

= Montana @-@ class battleship =

The Montana @-@ class battleships of the United States Navy were planned as successors to the Iowa class , being slower but larger , better armored , and having superior firepower . Five were approved for construction during World War II , but changes in wartime building priorities resulted in their cancellation in favor of the Essex @-@ class aircraft carriers and Iowa class before any Montana @-@ class keels were laid . With beams of 121 feet , they would have been the first U.S. battleships as originally designed to be too wide to transit the 110 @-@ foot @-@ wide locks of the Panama Canal .

Intended armament would have been 12 16 @-@ inch (406 mm) Mark 7 guns in four triple turrets , up from the Iowas ' three triple 16s . With an increased anti @-@ aircraft capability and thicker armor belt , the Montana class would have been the largest , best @-@ protected , and most heavily armed U.S. battleships ever , the only class to come close to rivaling the Empire of Japan 's immense Yamato @-@ class battleships .

Preliminary design work for the Montana class began before the US entry into World War II . The first two vessels were approved by Congress in 1939 following the passage of the Second Vinson Act . The Japanese attack on Pearl Harbor delayed construction of the Montana class . The success of carrier combat at the Battle of the Coral Sea and , to a greater extent , the Battle of Midway , diminished the value of the battleship . Consequently , the US Navy chose to cancel the Montana class in favor of more urgently needed aircraft carriers , amphibious and anti @-@ submarine vessels .

Because the Iowas were fast enough to escort the new Essex @-@ class aircraft carriers , their orders were retained , making them the last US Navy battleships to be commissioned .

= = History = =

As the political situation in Europe and Asia worsened in the prelude to World War II , Carl Vinson , the chairman of the House Committee on Naval Affairs , instituted the Vinson Naval Plan , which aimed to get the Navy into fighting shape after the cutbacks imposed by the Great Depression and pair of London Naval Treaties of the 1930s . As part of the overall plan Congress passed the Second Vinson Act in 1938 , which cleared the way for construction of the four South Dakota @-@ class fast battleships and the first two Iowa @-@ class fast battleships (hull numbers BB @-@ 61 and BB @-@ 62) . Four additional battleships (with hull numbers BB @-@ 63 , BB @-@ 64 , BB @-@ 65 , and BB @-@ 66) were approved for construction in 1940 , with the last two intended to be the first ships of the Montana class . By 1942 , it was apparent to the US Navy high command that they needed as many fast battleships as possible , and hull numbers BB @-@ 65 and BB @-@ 66 were allocated to planned fast battleships Illinois and Kentucky .

The Navy , mindful of the ongoing construction of Japan 's Yamato @-@ class battleships , had been working on a 58 @, @ 000 @-@ ton " super battleship " concept since 1938 . This new class , with twelve 16 @-@ inch (406 mm) guns , was assigned the name Montana and cleared for construction by the United States Congress under the Two @-@ Ocean Navy Act in 1940 ; funding for the new ships was approved in 1941 . These ships , the last battleships to be ordered by the Navy , were originally to be designated BB @-@ 65 through BB @-@ 69 ; however , BB @-@ 65 and BB ? 66 were subsequently re @-@ ordered as Iowa @-@ class ships , Illinois and Kentucky , and the Montanas were redesignated BB @-@ 67 through BB @-@ 71 .

Completion of the Montana @-@ class , and the last two Iowa @-@ class battleships , was intended to give the US Navy a considerable advantage over any other nation , or probable combination of nations , with a total of 17 new battleships by the late 1940s . The Montanas also would have been the only American ships to come close to equaling Japan 's massive Yamato and her sister Musashi in terms of size and firepower , with only the Kriegsmarine having even more enormous battleships planned , with their H @-@ 42 and onwards designs exceeding the Montana class in size and capabilities .

== Design ==

Preliminary planning for the Montana class battleships took place in 1939, when the aircraft carrier was still considered strategically less important than the battleship. The Navy began designing a 65,000-ton battleship to counter the threat posed by the Yamato class battleships of the Imperial Japanese Navy. Although the Navy knew little about the Yamato class, the new Japanese battleships were rumored to have a main gun battery of 18 inches (457 mm). Initially, plans were drawn for a 45,000-ton (46,000 metric ton) US battleship, but after evaluation, the Battleship Design Advisory Board increased the displacement of the planned ship to 58,000 tons (59,000 metric tons).

At the time, the design board issued a basic outline for the Montana class that called for it to be free of beam restrictions imposed by the Panama Canal, be 25% stronger offensively and defensively than any other battleship completed or under construction, and be capable of withstanding the "super heavy" 2,700 lb (1,200 kg) shells used by US battleships equipped with either the 16-inch / 45 caliber guns or 16-inch (406 mm) / 50 cal Mark 7 guns. Although freed of the restriction of fitting through the Panama Canal, the length and height of the Montana class were limited by one of the shipyards at which they were to be built: the New York Navy Yard could not handle the construction of a 58,000-ton (59,000 metric ton) ship, and vessels built there had to be low enough to clear the Brooklyn Bridge at low tide.

After debate at the design board about whether the Montana class should be fast, achieving the high 33 kn (38 mph; 61 km/h) speed of the Iowa class, or up-gunned and up-armored, firepower was selected over speed. By returning the Montana class to the slower 28 kn (32 mph; 52 km/h) maximum speed of the North Carolina- and South Dakota- class ships, naval architects were able to increase armor protection for the Montanas, enabling the ships to withstand enemy fire equivalent to their own guns' ammunition. This limited the Montanas' ability to escort and defend the Pacific-based Allied aircraft carrier fleet, as the class was to be powered by eight Babcock & Wilcox boilers which would have enabled them to steam at approximately 27 to 28 kn (31 to 32 mph; 50 to 52 km/h).

== Fate ==

By January 1941, the design limit for the 58,000-ton (59,000 metric ton) battleship plan had been reached, and consensus among those designing the battleship class was to increase the displacement to support the armor and weaponry on the ships. At the same time, planners decided to adopt a slightly greater length and reduce power for a better machinery arrangement, as well as improving internal subdivisions, and selecting as the secondary armament several dual-mounted 5-inch (127 mm) / 54 cal guns instead of the 5-inch (127 mm) / 38 cal guns used on the Iowas. At this point, the net design for the Montana class somewhat resembled the Iowa class since they would be equipped with the same caliber main guns and similar caliber secondary guns; however, Montana and her sisters had more armor, mounted three more main guns in one more turret, and were 22 ft (6.7 m) longer and 13 ft (4.0 m) wider than the Iowa class.

By April 1942, the Montana class design had been approved; construction was authorized by the United States Congress and the projected date of completion was estimated to be somewhere between 1 July and 1 November 1945. The Navy ordered the ships in May 1942, but the Montana class was placed on hold because the Iowa class battleships and the Essex class aircraft carriers were under construction in the shipyards intended to build the Montanas. Both the Iowa and Essex classes had been given higher priorities: the Iowas as they were fast enough to keep up with and defend the Essex class carriers with 20 mm and 40 mm guns, and the Essexes because of their ability to launch aircraft to gain and maintain air supremacy over the islands in the Pacific and intercept warships of the Imperial Japanese Navy. The entire Montana class was suspended in May 1942, before any of their keels had been laid. In July 1942, the

construction of the Montana class was canceled following the Battle of Midway and the corresponding shift in naval warfare from surface engagements to air supremacy and a corresponding shift from battleships to aircraft carriers .

= = Ships = =

Five ships of the Montana class were authorized on 19 July 1940 , but they were suspended indefinitely until being canceled on 21 July 1943 . The ships were to be built at the New York Navy Yard , Philadelphia Navy Yard , and Norfolk Navy Yard .

= = = USS Montana (BB @-@ 67) = = =

Montana was planned to be the lead ship of the class . She was the third ship to be named in honor of the 41st state , and was assigned to the Philadelphia Navy Yard . Both the earlier battleship , BB @-@ 51 , and BB @-@ 67 were canceled , so Montana is the only one of the (48 at the time) US states never to have had a battleship with a " BB " hull classification completed in its honor .

= = = USS Ohio (BB @-@ 68) = = =

Ohio was to be the second Montana @-@ class battleship . She was to be named in honor of the 17th state , and was assigned to the Philadelphia Navy Yard for construction . Ohio would have been the fourth ship to bear that name had she been commissioned .

= = = USS Maine (BB @-@ 69) = = =

Maine was to be the third Montana @-@ class battleship . She was to be named in honor of the 23rd state , and was assigned to the New York Navy Yard . Maine would have been the third ship to bear that name had she been commissioned .

= = = USS New Hampshire (BB @-@ 70) = = =

New Hampshire was to be the fourth Montana @-@ class battleship , and was to be named in honor of the ninth state . She was assigned to the New York Navy Yard , and would have been the third ship to bear that name had she been commissioned .

= = = USS Louisiana (BB @-@ 71) = = =

Louisiana was to be the fifth and final Montana @-@ class battleship . She was to be named in honor of the 18th state and assigned to the Norfolk Navy Yard , Portsmouth , Virginia . Louisiana would have been the third ship to bear that name had she been commissioned . By hull number , Louisiana was the last American battleship authorized for construction .

= = Armament = =

The armament of the Montana @-@ class battleships would have been similar to the preceding Iowa @-@ class battleships , but with an increase in the number of primary and secondary guns for use against enemy surface ships and aircraft . Had they been completed , the Montanas would have been gun @-@ for @-@ gun the most powerful battleships the United States had constructed , and the only US battleship class that would have come close to equaling the Imperial Japanese Navy battleships Yamato and Musashi in armament , armor , and displacement .

= = = Main battery = = =

The primary armament of a Montana @-@ class battleship would have been 12 16 " / 50 caliber Mark 7 gun , which were to be housed in four three @-@ gun turrets : two forward and two aft . The guns , the same used to arm the Iowa @-@ class battleships , were 66 ft (20 m) long ? 50 times their 16 @-@ inch (406 mm) bore , or 50 calibers , from breechface to muzzle . Each gun weighed about 239 @, @ 000 lb (108 @, @ 000 kg) without the breech , or 267 @, @ 900 lb (121 @, @ 500 kg) with the breech . They fired projectiles weighing up to 2 @, @ 700 lb (1 @, @ 200 kg) at a maximum speed of 2 @, @ 690 ft / s (820 m / s) with a range of up to 24 nmi (28 mi ; 44 km) . At maximum range the projectile would have spent almost 1 ½ minutes in flight . The addition of the No. 4 turret would have allowed Montana to overtake the Yamato as the battleship having heaviest broadside overall ; Montana and her sisters would have had a broadside of 32 @, @ 400 lb (14 @, @ 700 kg) vs. 28 @, @ 800 lb (13 @, @ 100 kg) for Yamato . Each gun would have rested within an armored barbette , but only the top of the barbette would have protruded above the main deck . The barbettes would have extended either four decks (turrets 1 and 4) or five decks (turrets 2 and 3) down . The lower spaces would have contained rooms for handling the projectiles and storing the powder bags used to fire them . Each turret would have required a crew of 94 men to operate . The turrets would not have been attached to the ship , but would have rested on rollers , which meant that had any of the Montana @-@ class ships capsized , the turrets would have fallen out . Each turret would have cost US \$ 1 @. @ 4 million , but this figure did not take into account the cost of the guns themselves .

The turrets would have been " three @-@ gun " , not " triple " , because each barrel would have elevated and fired independently . The ships could fire any combination of their guns , including a broadside of all 12 . Contrary to popular belief , the ships would not have moved sideways noticeably when a broadside was fired .

The guns would have been elevated from ? 5 ° to + 45 ° , moving at up to 12 ° per second . The turrets would have rotated about 300 ° at about 4 ° per second and could even be fired back beyond the beam , which is sometimes called " over the shoulder " . Within each turret , a red stripe on the wall of the turret , just inches from the railing , would have marked the boundary of the gun 's recoil , providing the crew of each gun turret with a visual reference for the minimum safe distance range .

Like most battleships in World War II , the Montana class would have been equipped with a fire control computer , in this case the Ford Mk 1A Ballistic Computer , a 3 @, @ 150 lb (1 @, @ 430 kg) rangekeeper designed to direct gunfire on land , sea , and in the air . This analog computer would have been used to direct the fire from the battleship 's big guns , taking into account several factors such as the speed of the targeted ship , the time it takes for a projectile to travel , and air resistance to the shells fired at a target . At the time the Montana class was set to begin construction , the rangekeepers had gained the ability to use radar data to help target enemy ships and land @-@ based targets . The results of this advance were telling : the rangekeeper was able to track and fire at targets at a greater range and with increased accuracy , as was demonstrated in November 1942 when the battleship Washington engaged the Imperial Japanese Navy battleship Kirishima at a range of 18 @, @ 500 yd (16 @. @ 9 km) at night ; the Washington scored at least nine heavy caliber hits that critically damaged the Kirishima and led to her loss . This gave the US Navy a major advantage in World War II , as the Japanese did not develop radar or automated fire control to the level of the US Navy .

The large caliber guns were designed to fire two different 16 @-@ inch (406 mm) shells : an armor @-@ piercing round for anti @-@ ship and anti @-@ structure work , and a high @-@ explosive round designed for use against unarmored targets and shore bombardment .

The Mk . 8 APC (Armor @-@ Piercing , Capped) shell weighed in at 2 @, @ 700 lb (1 @, @ 200 kg) , and was designed to penetrate the hardened steel armor carried by foreign battleships . At 20 @, @ 000 yd (18 @. @ 3 km) , the Mk . 8 could penetrate 20 inches (508 mm) of steel armor plate . At the same range , the Mk . 8 could penetrate 21 ft (6 @. @ 4 m) of reinforced concrete . For unarmored targets and shore bombardment , the 1 @, @ 900 lb (860 kg) Mk . 13 HC (High @-@ Capacity ? referring to the large bursting charge) shell was available . The Mk . 13 shell could create a crater 50 ft (15 m) wide and 20 ft (6 @. @ 1 m) deep upon impact and detonation , and could defoliate trees 400 yd (370 m) from the point of impact .

The final type of ammunition developed for the 16 @-@ inch guns , well after the Montanas had been cancelled , were W23 " Katie " shells . These were born from the nuclear deterrence that had begun to shape the US armed forces at the start of the Cold War . To compete with the Air Force and the Army , which had developed nuclear bombs and nuclear shells for use on the battlefield , the Navy began a top @-@ secret program to develop Mk . 23 nuclear naval shells with an estimated yield of 15 to 20 kilotons . The shells entered development around 1953 , and were reportedly ready by 1956 ; however , only the Iowa @-@ class battleships could have fired them .

= = = Secondary battery = = =

The secondary armament for Montana and her sisters was to be 20 5 @-@ inch (127 mm) / 54 cal guns housed in 10 turrets along the island of the battleship ; five on the starboard side and five on the port . These guns , designed specifically for the Montanas , were to be the replacement for the 5 @-@ inch (127 mm) / 38 cal secondary gun batteries then in widespread use with the US Navy .

The 5 @-@ inch (127 mm) / 54 cal gun turrets were similar to the 5 @-@ inch (127 mm) / 38 cal gun mounts in that they were equally adept in an anti @-@ aircraft role and for damaging smaller ships , but differed in that they weighed more , fired heavier rounds of ammunition , and resulted in faster crew fatigue than the 5 @-@ inch (127 mm) / 38 cal guns . The ammunition storage for the 5 @-@ inch (127 mm) / 54 cal gun was 500 rounds per turret , and the guns could fire at targets nearly 26 @, @ 000 yd (24 km) away at a 45 ° angle . At an 85 ° angle , the guns could hit an aerial target at over 50 @, @ 000 ft (15 @, @ 000 m) .

The cancellation of the Montana @-@ class battleships in 1943 pushed back the combat debut of the 5 @-@ inch (127 mm) / 54 cal guns to 1945 , when they were used aboard the US Navy 's Midway @-@ class aircraft carriers . The guns proved adequate for the carrier 's air defense , but were gradually phased out of use by the carrier fleet because of their weight . (Rather than having the carrier defend itself by gunnery this would be assigned to other surrounding ships within a carrier battle group .)

= = = Anti @-@ aircraft batteries = = =

For the first time since the construction of the Iowa class , the US Navy was not building a fast battleship class solely for the purpose of escorting Pacific @-@ based aircraft carriers , and thus the Montana class would not be designed principally for escorting the fast carrier task forces ; nonetheless they would have been equipped with a wide array of anti @-@ aircraft guns to protect themselves and other ships (principally the US aircraft carriers) from Japanese fighters and dive bombers .

= = = = Oerlikon 20 mm anti @-@ aircraft guns = = = =

The Oerlikon 20 mm anti @-@ aircraft cannon was one of the most heavily produced anti @-@ aircraft guns of World War II ; the US alone manufactured a total of 124 @, @ 735 of these guns . When activated in 1941 , these guns replaced the .50 in (12 @. @ 7 mm) / 90 cal M2 Browning MG on a one @-@ for @-@ one basis . The Oerlikon 20 mm AA gun remained the primary anti @-@ aircraft weapon of the United States Navy until the introduction of the 40 mm Bofors AA gun in 1943 .

These guns are air @-@ cooled and use a gas blow @-@ back recoil system . Unlike other automatic guns employed during World War II , the barrel of the 20 mm Oerlikon gun does not recoil ; the breechblock is never locked against the breech and is actually moving forward when the gun fires . This weapon lacks a counter @-@ recoil brake , as the force of the counter @-@ recoil is checked by recoil from the firing of the next round of ammunition .

Between December 1941 and September 1944 , 32 % of all Japanese aircraft downed were credited to this weapon , with the high point being 48 @. @ 3 % for the second half of 1942 . In 1943 , the revolutionary Mark 14 gunsight was introduced , which made these guns even more effective .

The 20 mm guns , however , were found to be ineffective against the Japanese kamikaze attacks used during the latter half of World War II . They were subsequently phased out in favor of the heavier 40 mm Bofors AA guns .

== Bofors 40 mm anti @-@ aircraft guns ==

The Bofors 40 mm anti @-@ aircraft gun was used on almost every major warship in the US and UK fleet from about 1943 to 1945 . Although a descendant of German , Dutch , and Swedish designs , the Bofors mounts used by the US Navy during World War II had been heavily Americanized to bring the guns up to the standards placed on them by the Navy . This resulted in a gun system set to British standards (now known as the Standard System) with interchangeable ammunition , which simplified the logistics situation for World War II . When coupled with hydraulic couple drives to reduce salt contamination and the Mark 51 director for improved accuracy , the Bofors 40 mm gun became a fearsome adversary , accounting for roughly half of all Japanese aircraft shot down between 1 October 1944 and 1 February 1945 .

== Armor ==

Aside from its firepower , a battleship 's defining feature is its armor . The exact design and placement of the armor , inextricably linked with the ship 's stability and performance , is a complex science honed over decades .

A battleship is usually armored to withstand an attack from guns the size of its own , but the armor scheme of the preceding North Carolina class was only proof against 14 @-@ inch (356 mm) shells (which they had originally been intended to carry) , while the South Dakota @-@ class battleship (1939) and Iowa @-@ class battleship classes were designed only to resist their original complement of Mark V 2 @, @ 240 lb (1 @, @ 020 kg) shells , not the new " super @-@ heavy " 2 @, @ 700 lb (1 @, @ 200 kg) APC (Armor Piercing , Capped) Mark VII shells they actually used . The Montanas were the only US battleships designed to resist the Mark VIII . Designed to give a zone of immunity against fire from 16 @-@ inch / 45 @-@ caliber firing 2 @, @ 700 lb (1 @, @ 225 kg) shell , between 18 @, @ 000 and 31 @, @ 000 yards (16 @, @ 459 and 28 @, @ 346 m) and 16 @-@ inch / 45 @-@ caliber firing 2 @, @ 240 lb (1 @, @ 016 kg) shell , between 16 @, @ 500 and 34 @, @ 500 yards (15 @, @ 087 and 31 @, @ 546 m) away .

Until the authorization of the Montana class all US battleships were built within the size limits for the Panama Canal . The main reason for this was logistical : the largest US shipyards were located on the East Coast of the United States , while the United States had territorial interests in both oceans . Requiring the battleships to fit within the Panama Canal took days off the transition time from the Atlantic Ocean to the Pacific Ocean by allowing ships to move through the canal instead of sailing around South America . By the time of the Two Ocean Navy bill , the Navy realized that ship designs could no longer be limited by the Panama Canal and thus approved the Montana class knowing that the ships would be unable to clear the locks . This shift in policy meant that the Montana class would have been the only World War II ? era US battleships to be adequately armored against guns of the same power as their own .

== Aircraft ==

The Montana class would have used aircraft for reconnaissance and for gunnery spotting . The type of aircraft used would have depended on when exactly the battleships would have been commissioned , but in all probability they would have used either the Kingfisher or the Seahawk . The aircraft would have been floatplanes launched from catapults on the ship 's fantail . They would have landed on the water and taxied to the stern of the ship to be lifted by a crane back to the catapult .

== Kingfisher ==

The Vought OS2U Kingfisher was a lightly armed two @-@ man aircraft designed in 1937 . The Kingfisher 's high operating ceiling made it well @-@ suited for its primary mission : to observe the fall of shot from a battleship 's guns and radio corrections back to the ship . The floatplanes used in World War II also performed search and rescue for naval aviators who were shot down or forced to ditch in the ocean .

= = = Seahawk = = =

In June 1942 , the US Navy Bureau of Aeronautics requested industry proposals for a new seaplane to replace the Kingfisher and Curtiss SO3C Seamew . The new aircraft was required to be able to use landing gear as well as floats . Curtiss submitted a design on 1 August , and received a contract for two prototypes and five service @-@ test aircraft on 25 August . The first flight of a prototype XSC @-@ 1 took place on 16 February 1944 at the Columbus , Ohio Curtiss plant . The first production aircraft were delivered in October 1944 , and by the beginning of 1945 the single @-@ seat Curtiss SC Seahawk floatplane began replacing the Kingfisher . Had the Montana class been completed , they would have arrived around the time of this replacement , and would likely have been equipped with the Seahawk for use in combat operations and seaborne search and rescue .