

TOWN CLASS LIGHT CRUISER

FEATURE ARTICLE

written by
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For



KEY INFORMATION

Country of Origin:	Great Britain.
Manufacturers:	Devonport Dockyard (Plymouth), Scotts (Greenock), Vickers-Armstrong (Tyne), John Brown (Clyde)
Major Variants:	Southampton class, Liverpool class, Edinburgh class
Role:	Reconnaissance, commerce protection, convoy escort
Operated by:	Royal Navy
First Laid Down:	October 1934
Last Completed:	November 1937
Units:	<i>HMS Southampton, HMS Newcastle, HMS Sheffield, HMS Glasgow and HMS Birmingham</i>

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INTRODUCTION

Cruisers were formally defined in the 1930 London Treaty as “*Surface vessels of war, other than capital ships or aircraft carriers, the standard displacement of which exceeds 1,850 tons (1,880 metric tons), or with a gun above 5.1 inch (130 mm) calibre*”. These were further sub-divided in to two sub classes: heavy cruisers, which carried guns between 6.1 inches (155 mm) and eight inches (203 mm), and light cruisers with guns of six inches (152 mm) or below. The Southampton class cruiser is a light cruiser.

The original variants of the Town class cruisers were the Southampton class ships. Five Southampton class cruisers were built by Great Britain (*HMS Southampton, HMS Newcastle, HMS Sheffield, HMS Glasgow and HMS Birmingham*), entering service just prior to the start of the Second World War. All apart from *HMS Southampton* survived the war, although all of the ships were damaged in action. The design was updated for the Liverpool class (*HMS Manchester, HMS Gloucester and HMS Liverpool*), then again for the Edinburgh class (*HMS Belfast and HMS Edinburgh*). Three of these five ships were lost.

Despite being designated as light cruisers, the advantage of firepower between the heavy and light cruisers did not always lie in ships with the bigger guns. In particular, the heavier eight inch gun took longer to reload, and because of this the six inch guns could put a heavier weight of shell out per minute than the eight inch guns. This was offset by the increased range of the eight inch guns. This meant that with good visibility the advantage clearly went to the heavy cruiser, with its ability to severely damage a light cruiser before it could get in range to use its guns. However in conditions of poor visibility, or at night, the increased range was of no benefit, and the light cruiser was at an advantage as its faster-firing weapons could inflict more damage in a shorter period of time.

Overall, the Town class was seen to be a success, with proven ability to stay afloat and continue to fight after sustaining considerable damage, effective main guns, adequate armour and sufficient speed - all the qualities of a good cruiser. In common with all ships of their time the Southampton class was shown to be initially lacking in air defence, although as the war progressed significant improvements were made to the anti-aircraft guns and this deficiency was rectified.

DEVELOPMENT

In 1922 the Washington Treaty placed limitations on aircraft carriers and on the number of ships over 10,000 tons displacement ('capital ships'). Ships below 10,000 tons were only limited by the size of the guns, which was fixed at a maximum of eight inches (203 millimetres). Further limitations were imposed in the 1930 London Treaty, putting a cap on the total tonnage of cruisers for the first time. In addition, the total number of heavy cruisers were limited to 15 for Britain.

The Southampton class cruiser was conceived as a light cruiser to fit within the limits set by the 1930 treaty. Under heavy criticism, twelve six inch (152 mm) guns (in four turrets) were selected as the main weapons. Pressure to increase this to 15 guns (to match the Japanese Mogami class and the American Brooklyn class) was resisted, on the grounds that this would break the 10,000 ton limit set by the treaties, although given the generally liberal interpretation of ship displacement by other powers the refusal appears strange. Under normal operating conditions the guns could fire eight rounds per minute each, and had a maximum range of approximately 25,500 yards (23,317 metres). Each round weighed 112 pounds (50.8 kg), and (unlike the rounds for eight inch guns) could be manually handled in the event of power failure.

Armour for the ships was chosen to provide some protection against the eight inch shells fired by heavy cruisers (which the Southampton class might be expected to fight), although they could not be expected to withstand the much heavier guns of capital ships.

Aircraft were provided for a reconnaissance role, and having experienced problems in other ships maintaining aircraft in an air-worthy condition the ships were fitted with two aircraft hangars - the first British cruisers to be so equipped. The aircraft were launched by catapult from the ship, and were recovered by crane after landing on the water. The chosen aircraft was the Supermarine Walrus, which was a single engine amphibious biplane. It had a crew of four and a maximum speed of 135 miles per hour (217 kilometres per hour). It was armed with one 0.303 inch (7.7 mm) machinegun in the front (in an open position in front of the cockpit), one or two 0.303 inch (7.7 mm) machineguns in the aft dorsal position (again in an open position), and could carry 600 pounds (272 kg) of bombs or depth charges.

Eight four inch (102 mm) guns were chosen for dual purpose air defence and short range weaponry, and had a rate of fire of 20 rounds per minute. These were supplemented with two four barrelled pom-poms, which were a cut down version of the eight barrelled weapon fitted to larger ships. These guns fired 115 rounds per minute per barrel, and were effective out to 1,100 metres (1,203 yards). Finally, eight 0.5 inch (13 mm) machineguns were installed in two mounts of four guns each, although these were found to be prone to jamming. The pre-war lack of appreciation of the threat posed by aircraft can be seen in this light selection of anti-aircraft weaponry.

Torpedo tubes were provided in case the vessel had to go in to action against a capital ship, which could be expected to withstand six inch (152 mm) guns.

During the war changes were continually made to the vessels to meet the needs of the areas where they were operating in at the time, to keep up to date with technological developments and to reflect war experience. By early 1941 no two ships mounted the same equipment, and by the end of 1941 there were no unmodified Southampton class cruisers. The development of each ship through the war is shown in the table at the end of this document. [Note: only significant modifications have been shown].

The threat posed by aircraft can be clearly seen by the rapid increase in anti aircraft armament. The installation of radar made the aircraft obsolete, and their removal considerably reduced the potential for fire when under attack.

VARIANTS

Two other variants of the Town class Cruisers were produced - the Liverpool and the Edinburgh classes. The Liverpool class (comprising *HMS Manchester*, *HMS Gloucester* and *HMS Liverpool*) were converted during building from the Southampton class by slightly increasing the breadth of the vessel, adding a small quantity of extra armour, and providing a more powerful propulsion system to overcome the extra weight. They also had better fire control (including a second director aft for both low angle and high angle), although the ships were essentially little changed from the Southampton class.

The Edinburgh class (comprising *HMS Edinburgh* and *HMS Belfast*) were designed from the keel up as an improvement on the Liverpool class. The initial intention was to provide four turrets each with four six inch guns, with improvements to the ammunition handling facilities for the main guns. Other changes in internal arrangement were made, although the final benefit achieved was questionable. Eventually, due to development difficulties associated with the quadruple mounts and fears that further delay may result in the ships being limited in a forthcoming naval treaty, it was decided to retain the triple mounts. Four additional four inch guns were also provided, to improve the anti-aircraft capability.

As with the Southampton class, ships of the Liverpool and Edinburgh classes were considerably modified during the war, particularly with respect to anti-aircraft weaponry.

OPERATIONAL USE

The main objective of the Royal Navy was to protect the British merchant fleet, and the navy was intended to meet the enemy fleet at sea and destroy it before it could do significant harm to merchant shipping (the Admiralty spent much of the pre-war years planning for 'the next Jutland', although the enemy was now seen to be the Japanese rather than the Germans). Cruisers were intended to act in a reconnaissance role in support of capital ships and to neutralise enemy cruisers. They were designed to mix speed with range, endurance and firepower, and were expected to be able to out-run any ship they could not out-fight.

As the war progressed cruisers began to see use in roles outside those initially intended. In particular they saw extensive use in convoy escort, specifically to provide increased protection against air attack with their anti-aircraft capability. Their usefulness in air-defence was recognised quickly, although a specialised anti-aircraft ship (a converted merchant ship which mounted the same anti-aircraft armament as a cruiser) was developed to replace the cruiser in this role. Further use was found in shore bombardment in support of allied landings.

Cruisers had no role to play in anti-submarine warfare as their advantages of speed, armour and firepower were irrelevant.

The Southampton class cruisers saw wide use in many parts of the world: as part of the Home Fleet they were present during the Norway campaign at the start of the war; acted as convoy escorts in the North Atlantic and were involved in the hunt for the Bismarck; worked with Force D, Force H and as convoy escorts in the Mediterranean; hunted for blockade runners and escorted convoys in the South Atlantic; supported the Burma campaign and protected shipping in the Indian ocean, including sinking tankers supporting German Uboats; acted as a flagship; supported the Normandy invasion.

The only ship of the Southampton class to be lost was *HMS Southampton*. Whilst serving in the Mediterranean in 1941 the ship was heavily damaged in an air attack on January 10th. Although still afloat the decision was made to sink her, and she was dispatched by torpedoes from *HMS Gloucester* and *HMS Orion* on January 11th.

The other variants fared less well. The Liverpool class served in the Mediterranean, where two of the three were lost (*HMS Gloucester* was sunk by air attack and *HMS Manchester* was scuttled after being badly damaged by E-boats). Of the Edinburgh class, *HMS Belfast* broke her back after passing over a mine in November 1939 (she didn't return to service until November 1942, escorting the Russia convoys), and *HMS Edinburgh* was deliberately sunk by a torpedo from *HMS Foresight* after being torpedoed whilst escorting a Russia convoy (twice initially by *U456*, then once again by the German destroyer *Z24* two days later).

Thus, of the 10 Town class ships, one was sunk by enemy action, three were deliberately sunk after sustaining heavy damage, and six survived the war.

After the war the surviving ships were modernised and continued in service for some time (*HMS Sheffield* being the last to exit service, in 1967, after serving as the flagship of the Reserve Fleet), with both *HMS Birmingham* and *HMS Belfast* taking part in the Korean war.

SPECIFICATIONS (AS-BUILT)

	Southampton Class	Liverpool Class	Edinburgh Class
Displacement	9,100 tons standard 11,200 tons full load	9,400 tons standard 11,650 tons full load	10,565 tons standard 12,980 full load
Length (OA)	591 feet 6 inches (180.29 m)	591 feet 6 inches (180.29 m)	613 feet 6 inches (186.99 m)
Length (pp)	558 feet (170.08 m)	558 feet (170.08 m)	579 feet (176.48 m)
Length (WL)	584 feet (178.0 m)	Not available	Not available
Beam	62 feet 3 inches (18.97 m)	64 feet 9 inches (19.74 m)	64 feet 9 inches (19.74 m)
Draft (Standard)	17 feet (5.18 m)	17 feet 6 inches (5.33 m)	18 feet (5.49 m)
Draft (Full Load)	20 feet (6.10 m)	20 feet 6 inches (6.25 m)	22 feet 6 inches (6.86 m)
Block Coefficient	0.54 full load	0.52 ^[Note 1]	0.51 ^[Note 1]
Propulsion	75,000 SHP (55.9 MW)	82,500 SHP (61.5 MW)	80,000 SHP (59.7 MW)
Speed	32 knots 30.5 knots full load	32 knots 30.5 knots full load	32 knots 31 knots full load
Weapons			
Main Guns	12 x 6 inch (152 mm) in 4 turrets	12 x 6 inch (152 mm) in 4 turrets	12 x 6 inch (152 mm) in 4 turrets
Other Guns	8 x 4 inch (102 mm) high angle guns in 4 mounts 8 x 2 pound (0.91 kg) pom-poms in two mounts 8 x 0.5 inch (13 mm) machine guns in two mounts	8 x 4 inch (102 mm) high angle guns in 4 mounts 8 x 2 pound (0.91 kg) pom-poms in two mounts 8 x 0.5 inch (13 mm) machine guns in two mounts	12 x 4 inch (102 mm) high angle guns in 6 mounts 8 x 2 pound (0.91 kg) pom-poms in two mounts 8 x 0.5 inch (13 mm) machine guns in two mounts
Torpedo Tubes	6 x 21 inch (533 mm) torpedo tubes in two mounts	6 x 21 inch (533 mm) torpedo tubes in two mounts	6 x 21 inch (533 mm) torpedo tubes in two mounts
Armour			
Side Belt	4.5 inches (114 ,m)	4.5 inches (114 ,m)	4.5 inches (114 ,m)
End Bulkheads	2.5 inches (64 mm)	2.5 inches (64 mm)	2.5 inches (64 mm)
Magazine	1 to 4.5 inches (25 to 114 mm)	1 to 4.5 inches (25 to 114 mm)	3 to 4.5 inches (76 to 114 mm) ^[Note 2]
Barbette	1 to 2 inches (25 to 51 mm)	1 to 2 inches (25 to 51 mm)	1 to 2 inches (25 to 51 mm)
Turret	1 to 2 inches (25 to 51 mm)	1 to 2 inches (25 to 51 mm)	2 to 4 inches (51 to 102 mm)
Machinery	1.25 to 1.5 inches (32 to 38 mm)	1.25 to 1.5 inches (32 to 38 mm)	1.25 to 2 inches (32 to 51 mm)
Miscellaneous			
Aircraft ^[Note 3]	2 Supermarine Walrus	2 Supermarine Walrus	2 Supermarine Walrus
Compliment	750 (peace) 930 (war)	800 (peace) 980 (war)	781 (peace) 950 (war)

Note 1: Good approximation, although the waterline length unknown.

Note 2: The box citadel approach used in the Southampton and Liverpool classes was abandoned in favour of an extension of the side belt.

Note 3: Up to three aircraft could be carried, although one must remain on deck. There is no known case of three aircraft being carried on any of these ships.

MAJOR MODIFICATIONS

Modifications Up To 1941

Ship	Modifications In Year (Items Added And Removed In The Same Year Are Not Included)			
	Pre-war	1939	1940	1941
<i>HMS Southampton</i>	None known	None known	None known	None (Sunk Jan 11)
<i>HMS Newcastle</i>	None known	None known	None known	Added: 9 single 20mm AA Surface warning radar Air warning radar Removed: Machineguns
<i>HMS Sheffield</i>	Added: Third HA DCT. Air warning radar Removed: Aft control position and rangefinder.	None known	None known.	Added: 6 single 20mm AA Air warning radar Ranging radar fitted to LA DCT Air ranging radar fitted to HA DCT Removed: Machineguns
<i>HMS Glasgow</i>	None known.	None known	Added: Air warning radar.	None known.
<i>HMS Birmingham</i>	Added: Third HA DCT. Removed: Aft control position and rangefinder.	None known	None known	None known

Modifications 1942-1945

Ship	Modifications In Year (Items Added And Removed In The Same Year Are Not Included)			
	1942	1943	1944	1945
<i>HMS Southampton</i>	N/A (sunk)	N/A (sunk)	N/A (sunk)	N/A (sunk)
<i>HMS Newcastle</i>	<p>Added: 10 single 20mm AA Surface ranging radar fitted to LA DCT. Air ranging radar fitted to HA DCT. Air ranging radar fitted to pom-pom directors.</p> <p>Upgraded: Air warning radar</p> <p>Removed: Aircraft and catapult</p>	<p>Added: 4 twin 20mm AA.</p> <p>Removed: 6 single 20mm AA</p>	None known	<p>Added: 2 x 4-barrel pom-poms</p> <p>Removed: X turret</p>
<i>HMS Sheffield</i>	<p>Added: 3 single 20mm AA Surface warning radar Air ranging radar fitted to pom-pom directors Barrage directors fitted with radar provided for main guns.</p> <p>Upgraded: Air warning radar</p>	<p>Added: 5 single 20mm AA.</p>	<p>Added: 8 single 20mm AA</p> <p>Removed: Aircraft and catapult</p>	<p>Added: 4 x 4 barrel 40mm 10 twin 20mm AA</p> <p>Upgraded: Surface warning radar.</p> <p>Removed: X turret 15 single 20mm AA</p>

Ship	Modifications In Year (Items Added And Removed In The Same Year Are Not Included)			
	1942	1943	1944	1945
<i>HMS Glasgow</i>	<p>Added: 4 single 20mm AA 8 twin 20mm AA Surface warning radar Surface ranging radar fitted to LA DCT. Air ranging radar fitted to HA DCT. Air ranging radar fitted to pom-pom directors.</p> <p>Upgraded: Air warning radar.</p> <p>Removed: Machineguns</p>	<p>Added: 2 single 20mm AA.</p>	<p>Added: 4 single 20mm AA.</p>	<p>Added: 2 twin 20mm AA 4 single 20mm AA 2 x 4 barrel pom-poms 4 single barrel pom-poms General warning radar (air and surface use).</p> <p>Upgraded: Air warning radar Surface ranging radar.</p> <p>Removed: X turret Aircraft and catapult Surface warning radar</p>
<i>HMS Birmingham</i>	<p>Added: 7 single 20mm AA Air warning radar Surface ranging radar fitted to LA DCT.</p> <p>Removed: Machineguns</p>	<p>Added: 8 twin 20mm AA. Surface warning radar</p> <p>Upgraded: Air warning radar.</p> <p>Removed: Aircraft and catapult 5 single 20mm AA</p>	<p>Added: 4 x 4 barrel 40mm AA 2 x twin 20mm AA 5 x single 20mm AA</p> <p>Removed: X turret.</p>	<p>None known.</p>

APPENDIX A: SURVIVING EXAMPLES



HMS Belfast is the only surviving example of a Town class cruiser. She is moored on the Thames in London, near to Tower Bridge. At the time of writing she could be viewed from 10 am - 6pm (last admission 5.15pm) seven days per week from March to October, and from 10 am - 5pm (last admission 4.15pm) from November to February. The ship is closed 24-26 December.

The ship was extensively altered post-war, and some of the equipment has been removed, however the ship remains in essence the same as the cruiser which fought through the Second World War.



Many of the internal compartments are open to the public, including the forward magazines (upper magazines, containing the shells), the forward engine room (providing power for the outer propellers), forward upper mess deck, the superstructure and some other forward areas in the hull.

The upper left photo shows a view of the shell hoists in the forward magazine ('A' magazine). Shells went from here to 'A' turret. Below this magazine is the cordite magazine, which is not open to the public.



Below this photo are the controls for flooding 'B' magazine, located in 'A' magazine to the left of the door to 'B' magazine. The large wheel is for activating sprinklers, whilst the smaller wheel is for rapid flooding.

The top right photo shows a view of some of the instruments within the turret, and below this is a view of the breech of a six inch gun within a turret.

Below that is a view of the engine room. The wheel closest to the camera controls power astern, the middle wheel controls power ahead, and the far wheel controls power to the cruising turbine. On the far wall can be seen the engine telegraph, and the bottom left photograph shows a close up of a similar telegraph.



The final picture, on the bottom right, shows the navigating bridge.

APPENDIX B: PRODUCTION FIGURES

Ship	Builder	Laid Down	Launch	Completed	Left Service	Fate
Southampton Class						
<i>HMS Birmingham</i>	Devonport Dockyard (Plymouth)	Jul-1935	Sep-1936	Nov-1937	Sep-1960	Scrapped
<i>HMS Glasgow</i>	Scotts (Greenock)	Apr-1935	Jun-1936	Sep-1937	Jul-1958	Scrapped
<i>HMS Newcastle</i>	Vickers-Armstrong (Tyne)	Oct-1934	Jan-1936	Mar-1937	Aug-1959	Scrapped
<i>HMS Sheffield</i>	Vickers-Armstrong (Tyne)	Jan-1935	Jul-1936	Aug-1937	Sep-1967	Scrapped
<i>HMS Southampton</i>	John Brown (Clydebank)	Nov-1934	Mar-1936	Mar-1937	Jan-1941	Heavily damaged by aircraft from II/StG2. Deliberately sunk by torpedoes from <i>HMS Gloucester</i> and <i>HMS Orion</i> (154nm ESE of Malta in the Mediterranean)
Liverpool Class						
<i>HMS Manchester</i>	Hawthorn Leslie (Hebburn)	Mar-1936	Apr-1937	Aug-1938	Aug-1942	Heavily damaged by Italian torpedo boat (either <i>Ms16</i> or <i>Ms22</i>). Scuttled (4nm E of Kelibia, in the Mediterranean)
<i>HMS Gloucester</i>	Devonport Dockyard (Plymouth)	Sep-1936	Oct-1937	Jan-1939	May-1941	Sunk by aircraft from StG2, I/LG1 and II/LG1 (10nm W of Antikithera Island, in the Mediterranean)
<i>HMS Liverpool</i>	Fairfield (Govan)	Feb-1936	Mar-1937	Nov-1938	Jul-1958	Scrapped
Edinburgh Class						
<i>HMS Belfast</i>	Harland & Wolff (Belfast)	Dec-1936	Mar-1938	Aug-1939	Aug-63	Museum ship, moored in the Thames in London
<i>HMS Edinburgh</i>	Swan Hunter (Wallsend)	Dec-1936	Mar-1938	Jul-1939	May 1942	Torpedoed first by submarine <i>U456</i> then by destroyer <i>Z24</i> . Deliberately sunk by a torpedo from <i>HMS Foresight</i> (120nm ENE of North Cape, Norway).