Interim Sea Control Ship Evaluation

From January 1972 to June 1974

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Record of Revisions

The following is a list of revisions made to this document:

Rev	Date	Pages Affected	Reason	Summary of Technical Changes
1.0	6-28-2015	All		Initial document release.

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Introduction

The *USS Guam* LPH-9 had a lustrous 33 year commission between 1965 and 1998. During that time the *Guam* played many different roles serving the U.S .Navy and America proudly. This article covers January 1972 through July 1974 when the *USS Guam* played a special role to test and evaluate the Interim Sea Control Ship (ISCS) concepts as part of Naval project P/C 2. This excludes July 1972 through November 1972 when the *Guam* was in dry dock. After completing the ISCS testing in July 1974, the *USS Guam* resumed its role as an amphibious assault ship.

Background

To understand the ISCS project you have to take your mind back to July 1970 when Admiral Elmo "Bud" Zumwalt Jr. became Chief of Naval Operations. You probably remember Admiral Zumwalt from his 121 Z-grams designed to bring the old-style Navy thinking in line with younger naval personnel. Civilian clothes were now permitted on ships, every sailor who could began growing a beard and rules were changed to help minority sailors.

Elmo R. Zumwalt

At a time when the Soviet Union was increasing their naval capabilities, there was a growing U.S. concern about how to provide escort vessels for large scale convoy operations in the event of a war with the Soviet Union. Admiral Zumwalt proposed what he called the "High-Low" plan in which large numbers of cheaper ($100 million in 1970 dollars) lower capability ships would be built to supplement existing ($800 million in 1970 dollars) high capability CVN type carriers. Time to build the ships was also a factor. The low capacity ship could be built in 2-4 years compared to 5-7 years for the high capacity CVN.

The smaller carrier, which was named the Sea Control Ship (SCS), was proposed to provide continuous anti-submarine and airborne early warning coverage. The SCS would protect Underway Replenishment Group tankers, Amphibious Groups, merchant supply convoys, and other naval task groups without carrier support thus freeing the full-size carriers for more critical duties. The new low-technology ships would complement, not replace, the existing high-technology ships. The large carriers had far too much offensive capability to waste on convoy duty. The SCS carrier would have a complement of SH-3G Sea King helicopters and V/STOL (Vertical or Short Take-Off and Landing) Marine AV-8A Harriers.

The *USS Guam* was selected in the summer of 1971 for the SCS testing because the ship size and architecture was similar to the proposed small carrier.

Specifications	***USS Guam***	**Proposed Sea Control Ship**
Commissioned	January 16, 1965	Never
Displacement	19,217 Tons	13,736 Tons
Length	603 ft	620 ft

Beam	84 ft	80 ft
Draught	30 ft	21.62 ft
Propulsion	2x600 psi boilers, 22,000 shaft horse power	2xLM2500 gas turbines, 45,000 shp
Speed	20 knots	26 knots
Complement	80 officers, 638 enlisted	76 officers, 624 enlisted

Artist conception (1972)

Preparations for ISCS Duties

There were several changes made to the *USS Guam* to support the ISCS testing. Marine AV-8A Harrier squadron VMA-513 and Navy SH-3G Anti-Submarine Sea King helicopters squadron HS-15 were assigned to the *USS Guam*. A new SPN-35 precision landing radar was installed in a dome behind the mast. Two OS2 personnel from the Combat Information Center (CIC) were sent to Anti-Submarine Warfare Air Controller's (ASAC) school in Glynco, Georgia and graduated January 14, 1972 just in time to start SCS testing. An Anti-Submarine Warfare trailer containing the sonobuoy plotters and other ASW equipment was installed on the hanger deck. Since *Guam* had no experience with handling of jet aircraft, many new flight deck procedures were created to protect personnel from the powerful jet blasts generated during the Harrier take-off and landings. Cases of "Mickey Mouse" ears were made available to protect against the loud jet noise generated by the Harriers. *Guam* roll and pitch tests were conducted as part of North Atlantic exercise Lantcortex in early 1973 to determine the impact of ship movements on flight operations. Conclusion was roll could potentially impacted flight deck maintenance functions like positioning aircraft on the deck and pitch could potentially impacted Harrier takeoff and landings.

Sonobuoys

The primary tool used to detect Soviet submarines was the sonobuoy. They were cylinders approximately 5 inches in diameter and 5 ft in length. The *Guam* would go to sea with crates and crates of sonobuoys in the rear of the hanger deck. The majority of the sonobuoys were passive and dropped in various patterns from the SH-3G helicopters and sometimes from the A-8 Harrier Jump Jets. The passive sonobuoys would listen for noise generated by the submarine's movement through the water caused by shape of the submarine's hull and turning of the screws. The sonobuoys would relay the noise along with the originating bearing to the helicopter which in turn relayed the information back to ship ink plotters. By analyzing the ink plotter for each sonobuoy you theoretically could determine what type of submarine was detected. If multiple sonobuoys detected the submarine you could triangulate the bearings from each sonobuoy to determine the actual submarine location.

The sonobuoys had 2 settings. One was for how far the microphone cable would drop once the sonobuoy hit the water. This could be several hundred to 3,000 feet. The second setting was for the salt plug in the bottom of the sonobuoy which determined how long it would float on the surface to transmit signals. Typically this was set

for between 30 minutes to 8 hours. At expiration time the sonobuoy would sink to the bottom of the ocean, they were not retrieved.

There were also active sonobuoys which emitted a sonar ping and waited for the return ping. These were used primarily when in close contact with the submarine. If the submarines didn't know you were tracking them with the passive sonobuoys they definitely knew it when pinging them with an active sonobuoy.

We tracked diesel-electric submarines, which made a lot of noise and were easy to identify, but focused on the newer Soviet nuclear submarines which were quiet and fast. Since the Soviets did a lot of their submarine sea trials in the Mediterranean Sea, the *Guam* would receive intelligence about when Soviet subs were expected to enter and establish a sonobuoy barrier near the Strait of Gibraltar. What you have to realize is every country in Europe had submarines in the Mediterranean. We use to joke that there were more submarines in the Mediterranean Sea than surface ships. Trying to identify and track that one new Soviet nuclear sub from the dozens entering the Straits was not an easy task. You were looking for an ink plotting pattern from the sonobouys you didn't recognize which may be the one you want. You would contact the Bridge and report the submarine was identified giving the sub heading and speed. The *Guam* would change course and would begin tracking the sub. Hopefully your identification of the sub was correct? Nothing was worse than telling the Captain Kenneth B. Austin we identified the desired sub and then finding out it was the wrong one.

SH-3G Sea King Helicopters

The Sea Kings were the heart of the Anti-Submarine Warfare effort. They performed barrier searches dropping passive sonobuoys in various patterns which listened for noise generated by the submarine's movement through the water. The Sea Kings also performed vectoring, MADMAN (Magnetic Anomaly Detection) and "Dipping" with a sonar ball in the helicopters belly depicted in the following HS-15 picture.

Keep in mind we are talking about technology that existed in 1972 which was crude compared to today's capabilities. For example dropping of the sonobuoys from the helicopter was accomplished by a crewman wearing a harness standing at the SH-3G open sliding door, grabbing a sonobuoy, setting the cable depth and salt plug expiration then throwing it out of the helicopter into the water. Another technology example. Interpreting the ink plot sound patterns from the sonobuoys was done using "Mark 1 Eyeball". Very subjective and prone to misinterpretation. Is the submarine one of ours, one of theirs, which one of theirs?

AV-8A Harrier Jump Jets

The AV-8A Harriers were purchased by the Marines in the summer of 1971, so testing on the *Guam* starting in January 1972 was a learning experience and very innovative.

Normally the Harriers would take-off running down the length of the 510 ft flight deck without catapults and land vertically on the fantail. Empty the Harrier weight was 12,200 lbs with maximum take-off weight including fuel and weapons was 26,000 lbs. With a 25 knot wind down the flight deck, the Harrier would have to reach 120 knots airspeed to lift off. Maximum flight speed was 731 mph. Harrier fuel consumption was closely monitored to ensure there was always adequate fuel remaining for the vertical landing.

The AV-8A had no on board radar but plans were in place for AV-8B which would have look-down/shoot-down radar giving the Harrier a fighter capability. Regardless Harriers are not designed to replace Tomcat fighters or Intruder strike aircraft.

Soviet Submarines

So what submarines were we tracking? The Soviets deployed about 8 different class of submarines both diesel-electric and nuclear in the early 1970s. Most of these are retired but some, like the Foxtrot class, are still deployed by the Libyan, Cuban, Indian, Poland and Ukrainian navies. From intelligence, we knew of new Soviet submarines being developed, like the Kilo and Oscar class, but they were not deployed until the early 1980s. The following early 1970 Soviet submarines were the predecessors to today's Soviet fleet. Keep in mind the *USS Guam* top speed was 20 knots causing the entire ship to vibrate! The Soviet subs submerged could easily outrun the *Guam*.

Charlie I – nuclear powered SSGN.

Deployed late 1960s. 24 knots submerged.

Delta I – nuclear powered SSGN.

Deployed early 1970s. 25 knots submerged.

Delta IV class nuclear-powered ballistic missile submarine.

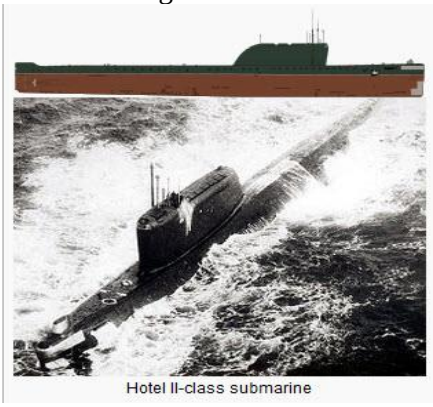
Echo II Class – nuclear powered anti-carrier missles.
Deployed in the mid-1960s.
22 knots submerged.


Nuclear-powered cruise-missile submarine of Project 675 (Echo II)

Foxtrot – diesel-electric submarine.
Deployed early 1960s. 15 knots submerged.

A Cuban Foxtrot underway

Hotel II Class – nuclear powered SSGN.
Deployed early 1960s.
26 knots submerge.


Hotel II-class submarine

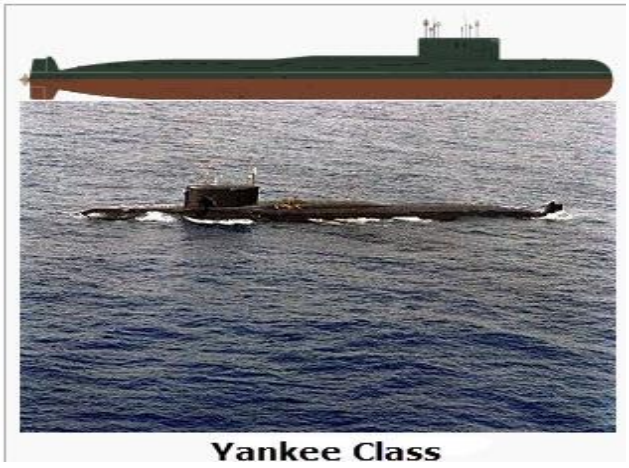
Tango Class – diesel-electric submarine.
Deployed early 1960s. 16 knots submerged.


A Tango-class submarine in the North Atlantic.

Victor II Class – nuclear powered SSGN.
Deployed 1972.
32 knots submerge.


A Victor III class submarine on the surface.

Yankee Class – nuclear powered SSGN.
Deployed late 1960s. 27 knots submerged.



Soviet Submarine Evasive Tactics

Once a Soviet submarine realized we were tracking them, which was easy because we were making a splash with the sonobuoys dropping in the water, the Soviet captain would do some of the following:

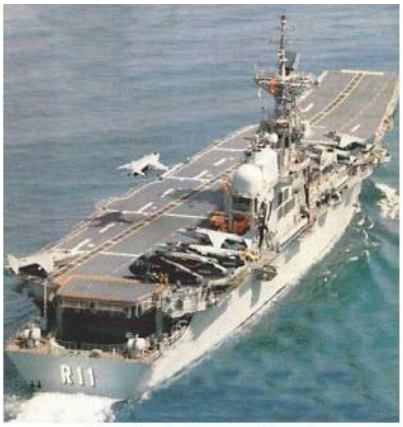
1. Pay no attention to us and continue on their course and speed as if we didn't exist. This was most common with the diesel-electric subs because the Soviets knew the old subs would not provide any new intelligence.
2. Go dead in the water, no sub screws turning and no movement through the water means no sound to track. We would drop an active sonobuoy in this case to see if the sub was actually still there?
3. Ocean water temperature changes the deeper you dive which is called temperature inversion layers. This impacted tracking because sound would get trapped between the inversion layers. Of course the submarine crew knew the location of the temperature inversion layers. We would be diligently tracking a sub at 500 ft when all of a sudden all the sonobuoys went quite? The sub dived to a different temperature inversion layer and the sonobuoys all of a sudden stopped detecting any sound. That's why the sonobuoys had an adjustment for the hydrophone cable length. In this case we would start dropping sonobuoys at maybe a 1,000 ft in the hope of re-establishing contact.
4. Change course and speed away as fast as possible, which for the Victor class, was at 32 knots. Remember the *Guam* could do 20 knots at best so the distance between us rapidly increased. In this case we might send out the Harriers to drop sonobuoys 50 – 100 miles away from the *Guam* in the direction we believed the sub was headed.
5. Every once in a while we would lose the submarine of interest. Amazingly a day or two later the lookouts on the fantail of the *Guam* would report to the bridge they saw red flares in the water. This was the Soviet sub saying ha-ha we could have blown you out of the water comrade. The sub tracking was unofficial cat-and-mouse games.

Note of Thanks

A special thank you goes out to the officer and enlisted men of the *USS Guam*, the Marine and Navy pilots and many special assignment personnel for the extraordinary efforts making the ISCS testing successful. Their dedication, knowledge and persistence was an excellent example of team work reflecting the highest standards of naval service and commitment to duty. Those who participated in the ISCS project should have a sense of pride about what they accomplished. Author in Combat Information Center (CIC) 1971 when I had dark brown hair and weighed less. I still have the Maxwell House coffee mug.

Final Disposition of SCS Project

The Commander of Operational Test and Evaluation Force concluded the *USS Guam* demonstrated the capability to continuously and simultaneously maintain two flank ASW sonobouy barriers and airborne surface surveillance while concurrently prosecuting contacts as they occurred. Remember the U.S. was spending most of its defense budget on the Vietnam conflict. The first SCS funding of $29.4 million was placed into the FY74 budget and put on hold. The monies would never be used for SCS development. According to Admiral Zumwalt the SCS concept was "killed" by a conference compromise between the House and Senate Appropriations Committees brought on in part by Admiral Rickover's intervention with the House Committee chaired by Congressman George Mahon. Admiral Rickover never failed to try, directly and indirectly, to have non-nuclear powered proposals eliminated. Congress refused to fund SCS due to limited size, capability and speed with the goal being 30 knots. Ironically the design and testing of the SCS concept was sold to Spain in 1977 they built the *Principe de Asturias* (R11), added a 12 degree ski-jump on the bow, and launched in 1982. Doesn't it look kind of familiar?



"Príncipe de Asturias" (R 11)


"Príncipe de Asturias" (R 11)

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