



PRIDE RUNS DEEP



"To perpetuate the memory of our shipmates who gave their lives in the pursuit of duties while serving their country. That their dedication, deeds and supreme sacrifice be a constant source of motivation toward greater accomplishments. Pledge loyalty and patriotism to the United States of America and its Constitution."

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Editor's Corner

What's to say? It's been a heckuva year—in so many respects. Here's hoping 2024 brings a reversal to all the ongoing tragedies and uncertainties and starts to deliver more joy to all of us, shipmates. Till then, need me? You'll find me in the yeoman's shack as always. Drop by and say hello sometime. Green board!—Jeff

First New "Stealthy" Nuclear-Armed *Columbia*-Class Submarine Arrives in 2028

The submarines could not start arriving too soon, since the existing Ohio-class ballistic missile submarines have already lived decades beyond their intended service life

(Reproduced from the Warrior Maven website - published November 4, 2023.)

by Kris Osborn - President, Center for Military Modernization



Artist's rendering of new *Columbia*-class SSBN. (U.S. Navy image.)

The Navy's first next-generation high-tech new *Columbia*-class submarine will arrive in 2028 as the service works intensely to build its first two nuclear-armed boats. Intended to quietly and secretly lurk in dark corners of the ocean in position to launch a catastrophic "second-strike" retaliation in the event the U.S. comes under nuclear attack, the new *Columbia*-class submarines will introduce a new generation of undersea technology.

The submarines could not start arriving too soon, given the existing *Ohio*-class ballistic missile submarines have already lived decades beyond their intended service life—and securing the undersea portion of the nuclear triad with *Columbia* submarines has long been deemed the Pentagon's top acquisition priority.

The Navy's most recent budget request asks for \$6.1 billion for research, development and procurement for the *Columbia* class for 2024, and the first two hulls are well along in the process of being built.

The request would procure "the second *Columbia*-class submarine, our nation's most survivable leg of the strategic triad, and [keep] us on track for the delivery of the first vessel in" 2028, Erik Raven, undersecretary of the Navy, said in a March 13 congressional briefing as quoted in an essay from *Arms Control Today*.

(concluded on page 12)



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From the Wardroom...



Dave Vanderveen,
Base Commander

Shipmates and Ladies,

I know the change to 2024 is technically just another day on the calendar. It feels like so much more, though, with the hope of new beginnings, fresh starts, new resolve and the satisfaction of finishing a year gone by. That last phrase can be bitter for those who have lost a loved one or suffered disappointment, and it can also mean successful conclusion of a significant happy effort. Whatever it means to you, I hope the new year will bring you and your families health, happiness, and prosperity!

Although our base calendar for 2024 shows key tasks and milestones, it does not show some major efforts we will undertake. Among them is "thinning out" our stash of memorabilia being stored in the Paulson's garage. Darin Detwiler is in discussions with Barry Commons (National Storekeeper) to trade some of it for SK goods. Additionally, we have contacted the World War II Museum in New Orleans regarding display of some memorabilia. They have a good representation of USS *Tang* and her loss, but little more information about the many boats and submariners responsible for destroying 55% of Imperial Japanese shipping during the war. Curatorial work using some of our memorabilia can expand that story to more museum attendees.

We will also begin preparation in the summer for hosting the Western Region Roundup in April of 2025. The standing committee which handles most of the preparation is immersed in the 2024 event in Bremerton, and they are enthusiastic about what our area offers for '25.

Our membership total flutters along just below 100 because some members did not renew, and painfully, because of shipmates departing on Eternal Patrol. We do have prospective members in the pipeline. Even with the slight diminishment in total membership, we are still strong and active, and our financial health is good.

Too often when we lose a shipmate, their families do not know the many notifications to be made or the benefits available to them. We also miss the opportunity to show our care and moral support to the family when we learn long after the fact that a shipmate has passed. To remedy that, I sent an email string which included specific information families need, contact information, and an outline of what families can miss. I urged our shipmates to write a plan for their families defining what they want for services and rest, who to contact and how to do it. That plan should be provided to next-of-kin (ahead of time, of course!). Those discussions can be painful for loved ones, but it can actually help them cope more easily with the loss. Some shipmates noted that my email is long, and seemed disjointed because it included multiple notes. So, I will draft a one-page digest and send that out to give folks a simpler message to use in their discussions with family about Eternal Patrol. More to come.

There is some kind of "ick" going around that feels like the flu but is not COVID. As always, please protect your health through basic safety precautions and plan to be here to turn 2024 into 2025!

Dave

Dave Vanderveen, Commander
Los Angeles-Pasadena Base

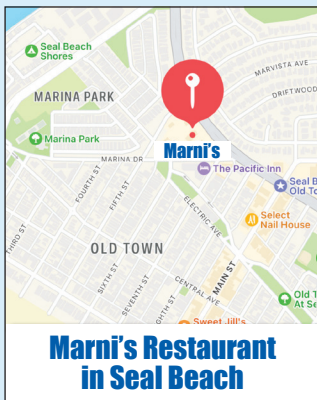
**Jan. Mtg. Location
Changed to Marni's!**

Jan. Meeting

Date: Jan. 20, 2024

Marni's in Seal Beach will be the site of our January gathering. ("Hobo Stew Day" gets postponed.) Board Meeting at 10:00 a.m.; General Mtg. at 11:00 a.m. Hope to see you there!

**Marni's Restaurant
620 Pacific Coast Hwy.
Seal Beach, CA 90740
(562) 594-3800**



Jan. Birthdays

We hereby extend the happiest of wishes to all our L.A.-Pasadena Base birthday celebrants!

- Ron Levenson 1/3
- Bob Schive 1/3
- RJ Hansen 1/18
- Sam Higa 1/26
- Larry Smith. 1/30

Ship's Store

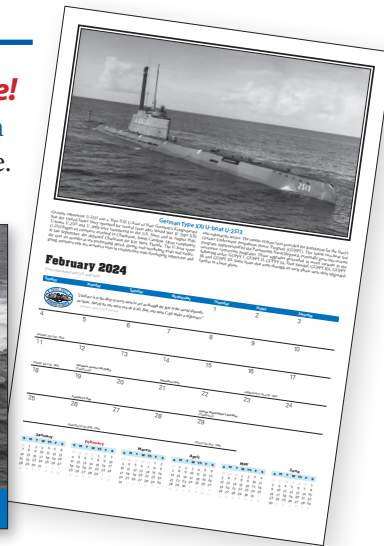


New Reduced Price on T-Shirts!

Our ever-popular L.A.-Pasadena Base "Submarine Service" tees are once again selling like fresh whites after a fall down the pump room hatch! Now a mere **ten bucks** apiece, there's no reason not to have a closetful. Contact Bill Moak for yours, or just bring a few extra bucks to the next meeting, you skinflint!

2024 Calendars Now Available!

Order at ussvnationalstorekeeper.com Or see details elsewhere in this issue. Don't miss out—they're selling fast!



Get in touch with our base Storekeeper, Bill Moak, at 805-660-4776 for more purchasing information.



USSVI Logo Patch
(9¾ x 6¾)
\$11.00 ea.



L.A.-Pasadena Base Patch
(3¾ x 5)
\$5.00 ea.



Holland Club Member Patch (3x3)
\$6.00 ea.

LOS ANGELES - PASADENA BASE

2024 FLOWER FUND and BOOSTER CLUB

A special thank you to the following folks whose generous contributions this year have helped make our base activities and charitable functions possible:

Wouldn't You Like to See Your Name Listed Here?



Booster Club and Flower Fund donations are welcome in any amount and are often also popular with 50/50 Drawing winners at our base meetings. Contributions can be made in cash or by check payable to L.A.-Pasadena Base of USSVI. Checks may also be sent to Mike Swanson at 1149 W. Santa Cruz Street, San Pedro, CA 90731. To ensure proper credit, be sure to indicate Booster Club or Flower Fund on your check.

UNITED STATES SUBMARINE FORCE LOSSES ON ETERNAL PATROL

"I can assure you that they went down fighting and that their brothers who survived them took a grim toll of our savage enemy to avenge their deaths."

— Vice Admiral Charles A. Lockwood, USN

JANUARY TOLLING OF THE BOATS



USS SCORPION (SS-278)



USS ARGONAUT (SS-166)



USS SWORDFISH (SS-193)

USS SCORPION (SS-278)

Lost on January 5, 1944 in the East China Sea during her fourth war patrol. Seventy-seven officers and men were lost. It is assumed *Scorpion* struck a mine.

USS ARGONAUT (SS-166)

Lost on January 10, 1943 off Rabaul during her third war patrol. *Argonaut* had torpedoed a destroyer as part of her attack on a Japanese convoy, but it survived to depth charge her in coordination with two other escorting destroyers. Forced to the surface, *Argonaut* was then sunk by escort gunfire. She went down with 102 officers and men.

USS SWORDFISH (SS-193)

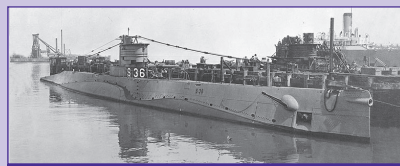
Lost on January 12, 1945 somewhere near Okinawa during her thirteenth war patrol. Eighty-nine officers and men perished. *Swordfish* was probably lost to a mine.

USS S-36 (SS-141)

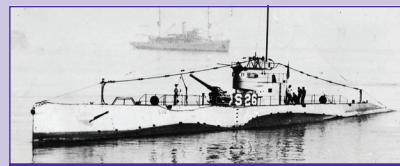
Lost on January 20, 1942—with no loss of life—on her second war patrol. She ran aground on a reef and radioed for rescue; a Dutch ship soon picked up her crew. S-36 was then scuttled to keep her from falling into enemy hands.

USS S-26 (SS-131)

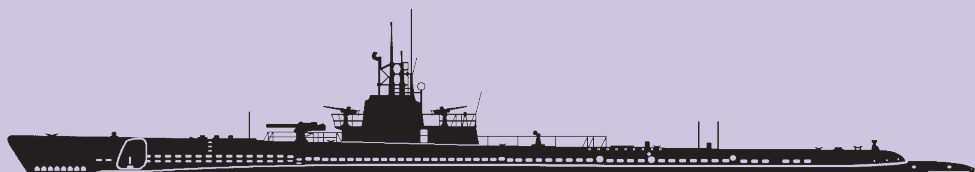
Lost on January 24, 1942 in the Gulf of Panama during her second war patrol. She was accidentally rammed by the USS PC-460 and sank within seconds. The CO, XO and one lookout on her bridge survived—all forty-six other officers and men were lost.



USS S-36 (SS-141)



USS S-26 (SS-131)



WE REMEMBER For those who gave their lives in defense of our country WE REMEMBER

Navy Mulling Large-Diameter Sub Hulls After Twelve *Columbias*, SSN(X) Requirements Due Next Year

(Reproduced from the USNI News website - first published November 8, 2023; updated November 9, 2023.)

by Sam LaGrone and Mallory Shelbourne



Ohio-class guided missile submarine USS Michigan (SSGN-727) heads out to sea in 2012. (U.S. Navy photo.)

ARLINGTON, Va. – After delivering the dozen nuclear ballistic missile submarines to meet the U.S. nuclear deterrent, the Navy could keep large diameter hull submarines in production, the service’s director of undersea warfare (N97) said on Wednesday.

The Navy needs to build twelve *Columbia*-class SSBNs to meet the requirements from the U.S. Strategic Command for nuclear ballistic missile patrols at sea, Rear Adm. Mark Behning said.

“*Columbia*, when it was first built and designed, is designed to replace the current *Ohio*-class of fourteen with twelve. We’re able to do that by eliminating the midlife refueling overhaul,” he said during a presentation at the Naval Submarine League 2023 annual symposium.

Following the last planned *Columbia* delivery in the 2040s—SSBN-838 set to replace USS *Louisiana* (SSBN-783)—the Navy wants to continue to build large-diameter submarines for a variety of missions.

Under the Navy’s long-range shipbuilding plan, it intends to take delivery of the first large-payload submarine in 2049, but the requirements for that hull are far from set. The Navy is trying to avoid a lull in building larger submarines after the \$186 billion *Columbia* program—like it experienced following the end of the *Ohio* boats in the late 1990s—and send a demand signal to industry to maintain a workforce capable of building large sub-

marines. The service has not yet determined the cadence between hulls in future submarines after the *Columbia*-class program.

“Those discussions continue to go on [but] the plan is to keep [the line] open,” Behning said.

Ohio Extention

The submarine force also plans to extend the lives of up to five *Ohio*-class SSBNs that would provide a safety margin in case of schedule slippage in the *Columbia*-class program.

As of Wednesday, first-in-class *District of Columbia* (SSBN-826) is forty percent complete. In the next several weeks, HII’s Newport News Shipbuilding will ship the stern section from the Virginia shipyard north to General Dynamics Electric Boat in Connecticut. Newport News builds the bows and sterns for the *Columbia* program, while EB constructs the inner section.

While the lead boat is on schedule right now, the Navy has very little margin for error, as it needs to replace the *Ohio*-class submarines one-for-one with *Columbia* boats.

The Navy has programmed short service life extensions on as many as five boats. The maintenance periods would each take eighteen months and provide each boat with three more years of service life.

As of now, extending the service lives of the five *Ohio* boats—

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Navy to Continue Building Large-Diameter Sub Hulls

(concluded from page 5)

starting with USS *Alaska* (SSBN-732)—is in both the Fiscal Year 2025 budget and the fifteen-year submarine maintenance plan, program executive officer for strategic submarines Rear Adm. Scott Pappano told reporters Tuesday.

“A lot of that work is outside the [Future Years Defense Program] right now,” Pappano said, referring to the Pentagon’s five-year budget outlook.

“We have the ability to come off that decision at any time. So up until I go do that availability, I could decide not to do it. And so beyond *Alaska*, there’s some flux in there, so I don’t want to speculate on what other submarines.”

The Navy has until Fiscal Year 2029 to decide whether or not it will extend *Alaska*, Pappano said.

U.S. Strategic Command requires the submarine force to be able to surge ten ballistic missile submarines in the case of a nuclear contingency. The current SSBN inventory is 14 boats, but without a service life extension for the *Ohios*, that number will dip to 13 in FY 2027, then 12 in FY 2029, according to the latest long-range shipbuilding blueprint. Without the life extension, the number of ballistic-missile boats would dip to 11 in FY 2030 through FY 2032.

Extending the lives of several *Ohio* hulls would give the Navy a buffer to meet that ten-submarine surge requirement, Pappano said.

SSN(X)

As for the next-generation attack submarine, Behning said the Navy will finish the final analysis of alternatives for its heavily armed, blue water attack boat next year.

The AoA for SSN(X) will be finalized in Fiscal Year 2024, with an anticipated start of construction in 2030 and delivery in 2042 for the first hull.

“We are on-plan in nearing completion of the initial capabilities document. It’s cleared the Navy and is now working through the Joint Staff with the intent to commence the analysis of alternatives for the capabilities of this platform here in ’24,” Behning explained.

The Navy is designing SSN(X) as a larger, faster and more heavily armed attack submarine than the current *Virginia*-class boats. It’s expected to have characteristics more in line with the *Seawolf*-class attack submarines, *USNI News* previously reported.

The requirements process will refine the balance of capabilities with how affordable the Navy can make the program.

The service estimated the attack boats will cost \$6.7 billion to \$7 billion, while the Congressional Budget Officer estimated the submarines could cost up to \$1 billion more, according to CBO’s analysis of the latest shipbuilding plan.



Seawolf-class USS Connecticut (SSN-22) surfaces through the ice in 2018. (U.S. Navy photo.)

Future USS Arizona Attack Submarine Assigned Commanding Officer

(Reproduced from the Arizona's Family website - published October 30, 2023.)

by AZFamily Digital News Staff



Cmdr. Thomas Digan, commanding officer of PCU Arizona (SSN-803) is piped ashore following the PCU Arizona establishment of command ceremony that was held at Historic Ship Nautilus (SSN-571) in Groton, Conn. on Friday, Oct. 27, 2023. (John Narewski/U.S. Dept. of Defense photo.)

GROTON, CONN. (3TV/CBS 5) — The future USS *Arizona* has been assigned a commanding officer, marking the first time in over eight decades the U.S. Navy has named a skipper for a ship with the same namesake.

Cmdr. Thomas Digan assumed command of the *Arizona* during a ceremony at the Submarine Force Museum in Groton, Conn., on Friday. It's an achievement he calls a highlight of his career.

"We are all very proud to be a part of the next warship named after the Grand Canyon State and look forward to completing this new construction process and eventually take *Arizona* out to sea to defend America for decades to come," Digan said.

The USS *Arizona* (SSN-803) will be the third U.S. Navy vessel named for the state. Currently dubbed "PCU

Arizona," it will be the 30th nuclear-powered *Virginia*-class attack submarine to enter into service with the Navy. Capable of carrying a crew of 135, it will ultimately join SUBRON 12 and be one of two squadrons based out of the Naval base in Connecticut. It's standard protocol to classify ships as PCU if they have not yet been commissioned.

The last vessel to carry the name USS *Arizona* (BB 39) was a battleship attacked on the naval base at Pearl Harbor on Dec. 7, 1941, and has long been memorialized in honor of the 1,177 who died on board. The latest ship will be sponsored by Nikki Stratton, the granddaughter of one of the last surviving members of the USS *Arizona*.

"My grandfather was a proud member of Battleship *Arizona*, and one of the fortunate few to survive that day," Stratton said. "Just as the men of BB-39, in 1916, forged their path into the history books, so too will the men and women of SSN-803."

China Adds New, High-Tech *SHANG III* Attack Submarines for “Clandestine” Missions and Land Attack

U.S. Navy Virginia-class vs. PLA-Navy SHANG-III attack submarines

(Reproduced from the Warrior Maven website - published October 27, 2023.)

by Kris Osborn - President, Center for Military Modernization



A Chinese SSBN. (PLAN photo.)

The People’s Liberation Army-Navy has more attack submarines than the U.S. Navy, is fast-tracking production of more, launching a new *SHANG III* class of boats, and adding several of the new guided-missile nuclear-attack submarines in the short term.

The concern is articulated in the Pentagon’s annual China report, called the “Military and Security Developments Involving the People’s Republic of China,” which states that the PLA Navy will have three new hulls of this class by 2025.

The most significant element of these new submarines, the Pentagon report explains, likely pertains to its quieting technologies and potential to conduct clandestine missions.

“This new *SHANG-class* variant will enhance the PLAN’s anti-surface warfare capability and could provide a clandestine land-attack option if equipped with land-attack

cruise missiles,” the Pentagon report says.

China Has More Attack Submarines Than the U.S. Navy

According to 2023 military assessments published by *GlobalFirepower.com*, China has 78 submarines, 10 more than the U.S. Navy—a likely reason why U.S. Navy leaders have been working with Congress for many years now to massively scale up attack submarine production. The concern among Navy leaders and prominent members of Congress has been that *Los Angeles-class* submarines are retiring much faster than *Virginia-class* submarines can be built, leading many to express concern about a U.S. Navy attack submarine deficit. This deficit has been expected to grow in the immediate years ahead, a key reason why Navy weapons developers have been working closely with members of Congress and the industrial base to essentially “flex” production to help close the U.S. Navy’s attack submarine gap.

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New Chinese *SHANG III* Attack Submarine

(concluded from page 8)

Several years ago, the Navy conducted an industrial base assessment which did indeed determine that industry has the capacity to expand and potentially build one more *Virginia*-class attack submarine per year than was previously planned. Sure enough, both General Dynamics Electric Boat and HII have scaled production capacity to a large extent to accommodate the Navy demand. The demand is significant, as for many years Navy combatant commander requests for attack submarines has exceeded available supply.

Apart from a potential numbers deficit, perhaps the most pressing question when it comes to any U.S.-China attack submarine competition relates to the measure of technological superiority. Attack submarines are greatly needed, especially in the Pacific given some of the new quieting technologies and undersea surveillance cutting edge Block III and beyond *Virginia*-class submarines and beyond. Submarines with additional “quieting” technology, a Large Aperture Bow sonar, high-fidelity longer-range sonar and new generations of communications systems are increasingly well-positioned to conduct clandestine undersea surveillance missions. There are coastal and island areas near enemy territories where larger, deep-draft surface warships simply cannot access without being greatly imperiled and put at risk of being easily detected and destroyed by enemy submarines, torpedoes and land weapons.

More than ten years ago, the U.S. Navy worked with industry to integrate a series of new innovations into a prototype *Virginia*-class Block III ship named the USS *South Dakota*. The details of these technologies were generally announced by Navy weapons developers, yet details were understandably not available for security reasons. The innovations, however, were explained by Navy developers as substantially performance enhancing, meaning they likely related to sensing, quieting technologies and detection capabilities. After being integrated years ago onto a prototype USS *South Dakota*, the technological enhancements became operational and built into subsequent *Virginia* boats. They are operational today, and the intent with these innovations has likely been to stay in front of major power adversaries to preserve the U.S. Navy’s undersea superiority.

The results of any competition between U.S. and Chinese attack submarines likely relates to these kinds of questions, because U.S. Navy attack submarines are quieter, less detectable and more able to sense, detect and target enemy submarines and locations. This margin of difference, should there be one between U.S. and Chinese attack submarines, could ultimately prove more impactful than pure numbers should China continue to operate with a

larger number of attack submarines. The Pentagon report says the new *SHANG III*-class is being built with a new generation of technologies aimed at enabling “clandestine” missions, so it is likely critical for Pentagon weapons developers to try to discern the relative maturity and capability of these technologies in order to ensure *Virginia*-class innovations maintain overmatch or superiority against them.

A significant essay published in *Covert Shores* as far back as 2017 analyzes earlier variants of the *SHANG*-class PLA submarines, stating that the boats do in fact have advanced quieting technologies. The essay says that, at this time, *SHANG*-class submarines were being built with “hidden enhancements such as improved sensors and better stealth.”

“As well as hidden enhancements such as improved sensors and possibly better stealth, the profile has changed markedly. The sail has been lengthened and a blended leading edge added, not unlike that on the U.S. Navy’s *Virginia*-class SSN. Behind the sail the casing has been raised.... The raised section behind the sail has been refined, gradually becoming less pronounced. The final significant difference is the addition of an integral towed sonar array. This feeds out from the top of the upper vertical rudder. Additionally, an anechoic coating using small square rubber tiles has been applied,” the essay states.

The question then becomes: How much have these technologies been updated? To what extent do they rival advanced U.S. Navy *Virginia*-class boats?

This being said, however, to quote Sun Tzu, “mass matters,” and any attack submarine deficit between the U.S. and China in terms of fleet size could prove critical in any kind of large-scale engagement. More attack submarines will provide more firepower and enable the U.S. Navy to attack in larger formations across wider areas of undersea terrain. The size of the Chinese Navy, to be specific, is such that it would likely require a greater amount of attack submarines for the U.S. Navy to counter any amphibious assault on Taiwan or offensive action in the Pacific.

Kris Osborn is the President of Warrior Maven - Center for Military Modernization. Osborn previously served at the Pentagon as a Highly Qualified Expert with the Office of the Assistant Secretary of the Army—Acquisition, Logistics & Technology. Osborn has also worked as an anchor and on-air military specialist at national TV networks. He has appeared as a guest expert on MSNBC, The Military Channel, and The History Channel. He also has a Masters Degree in Comparative Literature from Columbia University.

Meet the Navy's Newest Fast-Attack Submarine

(Reproduced from the Navy Times website - published October 20, 2023.)

by Geoff Ziezulewicz



The fast-attack submarine Hyman G. Rickover was commissioned into service on Saturday, Oct. 14, 2023, during a ceremony at Naval Submarine Base New London in Groton, Connecticut. (Chief Petty Officer Joshua Karsten/U.S. Navy photo.)

The Navy's newest fast-attack submarine, *Hyman G. Rickover*, officially joined the fleet Saturday during a ceremony at Naval Submarine Base New London in Groton, Connecticut.

It is the second boat to be named after the late Adm. Rickover, regarded as the father of the nuclear Navy who developed the world's first nuclear-powered sub, *Nautilus*, that went to sea in 1955, according to the Navy.

"He changed our submarine force, he changed the nature of naval warfare and he changed U.S. industry and ship-building forever," Adm. Frank Caldwell, director of the Naval Nuclear Propulsion Program, said at the ceremony, according to a Navy release.

Crewed by roughly 135 sailors, Rickover can dive deeper than 800 feet and speed faster than 25 knots, or nearly 29 mph.

Fast-attack subs take on a variety of missions and are able to deliver special operators and launch Tomahawk cruise missiles.

"The commissioning of [this] ship is dedicated to a leader who reshaped our sea service through an unrelenting 63 years of service," *Rickover's* commanding officer, Cmdr. Matthew Beach, said of his boat's namesake. "In front of you today on board this ship, the proud sailors of the next generation—*Hyman G. Rickover*—stand ready to continue this legacy of excellence, guiding our ship into harm's way and defending the values that we hold dear."

Geoff Ziezulewicz is the editor of Navy Times, but he still loves writing stories. He covered Iraq and Afghanistan extensively and was a reporter at the Chicago Tribune. He welcomes any and all kinds of military news tips at geoffz@militarytimes.com.

Submariner Recalls Banging Wrenches on Metal So Other Vessels Could Find Them After Silent Running Drill

(Reproduced from The Aviation Geek Club website—published November 9, 2023.)

by Dario Leone



(U.S. Navy photos.)



Silent running (or “ultra-quiet”) is a stealth mode of operation for submarines.

During silent running, the propellers have a characteristic RPM band in which no cavitation noise arises. Since this rotation speed is usually relatively low, the first electric submarines had special “silent running” engines designed for optimum performance at reduced speed.

Nuclear submarines can run even more quietly, at very low speeds only, by turning off active reactor cooling during silent running. The reactor is then only cooled by natural convection of the water.

The aim of silent running (a protocol that has been in use since the latter part of World War I, when hydrophones were invented to detect U-boats) is to evade discovery by passive sonar through eliminating superfluous noise: non-essential systems are shut down, speed is greatly reduced to minimize propeller noise, and the crew is urged to rest and refrain from making any unnecessary sounds.

“Being ‘quiet’ is more than not talking.... As a U.S. Navy nuke, we loved ‘rig for ultra-quiet,’” says Michael Denney,

a former U.S. Navy submariner, on *Quora*.

“A normal nuke day is six hours standing watch, six hours maybe off, theoretically six hours in the rack, and repeat. If any maintenance was due, it happened during the six hours ‘off.’ Any shipwide evolutions (drills or all-hands cleanups) could come during your rack time. During ultra-quiet, if you weren’t on watch, it was sweet—sweet bunk time.

“I’ll leave it to the sonar techs to say how much they could hear, but at the end of every wargame with other subs and ships, if it was time for the other guys to find us, the engineering watchstanders would roam around slamming hatches and banging wrenches on metal.”

Denney concludes:

“They’d usually find us after a half hour of this, [and that] certainly didn’t inspire us to tiptoe on a regular basis.”

Dario Leone is an aviation, defense and military writer. He is the Founder and Editor of “The Aviation Geek Club,” one of the world’s most read military aviation blogs.

Columbia Class to Arrive in 2028

(concluded from page 1)

The first *Columbia*-class patrols are slated for the early 2030s as part of a new era in undersea strategic deterrence intended to function well into the 2080s and beyond.

As mentioned in the essay by UnderSecretary Raven, the second *Columbia*-class submarine is also well underway in the construction process. Modules, as they are called, continue to take shape at General Dynamics Electric Boat in Groton, Ct., and much of the initial production and science and technology work began more than ten years ago. As far back as 2014 and before, the Navy was working on what's called "tube and hull forging" to weld missile tubes into 4-pack units to integrate into emerging ship modules.

The technologies for the boat also go back many years and have been designed to be a work in progress, meaning they are being engineered with technical standards such that new innovations can quickly and easily be integrated. Interestingly, the *Columbia*-class submarines are described by developers as perhaps destined to be the quietest and most lethal submarine ever to exist. While much of the technology of the boats is not available for security reasons, the boat is engineered with an electric drive propulsion system able to both power up the boat with additional electricity but also greatly reduce the submarine's acoustic "signature." Being stealthier than any submarine ever to exist would be a critical advantage for nuclear armed submarines as their tactical advantage depends upon "not" being detected. A quieter submarine emitting a smaller or less detectable undersea acoustic signature would of course be much less likely to give away its position of strategic advantage. The new *Columbia*-class submarines are also being built with a new "X"-shaped stern designed to improve maneuverability while also generating a less detectable acoustic signature.

Columbia-class "Electric Drive"

In today's *Ohio*-class submarines, a reactor plant generates heat which creates steam, Navy officials explained. The steam then turns the turbines that produce the sub's electricity and also propels the ship forward. This propulsion is achieved through "reduction gears" which are able to translate the high-speed energy from a turbine into the shaft RPMs needed to move a boat propeller.

"The electric-drive system is expected to be quieter (i.e., stealthier) than a mechanical-drive system," a Congressional Research Service report on *Columbia*-class submarines from several years ago states.

The *Columbia*-class submarines are designed to be 560-feet long and house sixteen Trident II D5 missiles fired from

44-foot-long missile tubes.

The "X"-shaped stern will restore maneuverability to submarines; as submarine designs progressed from using a propeller to using a propulsor to improve quieting, submarines lost some surface maneuverability, Navy officials explained.

Navy developers explain that electric-drive propulsion technology still relies on a nuclear reactor to generate heat and create steam to power turbines. However, the electricity produced is transferred to an electric motor rather than so-called reduction gears to spin the boat's propellers.

The use of an electric motor brings other advantages as well, according to an MIT essay written years ago when the electric drive was being evaluated for submarine propulsion.

Should one *Columbia*-class submarine be detected, giving a potential adversary the possible thought that they might be able to stop, neutralize or prevent any U.S. Navy second-strike retaliatory option, the Navy plans for built in redundancy with a fleet of twelve *Columbia*-class submarines simultaneously positioned in critical global oceans in position to strike. The presence of multiple *Columbia*-class patrols at one time can ensure a second-strike retaliatory attack capability even if one is found, disabled or destroyed by an adversary in advance of a nuclear attack. There are currently fourteen *Ohio*-class submarines, yet the *Columbia*-class will only consist of twelve boats, in large measure because they are being built with a cutting-edge "life-of-core" nuclear reactor, meaning they won't have to spend time away from service out of the water in drydock for mid-life refueling halfway through their service life. A fleet of twelve *Columbia*-class submarines can accomplish much more undersea strategic-deterrence "presence" and deployment times can be extended.

Also, *Columbia*-class submarines are being built with several cutting-edge technological innovations built into the U.S. Navy's new generation of *Virginia*-class attack submarines. Block III and beyond U.S. Navy *Virginia*-class attack submarines are built with a next-generation "fiber optic" visual sensor cable which enables commanders and ship navigators to see a "periscope" view from anywhere in the boat. The new nuclear-armed submarines are also being engineered with a "fly-by-wire" computerized navigational system which replaces previous hydraulic mechanical systems. Using computer automation, depth and speed can be analyzed and set to a certain extent semi-autonomously while managed by a human decision-maker, while maneuvering can be managed with a digital "joystick" type of navigation system.

“Mother Onion”

by Bob “Dex” Armstrong

The submarine tender, USS *Orion* (AS-18) was a floating wonderland of repair shops, supply distribution points, stores, medical facilities, and entertainment. The boredom of constant in-port duty had turned all the personnel assigned to quarterdeck watches into poor, wretched, sorry excuses for human beings and rendered them completely devoid of the ability to exercise common sense. When diesel boat sailors transited this hallowed area, comments like “scarecrow navy,” “friggin’ bums,” and “riffraff” were thrown around in an indiscriminate manner.

It was a helluva lot easier to use the lower brow—kinda like the tradesman’s entrance. The only problem with this point of entry were creatures called master-at-arms and bos’n mates—strange forms of primitive life that roamed around on surface ships, spreading ill will and evil attitude.

Proper nomenclature and use of officially condoned and authorized naval terms was very important to these high hashmark, brain-dead idiots. It was their “Mother’s Milk.” They used pirate movie vocabulary: “Avast matey, there be a vessel on the le’ward quarter, arrrr...”

If it was a slow day and you wanted to wind up the organ grinder’s monkey for entertainment, all you had to do was say, “Hey, Doc...” They *hated* to be called “Doc,” “Hoss,” or “Mr. Sailorman.” As in:

“Hey, Doc—how do I get to where the officers do all their officer stuff?”

“Crissakes son, how long you been in the Navy?”

“Not long, Hoss, how ’bout you?”

“Long enough to know you’re one (blanking) hopeless mother (blanker)!”

This was funny because I wasn’t the fool who was about to jump out of his brogans and have a heart attack.

“Yeah, Doc, last time I was over on your big boat, I think your officers lived upstairs at the end of a big gray hall with a lot of doors, fire extinguishers, pipes and electrical wire, and stuff...”

This kind of sacrilegious naval talk could make all the veins stand out on the neck of any sonuvabitch with fouled anchors below his crow. And, if he went into one of those “In the OLD Navy...” routines, you had him. He would then throw terms at you like, “Midships,

th’wartships, oh-two deck, up-ladder, stb’d passageway to the companionway aft of frame 32...” etc.

Once they started tossing around that Charlie Tuna talk, their eyes lit up. For one fleeting moment suspended in time, this poor pitiful excuse for a human being became Popeye, Barnacle Bill and the kid off the Cracker Jack box all rolled into one seafaring clown act.

“Thanks, buddy, I like that neat Navy talk. You musta paid a lot of attention to all that Navy silly shit in bootcamp. I’ll bet your mama’s real proud of you.”

By this time, even a certifiable idiot would unravel your act.

Once you got into “Mother Onion,” there were endless forms of things to do to amaze and entertain yourself.

Up off the boat deck was the radio shack. Radiomen have to go in and out of officer’s country all the time, so they gotta be clean and neat. Radio shacks are the best places to steal white hats. The radiomen on the *Orion* never seemed to figure that out.

You could always go down to the forward area where the ‘T’ Division bunked down. There was a good chance you could find some intellectually stimulating literature lying around—magazines with articles like, “I Was an American Sailor Trapped On an Island Inhabited by Sex-Crazed Amazon Women.” This kind of historically accurate recounting of sailor life details previously unknown contributed to a rapid increase in one’s naval awareness.

I once walked into a sophisticated, highly technical, state-of-the-art photo lab on the *Orion*. I found two highly placed members of the Naval Establishment using the massive carbon arc lights there to cook frozen pizzas. I left with a renewed faith and elevated confidence in the military preparedness of the Navy...and two hot slices of the pepperoni variety.

There was a vicious rumor that non-rated men would go to the tender to dope off and waste time, endlessly screwing around to no particular purpose. Whenever some obviously authority-drunk keeper of the flame and all-Navy gatekeeper would come toward you with that “What-in-the-hell are you doing here?” look in his eye, we would smile and launch a preemptive strike:

“Pardon me, Chief, where were we supposed to go to donate the blood you guys called for, y’know, to help those Taiwanese typhoon victims...?”

(concluded on page 14)

"Mother Onion" ... by Dex Armstrong

(concluded from page 13)

Hell, sometimes the old bastards went for it like a #5 dry fly. Most of the time though, they played "Pin the Tail on the Wiseass."

They were always blowing whistles and passing "Now hear this..." bulletins over their 21 MC:

"Now hear this: *Orion* arriving..."

"Now hear this: *Orion* departing..."

"Now hear this: Uniform of the day for all ship's company not engaged on work details: undress blues."

Sometimes we'd get so damned depressed we'd have to go to the radio shack and steal another white hat.

On *Orion*, there was a weird cult of unsalvageable individuals known as postal clerks. Two occupations I never figured out: *Orion* postal clerks and people who raise nightcrawlers for live bait stores. Can you imagine a thirty-year career sorting and bagging mail?

I once walked through an *Orion* heavy machine shop. They had equipment there fully capable of turning out a prop shaft for the biggest ship afloat. Instead, six guys were busting ass turning out two-inch-high metal chessmen. They had just completed what appeared to be five- to six-hundred rooks.

Orion also had a ship's service and a geedunk that did a landslide business in steel-belted hot dogs and stale potato chips. Hell, you could buy monogrammed lighters, pen sets, brooches, pendants, even little "USN" dangly earrings to use as "pogey bait" for that honey with loose panty elastic. Or maybe a sonargirl.

In those days, *Orion* was in a life-or-death race with rust. Bos'n mates were still considered to be part of the human race, and the Submarine Force had degenerated to the point where it was sending forth emissaries to steal, scavenge and wholesale-appropriate whatever was necessary to keep our petroleum-powered submersibles from taking up permanent residence in Davy Jones' Locker.

This was the point in naval history where some enterprising genius discovered that if you cut the end out of a Trojan and rerolled it, you had a universal O-ring. And that you could waterproof your watch by dropping it into a Trojan and tying a knot in it. If you are saying to yourself, "Why in the hell would some sonuvabitch wanna do that?," you obviously have never missed the last liberty boat and had to swim out to wherever your boat was swinging the hook. You could tell a frequent swimmer: he carried multiple rubbers and a laminated liberty card.



It was all too long ago in the land of DES SUB Piers.

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USS <i>Connecticut</i> (SSN-22)	USS <i>North Dakota</i> (SSN-784)
USS <i>Delaware</i> (SSN-791)	USS <i>Kentucky Blue</i> (SSBN-737)
USS <i>Greeneville</i> (SSN-772)	USS <i>Kentucky Gold</i> (SSBN-737)
USS <i>Helena</i> (SSN-725)	USS <i>Maine Blue</i> (SSBN-741)
USS <i>Hyman G. Rickover</i> (SSN-795)	

Questions?

Jack Messersmith
(928) 227-7753
or e-mail
MesserJ109@gmail.com

- ✓ Reach potential new members by sending three annual subscriptions of *American Submariner* to the boat or organization of your choice
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New Members

We proudly welcome aboard:

Patrick Zilliacus

(TM2-SS E5) Life Member, USSVI
Spouse: Mercedes
8180 Manitoba, Unit #323
Playa Del Rey, CA 90293-8668
cell: 310-592-7047
home: 310-305-2884
pwzilli@aol.com
(Qualified in 1944 on USS *Spot*,
SS-413; also aboard *Toro*, SS-422)

Scott Hultner

(MM1-SS E6; Petty Officer, 1st)
Spouse: Geri
5341 Vanguard Avenue
Garden Grove, CA 92845-1512
cell: 714-325-7321
shultner@yahoo.com
(Qualified in 1974 on *John Adams*,
SSBN-620; aboard till '78)

Larry T. Lovett

(Associate; Retired Pharmacist)
Wife: Robin
6632 Beachview Drive
Huntington Beach, CA
92648-2666
cell: 714-856-3508
rx4art@gmail.com
(Uncle lost on *Tullibee*, SS-284.)

Arthur B. Schwartz, Jr.

(HM2-SS E5; Petty Officer 2nd.)
Wife: Reta L.
13812 Reva Street
Cerritos, CA 90703-9062
cell: 562-972-7865
abschwartzjr@gmail.com
Qualified in 1975 on the
USS *George Bancroft* (SSBN-643)

David Detwiler

(Associate Member)
Wife: Mary Ellen
738 Madrid Street
San Francisco, CA 94112-3547
phone: 415-672-2294
dmdetwiler@att.net
Qualified in Life and
now enjoying retirement ;-)

Craig Ignatowitz

(IC2-SS E5; P.O.2c; '86-'92)
Partner: Anna Marie Lesh
6323 Capetown Street
Lakewood, CA 90713-1703
cell: 562-965-7710
Texasiggy@gmail.com
Qualified in 1988 on the
USS *Henry L. Stimson* (SSBN-655)



**"Get'cher Chapter News Here
— Read All About It! —"**

When News Breaks, We Pick Up the Pieces...



L.A.-Pasadena Base Christmas Luncheon

This year's annual Christmas Luncheon was very smooth, and Mike Swanson did himself and us proud! The turnout was good, conversation (sea stories) flowed well, and our after-lunch discussion featured the combat experiences of our four World War II submarine veterans, Royal Harrison, Harold Staggs, Bill Dillon and Pat Zilliacus.

Pat was with us (see photo next page), and Harold had expected to be there, but had to wave off because he wasn't feeling well. Ron Jones recorded the conversation because Bill and Royal had not been able to attend, and we'll send a copy of the conversation to all four of the fellows.

Mike was also able to reserve the space at the Eagle's Nest for 2024 on our regularly scheduled day; the *third* Saturday of December! Next time you run into Mike, give him a shout for his Christmas Luncheon work the past several years, because this is his final year as our base Treasurer.—*Dave Vanderveen*

(more photos on page 16)

L.A.-Pasadena Base Christmas Luncheon

(concluded from page 15)



Dave welcomes Pat Zilliacus to the base's Christmas party festivities.

Ken Dorn shows off a real, vintage USS Arizona (BB-39) Christmas card to the crowd, safely tucked away behind clear acrylic.



It's L.A.-Pasadena Base's fervent hope to eventually get this very special Christmas card into the hands of Cmdr. Thomas Digan (see page 7), CO of the new Block V Virginia-class attack sub, USS Arizona (SSN-803), now on the builder's ways.



**L.A.-Pasadena
Base 50-Year
Holland Club**

*(75-year members noted with *)*

- Ronald R. Jones..... 2023
- Gerard A. Krudwig..... 2022
- Gregory M. Paulson 2022
- Michael J. Swanson..... 2022
- Ralph J. Hansen 2021
- Robert F. Schive, Sr..... 2021
- Larry D. Long..... 2021
- G. Judson “Jud” Scott, Jr... 2021
- Edward E. Kushins 2020
- Bruce Evan Neighbors 2020
- David H. Vanderveen..... 2019
- Philip J. Jaskoviak 2019
- Dennis Bott 2018
- Robert “Mike” Cailor 2018
- Robert Miller..... 2018
- John A. Anderson..... 2017
- Roger C. Dunham, MD ... 2017
- Richard McPherson..... 2017
- Harry “Bill” Moak..... 2017
- Louis A. Myerson 2017
- Elliot Rada 2017
- Ronald G. Wagner 2017
- Dennis J. Walsh..... 2017
- Michael Kish 2016
- Gary Wheaton..... 2016
- Lawrence R. Butler 2015
- Samuel T. Higa 2015
- Harry P. Ross..... 2015

(concluded next page)



**Los Angeles-Pasadena Base
2024 Calendar of Upcoming Events**

- January 20 Monthly Meeting - Marni’s in Seal Beach
(formerly Glory Days Beachside Grill)
- February 17 Monthly Meeting - VFW Hall - (“Hobo Stew Day” TBD)
- March 16 Monthly Meeting - VFW Hall - (“Hobo Stew Day” TBD)
- April 20 Monthly Meeting - VFW Hall
Call for Memorial Day Prep Volunteers
- May 18 Field Day at the Memorial Site - 0900
Monthly Meeting at the Memorial Site
Nominating Committee Appointed
Call for participants in the
Huntington Beach 4th of July Parade
- May 25 Tarp Prep at the Memorial Site - 0900
- May 27 Memorial Day Service - 1100
Submarine Memorial, West
- June 15 Monthly Meeting - VFW Hall - Annual “Steakfest”
Call for nominations for 2025 Base Officers
- July 4 115th Annual...
Huntington Beach 4th of July Parade
- July 20 LeRoy Stone Memorial Picnic
(Location TBD)
- August 17 Monthly Meeting - VFW Hall - “Hawaii” Theme
2025 Base Officer Candidates Announced
- September 21 ANNUAL BUSINESS MEETING - VFW Hall
Election of Officers
- October 19 Monthly Meeting - VFW Hall
Annual Officer Installation Luncheon
- November 16 Monthly Meeting - VFW Hall - Thanksgiving Theme
- December 21 Annual Christmas Luncheon (Location TBD)

(Holland Club Roster, concluded)

- Charles H. Senior 2015
- Larry E. Smith..... 2015
- Sam Aboulafia..... 2014
- David Palagyi 2014
- Earl Thomas Peratt, Jr. 2014
- David D. Semrau, DDS.... 2014
- Ray Tracy Teare..... 2014
- Milton Harry Boudov 2013
- Kenneth Jon Dorn 2013
- M. Mark Hoffer..... 2013
- Michael P. Klein 2013
- Ronald L. Levenson..... 2013
- Edward L. Arnold..... 2012
- T. Michael Bircumshaw ... 2012
- Raymond Cheesebrough . 2012
- Bobby O. Mahaffey 2012
- John V. Mahan 2012
- Lee Melody 2012
- Clyde Matthew Turner..... 2012
- George R. Walrath..... 2012
- John L. Weisenberger 2012
- Edward A. Barwick 2011
- Joseph W. Koch, Jr. 2011
- Stephen D. Diumentì 2009
- David Whittlesey 2009
- Dennis A. Yure..... 2009
- Armen Bagdasarian..... 2008
- Paul A. Riggs 2008
- Rex L. Shields 2008
- Francis R. Traser 2006
- Ronald K. Thompson 2004
- James Rogers 2003
- *James E. Carter..... 1999
- *William F. Long..... 1999
- *Herbert J. "Bo" Bolton.... 1998
- *Kenneth E. Chunn..... 1998
- *Royal Harrison, Jr. 1995
- *Patrick Zilliacus. 1994
- *William J. Dillon 1993
- *Harold Staggs 1992

Eternal Patrol Notice



Robert E. "Bob" Conboy
12/21/2023

We've learned that our shipmate Bob Conboy departed on Eternal Patrol on December 21st. He was 91 and had been a Life Member of USSVI and L.A.-Pasadena Base, having served once as our COB. His wife Elena reports he passed painlessly and peacefully at a hospice care facility. He had requested cremation and that his ashes be scattered at sea.

Bob qualified in submarines aboard USS *Tiru* (SS-416) in 1953 and also served on USS *Jallao* (SS-368). He was in the Navy from '45-'54 and on submarines from '52-'54; final rating: EN2(SS) E-5 Petty Officer 2nd Class.

Condolences may be sent to Elena Conboy at this address:

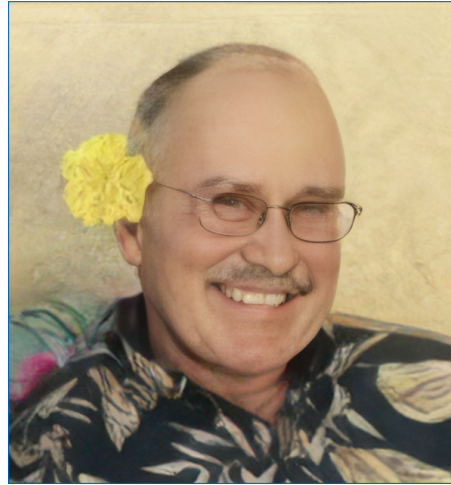
5125 Blackpool Road
 Westminster, CA 92683-4140
 Phone: 714-897-0106
 email: bobandelena@gmail.com

A Memorial Service will be held at St. Anne's Church
 340 10th Street, Seal Beach, CA 90740 - (562) 431-0721
 (Day, Date and Time to be Determined.)

Sailor, Rest Your Oar



Eternal Patrol Notice



Stephen C. Rowe
11/8/2023

We've also recently learned that our shipmate Stephen Rowe departed on Eternal Patrol on November 8th. He was 79 and had been a longtime member of USSVI and L.A.-Pasadena Base. His wife of 55 years, Ella, reports he passed peacefully of a heart condition while relaxing with some TV. He had requested cremation and that his ashes be scattered at sea by kayak. Our base is trying to assist by providing VA benefits info.

Stephen qualified in submarines aboard USS *Remora* (SS-487) in 1965 and was a proud Holland Club member; final rating: EN3(SS) - E4 - Petty Officer 3rd Class.

Condolences may be sent to Ella Rowe at this address:

P.O. Box 244
Surfside, CA 90743-0244
Phone: 562-761-1854
email: roweboat40@hotmail.com

A Celebration of Life Service
and Potluck Luncheon will be held at:
Sunset Beach Community Center
16861 12th Street, Sunset Beach, CA 90742
on Saturday, January 6, 2024 at 2:00 p.m.

Online Obituary:
[https://www.legacy.com/us/obituaries/thecatalinaislander/name/Steve-Rowe-Obituary-\(1944-2023\)-Catalina,CA-CatalinaIslander](https://www.legacy.com/us/obituaries/thecatalinaislander/name/Steve-Rowe-Obituary-(1944-2023)-Catalina,CA-CatalinaIslander)

Sailor, Rest Your Oar

2024 United States Submarine Veterans Calendar

GUPPY CONVERSION SUBMARINES

Spanning the years between World War II and the advent of nuclear power, these aging wartime workhorses, converted for greater speed and endurance, represented the vanguard of our undersea fleet.



Up for any mission, GUPPYs fill in between epochs.



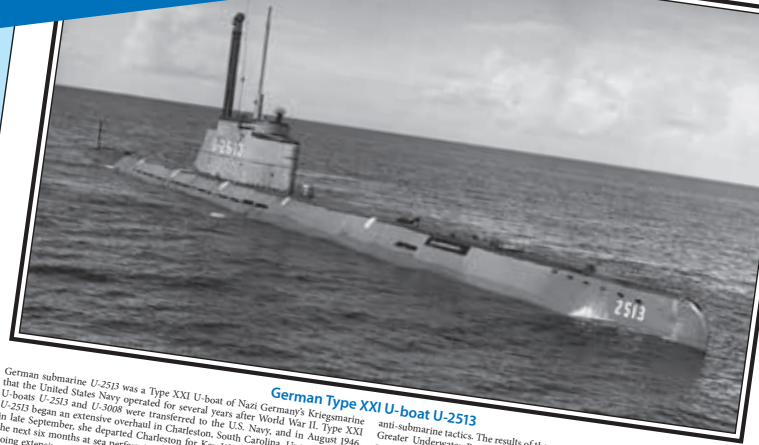
It is our purpose to perpetuate the memory of our shipmates who gave their lives in the pursuit of their duties while serving their country. That their dedication, deeds and supreme sacrifice be a constant source of motivation toward greater accomplishments. Pledge loyalty and patriotism to the United States of America and its Constitution.

In the years after the Second World War but before the advent of the nuclear Navy, GUPPY ("Greater Underwater Propulsion Power") conversions of WWII fleetboats took on every submarine task imaginable—with courage and conviction. Many of their missions remain classified today. These boats were old, tired, and due for a rest after winning the submarine war in the Pacific in 1945. But with a new cross-ocean enemy rebuilding its fleet and making its long-term aims known, there was no time to wait. Many of these World War Two boats were thus overhauled, modernized, and refitted with improved batteries and sleeker hulls for faster speeds and more endurance. Also, they received the latest electronics and state-of-the-art detection gear to stay a step ahead of our adversaries. This calendar tells the story of the Guppy Submarine Program and the hard-scrabble boats that held the line until their nuclear-powered replacements arrived.

The all-new 2024 USSVI Submarine Calendar **Order Now!**

Individual calendars are \$13.75+3.92 shipping. Order yours today by credit card at ussvinationalstorekeeper.com or by sending your check or money order made payable to USSVI to:

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German submarine U-2513 was a Type XXI U-boat of Nazi Germany's Kriegsmarine that the United States Navy operated for several years after World War II. Type XXI U-boats U-2513 and U-3008 were transferred to the U.S. Navy, and in August 1946 U-2513 began an extensive overhaul in Charleston, South Carolina. Upon completion in late September, she departed Charleston for Key West, Florida. The U-boat spent the next six months at sea performing speed, diving, and snorkeling trials and undergoing extensive sub-sea acoustics tests in conjunction with developing submarine and anti-submarine tactics. The results of these tests provided the foundation for the Navy's Greater Underwater Propulsion Power Program (GUPPY). The initial two-boat test program, implemented by the Portsmouth Naval Shipyard, eventually grew into several successive conversion programs. Those upgrades proceeded in seven variants in the following order: GUPPY I, GUPPY II, GUPPY IA, Fleet Snorkel, GUPPY IIA, GUPPY IB, and GUPPY IIB. Some boats that went through an early phase were then upgraded further in a later phase.

February 2024
 (Five submarines and 371 men lost)

"I believe it is the duty of every man to act as though the fate of the world depends on them. Surely no one man can do it all. But, one man CAN make a difference."
 —ADMIRAL HENRY G. BROWN

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29		

Events: BARACK (05-300) 1945; SHARK (05-176) 1942; ABRAHAM LINCOLN'S BIRTHDAY (Traditional); VALENTINE'S DAY; AMERICA (05-200) 1943; PRESIDENT'S DAY; GEORGE WASHINGTON'S BIRTHDAY (Traditional); GRAYBACK (05-200) 1948; TROUT (05-202) 1944.

Proceeds to benefit USSVI operations and projects.

L.A.-Pasadena Base Rogues Gallery

WANTED

'You seen these ornery varmints other than on the wall at the Post Office? Why not? They wanna be seen! Get to know your base shipmates by sight—you'll become faster friends! And send in your own mugshots to be included here in future issues. Whatcha waitin' for, horsefly?'



Mike "Willie" Williamson (above), seen here driving a 688 as if it were the family car. Willie's a dual Life Member of USS Bonefish Base (as Chaplin) and L.A.-Pasadena Base.

Next time we'll try for four or six shots. Send 'em in, guys!—ed.

Okay, I'll go first too. Sheesh. This is your humble editor, Jeff Porteous, happily ensconced in his other (non-military) submarine obsession. This shot is over a decade old, but I'm still nuts about radio-controlled model subs!





*In memory
of the
fifty-two
submarines
lost in
World War II*

SEALION
S-36
S-26
SHARK I
PERCH
S-27
GRUNION
S-39
ARGONAUT
AMBERJACK
GRAMPUS
TRITON
PICKEREL
GRENADIER
RUNNER
R-12
GRAYLING
POMPANO
CISCO
S-44
DORADO
WAHOO

CORVINA
SCULPIN
CAPELIN
SCORPION
GRAYBACK
TROUT
TULLIBEE
GUDGEON
HERRING
GOLET
S-28
ROBALO
FLIER
HARDER
SEAWOLF
DARTER
SHARK II
TANG
ESCOLAR
ALBACORE
GROWLER

SCAMP
SWORDFISH
BARBEL
KETE
TRIGGER
SNOOK
LAGARTO
BONEFISH
BULLHEAD

