The Champion Submarine-Killing Submarine of World War Two

Tour Booklet for the

U.S.S. BATFISH (SS 310)

Sinking three enemy submarines within 76 hours

USS Batfish Submarine and War Memorial Park Museum

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A Brief History of the USS Batfish (SS310)

Captains of the USS Batfish

Wayne R. Merrill,
Patrols 1 - 2

John K. Fyfe,
Patrols 3 - 6

Walter L. Small, Jr.,
Patrol 7

War Patrol Summary

War Patrol #1: Departed Pearl Harbor on Dec. 11 1943 and headed towards Honshu, Japan. Due to adverse weather, no offensive operations were launched until mid-January. On the night of Jan. 19, 1944, **Batfish** fired torpedoes at a convoy of four ships scoring hits on two freighters and sinking the cargo ship *Hidaka Maru*. Arrived at Midway on Jan. 30, 1944.

War Patrol #2: Departing on Feb. 22, 1944, **Batfish** again headed for Honshu, Japan. After 53 days and without firing a single torpedo, the **Batfish** returned to Pearl Harbor on Apr. 15, 1944.

War Patrol #3: With a new commander, **Batfish** departed Pearl on May 26, 1944 headed for the area south of Shikoku, Honshu and Kyushu. Shortly after reaching station, a Japanese training vessel was spotted and sunk. On June 18, a cargo ship was sunk. Four days later, **Batfish** fired a spread of 4 torpedoes at another cargo ship. With 2 hits, the target sank quickly. On July 1, **Batfish** battle-surfaced and, with her deck gun, sunk a trawler and an escort vessel. Arrived at Midway on July 7.

War Patrol #4: Departed for the Caroline Islands on July 31, 1944. On Aug. 23, **Batfish** torpedoed a Fubuki-class destroyer. Three days later, another Fubuki-class destroyer, the *Samidare*, was sunk. Arrived Freemantle, Australia on Sept. 12, 1944

War Patrol #5: Departed October 8, 1944 and headed for the South China Sea. On Oct. 19, with a spread of three torpedoes, **Batfish** attacked a cargo ship with 2 escorts missing the cargo ship, but sinking 1 of the escorts. On Nov. 11, Batfish entered San Fernando Harbor and torpedoed 2 ships at anchor, damaging one and sinking the other. Working in a wolf pack with *RAY* and *RATON* three days later, Batfish attacked a 4-ship convoy, sinking a cargo ship and a destroyer escort. Arrived at Pearl on Dec. 1, 1944.

War Patrol #6: Departing for her most famous war patrol on Jan. 10, 1945, **Batfish** headed for the South China Sea and Luzon Straits. **Batfish** began this patrol by attacking an armed landing craft with her deck gun. On Feb. 10, lookouts spotted and sank the first of 3 enemy submarines. In a little more than three days (76 hours), **Batfish** sank 3 Japanese submarines (*RO-115, RO-112*, and *RO-113*). Sinking an enemy submarine is strenuous and demanding task, but three? **Batfish** stands alone. **Batfish** ended this historical patrol at Guam on Feb. 21, 1945. From there, she was ordered to San Francisco for a major overhaul.

War Patrol #7: The final patrol of the war started on June 26, 1945. Leaving Pearl, her mission was to stand lifeguard for downed American aviators. Restless, Captain Small initiated a shelling barrage on a village of Yaku Shima causing considerable damage. On July 29, **Batfish** rescued 3 downed aviators and transferred them to Iwo Jima on August 4. Arrived Midway on August 22, 1945. Shortly afterwards was ordered to the United States.

U.S.S. Batfish (SS 310) War Patrol Results Summary

PATROL	TORPEDOES FIRED	HITS	SUNK (OFFICIAL)	TONNAGE (OFFICIAL)	SHIPS DAMAGED
1	8	5	2 (1)	15,700 (5,486)	None
2	0	0	0 (0)	0 (0)	None
3	16	4	5 (3)	9,500 (1,251)	None
4	9	5	2 (2)	2,900 (2,333)	None
5	21	5	3 (0)	5,300 (0)	1 - 4,000 AK
6	17	5	3 (3)	4,500 (3,262)	1 - 200 LBV
7	0	0	0 (0)	0 (0)	None
TOTALS	**71**	**24**	**15 (0)**	**37,900 (12,332**	**2 - 4,200 tons**

U.S.S. Batfish (SS 310) War Patrol Results Awards

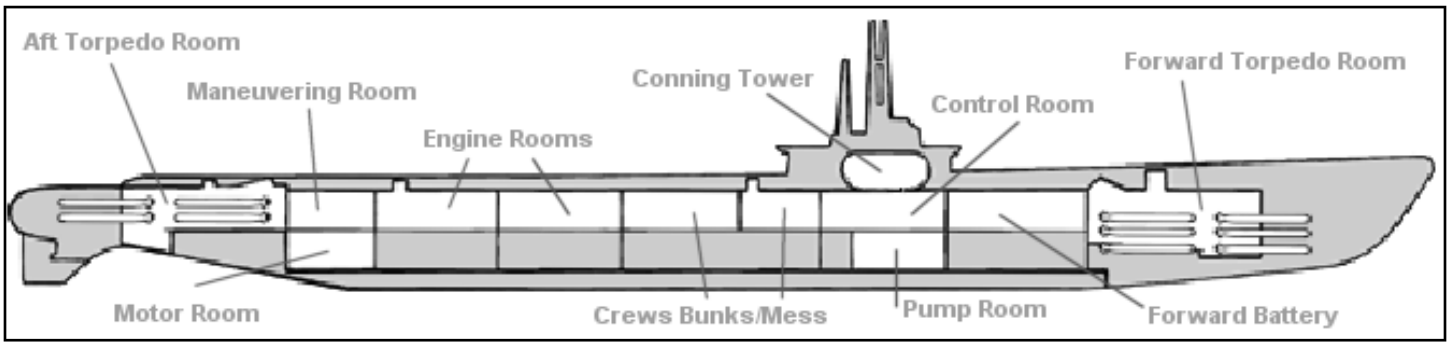
10 Bronze Star Medals, 9 Battle Stars, 4 Silver Star Medals, 1 Navy Cross, 1 Presidential Unit Citation

U.S.S. Batfish (SS 310) Statistics

Class	Balao
Armament	10-21 inch torpedo tubes (carried 24 torpedoes), 20mm and 40mm guns, 4” or 5” deck guns
Crew	~ 80 men
Length	311’ 6”
Beam	27’ 3”
Height	47’ 3.5”
Mean Draft	15’ 3”
Displacement	1,526 tons surfaced, 2,3 91 tons submerged
Range	10,000 miles (standard speed)
Speed Submerged	Maximum of 10 knots (for ~ 30 minutes)
Launched	May 6, 1943 - Portsmouth Naval Yard
Sponsored By	Mrs. A. J. Fortier
Commissioned	August 21, 1943 - LCDR W. R. Merrill
Decommissioned	April 6, 1946 - Mare Island Naval Yard
Re-Commissioned	March 7, 1952
Decommissioned	November 1, 1969
Struck from Navy List	February 28, 1972
Museum	May 7, 1972 - Arrived at Port of Muskogee

Internal Tour

Interior Tour: The cutaway below represents the interior of a Balao-class submarine, such as the BATFISH. The tour booklet starts in the forward torpedo room and works to the back of the sub, ending in the aft torpedo room. Following that is an overview of the outside of the submarine.

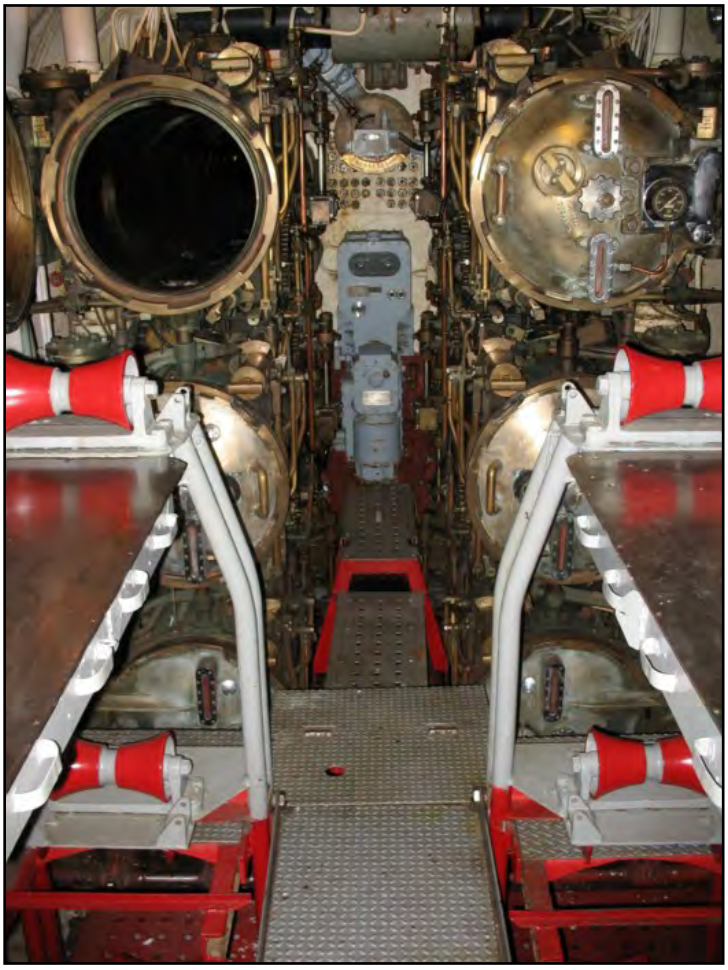


On Patrol, somewhere in the Pacific

Forward Torpedo Room

Used for storing and firing torpedoes. At the forward end of the torpedo room are the doors of six impulse type torpedo tubes, 21 inches in diameter and 21 feet long. The compartment stored a total of sixteen torpedoes – six in the tubes and ten in the room. It had heavy storage racks on both sides, stacked two high, for eight of the torpedoes. The room's removable deck plates allowed the other two torpedoes to be stored under the deck. The Batfish would take a total of 24 torpedoes on patrol, 16 of them being in the forward torpedo room.

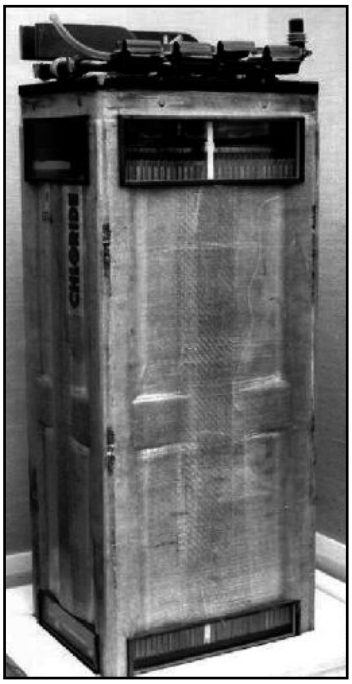
This area also provided bunk space for the torpedomen. Some of the crew's bunks filled space above and below the stacked torpedoes. Other bunks hung from the overhead and the remainders were on the starboard side, in the torpedo-loading pit.



The forward room incorporated an escape hatch and supply of Momson lungs, to provide means for the crew to escape from the submerged submarine in case of an emergency. In the aft part of the room, on the starboard side, is a shower and toilet that was used mainly by the officers.

Forward Battery Room

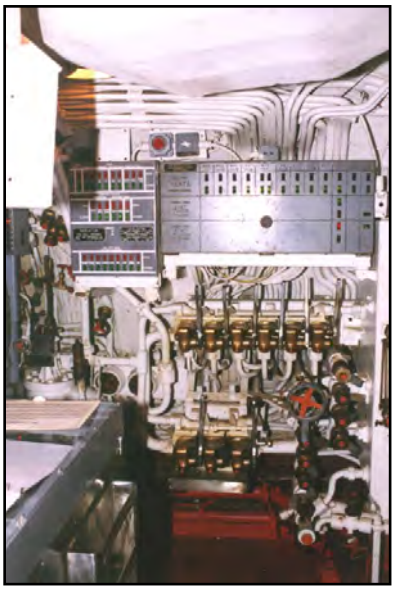
Through a water-tight door in the aft bulkhead of the torpedo room is the forward battery. This compartment is divided in two by a watertight deck. Below the deck was the forward half of the storage battery (126 large, lead-acid type electric cells, stored in the space below the deck plates, gave the compartment its name). Each cell was about four feet tall. They were connected in series by a set of lead-coated copper intercell connectors and to the main propulsion cubicle by a set of large copper busbars and cables.



The officers' quarters, above the deck plates provided cabins for both the commissioned officers and the chief petty officers. The forward end of the compartment was working space for the two Stewards Mates. Their small work area included a coffee urn, storage drawers, food warmers and the like. The captain was the only officer who had a private cabin; all others shared sleeping rooms. All officers shared the single head in the compartment. The wardroom, where the commissioned officers ate and met, contained a table, bunks and movable chairs. The ship's yeoman had a tiny office on the starboard side, at the aft end of the compartment. He was the enlisted man who maintained all of the ship's records.

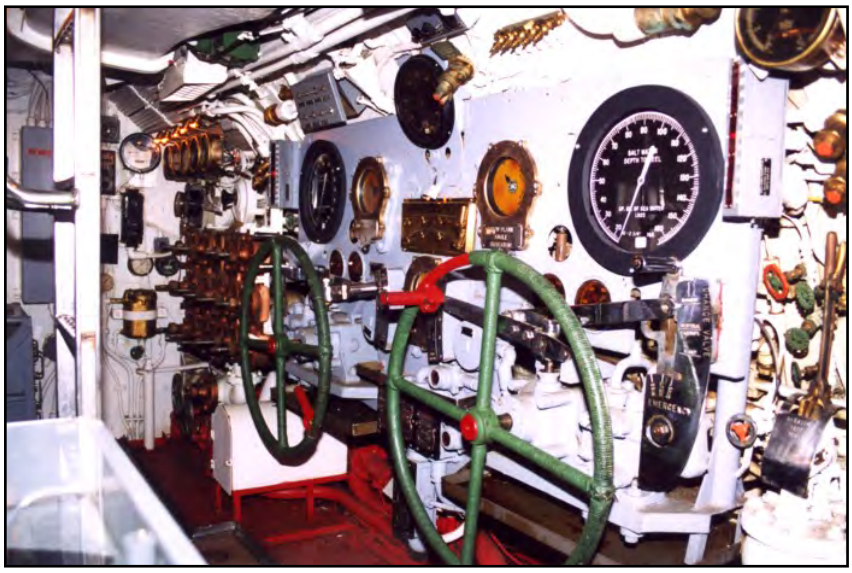
Control Room

Through the next watertight door is the control room. This compartment contained all the controls used during submerged operations, including the submergence ready light panel (Christmas tree - photo to right), bow plane and stern plane controls (bottom photos), inclinometer, depth gauges and hydraulic manifold.



It also contained other critical facilities such as the ship's master and auxiliary gyrocompasses, an auxiliary steering position, SD radar, IFF interrogator, and the IFF transponder. The pump room is below the control room deck plates. It contained hydraulic pumps, air compressors, the trimming pump, and other small pumps and equipment.

On the aft end of the compartment is the radio room. Barely large enough to allow two operators, this room contains (or contained) all the radio transmitters and receivers.

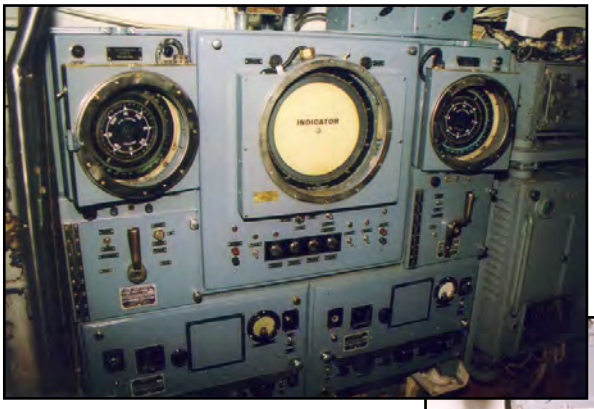


Conning Tower

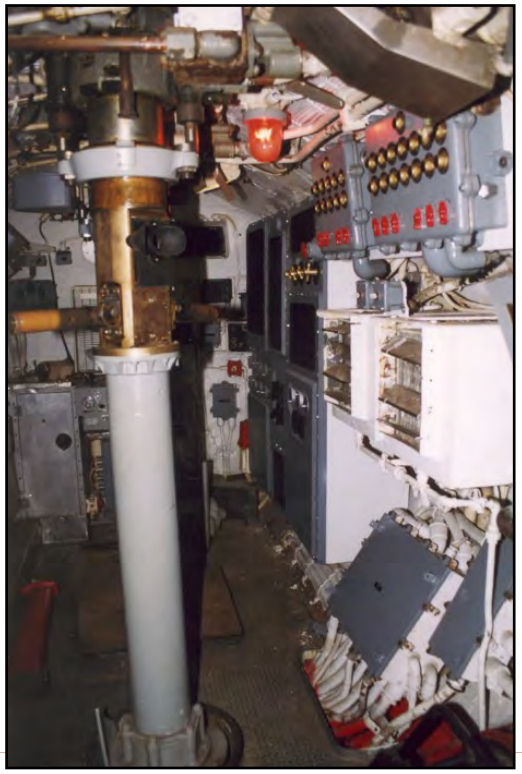
Above the control room is a small, 10 foot diameter, 20 foot long cylindrical compartment. This small room is where the officer of the deck (OOD) conned the boat while submerged.

This room contained ship controls (steering, motor speed annunciator, 1MC, etc.), torpedo controls (TDC, firing console, etc.), and detection equipment (two periscopes, SJ radar, sonar, etc.). A watertight hatch, below foot level on the forward port side of the compartment, led down into the control room by a vertical ladder. Another watertight hatch on the forward starboard side led upward by way of another vertical ladder to the bridge.

Attack periscope (foreground) and observation periscope (background) looking forward



SONAR console (above) and RADAR unit (right), starboard side bulkhead. Far right, view along port side bulkhead. Firing panel and A/C units in foreground, and mock TDC in background, look aft.



Crews Mess / Quarters / Aft Battery

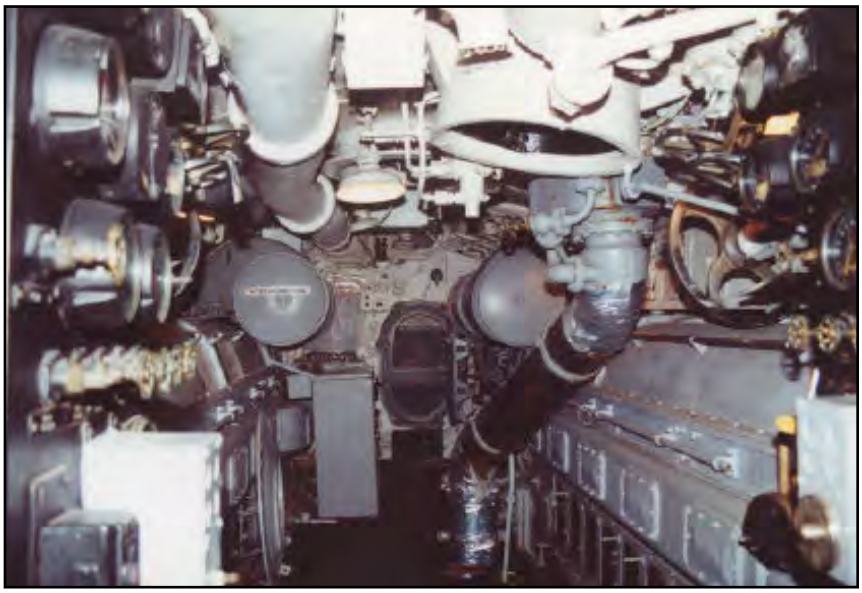
Continuing aft through another watertight door is the aft battery, that also derived its name from the battery of 126 lead-acid type electric cells stored in the space below its deck plates. The forward end of the compartment, above the deck plates, contained the ship's galley. The cooks prepared food for the entire ship's company there. Immediately aft of the galley was the crew's mess hall, containing four fixed tables, with stationary benches on each side. The room seated a total of twenty-four men. Below the mess area is the ammunition stowage magazine and food storage space.

Aft of the mess hall was the crew quarters. It contained a total of thirty-six stainless steel framed bunks, stacked in four rows running fore and aft. The crew's duty assignments while at sea were four hours on watch and eight hours off watch, thus there was always someone sleeping. The chief of the boat assigned some bunks to more than one person (known as "hot bunking"), since there were not enough bunks for every member of the crew. That meant that men from different watch times were assigned to the same bunk. A metal door at the after end of the sleeping space was the entry into the crew's head area. It contained two stalls with heads; two stall showers and two washbasins. It also held an automatic laundry machine.

Forward & Aft Engine Rooms

Through another watertight door was the forward engine room. Both engine rooms were nearly identical with two diesel engines occupying much of the space. A walking deck ran down the center of the room and a watertight bulkhead separated the forward and aft engine rooms.

Each of these compartments contained two diesel main engines. Each of the engines were directly coupled to a high-powered electrical generator. Output from the engine-driven generators provided electrical power to operate the electrical propulsion motors in the motor room when the boat was operating on the surface. While on the surface, the generators charged the batteries. In the aft engine room, below deck level was a small auxiliary diesel engine ("dinky"). It performed as a low power substitute for any main engine and could be used to charge the batteries if all the other engines were being used for propulsion. The forward engine room duplicated the aft engine room, except that the forward had a small machine shop in place of the "dinky".



Maneuvering Room

Sandwiched between the aft engine room and the aft torpedo room is a small watertight compartment called the maneuvering room. Occupying the majority of this space is the main propulsion control cubicle, a perforated stainless steel box that measured 8 or 10 feet on a side. The cubicle was shock-mounted; suspended by springs located at the edges and corners, to isolate the enclosed switches from the potentially disastrous effects of depth charges. The cubicle routed electricity from each of the 4 main engines (and the dinky) and the forward and aft storage batteries to connections for the main propulsion motors.

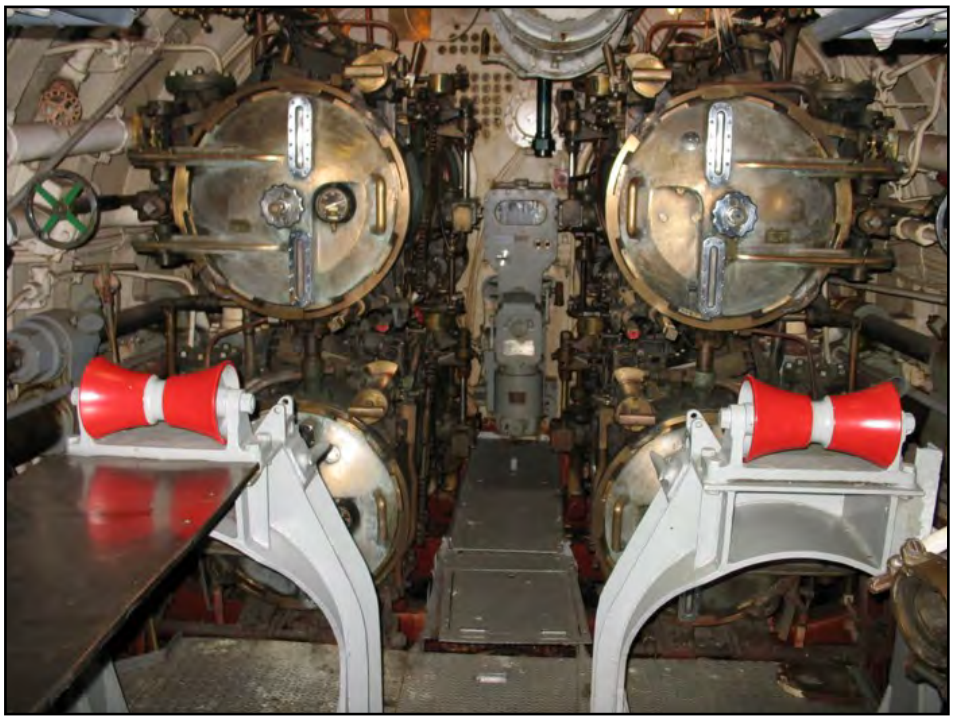
The two large electric motors in the motor room (below the main deck) propelled the submarine both on the surface and when submerged. Each motor drove a separate screw (propeller) through a rotary speed-reduction gear. The motors derived their electrical power from the diesel engine-driven electrical generators while the boat was on the surface. While submerged, power came from the electric batteries in the forward and after battery compartments.

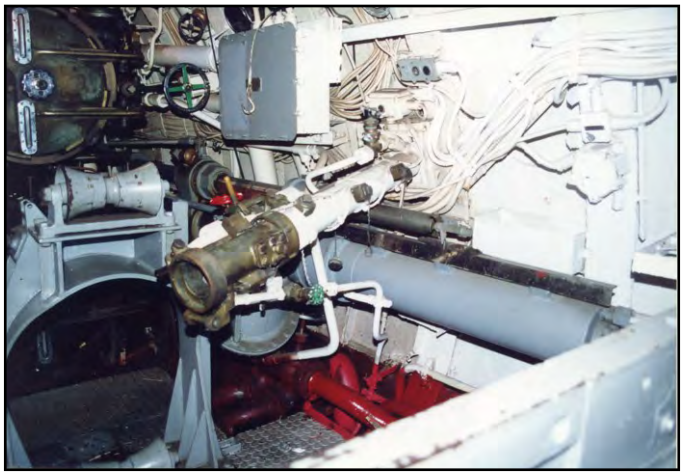
Huge electrical switches, needed to accomplish the change-over from generator to battery power and to establish the charging of batteries by the generators, were located in the cubicle. Two controllermen actuated the switches from the “maneuvering panel” that was aft of the cubicle, at the after end of the compartment. The controllermen adjusted individual motor speeds as ordered.

Aft Torpedo Room

Through the watertight door in the aft of the maneuvering room is the aft torpedo room. This compartment was very similar to the forward room, except it was smaller. Like the forward torpedo room, this area contains 4 torpedo tubes and had 8 torpedoes stored here during patrols. Four torpedoes were stored in the tubes and four other torpedoes were stored out in the room on loading racks.

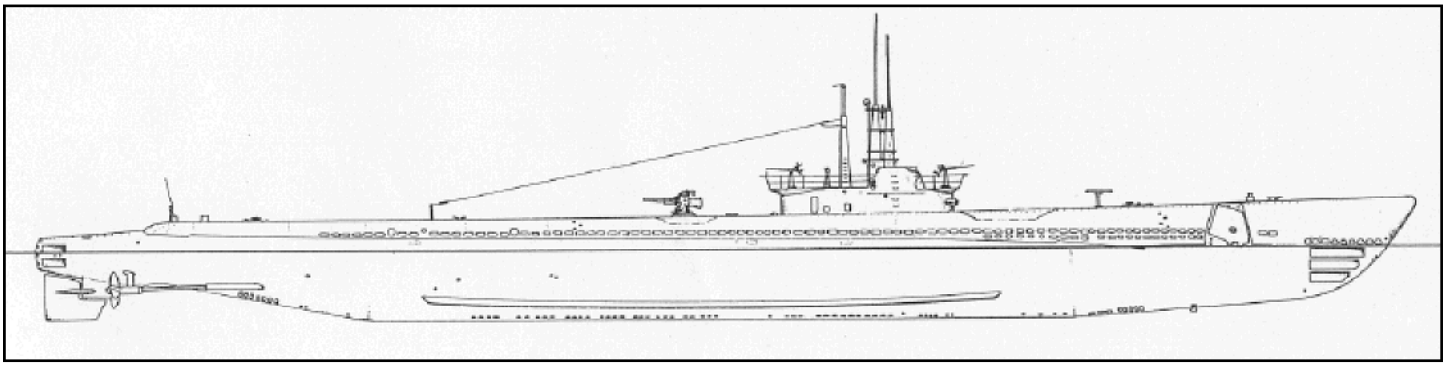
The after room also contained an emergency escape hatch with Momson lungs, similar to the forward room and the signal launcher was found on the port side bulkhead. In addition, this space was used for berthing for nearly 24 men.

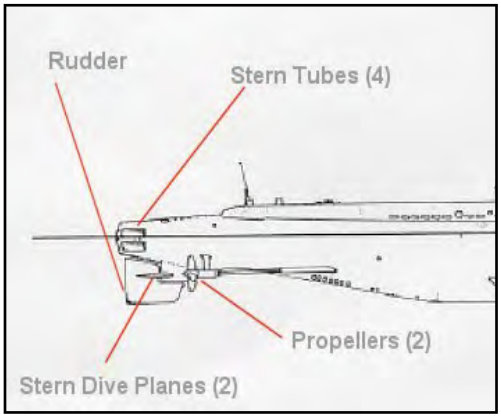




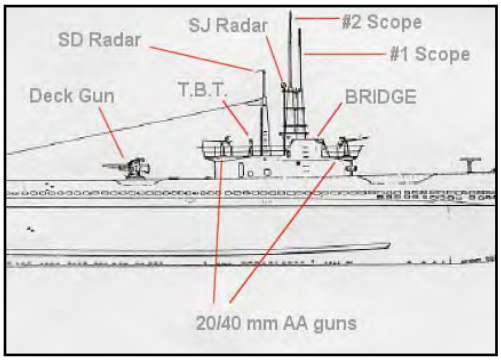
External Tour

Exterior Tour: The figure below represents the exterior of a Balao-class submarine.

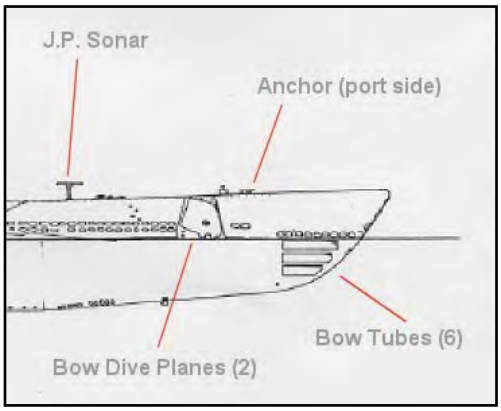




The external tour is divided into 3 sections, starting on the aft end of the sub. Here you can see the rudder, dive planes, stern tubes and propellers as illustrated on the diagram to the left. On the Batfish, the propellers have been removed, however, the propeller shaft supports can be viewed. The dive planes are probably removed also, but would be buried regardless. The very upper part of the rudder can be seen. The four aft tubes are visible, but the outer doors have been removed.



The bridge is located near the middle of the sub. It has been cut down from its wartime configuration, but recent efforts have been made to restore it. All guns have been removed, as have both TBT's. The SJ and SD radar masts can be seen as well as both periscopes in their raised position.



On the forward end of the sub, you can see the dive planes and 6 forward tubes. Again, the outer doors have been removed. The anchor is visible on the port side of the sub.

All three sections are described in more detail, including photos, on the next several pages.

Exterior Aft Section

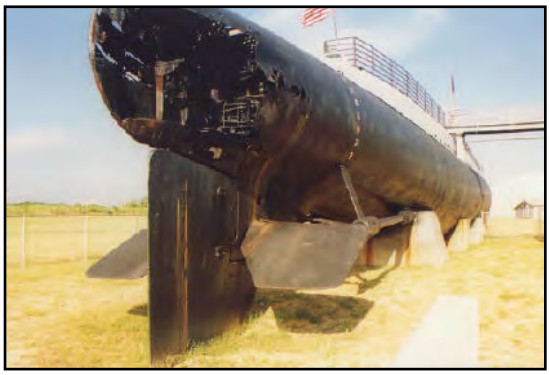
Stern Tubes:

The Batfish was equipped with four stern torpedo tubes. The outer doors are gone, and the four tubes are easily visible.

Rudder:

The rudder imparted lateral control whereas the bow and stern planes imparted vertical control. We'll look at each of these separately. The rudder works by acting against the water flow as the ship moves through the water. On the Batfish, only the upper part of the rudder is visible. On the right center of the photo you can see the propeller shaft support. See the Photo of the USS DRUM below under "Stern Dive Planes" for a better view of a rudder.

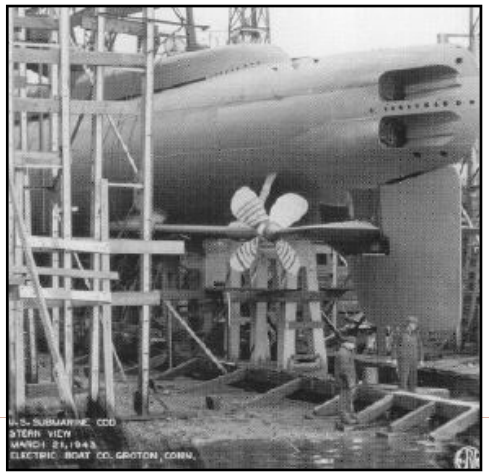
Stern Dive Planes:



The bow and stern planes control vertical motion through the water. These are horizontal rudders, attached in pairs to either side of the hull, at bow and stern. Angling these planes up or down causes the boat to rise or sink. In practice, the stern planes are normally used to control the angle of the boat in the water, while the bow planes are used to make it rise or sink. Stern dive planes on the Batfish are not visible (they would be below ground level) and were more than likely removed. The photo of the USS DRUM shows the dive planes and the rudder.

Propellers:

Backward and forward motion was controlled by the submarine's screws (propellers). Marine propellers are called "screws" because this is how they function. Turning the propeller has the effect of screwing it through the water. The propellers on the Batfish have been removed. This photo of the USS COD shows the relationship between rudder, dive planes and propellers.



Exterior Bridge Section

Bridge:

This is the area that houses and support for both periscopes and both the SD and SJ radar masts. Also seen are the lookout platforms, RD Loop and VHF antenna and the search light. On the forward part of the bridge was one of the two TBT and the hatch to the conning tower.

Periscopes:

The after scope is the attack scope and features an optical range finder for determining the range of a target. The forward scope is the general observation scope.

SJ Radar:

Unlike the SD unit, the SJ was a directional radar, which could be used to sweep the surrounding sea for targets. The primary limitation on range was the height of the retractable mast, radar being limited to line-of-sight. The fleet boats' SJ radar was designed for search, ranging, and navigation. In addition to conducting surface searches, the radar masts could also be extended above the water before surfacing, to check the area for enemy warships and aircraft.

Exterior Bridge Section (Con't)

SD Radar:

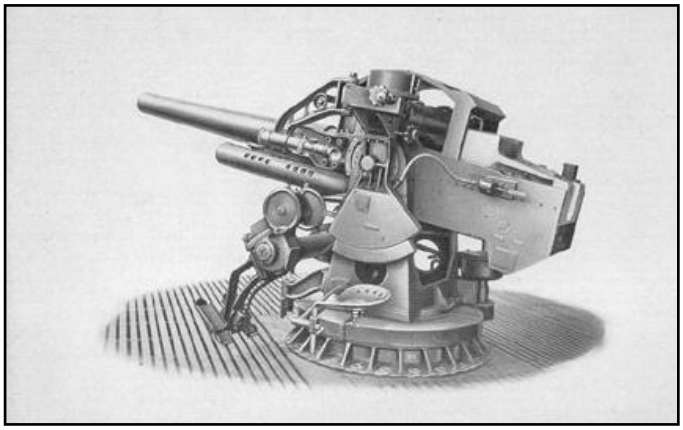
This was a very basic unit. Operated from the conning tower, the SD radar was only vaguely directional. It was capable of warning that a plane was within about 6 miles of the boat, but couldn't really pinpoint a bearing, or give much in the way of information. Late in the war, SD was replaced by SV radar. The Batfish is shown with SD Radar.

T.B.T.:

Target Bearing Transmitter. These were used to indicate the angle, or bearing, of a target from the submarine, and to relay that information to the torpedo data computer in the conning tower to establish the gyro angles for the torpedo run. There were two TBTs, one on the bridge and one mounted on a stand by the 40mm gun on the after gun deck. The mounting for the one on the bridge still exists.

Deck Gun:

Deck guns varied in location and type. They could be placed either forward of the bridge or aft of the bridge, usually it was the commanding officers choice as to where to mount it. Initially, the Batfish was outfitted with a 4" gun forward. Later in the war, the 4" gun was replaced with a 5" gun that was mounted aft of the bridge. Currently, there are no deck guns mounted on the Batfish.



Exterior Bridge Section (Con't)

20mm Gun:

The smallest weapon in the American arsenal firing an explosive shell, the 20-mm was a close-in anti-aircraft machine-cannon. The shells were loaded in a drum magazine, and a single gunner aimed and fired the gun. Most wartime production fleet submarines originally came fitted with at least one 20-mm, on the after part of the conning tower and, after the pre-war bridges were cut down, reducing the silhouette and, in the process, creating a second gun position at the front of the bridge, a second gun was fitted. When the skippers could convince the right people, these were both often replaced with 40-mm mounts, giving an increase in both range and destructive power.

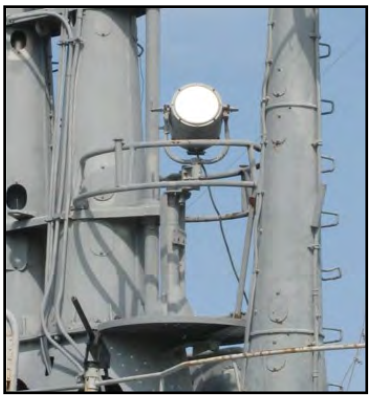
40mm Gun:

Not originally fitted to submarines, the 40-mm was added to the arsenal when commanders argued that they needed something to fill the gap between the 20-mm and the deck gun for close-in attacks on small vessels. The single-barrel "wet" version used on submarines had seats for the aimer and trainer, who could elevate, depress, traverse, and aim the gun with hand controls. Besides its rarely used anti-aircraft role, the 40-mm was used for attacks on supply junks and other light craft that weren't considered adequate targets for torpedoes or the main gun. Later in the war, a 40-mm was usually installed on the cigarette deck at the aft end of the conning tower, where it replaced the original 20-mm mount.

Exterior Bridge Section (Con't)

Machine Guns:

Fleet submarines all had mounting points for machine guns fitted at various locations around the bridge. The guns and ammunition were stored in pressure-proof containers near the mounts, where they could be quickly extracted on surfacing. The preferred weapon was the .50 caliber Browning heavy machine gun. Currently, there is one replica machine gun mounted on the port side of the bridge.



Search Light: used mostly for communication and for searching the ocean surface (e.g. after a torpedo attack) a submarine would search the wreckage for survivors or items that could be salvaged.

Exterior Forward Section

J.P. Sonar:

The American "JP" submarine hydrophone was a simple, highly effective design. Essentially, a long iron bar with a coil of wire wrapped around it. The back was covered with a sound attenuating material, so that it was relatively insensitive to sounds coming from the back. This was mounted on a shaft, with a hand wheel in the forward torpedo room that the operator used for training the head. The "JP" head was mounted on the upper deck of American fleet submarines. In this position it could pick up the sounds of surface vessels easily, without interfering sounds from within the submarine's own hull. Anti-submarine vessels, of course, mounted their hydrophones below the waterline. When the submarine was surfaced, the "JP" gear was secured.

Exterior Forward Section (Con't)

Anchor:

The anchor weighs approximately 2,200-pounds and has 105 fathoms of 1-inch die-lock steel chain. The anchor is housed in the hawsepipe in the superstructure. The anchor chain is self-stowing in the chain locker.

Bow Dive Planes:

The bow and stern planes control vertical motion through the water. These are horizontal rudders, attached in pairs to either side of the hull, at bow and stern. Angling these planes up or down causes the boat to rise or sink. The boat itself is normally kept as close as practical to neutral buoyancy, which is the point at which it will neither rise nor sink. In practice, the stern planes are normally used to control the angle of the boat in the water, while the bow planes are used to make it rise or sink.

Bow Tubes:

The Batfish was equipped with six forward torpedo tubes. The outer doors are gone, and the six tubes are easily visible.

War Memorial Park