avenger* from *Belleau Wood*. This knocked out the starboard engine room and started fires, but *Hiyō* was able to continue, albeit a slower speed. Two hours later, a large explosion occurred when leaking gasoline vapor ignited and it knocked out all power on the ship. The fires raged out of control and *Hiyō* sank stern first* [13] shortly afterwards at 16°20'N 132°32'E / 16.333°N 132.533°E.* [23] Roughly 1,000 men were rescued by her escorting destroyers, but 247 officers and enlisted men died aboard the carrier.* [13]

6.2.3 Footnotes

- [1] Silverstone, p. 329
- [2] Lengerer & Rehm-Takahara, pp. 17, 106
- [3] Lengerer & Rehm-Takahara, p. 107
- [4] Jentschura, Jung and Mickel, p. 52
- [5] Lengerer & Rehm-Takahara, pp. 189–90
- [6] Lengerer & Rehm-Takahara, pp. 108–14
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- [9] Lengerer & Rehm-Takahara, pp. 188, 193
- [10] Lengerer & Rehm-Takahara, pp. 188–89, 193
- [11] Stille, p. 23

- [12] Lengerer & Rehm-Takahara, pp. 17, 106–07
- [13] Tully
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- [17] Hata, p. 66
- [18] Hata, pp. 66, 80–81
- [19] Palomar & Genda, pp. 380–81
- [20] Brown, pp. 252, 257–61
- [21] Brown, pp. 261–62
- [22] Brown, pp. 263–64
- [23] Lengerer & Rehm-Takahara, p. 193

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6.2.6 External links

- [Hiyo in the World War II Database](#)

Chapter 7

Chitose class 千代田千歳

7.1 Japanese aircraft carrier Chiyoda 7.1.2 Design



Japanese seaplane tender Chiyoda in 1938

Chiyoda (千代田) was a light aircraft carrier of the Imperial Japanese Navy during World War II. Originally constructed as the second vessel of the Chitose-class seaplane tenders in 1934, she continued to operate in that capacity during the Second Sino-Japanese War and the early stages of the Pacific War until her conversion into a light aircraft carrier after the Battle of Midway. She was sunk during the Battle of Leyte Gulf by a combination of naval bombers, cruiser shellfire and destroyer-launched torpedoes. *[1]

7.1.1 Background

The Chitose-class seaplane tenders were procured by the Imperial Japanese Navy under the 2nd Naval Armaments Supplement Programme of 1934 as purpose-built ships, whereas their predecessors were all conversions of merchant or auxiliary ship designs. During the 1930s, the Imperial Japanese Navy made increasing use of naval aviation as scouts for its cruiser and destroyer squadrons. Due to restrictions imposed by the Washington Naval Treaty and London Naval Treaty, the number of aircraft carriers was strictly regulated; however, there was no limitation as to seaplane tenders.

Chiyoda was designed from the start on the premise that the design from the waterline upwards could be modified to suit a variety of missions. The hull and engine design was based on a high speed oiler, with a maximum speed of 20 knots, but the ship was completed as a seaplane tender, with four aircraft catapults for launching seaplanes, and cranes for recovering landed aircraft on her aft deck. As designed, *Chiyoda* carried a complement of Kawanishi E7K Type 94 “Alf” and Nakajima E8N Type 95 “Dave” floatplanes. Her armament consisted of four 12.7 cm/40 Type 89 naval guns and twelve Type 96 25 mm AA guns.

Propulsion was of four boilers, which operated two geared steam turbines providing 56,800 HP and two propellers. With two additional diesel engines operating *Chiyoda* could attain 28.5 knots.

With the loss of four large aircraft carriers at the Battle of Midway, the Imperial Japanese Navy rushed a project to convert the Chiyoda-class into light aircraft carriers as partial compensation. A wooden 180 x 23 meter flight deck was installed, with two elevators. The bridge was moved to the front end of the new hangar deck, and the boiler exhaust gases was discharged through pipes to the starboard side below the flight deck, and the diesel engines had smaller, separate smokestacks also on the starboard side. As converted, the ship could carry 30 aircraft.

7.1.3 Operational history

As a seaplane tender

Chiyoda was laid down on 26 November 1934 and launched on 29 November 1936 at Kure Naval Arsenal and was commissioned on 25 July 1938. On completion, she was assigned directly to the Combined Fleet under the command of Captain Tomeo Kaku and was dispatched to the front lines in the Second Sino-Japanese War paired with the seaplane tender *Kamoi*. She remained engaged in combat operations in China until May 1940. *[2] On returning to Kure Naval Arsenal on 23 May 1940, *Chiyoda* underwent her first major modification, with her aircraft

capacity reduced from 24 to 12 aircraft, and the space used to store 12 Type A Kō-hyōteki-class submarines. This rebuild was completed on 23 June, and *Chiyoda* was assigned to the IJN 4th Fleet based at Truk in September. Captain Kaku Harada was appointed captain in August. *Chiyoda* returned to participate in a naval review held on 11 October in Yokohama to celebrate the 2600th anniversary of the founding of the Japanese Empire. Afterwards, she was reassigned back to the Combined Fleet and began training operations on the use of her midget submarines through September, developing tactics for attacking other vessels (using *Chitose* as a target) and penetrating enemy naval bases. At the time of the attack on Pearl Harbor, *Chiyoda* was docked at Kure and continued training operations to 20 March 1942, when she was assigned to Vice Admiral Teruhisa Komatsu's IJN 6th Fleet together with the submarine tender *Nisshin* and the *Aikoku Maru*. * [2]

During the Battle of Midway, *Chiyoda* was part of Main Body of the Japanese fleet. For this operation, she carried eight Type A Kō-hyōteki-class submarines, which were intended to be stationed at Kure Atoll, which was to be seized as a seaplane base for operations against Midway Atoll. The operation was cancelled on the loss of the Japanese aircraft carriers during the Battle of Midway, and *Chiyoda* returned to Hashirajima with her submarines on 14 June without having seen combat. * [2]

During June, *Chiyoda* was refit for operations in northern waters, and departed Yokosuka Naval District on 28 June, arriving at Japanese-occupied Kiska in the Aleutian islands on 5 July with a construction team to build a seaplane base. She was attacked by aircraft from the USAAF 11th Air Force on the same day, without damage and arrived back at Hashirajima on 19 July. * [2]

On 25 September, *Chiyoda* was reassigned to the Guadalcanal area in the Solomon Islands and delivered eight Type A Kō-hyōteki-class submarines to Shortland Island on 14 October. She was attacked by Allied aircraft on 29 October and 31 October, but suffered no damage, and on 6 November, after her return to Truk, she was attacked by USS *Grayling* (SS-209), which fired three torpedoes at *Chiyoda*, all of which missed. *Chiyoda* returned to Yokosuka on 8 January 1943 and was converted from a seaplane tender to a light aircraft carrier at the Yokosuka Naval Arsenal beginning 16 January, with the work completed on 21 December 1943. * [2]

7.1.4 Conversion

After conversion, *Chiyoda* was assigned to the IJN 3rd Fleet and departed Yokosuka for Saipan, Guam and Palau, Balikpapan and Davao on 1 March as part of emergency reinforcements following the fall of Kwajalein to the Americans, returning to Kure on 10 April. On 11 May, she departed for Tawitawi with Air Group 653 as part of Operation A-Go, for the defense of the Mariana Islands. She was accompanied by the carriers *Chitose*,

', *'*, *Hiyō*, *'* and by the battleship *Musashi*. During the Battle of the Philippine Sea on 19 June, she was part of the Van Force with carriers *Chitose*, *Zuihō*, battleships *Yamato*, *Musashi*, *Kongō*, *Haruna* and cruisers *Atago*, *Takao*, *Maya* and *Chōkai*. She was hit by a bomb on 20 June on her aft flight deck, which killed 20 crewmen, wounded 30 more and destroyed two aircraft. She was withdrawn for repairs on 22 June. She remained at Kure through the end of July. * [3]

Final battle

On 20 October 1944 *Chiyoda* departed Oita as part of Admiral Jisaburō Ozawa's Decoy Force intended to the American fleet away from the landing beaches in the Philippines in the Battle of Leyte Gulf. This force included *Zuikaku*, *Zuihō*, *Chitose* and *Chiyoda*, all divested of aircraft and accompanied by converted hybrid battleship-carrier *Hyūga* and *Ise* and cruisers *Oyodo*, *Tama*, *Isuzu*. On 25 October, both *Chiyoda* and *Chitose* were sunk by a combination of naval bombers, cruiser shellfire and destroyer-launched torpedoes during the Battle of Cape Engano. * [3]

Chiyoda was crippled by four bombs dropped by aircraft from the carriers USS *Franklin* (CV-13) and USS *Lexington* (CV-16) that left her dead in the water. The converted hybrid battleship-carrier *Hyūga* attempted to take her in tow, but was prevented by a third attack. The cruiser *Isuzu* was ordered to remove *Chiyoda*'s crew, but this was also frustrated due to continuing danger from air and surface attack. After three attempts, *Isuzu* was forced to retreat with U.S. surface forces in sight and *Chiyoda* under naval gunfire. * [3] She was finished off by gunfire from four cruisers USS *Santa Fe* (CL-60), USS *Mobile* (CL-63), USS *Wichita* (CA-45) and USS *New Orleans* (CA-32) * [4] along with nine destroyers, all under the command of Rear Admiral Laurence DuBose. * [3] * [5] No survivors were permitted to be rescued, * [6] and Captain Jō Eiichirō and the entire crew of 1,470 officers and men went down with the ship at position 19°20'N 126°20'E / 19.333°N 126.333°E *Chiyoda* was removed from the navy list on 20 December 1944. * [3]

7.1.5 References

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7.1.6 External links

- Chitose specifications
- Nishida, Hiroshi. “Materials of IJN” . *Imperial Japanese Navy*.
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7.1.7 Notes

- [1] Jentsura, Hansgeorg (1976). *Warships of the Imperial Japanese Navy, 1869-1945*. Naval Institute Press. ISBN 0-87021-893-X. page 57
- [2] IJN Seaplane/Midget Submarine Carrier CHIYODA: Tabular Record of Movement
- [3] IJN Chiyoda: Tabular Record of Movement
- [4] The Leyte Operation
- [5] Morison, Samuel Eliot (2007). *The Two-Ocean War: A Short History of the United States Navy in the Second World War*. Naval Institute Press, p. 465. ISBN 1-59114-524-4
- [6] Willmont, Paul (2005). *The Battle of Leyte Gulf: The Last Fleet Action*. University of Indiana Press. ISBN 0253003512. page 200

Coordinates: 18°37′0″N 126°45′0″E﻿ / ﻿18.61667°N 126.75000°E﻿ / 18.61667; 126.75000

7.2 Japanese aircraft carrier Chitose

Not to be confused with Japanese cruiser Chitose.

Chitose (千歳) was a light aircraft carrier of the Imperial Japanese Navy during World War II. First laid down as a seaplane tender in 1934 at Kure Navy yard, the ship originally carried Kawanishi E7K Type 94 “Alf” and Nakajima E8N Type 95 “Dave” floatplanes. Although it has been speculated that *Chitose* also carried Type A midget submarines, only her sister ship, the *Chiyoda* had that capability. *Chitose* saw several naval actions, taking part in the Battle of Midway though seeing no combat there. She was bombed by B-17 Flying Fortresses off

Davao, Philippines on 4 January 1942, sustaining negligible damage. She covered the Japanese landings in the East Indies and New Guinea from January–April 1942, and was damaged in the Eastern Solomons in August 1942.

7.2.1 Conversion



Chitose after conversion to a light carrier in 1944

The *Chitose* underwent conversion to a light aircraft carrier at Sasebo Navy Yard commencing on 26 January 1943, was recommissioned on 1 November 1943 as CVL (24) and completed as a carrier on 1 January 1944. She was assigned to CarDiv 3 as part of the Japanese Third Fleet.*[1]

7.2.2 Final battle

Both *Chitose* and *Chiyoda* were sunk by a combination of naval bombers, cruiser shellfire and destroyer-launched torpedoes during the Battle of Leyte Gulf. According to the plan for the *Sho-ichi go* operation, both carriers were divested of aircraft and successfully used to decoy the main body of the American fleet away from the landing beaches in the Philippines. *Chitose* was sunk by torpedo hits during the first air strike made by naval aircraft of Task Force 38 (TF 38) from the carrier USS *Essex* off Cape Engaño.

At 08:35, she took three torpedo hits, or possibly near misses from bombs on the port side forward of the number 1 elevator. This resulted in boiler rooms 2 and 4 being flooded with an immediate list to 27° and rudder failure. The list was reduced to 15°, but by 08:55 further flooding had brought it back up to 20°. At 08:55, the starboard engine room flooded, cutting speed to 14 kn (26 km/h; 16 mph). The port engine room followed at 09:25. The *Chitose* was dead in the water, and her list grew to 30°. At 09:37, at position 19°20′N 126°20′E﻿ / ﻿19.333°N 126.333°E﻿ / 19.333; 126.333Coordinates: 19°20′N 126°20′E﻿ / ﻿19.333°N 126.333°E﻿ / 19.333; 126.333, she rolled over to port and nosed under, with the loss of 903 men. The cruiser *Isuzu* rescued 480 men, and destroyer *Shimotsuki* a further 121.*[1]

7.2.3 References

- [1] IJN Chitose: Tabular Record of Movement, accessed on 26 August 2008

7.2.4 External links

- Chitose specifications
- Chitose record of movements

Chapter 8

Unryū class 天城雲龍

8.1 Japanese aircraft carrier Amagi

Amagi (天城) was a *Unryū*-class aircraft carrier built for the Imperial Japanese Navy during World War II. Named after Mount Amagi,* [1] and completed late in the war, she never embarked her complement of aircraft and spent the war in Japanese waters. The ship capsized in July 1945 after being hit multiple times during airstrikes by American carrier aircraft at Kure Naval Base. *Amagi* was refloated in 1946 and scrapped later that year.

8.1.1 Design and description

The last purpose-built Japanese carrier construction during World War II was a group of vessels based on an improved *Hiryū* design, but with individual units differing in detail reflecting the changing circumstances as the conflict in the Pacific approached its conclusion. *Amagi* was ordered, under the provisional name of #5001, as part of the Kai-Maru 5 Program of 1942. This was a massive naval construction program intended to replace losses suffered at the Battle of Midway and focused on aircraft and aircraft carriers. The ship was one of 16 *Unryū*-class aircraft carriers planned, although only three were completed before the end of the war.* [2]* [Note 1]

Amagi had a length of 227.35 meters (745 ft 11 in) overall. She had a beam of 22 meters (72 ft 2 in) and a draft of 8.73 meters (28 ft 8 in). She displaced 20,450 metric tons (20,130 long tons). Her crew consisted of 1,595 officers and men.* [3]

The *Unryū*-class carriers used the same turbines and boilers as used in the heavy cruiser *Suzuya*. These consisted of four geared steam turbine sets with a total of 152,000 shaft horsepower (113,000 kW) driving four shafts using steam provided by eight Kampon Type B water-tube boilers. The ship had a designed speed of 34 knots (63 km/h; 39 mph). *Amagi* carried 3,670 metric tons (3,610 long tons) of fuel oil which gave her a range of 8,000 nautical miles (15,000 km; 9,200 mi) at 18 knots (33 km/h; 21 mph).* [3] She had two funnels on the starboard side, each angled below the horizontal. They were fit-

ted with a water-cooling system to reduce the turbulence caused by hot exhaust gases.* [4]

Flight deck arrangements

Amagi's flight deck was 216.9 meters (711 ft 7 in) long and had a maximum width of 27 meters (88 ft 7 in). A small island was mounted well forward on the starboard side and contained the ship's bridge and air operations control center. It was fitted with a small tripod mast that mounted one of the ship's radar antennas. The ship was designed with two superimposed hangars that were served by two aircraft elevators, each 14 by 14 meters (46 by 46 ft); the center elevator as used in *Hiryū* was deleted to simplify construction and reduce stress in the hull. The elevators had a maximum capacity of 7,000 kilograms (15,000 lb) and took 19 seconds to go from the lower hangar to the flight deck. *Amagi* was fitted with hydraulically operated Type 3 arresting gear with nine cables. She also mounted three Type 3 crash barricades. No aircraft catapult was fitted. The ship mounted a retractable crane on the starboard side of the flight deck, just aft of the rear elevator.* [5]

The ship's air group was originally intended to consist of 12 Mitsubishi A6M Zero fighters, plus three in storage, 27 Aichi D3A Val dive bombers, plus three in reserve, and 18 Nakajima B5N "Kate" torpedo bombers plus two in crates. *Amagi*'s hangars could not accommodate so many aircraft so eleven planes were planned to be permanently carried on the flight deck. In 1943 the air group was revised to consist of 18 Mitsubishi A7M "Sam" fighters (+2 in storage), 27 Yokosuka D4Y "Judy" dive bombers and six Nakajima C6N "Myrt" reconnaissance aircraft. Of these, the C6Ns were intended to be carried on the flight deck. When the ship commissioned in 1944, neither the A7M nor the C6Ns were yet in service, so the air group was reconfigured to consist of 27 Zeros, 12 D4Ys, three of which were to be the reconnaissance version, and nine Nakajima B6N "Jill" torpedo bombers. By this time, however, the shortage of carrier-qualified aircrew was such that they were ordered to operate from shore bases and *Amagi* never embarked her air group.* [6]

Armor, armament and sensors

Amagi 's waterline armored belt was 46 millimeters (1.8 in) thick over her machinery spaces and 140 millimeters (5.5 in) over her magazines. Her deck armor above the magazines was 25 millimeters (0.98 in) thick, but the deck above the magazines was 56 millimeters (2.2 in) thick.*[7]

The ship's primary armament consisted of a dozen 40-caliber 12.7 cm Type 89 anti-aircraft (AA) guns in twin mounts on sponsons on the ship's sides.*[8] *Amagi* was initially equipped with 16 triple 25 mm Type 96 and three single AA gun mounts, most on sponsons along the sides of the hull. By the end of the war, the ship mounted 22 triple and 23 single mounts.*[9] These guns were supplemented by six 12 cm (4.7 in) 28-round AA rocket launchers. For defense against submarines, the carrier was fitted with six depth charge throwers and carried between six and ten depth charges for them.*[10]

Two Type 94 high-angle fire-control directors, one on each side of the ship, were fitted to control the Type 89 guns. Each director mounted a 4.5-meter (14 ft 9 in) rangefinder. Six Type 95 directors controlled the 25 mm guns and the rocket launchers. Early warning was provided by two Type 2, Mark 2, Model 1 air search radars. One of these was mounted on the top of the island while the other retracted into the port side of the flight deck, between the two elevators. In addition, *Amagi* had two smaller Type 3, Mark 1, Model 3 air search radars, one mounted on the tripod mast on the island and the other on the aft starboard retractable radio mast.*[11]

8.1.2 Service



Amagi, capsized in Kure harbor, 1946

Amagi 's keel was laid down by Mitsubishi in Nagasaki,*[3] on 1 October 1942. She was launched on 15 October 1943 and completed on 10 August 1944.*[2] The ship was transferred among a number of ports on the Inland Sea until she arrived in Kure in February 1945 and was ordered to be camouflaged. Her intended air group, Air Group 601, was committed to the Battle of Iwo Jima about that same time. *Amagi* was briefly refitted from

10 to 24 February. On 19 March, the ship was attacked by aircraft from Task Force 58 and lightly damaged by one bomb that struck the edge of the flight deck. On 13 April, the ship was permanently moored at an island in Kure harbor and extensively camouflaged.*[12]

This did not prevent the aircraft from Task Force 38 from locating and attacking the ship on 24 July. She was hit twice and near-missed multiple times. A 500-pound (230 kg) bomb detonated near the rear funnel, severely damaging it, but doing little other damage aside from blowing a small hole in the starboard hull. A 2,000-pound (910 kg) bomb penetrated the flight deck and detonated in the upper hangar, between the elevators. The explosion blew a 50-meter (160 ft) section of a hangar wall overboard and the walls of the upper hangar deck were bulged and perforated multiple times. The flight deck between the elevators was bulged up and buckled for a length of 200 feet (61.0 m) and the forward elevator was dropped to the bottom of its shaft. It also blew a 25-foot (7.6 m) hole in the upper hangar deck. Fragments from the explosion penetrated into the bowels of the ship, penetrating bulkheads and decks below. Fragments from near-misses penetrated the sides of the port hull and caused the forward bomb magazine, two boiler rooms, and the aft port engine room to flood.*[12]

The captain ordered the ship abandoned later in the day, and the carrier was still afloat in the evening, albeit with a slight list to port and down by the bow. Over the next couple of days, more compartments in the ship flooded and she settled on the bottom of the harbor. Another attack on 28 July hit her several more times and the resulting damage from those hits and more near-misses to port caused the ship to list further to port. This gradually increased through the next day until *Amagi* capsized at 10:00 on the morning of 29 July with part of her flight deck falling overboard. The losses among the ship's crew are unknown, but were supposedly light.*[12]

The ship was stricken from the Navy List on 30 November*[12] and salvage work began on 5 December. The holes in the ship's hull had to be sealed to pump the water out and decrease her draft. The remains of her flight deck and upper hangar could not be made watertight and were removed using dynamite. Pontoons were used to right the ship and she was refloated on 31 July 1946. The salvage job was conducted by the Hitachi Zosen facility in Kure and they scrapped the ship afterward.*[13] The job was completed by 12 December 1947.*[12]

8.1.3 Notes

- [1] Two of these ships were canceled to release a slipway and material to convert *Shinano* into an aircraft carrier.*[2]

8.1.4 Footnotes

- [1] Silverstone, p. 325

- [2] Lengerer, p. 106
- [3] Jentschura, Jung and Mickel, p. 56
- [4] Lengerer, pp. 115, 117
- [5] Lengerer, pp. 110–12, 118
- [6] Lengerer, pp. 117–18
- [7] Chesneau, p. 184
- [8] Lengerer, p. 118
- [9] Stille, p. 37
- [10] Lengerer, p. 119
- [11] Lengerer, pp. 119–20
- [12] Tully
- [13] *Warships of the Imperial Japanese Navy*, pp. 110–12

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8.1.6 Further reading

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8.2 Japanese aircraft carrier Unryū

Unryū (雲龍) was the lead vessel of her class of fleet aircraft carriers of the Imperial Japanese Navy during World War II. She was commissioned on 6 August 1944 and eventually torpedoed and sunk by USN submarine USS *Redfish* (SS-395) in the East China Sea on 19 December that same year. The name *Unryū* means literally “cloud dragon.”

8.2.1 Background

Unryū was one of six fleet carriers laid down by the Imperial Japanese Navy as part of the 1941 **Rapid Naval Armaments Supplement Programme** in anticipation of a major conflict with the United States. In order to expedite building of the new carriers, a standard design was chosen based on ease of manufacture and availability of materials. *Hiryū*, with her high speed, good seakeeping and relatively large air group, required far less armor plate and use of special machinery than needed for the *Shōkaku*-class aircraft carrier and *Taihō*-class aircraft carrier classes, making her the ideal candidate and the design was quickly adopted with only a few modifications.*[1]

Other ships of the *Unryū* class included *Katsuragi*, *Amagi*, *Kasagi*, Japanese aircraft carrier *Ikoma* and *Aso*. A further eleven vessels were ordered in 1942 **Modified 5th Naval Armaments Supplement Programme** after the disastrous **Battle of Midway** but work on all ships of the class was suspended in 1945 when worsening wartime conditions left even those carriers already completed (*Unryū*, *Katsuragi* and *Amagi*) virtually inoperable due to a lack of aircraft, aircrews and fuel oil.*[1]

8.2.2 Design

Hull

Unryū's hull form was virtually identical to that of *Hiryū* with the exception that, since the carrier's island was now located on the starboard side of the flight deck, the width of the hull on her port side was increased in order to balance the transfer of weight. As in *Hiryū*, the hull was not bulged and the only anti-torpedo defense was the 150

mm (5.9 in) waterline belt armor abreast the machinery and magazines, tapering down to 90 mm (3.5 in) where the aviation fuel tanks were located at either end of the ship. The partial 20 mm (0.79 in) internal anti-splinter bulkhead was also retained. Deck armor was again limited to 25 mm (0.98 in) over the machinery spaces and 55 mm (2.2 in) over the fore and aft ordnance magazines and AvGas tanks, giving the carrier scant protection from plunging shellfire or armor-piercing bombs.*[1]

The carrier's aviation fuel tanks were still made integral with the ship's hull, a standard practice in Japanese carrier design that heightened the risks of fuel fires due to cracks and leaks developing from sudden shocks to the hull, whether from torpedo hits or bomb near-misses. In a concession to later wartime experience, aviation fuel capacity in the *Unryū*-class carriers was cut from 150,000 gallons to 48,000 gallons as it had been found that most Japanese carriers damaged or sunk during combat had time to use only a small proportion of their available Av-Gas. The empty air spaces around the aviation fuel tanks were also filled in with concrete as added splinter protection.*[2]

Machinery

The same cruiser-type machinery as had been used in *Sōryū* and 'Hiryū' was installed on *Unryū*. The four sets of geared turbines had an output of 152,000 shp (113,000 kW) and were connected to four separate shafts, giving *Unryū* a top speed of 34 kn (63 km/h; 39 mph) during sea trials. Steam was generated from eight oil-fired *Kampon* boilers. *Unryū*'s standard fuel oil capacity of 3670 tons gave her a radius of 8,000 nautical miles (15,000 km; 9,200 mi) at 18 knots (33 km/h; 21 mph).*[3]

Flight Deck & Hangars

Unryū's wooden-planked flight deck was 217 m (712 ft) long by 27 m (89 ft) wide and retained the standard arrangement of nine hydraulically controlled Type 3 arrester wires as used on *Hiryū*, three forward and six aft. These were capable of stopping a 6,000 kg (13,000 lb) aircraft at speeds of 60-78 knots. The three forward wires allowed *Unryū* to recover aircraft over the bows while steaming astern in the event the after end of the flight deck was rendered unusable due to bomb damage or during periods of excessively high winds.*[1]

The upper hangar measured 175 m (574 ft) long by 21 m (69 ft) wide while the lower hangar, though of the same width, was appreciably shorter at 130 m (430 ft).*[3] They featured the standard fireproofed fabric dividing curtains and twin rows of foam-dispensing pipes and nozzles running along the hangar walls and ends as had been installed on earlier Japanese carriers. The curtains served to limit the supply of air to and delay the spread of any fires breaking out on either deck while the foam suppres-

sion system worked to extinguish the blaze.*[4]

In order to save on building time and materials, only two aircraft elevators were installed fore and aft, the aft elevator being an entirely new design, roughly pentagonal in shape, measuring 14.2 m (47 ft) by 14.2 m (47 ft). Both elevators had the same load limit of 5,000 kg (11,000 lb) as those on the *Sōryū*-class carriers. The absence of an amidships elevator increased available floor space on the upper and lower hangar decks by 276 m² (2,970 sq ft) but total aircraft capacity remained unchanged due to the fact that *Unryū* was expected to operate the larger carrier-plane types just coming into service at the time of her completion.*[1]*[5]

The carrier's starboard-side island was larger than that of *Hiryū*'s but was offset enough that it did not encroach on the width of the flight deck.

Two Type 21 air-warning and control radars with mattress-type antennas were installed, one atop the island and the other on a retractable pillbox on the port side aft edge of the flight deck. Two Type 13 radars were also added, one on the main-mast abaft the island and the other attached to one of the two hinged radio masts on the ship's aft starboard side.*[6] The Type 21 radar had a maximum effective range of 80 nmi (150 km; 92 mi) while the Type 13 had a range of 54 nmi (100 km; 62 mi)*[7]

Armor, armament and sensors

Unryū's waterline armored belt was 46 millimeters (1.8 in) thick over her machinery spaced, but this increased to 140 millimeters (5.5 in) over her magazines. Her deck armor above the magazines was 25 millimeters (0.98 in) thick, but the deck above the magazines was 56 millimeters (2.2 in) thick.*[8]

The ship's primary armament consisted of a dozen 40-caliber 12.7 cm Type 89 anti-aircraft (AA) guns in twin mounts on sponsons on the ship's sides.*[9] *Unryū* was initially equipped with 16 triple 25 mm Type 96 and three single Type 96 AA gun mounts, most on sponsons along the sides of the hull. By the end of the war, the ship mounted 22 triple and 23 single mounts.*[10] These guns were supplemented by six 28-round AA rocket launchers. For defense against submarines, the carrier was fitted with six depth charge throwers and carried between six and ten depth charges for them.*[11]

Two Type 94 high-angle fire-control directors, one on each side of the ship, were fitted to control the Type 89 guns. Each director mounted a 4.5-meter (14 ft 9 in) rangefinder. Six Type 95 directors controlled the 25 mm guns and the 12 cm rocket launchers. Early warning was provided by two Type 2, Mark 2, Model 1 air search radars. One of these was mounted on the top of the island while the other retracted into the port side of the flight deck, between the two elevators. In addition, *Un-*

ryū had two smaller Type 3, Mark 1, Model 3 air search radars, one mounted on the tripod mast on the island and the other on the aft starboard retractable radio mast.*[12]

8.2.3 Operational history

Unryū was laid down at Yokosuka Naval Arsenal on 1 August 1942 and launched 25 September 1943. Upon commissioning on 6 August 1944 she was assigned to the IJN 3rd Fleet. She underwent shakedown and trials within Tokyo Bay through mid-September, and was then transferred to Kure Naval District, from which she made numerous training runs around the Seto Inland Sea until December. From 30 October to 7 November, she was briefly the flagship of Vice Admiral Jisaburo Ozawa's Mobile Fleet.*[13]

Final voyage

On 13 December 1944, thirty "Yokosuka MXY7 Ōhka" suicide rocket planes were loaded aboard *Unryū* for transport to Manila in the Philippines. Four days later, on 17 December 1944, *Unryū* departed Kure, Hiroshima escorted by *Shigure*, *Hinoki*, and *Momi* under the overall command of Captain Konishi. Her maiden sea voyage was a vain attempt to reinforce the garrison on the island of Luzon just prior to the Allied landings there.*[13]

On 19 December 1944, *Unryū* was torpedoed and sunk by the submarine USS *Redfish* (SS-395). *Redfish* fired four bow torpedoes, one of which hit directly under the carrier's bridge on the starboard side at 16:35, stopping the vessel dead in the water. *Unryū* engaged with all her starboard side guns. A second torpedo struck at 16:50 on the starboard side abreast the forward elevator, just as the carrier was managing to get under way again. The resulting explosion set off the Ōhka suicide planes stored on the lower hangar deck as well as the highly volatile aviation fuel underneath.*[13]

Once the boiler rooms flooded, the ship listed to 30 degrees and the order to abandon ship was given. With a 90 degree list, the ship sank to the bed of the East China Sea in just seven minutes at position 29°59'N 124°03'E / 29.983°N 124.050°E. Casualties were great: Captain Kaname Konishi and 1,238 officers and men lost their lives. Only one officer and 146 men survived and were rescued by the escort destroyer *Shigure*, which returned to Sasebo, Nagasaki on 22 December.*[14] *Unryū* was struck from the navy list on 20 February 1945.

8.2.4 See also

- List by death toll of ships sunk by submarines
- List of the largest artificial non-nuclear explosions

8.2.5 Notes

- [1] Brown, p.30
- [2] Stille, p.37
- [3] Brown, p.31
- [4] Brown, p.6
- [5] Brown, p.18
- [6] Stille, p.38
- [7] Friedman, p.207
- [8] Chesneau, p. 184
- [9] Lengerer, p. 118
- [10] Stille, p. 37
- [11] Lengerer, p. 119
- [12] Lengerer, pp. 119–20
- [13] Tully, Anthony P. (1998). "IJN Unryū: Tabular Record of Movement". *Kido Butai*. Combinedfleet.com. Retrieved 23 October 2011.
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Chapter 9

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