

= HMS X1 =

HM Submarine X1 was conceived and designed as a submersible commerce raider for the Royal Navy ; at the time of her launching she was the largest submarine in the world . The idea of a submarine cruiser had been proposed as early as 1915 , but was not put into practice until 1921 . X1 , which was based on the uncompleted German U 173 class of 2 000 ton " U cruisers " , was laid down on 2 November 1921 at the Naval Dockyard Chatham and completed on 23 September 1925 , commissioning in December 1925 .

The 1922 Washington Naval Treaty , of which Britain was a signatory , did not ban submarines but it did ban their use against merchant ships , which was X1 's unacknowledged purpose ; its armament had been designed to successfully engage the classes of vessels likely to be escorting convoys , such as destroyers and frigates . Therefore , a certain amount of secrecy surrounded X1 , the government even going to the lengths of taking a national newspaper to court over its pictures of the new submarine following her launch , all copies of the paper being seized .

= = Description = =

The X1 's 1 @-@ inch ( 25 mm ) thick pressure hull was 19 feet 7 @.@ 5 inches ( 5 @.@ 982 m ) in diameter amidships , and was divided into 10 water @-@ tight compartments . This was almost completely surrounded by her external hull , which also contained the main ballast tanks and most of her fuel . Her intended maximum diving depth was 500 feet ( 150 m ) , but was reduced to 350 feet ( 110 m ) once in service .

She was expected to sink her targets using gunfire and so was given four 5 @.@ 2 @-@ inch ( 130 mm ) guns to be able to defeat a destroyer or armed merchant ship , although she was fitted with six bow tubes for 21 @-@ inch ( 530 mm ) torpedoes to supplement her guns .

= = = Armament = = =

X1 carried four QF 5 @.@ 2 inch Mk I guns in twin unarmoured turrets , one forward and one aft of the conning tower . They had a range of about 16 @, @ 000 yards ( 15 @, @ 000 m ) . A circular trunk ran from each mounting to the magazine in the pressure hull which contained 100 rounds per gun . A working chamber which was 10 feet ( 3 @.@ 0 m ) in diameter encircled the trunk between the pressure hull and the gun mount . Her ammunition hoists were problematic and could not sustain the desired rate of fire of six rounds per gun per minute . Special ballast tanks were used to compensate for the loss of weight as ammunition was fired . Working and control of the guns required no less than 58 men . The fire @-@ control tower was in the middle of the conning tower and had a top section that could be raised 2 feet ( 0 @.@ 61 m ) when in use . The upper control room was between the tower and the pressure hull . Just aft of the control room was the rangefinding room , with a 9 @-@ foot ( 2 @.@ 7 m ) rangefinder on the bridge that could be raised 8 feet ( 2 @.@ 4 m ) .

Her six torpedo tubes came from a cancelled L @-@ class submarine and she was provided with one reload for each tube . It took some 24 minutes to reload them all because space in the torpedo room was restricted .

= = = Propulsion = = =

The main engines were two 8 @-@ cylinder Admiralty diesel engines with a total output of 3 @, @ 000 horsepower ( 2 @, @ 200 kW ) . Two auxiliary 1 @, @ 200 @-@ horsepower ( 890 kW ) MAN diesel engines taken from U @-@ 126 were installed for battery @-@ charging purposes . For underwater propulsion , two GEC electric motors of 1 @, @ 000 horsepower ( 750 kW ) each were fitted . It was hoped to achieve over 8 @, @ 000 horsepower ( 6 @, @ 000 kW ) using both diesels and electric motors together , but the highest power achieved ( during a full power trial in March 1926 ) was 7 @, @ 135 horsepower ( 5 @, @ 321 kW ) . She had three groups of batteries , each

with 110 cells weighing a total of 70 long tons ( 71 t ) . These batteries were also fitted with water filled cooling tubes , jackets , centrifugal pumps and finned heat exchangers ( the first recorded use of battery cooling ) to reduce core temperatures during aggressive charge and discharge cycles .

In theory she could make 19 @. @ 5 knots ( 36 @. @ 1 km / h ) on the surface , and at economical speed she had a greater range than normal cruisers , but both sets of diesel engines suffered from continual mechanical problems that reduced her speed and range . The X1 's average diving time ( to periscope depth ) was 2 minutes 20 seconds . Her handling underwater was considered superior to other submarines of the period .

= = Career = =

After X1 was commissioned in December 1925 and accepted in April 1926 she made a voyage to Gibraltar after which her main engine drive wheels were found to be damaged . After repairs she was sent to the Mediterranean Sea . Her starboard camshaft driveshaft broke during a full @-@ power run in January 1928 and a new set of gears was needed , but after refitting at Malta her port camshaft driveshaft broke in the same place in April 1928 . By 1930 her commanding officer reported " internal arrangements not very satisfactory because of overcrowding with auxiliary machinery , accommodation is cramped , ventilation poor and the ship suffers from humidity , diving arrangements good . " Both the main and auxiliary engines were troublesome and she spent most of her time under repair , before being laid up . X1 was placed in reserve after 1930 , before she was finally scrapped at Pembroke on 12 December 1936 .