

= Brandenburg @-@ class battleship =

The four Brandenburg @-@ class pre @-@ dreadnought battleships were Germany 's first ocean @-@ going battleships . They were also the first German warship , of any type , to be fitted with wireless communications . The class comprised Brandenburg , Kurfürst Friedrich Wilhelm , Weissenburg , and Wörth . All were laid down in 1890 and completed by 1893 , except for Weissenburg , which was completed in 1894 . The lead ship , Brandenburg , was built at the cost of 9 @. @ 3 million Marks and Kurfürst Friedrich Wilhelm cost 11 @. @ 23 million Marks . The British Royal Navy derisively referred to the ships as the " whalers . "

Brandenburg and her three sisters served in a wide range of roles . In 1900 , the four ships were deployed to China during the Boxer Rebellion , after which they were substantially modernized . In 1910 , two of the ships , Kurfürst Friedrich Wilhelm and Weissenburg , were sold to the Ottoman Navy . Kurfürst Friedrich Wilhelm was sunk in 1915 by a British submarine while Weissenburg survived the war , only to be broken up in 1938 . Brandenburg and Wörth saw limited service during World War I as coastal defense ships before they were withdrawn for auxiliary duties . Both ships were sold for scrapping in May 1919 .

= = Design = =

The Brandenburg @-@ class ships were the first ocean @-@ going battleships built by the German Navy . They followed a number of coastal defense ships , including the Siegfried and Odin classes that were only intended for local defense of the German coastline . Design work on the ships began in late 1888 , under the leadership of Vice Admiral Alexander von Monts , who also secured funding for the new ships from the Reichstag . Admiral von Monts was the first naval officer appointed by the recently crowned Kaiser Wilhelm II .

The Brandenburg @-@ class ships were the foundation of what eventually became the High Seas Fleet . As they represented a shift in the strategic outlook of the German navy , the traditional method of ship construction , which relied heavily on foreign models , was abandoned . Some experimentation was implemented in the design process , particularly in the armor types that were installed on the ships . Brandenburg and Wörth were equipped with compound armor that consisted of several layers of different materials , while the latter two ships received Harvey nickel @-@ steel alloy armor plating . The addition of a third main battery turret was also a significant innovation . While a novel concept , the midships turret caused prohibitive blast damage to the surrounding superstructure when fired , which led to the idea being abandoned . This arrangement has led some authors to characterize the ships as proto @-@ dreadnoughts . This is incorrect , as the guns were not the same caliber , and the ships were designed to fight at close range , unlike the later dreadnought battleships .

= = = General characteristics = = =

The ships of the Brandenburg @-@ class were 113 @. @ 9 m ( 373 ft 8 in ) long at the waterline and 115 @. @ 7 m ( 379 ft 7 in ) long overall . They had a beam of 19 @. @ 5 m ( 64 ft ) which was increased to 19 @. @ 74 m ( 64 ft 9 in ) with the addition of torpedo nets , and had a draft of 7 @. @ 6 m ( 24 ft 11 in ) forward and 7 @. @ 9 m ( 25 ft 11 in ) aft . The Brandenburgs displaced 10 @, @ 013 t ( 9 @, @ 855 long tons ) at their designed weight , and up to 10 @, @ 670 t ( 10 @, @ 500 long tons ) at full combat load .

As was the standard for German warships of the period , the hulls of the Brandenburg @-@ class ships were constructed from both transverse and longitudinal steel frames , over which the steel side plates were riveted . The vessels had 13 watertight compartments and a double bottom that ran for 48 percent of the length of the hull . The German navy regarded the ships as excellent sea @-@ boats ; the Brandenburgs had easy motion . They were also responsive to commands from the bridge and had a moderate turning circle . Speed loss at hard rudder was reduced to 30 percent , and the metacentric height was 1 @. @ 05 m ( 3 ft 5 in ) . However , the ships were " wet " at high

speeds and suffered from severe pitching . The ships ' crew numbered 38 officers and 530 enlisted men , though while serving as the squadron flagship the standard crew was augmented by an additional 9 officers and 54 men .

#### == Machinery ==

The ships were equipped with two sets of 3 @-@ cylinder triple @-@ expansion engines ; each set drove a 3 @-@ bladed screw that was 5 m ( 16 ft ) in diameter . Both sets had their own engine room . Twelve transverse cylindrical boilers , with three fireboxes each , supplied steam to the engines at up to 12 atmospheres of pressure . The boilers were also divided into two boiler rooms . The engines were rated at 10 @, @ 000 ihp ( 7 @, @ 500 kW ) , though in practice maximum power ranged from 9 @, @ 686 ihp ( 7 @, @ 223 kW ) for Kurfürst Friedrich Wilhelm to 10 @, @ 228 ihp ( 7 @, @ 627 kW ) in Wörth . The ships had a designed speed of 16 @. @ 5 knots ( 30 @. @ 6 km / h ; 19 @. @ 0 mph ) ; Brandenburg was the slowest , at 16 @. @ 3 knots ( 30 @. @ 2 km / h ; 18 @. @ 8 mph ) , while Kurfürst Friedrich Wilhelm and Wörth both achieved 16 @. @ 9 knots ( 31 @. @ 3 km / h ; 19 @. @ 4 mph ) on trials . The ships were designed to carry 650 t ( 640 long tons ) of coal for the boilers , though additional spaces in the hull allowed for up to 1 @, @ 050 t ( 1 @, @ 030 long tons ) . This enabled a maximum range of 4 @, @ 300 nautical miles ( 8 @, @ 000 km ; 4 @, @ 900 mi ) at a cruising speed of 10 knots ( 19 km / h ; 12 mph ) . Electrical power was provided by three generators . The equipment varied from ship to ship ; power output ranged from 72 @. @ 6 to 96 @. @ 5 kilowatts at 67 volts . The ships each had a single rudder .

#### == Armament ==

The vessels were unusual for their time in possessing a broadside of six heavy guns in three twin gun turrets , rather than the four guns typical of contemporary battleships . The forward and after turret carried 28 cm ( 11 inch ) K L / 40 guns , while the center turret carried a shorter L / 35 barrel . The shorter barrels were required to allow the turret to train from side to side . The L / 40 guns were mounted in Drh.L. C / 92 type turrets , which provided depression to ? 5 degrees and elevation to 25 degrees . Both types of guns could fire armor @-@ piercing ( AP ) and high explosive ( HE ) shells . These shells weighed 240 kg ( 529 lb ) , and used the 73 kg ( 161 lb ) RPC 12 propellant charge . Muzzle velocity for the L / 40 gun was 820 meters per second ( 2 @, @ 690 fps ) . At maximum elevation , these guns could hit targets out to 15 @, @ 900 m ( 17 @, @ 400 yards ) . Because the barrels of the L / 35 guns were shorter , they had a correspondingly lower muzzle velocity , which was approximately 685 mps ( 2 @, @ 247 fps ) . As a result , the range of the guns was somewhat shorter , at about 14 @, @ 400 m ( 15 @, @ 700 yd ) . At a range of 12 @, @ 000 m ( 13 @, @ 000 yd ) , the AP shell could penetrate up to 160 mm ( 6 @. @ 3 in ) of belt armor . Ammunition magazines stored a total of 352 shells .

The Brandenburg class 's secondary armament initially consisted of seven 10 @. @ 5 cm ( 4 @. @ 1 in ) SK L / 35 quick @-@ firing guns in casemates arranged around the forward superstructure . During the modernization between 1902 and 1904 , the Brandenburgs received an additional 10 @. @ 5 cm gun . These guns were supplied with a total of 600 rounds , although after the modernization , the 10 @. @ 5 cm magazines were increased to provide storage for a total of 1 @, @ 184 shells .

The ships also carried eight 8 @. @ 8 cm ( 3 @. @ 45 in ) SK L / 30 quick @-@ firing guns , also mounted in casemates . Four were placed in pairs in sponsons towards the bow , while the remaining four were emplaced around the rear superstructure . These guns were supplied with a total of 2 @, @ 000 shells , though as with the 10 @. @ 5 cm guns , ammunition storage was increased during the modernization , to 2 @, @ 384 rounds . These guns fired 13 @. @ 8 kg ( 30 @. @ 4 lb ) at a muzzle velocity of 590 mps ( 1 @, @ 936 fps ) . Their rate of fire was approximately 15 shells per minute ; the guns could engage targets out to 10 @, @ 500 m ( 11 @, @ 500 yd ) . The gun mounts were manually operated .

The ships were also armed with six 45 cm torpedo tubes , all in above @-@ water swivel mounts .

Four tubes were mounted on the sides of the ship , another in the bow , and the last in the stern . The tubes were supplied with a total of 16 torpedoes . These weapons were 5 @. @ 1 m ( 201 in ) long and carried an 87 @. @ 5 kg ( 193 lb ) TNT warhead . They could be set at two speeds for different ranges . At 26 knots ( 48 km / h ; 30 mph ) , the torpedoes had a range of 800 m ( 870 yd ) . At an increased speed of 32 knots ( 59 km / h ; 37 mph ) , the range was reduced to 500 m ( 550 yd ) . One of the tubes was removed during the modernization .

= = = Armor = = =

Weissenburg and Kurfürst Friedrich Wilhelm were armored with nickel steel Krupp armor , but due to delivery problems , Brandenburg and Wörth were armored with a composite armor . The composite armor was constructed by layering steel @- @ clad wrought iron plates and wood planks , which was backed by two more layers of sheet iron . Krupp 's nickel steel armor was based on the Harvey process , which enriched the upper layers of the steel with carbon . This type of armor produced greater strength with thinner armor belts , which enabled ships equipped with it to carry more complete protection . Some portions of Brandenburg did receive the new Krupp armor , including the barbettes that held the fore and center main battery turrets . All four ships retained teak backing to their armor belts .

The Brandenburgs had a 60 mm ( 2 @. @ 4 in ) thick armored deck . The forward conning tower had 300 mm ( 12 in ) thick sides and a 30 mm ( 1 @. @ 2 in ) thick roof . Above the waterline , the armored belt was 400 mm ( 16 in ) in the central portion of the ship and tapered slightly to 300 mm fore and aft . Including the teak backing , the total thickness of the belt in the strongest area was 600 mm ( 24 in ) . Below the waterline , the armored belt was significantly thinner ; the thickest section of the belt was 200 mm ( 7 @. @ 9 in ) thick , and tapered down to 180 mm ( 7 @. @ 1 in ) on either end of the belt . The ships ' cupolas had 50 mm ( 2 @. @ 0 in ) thick roofs and sides that consisted of three 40 mm ( 1 @. @ 6 in ) thick layers , for a total of 120 mm ( 4 @. @ 7 in ) . The barbettes were 300 mm thick and backed with 210 mm ( 8 @. @ 3 in ) of wood .

= = Construction = =

Ordered as battleship A , Brandenburg was laid down at the AG Vulcan shipyard in Stettin in 1890 . She was launched on 21 September 1891 . Fitting out work , which included the installation of the ship 's armament , lasted until 19 November 1893 when she was commissioned into the German navy . Wörth was ordered as battleship B , and was laid down at Germaniawerft in Kiel also in 1890 . Initial work on the ship proceeded the slowest of all four vessels of the class ; she was launched on 6 August 1892 . Fitting out work proceeded quickly , and she was commissioned on 31 October 1893 , the first ship of the class to enter active duty . Weissenburg , ordered as battleship " C " , was also laid down at the AG Vulcan shipyard in 1890 and launched on 14 December 1891 . She was the last ship of the class to enter active service , when she was commissioned on 5 June 1894 . Kurfürst Friedrich Wilhelm was the fourth and final ship of the class . She was ordered as battleship D , and was laid down at the Kaiserliche Werft Wilhelmshaven in 1890 . She was the first ship of the class to be launched , on 30 June 1891 . She was commissioned into the fleet the same day as her sister Brandenburg .

Shortly after the turn of the century , the ships were all taken into the drydocks at the Kaiserliche Werft Wilhelmshaven for a major reconstruction . Wörth was the first to do so , starting in 1901 . Weissenburg followed in 1902 , Brandenburg in 1903 , and Kurfürst Friedrich Wilhelm entered the shipyard in 1904 . During the modernization , a second conning tower was added in the aft superstructure , along with a gangway . The ships had their boilers replaced with newer models , and also had the hamper amidships reduced . The modifications resulted in a weight decrease of between 500 t ( 490 long tons ; 550 short tons ) and 700 t ( 690 long tons ; 770 short tons ) depending on the ship .

= = Service history = =

The ships of the Brandenburg @-@ class were assigned to the I Division of the I Battle Squadron upon their commissioning , along with the four older Sachsen @-@ class armored frigates , though by 1901 ? 2 , the Sachsens were replaced by the new Kaiser Friedrich III @-@ class battleships . They saw their first major operation in 1900 , when they were deployed to China during the Boxer Rebellion . The expeditionary force consisted of the four Brandenburgs , six cruisers , 10 freighters , three torpedo boats , and six regiments of marines , under the command of Marshal Alfred von Waldersee . Admiral Alfred von Tirpitz opposed the plan , which he saw as unnecessary and costly . The force arrived in China after the siege of Peking had already been lifted . As a result , the task force suppressed local uprisings around Kiaochow . In the end , the operation cost the German government more than 100 million marks .

After the Brandenburg @-@ class ships emerged from their refit in 1905 , they rejoined the active fleet . However , they were rapidly made obsolete by the launch of HMS Dreadnought in 1906 . As a result , their service careers were limited . On 12 September 1910 , Kurfürst Friedrich Wilhelm and Weissenburg , the more advanced ships of the class , were sold to the Ottoman Empire and renamed Barbaros Hayreddin and Turgut Reis respectively . At the outbreak of World War I in 1914 , Brandenburg and Wörth were assigned to coastal defense duties , though this lasted only until 1915 , when they were withdrawn from active service . That year , both ships were transferred to the role of barracks ships ; Brandenburg was stationed in Libau while Wörth was in Danzig . It was intended to rebuild Brandenburg as a target ship , though this plan was eventually abandoned . Both Brandenburg and Wörth were struck from the naval register on 13 May 1919 and sold for scrapping . The two ships were purchased by Norddeutsche Tiefbauges , a shipbreaking firm headquartered in Berlin ; the firm had Brandenburg towed to Danzig where she and her sister ship were broken up for scrap .

On 8 August 1915 , Barbaros Hayreddin was en route to support the Turkish defenses at the Dardanelles when she was sunk by the British submarine HMS E11 , with the loss of 253 men . On 19 January 1918 , the battlecruiser SMS Goeben and light cruiser SMS Breslau left the Dardanelles to attack British ships . At 11 : 30 , Goeben ran aground and was subjected to air attacks , which impeded salvage attempts . On 25 January , Turgut Reis arrived on the scene and towed the battlecruiser back to port . Turgut Reis survived the war and was used as a training ship in 1924 . She was later used as a hulk in the Bosphorus , and eventually scrapped in 1938 .