= Japanese battleship Mutsu =

Mutsu (??) , named after the eponymous province , was the second and last Nagato @-@ class dreadnought battleship built for the Imperial Japanese Navy (IJN) at the end of World War I. In 1923 , a year after commissioning , she carried supplies for the survivors of the Great Kant? earthquake . The ship was modernized in 1934 ? 36 with improvements to her armor and machinery , and a rebuilt superstructure in the pagoda mast style .

Other than participating in the Battle of Midway and the Battle of the Eastern Solomons in 1942 , where she did not see any significant combat , Mutsu spent most of the first year of the Pacific War in training . She returned to Japan in early 1943 . That June , one of her aft magazines detonated while she was at anchor , sinking the ship with the loss of 1 @,@ 121 crew and visitors . The IJN conducted a perfunctory investigation into the cause of her loss and concluded that it was the work of a disgruntled crewmember . The navy dispersed the survivors in an attempt to conceal the sinking in the interest of morale in Japan . Much of the wreck was salvaged after the war and many artifacts and relics are on display in Japan .

= = Description = =

Mutsu had a length of 201 @.@ 17 meters (660 ft 0 in) between perpendiculars and 215 @.@ 8 meters (708 ft 0 in) overall . She had a beam of 28 @.@ 96 meters (95 ft 0 in) and a draft of 9 meters (29 ft 6 in) . The ship displaced 32 @,@ 720 metric tons (32 @,@ 200 long tons) at standard load and 39 @,@ 116 metric tons (38 @,@ 498 long tons) at full load . Her crew consisted of 1 @,@ 333 officers and enlisted men as built and 1 @,@ 368 in 1935 . The crew totaled around 1 @,@ 475 men in 1942 .

In 1927 , Mutsu 's bow was remodeled to reduce the amount of spray produced when steaming into a head sea . This increased her overall length by 1 @.@ 59 meters (5 ft 3 in) to 217 @.@ 39 meters (713 ft 3 in) . During her 1934 ? 36 reconstruction , the ship 's stern was lengthened by 7 @.@ 55 meters (24 ft 9 in) to improve her speed , and her forward superstructure was rebuilt into a pagoda mast . She was given torpedo bulges to improve her underwater protection and to compensate for the weight of the additional armor and equipment . These changes increased her overall length to 224 @.@ 94 m (738 ft 0 in) , her beam to 34 @.@ 6 m (113 ft 6 in) and her draft to 9 @.@ 49 meters (31 ft 2 in) . Her displacement increased over 7 @,@ 000 metric tons (6 @,@ 900 long tons) to 46 @,@ 690 metric tons (45 @,@ 950 long tons) at deep load .

= = = Propulsion = = =

Mutsu was equipped with four Gihon geared steam turbines , each of which drove one propeller shaft . The turbines were designed to produce a total of 80 @,@ 000 shaft horsepower (60 @,@ 000 kW) , using steam provided by 21 Kampon water @-@ tube boilers ; 15 of these were oil @-@ fired while the remaining half @-@ dozen consumed a mixture of coal and oil . The ship had a stowage capacity of 1 @,@ 600 t (1 @,@ 600 long tons) of coal and 3 @,@ 400 t (3 @,@ 300 long tons) of fuel oil , giving her a range of 5 @,@ 500 nautical miles (10 @,@ 200 km ; 6 @,@ 300 mi) at a speed of 16 knots (30 km / h ; 18 mph) . The ship exceeded her designed speed of 26 @.@ 5 knots (49 @.@ 1 km / h ; 30 @.@ 5 mph) during her sea trials , reaching 26 @.@ 7 knots (49 @.@ 4 km / h ; 30 @.@ 7 mph) at 85 @,@ 500 shp (63 @,@ 800 kW) .

During a refit in 1924 the fore funnel was rebuilt in a serpentine shape in an unsuccessful effort to prevent smoke interference with the bridge and fire @-@ control systems . That funnel was eliminated during the ship 's 1930s reconstruction when all of her existing boilers were replaced by ten lighter and more powerful oil @-@ fired Kampon boilers , which had a working pressure of 22 kg / cm2 (2 @,@ 157 kPa ; 313 psi) and temperature of 300 ° C (572 ° F) . In addition her turbines were replaced by lighter , more modern , units . When Mutsu conducted her post @-@ reconstruction trials , she reached a speed of 24 @.@ 98 knots (46 @.@ 26 km / h ; 28 @.@ 75 mph) with 82 @,@ 300 shp (61 @,@ 400 kW) . Additional fuel oil was stored in the bottoms of the

newly added torpedo bulges , which increased her capacity to 5 @,@ 560 t (5 @,@ 470 long tons) and thus her range to 8 @,@ 560 nmi (15 @,@ 850 km ; 9 @,@ 850 mi) at 16 knots .

= = = Armament = = =

Mutsu 's eight 45 @-@ caliber 41 @-@ centimeter guns were mounted in two pairs of twin @-@ gun , superfiring turrets fore and aft . Numbered one through four from front to rear , the hydraulically powered turrets gave the guns an elevation range of ? 2 to + 35 degrees . The rate of fire for the guns was around two rounds per minute . A special Type 3 Sankaidan incendiary shrapnel shell was developed in the 1930s for anti @-@ aircraft use . The turrets aboard the Nagato @-@ class ships were replaced in the mid @-@ 1930s using those stored from the unfinished Tosa @-@ class battleships . While in storage the turrets were modified to increase their range of elevation to ? 3 degrees to + 43 degrees , which increased the guns ' maximum range from 30 @,@ 200 to 37 @,@ 900 meters (33 @,@ 000 to 41 @,@ 400 yd) .

The ship 's secondary armament of twenty 50 @-@ caliber 14 @-@ centimeter guns was mounted in casemates on the upper sides of the hull and in the superstructure . The manually operated guns had a maximum range of 20 @,@ 500 metres (22 @,@ 400 yd) and fired at a rate of six to ten rounds per minute . Anti @-@ aircraft defense was provided by four 40 @-@ caliber 8 @-@ centimeter 3rd Year Type AA guns in single mounts . The 3 @-@ inch (76 mm) high @-@ angle guns had a maximum elevation of + 75 degrees , and had a rate of 13 to 20 rounds per minute . The ship was also fitted with eight 533 @-@ millimeter (21 @.@ 0 in) torpedo tubes , four on each broadside , two above water and two submerged .

Around 1926 , the four above @-@ water torpedo tubes were removed and the ship received three additional 76 mm AA guns that were situated around the base of the foremast . The 76 mm AA guns were replaced by eight 40 @-@ caliber 127 @-@ millimeter dual @-@ purpose guns in 1932 , fitted on both sides of the fore and aft superstructures in four twin @-@ gun mounts . 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 . Two twin @-@ gun mounts for license @-@ built Vickers two @-@ pounder light AA guns were also added to the ship in 1932 . These guns had a maximum elevation of + 80 degrees , which gave them a ceiling of 4 @,@ 000 meters (13 @,@ 000 ft) . They had a maximum rate of fire of 200 rounds per minute .

The two @-@ pounders were replaced by 1941 by 20 license @-@ built Hotchkiss 25 mm Type 96 light AA guns in five twin @-@ gun mounts . 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 twin and triple mounts " lacked sufficient speed in train or elevation ; the gun sights were unable to handle fast targets ; the gun exhibited excessive vibration ; the magazine was too small , and , finally , the gun produced excessive muzzle blast " . 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 15 @-@ round magazines .

= = = Armor = = =

The ship 's waterline armor belt was 305 mm (12 in) thick and tapered to a thickness of 100 mm (3 @.@ 9 in) at its bottom edge ; above it was a strake of 229 mm (9 in) armor . The main deck armor was 69 mm (2 @.@ 7 in) while the lower deck was 75 mm (3 in) thick . The turrets were protected with an armor thickness of 305 mm on the face , 230 ? 190 mm (9 @.@ 1 ? 7 @.@ 5 in) on the sides , and 152 ? 127 mm (6 @.@ 0 ? 5 @.@ 0 in) on the roof . The barbettes of the turrets were protected by armor 305 mm thick , while the casemates of the 140 mm guns were protected by 25 mm armor plates . The sides of the conning tower were 369 mm (14 @.@ 5 in) thick .

The new 41 cm turrets installed during Mutsu 's reconstruction were more heavily armored than the original ones . Face armor was increased to 460 mm (18 in) , the sides to 280 mm (11 in) , and the roof to 250 ? 230 mm (10 ? 9 in) . The armor over the machinery and magazines was increased by 38 mm on the upper deck and 25 mm on the upper armored deck . These additions increased the weight of the ship 's armor to 13 @,@ 032 metric tons (12 @,@ 826 long tons) , 32 @.@ 6 percent of her displacement . In early 1941 , in preparation for war , Mutsu 's barbette armor was reinforced with 100 mm (3 @.@ 9 in) armor plates above the main deck and 215 mm (8 @.@ 5 in) plates below it .

= = = Aircraft = = =

Mutsu had an additional boom added to the mainmast in 1926 to handle the Yokosuka E1Y floatplane recently assigned to the ship . In 1933 a catapult was fitted between the mainmast and Turret No. 3 , and a collapsible crane was installed in a portside sponson the following year ; the ship was equipped to operate two or three floatplanes , although no hangar was provided . The ship was operating Nakajima E4N2 biplanes until they were replaced by Nakajima E8N2 biplanes in 1938 . A more powerful catapult was installed in November 1938 to handle heavier aircraft like the single Kawanishi E7K , added in 1939 ? 40 . Mitsubishi F1M biplanes replaced the E8Ns on 11 February 1943 .

= = = Fire control and sensors = = =

The ship was fitted with a 10 @-@ meter (32 ft 10 in) rangefinder in the forward superstructure . Additional six @-@ meter (19 ft 8 in) and three @-@ meter (9 ft 10 in) anti @-@ aircraft rangefinders were also fitted , although the date is unknown . The rangefinders in No. 2 and 3 Turrets were replaced by 10 @-@ meter units in 1932 ? 33 .

Mutsu was initially fitted with a Type 13 fire @-@ control system derived from Vickers equipment received during World War I , but this was replaced by an improved Type 14 system around 1925 . It controlled the main and secondary guns ; no provision was made for anti @-@ aircraft fire until the Type 31 fire @-@ control director was introduced in 1932 . A modified Type 14 fire @-@ control system was tested aboard her sister ship Nagato in 1935 and later approved for service as the Type 94 . A new anti @-@ aircraft director , also called the Type 94 , used to control the 127 mm AA guns , was introduced in 1937 , although when Mutsu received hers is unknown . The 25 mm AA guns were controlled by a Type 95 director that was also introduced in 1937 .

= = Construction and service = =

Mutsu , named for Mutsu Province , was laid down at the Yokosuka Naval Arsenal on 1 June 1918 and launched on 31 May 1920 . Funding for the ship had partly come from donations from schoolchildren . While Mutsu was still fitting out , the American government called a conference in Washington , D.C. late in 1921 to forestall the massively expensive naval arms race that was developing between the United States , the United Kingdom and the Empire of Japan . The Washington Naval Conference convened on 12 November and the Americans proposed to scrap virtually every capital ship under construction or being fitting out by the participating nations . Mutsu was specifically listed among those to be scrapped even though she had been commissioned a few weeks earlier . This was unacceptable to the Japanese delegates ; they agreed to a compromise that allowed them to keep Mutsu in exchange for scrapping the obsolete dreadnought Settsu , with a similar arrangement for several American Colorado @-@ class dreadnoughts that were fitting out . Mutsu was commissioned on 24 October 1921 with Captain Shizen Komaki in command . Captain Seiichi Kurose assumed command on 18 November and the ship was assigned to the 1st Battleship Division on 1 December . Mutsu hosted Edward , Prince of Wales , and his aide @-@ de @-@ camp , Lieutenant Louis Mountbatten , on 12 April 1922 during the prince 's visit to Japan .

On 4 September 1923 , Mutsu loaded supplies at Uchinoura Bay , Kyushu , for the victims of the

Great Kant? earthquake . With her sister Nagato , she sank the hulk of the obsolete battleship Satsuma on 7 September 1924 during gunnery practice in Tokyo Bay , in accordance with the Washington Naval Treaty . Captain Mitsumasa Yonai , later Prime Minister of Japan , assumed command on 10 November . The ship was transferred to the reserve on 1 December 1925 . Mutsu served as flagship of Emperor Hirohito during the 1927 naval maneuvers and fleet review . Captain Zengo Yoshida relieved Captain Teikichi Hori on 10 December 1928 . On 29 March 1929 , the ship was assigned to Battleship Division 3 , together with three light cruisers .

Mutsu 's anti @-@ aircraft armament was upgraded during 1932 . Upon completion , she was assigned to Battleship Division 1 of the 1st Fleet , and again served as the Emperor 's flagship during the annual maneuvers and fleet review in 1933 . The ship was placed in reserve on 15 November and began her lengthy reconstruction . This was completed on 30 September 1936 and Mutsu rejoined the 1st Battleship Division on 1 December 1936 . In August 1937 , she transported 2 @,@ 000 men of the 11th Infantry Division to Shanghai during the Second Sino @-@ Japanese War . Her floatplanes bombed targets in Shanghai on 24 August before she returned to Sasebo the following day . On 15 November 1938 , Captain Aritomo Got? assumed command of the ship . Mutsu was placed in reserve from 15 December 1938 to 15 November 1939 . She was refitted in early 1941 in preparation for war ; as part of this work , she was fitted with external degaussing coils and additional armor for her barbettes .

= = = World War II = = =

During the war Mutsu saw limited action , spending much of her time in home waters . On 8 December 1941 , she sortied for the Bonin Islands , along with Nagato , the battleships Hy?ga , Yamashiro , Fus? , Ise of Battleship Division 2 , and the light carrier H?sh? as distant support for the fleet attacking Pearl Harbor , and returned six days later . On 18 January 1942 , Mutsu towed the obsolete armored cruiser Nisshin as a target for the new battleship Yamato , which promptly sank her .

In June 1942 Mutsu , commanded by Rear Admiral Gunji Kogure , was assigned to the Main Body of the 1st Fleet during the Battle of Midway , together with Yamato , Nagato , Hosho , the light cruiser Sendai , nine destroyers and four auxiliary ships . Following the loss of all four carriers on 4 June , Yamamoto attempted to lure the American forces west to within range of the Japanese air groups at Wake Island , and into a night engagement with his surface forces , but the American forces withdrew and Mutsu saw no action . After rendezvousing with the remnants of the Striking Force on 6 June , about half of the survivors from the sunken aircraft carriers of the 1st Air Fleet were transferred to Mutsu . She arrived at Hashirajima on 14 June .

On 14 July , Mutsu was transferred to Battleship Division 2 and then to the Advance Force of the 2nd Fleet on 9 August . Two days later , the ship departed Yokosuka accompanied by the cruisers Atago , Takao , Maya , Haguro , Yura , My?k? , the seaplane tender Chitose and escorting destroyers to support operations during the Guadalcanal Campaign . They arrived at Truk on 17 August . On 20 August , while sailing from Truk to rendezvous with the main body of Vice Admiral Ch?ichi Nagumo 's 3rd Fleet , Mutsu , the heavy cruiser Atago , and escorting destroyers unsuccessfully attempted to locate the escort carrier USS Long Island in response to a flying boat detecting the American ship .

During the Battle of the Eastern Solomons on 27 August , Mutsu , assigned to the Support Force , fired four shells at enemy reconnaissance aircraft during what was her first and only action of the war . Following her return to Truk on 2 September , a group of skilled AA gunnery officers and men were detached to serve as instructors to ground @-@ based naval anti @-@ aircraft gunners stationed in Rabaul . During October Mutsu off @-@ loaded surplus fuel oil to the fleet oil tanker Kenyo Maru , allowing the tanker to refuel other ships involved in Guadalcanal operations . On 7 January 1943 , Mutsu steamed from Truk via Saipan to return to Japan together with the carrier Zuikaku , the heavy cruiser Suzuya and four destroyers . Mutsu left Hashirajima for Kure on 13 April , where she prepared to sortie to reinforce the Japanese garrisons in the Aleutian Islands in response to the Battle of the Komandorski Islands . The operation was cancelled the next day and

the ship resumed training .

= = = Loss = = =

On 8 June 1943 , Mutsu was moored in the Hashirajima fleet anchorage , with 113 flying cadets and 40 instructors from the Tsuchiura Naval Air Group aboard for familiarization . At 12 : 13 the magazine of her No. 3 turret exploded , destroying the adjacent structure of the ship and cutting her in half . A massive influx of water into the machinery spaces caused the 150 @-@ meter (490 ft) forward section of the ship to capsize to starboard and sink almost immediately . The 45 @-@ meter (148 ft) stern section upended and remained floating until about 02 : 00 hours on 9 June before sinking , coming to rest a few hundred feet south of the main wreck at coordinates 33 ° 58 ? N 132 ° 24 ? E.

The nearby Fus? immediately launched two boats which , together with the destroyers Tamanami and Wakatsuki and the cruisers Tatsuta and Mogami , were able to rescue 353 survivors from the 1 @,@ 474 crew members and visitors aboard Mutsu ; 1 @,@ 121 men were killed in the explosion . Only 13 of the visiting aviators were among the survivors .

After the explosion , as the rescue operations commenced , the fleet was alerted and the area was searched for Allied submarines , but no traces were found . To avert the potential damage to morale from the loss of a battleship coming so soon after the string of recent setbacks in the war effort , Mutsu 's destruction was declared a state secret . Mass cremations of recovered bodies began almost immediately after the sinking . Captain Teruhiko Miyoshi 's body was recovered by divers on 17 June , but his wife was not officially notified until 6 January 1944 . Both he and his second in command , Captain Ono Koro , were posthumously promoted to Rear Admiral , as was normal practice . To further prevent rumors from spreading , healthy and recovered survivors were reassigned to various garrisons in the Pacific Ocean . Some of the survivors were sent to Truk in the Caroline Islands and assigned to the 41st Guard Force . Another 150 were sent to Saipan in the Mariana Islands , where most were killed in 1944 during the battle for the island .

At the time of the explosion , Mutsu 's magazine contained a number of 16 @-@ inch Type 3 " Sanshikidan " incendiary shrapnel shells , which had caused a fire at the Sagami arsenal several years earlier due to improper storage . Because they might have been the cause of the explosion , the Minister of the Navy , Admiral Shimada Shigetaro , immediately ordered the removal of Type 3 shells from all IJN ships carrying them , until the conclusion of the investigation into the loss .

= = Investigation into the loss = =

A commission led by Admiral K?ichi Shiozawa was convened three days after the sinking to investigate the loss . The commission considered a number of possible causes :

Sabotage by enemy secret agents . Given the heavy security at the anchorage and lack of claims of responsibility by the Allies , this could be discounted .

Sabotage by a disgruntled crewman . While no individual was named in the commission 's final report , its conclusion was that the cause of the explosion was most likely a crewman in No. 3 turret who had recently been accused of theft and was believed to be suicidal .

A midget or fleet submarine attack . Extensive searches immediately following the sinking had failed to detect any enemy submarine and the Allies had made no attempt at claiming the enormous propaganda value of sinking a capital ship in her home anchorage ; consequently , this possibility was quickly discounted . Eyewitnesses also spoke of a reddish @-@ brown fireball , which indicated a magazine explosion ; this was confirmed during exploration of the wreck by divers .

Accidental explosion within a magazine . While the Mutsu carried many projectiles , immediate suspicion focused on the Type 3 anti @-@ aircraft shell as it was believed to have caused a fire before the war at the Sagami arsenal . Known as a " sanshiki @-@ dan " or " sankaidan " , these were fired by the main armament and contained 900 to 1 @,@ 200 25 mm diameter steel tubes (depending upon sources) , each containing an incendiary charge . Tests were conducted at Kamegakubi Naval Proving Ground on several shells salvaged from No. 3 turret and on shells from

the previous and succeeding manufacturing batches . Using a specially built model of the Mutsu 's No. 3 turret , the experiments were unable to induce the shells to explode under normal conditions .

The commission issued its preliminary conclusions on 25 June , well before the divers had completed their investigation of the wreck , and concluded that the explosion was the result of a disgruntled seaman . Historian Mike Williams put forward an alternative theory of fire :

" A number of observers noted smoke coming from the vicinity of No. 3 turret and the aircraft area just forward of it , just before the explosion . Compared with other nations ' warships in wartime service , Japanese battleships contained a large amount of flammable materials including wooden decking , furniture , and insulation , as well as cotton and wool bedding . Although she had been modernized in the 1930s , some of the Mutsu 's original electrical wiring may have remained in use . While fire in the secure magazines was a very remote possibility , a fire in an area adjacent to the No. 3 magazine could have raised the temperature to a level sufficient to ignite the highly sensitive black @-@ powder primers stored in the magazine and thus cause the explosion . "

= = Salvage operations = =

Divers were brought into the area to retrieve bodies and to assess the damage to the ship . Prior to diving on the wreck they were allowed to familiarize themselves on board Mutsu 's sister ship , Nagato . The Navy leadership initially gave serious consideration to raising the wreck and rebuilding her , although these plans were dropped after the divers completed their survey of the ship on 22 July . Thus Mutsu was struck from the Navy List on 1 September . As part of the investigation , Dive @-@ boat No. 3746 , a small Nishimura @-@ class search and rescue submarine , explored the wreck on 17 June with a crew of seven officers . While crawling on the harbor bottom , it became snagged on the wreckage and its crew nearly suffocated before they managed to free themselves and surface . In July 1944 , the oil @-@ starved IJN recovered 580 metric tons (570 long tons ; 640 short tons) of fuel from the wreck .

The 1 @.@ 2 @-@ meter (3 ft 11 in) diameter chrysanthemum crest , symbol of the Imperial Throne , was raised in 1953 , and one of the 140 mm casemate guns was raised in 1963 and donated to the Yasukuni Shrine . In 1970 , the Fukada Salvage Company began recovery operations that lasted until 1978 and recovered about 75 % of the ship . The two aft turrets were raised in 1970 and 1971 . The salvagers retrieved 849 bodies of crewmen lost during the explosion . In 1995 , the Mutsu Memorial Museum declared that no further salvage operations were planned .

The only significant portion of the ship that remains is a 35 @-@ meter (114 ft 10 in) long section running from the bridge structure forward to the vicinity of No. 1 turret . The highest portion of the ship is 12 meters (39 ft 4 in) below the surface .

= = = Surviving artifacts = = =

In addition to the 140 mm gun donated to the Yasukuni Shrine , now on display at the Yasukuni Museum , the following items recovered over the years can be viewed at various museums and memorials in Japan :

Many artifacts are displayed at the Mutsu Memorial Museum in T?wa @-@ Cho . This is a successor to a local museum funded by the town of Su? @-@ ?shima which opened in July 1970 . To make room for a new road , this museum was moved in April 1994 to a new building . Since 1963 , a memorial service has been held here every year on 8 June in honor of the crew .

The fully restored No. 4 turret is on display on the grounds of the former Imperial Japanese Naval Academy at Etajima . This is the ship 's original turret , removed during her refit in the 1930s .

The left @-@ side 410 mm gun from No. 3 turret is displayed outside the Yamato Museum in Daiwa Park , Kure . This park also contains one of Mutsu 's 3 @.@ 5 @-@ meter (11 ft 6 in) diameter propellers , a rudder and an anchor .

One 410 mm gun from No. 3 turret is on display at the Museum of Maritime Science , Shinagawa , in Tokyo .

A rudder and a section of propeller shaft were on display at the Arashiyama Art Museum until it

closed circa 1991 . Their current whereabouts are now unknown .