

Chicago in 1920, the museum organization moved and the former site was left vacant.

Art Institute of Chicago professor Lorado Taft led a public campaign to restore the building and turn it into another art museum, one devoted to sculpture. The South Park Commissioners (now part of the Chicago Park District) won approval in a referendum to sell \$5 million in bonds to pay for restoration costs, hoping to turn the building into a sculpture museum, a technical trade school, and other things. However, after a few years, the building was selected as the site for a new science museum.

At this time, the Commercial Club of Chicago was interested in establishing a science museum in Chicago. Julius Rosenwald, the Sears, Roebuck and Company president and philanthropist, energized his fellow club members by pledging to pay \$3 million towards the cost of converting the Palace of Fine Arts (Rosenwald eventually contributed more than \$5 million to the project). During its conversion into the MSI, the building's exterior was re-cast in limestone to retain its 1893 Beaux Arts look. The interior was replaced with a new one in Art Moderne style designed by Alfred P. Shaw.

Rosenwald established the museum organization in 1926 but declined to have his name on the building. For the first few years, the museum was often called the Rosenwald Industrial Museum. In 1928, the name of the museum was officially changed to the Museum of Science and Industry. Rosenwald's vision was to create a museum in the style of the Deutsches Museum in Munich, which he had visited in 1911 while in Germany with his family.

Sewell Avery, another businessman, had supported the museum within the Commercial Club and was selected as its first president of the board of directors. The museum conducted a nationwide search for the first director. MSI's Board of Directors selected Waldemar Kaempffert, then the science editor of The New York Times, because he shared Rosenwald's vision.

He assembled the museum's curatorial staff and directed the organizing and constructing the exhibits. In order to prepare the



The entrance hallway of the Museum (3)

museum, Kaempffert and his staff visited the Deutsches Museum in Munich, the Science Museum in Kensington, and the Technical Museum in Vienna, all of which served as models. Kaempffert was instrumental in developing close ties with the science departments of the University of Chicago, which supplied much of the scholarship for the exhibits. Kaempffert resigned in early 1931 amid growing disputes with the second president of the board of directors; they disagreed over the objectivity and neutrality of the exhibits, and Kaempffert's management of the staff.

The new Museum of Science and Industry opened to the public in three stages between 1933 and 1940. The first opening ceremony took place during the Century of Progress Exposition. Two of the Museum's presidents, a number of curators and other staff members, and exhibits came to MSI from the Century of Progress event.

For years visitors entered the museum through its original main entrance, but it was too small to handle an increasing volume of visitors. The new main entrance is a structure detached from the main museum building, through which visitors descend into an

underground area and re-ascend into the main building, similar to the Louvre Pyramid.

For over 55 years, admission to the MSI was free. However, fees began to be charged during the early 1990s, with general admission rates doubling from \$13 in 2008 to \$27 in 2013. Occasional "free days" were designated. However, in recent years those free days were restricted to Illinois residents showing proof of residence.

GERMAN SUBMARINE U-505

From Wikipedia, the free encyclopedia

Name: U-505
Ordered: 25 September 1939
Builder: Deutsche Werft AG, Hamburg
Launched: 24 May 1941
Commissioned: 26 August 1941

Fate: Captured on 4 June 1944 by US Navy ships in the Atlantic.

Status: Preserved as a museum ship
Type: Type IXC submarine

Displacement: 1,120 tons surfaced, 1,232 tons submerged

Length: 251 ft 10 in overall, 192 ft 7 in pressure hull

Beam: 22 ft 2 in overall, 14 ft 5 in pressure hull

Height: 31 ft 6 in

Draft: 15 ft 5 in

Propulsion: 2 MAN M 9 V 40/46 supercharged 9-cylinder diesel engines, 4,000 hp (3,000 kW) and 2 SSW 2 GU 345/34 double-acting electric motors, 1,000 hp (750 kW)

Speed: 20.9 mph surfaced, 8.4 mph submerged

Range: 15,480 miles at 12 mph surfaced, 74 mi at 4.6 mph submerged

Test depth: 750 ft

Complement: 48 to 56 men

Armament: 6 - torpedo tubes (four bow, two stern), 22 - 21" torpedoes 1 - 4.1 in SK L/45 deck gun with 180 rounds and anti-aircraft guns

Service record

Part of: Kriegsmarine

4th U-boat Flotilla, Training 26 August 1941 – January 1942

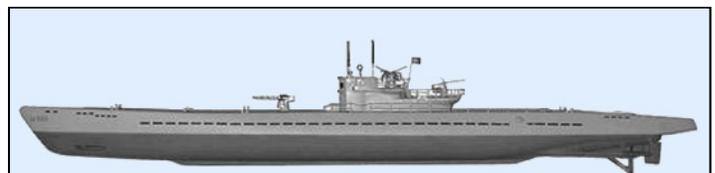
2nd U-boat Flotilla, Front Boat, 12 patrols. 1 Feb. 1942 - 4 June 1944

Operations: 12 patrols

Victories: Eight ships sunk for a total of 44,962 gross register tons

U-505 is a German Type IXC U-boat built for service in Nazi Germany's Kriegsmarine during World War II. She was captured on 4 June 1944 by United States Navy Task Group 22.3 (TG 22.3). Her codebooks, Enigma machine, and other secret materials found on board assisted Allied code breaking operations.

All but one of *U-505*'s crew were rescued by the Navy task group. The submarine was towed to Bermuda in secret and her crew was interned at a US prisoner of war camp where they were denied access to International Red Cross visits. The Navy classified the capture as top secret and prevented its discovery by the Germans.



Germany's "Unterseeboot", which means "undersea boat". U-505 (5)



Commanders:

KrvKpt. Axel-Olaf Loewe
Aug. 26, 1941-Sept. 5,
1942 (left) (6)
Kptlt. Peter Zschech
Sept. 6, 1942-Oct. 24,
1943 (center) (7)

Oblt.z.S.. Paul Meyer (acting) Oct. 24-Nov. 7, 1943
Oblt.z.S.. Harald Lange Nov. 8, 1943-June 4, 1944 (right) (8)

In 1954, *U-505* was donated to the Museum of Science and Industry in Chicago, Illinois and is now a museum ship.

She is one of six U-boats that were captured by Allied forces during World War II, and the first warship to be captured by U.S. forces on the high seas since the War of 1812. In her uniquely unlucky career with the Kriegsmarine, she also had the distinction of being the "most heavily damaged U-boat to successfully return to port" in World War II (on her fourth patrol) and the only submarine in which a commanding officer took his own life in combat conditions (on her tenth patrol, following six botched patrols). *U-505* is one of four German World War II U-boats that survive as museum ships, and one of two Type IXCs still in existence, the other being *U-534*.

U-505's keel was laid down on 12 June 1940 by Deutsche Werft in Hamburg, Germany as yard number 295. She was launched on 25 May 1941 and commissioned on 26 August with Kapitänleutnant (Kptlt.) Axel-Olaf Loewe in command. On 6 September 1942, Loewe was relieved by Kptlt. Peter Zschech. On 24 October 1943, Oberleutnant zur See (Oblt.z.S.) Paul Meyer took command for about two weeks until he was relieved on 8 November by Oblt.z.S. Harald Lange. Lange then commanded the boat until her capture on 4 June 1944.

She conducted twelve patrols in her career, sinking eight ships totaling 44,962 gross register tons (GRT). Three of these were American, two British, one Norwegian, one Dutch, and one Colombian.

Tenth patrol – Zschech's suicide

After ten months in Lorient, *U-505* departed for her tenth Atlantic patrol, seeking to break her run of bad luck and bad morale. On 24 October 1943, not long after crossing the Bay of Biscay, *U-505* was spotted by British destroyers east of the Azores and was forced to submerge and endure a severe and lengthy depth-charge attack.

In a testament to both the intensity of the attack and his own instability, Zschech snapped under the strain and committed suicide in the submarine's control room, shooting himself in the head in front of his crew. The first watch officer, Paul Meyer, quickly took command, rode out the rest of the attack, and returned the boat to port with minimal damage. Despite his quick thinking, Meyer was not rewarded, merely "absolved from all blame" by the Kriegsmarine for the embarrassing incident. Zschech is recorded as the first submariner in history to commit suicide underwater in response to the stress of a prolonged depth charging, and the first (and thus far only) officer to commit suicide while commanding a warship in battle. Experts have speculated that bad morale and poor command influence demonstrated (and encouraged) by this series of humiliating failures might help explain the crew's later failure to scuttle *U-505* properly before abandoning her, although this is disputed by some crew members.

TWELFTH PATROL AND CAPTURE

Anti-sub task force

Ultra intelligence from decrypted German cipher messages had informed the Allies that U-boats were operating near Cape Verde, but had not revealed their exact locations. The U.S. Navy dispatched Task Group 22.3, a "Hunter-Killer" group, commanded by Captain Daniel V. Gallery, USN, to the area. TG 22.3 consisted of Gallery's escort aircraft carrier *Guadalcanal*, and five destroyer escorts under Commander Frederick S. Hall: *Pillsbury*, *Pope*, *Flaherty*, *Chatelain*, and *Jenks*. [25] On 15 May 1944, TG 22.3 sailed from Norfolk, Virginia. Starting in late May, the task group began searching for

U-boats in the area, using high-frequency direction-finding fixes ("Huff-Duff") and air and surface reconnaissance.

Detection and attack

At 11:09 on 4 June 1944, TG 22.3 made sonar (ASDIC) contact with *U-505* at about 170 mi off the coast of Río de Oro. The sonar contact was only 800 yards away off *Chatelain*'s starboard bow. The escorts immediately moved towards the contact, while *Guadalcanal* moved away at top speed and launched an F4F Wildcat fighter to join another Wildcat and a TBM Avenger which were already airborne.

Chatelain was so close to *U-505* that depth charges would not sink fast enough to intercept the U-boat, so instead she fired Hedgehogs before passing the submarine and turning to make a follow-up attack with depth charges. At around this time, one of the aircraft sighted *U-505* and fired into the water to mark the position while *Chatelain* dropped depth charges. Immediately after the detonation of the charges a large oil slick spread on the water and the fighter pilot overhead radioed, "You struck oil! Sub is surfacing!" Less than seven minutes after *Chatelain*'s first attack began, the badly damaged *U-505* surfaced less than 700 yd away. *Chatelain* immediately commenced fire on *U-505* with all available automatic weapons, joined by other ships of the task force as well as the two Wildcats.

Believing *U-505* to be seriously damaged, Oblt.z.S. Lange ordered his crew to abandon ship. This order was obeyed so promptly that scuttling was not completed, (although some valves were opened) and the engines were left running. With the engines still functioning and the rudder damaged by depth charges, *U-505* circled clockwise at approximately 8.1 mph. Seeing the U-boat turning toward him and believing she was preparing to attack, the commanding officer of *Chatelain* ordered a single torpedo to be fired at the submarine; the torpedo missed, passing ahead of the now-abandoned *U-505*.

Salvage operations

While *Chatelain* and *Jenks* collected survivors, an eight-man party from *Pillsbury* led by Lieutenant (Junior Grade) Albert David came alongside *U-505* in a boat and entered through the conning tower. There was a dead man on the deck (the only fatality of the action), but *U-505* was otherwise deserted. The boarding party secured charts and codebooks, closed scuttling valves, and disarmed demolition charges. They stopped the water coming in, and although low in the water and down by the stern, *U-505* remained afloat. They also stopped her engines.

While the boarding party secured *U-505*, *Pillsbury* attempted to take her in tow, but collided repeatedly with her and had to move away with three compartments flooded. Instead, a second boarding party from *Guadalcanal* rigged a towline from the aircraft carrier to the U-boat.

Commander Earl Trosino (*Guadalcanal*'s chief engineer), joined the salvage party. He disconnected *U-505*'s diesels from her electric driving motors, while leaving these motors clutched to the propeller shafts. With the U-boat moving under tow by *Guadalcanal*, the propellers "windmilled" as they passed through the



U-505 being ready for her tow (9)

water, turning the shafts and the drive motors. The motors acted as electrical generators, and charged *U-505*'s batteries. With power from the batteries, *U-505*'s pumps cleared out the water let in by the attempted scuttling, and her air compressors blew out the ballast tanks, bringing her up to full surface trim.

After three days of towing, *Guadalcanal* transferred *U-505* to the fleet tug *Abnaki*. On Monday, 19 June, *U-505* entered Port Royal Bay, Bermuda, after a tow of 1,960 miles.



The USS Guadalcanal along side the U-505 (10)

This action was the first time the U.S. Navy had captured an enemy vessel at sea since the War of 1812. 58 prisoners were taken from *U-505*, three of them wounded (including Lange); only one of the crew was killed in the action.

U-505's crew was interned at Camp Ruston, near Ruston, Louisiana. Among the guards were members of the U.S. Navy baseball team, composed mostly of minor league professional baseball players who had previously toured combat areas to entertain the troops. The players taught some of *U-505* sailors to play the game.

Outcome

The cipher materials captured on *U-505* included the special "coordinate" code, the regular and officer Enigma settings for June 1944, the current short weather codebook, the short signal codebook, and bigram tables due to come into effect in July and August respectively.

The material from *U-505* arrived at the decryption establishment at Bletchley Park on 20 June 1944. While the Allies were able to break most Enigma settings by intense cryptanalysis (including heavy use of the electromechanical "bombes"), having the Enigma settings for the U-boats saved a lot of work and time, which could be applied to other keys. The settings break was only valid until the end of June and therefore had an extremely limited outcome on the eventual cracking of the Enigma code, but having the weather and short signal codebooks and bigram tables made the work easier.

The "coordinate" code was used in German messages as an added layer of security for locations. Allied commanders sent Hunter-Killer task groups to these known U-boat locations, and routed shipping away.

A more lasting benefit came from the intact capture of the U-boat's two G7es (Zaunkönig T-5) acoustic homing torpedoes. These were thoroughly analyzed and then tested on the range, giving information that was invaluable in improving the Foxer and FXR countermeasures systems, as well as the doctrine for using them to protect escorts.

That *U-505* was captured and towed—rather than merely sunk after the codebooks had been taken—was considered to have endangered the Ultra secret. The U.S. Chief of Naval Operations, Admiral King, considered court-martialling Captain Gallery. To protect the secret, *U-505*'s crewmen, who knew of the U-boat's capture, were isolated from other prisoners of war; the Red Cross were denied access to them. Ultimately, the Kriegsmarine declared the crew dead and informed the families to that effect. The last of the German crew was not returned until 1947.

For leading the boarding party, LTJG Albert David received the Medal of Honor, the only time it was awarded to an Atlantic Fleet sailor in World War II. Torpedoman's Mate Third Class Arthur W. Knispel and Radioman Second Class Stanley E. Wdowiak, the first two to follow David into the submarine, received the Navy Cross. Seaman First Class Earnest James Beaver, also of the boarding party, received the Silver Star. Commander Trosino received the Legion of Merit. Captain Gallery, who had conceived and executed the operation, received the Navy Distinguished Service Medal.

The Task Group was awarded the Presidential Unit Citation. Admiral Royal E. Ingersoll, Commander in Chief, U.S. Atlantic Fleet, cited the Task Group for "outstanding performance during anti-submarine operations in the eastern Atlantic on 4 June 1944, when the Task Group attacked, boarded, and captured the German submarine *U-505* ... The Task Group's brilliant achievement in disabling, capturing, and towing to a United States base a modern enemy man-of-war taken in combat on the high seas is a feat

unprecedented in individual and group bravery, execution, and accomplishment in the Naval History of the United States."

U-505 was kept at the navy base in Bermuda and intensively studied by U.S. Navy intelligence and engineering officers. Some of what was learned was included in postwar diesel submarine designs. To maintain the illusion that she had been sunk rather than captured, she was temporarily renamed *USS Nemo*.

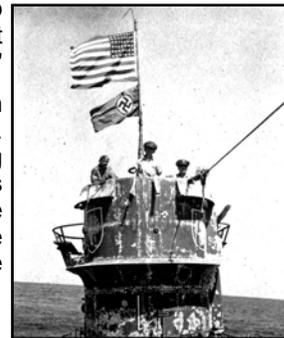
Museum ship

After the war, the Navy had no further use for *U-505*. She had been thoroughly examined in Bermuda, and was now moored derelict at the Portsmouth Navy Yard. It was decided to use her as a target for gunnery and torpedo practice until she sank. In 1946, Gallery, now a rear admiral, told his brother Father John Gallery about this plan. Father John contacted President Lenox Lohr of Chicago's Museum of Science and Industry (MSI) to see if they would be interested in *U-505*. MSI, established by Chicago businessman Julius Rosenwald, was a center for "industrial enlightenment" and public science education, specializing in interactive exhibits. As the museum already planned to display a submarine, the acquisition of *U-505* seemed ideal. In September 1954, *U-505* was donated to Chicago by the U.S. government, a public subscription among Chicago residents raised \$250,000 for transporting and installing the boat. The vessel was towed by United States Coast Guard tugs and cutters through the Great Lakes, making a stop in Detroit, Michigan in the summer of 1954. On 25 September 1954, *U-505* was dedicated as a permanent exhibit and a war memorial to all the sailors who lost their lives in the two Battles of the Atlantic.

When *U-505* was donated to the Museum, she had been sitting neglected at the Portsmouth Navy Yard for nearly ten years; just about every removable part had been stripped from her interior. She was in no condition to serve as an exhibit.

Admiral Gallery proposed a possible solution. At his suggestion, Lohr contacted the German manufacturers who had supplied *U-505*'s original components and parts, asking for replacements. As the Admiral reported in his autobiography, *Eight Bells and All's Well*, to his and the museum's surprise, every company supplied the requested parts without charge. Most included letters that said in effect, "We are sorry that you have our U-boat, but since she's going to be there for many years, we want her to be a credit to German technology."

In 1989, *U-505* was designated a National Historic Landmark. When the U.S. Navy demolished its Arctic Submarine Laboratory in Point Loma, California in 2003, *U-505*'s original observation periscope was discovered. Before the submarine was donated to the MSI, the periscope had been removed from *U-505* and placed in a water tank used for research. After being recovered, the periscope was given to the museum to be displayed along with the submarine.



Capt. Dan Gallery (center) standing on the bridge of U-505 (11)



U-505 in the Chicago River, June 1954 before being brought to the Museum of Science (12)

By 2004, the U-boat's exterior had suffered noticeable damage from the weather; so in April 2004, the museum moved the U-boat to a new underground, covered, climate-controlled location. Now protected from the elements, the restored *U-505* reopened to the public on 5 June 2005