

= Brazilian monitor Piauí =

The Brazilian monitor Piauí was the fourth ship of the Pará class river monitors built for the Brazilian Navy during the Paraguayan War in the late 1860s . Piauí passed the fortifications at Humaitá in July 1868 and provided fire support for the army for the rest of the war . The ship was assigned to the Mato Grosso Flotilla after the war . Piauí was scrapped in 1893 .

= = Design and description = =

The Pará class monitors were designed to meet the need of the Brazilian Navy for small , shallow draft armored ships capable of withstanding heavy fire . The monitor configuration was chosen since a turreted design did not have the same problems engaging enemy ships and fortifications as did the central battery ironclads already in Brazilian service . The oblong gun turret sat on a circular platform that had a central pivot . It was rotated by four men via a system of gears ; 25 minutes were required for a full 360 ° rotation . A bronze ram was fitted to these ships as well . The hull was sheathed with Muntz metal to reduce biofouling .

The ships measured 39 meters (127 ft 11 in) long overall , with a beam of 8 meters (28 ft 0 in) . They had a draft of 1 meter (4 ft 11 in) to 1 meter (5 ft 1 in) and displaced 500 metric tons (490 long tons) . With only 3 meters (1 ft 0 in) of freeboard they had to be towed between Rio de Janeiro and their areas of operations . Their crew numbered 43 officers and men .

= = = Propulsion = = =

The Pará class ships had two direct acting steam engines , each driving a single 3 meter (4 ft 3 in) propeller . Their engines were powered by two tubular boilers at a working pressure of 59 psi (407 kPa ; 4 kgf / cm²) . The engines produced a total of 180 indicated horsepower (130 kW) which gave the monitors a maximum speed of 8 knots (15 km / h ; 9 mph) in calm waters . The ships carried enough coal for one day 's steaming .

= = = Armament = = =

Piauí had a single 120 pounder Whitworth rifled muzzle loader (RML) in her gun turret . The gun had a maximum range of about 5 , 540 meters (6 , 060 yd) . Its 7 inch (178 mm) shells weighed 151 pounds (68 kg) and the gun itself weighed 16 , 660 pounds (7 , 556 kg) . Most unusually the gun 's Brazilian designed iron carriage was designed to pivot vertically at the muzzle ; this was done to minimize the size of the gunport through which splinters and shells could enter .

= = = Armor = = =

The hull of the Pará class ships was made from three layers of wood , with the grain of each layer at right angles to the next layer . It was 457 millimeters (18 inches) thick and was capped with a 102 millimeter (4 in) layer of peroba hardwood . The ships had a complete wrought iron waterline belt , 91 meters (30 ft) high . It had a maximum thickness of 102 millimeters amidships , decreasing to 76 millimeters (3 in) and 51 millimeters (2 in) at the ship 's ends . The curved deck was armored with 12 millimeters (0 . 5 in) of wrought iron .

The rectangular gun turret had rounded corners . It was built much like the hull , but the front of the turret was protected by 152 millimeters (6 in) of armor , the sides by 102 millimeters and the rear by 76 millimeters . Its roof and the exposed portions of the platform it rested upon were protected by 12 millimeters of armor . The armored pilothouse was positioned ahead of the turret .

= = Service = =

Piauí was laid down at the Arsenal de Marinha da Côte in Rio de Janeiro on 8 December 1866 , during the Paraguayan War , which saw Argentina and Brazil allied against Paraguay . She was launched on 8 January 1868 and commissioned later that month . Together with the ironclads Silvado and Cabral , Piauí passed the weakened Paraguayan fortifications at Humaitá on 21 July 1868 . She bombarded Asunción that same day . The monitor and a number of Brazilian ironclads bombarded Paraguayan batteries at Angostura , downstream of Asunción , on 28 October , 19 November and 26 November . Piauí , together with her sister ships Ceará and Santa Catharina , broke through the Paraguayan defenses at Guaraio on 29 April 1869 and drove off the defenders . On 31 August 1869 the monitor unsuccessfully tried to locate and destroy the remnants of the Paraguayan Navy on the Manduvirá River . In the 1880s the ship 's armament was reinforced with a pair of 11 @-@ millimeter (0 @.@ 43 in) machine guns . After the war she was assigned to the Mato Grosso Flotilla and was scrapped in 1893 .