POOPIE SUITS & COWBOY BOOTS

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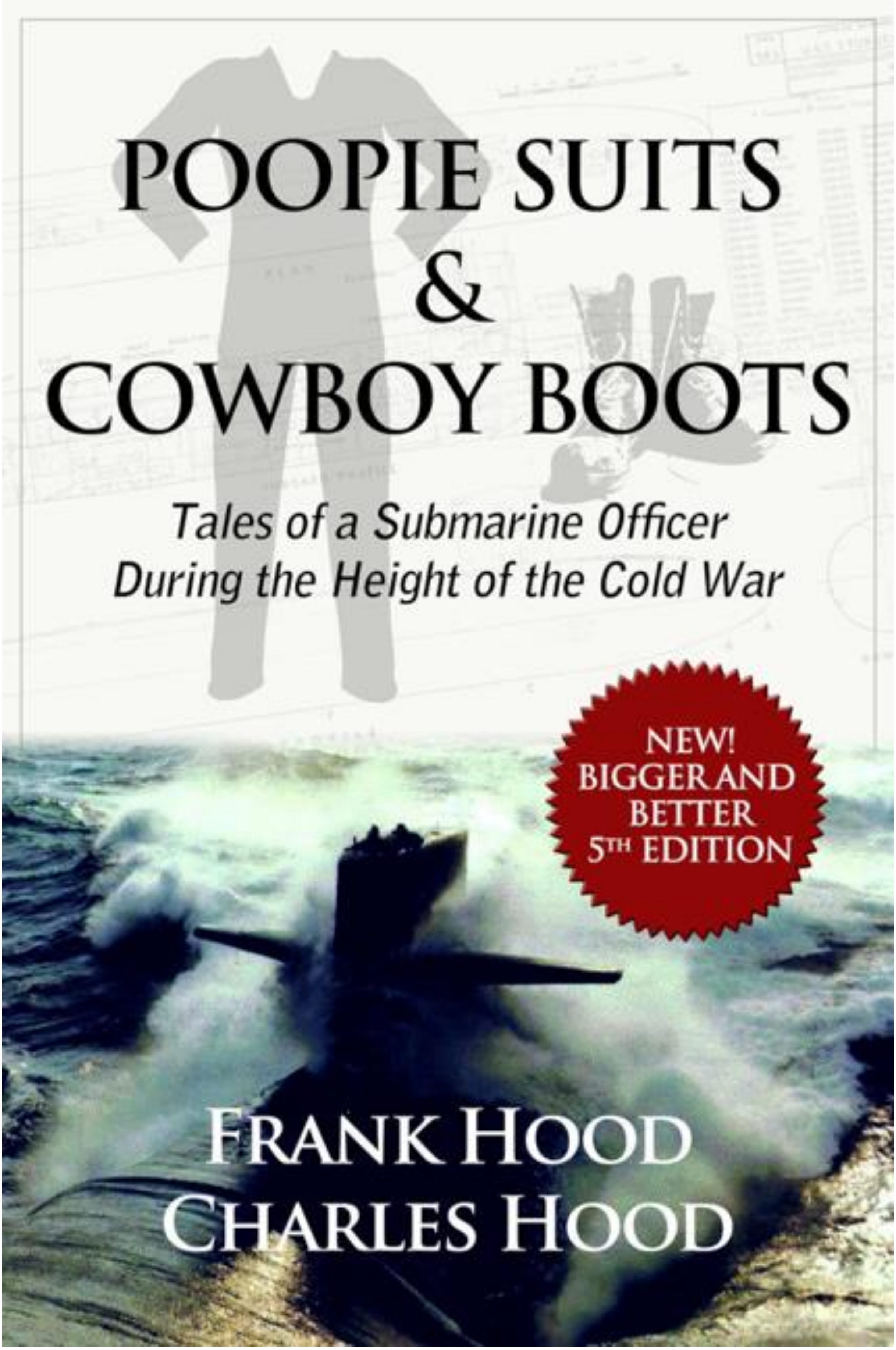

BOOK PREVIEW

From Chapter 11

We were always aware that Soviet submarines—both fast-attacks and boomers—were never too far away, even during these drills. The Soviet equivalent of our boomers functioned similarly—staying submerged for prolonged periods, tracing the same circular paths underwater, standing at the ready for a nuclear strike on the US mainland. Of course, we had our boomers in place similarly along the Soviet coast. These tactics were highly volatile, as one wrong move could have resulted in global annihilation, but the knowledge that any missile strike by one side in the US/USSR Cold War would result in an immediate and blistering counteroffensive by the other side (the so-called Mutually Assured Destruction or MAD Doctrine) did serve its purpose as an effective deterrent to nuclear war.

Back in those days, our submarines were superior to the Soviets' regarding effective sound-dampening technologies. We ran very quietly, and we could approach their submarines fairly closely without detection. The converse wasn't generally true, however; we seldom experienced difficulty in determining that we had some Soviet company nearby. We stayed in the passive mode with sonar—listening only—and couldn't believe just how noisy the Soviets were. On their boomers, we could hear all sorts of sounds: A dropped wrench, a flushed toilet, even the soundtracks of their movies or loud conversations. The lack of sound insulation compared to our boats was stunning, but it gave us a big advantage in the cat-and-mouse "games" (for lack of a better word) played underwater.

Our sound equipment was incredibly sensitive. To gain the best understanding of the sheer collecting power of our equipment, familiarity with the amazing tech inside the sonar dome was essential. This was an 18-foot diameter orb-shaped unmanned room positioned immediately inside the ship's bow. Here, an array of more than 100 sound sensors was deployed on the exterior of a big sphere; think of it as a round studio with a bank of microphones (hydrophones) pointed outward in all directions, with each microphone connected to its own speaker in the Sonar Shack in Ops. Each hydrophone yielded unique auditory information that was subjected to sophisticated sound processing and then displayed on a circular screen inside the Sonar Shack. Inside that room, which was always kept very dark, there were usually two highly trained men on watch who monitored all of the displays surrounding them as they intently listened to the sounds of the sea through earphones. Like air traffic controllers, these guys had to remain hypervigilant for any noises considered out of the ordinary.

These sonar operators were called sonarmen, and they played an extremely important role in our survival and success at sea. To the untrained ear, listening to the cacophony of sounds funneled into their earphones and displayed in wave format on the monitors around them was a bewildering experience. The sea was a relatively noisy place at times, with multiple sound sources superimposed upon one another. For example, the sounds of sea mammals like whales and dolphins were easily detected by our hydrophone system. The whale songs could last for minutes if not hours, and they never repeated themselves. In addition to these biologics, the sonarmen had to tune out the pounding sounds of the ocean itself especially during periods of heavy wave action and storms. Add to the list of interfering noises the turbulence created by our own boat slicing through the water. We could often hear these background sounds of the sea in the Control Room as a live audio feed from the Sonar Shack, and I can recall my difficulty in trying to discern what I was hearing at any particular moment.

The job of the sonarmen was to eliminate or ignore the irrelevant background noise and to instead discriminate those sounds that might signal the proximity of an enemy ship. Let me tell you, these guys were really, really good at their jobs. With their experience in detecting even the slightest hint of a man-made sound originating anywhere outside our boat, they could detect a Soviet sub or surface ship from many miles away. Once while we were in the Mediterranean Sea, the sonarman standing watch picked up on a Soviet cruiser that we subsequently learned was more than 250 miles away at the time. It was an amazing feat, but when the sea conditions were just right ("good thermals"), the sound of the enemy could propagate through the water for many miles.

Remember that while we were busy trying to detect the enemy by passive sonar, they were doing the same thing, by both submerged (submarine) and surface (destroyer) sonar. Our goal was to keep tabs on them without revealing our position. Since we had superior sound detection equipment and analysis, and because our subs ran quieter, we were able to meet this compound objective under most circumstances. Two important keys to our success were (1) going deep and (2) staying in passive (listening-only) sonar mode. The importance of proper depth, while not necessarily immediately obvious to a novice, was absolutely crucial in helping us maintain our cover. Although sound waves do travel a long way in shallow water, there is a certain depth below which sound wave transmission is significantly degraded. By finding that depth, we could become nearly completely inaudible to an enemy. On the other hand, that same principle which facilitating our concealment also meant that our own passive sonar capability for detecting a nearby enemy was compromised. Every move, I learned, had tradeoffs.

The odds of a surface enemy ship "seeing" us diminished greatly below a depth of 400 feet and became almost nil (even with the best Soviet destroyer sonar equipment) at 600 feet. Thus, we walked a tightrope at all times in finding just the right depth to continue monitoring our enemies while minimizing their capacity to detect us. If you stop to think about it, it was for this precise reason that the US Navy placed such a premium on constructing submarines that could withstand very deep dives. By staying below the effective zone of sonar detection, our travels could not be easily ascertained by the enemy. This strategy also helped to explain why the Soviets placed such a premium on maintaining their sonobuoy network on the seabeds of important shipping routes in the Atlantic and Mediterranean waters.

The general upshot of this paradigm was that we routinely varied our operating depth: Deeper for better cover but less ability for surveillance; shallower for better sonar capability but poorer cover.

Those vessels around us that relied on active sonar—whether submerged or surfaced—were very easy to detect. (Pinging is extremely loud. At the source, the sound of a single ping may exceed 200 decibels.) As a result, such intermittent pinging could be readily heard from just about any compartment aboard the Seahorse. Also, I should point out that the classic Hollywood version of the "ping" sound is nothing like the real thing. An actual ping is not a single note, but a series of different frequencies in crescendo, and the sound is a lot shriller.

From Chapter 12

Now let's examine a surfacing operation. It was a bit more complicated than the mere reverse of what I have just described. First, the OOD would order the sub to come up from its typical operating depth to an intermediate depth, say 100 feet. At that point, the order was given to clear baffles, following which the sub ascended to periscope depth (PD)—about 60 feet for a *Sturgeon*-class submarine like ours (the succeeding *Los Angeles*-class subs had a similar depth). We always paused at PD before surfacing; it was critical to survey the ocean surface a full 360 degrees using the main periscope to ensure that our surfacing could occur safely. Once the scope was raised, and the officer manning it made his 360-degree pass, he was expected to say either "no close contacts" or "emergency deep"—the latter response a trigger for initiation of an emergency dive, implying that there was a contact nearby that was too close for comfort.

Those moments at PD were always tense. If it was nighttime, and the sub was already rigged for red, the Control Room was then rigged for black, as described in Chapter 11. Also, the ship's speed needed to be slow enough to prevent inadvertent bending of the periscope mast, particularly in heavy seas. Generally, this required throttling down to less than 12 knots for the larger navigation scope and 6 knots for the smaller attack scope. Another important reason for slowing to a crawl during periscope surveillance was to minimize the thread of surface disruption created by the periscope mast itself. This narrow wake or "feather" could be detected by enemy aircraft to reveal the submarine's location.

Another key step that occurred when going to PD was getting on the squawk box and notifying those men in the galley, crew's mess, wardroom, Engine Room, Torpedo Room, and other work areas of the impending evolution. This communication served as more of a warning to "hang on" if rough surface weather was anticipated. The relative calm of the deep sea was often precipitously lost as we returned to PD just below the surface. This contrast was one of the more profound sensations of serving aboard a submarine. At 300 feet or more below, the ocean usually seemed placid. (Those who have served on a submarine affected by a hurricane might disagree!) Even during a raging storm on the surface, we could always find some peace and quiet just a short distance below.

Our discussion of PD is a perfect segue to a discussion about the iconic symbol of submarines—the periscope. As introduced in Chapter 7, on the *Seahorse* there were two periscopes, lined up forward and aft at the stand in the center of the Control Room. The larger of the two was positioned aft. It was called the *main* or navigational periscope. This scope was the one commonly used for routine PD sweeps and maneuvering watch navigation. It had a wide field of view and could be telescoped about 30 feet above the top of the sail.

With the keel of the *Seahorse* at the desired depth of 60 feet, the top of the sail was positioned only 15 feet below the surface. So, when the 30-foot telescoping periscope mast was fully extended, the scope protruded about 15 feet above the ocean. Once in position, a full 360° sweep was made on the main periscope to look for enemy surface ships. Subsequently, the mirror was angled to look up into the sky as far as 60° above the horizon. The design limitations of the mirror prevented seeing that small portion of the sky directly overhead. Even with the blind spot, which meant that we could conceivably miss an enemy plane flying directly over us, this assessment for any threats in the sky was an important routine step.

The smaller scope, found just forward at the same stand, was called the *attack* periscope, and it intentionally did not extend as far above the water surface. (On other subs the attack periscope went by the names "targeting" or "commander's" periscope.) The attack scope featured a much narrower field of view and a higher degree of magnification; it was very important in World War II-era submarines for helping to determine the "Solution" for torpedo warfare, in part because sonar technologies were lacking or very primitive at that time. During my time on the *Seahorse*, the attack scope was sparingly used; its main purpose was during torpedo targeting practice, as described in detail in Chapter 9. (On the *Seahorse*, we often referred to the periscopes as "#1" for main and "#2" for attack, but aboard other boats, the nicknames were reversed; in either event, the periscopes were referred to by number most of the time.)

While at PD, we routinely downloaded the latest communications from command, and several other functions of the submarine were also conducted in the absence of any hostilities. These included the disposal of trash via the TDU, the blowing of sanitation tanks, and the pumping out of bilge water. (In later years, PD would also serve as an opportunity to get an exact GPS fix on the submarine position from satellite navigation.) While we were at PD, someone *always* had to be looking up out of the #1 periscope to check our real-time status. During normal operations, "periscope liberty" was sometimes available, meaning that any crew member could take a peek when the conditions were conducive to granting such a privilege.

Most of the time, after completing our tasks at PD, we returned to deeper waters to continue our mission. However, if it was time to surface (approaching port, for example), then it was a simple matter to take the submarine the rest of the way up. Once the periscope survey was completed at PD, and the word came back “no close contacts”, then we again cleared baffles, followed by the blare of the ahooga horn three times. The OOD announced, “Surface, surface, surface.” The order “surface” was spoken three times and only three times.

The planesman, helmsman, and COW worked together to bring the ship up by turning the diving planes and increasing the boat’s positive buoyancy. The COW blew stored compressed air into the MBTs; with the upper vents of the ballast tanks in the closed position, this injection of air under pressure drove out the seawater through the open bottom grates. The state of buoyancy became rapidly positive, and in almost no time we popped right up out of the water.

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