On the eve of World War I in 1914, submarines were still considered a novelty; no navy was prepared to oppose them. The Imperial German Navy began the war with 29 such “undersea boats” or simply *U-boats*, but like the Allied navies, the Imperial German Navy went to war anticipating sea battles involving mainly surface ships.

Within a month of the war’s onset a U-boat sank a British battleship, and another sank three British armored cruisers in just over an hour. German naval leaders quickly grasped the value of submarine warfare, especially against merchant shipping. The Allied navies scrambled to devise defenses against this new, unseen menace.
Unrestricted Submarine Warfare

By the end of 1914 the first offensives ended and armies on both sides began to dig trenches. The Western Front devolved into war of attrition; the first side to exhaust its manpower and resources would lose. To add pressure, Great Britain immediately established a blockade of German ports, which stopped ships from supplying Germany.

In response, Germany ordered its U-boat fleet to aggressively target the vulnerable merchant ships that supplied Great Britain with food and war material. The British Navy was at first unprepared to meet this new kind of threat, and it looked as if the U-boats would win the war for Germany.

However Germany’s greatest weapon proved to be its downfall. In 1917, believing that Great Britain’s will to fight was nearly broken, Germany released its U-boats from restrictions against attacking neutral vessels; this act helped lead the United States to declare war on Germany in April 1917.

Although Germany’s U-boat campaign was very successful, it claimed American lives in the process — most notably the sinking of RMS Lusitania in May 1915. Wishing to avoid armed conflict with the United States, Germany placed restrictions on which targets its U-boats were allowed to attack.
Anatomy of a U-boat

A U-boat was essentially a water-tight hull enclosing the crew, engines and weapons, surrounded by flooding compartments that allowed it to submerge. Driven by air-breathing diesel engines when on the surface, it relied on battery-powered electric motors when submerged. As the batteries could only be charged by the diesel engines, submarines had to remain surfaced much of the time.

In 1914, a submerged U-boat was a terrible threat; there were no sensors that could detect them and no weapons that could harm them. It took many months to develop anti-submarine technology, such as hydrophones to detect them and depth charges to sink them. In the meantime, U-boats operated with near impunity, and Allied mariners lived in fear of meeting one anytime, anywhere.

To dive, U-boats opened valves and let seawater flood special tanks in the submarine, which reduced the buoyancy of the boat and made it sink in a controlled manner. It would surface by blowing water out of the tanks with compressed air.

In the climate of suspicion the war brought to America, the U.S. Navy adopted photographic identification, a new security technology, to prevent enemy saboteurs and spies from infiltrating the Navy’s vastly expanded civilian workforce.
Attacks on the Surface

Early in the war, when German U-boats first began their war on British shipping, they followed the old “cruiser rules” of a more civilized age. Each ship was stopped, searched, and safely evacuated before the ship was sunk. By necessity, these kinds of attacks were made on the surface.

However, after Great Britain began arming merchant ships with artillery, German U-boats adopted the safer tactic of diving underwater and sinking merchant ships without warning. The only weapon available to a submerged U-boat was the torpedo.

Modern chemical weapons, namely artillery shells filled with a variety of poison gases, were first used on the battlefield in 1914. The U.S. Navy learned from its allies’ experience and issued sailors protective masks.
The Torpedo

The U-boat’s primary weapon was the torpedo: a self-propelled, high-explosive projectile that ran just below the surface. Its powerful warhead could hit a ship below the waterline, and a single torpedo was often enough to sink even the largest of ships.

The torpedo would run on course for at least 1,000 yards at about 30 knots, but its slow speed — barely faster than many warships — meant that significant lead was needed to score a hit. Without the aid of modern computers, only very skilled U-boat commanders fired at targets beyond a few hundred yards.

The short effective range of the torpedo made it difficult to obtain a firing position on a ship, which was always faster than a U-boat, especially after the submarine had to submerge to avoid discovery.

To set up a shot, the U-boat commander plotted an intercept course well ahead of time, based on the target’s heading and speed. Any delay or miscalculation caused by confusing Razzle Dazzle camouflage could allow the target to escape.