

# SOSUS Hydrophone sub-detection system

## Greenland-Iceland-United Kingdom (GIUK) Gap



**SOSUS**, an acronym for **Sound Surveillance System**, is a chain of underwater listening posts located across the northern Atlantic Ocean near Greenland, Iceland and the United Kingdom—the so-called GIUK gap. It was originally operated by the U.S. Navy for tracking Soviet submarines, which had to pass through the gap to attack targets in the Atlantic. Other locations in the Atlantic and Pacific Ocean also had SOSUS stations installed.

SOSUS development was started by the Committee for Undersea Warfare in 1949. This panel was formed by the Navy in order to further research into anti-submarine warfare. At the time the primary threat was snorkeling diesel submarines, and it was known that the Soviets were in the process of building a large fleet. The group quickly

decided that the solution to detecting these submarines was to use sound detectors that would use the SOFAR channel to detect low-frequency engine sounds from hundreds of kilometers. Each listening site consisted of multiple detectors. This then allowed them to estimate the submarine's position by triangulation. They allocated \$10 million annually to develop these systems.

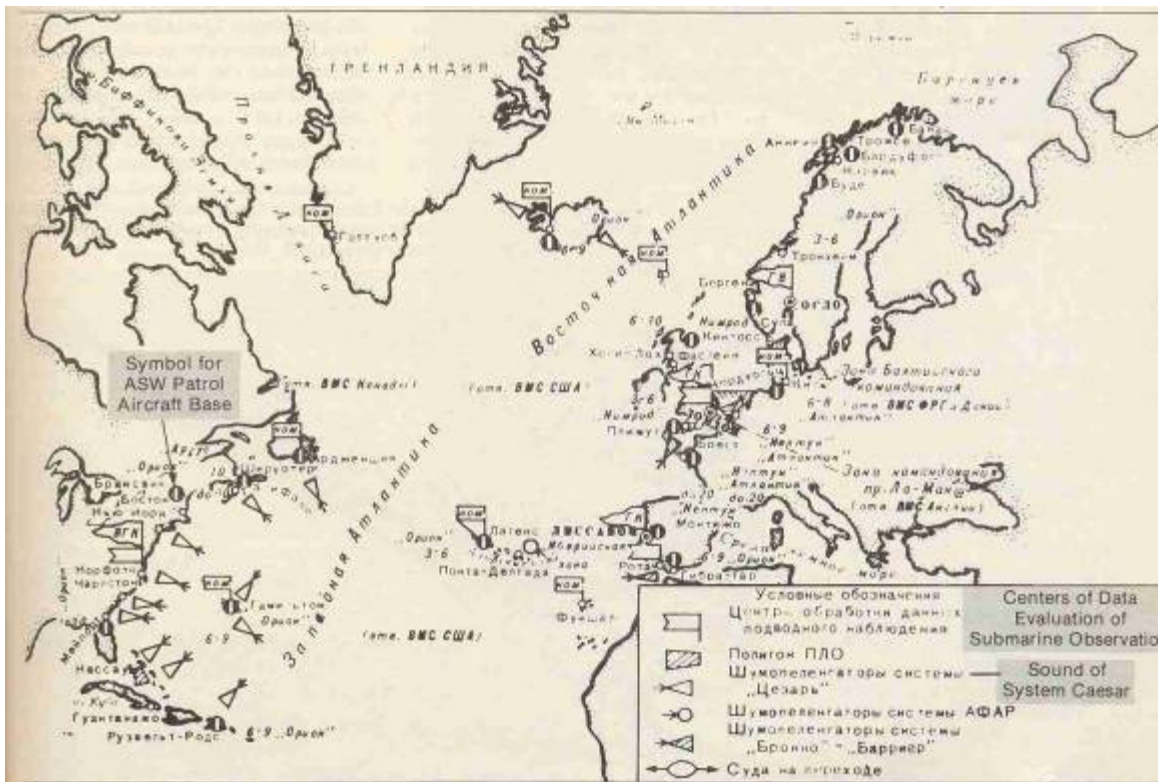
At MIT during 1950, the committee sponsored **Project Hartwell**, named for the director of the committee, Dr. G.P. Hartwell, professor at the University of Pennsylvania. In November, they selected Western Electric to build a demonstration system, and the first six element array was installed on the island of Eleuthera in the Bahamas. Meanwhile **Project Jezebel** at Bell Labs and **Project Michael** at Columbia University focused on studying long range acoustics in the ocean.

By 1952 such progress had been made that top secret plans were made to start deployment of six arrays in the North Atlantic basin, and the name SOSUS was first used. The number was increased to nine later in the year, and Royal Navy and USN ships, including USS *Neptune* and USS *Peregrine*, started laying the cabling under the cover of **Project Caesar**. In 1953 Jezebel's research had developed an additional high-frequency system for direct plotting of ships passing over the stations, intended to be installed in narrows and straits.

In 1961 SOSUS tracked the USS *George Washington* from the United States all the way to the United Kingdom. The next year it tracked the first Soviet diesel submarine to be detected using the system. Later that year the SOSUS test system in the Bahamas was able to track a Soviet Foxtrot class submarine during the Cuban Missile Crisis. SOSUS underwent a number of upgrades over the years, as the quality of the opposing submarines increased.

The SOSUS systems consisted of bottom mounted hydrophone arrays connected by underwater cables to facilities on shore. The individual arrays are installed primarily on continental slopes and seamounts at locations optimized for undistorted long range acoustic propagation. The combination of location within the ocean and the sensitivity of arrays allows the system to detect acoustic power of less than a watt at ranges of several hundred kilometers. SOSUS monitoring stations, known as Naval Facilities NAVFAC (not to be confused with Naval Facilities Command), existed in the US west and east coasts, Keflavik (Iceland), Antigua, Barbados, Eluthera, Nan-tucket MA, Cape Hatteras, Bermuda, Grand Turks, Nova Scotia, Lewes DE, Brawdy (Wales, UK), Puerto Rico, Argentina (Newfoundland), Pacific Beach WA, Coos Bay OR, Midway Island, Guam, Adak Alaska, Whidbey Island (1987), Oahu, Hawaii, San Nicolas Island, Ca, Point Sur, Ca., Treasure Island Ca, Centerville Beach Ca.

SOSUS was gradually condensed into a smaller number of monitoring stations during the 70s and 80s. However, the SOSUS arrays themselves were based upon technology that could only be upgraded irregularly. With the ending of the Cold War in the 1990s, the immediate need for SOSUS decreased, and the focus of the US Navy also turned towards a system that was deploy-able on a theatre basis. The SOSUS components are now being used for various scientific projects, such as tracking the vocalizations of whales in various study projects, as a data network for undersea instrumentation packages, and for acoustic thermometry. The system was officially declassified in 1991, although by that time it had long been an open secret, in fact, a laughing stock to the Soviet nuclear sub command at Ribachiy, were we first secured confirmed feedback that it had been mapped by the attack fleet recon-subs/



Soviet chart of Western ASW defenses including SOSUS/Caesar sites in the Atlantic, clearly demonstrating how our Maginot Line SOSUS barrier against the Kremlin's silent fleet was consistently perforated, in fact, by the titanium-hull Alpha class nuclear attack submarine, with its 4,000-foot depth and 42-knot speed as late as 1980 confirmed by the DoD, though we at the Kishlak HQ produced such reports much earlier.

Our problem out in Siberia—or for Siberian reporting—was that the bureaucratic hoppers in the Pentagon, especially among the other branches of national intelligence, we were often disbelieved until it was too late...

You will recall how the French invested a fortune between 1930-34 into constructing its Maginot line defensive barrier along the German border designed to keep German tanks and armored units out of France. France fell shamelessly in 1940 within 24 hours before the smashing German ground forces! Obviously, just as futilely the Pentagon spent 25 years in developing our extensive hydro-phone network to

detect intruding enemy submarines; the Soviet Alpha class plied the deep waters of Poseidon way below the hydrophones...On the other hand, the Trident boat could deliver 240 warheads to Soviet military sensitive locations and population centers, so it kept us at loggerheads and our of hot warfare.

Such was the upmanship nature of the Cold War!



**PS.** Very early on we acquired this chart from the Soviets via our agents, and promptly advised the Washington, at times giving the coordinates and assigned number of the nuclear attack sub (Titanium hull) departing for U.S. waters from Soviet ports such as Rybachiy, Russian Island, Tiski, Severdvinsk, Murmansk et al nuclear sub facilities.

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