

## Phase IV Introduction

---

ONCE AGAIN, THE STERN SECTION of *Albacore* was removed and modified to allow for the installation of a contra-rotating propeller propulsion system. A high-capacity silver-zinc battery was installed to provide the power to drive now two main motors that doubled the propulsive horsepower. It was this power-control system combination that would allow *Albacore* to set the underwater speed record twice.

The “old” stern was removed to make way for the addition of a second main motor. This second motor raised the available horsepower on the battery up to fifteen thousand, the same as that of a Skipjack-class SSN. The new portion of the after hull went from the original double hull to that of a single hull and in the process eliminated one ballast tank and one fuel tank.

The contra-rotating propeller system offered a way to put all the added horsepower into the water. Increased propulsion efficiency was realized through increased thrust. The forward propeller would put a rotational force to its wake, thereby wasting some of the power. The after propeller would recover this rotational force. The initial spacing between propellers was 10 feet. Next, the spacing was closed to 7½ feet and, lastly, to 5 feet.

The high-capacity silver-zinc battery had many times the energy storage capacity of the lead-acid battery it replaced. This energy was what allowed *Albacore* to again set the underwater speed record in 1966. The big

disadvantage of this battery was that it took a long time to charge using *Albacore's* relatively puny diesel-driven generators. The combination of a high-capacity battery and contra-rotating propellers now made *Albacore* truly capable of operating at speeds in excess of thirty knots.

Controllability was again very much a concern at these higher speeds. In order to address these concerns, a 'Vernier' control system was installed to limit the movement and angle of the control planes at these speeds. When operating above a set speed, this system was activated, which reduced the maximum displacement of the control surfaces and thus preventing over-controlling at high speeds.

Operations with an experimental noise-detection system dubbed the FAB (for the Fly-Around Body) were conducted during this phase. The FAB was a system designed to be deployed on every submarine completing a major upkeep or overhaul period to measure the noise emanating from that sub. The idea behind the FAB was to eliminate lengthy transits to a sound range to obtain this noise data. Using the FAB, the data could be recorded near the sub's home port. The system worked but proved to be impractical due to sea-state limits on its deployment.

There was a final project, unofficially Phase IV plus, installed and tested before *Albacore* was decommissioned. Termed "Slippery Water" by the crew, this was an experiment designed to induce laminar flow over the boat's hull. This was done by ejecting a polymer fluid that coated the hull thereby reducing water friction and drag-producing turbulence. The system proved to be successful and provided about a ten percent increase in speed but only for a limited period of time.

## Jack Hunter was a Lieutenant who served on *Albacore* from 1966 to 1968 during Phase IV operations

---

### BACKGROUND

I WAS BORN JULY OF 1937. My family lived in Teaneck, New Jersey. I spent my first four years there, and then we moved to Ridgewood, New Jersey, where I lived through high school graduating in 1955. I had one brother, one sister. I tried for a competitive appointment to the Naval Academy but lost out to my Congressman's son. I was able to garner a Navy ROTC Scholarship to Rensselaer Polytechnic Institute in Troy, New York. I had a burning desire to be an aeronautical engineer. I liked to build model airplanes. I could never get one to fly successfully, but I loved the effort of building. My initial goal was to become a Navy test pilot. Poor eyesight ended that career path.

I went through all the Ridgewood school system and went off to Rensselaer and did graduate as an aeronautical engineer. It took me five years because I was somewhat of a lunkhead. I always loved math and science, but I got into college, and all of a sudden, those became my worst subjects. Calculus just blew my mind away and I never could get my arms around it, and as a consequence, I suffered for five years.

The summer of my freshman year, because I had bollixed up my grades so badly, the Navy would not send me off on the normal midshipman summer cruise. I went to summer school. As a consequence, I had

an opportunity to take a trip out of New London on a submarine. The head of our Navy ROTC Unit was a submariner, a four-stripe Captain. He was a great recruiter and he caught my attention right away, so that freshman summer I took the week trip to New London. I had a good experience on the submarine and said, "Since I can't fly for the Navy, this is it for me."

#### INITIAL DUTY

On graduation, I had a four-year Navy commitment to fulfill and my first ship was a destroyer, USS Haynesworth. When I reported on board, the Executive Officer took a look at where I went to school and said, "Welcome, you are our Main Propulsion Assistant." I said, "I would like to be in the operations department." He said, "No, we've got a Naval Academy grad coming in who is going to be in operations. You are an engineer."

I reported to the Destroyer in June of 1960 and my wife Ellie and I were married in November. So, that's what? Five months after commissioning. But we had known each other since the start of college. We met at a church breakfast on the first September Sunday morning of our freshman year when both schools were opening. She was at Russell Sage College in downtown Troy. The church across her dorm in the center of Sage campus held this college student get-together breakfast. It was love at first sight.

In 1960, you had to be a qualified Officer of the Deck for Fleet Operations before you could request a transfer to submarines. After two years I had that qualification and my current Executive Officer said, "Sorry, you can't leave. We're going to deploy, so you're going with us." So, it took me three years instead of two to get to submarine training. During that time, I made two deployments to the Mediterranean and spent time on the Cuban Blockade during the missile crisis. We did a lot of interesting things but I was happy to leave for sub training. I have good memories of my time on the destroyer.

#### SUBMARINE SCHOOL

I transferred to Submarine School in Groton in July and spent the next six months there. My first underway was kind of interesting. We came back in after five days at sea, a whole bunch of us rode on two different submarines, and we all came in to the on-base Navy-housing complex where we were living. We had student quarters on the submarine base. At the time, there was a series of ten unit long buildings and there were probably five or six buildings that were Officers' Submarine School housing. Our wives welcomed us home, took one sniff and shooed us out in the backyard. We stunk of diesel oil. Submariners picked up that aroma. I tried convincing my wife that that was the aroma of money because we were going to be getting submarine pay. She said, "Don't care, backyard."

Submarine School was an interesting experience. I particularly enjoyed the engineering aspects of it, where we learned basically how all the systems on a submarine work. We learned about the weapons that they carried and about the operational aspects of submarines. And, of course, we learned how to dive and surface a submarine. The first thing that they want a new officer to do when he gets to his boat is to qualify as a diving officer. As a consequence, they had a series of diving trainers there at Sub School and we would practice making dives and learning the language and the series of commands that should be given. That way, when you went underway on your first submarine, you knew enough to be able to perform that particular function. When it came time to go to sea, we were pretty well up on how to dive a submarine, at least the procedures that went into it.

My class had two sections of officers who were going to diesel submarines and three groups going to nuclear boats. There was a little rivalry not only between the diesel submariners – there were about forty of us – but between the sixty nuclear officers. The kindly old gentleman in Washington made that selection [of who went where]. This was in 1963. Admiral Rickover made the selection as to who was going nuclear power. He was looking for somebody who got very good grades in college which I did not.

We officers learned probably quite a bit more than the enlisted men, but a broader brush. We didn't get into the details of how an air compressor actually worked. We knew that it took air in. There was a series of pistons that pounded the air down and raised the pressure and decreased the volume, and what came out then was stored in a big tank. Well, the enlisted men, in their advanced schooling, got into the nits and the grits. How the compressor was built, what the parts were, how you would overhaul it. The care and feeding of it. That's just one thing, but they went into a lot more detail on their specialized systems. They got a general overview on how a submarine worked in basic sub school, and then if they were going to be a machinist-mate, they got into the mechanics of the equipment that they were going to be working with.

#### FIRST SUBMARINE

I did well enough academically that I was able to select the boat I went to after graduation. The first [submarine I served on] was the USS Spinax SS 489 out of San Diego. Spinax was completed right at the end of World War II. It was a diesel submarine and at one time had been converted to a Radar Pickett submarine. During World War II in the Pacific, the Japanese kamikazes were crashing into our ships. Destroyers were positioned as pickets out ahead of the fleet to warn of approaching aircraft, but there was no place for those destroyers to hide and a fair number of them were badly damaged or sunk by kamikazes. So, some bright person in Washington said, "Gee, if our pickets were submarines, they could detect these flights and they could submerge and not be attacked." When I got to her, Spinax had all the special radars removed because the need for a radar picket wasn't there anymore. She was twenty years old when I got there in 1964 – almost twenty years old. There were eighty [crew] in round numbers. There was a wardroom of eight Officers and seventy or seventy-two enlisted men. So, it was a pretty good-sized vessel and crew.

#### OFFICER-ENLISTED RELATIONS

The relationship between Officers and crew was pretty casual. The surface Navy was very much more formal than the submarine Navy. In the Surface Navy, an Officer never addressed an enlisted man by his first or nickname. He might be Seaman Dokes or Petty Officer Jones or Hospitalman Smith, or something like that. In the submarine force, it was a lot less formal and it was kind of on nickname basis. To this day, I have a machinist mate first-class friend from Spinax. He is Sarge and I am Mr. Hunter. I can't break him of the habit. But Sarge was his nickname. And so, it was far more informal than the surface Navy, especially from the Officer standpoint. There was a lot of give-and-take in the submarine force that was not condoned in the surface Navy. The fact that I trusted you with my life when I was at four hundred feet under the ocean, and he trusted me with his life, and so a lot of barriers fell because of that. We truly were all in the same boat trying our best to keep the water on the outside.

#### FIRST AT SEA EXPERIENCE

The Guadalupe 500 sticks in my mind as my first significant operation on Spinax. That was a three submarine operation where we went down to the Guadalupe Islands off Mexico. One or two submarines tried to run a ring around the islands, running undetected while the one or other two tried to attack and sink – practice sinking. This was my first real chance to experience what submarines were practicing. One thing that sticks out in my mind is not the operation so much as that we were out there for two weeks and our Commanding Officer had a great love for avocados. The Officers' shower, when we got under way from San Diego, was floor to ceiling with crates of avocados! We did not take a shower until all those avocados were eaten. I had never eaten an avocado before. And, to this day, I do not like avocados, except when they're well mashed and they've got some hot sauce in them, and you can scoop them up with a cracker. [Guacamole—with a margarita on the side.] But that was my introduction to avocados and to

an extended period under way with this particular Commanding Officer. During that time, we were probably submerged the entire two weeks.

#### DUTY STATION CHANGES

I came to Spinax in February of 1964 and left I think it was April of 1966. I went from San Diego and Spinax to Albacore in Portsmouth, New Hampshire. This was a normal change of duty station. Our ever-loving detailers said that once you get in a homeport, we're going to keep you there for a couple of tours of duty. It never worked in my case. My first duty station (Haynesworth) was in Norfolk. Then I went to Submarine School up in Groton. Then to San Diego. Then to Portsmouth. And then back to San Diego. Then back to Groton. Then to Norfolk. One thing we could count upon from a detailer and that is he was going to lie to you. And he did. He had billets to fill and if you were coming up on rotation time, you could be sent anywhere to fill an opening. The catch phrase was "to meet the needs of the service". I counted it up. I think we moved seventeen times in twenty years.

#### COMING TO ALBACORE

I didn't request the Albacore. The Detailer said, "I've got a set of orders for you. You're going to like the vessel. It's going to be a little change-of-pace. Good luck." I knew not a thing about the Albacore. My poor wife – she came ahead and went to New London, looking for the Albacore. Except it wasn't there. She was part of Squadron Two, which was in New London, but the boat was not there. So, where is it? They said, "Oh, you've got to go up to Portsmouth, New Hampshire." So, that's how she found out where it was. We eventually got up to Portsmouth. We spent about a week in shipyard housing while we looked for a house to rent and found a place and settled there for the next two plus years.

Portsmouth was cold. We were coming from San Diego with two young children. We didn't have a lot of money, so when it got cold, the children

got the snowsuits, the warm stuff. Ellie and I dressed in layers until we could get some cold weather clothing. Portsmouth was a delight. A wonderful place. Nice people. We had – again – a good tour in Portsmouth and thoroughly enjoyed our time there. We must have because we keep going up once a month for our Friends of Albacore meeting. We still have some friends up there that we visit. I didn't really think that I was going to enjoy the tour on Albacore because it was based in out-of-the-way Portsmouth and it was a research and development submarine. It did not deploy; it didn't do a lot of spooky things that other submarines did. But in the end, I thought it was probably the best tour of duty I had. Just because it was a research and development submarine that didn't go out and do a lot of spooky things. This was a family time for us. After three deployments on the destroyer and a significant deployment on the Spinax, a yard period in San Francisco with another move on Spinax, it was nice to get in one place and pretty much stay there. Albacore did local operations, except for two trips down to Fort Lauderdale. My family made both those trips to Florida.

#### A NORMAL DAY IN PORT

We had shore-side offices when I reported on board. I was the Food Services, Commissary and Supply Officer and I had an outstanding leading commissaryman (Henry "Shaky" Graves) who did all the menu preparations, ordered the food, cooked the food and kept the financial records. He took a lot of the job off my hands and I didn't have to overly worry about that operation. The other part of the job that got most of my attention was the supply side. Worrying about getting parts for things that broke and we had a lot of things that broke. So, it was the challenge to keep things running. We would order the parts from the Navy but trying to keep an adequate supply of things was a challenge. We were not high on anybody's priority list for funding because we were a research and development submarine.

Admiral Rickover was not at all in contact. I think he came aboard probably two or three times, but never while I was there. The good admiral had his nuclear-powered submarines, which were his favorite.

The officers were running a five-section duty. You stood duty every fifth day, either on the submarine or on the barge, depending upon the condition of the boat. If it was torn apart, then we'd have duty on the barge. If the boat was in the water, we would sleep onboard. That was nice. The crew was four sections at the time, so every fourth day there were probably fifteen of the enlisted men on board.

#### SUBMARINE FOOD

The food on submarines was outstanding. We received a little extra money because of submarine duty, and with that extra money we could get a better cut of meat, and extra fresh vegetables. We could get some good things that the surface Navy couldn't afford. And being in Portsmouth, we had an advantage of when we were in port that every other Friday we were probably eating lobster. One Friday it would be boiled lobster, the next Friday it would be Lobster Newburg. My introduction to the Lobster Newburg was when the leading commissaryman, Shaky Graves, a first class at the time said, "Mr. Hunter, you don't want to ask what the special ingredient in the Lobster Newburg is." And he said, "The Captain doesn't ask, so you don't ask." I said, "Okay, Shaky, I will not ask." It turns out that on Newburg Fridays, Shaky would go up to the Executive Officer and say, "I need the secret ingredient out of your safe," The Executive Officer would say, "Just a minute," walk in the room, open the safe, shut the safe, and come out with a cloth sack, give it to him and say, "Here you are, Shaky. You're all set." He'd say, "Thank you, sir." And so, the secret ingredient would go back to the galley and into the Newburg. Well, it was a bottle of Dry Sack sherry. And if you've ever had Lobster Newburg without sherry, it's nothing. But in the dry Navy, you're not supposed to have alcohol on board except for the medicinal stuff. That was my earliest introduction to "Don't ask, don't tell." The Welfare and Recreation Committee had a certain amount of money that every other week someone would go out and purchase a bottle of wine and slip it to the Executive Officer. Submariners – you wouldn't get away with this on a surface ship. Submariners are just a little looser.

#### ALBACORE DIFFERENCES

My first time underway on Albacore was an eye-opener. I found out that the slowest the boat would go on the surface was six-and-a-half knots! That was dead slow. And, of course, submerged, there was just no comparison. I mean, it was a world of difference. The Spinax, on its best day, with a following wind, strong following sea, going as hard as it could, get make about ten knots submerged. It shook and rattled like a freight train on rough rails. The Albacore could go through twenty knots and not even quiver. And the reaction of the controls and everything were totally different. So, it was night and day. It was because it had a streamlined hull and could slice through the water so much easier. The design was far superior. At the time, in the mid-1960s, it was the fastest submarine. We could hold our own with a nuclear powered submarine submerged. We could keep up for about an hour and then our battery gave out. They could go forever.

#### ALBACORE OPERATIONS

When I joined Albacore, it was in Phase Four and we were testing the contra-rotating propeller propulsion system. The plan was to start out with a ten-foot spacing, then go to a seven-and-a-half and finally a five-foot spacing. What they were looking for was the greatest propulsion efficiency. The engineers pretty well knew by laboratory and model testing what it was going to be, but in real life they wanted to make sure.

That was one project. Another was a set of dive brakes. There had been a great deal of concern about controllability and loss of control at high-submerged speeds. How could you decelerate the submarine quickly and so dive brakes were considered. There were five large doors that opened out on each side of the submarine. They were very effective and created a tremendous drag and slowed you down dramatically. But they had a habit of opening at high speeds when you didn't want them to. It was a good idea but they proved to be not practical for fleet use.

We also ran a series of tests on what was called the Fly Around Body – FAB. What the engineers were trying to do was measure the noise radiating

from the submarine while it was running submerged. To do that, they had a little – sort of like an airplane that they towed off the bow and trailing behind it was a hydrophone array. This airplane-like device could be flown three hundred and sixty degrees around the submarine towing this array listening to the noise being radiated out around the submarine. Normally this measurement was done after every submarine overhaul and it required the submarine to go down to the Tongue of The Ocean (TOTO) in the Bahamas on an instrumented range and do multiple runs past a suspended hydrophone. What the Navy was hoping to do was to make the same measurements but to do it out of a submarine's homeport. If successful, the FAB would obviate the need for up to a five-day transit to TOTO and the five-day transit back. This would save time, money and wear and tear on the boat. And so, we made two trips to Fort Lauderdale with the FAB trying it out. It worked just fine. The only problem was, in order to get this hydrophone array on this airplane-like device, you needed to put divers in the water. And the divers wouldn't go in the water if the sea state was any greater than two, which is something you can achieve in your bathtub. So, we spent a lot of time sitting in Fort Lauderdale, waiting for the weather to calm down.

Those of us who had our families down with us loved it. It gave us a lot of shore time in Fort Lauderdale. [My family drove down.] We stayed at a motel that was right on the beach. It was about five miles from where the ship was moored in Port Everglades. I paid for that motel. Oh, no. The government didn't pay. What the government did pay for was for rooms for some of the enlisted men in a motel down by the Port Everglades Harbor, because we had several of their bunks loaded with instrumentation, so they couldn't sleep on board. They had to sleep ashore. So, the government picked up that tab. It was an expensive time down to Fort Lauderdale, but we had a good time.

#### BERTHING

For the Officers, the berthing space was no worse than anything I've experienced either on a surface ship or on any of the other submarines. They were snug but comfortable. A three-man stateroom was the norm. Bunks were one

over the other, but they were nicer bunks. A little firmer. You had a secluded area with a curtain that you could draw at the door way and shut the rest of the world out. Whereas the enlisted men just had an open berthing area. I never did find a bunk long enough for me, even on the destroyer. I was hanging over one end or the other, unless I'd kind of scrunched up a little bit. At the time, I was six-four. I'm now down to six-two and getting shorter.

Regarding height requirements, anybody over six-six, they wouldn't necessarily let in. But I was well under that. The last submarine I was on, the wardroom officers were all well over six-footers except for one guy, and he was about this tall, [about five-foot six] and that was how the periscope was set-up. All of us were hunched over like this, trying to look through the periscope, and he was standing on tippy-toes to look out.

#### ROLE OF THE DUTY OFFICER

Basically, the Duty Officer was the Captain's direct representative, and, as such, when the Captain was ashore, the Duty Officer was in charge of the submarine and responsible for the safety of the people on-board and for the wellbeing of the submarine. Responsible for anything that went on. If something was being repaired or some system had to be taken down for repairs, the Duty Officer had to involve himself to the point of knowing what was supposed to happen, who was going to do it, about how long it was going to take, what was involved in the execution of the task, and then making sure that when it was done, everything was put back together, cleaned up and restored back to the way it should have been.

If we were in port, the Captain was away just about every night. He had his quarters ashore and that was pretty typical. The Captain – unless we were underway – just didn't spend time on-board at night. He didn't need to. That's what the Duty Officer was for. He took care of things.

#### QUALITIES OF A SUBMARINER

As far as the Albacore is concerned, everyone fit in. The submarines I was on, we never had a problem. People usually didn't get into the submarine

force unless they absolutely wanted to, and if they came up short, they were escorted out.

Compared to surface sailors, submariners were a lot more relaxed. Yes. Easy-going. If someone was told to do something, they did it. Nobody questioned orders. But the way of getting things done was much more relaxed. The supervision wasn't as tight because people really knew their jobs. And you could depend upon them to do it and do it properly and do it properly the first time. On a surface ship, my experience was that was not always the case. On the destroyer, I was blessed to have first rate chiefs and Leading Petty Officers in my engineering department.

The people and the personalities and the level of qualification and dedication were far better in the submarine force than it was on a surface ship. First of all, as a submariner, you elected to go there, and then you were selected to be a submariner. Yes, you can volunteer. But that doesn't mean you're going to be a submariner. So, the people were far more interested in what they were doing on a submarine than they were on a surface ship. You know, "We're all in this thing together." And you depended on each other far more than you did depend upon each other on a surface ship.

Who makes a good submariner? Someone who is willing to put his shipmates before himself. Someone who is very much interested in where he is, what he's doing and doing it to the best of his ability. Someone who can get along well with others – plays nice with others if you wish. And have a sense of duty and a good sense of humor. The vast majority I served with had those characteristics. I found very few folks who – first of all, didn't have a sense of humor. You had to have one to get along because a lot of guff was exchanged, especially amongst the enlisted men. If you did not have a sense of humor, you were gone. You couldn't take it. Some of it was extremely tough. It was all in good fun, but got kind of harsh at times.

#### ALBACORE INDIVIDUALS I REMEMBER

A few that I remember: Norm Bower, our Chief of the Boat (COB); William Apostolos, Quartermaster, the 'Greek'; Stan 'Ski' Zajechowski, Engineman; Dennis 'Killer' Kane, Seaman; Henry 'Shaky' Graves, Commissaryman; Tony Szymbor, Electrician; 'Frenchy' Tranchemontagne, Interior Communications; Rick Winter and Bob Walker, Storekeepers; Captains Organ and Kattmann; XO's Bob Buzzard and Dave Fahrney; wardroom officers 'Luke' Riley, Paul Moses, Ron Hines, Tim Brady. Then there is Austin Jordan. The way I knew Austin on board was as "Butch." When I first started to see him referred to in e-mails as "Austin," I thought, "Who is this Austin?" Butch is probably the number one person from Albacore that I have had the most contact with over the years. He has a way about him that is a little sandpapery on one side and a little soft and feathery on another. And depending upon what was required, he could flip either way. A good guy. We stood a number of watches together, and as I'm sure he has related, he will never forgive me for the hurricane that he says I got us into, one that I claim absolutely no responsibility for.

We were coming back from FAB trials in Fort Lauderdale and all of a sudden the seas just got terrible. We had had no warning about any weather breaking up or coming up upon us. Before we knew it, we were taking green water over the bridge. This is solid water. No air mixed in that gives us the nice, white, foamy appearance. We took a couple of greenies over the bridge and the Captain decided that Butch and I would be a lot safer standing our watch down in the control room. So, we spent a bunch of real agonizing hours getting through that storm. Our engines were their usual wonderful, unreliable selves. Our battery was going flat. The bilges were filling with water because we had to take air into the boat to keep the engines running. With the air was coming water. No, I wasn't frightened. Perturbed. If we ran out of engines, then I would begin to get a little more perturbed. And if the battery was truly flat, then I would be even more perturbed. But no, I can't say that I was frightened. I was frightened about some other things, but not at that time. So, it was a little touchy for a while there.



## OTHER EVENTS

One time we were down doing one of our periodic deep dives just to prove that we could keep the water out successfully. I was stationed in the maneuvering area and I saw a little puff of smoke coming out of the cubicle. Tony Szymbor, the electrician on watch, also saw it and informed the Control Room “Fire in the cubicle.” All of a sudden, the water tight door behind me slammed shut and I said to myself, “Okay, normal response for a fire.” They’re doing what they’re supposed to –isolating the compartment where the fire is. Well, I’m in there. I looked up at Tony and he had taken the battery off propulsion so we weren’t turning the screws anymore. He saw no more smoke, so he announced, “Fire in the cubicle is out.” Then he tried to get the screws turning again but he couldn’t, so he called up and said, “Unable to answer any bells.” Well, we’re at five hundred feet, with no propulsion, and we didn’t have any way to power ourselves up to the surface. I thought, “Well, this is a kind of antsy little moment here.” Then I hear the emergency blow system go, which is dewatering the ballast tanks and I thought, “Well, okay. That’s all right. It’s a good response to the situation.” That was kind of an attention getting incident. For a few moments, I was a little concerned. This incident illustrated that there are people in place who are aware of what’s going on and what needs to be done to fix whatever is wrong at the moment.

## THE TOTO SOUND TRIAL

After we did the FAB the second time in Fort Lauderdale, they successfully measured the sound radiating from the boat, all the way around. The Naval Undersea Warfare Center (NUSC) in Newport had just built a new sound range – down in Tongue Of The Ocean – TOTO. And they wanted a submarine to go down and run the range. They were going to do sound measurements on that submarine to verify that the range was up and functioning properly. Since we had just finished the sound trials and measurements off Fort Lauderdale, Albacore was a logical choice to go over to TOTO and have repeat measurements taken. We did a series of runs

against the old style noise measurement barge that was there, which was titled the MONOB. I think it stood for MOBILE NOISE BARGE. We did a series of near passes to the array that was suspended from the barge. That gave NUSC a second set of noise measurements to use for comparison. Next, we moved over to the newly installed sound range and did a series of runs on the new range hydrophones. With the FAB measurements, the MONAB measurements and the sound range measurements, they could look at all three and determine that yes, in fact, they had adequate data. They were all pretty much the same and therefore their new sound-measuring array was, in fact, serviceable.

## LEAVING ALBACORE

In 1968, I was due for orders, except this time it was a little different. I got a call from my Detailer one day and he said, “Tear up the orders you’re going to receive in a couple of days. I’ve changed my mind.” I said, “Okay. Where were you going to send me?” He said, “It doesn’t make any difference. Those orders aren’t any good anymore, so don’t ask.” I said, “Okay. Where are you going to send me?” And he said, “Well, the orders I’m going to send you next are back to San Diego.” I thought, “Geez, okay.” “That’s fine. What boat?” He said, “Well, it’s Blackfin, a boat that’s coming from Hawaii. It’s going to Hunter’s Point Naval Shipyard for a six month overhaul, and then it’s going to be home ported in San Diego.” He said, “When you get to San Diego, buy yourself a house, get settled in and then the squadron will send you over to Hawaii and you’ll pick up the boat and bring it back to Hunter’s Point and go through the overhaul.” I wasn’t too keen on another six months in a shipyard, but I said, “All right. I can deal with that.” So, we get out to San Diego and find a house two days after getting there. We bought the house and arranged for our furniture to be delivered. We came back to our friends’ house where we were staying and there’s a note on the bulletin board that says, “Jack, call your Detailer.” I called the Detailer and he said, “We’ve got a change of orders for you.” He said, “I’m sending you to a boat in Pearl Harbor and it’s going to stay there.” I said, “No, you’re

not.” He said, “What do you mean?” I said, “I just today bought a house in San Diego. I am not going to Pearl Harbor.” He said, “I’ll call you back tomorrow.” He called me back and the orders to Blackfin were cancelled and I was to meet a boat coming back from a West Pac deployment in about three weeks. He said, “Report into the squadron. They’ll give you something to do for three weeks. Good luck.” Click. So, that was it. I got to stay in San Diego for a full two years without any shipyard time.

[The Detailer] is a submarine officer. He is senior in rank to whom ever he is giving orders to. And he is ‘God,’ if you wish. This individual changes every couple of years. He’s in Washington, D.C. I got to meet my detailer in person I think twice in twenty years. I always was being detailed by a Lieutenant Commander. Then, as I achieved that rank, it was a Commander. Their primary responsibility was to make sure that ships were adequately staffed to meet their operational commitments regardless of the individual’s wishes. As I said before, “the needs of the service” come first. That’s why you could go from coast to coast to coast. Wherever the biggest hole was or a fire was burning the brightest, that’s the one that had the Detailer’s attention – grabbed his eye. And so, he would work to fill that particular billet.

The important thing to me was to be on a submarine home ported in San Diego. I met it when she came back from the Western Pacific and we did a series of local ops for almost a year before she deployed to the Western Pacific for six months. This was the Medregal. My daughter liked to name my submarines as the – what was it? The Spinach, Apple Core and the Metrical. I was Operations Officer and Navigator on the Medregal. I spent two years on her before she went out of service at Hunter’s Point in 1970. From there, I had orders to be an instructor at Naval Submarine School.

#### DUTY AT SUBMARINE SCHOOL

We were back in Groton for two more years. I was in the Weapons & Tactics Department in Officer Sub School and there I got into a program that I

stayed with for the next twenty-nine years. Ten in the Navy and nineteen as a civilian.

I dug into the weapons end of submarines. In 1970, the Navy was introducing the new Mark 48 Torpedo that was a heavy weight torpedo that was replacing one of the old steam-powered World War II torpedoes. When I reported in, my boss at Submarine School said, “I’ve got a project for you. I want you to learn all you can about the Mark 48 Torpedo.” He said, “You are going to be Submarine School’s expert.” You don’t often get a opportunity like that. I immersed myself in learning all aspects of the torpedo and yes, I was the school’s expert. I used that torpedo knowledge for the next twenty-nine years. (When I got out of the Navy, I went to work as a defense contractor in Newport, working for a group that was doing all the analytical work on the Mark 48 Torpedo. At one point I had a group of eighteen people working for me who did nothing but analyze all the fleet firings of the Mark 48.) But for Sub School, I was the expert.

#### DUTY AT SUBMARINE HEADQUARTERS AND AFTER

After two years at Sub School, I received orders to the staff of the Atlantic submarine force commander in Norfolk, Virginia and spent the next four years as the Mark 48 Torpedo Officer. This was 1972 and we were beginning to introduce the Mark 48 into the fleet. All submarines were going through their classroom training and simulated firings, learning all they could about this new torpedo. I spent four years on the staff, and then it was back up to New London for two years.

At SubLant, when I was the MK 48 Project Officer, there were two training and certification teams on the East Coast, made-up of two officers and four enlisted men. The teams did the schoolhouse training for all the submarine crews, educating them on the capabilities of the weapon, how to employ it, and doing the submarine attack teacher training, where they fired simulated weapons. It was my job to set the scheduling of the schoolhouse training and the on-range training. It was my job to get the practice

torpedoes to the submarines before they went to TOTO to do their under-way training. I helped in getting the war shot torpedoes to the submarines once they became Mk 48 certified. That, primarily, was what I was doing at SubLant for those four years.

While on staff, I rode the submarine that fired the first Mark 48 warshot torpedo. We had a surface craft, an old DE, which we fired at and sank. That was the first war shot firing of the Mark 48 torpedo. As part of my staff duties, I rode a number of the submarines when they were going through their training. One of the reasons I was happy to do this was submarine pay. You had to spend forty-eight hours a month at sea on a submarine in order to qualify for submarine pay. It was an extra hundred dollars in my pocket, which in the 1970s, was significant money.

#### COMMAND TOUR

Not teaching, this time I took command of one of the floating dry docks at the sub base in Groton. For two years, we docked submarines while repairs/modifications were made, cleaned and painted their hulls and put them back in the water. On several occasions, I met with 'Shaky' Graves, now a Command Career Councilor and 'Frenchy' Tranchemontagne, now a Chief Interior Communications man both of whom were assigned to commands on the base.

#### FINAL TOUR

My last two years in the Navy were spent down the street from the dry dock as a member of Submarine Development Squadron 12 staff where I was assigned to the Weapons & Tactics Department. There, I was working with the Mark 48 Torpedo again and I had the Tomahawk and the Harpoon missiles, also. Once again, it was a very interesting two-year period.

#### WESTPAC EXPERIENCES

Two of the deployments that I made were in the Western Pacific. During the Vietnam War, we went into the South China Sea. We did the spooky things that submarines do and once found ourselves in an old World War II minefield. Another time, we found ourselves in amongst a bunch of probably a hundred fishing boats, where we had no place to go because we were in ninety feet of water and we couldn't go deep enough to get away from their nets or anything else. We were on plane guard duty when they were doing bombing raids in the north. We'd sit at periscope-depth, ready to surface and run after a pilot if he was ejected out into the South China Sea – those kinds of things. And we played electric rabbit for the destroyers that were out there, too.

Going through this gave me a greater appreciation for what the men in World War II went through as submariners. They didn't have the speed to out-run the Japanese destroyers trying to kill them. They had limited capabilities of maneuverability, depth and endurance to evade and many of them didn't succeed. What else did I gain? An appreciation for the nuclear Navy and the greater capabilities that they had that the diesel guys could never ever think of having. I served with a good deal of nuclear-trained folks and in the bull sessions that invariably occurred, a lot of tongues got loosened and a lot of interesting things were revealed that I had never thought we could do before with our submarines. Having served on Albacore gave me an appreciation of the qualities and capabilities that the nuclear boats had. During one of our Western Pacific operations, we took some spooks up and we listened to Russian communications. Well, that, for us, was a big deal. For the nuclear guys, they did that all the time. I mean, it's old hat for them. And if you read *Blind Man's Bluff*, you know that the submarines did some real weird things. Having an adaptation of the Albacore hull coupled with a nuclear power plant and you've got capabilities times a hundred over what the diesel boats had.

### THE SLIPPERY WATER PROJECT

Just before I left, Albacore went into a non-phase of project testing. Slippery Water was not the real name of what this was all about. The project was to try and get more speed out of a submarine. This experiment had been tried on torpedoes successfully, and so the thought was, "Let's see what it does for a submarine." One of the thoughts for Albacore down the road was to take the sail off, so that all you had was just the rounded hull. But as an interim step they thought, "Well, let's see what this polymer ejection system could do." What it was was a chemical that was mixed in fresh water and pumped out of the submarine through a series of two rings, one up near the bow and one near the sail. This fluid then flowed over the submarine and allowed the water to flow over the surface of the submarine in a much smoother way, so that the turbulence was postponed until it was farther back on the after-end of the submarine. By reducing the amount of turbulence, it reduced the drag so you could go faster. The theory was if we pump enough of this stuff out we're going to get a good increase in speed. I never got to see the fruits of that experiment, but I did understand that it picked up probably about a ten percent speed increase, which equates to a couple – three – knots. But because of the limited capacity of the system, it was kind of a sprint type of deal. You couldn't continue doing this for any length of time – maybe ten to twenty minutes – and then the fluid was all gone, and then you slowed back down again. So, it was kind of impractical – but it was again, another experiment. Something else tried. Something else – yes, it works, but not really practical.

### WHO MADE PLANS FOR THE ALBACORE

The Naval Sea Systems and the David Taylor Model Basin people worked together. Basically, the first four phases of Albacore were laid out before she even had her keel laid. It was all pre-planned. And then, as things evolved, other things got tossed in. The Captain had little to no say about this. We had little say as to what was going on. It was at a much higher level that all these decisions were made. Naval Sea Systems Command would come down and say, "Okay, let's get ready to start Phase 2 or Phase 3 or Phase 4 or whatever." That's how we found out.

### EFFECT ON LIFE AND FAMILY

I got to Albacore in 1966, so I had been basically at sea – except for the six months at Sub School – for six years. Two deployments to the Mediterranean, time spent on the Cuban Blockade and one extended deployment to the Western Pacific. When I got to Albacore in 1966, my daughter was three years old and my son was eight months old. I had a very young family, and it was nice to spend two-and-a-half years, almost – with the family in one place, without having to worry about a deployment. That was a big plus. That I was able to have the family down in Fort Lauderdale those two deployments and spend a month to two months down there with me was a further treat. I and they enjoyed it. When I went to teach at Sub School in 1970, that was really the end of my making deployments. I was kind of an off-and-on, stay-at-home dad for the last ten years of my service. I got to see the kids into and through most of their teenage years. But a lot of service people don't have that opportunity. I mean, they continually deploy, almost up until they retire. My son had an opportunity to go down to the Naval Academy when he was in high school at the end of his junior year. They were running kind of a familiarization/recruiting time down there, so he said, "Okay, I'll go down," because he was interested in a lot of things. He spent a week there and he came back and said, "Dad, at the end of the week they asked, 'Doug, how do you feel about the Naval Academy?'" He said, "Well, I enjoyed my time down here, but my dad and I have been in the Navy now for seventeen years. If you retire me on three more, I'll come to the Academy." They said, "No, it doesn't work that way, Son." He said, "Well, that's it." But no – he didn't go into service.

### AS TO CAREER

Wouldn't change a thing. I thoroughly enjoyed my time in the Service. I think I made a contribution-- The Mark 48 Torpedo. I felt very satisfied coming out of my time with SubLant, those four years there. In those years, we put that new weapons system on fifty-two submarines and two tenders. That's pretty good work for four years. I felt very tickled about that. [It is

still being used.] It's the mainstay of the submarine force. It's gone through a number of improvements and variations, but it is still *the* heavyweight torpedo that the Navy uses.

**End of Interview**

Austin “Butch” Jordan was a Yeoman who served on Albacore from 1966 to 1968 during Phase IV operations.

---

**BACKGROUND**

I WAS BORN IN BOSTON, Massachusetts, November 23, 1946, the only child of an iron foundry worker and a laundry worker. I grew up in the West Roxbury section of Boston, attended public schools, attended Roslindale High School, which is now, interestingly enough, converted to an old folks' home, which I have not taken personally, but it does ring home.

In my senior year in high school, it became apparent to me that with all that was going on in the world in the early 1960s, that the draft was not merely a distinct possibility, but an inevitability. And I decided at that point to take charge of my life and I enlisted in the Navy while I was still in high school, under a specific reserve program that allowed me to finish high school and then go on from there. Interestingly enough, shortly after I had begun the process of joining the Navy, but before it had actually taken hold, on a blind date, I met a charming and delightful young woman. She was also a senior in high school, but was in a parochial school, and she eventually became my wife and the mother of my children.

In any event, after enlisting in the Navy, I attended – after all of the preliminary stuff – the Naval Submarine School here in Groton, Connecticut.

I also attended what was called, at that time, Yeoman Class A School, which was a technical specialty school in the Navy. And that, essentially, meant that I was an administrative specialist, who processed documents, maintained files, and so on, for the administrative processes of the various commands to which I was assigned.

As I mentioned, my father worked in an iron foundry and my mother worked in a laundry. Both of them were very proud of the fact that I wanted to be in front of this, actually take charge and go out and join the Navy. The only reluctance came more clearly from my mother and less clearly, but definitely there, from my father when they learned that I had volunteered for submarine duty. Ten months before I enlisted in the Navy, the Thresher went down. That was one of the things that motivated me into volunteering for submarines in the first place, because all of the notoriety that evolved as a consequence of the Thresher disaster made submarines all the more intriguing to me.

#### WHY NAVY AND SUBMARINES

I started thinking about submarines, actually, about – well, I started thinking about submarines and what it would be like to serve on them when I was a boy, having seen movies like ‘Run Silent, Run Deep.’ A lot of the World War II submarine movies actually fascinated me. Duty in a submarine sounded really interesting.

I didn’t know what the numbers were back then, but I knew as a consequence of the movies and reading and school, that after Pearl Harbor, the Pacific Fleet had essentially been destroyed except for the submarine force, and the submarine force basically took it to the Japanese Navy. If you look at the numbers, a third of the Japanese Navy and two-thirds of Japanese merchant shipping has been destroyed by the United States Submarine Force. So, essentially, the numbers are that two percent of the United States Navy accounted for sixty percent of merchant losses for the Japanese and a third of their military vessel losses through World War II. So, that’s a significant number. This is a very small group. This is an elite group of people

who were able to have such an impact in the outcome of the war. That, I found, interesting. That, I found, attractive.

My father was in the Coast Guard during World War II and I have some cousins who are in the Army and had careers in the Army, but no one in my family really had any Navy history. I just found the Navy to be really – the submarine aspect of things I found attractive. The fact that the Navy was reputed to offer the best technical training of any of the Armed Forces, I found attractive. The prospect of seeing more than West Roxbury, Massachusetts, I found attractive. That I would be doing something that not everybody else did, I found attractive. That I could – it struck me that the only thing that would limit me in the United States Navy was me. No one – given all that I knew and all that I understood and all that I read about, about the United States Navy was you can go as far as you can go, based on your ability and your ability alone. That I found very attractive.

The recruiters are recruiters. Even then I knew that a recruiter was a salesperson, okay? But based on what I saw – and I had met people who were in the Navy – not one person I had met who had done time in the Navy, ever had a bad thing to say about the Navy. Anybody I had ever met who had been in the Army had negative things to say. They had negative things to say about the Air Force. I never heard anybody say anything bad about the Marines, but the Marine Corps struck me as being a rather heroic outfit. Don’t get me wrong, there’s nothing wrong with being heroic, but I wanted to look beyond the uniform and the ribbons and the admiration. I respect the fact that that individual has done what he’s done and I know they are generally where the action, the tough action, is. But the Navy offered me so much. It offered me an opportunity to get out of where I was. I did not want to be a foundryman because every man – every one of my forefathers – my father, my grandfather, my great-grandfather – were all foundrymen, and I didn’t want to work in an iron foundry. I had no interest in working there. I had interest in doing something that I wanted to do, and I wasn’t quite sure what that was, but I didn’t want to be restricted by what had happened before. I didn’t want my father’s life. I didn’t want my grandfather’s life and I

didn't want my great-grandfather's life. I wanted my life, and I wanted to make it what it was. My father liked the idea of me joining the Navy because he liked the idea of me joining the Navy and he wanted to be proud of his son, okay?

I think he didn't want me to be a foundryman, either. And one of the ways that I have come to that conclusion over the years was he brought me into an iron foundry in Boonton, New Jersey, in August. I think I was nine. And any ideas I had about being a foundryman were totally eliminated by going into a place where it was, like, a hundred thirty degrees, and the people who worked there all had old burn marks on their hands and forearms. They were all hard-working men and I had a lot of respect for blue-collar, hard-working people, but I didn't think it was for me. My mother wanted me to make something of myself. I was always her pride and joy. She was worried about me. She sat with me when the recruiter came to our house, and she was very helpful and very supportive. But I think deep down inside, she was frightened. She was particularly frightened of the fact that I wanted to volunteer for submarine duty.

She never really came out and said, "Butch, I don't want you to do this." What she did say was, "Does it have to be submarines?" I don't remember if I said, "Yes, it has to be submarines, Mom," or "It has to be what I want," but it was something like that that I said. I didn't want her to be – I didn't want to upset my mother, but by the same token, I didn't want what my parents wanted and I didn't want anyone to control my life.

I certainly wasn't performing academically to my capability. I was much more interested in basketball, football and girls than I was in academic achievement. I lettered in basketball and football in high school. And with respect to girls, I met some very nice people, the nicest of which I held on to. Sheila, I met on a blind date.

My academic achievements – I graduated from Old Dominion University *summa cum laude* and that didn't manifest itself until I matured. I graduated high school in 1964. I graduated college in 1984. I like to attribute it to the fact that I'm a slow learner, but –

But I really just did a lot of time at various colleges around the country, getting my credits as I could as I went, because I went where the Navy sent me and I did that for twenty-five years.

When I got into the Navy – you know, when you grow up in an area and you find your niche with your friends, you kind of fit in to a pattern. You fall into this lock-step thing where you do what you expect yourself to do, and you fall into a role that you expect yourself to follow and you see yourself fitting into a certain area with a group. What the Navy did for me is it kind of helped me break that mold, break that pattern, and not get into this role-playing business. And it allowed me, whether I consciously was aware of it or not, to see where I fit in the context of my peers. Not just in West Roxbury, Massachusetts, but all over the country. I knew once I began – once I said, "Okay, this is where I am and this is how I'm doing and this is where I sit relative to all these other people." And really, people I don't think like to admit this, but your self-image – to a greater or lesser degree – is dependent on the perception that people have of you. And the more time I spent in the Navy and the greater the number of people with whom I became acquainted and who I encountered, the more I realized (1) I'm looked on as a leader; (2) I'm looked on as above-average intelligence; (3) the more I try to do things, the more successful I am about doing them. That wasn't always the case when I was at home, and that wasn't always the case when I was in high school, largely because I – you know, nothing succeeds like success. Success breeds success, and the more you find that you can accomplish things, the more you find that you want to accomplish things, and the more that you succeed in doing those things, the more you realize, "You know, what? I can do this. And if I can do this, then maybe I can do that. And if I can do that, then I can do many more other things." Self-confidence builds on itself and it doesn't come automatically. And it particularly doesn't come automatically when you come from a household where they throw ticker-tape parades if you graduate high school, you know?

My father finished the eighth grade. My mother finished the fifth. That was the expectation. When I finished high school, it was this enormous

thing and I said to myself – even then I said to myself, “This isn’t that big a deal. This is not that big a deal.”

My father died in 1980 and my mother died in 1995. My father was around when I got commissioned. That was big. Although he was on his death bed in hospital in Cape Cod and my mother called me and said, “Things are not good. You probably should come home.” I was a Lieutenant at the time. January 1980. I was in dress uniform and I walked into his room in the hospital and he perked up when I walked in. And we talked for a bit and my mother had not had dinner yet, so I said, “Dad, I really need to go. I need to take Mom to dinner.” And as I’m going out the door I heard him say, “I’m done.” And he looked at me and for the first time in my life he said, “I’m proud of you.” And I said, “I’m proud of you.” That was a pretty significant time.

#### ENLISTING WITH SCHOOL MATES

Three of my friends followed me into the Navy and submarines. My best friend, Bill Hardy, who I just lost two years ago – prematurely, due to lung cancer – I recruited him directly and he volunteered for submarine duty as a consequence of me doing it. Two other good friends of mine who I routinely see, who I grew up with, both also joined the Navy, both also volunteered for submarine duty. Jay McFeeley and Paul DiIeso. Those three basically joined the Navy and volunteered for submarine duty. I think, as a consequence of me having done it was why Bill joined. Not certain about Jay or Paul though. Bill was on the West Coast. Paul and Jay – I was on shore duty on the West Coast, post-Albacore, and Paul and Jay were serving down here, in New London. I guess I was leading. I never really thought of it that way, but I guess I was.

Paul and I had lunch together a couple of months ago and he said to me, “When you joined the Navy, half the high school class – half the guys in high school said, ‘Wow.’” And there were three hundred and twenty-five people in my high school graduating class. And he said, “Well, everybody else is looking for a way to avoid the draft or to do anything but that, and you just decided that you were going to do it.” I said, “Well, I knew it would

happen eventually. I might as well get it out of the way.” I suppose that was the case.

#### SUBMARINE AND YEOMAN SCHOOL

I attended Submarine School here in New London, Connecticut. When I went to Submarine School, it was the first really tough, rigorous technical schooling that I had undertaken, and it was different because a lot of it was about subjects that I didn’t have a great deal of exposure to – electricity and hydraulics and air systems and tanks and ship configurations and physics and things like that, and I did not have a great deal of that in high school. On top of that, at that time, there was this escape training tank that they had, that everybody that graduated Submarine School had to go through. You had to successfully complete buoyant ascent training.

What they do is they take you in a – this tower is, like, a hundred and fifty feet high, that’s filled with water, and they have the various pressure chambers along the way. And what you do is they put you in these chambers. They flood the chamber down until it’s neck-high. You have this life vest on that they inflate, and then you go out into the tank. It was called, at that time, the ‘blow and go method.’ It was buoyant ascent training. And you would breathe in compressed air, so you had to blow the air out of your lungs. Or, if you went up too fast, it could actually damage your lungs. Your lungs could explode. I had a real difficult time with that the first couple of times. The first time I went through, I totally panicked and I started swimming and all kinds of stuff. They grabbed me. But I had to finish that, and I wasn’t going to give up on it. It took me five times.

Most people are successful the first time through and second time through or third time through. The third time I did it, I was almost to the surface when I thought I had run out of air, and the guy pulled me aside and said, “You were close.” So, I decided, “I’ve got to do this,” and I did it. I went through and – what happens is the divers, when they pull you out of the tank, they look you in the eye, and if you’re successful they say, “You had a good run.” And they pulled me out of the tank, and this guy had seen me



each time and the corners of his mouth went up and just a hint of a smile and he said, “You had a good run.”

He just might as well have said, “You won the lottery” because I just wanted that so bad. I wanted submarines, I wanted to get through Submarine School, and I had to get through buoyant ascent training or I wasn’t going to get through this. Anyway, that was the tough part. The first exam – the first week – I was really scared because I had never taken a technical exam before. As it turns out, I did very well in it. I did very, very well. I was very pleased about that. I was seventeen years old. I didn’t know anything.

The classes were taught in a classroom with experienced submariners – senior people – teaching. We were the third class to be taught the nuclear submarine. All of the other classes prior to that were taught diesel. We couldn’t take any of the classroom materials out of the classroom because it was all classified. Classes were intense and went on for eight weeks. I finished up my eight weeks. I went home and I was basically a drilling reservist for a period and then I went out to San Diego to attend Yeoman Class A School, which was also eight weeks long.

That was service records and files and things like that. During that time, Sheila and I had been talking about – we’d been dating and we knew things were going very well between us and we were serious. So, while I was out there I bought her an engagement ring, and when I returned I was going to have six weeks from the time I finished school to the time I reported to my next duty station. So, I came home and we decided to get married. Just before I reported into my next duty station, we got married. I had taken the exam for third class Petty Officer at that time. As it turns out, I got married and I made third class, I reported to my first duty station, which I thought was going to be the USS Hardhead, which is a diesel submarine down here in New London. I reported in there, and as it turns out, I was an extra. Sheila was busy, out looking for an apartment for us, and I’m busy trying to get acclimated, and the next thing I know, they call me up to the squadron and said, “We’re going to send you up to the USS Albacore.” “Oh, okay.” So, at the end of the day, Sheila and I saw each other and she said, “I

got news,” and I said, “I got news.” She said, “I found us a beautiful apartment,” and I said, “I just got transferred.” But she found us a beautiful place in Mystic. It overlooked the river and everything else. That was 1966 when I went to the Albacore.

#### COMING TO ALBACORE

I knew nothing about the Albacore. Absolutely nothing. I said, “A submarine, at home port in New Hampshire.” I knew that submarines were in New London and Norfolk and Key West and Charleston, and on the west coast – I didn’t know that there were any in Portsmouth, New Hampshire. But anyway, we got up there. It was really strange. I had never seen anything like it. It was low in the water and you didn’t see much of it, and it was really – compared to the other submarines that I’d been on – because you do a lot of training on submarines. The other diesel boats I’d been on were bigger. I had actually seen the nukes and I had actually studied them, and I knew the nukes were bigger. So, this was kind of a strange looking situation, you know? Anyway, I reported on June 5, 1966. And, as it turns out, the Duty Officer – because I reported over the weekend – the Duty Officer that day eventually became a good friend of mine in later years—Jack Hunter. He was the Duty Officer when I reported to duty. And then I started to do what every newly reporting aboard, aspiring submariner has to do, and that is to begin the process of qualifying in submarines.

#### SUBMARINE QUALIFICATION

You need to learn how to get good and dirty because you are going to get good and dirty. And what you have to do is learn every electrical, air, hydraulic, mechanical, electronic system on-board. You need to not just know it, but you have to understand the principles of operation of every system on-board that ship, and you also need to be able to not merely understand it – when, at the time of your qualification you need to be able to operate it. You need to be able to light-off a diesel engine; you need to be able to

blow the sanitary tanks. You need to pump water from one tank to another. You need to be able to combat casualties. You need to be able to put out fires. You need to be able to steer the ship. You need to be able to operate the planes. You need to be able to operate the maneuvering control console, which allows you to operate the ship while it's submerged on electrical power. We didn't have a snorkel on-board the Albacore, so when you're submerged, you're totally on battery-power. You need to know all of that stuff. You need to not just know it so that you can repeat it or state it back to someone. You need to be able to understand the principle of operation, and why things are this way.

The information that you gathered while you were in Submarine School was good for the purposes of understanding context and the basic principle. But every submarine – even submarines in the same class – are unique unto themselves, because not every submarine has the identical procedure for operating certain systems or doing things a certain way. And Albacore was a truly unique submarine, so there was no other submarine like it. So, what you learned, you learned fresh. Most of it was self-taught. What you would do is you would get the drawings, you would get all of the technical information which was available – you would have to do that – then, what you would do is you would trace the system. If it was an air system, you'd learn, for example, the ship service air system, which was the first system that I learned on-board that ship, and you would trace it from the forward room to the forward battery to the control room –

You'd literally trace it. You would trace it by hand. You would follow the pipe and see where the valves are and make note of your drawing because you have to draw the system yourself. You have to have your own drawing. The ship service air systems are all light brown, so you know that those valves service three hundred and eighty pounds per square inch – they could do that much. And you take it from the beginning, and you walk it all the way – you follow every one of them. You find the valve, follow the pipe, follow the valve, you make note where all the valves are and you keep going, and you do that with every system. You do it – and when it came to electricity, I was totally intimidated by electricity. Totally intimidated

by main power and auxiliary power, and I went to one of the most knowledgeable electricians on-board and I sat down and I said, "Tony [Szymbor], this scares the hell out of me because I don't understand how it works." He said, "What is there to understand? Tracing the electrical system is just like tracing the water system or an air system. A breaker is nothing more than a valve, okay? And instead of opening a valve to let the water go through, you shut the breaker to let the electricity go through. That's the only difference. Go away and come back when you know it." So I did just that.

Sometimes [the ship is] underway. Sometimes it's in port. Sometimes it's in the dry dock because Albacore required a lot of retrofitting and updating of various systems. It's also important to recognize that I had my own job to do. I had work to do, so any qualification that I did was done on my own time off. So, instead of going home and seeing my wife, I'm on-board the ship, learning this stuff. Or, while I'm underway, I'm up qualifying.

#### ALBACORE CREW STABILITY

Albacore went into commission in 1953 and I reported on-board in 1966, so it had been around a while. There were some people who had been on there quite some time. Henry Graves was the chief cook. And he'd been on there a long time. Albacore was kind of a unique ship. People want to stay on-board because of the nature of the operation. They'd spend a lot of time in the shipyard so they didn't have to go to sea all that often. But, on the other hand, when they went to sea, it was really interesting things that we did, so people liked to stay.

The Navy rotates people automatically. Because of Albacore's unique nature, it was to the Navy's advantage and to the ship's advantage, to keep people on-board for extended periods of time, so they were able to extend, but they formally would have to extend. In any event, there were also people who had been on-board for several years. Henry Graves had been on-board a long time. A chief engineman by the name of Zajechowski had been on-board a long time. There were a lot of people who had been on-board there longer than four years. Four years was usually the max any person

stays in one duty station. And sometimes there were shorter periods, but sometimes – but for the most part, people would stay on there for pretty much four years.

Every newly reporting submariner – if you're not already qualified in submarines, you're viewed as being somewhat low down on the food chain. And you're treated that way, and you're treated that way not necessarily in a mean-spirited way. In the spirit of – this is the way it's always been and non-qualified people are considered 'non-qualified pukes' is the term that was used.

Just like anything else, you have to prove yourself. And when you're there, and you work hard, and you show that you're earnest in learning the submarine, and that you're genuinely interested in becoming qualified. Not just getting your Dolphins, but actually becoming qualified so that you earn your Dolphins, and then, at the same time, you do your work and you do it the way it's supposed to be done, people notice. People understand this. And you don't necessarily hear people say, "You're a good man," but you can tell in which the way you're treated that you basically – that you're being more and more accepted as time goes by. And that's basically the way it works in just about any operation of that kind.

#### QUALIFICATION PROCEDURE

You have a qualification card and as you get checked out on a system, you had to have a qualification petty officer's signature and you had to have a qualification officer's signature. So you had to first go to the qualification petty officer and he would drill you with questions, and then he would sign you off or he would say to you, "Okay, go find out this, this and this." And once you got the answers, he would sign it off. You then had to go see an officer – a commissioned officer – and then he would drill you with questions and you'd get that signed off. That's the way it was on Albacore. Not all submarines work that way, but that's the way it was on Albacore at that time. And you had to get a system signed off a week. That's the way it was. Pretty much a system signed off a week. And you had to get qualified on

certain watch stations as well, and do all of that kind of stuff. Normally a person qualifies in submarines in six to seven months.

It took me seven months and I was on the delinquent list for some of that time. Delinquent list means I didn't get my required number of signatures during the allotted time. And the reasons for that really don't matter. The simple fact of the matter is I didn't perform to the standard and I was on the delinquent list, but that's okay. All of that goes away once you're qualified in submarines, and that was one of the best days of my life, when I got qualified in submarines. And then shortly after that, I had already taken the exam to become a second class petty officer, and shortly after getting qualified in submarines, the exam results came back and I made second class. So, things were progressing well at that particular time.

#### SUBMARINE PAY

You are drawing hazardous duty pay the moment you report on-board the submarine – back then. It wasn't a whole lot back then. Maybe about a hundred bucks a month. It wasn't very much. As a matter of fact, I think hazardous duty pay for a third class petty officer at that time was, like, sixty-five dollars. Not very much. And I wasn't making a whole lot as a third class petty officer, anyway. And then, when I made second-class, there was more money then and all of your pay goes up – you have basic pay and basic allowance for quarters and hazardous duty pay and sea pay. Sea pay wasn't much back then – it was maybe ten bucks. But those pays increased as you went.

#### LENGTH OF TRIPS

We were away from home for – I want to say – let me think about this – we were away from home for maybe three-and-a-half months, [but no really sustained voyages]. We would deploy down to Fort Lauderdale, Florida, and operate out of Fort Lauderdale, to do speed runs and sound runs. That's what we did when they sent us down there to do that. But we would have

short periods when we would be out, say, a week or ten days, where we would go out and do trials out in the Gulf of Maine or have a port visit here and there.

Simply because the nature of our mission, we were able to do experimental stuff, we would go out, do the experiments, go back in, go out and do them, go back in. The longest I think I ever was at sea without returning to port was ten days while on board Albacore. I think that's the longest I was ever at sea to that point.

#### ON ASSUMING A LEADERSHIP ROLE

In early 1967, the leading yeoman was transferred off the ship and they made me the leading ship's yeoman. And that was my first leadership position. I had been in positions of leadership before but only on a temporary basis. This was in 1967, probably April or May of 1967. From that point I was responsible for all of the administrative processes on board. Before I had just been a worker. Now I was responsible not just for doing the work, but making sure I had a subordinate and that individual did his work as well. I was responsible directly to the Executive Officer and Captain for the work that I did, instead of going through somebody else, and that was good. That helped me in a number of ways. It was challenging and it was – observing how things had been done in the past and observing the interaction of the crew – I realized that now is an opportunity for me to put into practice what I said to myself that I believed. And I think I did that and some of the results were as I anticipated they would be and some weren't. When people would ask me things, I'd answer the question. If I didn't know the answer, I'd say, "I don't know but I'll find out for you." That was how things got underway.

#### SIGNIFICANT ALBACORE MEMORIES

My last year on board Albacore was very eventful. The first significant event that I recall after making second class, getting qualified, being the

leading yeoman, was we had a fire in the forward battery, a fire in the deep fat fryer. Deep fat fryers were on submarines at that time. They have since been removed. The fire had been put out, but the compartment had been evacuated and it was full of greasy smoke. You couldn't see anything. I was in the compartment working. I had been brought into the control room (just aft of the forward battery). That's the way I evacuated out. And the chief of the boat (COB), who was Norm Bower, said to me, "Jordan, put on an OBA" An OBA is this big cumbersome device; it's an oxygen breathing apparatus. You've got a big vest and a face mask that looks like a gas mask. And you take these big green canisters and you put it up inside the device and you light off the canister. It allows you to breathe oxygen in a smoke-filled compartment or in a compartment with noxious fumes. So, I put the thing on. I didn't have the mask on yet. The COB said, "I want you to go into the compartment and I want it rigged for emergency ventilation. Are you ready to do that?" I said, "I am." And I put the mask on, fired up the OBA and we opened the compartment door. I went in and they shut the compartment door behind me. I couldn't see anything! This is where all that training that you go through to qualify – I had to remember how to line the compartment up for emergency ventilation.

So, I had to go through the procedure to do that. Part of the problem was that everything was slippery because of the greasy smoke. But there were basically three valves that I had to open. One was a diffuser valve and there were two what are called flapper valves. What they are, they have this big lever of a handle, and what it is is it's a flat piece of sheet metal that just shuts or opens, depending on which way you move the handle. I had to open those two and I had to change the diverter to get the air flowing in the right direction. Anyway, I got it lined up for emergency ventilation and I came back and I said, "It's lined up for emergency ventilation." He said, "Are you sure?" I said, "I am." And they lit off the low pressure blower to get the smoke out of there, and sure enough, it was lined up correctly and it drew the smoke out. That was probably the first time in my life I was truly afraid. I had seen other things and had witnessed other casualties. That was the first time – and I was afraid more because I was directly responsible for

combating the casualty. I was the only guy in the compartment at the time. If not done properly, it could have damaged the blower. The smoke would still be in there, and it could be smoky.

The second significant event occurred while we were deployed down in Fort Lauderdale. My wife Sheila was pregnant with our first child and I was hoping that she'd have the baby before we deployed, but it didn't work out that way. And while we were at sea, I got a radio message saying that our first child was born, but he was not well. He was born with multiple birth defects. But what was so memorable about this from a Navy standpoint – not just from a personal standpoint, but from a Navy standpoint – is how the ship mobilized to get me home. I didn't have money for a plane ticket, so the ship's recreation fund loaned me the money. I had no way of getting to the airport, so they put me in a vehicle and drove me to the airport. I flew into Boston and they had a driver from the shipyard meet me in Boston and drive me to the Naval Hospital in Portsmouth. The Navy doctor met me when we got there. Then, after I got to see Sheila, our son was transferred to what was then Chelsea Naval Hospital down in Chelsea, Massachusetts, where they had an extensive neurosurgery department. What was significant about that was how everything had been mobilized to help me and to help my family and it gave me the first indication as to just how the Navy – as an organization, and the Albacore in particular, responded to personal emergencies. They were my extended family and it was my first real indication that this was how the Navy would react to these kinds of things.

And then the big one – I mean, and this is – I can't imagine anybody who was onboard at this time doesn't call this the big one. We were on our way back from this deployment, and we sailed right into a hurricane! We absolutely did. Jack Hunter figures prominently in my time on-board the Albacore and he was the officer of the deck at the time. We're making a surface transit and we sailed right into that hurricane.

The interesting thing is, hurricane tracking back in the 1960s wasn't what it is today, okay? We knew there was bad weather, but we didn't have a real clear indication that our track was taking us right into the damn thing, and it did. And oh! It was something! I mean, I was standing helm and

lookout watches at the time. Lieutenant Hunter (Jack) was the officer of the deck, we were having a heck of a time keeping steerage way, we were having a heck of a time just maintaining a course of any kind and what they eventually had to do was secure the bridge watch because we were just getting hammered up there on the bridge. An indication as to just how bad it was – when you're on the surface, there's a gauge called the digital depth gauge. What the digital depth gauge does is it reads the depth of the water above the keel of the submarine; the surface of the ocean is so many feet above the keel of the submarine. The digital depth gauge measures the distance between the two. When we're on the surface, that usually reads nineteen feet. So, there was nineteen feet from the surface to the keel. When we were submerged, that usually read – at periscope depth that usually read fifty-three feet. So, you would see – you can see the difference. During the storm, that depth gauge was all over the place and it was reading anywhere from nine feet to fifty-seven feet, and we were on the surface! The diesel engines running, so we have the main induction open. We're running on the surface and we're taking water down the main induction like it was coming out of a faucet.

The main induction is a huge, huge air in-take. It's like three feet in diameter. So, we're on the surface, up and down, partially submerged when we're supposed to be on the surface, and we're taking water coming down through this induction piping, and it's wreaking havoc with our ship systems. It shorted out every piece of AC electrical equipment in the after battery, which is where the galley is. The only thing that worked in the galley after that was the deep fat fryer because that was powered by direct current. (That's relevant because of what we had for dinner later.) Water shorted out the main generators. I mean, we were in serious, serious trouble. But we eventually got through the hurricane. God, it seemed forever. I think – I think – if I try to step back – it couldn't have been more than ten hours or so that we were in heavy seas, but it seemed like forever, you know?

And people were being thrown about all over the ship. You know, I remember, after I got off watch, playing gin rummy. I was playing gin rummy in the after battery with this guy and we got hit by a wave. I got thrown right off the bench onto the deck.

Why we didn't submerge? Your battery is only going to last you so long. And surfacing – or submerging in that kind of weather – is a problem. And the reason it's a problem is this: When you're on the surface, the center of buoyancy is at a certain point on the vessel, and the center of gravity is above it at a certain point on the vessel. When you are submerged, the reverse is true. The center of buoyancy is above the center of gravity and the center of gravity is below it. Now, why that matters is this: When you submerge – at some point, the center of gravity and the center of buoyancy pass through each other. And when that happens, the platform – the vessel – is unstable. And theoretically even a ripple could capsize the vessel. You don't want to try and surface in rough weather – in that kind of weather – because it could capsize the vessel. Because you'll be having the center of gravity down here and the center of buoyancy, and passing through it – and you get hit by this big wave and – pow! Then there's nothing you can do at that point. So, it wouldn't have mattered for us. For a nuclear submarine, it's another matter altogether. With nuclear power, you don't have to worry about that kind of thing simply because you rarely operate on the surface so you'd be transiting submerged. The surface activity doesn't affect you and you stay submerged and you sail out of it. We were limited by what we were able to do.

On Albacore, we didn't stay submerged for extended periods of time anyway because of the nature of our work. We would typically submerge, conduct tests – whatever those tests would be, we'd stay down for a while – and then we'd come back up. And that was really what we did. So, we would stay down for no more than a couple of hours at a time – maybe three – and then we would have to charge the batteries because you're propelled by the power in the batteries at that time, and those batteries draw down. You've got two large batteries. One is a forward battery you've got the battery here, and then you've got these sleeping quarters for the officers and the ship's office and the officer's ward room up above. In the after battery, you've got the battery well down below, and above that, you've got sleeping quarters for the crew, you've got the galley, and you've got the crew's mess, where people eat. So, those battery cells would be drawn down substantially by being submerged.

#### THE EVENING MEAL AS SEAS BEGAN TO CALM

When time to serve the evening meal was approaching, the only functioning equipment in the galley was the deep fat fryer. So the cooks announced to everyone who was sitting in the after battery that they had a surprise for us for dinner. As it turns out that surprise was deep-fat-fried Swiss steak. I'd never had anything like it before and have had anything like it since. It wasn't really bad, just a little chewy.

#### EATING AND SLEEPING ON ALBACORE

First of all, submarines notoriously feed better because they get an extra allowance for food. So, we would have steak at least once a week, which was not all that uncommon in submarines. We would have Lobster Newburg on occasion. There's a story associated with Lobster Newburg. Lobster Newburg – the recipe called for sherry. We were not supposed to have alcohol, except for medical purposes, on board a Navy ship. So, we had to retrieve the sherry that was locked up in a safe whenever we had Lobster Newburg – which was fabulous stuff. Just absolutely wonderful. We would have that Lobster Newburg and it was so, so tasty.

We would have steak at least once a week, we would have Lobster Newburg and we would have steamed clams. We'd have all kinds of really good, good food. And Shaky, who was the Chief Cook – he was a great cook! Henry Graves. Everybody called him Shaky. Which is not to say that he was unprofessional. As a matter of fact, he, Norm Bower and Bill Apostolos were three people – three chiefs who were on board – who made a big impression on me. William no-middle-name Apostolos. He was a World War II veteran who had made war patrols during World War II. And what impressed me the most about him is he didn't let anything get by him, he was just focused. He was the chief quartermaster and he was responsible for the ship's navigation. He was just professional and it didn't matter what came his way – he just took it in stride. Norm Bower, who was the Chief of the Boat, impressed me because there was no doubt that he was in charge. We took direction from him in terms of the way things were to

be done aboard the ship. He did things his way and it was very clear. He addressed the crew all the time. He was definitely THE Chief Petty Officer and Shaky Graves – you could see that he had a sense of ownership for the galley, for the cooking and he took very seriously his job and he was always focused on it. Always, always, always concerned about the quality of the food, always concerned about the way it was done and the way the mess was managed and how well-balanced it was. He would have two other cooks, and he had two what are called mess cooks. These are the guys that basically did KP duty. They washed the dishes and cleaned up and did that kind of thing. But Shaky was just outstanding as a chef. He took care of the crew's food service - period

#### FAITH AND TRUST

Everybody – the yeoman, the storekeepers, the stewards, the cooks, the quartermasters, the electricians, the enginemen, the interior communications electricians – everybody knows that when you see those Dolphins on somebody's chest, you know – you absolutely know – that that individual has done what he has had to do to earn those Dolphins. They don't give those things away and the reason they don't give them away is because your life depends on that individual knowing what they're supposed to know. I have to know that that guy sleeping in the bunk underneath mine knows what to do if I'm sound asleep in the compartment and the compartment starts to flood. I count on him. My life is in his hands. His life is in my hands. And that's the way it is all the time. It's not just your professional job that you're responsible for doing, you're responsible to your shipmates for knowing what you're supposed to know. There are no corners to be cut on that. There aren't any easy ways of qualifying in submarines.

#### SLEEPING ACCOMMODATIONS

[Personal anecdote] I had a bunk – I had a top bunk in the forward room and there were two seawater valves in the overhead at the foot of my bunk.

The valves were the cooling seawater overboard discharge (and back up) for the high-pressure air compressor in the forward room on the lower level. There were seawater intake valves that brought in the seawater for cooling the air compressor and the valves over my bunk were the discharge valves to allow the water to flow overboard. Every connection that brought water in from the sea has a discharge valve and a back-up valve. Well, the valves over my bunk would occasionally leak. I mean, it wasn't a big deal and it wouldn't flood the ship but it would make my bunk wet. So, I had to have a conversation with the auxiliaryman who was responsible for the compressor. I told him, "It would really be cool if I could have a good night's sleep without my feet getting wet."

And he gave me a hard time (good naturedly) but obviously fixed the valves. All in all, though, I never had any trouble sleeping at sea. I've known guys who have been in the submarine force for many, many years who used to get nervous when they'd submerge, but it was nothing to me. It was routine. I had total confidence in my submarine and total confidence in my shipmates. I knew that they knew what they were doing. I knew. Because I knew what I went through and I knew what everybody else – I knew that everybody else would have to go through those same processes in order to be qualified.

#### CHARACTERISTICS OF A SUCCESSFUL SUBMARINER

You go to submarine school and there's a lot of psychological testing that goes on there. And you know when somebody's not working out. And when somebody's not working out, they don't continue.

Professionalism, discipline, a sense of humor. You can't be sensitive about privacy issues because there is simply no such thing. There's some sense of privacy when you're in the head or in the shower but that was it. Every other time you're out there in front of everybody. You have to be adaptable. Diesel fumes are unpleasant. Sanitary tanks, which is where the commodes – the heads flushed in. Filters didn't always work well, so when sanitary tanks are venting inboard, it could be very unpleasant so you can't

be sensitive to that kind of stuff. You have to be adaptable. You have to be able to deal with it. And you have to be able to deal with what comes your way. You can't say, "Well, man, I didn't expect this." I mean are you going to leave?

You've got to be disciplined; you've got to be focused. You don't have to be brilliant. Do you have to have a certain innate intelligence? Yes. You have to pass certain tests in order to get in the submarines to begin with, with regard to intellect. But you don't have to be brilliant. I wasn't the most mechanically inclined individual on the planet, so, as I say, you've got to be adaptable. You have to have that magnificently human characteristic – that ability to adapt. That's how humanity has survived and evolved and it is abundantly apparent in submariners.

#### LEAVING ALBACORE

Normal rotation was the reason I left the Albacore in 1968. I went to shore duty. I initially was going to go to an officer program that would have resulted in education, and eventually, commission but that particular program didn't work out. I was due to be rotated off the ship, anyway. So, instead of that commissioning program, I went to shore duty out in California. And I spent three years in shore duty in California and then returned to the East Coast to another submarine, which was fantastic – a ballistic missile submarine. Very different from the Albacore, but still a submarine – USS Benjamin Franklin (SSBN 640).

#### WHAT I LEARNED ON ALBACORE

First, I learned the meaning of professionalism. I had some outstanding examples of what it meant to be a professional. I saw how the officers conducted themselves. Jack Hunter was one of them. Captain Organ was another. I saw how Captain Organ conducted himself. I saw how Jack Hunter conducted himself. I saw how other Naval Officers conducted themselves. These are professional people. These are people who know what is right and

know what has to be done and they know how to do it. I saw how chief petty officers conducted themselves. I saw what it means to be a leader. I learned about leadership on-board Albacore. That was my first real exposure to leadership. I learned about professionalism. I learned what it meant to do your job properly, and because you did your job properly, good things result for the command and for you as an individual. Albacore – my success on Albacore – and I would like to call it successful on Albacore – imbued in me a sense of self-confidence. I knew when I left Albacore that I knew my job, that I was a submariner, and that I could do well and I knew how to lead and how to motivate people. I knew how to do my job and I could see that there were opportunities there. I reenlisted for the first time on-board Albacore when my original hitch was up.

I joined in 1964 and my enlistment was up in 1968. I re-enlisted. And I also – I got a sense of context about myself. I could see where I was beginning to fit in. I had great shipmates on board Albacore, but I could see that many of them, although friends of mine and shipmates of mine, looked to me for certain things, and I became aware that there was a place for me. When I went on shore duty, the place I reported to had been without administrative staff for a long time and I had a lot of work to do and it prepared me to approach things. I knew that not every command would be an Albacore, but you could take the things that you learned from Albacore and apply them in a context of that command. And then what I knew from the shore command to the Benjamin Franklin. I returned to the environment I was familiar with, with much more technically sophisticated equipment – it was a nuclear submarine, it had Poseidon missiles. I mean, it could blow-up half the planet with what we were carrying. And again, nothing succeeds like success. I applied the things that I learned and I saw that they worked, and I knew that – okay, if you treat people this way and you act with people in a certain way, that's going to work for you. It's going to make you effective as a leader. It's going to make you effective as a professional. It's going to take you to certain places. Albacore was also my honeymoon ship. I mean it was my first duty station being married. Albacore means as much to Sheila as it does to me. I mean it was wonderful for us. I've got a picture



somewhere of Sheila on a dependents cruise. She was 8 months pregnant at sea and steering the ship.

#### MARRIED AND GOING TO SEA

First of all, all marriages – all relationships – are based on trust. It doesn't matter whether you're a friend or a boyfriend/girlfriend or husband/wife. All relationships are based on trust. If your relationship is good, if your marriage is good, if the basis for all of that is good, then it's going to be good. When I was at sea, did I miss my wife? Absolutely. Yes, I missed her. And it was good to get a letter from her. We didn't have e-mail or cell phones or any of that stuff back then. To get a letter from her – I mean, I could feel my face come alive, and I could feel my whole being come alive when I got a letter from Sheila. Her handwriting is beautiful. It's so distinctive and so legible, unlike mine, which is horrible.

Absence does make the heart grow fonder. It kind of reinforced my feelings – for me it reinforced my feelings about my wife. Later in my career when I returned from extended deployments at sea, my children had grown quite a bit while I was gone. I came back from one deployment many years later, recognizing that my son had grown a great deal, but not recognizing this young woman who was standing next to my wife on the pier and it turned out to be my daughter.

Sheila's traveled the world with me. We've gone places together. We've done things that we wouldn't have done if it hadn't been for the Navy.

#### ADJUSTMENTS ON RETURNING FROM DEPLOYMENT

There's an assessment period. There's an adjustment period. Well, sometimes you work it out really well and sometimes you don't. With Albacore, it wasn't that much of a problem because we weren't gone that long. I mean, with the first deployment, when our first child was born, there were a lot of issues and we had to work together on things, period. But for her, she goes from being a partner in one context to being solely responsible for all of this the next

once I deploy. And I am truly a very fortunate man because I'm blessed with a wife who really has an incredible head on her shoulders, who has good – better financial sense than I do – who understands how things work. And so you return from sea, say a seven month deployment, and you've missed your family and you're like, "Okay, I'm back and I'm going to do this, this and this." And you find out that there's a certain tension there because doing this, this and this isn't the way it's been for a while. You go down that road and you hear, "Okay, you need to listen to me. You've been gone for seven months. I've managed quite well while you've been gone. I've missed you, but I've managed quite well. And don't be so quick to try to come in and declare martial law here to take over all of this stuff. Let's talk about some of these things. I made these arrangements. You didn't. I contracted with this cable company. You didn't. Don't be making decisions like that without consulting me." That's an example. And it requires some give-and-take. It requires me taking a step back and recognizing, "You know what? Maybe that wasn't the brightest thing I've ever done in my life. Maybe I need to listen a little bit more." It requires adjustment. It requires accommodation. It requires the submariner's ability to be adaptable to situations. Yes, there's a dynamic that takes place that's not necessarily the same as it is in other situations.

#### CAREER PROGRESS

I was on the Benjamin Franklin for two years and then I transferred to Pensacola, Florida. Before I left Franklin, at the encouragement of my commanding officer, I applied for a warrant officer appointment. I was transferred to Pensacola to go to a special program where they would send you to a civilian school to get an Associate's Degree. So, while I'm attending school getting my Associate's Degree, I got word that I made warrant officer. So, I'm getting my Associate's Degree and I've got this warrant officer appointment. After Pensacola, they sent us to La Maddalena, Sardinia, to the USS Howard W. Gilmore, a submarine tender. We went over to Sardinia and spent two years there. It was tremendous. And when we left, we left with tears in our eyes. Yes, for the first six months the culture shock was tough.

Very, very tough. For example, we spent seventy-three days without running water. (Our children were three and a half and five.) We had to find a new place. The first place we got was beautiful, but the water pressure was horrible. So, we had to find another place. And the second place – we just had a beautiful view of the Straits of Bonifacio. We loved Sardinia so much that in 2004 we took a vacation and went back there to see the place. And then our daughter, a Navy doctor stationed in Naples at the time, she and her husband joined us.

#### ALBACORE EFFECT ON HIS LIFE

It was my springboard. It was my springboard to a successful career. It was my springboard to a successful personal life. It was my springboard to a successful marriage. It formed the basis of what I really knew about the operation of the Navy. It was an incredible experience. It taught me about the Navy and about Navy life, and the men on board – in particular those in a position of leadership – taught me what it was like to be a leader and how to lead. Even the ones that weren't so good. I knew from seeing them that this was not the way that things should be done. But the ones who were good – the Bill Apostolos' and the Henry Graves' and the Norm Bowers' and the Jack Hunters' and the J.W. Organs'. Those are the people from whom I learned how to lead, how to interact with people, how to conduct one's self. It was in every conceivable way, a very positive beginning to my Naval career.

#### TODAY'S EXPERIENCE FOR SUBMARINERS NOT THAT DIFFERENT

I know what submariners were like when I retired in 1989 and they were exactly that way in 1964 when I joined the Navy. I interact with submariners still. When I go to the base, I see them and I see how they conduct themselves. And I see how naval officers down there lead. I'm a member of the Naval Submarine League and I see the articles that are written and they talk about certain concepts and those concepts are still the same. There was

this sense in 1964, in 1989 and today – there are feelings that if you're a submariner, you're someone special. Because of being that special human, when you wear that insignia on your chest, it just doesn't mean that you've gone through this check-up. That's not what it means. That's required to get there. What it means is that you're someone that can be counted on. That holds true today just as it held true in 1989 when I retired, just as it held true in 1964 when I joined.

Can someone join and spend ten years as an enlisted man and four years as a Warrant Officer and eleven years as a Commissioned Officer today? Absolutely. That pathway is still there. And there's always going to be a need. There is always going to be a need for people like myself who are late bloomers, who join the Navy and realize that at some point along the way, that they are more than just what they are at that point, and that maybe their potential is even greater than what the enlisted community can provide.

#### LIFE AFTER THE NAVY

The first job I had after I retired from the Navy, I worked for a non-profit organization that conducted professional educational conferences on insurance taxation of all things. But my job – I was the principal deputy and I was essentially the event planner and laid out the properties where we would have these conferences. We had conferences in Austria and Washington, D.C. and Brisbane, Australia. So, that was an experience. I always take something from every experience and I learned a great deal about making a transition because it's different – you're very cloistered when you're in the military. It's a very different way of life and you make a transition. In civilian life, you have to learn the language and the uniforms and the customs and the culture. All of that's different. And that's what I did initially. I left that job after a while and then I took the one I'm in now. I've been in this job eighteen years. I'm the chief executive officer of a non-profit organization in Hartford, Connecticut, and some of the very principles that I learned on Albacore about professionalism and about focus and about discipline and

about adaptability still apply. And it has applicability to what I do now. I run a non-profit organization with an annual budget of \$1.5 million. I employ twenty-five people. It's The Hartford Guides, Incorporated. The people who work for me look to me for leadership. They look to me for guidance. They look to me for assistance. They look to me for counseling. And they get it.

#### REFLECTING ON MY NAVY CAREER

This doesn't apply to Albacore, but it applies to the Navy as a whole. There have been times that have been less fun than others, when I worked for people that were difficult, when things didn't go as well as I would have liked them to have gone, or when mistakes were made. But all in all, like Albacore, it was tremendously fun. And I learned so much, I guess. And the learning was fun. And, you know, there were some tough times, there were some brutal times. But it was so educational and so informative and so inspiring and challenging, and Albacore, more than anything else, taught me that all of those things, in and of themselves, can be fun.

I'd like to think that every place I've ever been has been educational. This job that I'm in now, the job I had prior to this, my last command in the Navy, my first command in the Navy. They've all been educational and it's all been fun.

I think my most challenging assignment, and the most fun, was as Administrative Officer on board USS Nimitz (CVN-68) – an aircraft carrier. As a department head I had nine officers and a hundred and fifty enlisted men in my charge. That was on a ship that deployed with over 6,000 officers and crew in ship's company and the embarked air wing. Now that was fun!

#### FINAL NAVAL ASSIGNMENT

My last command in the Navy was Commander of Submarine Development Squadron 12. It was a Submarine Squadron, interestingly enough, the same

Squadron that Albacore was in. Yes, it did come full circle. And my first exposure to submarines was at the submarine base in New London and the submarine school. I retired from the submarine base.

#### CONTACT WITH OTHERS AFTER THE NAVY

We have great friends who live in Portland, Oregon, the Griefs. Bruce and I qualified in submarines together. He was qualifying at the same time I was. We have kept in touch with the Hunters, more often in the last five years or so than at any other time. I didn't know that Albacore was an exhibit until 1993, I want to say. Sheila and I learned that Albacore was now an exhibit in Portsmouth, New Hampshire. We had this reunion in 2004, I guess it was 2004, and that's when the idea behind the Friends of Albacore all came together.

Dorothy Grief, who is Bruce's wife, and Sheila are very close. They're very close friends. And she speaks with Ellie Hunter often. They have their own relationships as well. Dorothy is terrific. And Sheila and Dorothy get along together well. When we had the reunion in 2008, that's the first time that Sheila had seen Dorothy since 1970, I think. That's a long time. And they fell right back into the friendship they had had when we were next-door neighbors.

Albacore was a special ship a special place. It certainly was a special place for Sheila and me. And I think it was a special place for others, too.

#### **End of interview**

## David Kratch was Commanding Officer of Albacore from 1971 to 1972 during Phase IV Operations and was her final Commanding Officer

---

### BACKGROUND

I WAS BORN ON THE 20<sup>th</sup> of January 1935 in Brooklyn, New York, and grew up on Long Island. I went to public school across the street from my home and went to Brooklyn Technical High School, which at the time was all boys, and a school that was controlled by competitive examination within the five boroughs of New York. After graduation, I attended the US Merchant Marine Academy out at Kings Point, and graduated in August of 1956 with a commission as ensign in the naval reserve and a license as third mate. I never did sail on my merchant marine license. My merchant sailing was all confined to my second class year when I sailed for Farrell Lines on the SS African Moon, and Moore-McCormack Lines aboard the MooreMac Star.

What did my father do? My father worked in the retail business. He was the manager of men's shops for the Hat Corporation of America, the Knox chain in Manhattan. My mother was a homemaker. I had a sister who went to high school on Long Island at Jamaica High School. My father and mother have both long since passed on. My father had served in World War I and volunteered as an auxiliary policeman in Manhattan during World War II. Was anyone in the family involved with the sea, with the Navy? Not to my knowledge.

### KINGS POINT

What led me to going to Kings Point from Brooklyn Tech? Well, I guess it was growing up during wartime and being interested in things naval. I took the exam for the Naval Academy and Fort Skylar in addition to Kings Point, and Kings Point was the one I chose to attend. What was my training like there? What were my studies like? Obviously maritime-oriented. Navigation, both celestial and electronic, GPS had yet to be, ship's medicine, safety at sea, ship handling and "Rules of the Road". Recall that the fifties were prior to the introduction of container ships and cargo storage was a primary course. Learning how to load cargo ships so that cargo was accessible at the appropriate time and at the appropriate ports, communications, radio. And again, navigation was comprised of radio math—obviously before the time of GPS—the handheld sextant and good heavens what else. Oh, there was another electronic navigation system at the time, LORAN.

### FOLLOWING GRADUATION

What was my first post after graduation? In 1956 the draft was still a part of life for young men and the only way to avoid that was to activate our commission in the Naval Reserve right away. And in 1956, for a while, the only way we would be accepted was if we applied for and were accepted in flight training. So I started out my Navy time at Pensacola. In 1957, the Navy determined they were training too many pilots and offered those of us who had not yet progressed to advanced training to leave.

I applied for submarine school. And after serving about six months on a surface cargo ship, I started submarine school at the sub base in New London, CT. One of the officers on board the surface ship had served in submarines and was very enthusiastic about that. He made it sound fascinating. In addition to the extra money, it sounded like a great adventure. That's what prompted me to apply to sub school. I was twenty-three at the time.

## SUBMARINE SCHOOL

What was sub school like? Well, the courses were engineering-oriented, primarily, with some tactics, and of course, surfacing and submerging, safety onboard. It lasted six months. We had underway periods where we were given the opportunity to dive and surface the boat; and respond to simulated casualties.

And at the time, the training tank was still operational, if you're familiar with that. The tower tank that's filled with water and where we exercised at making escapes from various levels. How did I do with that? Well, I don't know whether my [Laughs]—my background had me a little concerned. As a teenager, some buddies decided they that they were going to teach me how to swim and they went about it by capsizing a canoe in the middle of a lake. They wound up on one side of the canoe and I wound up on the other. While I tried to get myself on top of the capsized canoe, I managed to spin the canoe and was hit on the head by the gunwale. The next thing I knew the sky was getting darker and then everything went black. I woke up on pier, prone, with someone giving me artificial respiration the old-fashioned way. So it seems strange that somebody who had that experience would wind up voluntarily going to sea at all, never mind going to sea in something that was going to operate under the surface of the water.

Did I learn to swim, subsequent to that? No. As a matter of fact [Laughs] I really didn't learn how to swim until I left the Navy. It's funny, though, because during flight training, I had gone through all sorts of water exercises, and I guess the fact that I knew that no one was going to allow me to drown saw me through that. Are you familiar with the Dilbert Dunker? No? Okay, the Dilbert Dunker is an aircraft cockpit that's put on near vertical runners that end below the surface of a swimming pool. You're strapped in with a parachute seat pack. The cockpit was launched down rails and when it entered the water it turned over and sank. You had to gain your way out of your straps, fight the buoyancy of the parachute seat that was trying to keep you in the cockpit and get out of the cockpit and come to the surface.

Another exercise had us wearing a parachute harness. We were raised to the top of the swimming pool shelter and then released. We had to get out of our harness when our feet got wet and not before. Over time it was found that pilots slipping out of their parachute harness at sea, with no reference mark to see, many of them released their harness at 150, 200 feet above the water and the impact proved fatal.

Getting back to the tank. So I told you about my swimming experience. Would what happened in the tank have been a little nerve-wracking? Well, there were divers stationed in plastic bubbles at various intervals, so if they saw an escapee was having trouble, they would grab you and bring you into one of these bubbles. But during the training at our time, the technique that was used was so-called 'blow and go'. You and a number of other people entered a small compartment on the side of the tank at some depth - 25, 50, or 75 feet down and the compartment was flooded. You wore a slightly inflated life jacket. As the pressure in this compartment built up, you were breathing pressurized air. You didn't want to hold your breath when you stepped out of that chamber and started your ascent, because obviously the air in your lungs could prove fatal. So you had to exhale, forcibly blow out all the way to the surface, to avoid that expansion from damaging your lungs. In the seventies. When I was serving in Albacore, we never had to send anyone down through the New London tank. As far as I know, it was not operating in '71-'72.

## AFTER SUBMARINE SCHOOL

My first boat after submarine school was the Sea Owl (SS 405). Sea Owl was involved in at-sea training prospective commanding officers (PCOs). During a deployment to the Mediterranean, the XO roused me out of the sack one morning and told me to grab my gear because they were going to surface and turn me over to a launch. They had received orders for me to go to guided missile school in Dam Neck, Virginia, in preparation for going to a new construction SSBN. Upon completion of the course there, I reported

to the pre-commissioning crew of the USS Sam Houston (SSBN 609) at the Newport News shipbuilding company, as part of the gold crew.

We went through the sea trials on the Houston, including demonstration of the operational capability of the Polaris missile system. Although the crews made New London, CT home, Sam Houston operated out of Holy Loch. I made three patrols. I remember two occasions in my three patrols, one of which I happened to have the bridge on the surface outbound from Holy Loch, starting on patrol in November of '63, when the captain came over the IMC system, announced that President Kennedy had been assassinated. I think everyone remembers where they were when they found that out.

#### LATER SUBMARINE ASSIGNMENTS

What did I think should be happening while I was on the submarines? I mentioned that low and slow was not what I had in mind. I later served on Pomodon (SS 486) and Pomfret (SS 391). What did I do on those ships? On Pomodon, I was third officer, navigator and I was the Executive Officer on Pomfret. And oh, by the way, there were three different skippers during my tour on the Pomfret. The last one I served with was somebody I think you already interviewed who served on Albacore as XO, Buzz Henifin. Yes. I thought he and I might be interviewed about the same time because Buzz was a neighbor there at Delaware. Our families have remained very close ever since we met back in the sixties. Where did we meet? Well, I was on Pomfret at the time, at the shipyard in Mare Island, when Buzz reported to relieve the then commanding officer.

#### MEETING HIS FUTURE WIFE

What was New London like when I was in training? Did I have any opportunity to see the town and the city? Well, at the time I was engaged. My fiancée was teaching school in Syracuse, New York at the time and on weekends she would head east and I would head up to New Hampshire.

She had relatives; she was a first generation Finn, and there's a Finnish community up in New Hampshire, and we would meet at her relatives. How did I meet her? When I was a plebe, a freshman at Kings Point, we had a blind date. After that date, we never had anything to do with one another for three years—until we found ourselves in the same wedding party. Then we resumed dating. We married three years later in 1959.

#### FAMILY SEPARATIONS

With respect to getting married, were there any issues that arose, being in the Navy and starting a family? No, there haven't been. I mean, there have been some. During the period from '66 to '69 when I was on Pomodon and Pomfret, most of that time was spent in WestPac and obviously during the Vietnam War there was a lot going on then. The tendency seemed to be that you had a six-month deployment. You'd bring the boat back and have maybe two months at home. You would be transferred to another boat and either head back over there or go up to the shipyard at San Francisco. If I had known I was going to spend so much time up there while back in the States, I think I might have located the family in the San Francisco area rather than San Diego. But the family wound up in San Diego. I think out of being assigned to San Diego boats for 36 months, I spent three months in San Diego. I did manage to get the family up to San Francisco on occasion for a couple of weeks at a time. Did I have children at the time? Yes, two. The oldest was born in 1960 and the youngest in '62.

#### COMING TO ALBACORE

How did I get to the Albacore? What was that process like? I was serving at the Navy Special Projects Office in Washington, DC after completing my Pomfret tour in 1969. In 1971, I received a call from the submarine Detailer. First, he told me that many diesel boats were being tied up, decommissioned, and that command opportunities were limited. And then he said—he said, "How would you like to go to a boat that wasn't going to

spend a lot of time in WestPac?” And I said that sounded pretty good. And then he said, “How would you like to take Albacore?” And I thought—I couldn’t believe what he was offering at the time, because I had been aware of some of the people that had command over the years or otherwise had served. And as I said, Buzz Henifin had told me a great deal about Albacore.

When I took over command on the Albacore, did I know it was going to be decommissioned? No. No, I didn’t. As a matter of fact, there was talk at the time after we finished the project we were working on, which was classified, that there was another project brewing. I had heard that they would bring the boat into the yard in Portsmouth and remove the sail, and that essentially we would be very much like Holland, the first US Navy submarine, with hardly any superstructure at all, with masts and periscopes retracted, or capable of being folded down along the hull, but we ultimately heard that that would not be done.

Was this because the engines were getting old? Perhaps. As a matter of fact, if the Navy provided the engines, the enginemen would provide the labor to install them. Was there enough room for that to fit? Enough room for these bigger engines? When I relieved Tom Poole as CO, Tom told me that he was involved in a buyback of pancake engine parts; there had been talk of decommissioning Albacore. It had reached the point where the Navy had found a buyer for pancake engine parts.

#### ALBACORE’S UNIQUENESS

How different was the Albacore from the other ships that I had been on? Albacore had no torpedo tubes. We did have plans that provided for a single torpedo tube if there was ever any purpose for that. We had a large dorsal rudder. We had tandem counter-rotating propellers. We had an X-stern that combined stern planes and diving planes. We had also sacrificed a significant amount of fuel capacity to accommodate materials for a new experiment.

Can I say what the classified experiment was? No, I am sorry. Were we successful in doing what we started out to do? You would have to contact

the David Taylor Model Basin, in Carderock, Maryland, for information concerning the nature and results of the experiment.

The crew was all well trained sailors—dedicated. There were maybe more natives to the area up there than you might find, say, at any other submarine port. And I think probably the nature of the operations for some native New Englanders might have played a part there, realizing that, hey, Albacore was a ship that was not going to make six-month deployments to WestPac [Laughs] or three-month deployments to the Mediterranean.

Because of the experimental nature of the program on Albacore, was the relationship among the shipmates any different than on other ships I was on? Of the operations we were on, the very longest was perhaps a couple of days. Whereas on other submarines, both nuclear and diesel, we would be away from homeport for weeks or months. The crew was obviously much smaller and we were able to accommodate people’s personal lives better than a submarine that was otherwise occupied. In what way? What kinds of issues would come up? Family things? Yes, we could accommodate personal lives. Well, husband and wife things, financial problems, perhaps health problems within a family. Why were we able to do this? Because we could get along—on a daily operation, for example, it wasn’t a case of tiring anybody out. They could easily stand twelve hours of watch without any physical problem.

#### COMMAND RESPONSIBILITY

As the commanding officer, what did I see as my main duty? Well, to make sure that Albacore was operated safely and in full support of the experiments that were going on. What did I have to do to decommission Albacore? What was the process like? When we were preparing it to be decommissioned, did we do anything special to get it ready to be put into mothballs? Oh, boy! We’re going back quite a ways now. I remember that we sent a number of items down to the Navy Museum of History, at the Washington Navy Yard, including the flag that was flown when the boat made the submarine speed record. The ship’s chronometers went to the museum. The logbooks went

down there, too. Any specific preservation that went on with regard to any of the operating equipment? I don't recall.

#### RANDOM THOUGHTS

What about the food on the Albacore. Was it any different than the food on other ships that I had experience with? No, not that I—not that I recall.

How about the sleeping quarters? Did I sleep on it or did I go back to my home? I did spend some nights on board. But there was one difference there. On every other submarine, the commanding officer had his own stateroom. On Albacore, that was not the case. The CO and XO shared the same room.

#### AFTER ALBACORE

Following my tour on Albacore, I wound up back in Washington at the naval staff in the Pentagon. I was there for five years. The first two years I was involved in establishing nuclear reactor clearances for port visits for nuclear submarines. The last three years were in the communications directorate.

After the Navy, I worked for a number of contractors supporting the Navy, first in the Polaris program with the Navy Special Projects Office and subsequent to that involved with Navy Cruise Missile Project.

#### THE ALBACORE EXPERIENCE

How did my experience on the Albacore fit in to my entire experience in the Navy? Does it have any special aspect to it or was it just more of the same? Well, I mean, it certainly differed in that it was my only command. As far the nature of the operations would be concerned, I would have to say the most rewarding experience had to do with my time in the Western Pacific as third officer and exec. Those three years were—well, they were special, I guess, really feeling that you were doing something that was more exciting.

But certainly watching summer come and go on July 4<sup>th</sup> in Maine was fascinating. Walking from my home on Bond Road to the shipyard after umpteen inches of snow, because the roads were all closed, was interesting. Certainly, it was a good time, because I was able to spend so much time with family.

#### FINAL THOUGHTS

Is there anything that we haven't asked that I'd like to talk about? No, I don't have any other stories to tell. But I did attend one Albacore reunion. Buzz Henifin and I drove up for the 2006 reunion of Albacore sailors and officers.

With respect to Buzz, I said that we lived in the same community. Did I choose to live in the same community as a consequence, or was it by accident that I ended up in the same place? Well, I left San Diego and arrived in the DC area in September of '69. Buzz arrived there in December of '69. So we were near neighbors there again. We have spent 33 New Year's Eves together over the years. Recently, family obligations have interrupted that tradition. We also shared summer cottages in Delaware for many years. We've been pretty close.

I should put my wife on the line. One thing I didn't tell you about was the dependents cruise we took. Well, Buzz had told me that apparently when he was on board Albacore, either when he was there, or before he reported on board, there was a dependents cruise where there was a rumor ashore that there was a small fire on board. But there was concern raised, that good heavens, what happens if you've got a boat load of dependents out there, never having been through a drill of any sort, never mind having been aboard the boat, and you had a fire, or some other causality like that.

Well, the troops had lobbied for a dependents cruise, especially when we found out we were going to be decommissioned, so we went ahead with a cruise. Now, normally the CO's wife would have been kind of the on board hostess for the cruise. Albacore doesn't have bilge keels, so when on the surface in the open ocean and there is a swell, the boat's going to rock,



especially at lower speed. Well, slowing before diving we had a situation like that, and so my bride wound up in my bunk for the duration. So she got a little motion sick. I'm going to deny I said that [Laughs] when the transcript comes through.

**End of Interview**

**James Martin was a Machinist Mate  
who served on Albacore from 1964 to  
1968 during Phase IV Operations**

---

**BACKGROUND**

I WAS BORN ON SEPTEMBER 11, 1944. I was born in Kansas in a little farm town called Concordia, Kansas. That's where I lived. I lived about fifteen miles outside of town on a farm. I'm one of ten kids – second oldest of ten. My parents were sharecroppers and when I lived on the farm, I went to a little country school, like Little House on the Prairie. I was the only kid in the first, second and third grade. All eight grades were in one room and we had no running water. We had two out houses – a boy's out house and a girl's out house. We had no electricity in the school, so when we went to school and it started getting dark, we went home. We had a wood stove. I went three years there. First, second and third grade. And then, in the fourth grade, the person that owned the homestead that we were at, sold it and we moved to town, and then I went to another school. I graduated from the high school in that town and there were fourteen kids in my graduating class.

That house I was living in when I was going to the original school – did it have running water? No, it didn't. We had an outhouse. No running water in our house as well. I can remember when they brought in electricity in the 1950s – maybe 1953 or 1954 – when the Rural Electrification Association came in. The REA came and brought electricity in. I remember

the guys coming in. That late, though? Yes, it was late when we finally got electricity. The first thing we electrified was the well to pump the water for the cattle and things like that. And then the house got electrified. We never did get running water. When we moved into town, we had running water and electricity and everything, obviously. I was about eight years old.

Because I didn't go to kindergarten, I graduated high school when I was seventeen. I joined the Navy when I was seventeen years old. I hadn't left Kansas, hadn't seen the ocean or anything like that and I fell for the pitch of 'See the World.' you know? So, I signed up with a recruiter in the town. Then I had to go to Kansas City. I joined a – I forget what it was called; it was such a long time ago. But in 1962, it was a group from Kansas that was a special company of just Kansas boys that went in – like, three hundred of us – and went to Boot Camp all together out of Kansas – all different places in Kansas.

#### ON JOINING THE NAVY

Had anyone in my family been associated with the Navy? My cousins were in the Navy. My dad was one of ten kids and all of his brothers and sisters had lots of kids. My mother was one of fifteen, so I had plenty of cousins. And my cousins on my dad's side – two of those were in the Navy, and both of those were in the submarine service.

Did I speak with them much about the submarines? I only spoke to my cousin Vinny and he was an x-ray technician. He had tons of girls that were after him all the time because they were mostly WAC nurses that were girls, and so I wanted to be an x-ray technician. Did I think that was the key? That was the key for me. I said, "Now, that's a job I'd like to have!" [Laughs] So, I went in to be an x-ray technician. To jump ahead a little bit, my sister was in the Air Force – my older sister. My brother, Jerry, who is after me, he was in the Air Force. He was in Vietnam in the Air Force. And my other two sisters, who are twins, were both in the Air Force.

So, out of the ten, five of us were in the Service. So, it was a family tradition. My father was in the Navy. He was in World War II in the Navy. He

was a gunner and a welder on a ship. And my son – my older boy, who is twenty-six – is now a Lieutenant in the Navy and he's gone to supply school and he works for naval reactors. He does contracts for naval reactors for nuclear aircraft carriers. So, that's what he's doing.

But anyway, I just jumped ahead a little bit. But anyway, back to what I was saying. I went to San Diego to go to Boot Camp, and they gave you the test to see what your aptitude is, and I'm very good mechanically. They said, "You're not going to be an x-ray technician, you're going to be a machinist mate." I said, "Okay, I'll do the machinist mate route," because I liked it anyway. And I ended up – to make a long story short – I ended up getting out of the Navy and going to college and becoming an engineer. But I'll get to that. But anyway, I went in and they convinced me that if I went to nuclear power school, that that would be equivalent to a college education. So, I signed up for the extra whatever it was – twenty-eight months or whatever it was. I was actually in for almost six years when it was all over. First I went to Boot Camp in San Diego.

#### BOOT CAMP AND NUCLEAR POWER SCHOOL

How long was that? Twelve or fourteen weeks – something like that. Then I went from Boot Camp to machinist mate school in Wisconsin – Great Lakes – up in Illinois, up by Wisconsin. I went to machinist mate school for four to six months or something like that. Then I went from machinist mate school to the U.S.S. Bang 385. It was a really old submarine. I think it was built in 1926. I don't remember, but it was old. It was an old diesel boat and I served time on it while I was waiting to go to nuclear power school. Next, I went to Submarine School in New London and then I was assigned to the Robert E. Lee (SSBN 601). I was assigned to the gold crew but I never went on the boat. The blue crew had the boat out at sea. Yes, I was in New London, but I never went on the boat. From there, I went to nuclear power school in Bainbridge, Maryland. It's kind of ironic because I went down there the other day to visit my son who is in Washington, D.C., and I went by where the nuclear power school was. There's nothing there. [Laughs] So,

everything that I was on or had a part of is gone. [Laughs] Except the sub base up in Portsmouth. Everything else is no longer there.

#### MACHINIST MATE SCHOOL

What kind of training did I get at the sub school? At the sub school – well, first machinist mate school. I could talk to that because that really helped me later in life. I learned how to weld. I learned how to operate machines. Lathes, drill presses – you know, machines like that.

I learned how to repair equipment – pumps, motors, and valves – things like that. I learned how to fix all that stuff. And then we learned a lot of things like damage control, how to fix things in an emergency, and how to keep things running, things like that. Learned a lot of – obviously, the nuts and bolts of it. And being a farm boy, that's what we did, anyway. When it broke, you fixed it. You're fifteen miles from town. So, a lot of the stuff that I grew up with helped me. And then, obviously, the school enhanced my ability to do that stuff, which helped me immensely when I got out of the Navy and I went to work – and I'll get to that later – but I went to work at a nuclear power plant. I was Head of Engineering for a while at a nuclear power plant. Which one? Seabrook Station. I worked at a lot of different nuclear power plants. So, that's what I did at the machinist mate school. They taught me how to fix equipment and I still use what I learned then – today.

#### SUBMARINE SCHOOL

And then, after nuclear power school, I jumped to Sub School. When I went to Sub School, the kinds of things you learned in Sub School were how the submarine actually works. You know, how does it move, how does it go up, how does it go down, you know? How do you keep it stable. What is the equipment on there? You had to be qualified at every station you worked. Everybody you interview is going to talk about qualification. You had to learn how to run everything on the boat. So, you kind of went through what were all the things on the boat. Everything from 'this is how big it is',

'this is what's expected of you', 'this is what you've got to do', 'how to fight a fire,' and how to do all these different things that could happen to you while you're on the submarine. So that's kind of what Sub School was. They would take you out to sea and see if you were claustrophobic. They'd take you out on a submarine into Long Island Sound and take it down to the bottom to see if you'd get a little nervous.

#### THE ESCAPE TOWER

Then we went through the Tower, which was the escape tank. I don't know if anybody's talked to you about that. But down in New London, there's a tower that – oh, it's probably as big around as this room. It's probably sixteen feet in diameter, maybe. And it's a hundred feet high and it's a tank full of water. Arranged at the side of this tower there are two rooms – one at the bottom and one at fifty feet. So, if you go into the room – it's like going into a tank. You walk into a round tank that's lying on its side and it had benches on both sides of this long tank. They would shut the watertight door at the end of the tank behind you. There was about 6'5" head clearance, I would say – something like that. I was 6'2" back then. I'm shrinking a little bit now. But my head was just about touching the top. You would sit down on the benches and there would be eight people in there, I think it fit, if I remember, if I can picture it right. At the other end of it was a hatch that leads into this tank full of water. So then they would put water into the tank until it was over the top of this hatch. Then they would pressurize the tank to the same pressure as the water pressure on the other side of this hatch. When the pressure built up, it would steam up and it would be hot. The first time we did it, the guy next to me started going crazy and his ears popped and he had blood running out of his ears. So we had to drain it down, get him out and then we started again.

So, then the water gets up to about chest high and it's just above the top of the door. Just about now the air pressure inside is the same as the water pressure in this hundred-foot-high tower of water. Then you put on this life vest, it was called a Steinke Hood. The guy's name was Steinke who

invented it. It was just a life jacket but it had an attached hood you put over your head. The hood had a plastic window that you could see through. The jacket had no air in it at this point. You would put this on, they'd open this door and you'd put one foot through and you'd swing around, duck down, and hang on. As soon as you got on the other side of the door, they filled your life jacket with air which made you positively buoyant. You'd let go and you just headed for the surface, a hundred feet up.

And on your way up, they made you yell "ho, ho, ho," just so you couldn't hold your breath. If you held your breath, your lungs would explode, so they wanted to make sure that didn't happen. Also, they had divers in the water all the way up, and they would punch you in the stomach or something, just to make sure you exhaled on the way up. And if you passed out or had a problem of some sort, they had this thing that looked like the Liberty Bell. A big, huge bell. It was hanging in the water and it followed you up as best they could. They'd grab you and throw you into it. There was air in there and it allowed the divers to get you out of the water, so you wouldn't get the bends. You had to go through that escape training.

How did I relate to that? Oh, I thought it was fun. Everything I did on the sub I thought was fun. I don't know why, but if I had to do it all over again, I would sign-up tomorrow. I really liked it. I had a good time. I learned a lot. What percentage of people had my experience that it was fun and what percent had some version of the ears popping or other problem? I only saw that happen once to the kid sitting next to me. I only saw it happen that one time. One thing about the Navy – you'd see somebody and one day you'd be talking to them and you'd never see them again. Then, later on, you'd find out that they either dropped out or they transferred or they did something else. You never really found out why. The people that I was with all had made it through. And the people that didn't make it through – they just went away. You don't know where they ended up. I mean, maybe they went on a surface craft or they went somewhere else. I never ran into those people.

## THE FINAL TEST

I did run into my cousin one time. I was down in New London on the Bang and my cousin Vinny – his brother, Pat, the older boy – was on a submarine in New London. I can't remember which one it was. It was the Sea Owl, I think. I can't remember the name of it. But anyway, I ran into him. I didn't even know he was in New London. He didn't know I was in New London. The ships are tied-up, three deep. Down there, back in that day, there was half a dozen or eight of them, all lined up. But anyway, after you go through the tower and you pass that, then you'd go out on a sub to see if you could do what you were supposed to do. And they usually, traditionally, fed you greasy pork chops and something else for breakfast just as you were leaving the dock. You always left early in the morning and they'd feed you these greasy pork chops that would get you sicker than a dog if you were seasick-prone. Just to make sure. Was that done on purpose? As far as I could tell, it was. [Laughs] Because every time we went out, they had pork chops for breakfast! [Laughs] But I liked it – it was great. It didn't bother me. There was one guy that used to get sick. He got over it after a while, but he would get sick. He told me when we were getting underway that he would get sick.

Now, this experience was after Sub School. So, there was the possibility that they could invest you with all of this training and you could still flunk out? First off, I think they were more concerned at the time with the intelligence of the people and the demeanor of the people, to see if you could get along with others. Once you got through that part of it, you were able to understand the mechanics of what makes a submarine work – whether you were the electrical, the instrumentation guy, or whether you were the mechanic, like I was. After they figured out that you could get along with people and that your demeanor was suited for submarines, then they wanted to make sure that you had the aptitude to do it. "Okay, now let's see if you can really do it." Then they would take you to sea. It was usually one trip – sometimes two trips. I went twice, but it was sometimes once or sometimes two trips, depending on the availability of the submarines. I think that's all it was.

Now, when they were checking to be sure that we fit in and so forth, was this observation on the part of people? Were there psychological tests that they used, too? No. They probably did, but nothing that I set down – I mean, they gave you a psychological test. I can't remember what the questions were, but I know it was a psych test. At what stage? It was – I think it was in Sub School they did that. I'm trying to think, but that's a long time ago. You're talking fifty years ago! But I think it was in Sub School. But you know you're observed, you know, they were keeping an eye on you, just to see how well you were doing.

#### GETTING TO ALBACORE

When did I get to the Albacore? I went to the Albacore in 1964 and I got out in 1968. I was assigned to two submarines before the Albacore. The Bang and the Robert E. Lee. The Robert E. Lee was a nuclear boat, but I never went out to sea on that one. But I did go to sea on the Bang. So, I got to the Albacore in 1964. Why Albacore? They were looking for – as I recall, they were looking for volunteers to go to Portsmouth, New Hampshire, and I said, "That sounds like a place I'd like to be." I knew nothing about the Albacore or anything else. I stuck my hand up and said, "I'll go to the Albacore." It was an experimental submarine back then, doing crazy stuff. I said, "It sounds like something I'd like to do." So, I volunteered to go, and off I went.

What was there about it that I found attractive? I think just being on the edge of technology, because it was billed as doing new and exciting things, to improve the submarine service. And back then, you've got to remember, the Nautilus was the first nuclear submarine. Nautilus that started the whole thing. They were building nuclear submarines, but they were looking to get them to go faster and quieter. All they had done back then was cut an old submarine in half, stretched it out and put a reactor in it, and then welded it back together. That's what they had done. They were looking for shape and speed and things like that, so they had developed the Albacore

to test different things, and that's how it was built, and I said, "It sounds like something I would be interested in doing."

What the Albacore was like when I first got there? I still remember – well, I came up on a train – I came out of New London on a train and rode up. The train track is no longer there. Everything is no longer there. But I came up on the train and looked at the ocean. When I got here and got off the train, I went over to the gate and the train was pretty darn close to the gate. I mean, you get off the train and the security shack is on this side of the train tracks, and then the train tracks and then the base is over here, so it kind of ran right next to the base. You could get off and just walk over there. I got off and I was pretty impressed. To me, it was a big shipyard, way bigger than New London. There were a lot of people all over the place, a lot of construction going on and things like that. I went in and they said, "Okay, go up to the barracks," and I walked up to the barracks and I met some people that I still communicate with to this day.

Who is that? Steve Hogan, this guy named Doug Stanton. Hogan was the cook on the submarine. I think he was on the Nautilus, too. But he was on the submarine I was on. He's down in Florida now. And Jimmy Hamill, who lived right over here in Hampton; he was there. So, after I met these people, I went down to the boat. When I went down there, it was in dry dock. It was being fitted out with stuff. So it was just a big round thing in dry dock all torn apart, you know? I started looking at things like – I could see the difference right away from the boat I was on that was built in 1926, to this one.

#### FIRST IMPRESSIONS

So, what differences did I see? Well, for one thing, the first boat I was on had Fairbanks-Morse Diesel Engines – the Bang – and they were big, long engines. They were probably, I would say, twelve to fourteen feet long, and they ran the length of both sides of the engine room. Each engine has a large generator mounted on their after end. There were two

engine rooms – double engine rooms – on the old World War II boats. There were two engines in the forward engine room and two engines in the after engine room. They were big, long, huge diesels. The Albacore had very small engines. They were sixteen-cylinder engines but they were like airplane engines. They were turned on-end, set up vertically with the generator underneath, so they kind of hung there. When I went through, I didn't even realize I was in the engine room. You could open this little door and there's this small, small engine. And the only purpose of those engines was to charge the batteries. The boat ran everything off the battery including the motors. On the old diesel boats, you could run the propellers from generators mounted on the engines. You know, you could charge the battery, turn the propellers or do both taking the electricity generated by running the engine. So, that was the first thing I noticed, being a mechanic – the first thing I noticed.

And also, the bunkrooms – they were a lot smaller. Back on the old boats, they used to have bunks supported by chains. When they'd use the space as a berthing area, they'd take the bunks and flop them down like this, hang a chain on them, and that's what suspended you. When everybody was up and things were active, you'd swing them up against the bulkhead and they would hang them up there, so you'd have more room to get around. But at night, when you were going through this berthing area on an old boat, it was very narrow. But on the Albacore those were fixed bunks where you could lift up the bunk and you had storage underneath. When you get on and visit it, you'll see, when you go into the after battery – what we called the after battery – it was also the chow hall where the mess tables were. Those are the kinds of things that I remember when I was on it.

## THE FOOD

What about the food on the Albacore? Oh, it was unbelievable – great. The best food. I weighed a hundred sixty-eight pounds when I went in the Navy. I weighed two hundred fifty when I got out. Mostly from the Albacore? I think I gained it more from there – I blame Hogan for that. I think I gained

most of it on there. [Laughs] And I still weigh two hundred fifty. That was about five years? Yes. I went from one hundred sixty-eight pounds when I was 5'8", when I went in at seventeen. I was still growing. I got out at 6'2" and I weighed two hundred fifty and I cannot get into my Navy uniform they gave me.

Yes, I grew up in the Navy. It was interesting times. The food was unbelievable. It was the best. "Shaky" Graves – Henry Graves – was the cook. I don't know if you've interviewed him. Henry Graves – you've got to ask him why they call him "Shaky." And he had another guy that worked with him – this Steve Hogan, I already mentioned – they were the cooks. We had steak – I mean, good steak – Lobster Newburg. I mean, every week we'd have lobster if we could get it. We always had excellent, excellent food. And those guys could cook. And not only when we were in port. It did go to sea for extended periods of time. But it didn't go to sea but maybe two or three weeks at the most – and they'd load up food before we sailed. When you go into the after battery and you go from the after battery walking aft, just before when you step into the engine room, right below you is a freezer. There's a hatch in the floor. If you lift that hatch up and go down there, there's a walk-in cooler – a big freezer. They'd load that with frozen food. They would start storing other food – coffee, juice. We used to call it 'bug' juice, but it was Kool-Aid – and they'd start storing that stuff wherever they could find room. Usually, when you got underway, you had cases of canned goods and stuff like that stored in the engine room. We'd have five-pound cans of coffee, and juice, and dry foods that were stored in the engine room. While you were underway, you just consumed that. There were probably sixty guys on that boat. You'd load up with food and you'd run out of milk real quick and you'd run out of things like fresh vegetables real quick.

What did they do with the cans? They'd smash them and put them in a sack – throw them over the side back in the day. Yes, they threw them over the side. They had garbage dumps. They don't do that anymore, but back in the day, they'd just go up and throw it over the side. That's what they did. It attracted seagulls and all the other fishes and the sonar guys would

listen to the whales and the fish and things like that. But you'd go up and throw it over the side.

#### FRESH WATER AND HYGIENE

What did we do for bathing, showering – this kind of stuff? [Laughs] Well, if you were a person who liked to shower every day, you don't want to be on submarines! [Laughs] This old Chief told me one time, "Anybody that takes a shower every day is just too lazy to scratch." [Laughs] The showers, when you go on it, the showers were a toilet, a sink and a shower all in one closet. So, when you went in to go to the bathroom, you sat on the toilet. If you wanted to take a shower, you would lift the toilet up and it would go into the wall. It's still there. You can see it. It's like the old Pullman cars, if you've ever been on one, back in the day, when you were on the train – Pullman cars. They would flip up. Well, the toilet would flip up, the sink would flip up, and you'd close this door – this stainless steel door – that would close off the sink and the toilet, and now you're in the shower, and you can take a shower. But I have never taken a shower on the Albacore. Not one time. Never took one. So, I guess that would answer your question. And I was on it for four years. So, I'd wait until we came in. And in the engine room, when it really got bad – because the engine room was smelly – we'd take a saltwater shower. We'd go down and there was a saltwater thing, and we would just stand underneath it. Ocean water and wash off. And you'd flake afterwards? Yes, you'd rake the salt off if you had the itch, but it usually didn't last long because it was pretty hot in the engine room. Usually, when you got underway, the shower is where they first put the food. They'd keep one -- for sixty guys, they'd keep one head open so you could use that as a bathroom. But the other two – when you'd go aft – the other two on the right-hand side, when you're going aft – those two shower stalls there were usually stacked with food. And behind those, there's a door behind that which is the air conditioning system for the boat itself. We had the stills in the engine room, and they made a hundred gallons of water a day. The engines used about ninety! [Laughs] There was a drinking water

fountain that we called the scuttlebutt. When you're going aft to the shower stall, right on the left-hand side is a little drinking fountain, and the fresh water went to that. There were fresh water tanks placed throughout the boat where we would store fresh water. Before we'd go to sea, we would fill the tanks from a fresh water connection on the pier. That way, we would start out full of water and wouldn't have to make a lot while we were underway. The stills, when you go in to the engine room, they are on the right-hand side when you are headed aft. We used to make fresh water and battery water with them.

#### DEPLOYMENTS

When I was on the Albacore, the Albacore didn't go on long trips like a nuclear sub. What's the longest voyage that I took? Do you mean longest time spent at sea without touching land? I'd say two weeks, something like that. Two or three weeks at the most – while I was on it. They might have done it longer. But when we'd go down to Florida, we would operate out of Key West on a daily basis, out in the morning, back in at night. So, when you left here – for the guys that were married – when they left here, you might be gone for six months – gone from home – but you'd pull into port for visits.

#### DIVE BRAKES

What were some of the things that I remember most about the Albacore, in terms of events that happened and things that we were involved in? Well, there are quite a few different events that went on. And like I said, it was an experimental submarine where they did testing of different devices. They don't have this on there now. This was supposed to be top secret. I don't know why they took them off, so I don't know if this is repeatable or not, but I'm assuming it is, so I'm going to go with that. If they tell you it wasn't repeatable, you can erase it! [Laughs] Pull it out! But they designed this thing called Dive Brakes, and what they did was, when the Thresher sank,

they thought when the submarine was headed for the bottom – headed for the deep – there had to be a way to slow this thing down.

So, you know when you're riding in a car – I'm trying to get you a picture – you're riding in a car and you stick your hand on the window and the wind pressure pushes your hand back? Well, the engineers decided that when a submarine is headed for the bottom, if there was a way to have something stick out like this, it would catch the water and it would slow it down. So, they put these doors – hydraulic doors – around the submarine that would open with hydraulic rams and just like you would open a car door – the old suicide doors on an old car – you'd open a car door and it would catch the wind and it would slow it down. So, they put these things on there. [Laugh] The reason I'm laughing is because it did not work. They put these things on there, and they were huge doors. I mean, they were probably eight feet wide by fifteen feet long, I would say, and they wrapped the whole thing around – the whole submarine around – with hydraulic rams and everything else. So, we take this boat out in deep water, put it at forty-five degrees or around that, and head for the bottom at full speed – headed for the bottom. And they open those doors and it kept going! [Laughs] It didn't even slow down. It just headed for the bottom. So, now there's a big panic to get this thing to stop! So, everybody is rushing around trying to stop this thing. Those were the kind of experiments we did. You'd think it would do something. It did nothing. {Editor's Note: The Dive Brakes were effective in slowing down the submarine. The problem with them was that at high speeds, they tended to randomly open by themselves! An effective alternate to the dive brakes was the rudder. Using full rudder created a lot of drag and thus slowed the boat down. It also produced a 'squatting moment' that pushed the stern down thereby reducing the down angle of the boat.} So how did they get out of the dive? They just put it all in reverse. Well, you put the motor in reverse. You start the prop going backwards and then you blow the tanks. The way the submarine works is, it's two cylinders. Two round things. Like this, and then a big one that goes around the outside of that.

And the people live on the inside cylinder. The outside cylinder has tanks for water and air. So, if you want to submerge, you've got to change the amount of buoyancy that this cylinder has. So, what you do is you fill the outside cylinder with water. Now the submarine weighs more than the amount of water it displaces, so it doesn't float anymore. It just starts sinking to the bottom. So, when you want to surface, you just blow some high-pressure air into those tanks on the outside, and the air pushes the water out the bottom. When enough water has been expelled to overcome the weight of the submarine, it will start surfacing – it will start coming to the surface. So, a submarine will surface if it has enough air in its tanks. It will surface on its own. It will just float to the surface. And so, that's called blowing the tanks. When they say 'blow the tanks' or 'blow the ballast tanks' – when you're interviewing people and they say, "Yeah, we blew the tank," what they mean is they just put air in it, blew the water out, and when they displaced that water, it becomes buoyant and floated to the surface. So, you don't need the engines or anything like that. But it depends on the angle that you're at when you decide to blow the tanks. If you're sitting flat, you can blow them all at once and it will come up flat. But if you're sitting at a down angle and you blow the aft tank, it's going to come up this way. Do you see what I'm saying? So, you don't want to do that. That's where the diving officer and the captain have to get the ship leveled out before they decide which tanks to blow.

Now, when they dive the submarine, everybody has a watch station, they call it -- a place to go, to stand. You might be responsible for blowing the forward tank. So, they would say, "Blow the forward tank," and you're on a headset and you turn a valve and the air goes into the forward tank. Or you might be forward or you might be in the control room, at a ballast station, which they have assigned. So we did this one dive brakes test, it didn't work. I noticed when I was back on it years ago – I haven't been up there for a couple years – I see it all the time, but I don't go on it – those things are not there anymore. I don't know if somebody said, "Let's just weld those and pretend like that did not happen." But those were Dive Brakes.



### ANGLES AND DANGLES

And then we had this other test that we used to do. They wanted to see if a submarine could actually mimic a fish, and it used to be called 'rig for angles and dangles.' And what we would do is on the back of the sail is a rudder. And if you look at the controls, it looks like an airplane and it flies like an airplane. So, if you're going forward under water, and you wanted to go down and to the left, you just pushed down and turned to the left and it's going to go down and turn to the left. And if you're going at thirty knots or more, it's kind of funny. You're going – swoosh – through the waters. They used to call that 'rigs for angles and dangles.' They would see how steep they could get it to go and how fast they could make the turns and stuff like that. Those were a couple of tests that I remember.

### COUNTER-ROTATING PROPELLERS

Now, another system that we've tried – somebody came up with a good idea that – on the Albacore, there's two shafts, two motors that run the propellers. The forward motor sits like this, and then there's a motor exactly behind it, and there's a little space between the two motors. The rotor, which is the inside of the motor that spins, the shaft that's attached to that, goes through the middle of the motor that's behind it. This motor behind it has a shaft – it's hollow, like a pipe. And the forward shaft goes out and it runs the after propeller, and the after motor shaft, which is a pipe, goes over the top of that. It runs the forward propeller. The forward motor goes clock-wise, the after motor goes counter-clock-wise. So, the propellers are doing this, you know? [Laughs] And that was to cut-down on the cavitation, so you could run it quieter. And a lot of the nuclear submarines – even some outboard motors now have counter-rotation. You can buy it from Evenrude; you can buy an outboard motor that has the same concept on it, for the motor. And we were the first ones to test it.

### SHAFT SEALS

We had a packing gland of just rope that's impregnated with oil and it's real heavy and thick. There's a space between the inner shaft and the outer steel

tube that goes out into the ocean. You have to put something between them to keep the ocean from coming in. This stuff is about an inch wide, and you'd put it in and you'd pack it in there – that's why it's called a packing gland. You'd put maybe three or four rings of this stuff in there and then you'd put this big ring on it and you'd bolt it down to hold it in place. Well, you couldn't bolt it too tight because it would compress that rope material called Oakum. If it was too tight, it would cause the shaft to burn. It would be too tight and the shaft wouldn't spin easily. So, you had to get it packed just right so that it would maybe drip a couple of drips of ocean water coming in, but it was loose enough to where you could get the fastest RPMs out of the shaft.

Well, somebody came up with the thought of, "What happens if that thing fails? We need some way to have an emergency stop for the water." So they designed and made a bladder that went over the top of our shaft, went around the shaft and went into this seal. So, we took the packing gland out and put this thing in there, and it was all bolted in, nice and pretty, and we took it down to five hundred feet. So, we're sitting at five hundred feet and we locked the shaft – there's a locking motor. If I was there, I could point all this stuff out to you. But there's a locking motor that locks the shaft so it won't turn – and I was sitting on the steps. When you go through the boat, you go all the way to the back before you go out the door, and they cut a hole in the hull to go outside in that. But before you go out that door, there's a set of steps that go up and over the shaft, just like a little archway that goes over the shaft. I was sitting on those steps, and if you look back, you'll see the shaft goes through the back. They said, "Okay, inflate the bladder," so they inflate the bladder and it blew out like a balloon. It went "POW"! And ocean water came in around that shaft probably an inch wide – we're at five hundred feet! And I'm quite away from the shaft. It hit me – I'm getting soaking wet. So, the Engineering Officer – he walks over to the intercom, picks up what was called the 'Seven MC' and said, "Control, this is the Engineering Officer. I'd suggest you surface the boat." They called back and said, "Why?" He said, "We have a little problem back here." Nobody ever panicked on that thing. "We have a little problem back here," and water was pouring into that thing. A little problem! "We've got a

little problem back here, so we better get the boat to the surface.” We got it to the surface. We were pumping water out of the bilges as fast as we could. God! But little things like that. They go out to test something and it didn’t work and they would say, “Well, that was a bad idea!”

#### THE TOILET

Do I have a sense of what proportion of things did work as opposed to what didn’t work? Well, you see, you never knew about the ones that did work. We tested a lot of things – because we were an experimental ship – and if they were successful, we didn’t know what happened to them. I’ll give you one that I came up with and I didn’t do anything about it. When you had a toilet – and this is kind of a weird one – but when you go to the bathroom and you flush the toilet, all you did was you pulled a handle and it went down a tube into this big tank. Well, if that tube plugged up, what you had to do was go down to the tank. You had to get a respirator on, crawl into the tank and clear the block. Now, that’s not a good job. Crawl into the tank, crawl up and clean out the thing. So, I said, “That’s ridiculous.” Why don’t we put a little air-fitting thing right between where the ball valve is, where you flush the toilet, and the line going down. Just drill a hole in there, under the valve, put the air fitting in there with a little valve on it. Attach an air line in there, shut the valve and hit it with a blast of air and it will blow out whatever’s plugged up. It worked like a charm. And so, we did that on the Albacore. It was probably ten years or so later, after I got out, a guy ran into me and he had said that he had submitted that idea to the Navy which had a good idea program going [Editor’s Note: It was the Beneficial Suggestion or BeneSugg Program.] and they put it on all submarines. So, there’s something that we just did that actually worked! I never thought about it, you know? So, a lot of the other things that we tested that worked – they might be installed on submarines and but since you never got assigned to any other submarines, you don’t say, “Hey, that was something that we did.” You just tested them. If they worked, they wrote it down. We had a lot of civilians on

Albacore when we were at sea. There were guys that came out – engineers – to see their little project through and see if they worked.

#### TESTING AND TEST RIDERS

Was there room for them? What happened when they got on board? They usually left part of the crew in – that was the fun part. One example. If you were selected to stay in port while the civilians were going out to test, we stayed at the Fort Lauderdale Biltmore. The group doing the testing paid for rooms for the crew left in port. That was good. We had a room. If they’d go out to sea for three or four days, they’d put you up in a hotel, so you’d get room service. And we don’t have any duties at that time. So, we were just on a little vacation. Yes. The best one I remember was when they had a hurricane down in Fort Lauderdale and they had gone to sea and then came back. It was a hurricane and myself and a bunch of the guys that I hung around with had been left in port. Because the hurricane was coming, they tied the submarine up out in the harbor because they didn’t have time to get back out to sea. The best place for a submarine in a hurricane is at sea, not in port because it’s too shallow and it gets bounced around. They put ropes to both sides of the marina docks and they had the submarine tied up in the middle of the harbor. The guys couldn’t get off, they were stuck on the submarine. And I was stuck at the Biltmore. [Laughs] We’d go down to the bridge and wave at them! Oh, they were so mad at us! [Laughs] We’d be up there, drinking beer and hooting and hollering and yelling at them and they were so mad at us! That was fun!

#### KILLER KANE

I had mentioned something about a story about somebody – “Killer Kane” and a sanitary tank. Killer Kane’s sister –her name was Mara-- her and I dated a couple of times. Anyway, two parts to this story. He was a good buddy of mine but he was always reading my mail. He’d go up to the post

office to get the mail and he'd come back and he would read my mail. [Laughs] Because it was from his sister. So, I called his sister up and I said, "Do me a favor. When you write me the next letter, say some really good stuff in there." This is back in the day that if you were holding hands, you might as well be engaged, you know? I said, "Write some really juicy stuff in there." So, she wrote this really hot letter back to me and he got the mail and was reading this letter, just steaming! So, anyway, he comes on the boat and I was painting the boat. He was going to push me in the water. Well, the Captain or one of the Officers saw him going to push me in the water. So, anyway, they gave him the duty of cleaning the tank – the toilet tank.

So, he gets the respirator on and he gets down to go inside the tank to clean the tank. I'm tending the other end of his air hose. I'm the guy that's watching to make sure that nothing happens. So, he starts down into the tank and he's not all the way in yet. He's still got one leg out of the tank. And I shut off the air. [Laughs] So, anyway, I shut off the air and he started chasing me, and I ran up the passageway and topside. He's got toilet paper hanging off of him and everything else, and he's running after me, trying to get to me, and I just dove in the water and he dove in after me. We called him "Killer." He was a good guy. He was a very slight build, but if you were in a room and you heard him talking to somebody else, he sounded like the toughest guy you would ever meet. I don't think he weighed a hundred twenty pounds, but we called him "Killer" because if you didn't see him but you heard him – everybody used to tease him about that. But that name stuck. I'd go down to his house all the time. He lived in Medford, Massachusetts, and I'd go visit him all the time.

#### THE HEARSE

I drove around in a 1954 Packard hearse. Killer was with me when I bought this hearse, and it came with a coffin. I bought it from a funeral parlor. So, we converted the coffin – we put Styrofoam in it and converted the coffin to a big, giant beer cooler. So, we'd take this thing and we'd go to the beach or wherever. A funny story about Killer – we were coming back one time from

Boston. We were driving the hearse, and this guy – we called him "Odd Job." I can't think of his name now, but we called him "Odd Job." He was a Filipino and he was a steward in the wardroom. I'll think of his name in a second. But anyway, he had his white steward coat on, and I was driving, and Killer was in the back of this car and he decided that he was going to sleep. There wasn't much room in the back of this thing because the coffin was in the back. So, he climbs in the coffin and is lying in this cooler – because it was empty – but he was lying in this cooler. So, we go to pick up a guy that's hitchhiking – and this is two o'clock in the morning – so, the guy gets in the car. I pulled into a filling station and me and Odd Job – we get out to go in to the station to go to the bathroom and do whatever, and Killer's still sleeping in the coffin. When we come out, there's our hitchhiker running down the exit ramp! So, I go out and Killer says, "Who the heck was that?" I said, "I don't know. We picked him up. He's a hitchhiker." He said, "Well, I got up to see why we stopped and the guy was looking in the back window," and the lid to the coffin goes open and Killer sits up and this hitchhiker gets out and takes off, running! [Laughs] So, we pulled up next to him and said, "Come on, get in." He would not get in. It was two o'clock in the morning and there wasn't a car in sight, but there was no way he was getting back in that car! [Laughs] We used to drive that car all over.

This was during my time in the service. They would remember it. If you have anybody you interview that was on with me, they would remember the hearse. I had a sign on the back that said, "I want your body." It used to say 'Funeral Coach' and we took off part of it and put 'Fun Coach.' It had red velvet interior and we used to drive that thing all over. It was a big, huge Packard. Huge, huge car. We had a lot of fun in that. But anyway, that was kind of a funny story about Killer and his little escapade.

And then one time he was on the beach with his wife – he ended up marrying her – and they had a bunch of kids and lived happily ever after, until he died a couple years back. But he was down here at Hampton Beach and we backed the hearse up to the sea wall. He was sitting on the beach with his girlfriend and five of us got out and took the coffin, walked down next to him – he knew this was going on – picked him up, threw him in the

coffin, dug a hole and buried him right on the beach. [Laughs] And, don't you know, the police had a little chat with us about that. [Laughs] They didn't see the humor in that. We were trying to get his girlfriend all torked up and she was screaming. The police came and had a little talk with us and told us not to do that anymore.

#### STANDING TOPSIDE WATCH

I talked about the experience that I had with a Nor'easter. That was something. We used to stand a topside watch. You wore your blues in the wintertime and in the summer you wore whites. It was ridiculous! If you had topside watch, you had a pea coat on, a white hat - there was no stocking hat that you pulled down - just a white hat. And you had gloves. But you'd stand up there and you'd try to get on whichever side of the sail you could get on that the wind wasn't blowing. But if you were on the other side away from the pier, where you were supposed to be watching the gangway, making sure nobody came aboard and stole the submarine or whatever they were going to do - I don't know. Up in Portsmouth, you'd stand on that river, it was awful cold. You'd get up there, and especially if a Nor'easter would come along, and the snow was blowing and you're standing up there saying, "What the heck am I doing?" you know? But there were some times when it was cold and miserable, but you got over it real quick.

#### BERTHING CONDITIONS

How many hours long watch would you have? You'd have four hours. On a submarine, the way that they set them on the Albacore - most submarines are like this - you slept for four and you were up for eight, and then you slept for four and you were up for eight. You never slept for eight. [Editor's Note: Watches were four hours in length followed by eight hours off.] And there were three people to two bunks, unless you were a Chief or an Officer. If you were a Chief, you had your own bunk, and if you were an Officer, you had your own bunk. But if you were an enlisted man, like I was, there

were three people assigned to two bunks. So, when you got out of bed, the guy that woke you up got into the bed. He woke you up and said, "Come on, let's go." You'd get up. He would just crawl in. It was called hot bunking because it was always hot. You got in and flipped the pillow over. We never used blankets. You just lay on what we called a flash cover, which was a plastic liner that went over the mattress, and usually you just slept on that in your clothes. You just rolled over on that, flipped the pillow over and went to sleep. And four hours later, somebody would wake the guy up in the other bunk and they would crawl in. So, there were three people to two bunks. After you got used to it - once in a while, I still wake up every four hours. You know, you get into the habit. But the bunk I was in - when you go into the bunk room, you go in and you go to the right - you crawl in one of those bunks. If you've got claustrophobia, you won't get into one of those bunks! [Laughs] I had to crawl out and crawl back - if I was on my back and I wanted to roll over, I had to crawl out and crawl back in on my stomach. It was that tight. You'll see when you get in there. It was pretty tight. How many bunks were there-? They were stacked four or five high. There was one on the floor - let's see. I'd say five bunks and maybe seven feet high. When you go into the after battery and you go into that area, you'll see it. It's pretty tight in there. But the bunks were like this on both sides, but at the end of it was a locker - just a regular locker - and the locker was maybe that wide and that deep, and it had double doors on it. That's where the corpsman kept all his supplies. We had a medical corpsman on the boat, and he would stitch you up if you had some problems. But that locker was here and if your bed went in here, you had maybe this much room to get in and out of your bed. So, if you crawled in head first, then to get out, you kind of had to drop your legs over the side and scoot back to get out. So, if you had claustrophobia --

I was going to tell you a story about claustrophobia. I went in to get a CAT scan about a year ago in my stomach area because I had a swelling in my leg and they were trying to figure out what was going on. So, the lady said, "This will take about a half-hour." She said, "Can you not move for a half-hour?" I said, "Well, is it okay if I go to sleep?" And they put me in

this machine and she just looked at me and said, “Yes.” My wife goes crazy in one of those things, but I just go to sleep! The lady said, “You weren’t kidding.” I said, “Well, it’s just like home.” You pull me out of there, slide me in this tube and say, “Okay, I’ll go to sleep. I won’t move.” You had your head like this in this little block thing. I went to sleep. She said, “You’re the first person that ever did that.” Because they say if you get panicky or whatever, push this button. Did I tell her about my life at sea? I just told her I was on submarines and that I was used to tight spaces. That’s all. I didn’t elaborate too much.

#### OFFICER CREW RELATIONS

What was the relationship between the crew and the officers? Excellent, I thought. I didn’t go up to the wardroom very often, but they treated us top-shelf. Who was my Commanding Officer? Springer was one and Organ was the other. I think those were the ones. But we got along really good. I can remember one time when I had liberty, and it was my job as the auxiliary man, they used to call them, to work on the air compressors. I was over in Portsmouth at the U.S.O. having a good time and the Shore Patrol showed up. The air compressor was busted and they wanted me to come and work on the air compressor. I go back to the boat and I’m not happy. So, I’m down there working on the air compressor and the guys in the after battery were watching a movie. They had a little metal tray you could pull down and they had a little projector and you could watch a movie and they were watching a movie in the crews mess! Anyway, the Shore Patrol came and got me, and they’ve got a whole crew on the boat! So, I’m not happy. So, I’m down there bitching and moaning and the Captain came from home to see what was going on because the compressor had broken down. I didn’t know he was there, so I was down there complaining. He said, “What’s the problem?” I didn’t know who it was. I had my head down in the bilges working. So, anyway, he leaves and he goes to the wardroom and gets Shaky – it was either Shaky or Hogan, one of the cooks – I can’t remember which, but he said, “Make me a cheese steak sandwich.” They made him a cheese steak

sandwich and a bowl of ice cream. It was like a big, huge salad bowl type of bowl of ice cream, and he put it at the table in the mess and then they sent a guy back to get me and said, “The Captain wants to see you.” So, I go up and he said, “Have a seat.” This was right in front of the movie. He said, “When you’re done eating that, you can go back to work.” Of course, I’m sitting in front of the movie slowly eating my cheese steak sandwich! Everybody’s looking at me like, “What the heck did you do?” But they treated us top-shelf. I mean, I thought they were great. I never had any trouble whatsoever with them.

#### ON LEAVING ALBACORE

I left the Albacore in 1968. Why, what precipitated that? Well, it’s interesting. In a way, I’m glad I did. If I was to do it all over again, I probably wouldn’t. But my life turned out well. I went to college. I was offered an opportunity when I was getting off the Albacore to go to OCS – Officer Candidate School – but I decided that I wanted to go do it myself. But I haven’t quit going to college since. But going back to leaving the Albacore, what precipitated that? My time was up. You know, when you’re getting out, you’re getting out. That’s it. There was no saying, “Boy, am I glad I’m getting out.” Your time was up and that was it. You just look down the road. I wasn’t in the Navy a month before I signed up for six years. Then, when my time was up, they interview you and they ask you what you’re interested in. So, I told them I was going to go to college. Where did I go? I went to different schools when I left there, but I have a Bachelor’s Degree in Mechanical Engineering. I have a Master’s Degree in Fluids and Heat Transfer. I have a Master’s Degree in Business Administration. I have a Master’s Degree in Communications and Marketing and I have a Master’s Degree in Education.

#### WORKING AND SCHOOL HISTORY

I have lots of Masters’! [Laughs] Where did I work? The first place I went to after I got out of the Navy was to live in a town called Lawrence,

Massachusetts. I went to work as a steam fitter and a plumber in a carpet factory. I started my own company – a dive company – doing underwater salvage and stuff like that. I was living at the YMCA – I had a room at the YMCA – and I was working in the carpet factory, and I went to Lowell Tech – this is how naïve I was. I just said, “I’m going to go to college. Where’s the nearest college.” So, the University of Massachusetts at Lowell. Back then it was called Lowell Tech. So, I go down to Lowell Tech and I said, “I want to start college.” They said, “Well, you don’t just walk in off the street and say, ‘I want to go to college.’” They said, “You’ve got to get your College Boards.” So, they sent away for my College Boards. This is kind of a funny story, I think. I had taken them in 1958 and now it’s close to 1969. But I had taken the College Boards in 1958 and they weren’t that good. So, Dean King, who was the Dean of the school said, “You know, these College Boards aren’t that good. But what position did you graduate in high school? Maybe that will help.” I said, “I was eighth.” He said, “Wow! Eighth. That was good.” So, he writes down, “Top ten.” I said, “That’s me – top ten.” Then the next line is ‘percentage of students.’ He said, “How many kids in your graduating class?” I said, “Fourteen.” He goes like this. “You’ve got to go to night school.” [Laughs] So, I went to night school. They said if I went to night school for a year and took these courses and I did well, that I would get accepted. So, I went to night school for a year and did well and got accepted. That’s where I met my wife. She was working there and going to school there at the same time. That was 1969, I think it was.

So, I stayed and they had a grant from the Coast Guard to build a wave-simulating machine, to simulate ocean waves, to study the effect of spills of hazardous chemicals. I did studies on oil and kerosene and stuff like that, how oil was going to move due the ocean waves and wind currents. I wrote an equation, and the guy that I did the thesis with, Dr. Morrona was his name, he wrote a book using the formula that I came up with. They used that formula when the Exxon Valdez hit up in Alaska, where that oil spill was. It was a good formula and yes, it worked. And I built the wave channel, which is still there. I did all the welding. I did all the construction of

it – that’s what I do. Then, when I finished that, I went to work at a nuclear power plant.

At Seabrook? No, at Yankee. I went to work for a company called Yankee Atomic Electric Company. It was funny because when I went for my interview, I wanted to be a schoolteacher because my mother was a schoolteacher. Same sort of thing – I wanted to be an x-ray technician, I thought I wanted to be a schoolteacher. So, with ten kids, my mother was teaching. And she was pumping all the water! And she was a nurse in the summertime. She went to work as a nurse at the hospital – a nurse’s aide. Anyway, I thought I wanted to be a teacher, so that’s why I was doing the Master’s in Education. I was taking courses in education and I was teaching at Lowell Tech. I was teaching Machine Design and Fabrication and Welding and Drafting. I was teaching those courses as a graduate student. I thought, “Well, I should be a teacher. This is fun. I could be a teacher.” The job I got offered as a teacher was six thousand four hundred dollars to start, and I had to teach for six months for free – to be a student teacher. The job I got offered to be an engineer for this Yankee Atomic Electric Company was sixteen thousand two hundred dollars. So, off I went to be an engineer.

So, that was the end of my aspirations to be a teacher. I’m a teacher now, though. I retired from being an engineer and I went down to Massachusetts and took the test, and I now teach Trigonometry and Calculus and Physics. Is that an alternate track or something? I’m teaching at a vocational technical school, so I had to take a teacher’s certification test to do that. I took those and I’m going back to Boston University at the end of the month to get my Master’s in Physics. That will be my fifth Masters if I live that long! Obviously, I like going to school, it keeps you thinking.

Did I ever think of going on for a Doctorate? No. Why not? I just said, “No.” So, what I’m doing is basically what I’ve been doing my whole life. I’m doing Physics – Physics is mechanics – how it works, you know? That’s what I’ve been doing my whole life. I went to work at a nuclear power plant called Yankee Atomic Electric Company out of Rowe, Massachusetts, and I was what they called a Field Engineer. I would go out to the field and I would talk to the guys in the field and find out what the problems were.

I'd carry that information back and translate it to English so that the guys in the Engineering Offices could re-design or fix whatever they needed to fix. Because I could weld, I could talk to the welders. And because I was a mechanic and I knew how to take things apart and put them back together from machinist mate school, I got a little respect from the guys in the field. Even though I wasn't an engineer, I could go out and talk to them and they knew I knew what I was doing. You talk like, "Well, this pump needs to be done this way and that," you know? That's why I like teaching at the vocational school because I can go down to the machine shops, and I can say to the kids when I'm teaching Physics, "What career path are you on? I'm a machinist." Okay. Here's a problem. It's a Physics-related problem to what you're doing. You're going to be a carpenter? Here's a Physics-related problem to carpentry, you know?

#### GETTING DRAFTED

Now, to go back to when I left the Albacore for a moment. Was there any pressure for me to stay in the Navy? This was the time of Vietnam and stuff. But, no. As a matter of fact, when I got out of the Navy, I got drafted. Yes. [Laughs] I got out of the Navy and was in college and I got my Draft Notice. So, I go down to the Draft Office in Lowell, and there's all these guys lined up because it was right there, during the Vietnam War. It's my turn and I get up to the guy and I say, "I'm not going." The guy looked at me and said, "What are you talking about?" I said, "I'm not going. I've been there." He was looking at me. The guy behind me – you know, they were just looking at me. I had what they call your DD 214, which is your 'getting out' papers and I handed it to him. He said, "I can take care of this." I started walking out and the guy behind me said, "What did you say to him?" I said, "Oh, I have a permission slip from the President." [Laughs] But my number came up and I had to go in and show them that I actually did do the time. But there was no pressure for me to stay. My time was up. I had done my six years.

#### WHAT MAKES A GOOD SUBMARINER?

What do I think, in terms of submariners, being the main characteristics of being a good submariner? I think I get along with everybody that I ever met in submarines, and I think they get along with me. Like right now, if ten of those guys were to come into the house and we hadn't seen each other in thirty years – it would be like we're brothers, you know? I don't know what that is, but it's just something that's in a person and a person's personality, that they get along with people. Works and plays well with others.

I had to take a psychiatric test to work at the nuclear power plant. I forget exactly what it was, but mine was shaped like a V. At the bottom of the V, it's your ability to get along with people. I said to the psychiatrist, "This thing is off the chart, low." I said, "That doesn't make any sense because I really like people and I get along with people and everything else." He said, "Well, that's not the problem." He said, "You're just the opposite of what this is supposed to indicate." He said, "You could care less if people like you," you know? [Laughs] He said, "You really like people, but you could care less if they like you." And this is designed for people that – you know, you go to work in a company where some people only work there if everybody likes them. Do you see what I'm saying? They're concerned about how they look, what people think of them, who is talking about them, who is not talking about them. The people I knew – they could care less what you think about them, you know? I like you! Good enough. I don't know what that trait is called, but like I said, I never saw a fight, I never saw an argument.

And we did some horrendous things to guys, just to try to get them all torqued up. We had this one fellow whose name was Randt – Phillip Randt – and he had a beard. We tried to dye half his beard one night with peroxide while he was sleeping! [Laughs] Now, peroxide is pretty smelly stuff. He slept on the top bunk and he knew we were going to try to do something to his beard. We rigged up this thing to drip peroxide through a hose onto this guy's beard. [Laughs] That's what happens when you're under water for a long period of time! [Laughs] They were dripping peroxide,

just one drip at a time, on his beard. He ended up with little white spots all over his beard, on one side of his beard. It didn't bother him, it was just the idea that he knew we were going to do something.

#### THE EFFECT OF SERVICE ON ALBACORE

What effect would I say having served on the Albacore had on the rest of my life, if any? I think it's part of who I am, you know? I don't talk about it much. If somebody says, "What did you do?" I'll tell them I was on submarines. I don't dwell on it. I don't look back on it. If they have a reunion, I'll go to the reunion. And I e-mail back and forth. We've got an e-mail list, people sending jokes most of the time on e-mail. And if somebody is having difficulty or something like that, you'll talk to them and stuff like that. Or, if they come up to this area and they visit, they come over to my house. But I'm not going to see somebody for twenty-five or thirty years, you know? It's who I am because I think it settled me down. I mean, I was driving around in a hearse. Seventeen-years-old. I was gone from home, you know? So, I grew up. And you can't say after six years of doing something like that that it has no effect on you.

#### TESTING THE NEW HIGH PRESSURE BALLAST TANK BLOW SYSTEM

Well, I talked about when the submarine flipped upside down, the time we surfaced upside down. [Editor's Note: Not upside down but rather with a large starboard list.] Has anybody talked about that? One of the things that happened when the Thresher went down was, the air pressure used to blow the water out of the ballast tanks was only five hundred pounds. And back on the submarine I was on – the Bang – it was only three hundred eighty pounds. So, at five hundred pounds pressure of air to blow the water out, if the ocean pressure is greater than five hundred pounds, that five hundred pound air does no good. It won't blow the water out. So, there is a depth in the ocean that once a submarine gets down below that depth, even if the submarine doesn't crush because of the pressure – you

can't get the thing up because the air pressure isn't enough to blow the water out. You've got to overcome sea pressure. So, they decided – another one of their tests – they decided when the Thresher sank, that maybe they needed to increase the air pressure in the submarines. Go from this five hundred pound ballast system to the five thousand pound ballast system so that there was plenty of air pressure. So, they put this big tank in and they did all this stuff, and they installed the air compressors to make that high-pressure air.

So, we're setting down at five hundred feet, setting dead in the water, and I was on the after blow system – which is aft of the after battery. You step into the engine room, you go around the engine compartment, right there on the right, and you look down at a whole bunch of pipes right there. So, I'm wedged in there, and all I had to do was switch this little toggle switch like that – just switch it – and it would put air into the after ballast tanks. So, the intercom said, "Okay, two second blow." Nothing happens. So, they said, "Okay, half a second blow," like that, just to get another squirt. Well, what actually happened was, the first time they blew it, there was so much air pressure – this is what they speculated – that it blew all the water out of the tanks, instantaneously. It was gone. But the momentum of the boat didn't feel like an elevator going up, you know? The momentum hadn't changed. But once it started going up, they now had all this air in the tanks. The sail, which is the top part of the boat that sticks up – when the sub went up, the sail acted like a rudder. So, now the submarine is going up like this, and the sail was slightly tilted in this direction. That sail acted like a rudder and the water caught it and started pushing it over more. And as the boat came up, not completely upside down like this, but it came up with a large angle to one side. On the bottom of the submarine there's holes, like this size. Pretty good. You can swim into them. I've swum into them before. They're about that big around. And they're open. There's no valves or anything on them, so you can actually dive off the side of the submarine, go down and go underneath, and swim up inside the submarine tanks. There's air in there when it's on the surface. Well, when this thing surfaced, it rolled over and those holes came out of the water, and they burped out the



air. The water flooded in and it swam around like this, and then we started sinking again. [Laughs]

That really caused a problem, because we were at sea for, I'd say, a day-and-a-half or two days. All the stuff in the bilges – all the water in the bilges – it started running down the walls, and it gets in motors. Everything is designed for dripping – everything to spray down on top. All the ventilation is underneath, so the ventilation got water in it and stuff like that, and that caused real problems. Hogan was in the after battery and you can take a look at this when you're in there. He had a pot of pea soup – this big – on the stove, with a bracket around it to keep it in place. The pot fell off of that stove, went across the compartment and landed in the sink, from here to that wall, and didn't spill a drop. It fell straight down. So, that was the test they did. We refer to it as coming upside down, but it went over better than ninety degrees and tipped way over. [Editor's Note: The angle taken during this test was on the order of 47 degrees to starboard. It was large and unpredicted by the test team.] And I'll tell you, this is the personality – you asked about the personality – I'm standing in the back, wedged into these pipes and I can remember saying to Arnold, who was in the engine room with me, "Jesus Christ! It's going to be rough out today!" Because I thought we had been hit by a wave, and we were rolling back and forth like this. All I thought about was – I didn't think this thing was flipping upside down, I just thought it's going to be rough after that. [Laughs] Then, after that, everybody is going nuts! But I just thought it was a wave, because that's what happened out there.

Those were a few times that it got exciting.

On that note, I'll sign off.

### **End of Interview**