Life Aboard WW2 US Subs

**What did a typical day at sea consist of?**

A typical day consisted of two four-hour shifts on watch plus time spent for maintenance, paperwork, studying and training. The time between 08:00 and 16:00 (8 AM to 4 PM) would usually be a work day, when maintenance, etc. would be completed. Twelve hours would not be unusual for a regular workday, and it could be even longer if the sailor was working toward his submarine qualification or studying for a promotion.

Sundays were a day of rest. As long as there were no attacks in progress and no essential repairs, there would often be no routine work on those days. In other words, on your day off you “only” stood eight hours of watch.

This assumes that there were three watch sections and the crew would be standing watches four hours on and then have eight hours off. If there weren’t three qualified watchstanders for a specific position, then watches would be “port and starboard”, meaning something like four hours on and just four off duty. That would last until a third watchstander could pass qualifications. The routine would also be adjusted a bit by dogging the watch about once per week.

During the war, the routine would be changed by the need to carry out long attacks on enemy ships or by attacks on the boat by enemy ships and aircraft. Either of those could last many hours and would involve the whole crew. That would naturally require changes to the normal schedule and the boats would make whatever adjustments were needed for rest and food.

There were a few instances of captains reversing the day so that the crew would be working at night when the engines were running (and noisy) and pulling fresh and, hopefully, cooler air into the boat. This would also mean that the boat could be submerged - quieter and calmer - while the crew is sleeping. This was usually done only when in the tropics. In these cases, the workday would be from 20:00 to 04:00 (8 PM to 4 AM) and meals would be offset by 12 hours. For example, breakfast would be around 20:00 rather than at 08:00. The crew would then sleep during daylight hours from 08:00 to 20:00.

**What did a typical day in port consist of?**

The typical workday would be from 08:00 to 16:00. That could be started and ended earlier, called tropical hours, so that the crew isn’t working during the hottest part of the day. However, in WW2 it was often longer than eight hours as men trained or got the boat ready for the next patrol.

One third of the crew would remain on board overnight. This was so that there were enough men on board in case of emergencies and so the boat could get underway and change locations as needed. The duty section would likely have some work to do to continue repairs or to clean up after shipyard workers.

This assumes that there are no major problems to be corrected. If, for example, engines needed to be overhauled, then the enginemen (motor macs in WW2) would work more hours. Others in the crew might be assigned to assist. The key thing is to get the boat ready for the next patrol. It is important to remember that sailors in the Pacific area did not go home at night. They may not see their families for a year or more at a time.

**What is a “watch”?**

A watch is a normal shift for the routine operation the submarine. In WW2, that was normally four hours in length with eight hours off before the next watch. There would normally be three watch sections.

**What clock times did the Navy use in WW2.**

The Navy used, and still uses, a 24-hour clock. That is often called military time or European continental time. Times between fifty-nine minutes past noon and midnight are expressed by adding 12 to the time that we are used to. Thus, 4 PM is 16:00; 8 PM is 20:00 and 11:59 PM is 23:59. Midnight is 00:00 and the hour until 01:00 is expressed as 00 plus the minutes. Noon is still 12:00.

“Zero Dark 30” is still any time in the very early morning when sensible people are still asleep. This is true no matter where you are.

For our ships, times were normally local. As the boats headed west, the clocks would be set back one hour as they crossed into the next time zone. Just as we civilians do now, we would set the clocks back three hours as we travel from the East Coast to the West Coast.

**NOTE**: The German and Japanese navies did not use local time. Their clocks remained set to the time zones of their capitols.

If there were a need to specify a time regardless of where the submarine might be, that would be stated as time zone Zulu. That is what most civilians might know as Greenwich Mean Time (GMT). This would be used, for example, as the time for the cessation of hostilities, the end of the war. That way, everyone everywhere would follow the given order to cease fire at the same time.

**How does dogging the watch work?**

It means that one watch, usually the 12:00 to 16:00 is split into two shifts of two hours each. This has the effect of changing everyone’s watch forward by four hours so no one stands the same watches all the time. This would be done about once per week.

For example, the schedule for watch sections could be:

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | 08:00 | **12:00** | **14:00** | 16:00 | 20:00 | 00:00 | 04:00 |
| Day 6 | 1 | **2** | **2** | 3 | 1 | 2 | 3 |
| Day 7 | 1 | **2** | **3** | 1 | 2 | 3 | 1 |
| Day 8 | 2 | **3** | **3** | 1 | 2 | 3 | 1 |

Watch section 2 in this example only stands half the 12:00 to 16:00 watch on day 7. Section 3 stands the last half of that watch, and will stand all of it on day 8. This gives section 2 a break from always standing mid-watches (00:00 to 04:00) and section 3 from always having the 04:00 to 08:00 watches. Everyone now stands watch four hours earlier than before we dogged the watch.

**What were the general living conditions on a submarine like this?**

Living conditions were fairly poor, including the following, some of which are discussed further below:

* A shortage of bunks
* A lack of fresh air
* Possible temperature extremes
* Close quarters
* Limited fresh water
* A strong smell
* Little dedicated food storage space
* A lack of much personal storage
* A lack of privacy

**Since the crew size grew, but not the number of bunks, where did they all sleep?**

There are enough bunks. There just aren’t enough bunks for everyone to have a bunk to themselves. The numbers vary a little based on the actual number of men aboard for the patrol and the actual number of bunks available. However, assume there were about 70 bunks and 80 men. In that situation, 50 men would have their own bunks. The other 30 men would be assigned with three men to two bunks. They were assigned so that one of the three would be on watch at any time. That meant that if you were one of the 30 junior men and you had an opportunity to sleep - your work was done and your qualifications were current – there was a bunk available.

That was the good news. The less good news, for these 30 junior men, was that when they came off watch at midnight or 04:00 (AM) they would be getting into the same bunk that their relief had just gotten out of. It was called hot bunking for a reason. To further put that in context, we think the boats rarely were cooler than 90 degrees Fahrenheit if they were in the tropics as most of them were.

There was the possibility of some good news. If the captain had an opportunity and fired torpedoes from the after torpedo tubes, bunking could improve. Reload torpedoes would be moved into the tubes, which were always kept full if possible. Now, for every torpedo fired, you could make two or three bunks on each empty skid. For every bunk that is created in this way, three sailors would no longer be hot bunking.

**Is there a best place to sleep?**

Submarines are relatively noisy at night. Engines are running and batteries are being charged. The boat is on the surface plowing through waves. People are on watch, operating the submarine. All of that makes noise. Red lights help to make it easier to sleep, but the boat can’t go completely dark. As a result, nothing will be as quiet and dark as your bedroom at home.

Most areas seem to have advantages and drawbacks. The forward torpedo room is farthest from the engines, so that noise is at the lowest level here. However, you do hear the bow crashing through the waves. In addition, the bow, as well as the stern, experience the most vertical motion - up and down - due to the swells of the ocean.

The after torpedo room has a little separation from the engines but does have the propellor shafts running under it with the screws not far behind. That does generate noise while on the surface.

The after battery – crews’ berthing – will probably have the least vertical motion. However, it is next to the forward engine room which will normally have at least one engine running at night. It also has a large fan pulling air out of the battery well during the battery charge. With 36 bunks in this space, the chances of at least one sailor snoring like a chain saw are close to 100%.

**NOTE**: The area on the port side of the crew’s berthing, away from the main passageway, is usually a bit better. There would normally be a divider of some sort between the 18 port side bunks and the other 18. That area on the port side, called Hogan’s Alley, could then be a little darker and a bit quieter.

The top bunks are usually preferred since no one would step on your bunk as they climb up to theirs. Just watch out for all those little valves in the after corners of the crew’s berthing area. You don’t want to wake up with a start and imprint those valves on your forehead.

The forward battery is likely to be one of the better places to sleep. There are still engine, fan and wave noises, as well as lights. But this space doesn’t have the worst of any of the disadvantages. The key may be to become an officer or a chief petty officer so you can have a bunk in this compartment.

**Is it ever truly quiet for sleeping?**

Finding a truly quiet place to sleep is very unlikely. There is constant activity on the boat. The engines are probably running at night and you can hear them, perhaps at a low noise level, anywhere on the boat. The battery is being charged. The electricians will go in and out of the battery wells to check on the specific gravity, to monitor progress of the charge. The boat is also on the surface which adds the noise of the boat cutting through the waves. If the swells are small, the rocking of the boat can help you get to sleep. If the swells are large, you may find yourself sleeping in odd positions so you can stay in your bunk.

The key here is to get used to the noise and light quickly. It also helps to be tired after a long workday.

**What kept you from falling out of your bunk in heavy seas?**

This was mostly up to you. Find a sleeping position that was spread out enough so that you wouldn’t be as likely to roll over unintentionally. You may not get a very good night’s sleep but it is possible to sleep this way.

In big storms, captains would sometimes go deep for 12 hours or so. This would get the boat below most of the wave motion. Then the crew would have some time to eat a meal and get some sleep before going back up on the surface to fight the storm.

In very heavy seas, you may have to strap yourself into your bunk in order to stay put.

**How deep do you have to go to get below the effect of waves?**

Naturally, this depends on the size of the waves. However, it quickly becomes calmer than being on the surface. Even periscope depth is somewhat calmer than the surface. A depth of 100 feet makes a significant difference. Going to 150 or 200 feet would be below most wave action. Captains would go down to 300 or 400 feet in big storms and that would usually be calm enough. This would allow the crew to eat, digest their food and get some rest.

Modern submarines need to be at 200 feet frequently to pick up any messages addressed to them. They have reported being bounced around quite a bit at 200 feet when they were in typhoons. Remember that waves in typhoons can be as high as 50 to 90 feet.

**What was the largest number of men on a US WW2 submarine?**

Again, the Gato/Balao/Tench boats generally had 80 to 85 men aboard. For the normal crew size, the largest number was likely the *Narwhal* and *Nautilus*, which were large, slow submarines built in the late ‘20s. (These boats were about 35 feet longer, 6 feet wider and almost twice the displacement of the Gato/Balao/Tench boats.) They usually had crews of about 90 men. That increased briefly to nearly 100 in the middle of the war and then returned to about 90. These submarines had two six-inch guns and were often used for minelaying and transport of small units of guerillas and regular troops.

However, there were cases when boats had extra passengers as the result of special operations, rescues or lifeguard duty. A small sampling includes:

* USS *Seawolf* (SS-1977) was lost in1944 with 82 crew and 17 US Army personnel aboard.
* At one point, USS *Narwhal* (SS-167) picked up 32 evacuees, including eight women and two children.
* Overall, submarines rescued 504 downed aviators during the war with USS *Tigrone* (SS-419)-rescuing 31 in a single patrol to break therecord of 22 by USS *Tang* (SS-306). Some rescued airmen stood watches while on the boats.
* USS *Gato* (SS-212), in 1943, evacuated 27 children, nine mothers and three nuns from Bougainville.
* In September of 1944, USS *Pampanito* (SS-383) rescued 73 British and Australian soldiers in the South China Sea. The rescued soldiers were aboard for about five days. *Sealion* (SS-315) participated in the same rescue, picking up 52 soldiers.
* When the USS *Darter* (SS-227) ran aground on a coral reef in late 1944, her crew was rescued by the USS *Dace* (SS-247). With two full crews aboard. there were likely about 160 sailors aboard the *Dace* for approximately one week.
* In February, 1942, the USS *S-38* (SS-143) picked up 58survivors from the British destroyer HMS *Electra*, sunk the day before at the Battle of the Java Sea. This is particularly noteworthy because the normal crew size is only about 42 men.

**How could you all move quickly when going to battle stations?**

Submarine sailors quickly learn to get past each other in the narrow passageways. However, there wasn’t necessarily all that much movement going to battle stations, particularly during WW2. First, you often worked and slept near your battle station. For example, torpedomen usually stood watch, worked, slept and had their battle stations in the torpedo rooms.

In addition, sailors typically had plenty of warning during the war that the captain was planning to attack. Smoke from potential targets could be spotted at least ten or fifteen miles away. Smoke would be seen well before the ships themselves. If the target would be cargo ships or tankers, which usually proceeded at 10 to 12 knots, the tracking party would be called away first. That could be an hour or more before going to battle stations.

In addition, there are very few secrets on a submarine. There is barely enough room for a private thought, much less a secret. Word about a possible attack would spread through the crew quickly. Sailors would then have plenty of opportunity to drift toward their battle stations before the alarm would be sounded.

**What is “battle stations”?**

Battle stations is the condition when the ship is expected to go into battle. Every position is manned, usually by the best operators available. Crew members not at a specific battle station would be available as reserves or for damage control.

On submarines, there could be different assignments for battle stations surfaced, battle stations guns or just battle stations (which assumes attacking while submerged.)

**What is a “battle station”?**

It is an individual’s job when the submarine went into combat. Some of the crew had different stations depending on whether the boat was attacking on the surface, preparing to use the deck guns, or submerged. This would normally be related to one’s rating or specialty. It could be as one of the primary operators or as a back-up or available for damage control.

**Who was responsible for damage control?**

Most large Navy ships have dedicated sailors for what is known as damage control parties. This is in addition to their regular assignments. Their role, in the event of a mechanical casualty or drill, is to report to the assigned damage control locker. From there, they will grab the appropriate gear and proceed to combat the problem.

These submarines did not have assigned damage control parties. The sailors who happen to be in the compartment where the problem occurs are the damage control party. That is why every submarine sailor has to learn damage control techniques. And that is why every submarine sailor needs to know the basics of every system on the boat. They have to know how to isolate the problem and combat it effectively. This is all a part of submarine qualification and earning their dolphins.

**What was a tracking party?**

The tracking party is the part of the battle stations crew that is determining the location and direction of the potential targets while still a distance away. This could be an hour or more before the rest of the crew went to battle stations, depending on the speed of the targets. The information gathered at this time would eventually be the basis for the attack and the final course of the torpedoes.

The captain and executive officer were key members, of course. You would also want the sonar and radar stations manned by your best people. The torpedo data computer (TDC) would be used to track the targets’ progress and to begin to develop the firing solution for the torpedoes. Therefore, the TDC operator(s) would be included, along with anyone else the captain deemed relevant.

**Where did they store all the oxygen for so many people?**

They didn’t. These submarines did not have the capability to make or store large quantities of oxygen or to remove CO2. (Modern submarines do, and that’s why they can be submerged for two or three months at a time.) In the WW2 boats, the air that they were breathing was the same air they had been breathing since they submerged. That air was intended to last 16 to 18 hours. Since most of the crew smoked, let’s call it 16 hours. The normal procedure would be to surface every night to get fresh air in the boat.

**How do you get fresh air into the boat? Where does the oxygen come from?**

The best way to get breathable air in the boat is to run the engines to charge the battery. (To say it is *fresh* air may be a bit of a stretch.) The air system is set up so that most of the air for the engines goes straight to the engine rooms. However, some of it goes to the ends of the boat and gets pulled toward the engine rooms, refreshing the air in all the spaces. Running the low-pressure blower to push the last of the water out of the ballast tanks would use the air in the middle of the boat, also pulling fresh air in, this time through the conning tower hatch. The same thing would happen if the air compressors in the pump room were running to recharge the air banks.

The routine was to be on the surface every night. This would hopefully top off the battery for the next day while freshening the air in the boat. Being on the surface each night also allowed the boats get their messages and, if the skies were cooperative, get a position fix using stars at dusk and again at dawn.

If the boat had to remain submerged more than 16 hours - usually because it was being attacked - there were one-time measures that could be used. The first of those were the six green oxygen bottles and the many CO2 absorbent cans in the overheads. The silver-colored cans in the overhead, labeled “DO NOT PAINT”, are the CO2 absorbent, typically lithium hydroxide. These will give you a couple more hours of breathable air.

After that, the main option was to bleed air from the high-pressure air banks into the boat. This would pressurize the boat somewhat, but would improve the O2 and CO2 percentages. Even if the air in the boat were doubled, to two atmospheres, decompression would not be an issue. It would about the same as swimming and diving down to about 25 feet. To be clear, this air from the air banks isn’t to be confused with fresh air, but it is air that allows the crew to survive.

**Were these submarines hot inside?**

Most of them were, but that depended on where they were. If they were in the tropics, we suspect that the boats were rarely if ever below 90 degrees. And most of our boats were in the tropics for the majority of the time. The first issue is that the water temperature is 80 to 85 degrees. The next one is that the boat is constantly generating heat mainly from cooking, the engines and from charging or discharging the battery. In the tropics, the engine rooms would easily reach 100 degrees.

When the engines were shut down when submerging, the cooling water to the engines would also shut down. Then the engine rooms could reach 120 degrees and the rest of the boat could be 110. It would take some time for the warm ocean waters to cool the boat back down.

There is air conditioning, but it was really little more than a dehumidifier. Freidman, Page 200. It helped but didn’t really cool the boat that much.

If the boats were in northern or southern latitudes, the temperatures could be more moderate. This was particularly true in spring and fall.

If the boats were operating off Alaska, they might actually be rather cold. The Japanese occupied the last two islands in the Aleutian chain at the time of the Battle of Midway. After that, we often had a submarine in the area monitoring any Japanese activity. In that area, the air and water temperatures may well be in the low 30s. If so, the boat would be cool or cold. The crew might be wishing for some of that excess tropical heat. It would also be cold in the boats during the winter if they were being tested during sea trials off Manitowoc, WI; Portsmouth, NH; or New London, CT.

**Weren’t the boats crowded?**

Submariners didn’t usually think so. No one thought a submarine would be spacious when they volunteered. They knew it was small and would be all closed up when submerged. (The non-submarine admirals who complained that the new designs were too plush seemed to think otherwise.) Therefore, the boats did not seem that crowded to the crews.

**NOTE**: We sometimes point out that conditions on these submarines do not meet the minimum standards for U. S. prisons. Most of that is simply due to the lack of space per person and the fact that many of the crew will not see daylight for weeks. Some may not even see the sky at night. However, to be fair, conditions on most surface ships aren’t that much better.

Still, it’s really a matter of what you get used to and the crews quickly became accustomed to the conditions. It simply became the new normal. As Fletcher Pratt wrote about submariners in “The Navy’s War”, page 140: “It was a club of individuals with an almost incredible ability to treat every circumstance as normal.”

“Killer-Angel quote about normal

Even though the crew could become accustomed to the close quarters, that didn’t make it ideal. Of course, carrying a significant number of extra passengers, such as rescued personnel or special operations troops would make it more crowded. The crew might have to work a bit harder to make it seem normal.

**There are showers on board. How often could the crew take showers?**

Rarely, if ever. On a submarine, there isn’t enough fresh water for everyone to take showers regularly. This varied from boat to boat, but the stills only produced so much fresh water. They were also famously unreliable. If both stills were working at full capacity, they would produce about 5,000 gallons per week each. They were rarely both working at capacity and, in the patrol area, you would not use the stills when submerged. They use too much power and make too much noise.

The first 500 gallons each week has to be distilled twice for the battery. The next claim for fresh water is the internal cooling systems for the engines. However, the engines don’t normally require much water each week. The next claim would be by the cooks. Water is needed for coffee or bug juice (a sort of Kool-Aid), to cook your food and to wash the dishes. That leaves only a few gallons per day for the crew to brush their teeth, shave if they want to, and wash up a bit.

We would like to have the cooks and the pharmacist mate (medic) shower about once a week. With so little water left after that, the rest of the crew would not normally take showers. They might only get a bucket of water periodically from the air conditioning condensate to wash out skivvies and then take a sponge bath. Since that water is extracted from the air in the boat, it will almost certainly have a thin sheen of oil on top.

Any showers would be “navy showers”. Fresh water is precious throughout the fleet, even where it is more plentiful than it was on submarines. A navy shower means that the sailor wets down and then turns the water off. He or she then soaps and lathers up. Then the water is turned back on to rinse off. Ideally, the total water usage is no more than three minutes.

San Francisco residents tend to use water efficiently and that is still about 60 gallons per day. That would be over 5,000 gallons **per day** for 80 people plus the water needed for the battery. Submarines often didn’t make that much water in a week.

**Why not take salt water showers?**

An occasional salt water shower wouldn’t be a problem. However, regular showers with sea water irritates the skin. Soon the sailors would be scratching themselves and raising welts with infections possible. Since this isn’t a terribly good idea, the boat is not plumbed to have salt water in the showers.

**If no one could take showers, didn’t the submarine smell bad?**

Absolutely. Diesel submarines stank, especially when at sea.

To clarify, it was true that most of the crew did not take showers. It would vary from boat to boat, but there just wasn’t enough fresh water for everyone to take showers regularly. For obvious reasons, it was preferable that the cooks and the pharmacist mate (medic) be able to take showers, perhaps weekly. The rest of the crew may have gotten a bucket of water occasionally from the air conditioning condensate. They could use that to wash out skivvies and then take a sponge bath. Humans contributed significantly to the smell.

But human bodies were not the only source of odors on submarines. There was the all-pervasive smell of diesel, other oils and engine exhaust gasses. Paint smells linger too. Paint might be the largest component of the odors on the *Pampanito* today. Most of the crew smoked since cigarettes were given away free to servicemen in WW2. (To be more accurate, most of the crew were active smokers and all the rest were second hand smokers.) Yes, you could smoke in these confined spaces even when submerged.

Finally, three of the four heads (toilets) drained to sanitary tanks. The good news here is that these heads could usually be used when submerged. The less good news is that when you drain something into the sanitary tanks, you need to vent an equal amount of air. That would go through charcoal filters before venting back into the boat, but that only helped a little.

Yes, diesel submarines smelled bad.

**How could the sub sailors put up with the smell?**

There is some good news here. Diesel submarines are like gardenias, night-blooming jasmine, tuberose and hydrogen sulfide. (Hydrogen sulfide is a poisonous gas that smells like rotten eggs. However, submarines aren’t usually poisonous.) What all these things, and many others, have in common with submarines is that after 15 to 30 minutes you stop smelling it. Olfactory nerves get saturated and stop sending signals to your brain. The nerves give up. You don’t get used to the smell; you stop smelling it. You only notice the new smells, like fresh-baked bread and rolls at night.

This is what makes hydrogen sulfide so dangerous. You no longer smell it but it can still kill you. The good news is that it is very rare to have hydrogen sulfide on an operating boat since it develops in closed spaces. We have very few of those and almost never go into them when at sea.

Even if you are up on the bridge for a watch, the olfactory nerves don’t normally reset. You are still mostly “protected” when you come down off the bridge.

**How much food could these boats carry?**

The boats were designed for patrols of about 75 days. Therefore, you would carry at least as much food as the planned patrol would last.

**What kinds of food would it be?**

The menu was fairly basic. You were trying to keep 80 men happy even though they were from different regions of the country with different cuisines. Meat, potatoes and vegetable were the basic menus. That would vary some with pasta and rice being on the menu at times. Fresh bread or rolls were normal. In addition, the overnight baker may have made pies or cakes.

After the first week at sea, there would be little fresh fruit, vegetables or salads. Fresh food doesn’t last that long, particularly with limited cold storage. Cheese and fresh eggs didn’t last long either. Eggs would then be powdered after that. Much of the meat would be frozen or canned.

**Where would it be stored? Where is the storage space?**

If we are talking about a patrol planned for 60 days or more, the simple answer is: everywhere. Naturally, the limited pantry and cold storage spaces are full. Large cans of coffee, sugar and flour would be stored outboard of the engines. Eggs, butter and cheese would be stored in the forward escape trunk for as long as they lasted. As warm as it might be, it was likely the coolest place on the boat.

Canned goods would be stored wherever there was room as long as they could be tied down securely and weren’t in the way of operating equipment. One logical place would be the berthing spaces in the battery compartments. You would then be walking on your food – the cases of canned goods covered by cardboard or wood – until the crew ate the food down to the deck.

Sailors were often taking cans of peaches with them on patrol, as long as the cans fit in their individual storage.

**What was the food like on a submarine?**

Since it has to be palatable to everyone aboard, it would tend to be basic. Perhaps it could be best described as basic American food – meat, vegetables and potatoes or perhaps rice or pasta.

Much of the food was canned although there was some freezer and refrigerated space aboard. Fresh vegetables and fruit didn’t last long. Neither did fresh milk. Eggs and butter would be stored in the forward escape trunk and might last a bit longer. (The escape trunk might be the coolest place on a submarine but, if you are in the tropics, it wasn’t really very cool.) Bread, rolls and perhaps pies or cakes were baked fresh each evening. Much of this is also true of surface ships. Food on submarines was not much more limited than it was on surface ships.

To be fair, the crews might still grumble about the food. It has been said that a sailor isn’t happy unless he (or she) is complaining about something. Sometimes the crew would drive the cooks crazy. On one patrol, the main request might be for strawberries. The cooks would then order more strawberries for the next patrol. Of course, the crew would now want more peaches on that next patrol and would complain about being stuck with all those stupid strawberries.

There was one overnight baker on a submarine who asked his shipmates to write home for the recipe for his favorite cake. Get the recipe from his shipmates’ wives, girlfriends or mothers. Then, on that sailor’s birthday, he would bake that cake for dessert. This may not seem to be a big deal, but it mattered for morale. Scaling up the recipe may not have been as simple as it might seem since some ingredients, such as spices, can require different proportions.

**Was the food really better than the rest of the Navy?**

Surprisingly, the food on submarines was the best food in the seagoing Navy. That goes back to the earliest days on subs. President Theodore Roosevelt visited one of our first submarines in 1901 or 1902. It was apparent that there needed to be some added incentives to get sailors to serve on those primitive boats. The answers were to increase the pay and to increase the food allowance.

The food incentive was to increase the allowance per sailor on board. The Navy provides a certain amount per enlisted sailor for meals each day when assigned to a ship. The Navy provides a larger amount for those sailors assigned to submarines. Therefore, the Supply Officer and the cooks can order the special things from the standard stores list a little more often. Examples might be that they could order more frozen shrimp for shrimp cocktails or they could order better cuts of steaks more often.

As a result of this incentive, the quality of the food on submarines became a fairly big deal. There are stories of captains fighting over good cooks, perhaps even physically. And you certainly didn’t want to be a bad cook on a submarine. You may not last long on the boats.

**How could everyone fit in that small space?**

There are four tables with three seats on each side. That means the Crew’s Mess seats 24, comfortably. The crew eats in sections, one third at a time. Given the crew size of 80 sailors, minus the officers who eat in the wardroom and the cook and mess cooks, that leaves 22 or so who need to be fed at each seating.

**When were the meals?**

Meals were tied to the changes of the watch. That means breakfast was at 08:00, lunch was at noon, soup down was at 16:00 and dinner at 20:00. This is done so that no one needs to miss a meal. The watch section which will be going on duty eats first. During the time that the watch changes, the section not involved eats next. (The change of the watch is not instantaneous. The section coming on watch needs to be told about the current situation and any upcoming changes or expected operations.) The section coming off watch eats last.

**Is that an ice cream machine in the crew’s berthing?**

Yes, it is. Early in the war, there was no capacity to make ice cream on submarines. The boats may have been able to take small amounts with them on patrol, but there is little freezer space for up to 75 days at sea. Ice cream and oranges were the first things that sailors wanted when they returned from patrol.

However, *Pampanito* has an ice cream machine. It is not clear when it was installed, but it doesn’t seem likely that she had one when she was first built. The first machine wasn’t installed on any submarine until the last half of ’43 and probably didn’t become standard equipment until ’44.

The first ice cream machine on a US submarine was stolen. It wasn’t stolen from the submarine. It was stolen by the submarine. While the USS *Tang* (SS-306) was in Mare Island Naval Shipyard, Dick O’Kane, the captain, let it be known that he wanted an ice cream machine. It was not then standard equipment for submarines. His comment was probably code for “make it happen and I probably don’t want to know how you did it.” The crew found an ice cream machine, on a pier, due to be installed in the wardroom of the battleship USS *Tennessee*. The crew “acquired” it and installed it in the pump room of the *Tang*.

This story should sound too good to be true, a veritable “sea story”. However, O’Kane made a reference to it in his book “Clear the Bridge” when he mentioned a forged receipt that was left for the *Tennessee*.

After a war patrol, Admiral Lockwood, commander of submarines in the Central Pacific, came aboard for the usual patrol debrief. When he was served ice cream, he commented that the *Tang* had gotten the ice cream aboard quickly. O’Kane confessed that they had made the ice cream on board and showed Lockwood the machine. The admiral thought that was a good idea, and ice cream machines became standard equipment on submarines.

What flavors were available? It seemed to be that you could have any flavor you wanted as long as it was white.

**How much personal storage was there?**

Not much. For the individual enlisted sailor, there was about one square foot of storage, plus whatever could fit between the springs and the mattress. Uniforms and cigarettes can be stored under the mattress. Officers had a bit more storage, but they also had to store some paperwork for themselves.

**What privacy was there?**

Obviously very little. Even the captain, who had a stateroom to himself, didn’t have a door to close. It isn’t too much of a stretch to say that there wasn’t room for a private thought. However, everyone was in the same situation. If you expected to have what privacy was possible, you had to respect the privacy of others. Most often, that did work out pretty well. If you needed to be left alone for a bit, you normally would be.

**If the war patrols were 45 to 60 days, how much time off did the crew get between them?**

Generally speaking, the crew was in port for about four weeks after completing a full patrol. For the first two weeks, the crew had no responsibilities for the boat and were on liberty the whole time. A relief crew was responsible for the boat. (See below.) After that, the crew returned to duty for specialized training, finishing any work on repairs or upgrades on the boat, loading supplies and cleaning. Then they would spend about a week training as a crew.

It was important to train as a full crew because there would be many new faces on board for the next patrol. Many of these newcomers were new to submarines and a few would be experienced hands returning to submarine duty. About 15 to 20% of the crew would be replaced at the end of each patrol. This was done to give some of the men a break after a series of war patrols.

**Where would sailors be assigned when it was time for them to get a longer break?**

The crewmen who were being rotated off the boat could be assigned to any number of duties. One of the most common would be to new construction. Submarines in the latter stages of being finished needed many experienced crewmen. The men coming off combat would help finish the new boat and provide the experienced core of the new crew. This way, they would also get a few months break from combat while the new boat is completed and then undergoes sea trials, post-construction repairs, training and then the transit to their new homeport.

Other possibilities for assignments included training billets, division or squadron staff or relief crews. Relief crews were the experienced sailors who would take over for the first two weeks for boats coming off patrol. They started or assisted with repairs and upgrading equipment as needed. They were fully responsible for the boat so that the crew could get the full two weeks off. However, the commanding officer, executive officer and senior department heads would often monitor the work being done on the boat even during that two-week-off period.

After about six war patrols, submarines were given an overhaul. Overhauls were extended maintenance periods for larger repairs and the installation training for new equipment. The hull might be cleaned for better speed. It could also be repainted. This would often be back on the West Coast so the added transit time is also part of the longer break between patrols.

**How are things different before a sailor is qualified?**

When you report aboard your first submarine you are a non-qualified puke (NQP), a life form just below pond scum. Another version of this is that you are a useless food-consuming being (UFB).

The main point is that you have a great deal of work to do before you are a qualified submariner. You are expected to spend your spare time working on your quals. During that time, you are not allowed to watch movies or play games. Your spare time, such as it may be, is supposed to be spent on your qualifications.

**What did they do for entertainment once they completed qualifications?**

The most common thing would be playing cards chess, or checkers. Acey deucey was a Navy version of backgammon. Cribbage was a frequent card game along with Bridge in the wardroom. There were also books and the radio. There were also movies, although not all were recent and they would often be shown multiple times.

Playing cards had to be specially made or adjusted to be used under red lights. The hearts, diamonds and red numbers disappear in red light. (See below for information about the red lights.)

When out in the Western Pacific, the radio would pick up Tokyo Rose, who was actually different persons at various times. The sailors would laugh at the propaganda – it was interesting to find out you had been sunk multiple times – but the music was surprisingly current.

In addition, there would be the normal jumping to conclusions and the good-natured harassment of each other.

**What does it feel like to be submerged?**

As long as you are OK being in small space, it doesn’t feel much different. You are inside the pressure hull, meaning that the pressure you feel personally isn’t very different. It is sort of like being in a passenger plane. The change in pressure isn’t very noticeable. The difference, of course, is that in airplanes, the outside pressure is less. In submarines, it is greater but it is still outside the pressure hull. In short, it was no big deal. Depending on the weather and the sea state topside, being submerged might be preferable

The hull will compress a little when you go deep. However, at least on these WW2 boats, it isn’t enough to notice a pressure change. It may still be enough to mess with the new crew members. You can tie a string from one side of the hull to the other and pull it tight when on or near the surface. Then, as you go deeper and the hull compresses, the string will sag all out of proportion to the actual compression. It looks far more significant than it is.

**Does the hull creak when you go deep?**

It does, a little, on these WW2 boats. However, it isn’t a big deal. Soon you will barely notice it because it has become a normal noise. You might even forget that it made noise.

**Do you feel the motion when you are submerged?**

Yes, but it quickly gets to be at a lesser amount. Down at 100 to 150 feet, the wave motion from the typical swells is mostly or completely gone. The boat is much steadier. However, you probably will be aware of up and down angles during larger changes in depth. Those are due to operation of the boat and are separate from wave action.

Shortly after leaving port, the captain will usually do “angles and dangles.” This is normally announced in advance. The captain would then order depth changes with larger up and down angles. This is done to shake loose any equipment and supplies that aren’t stored properly. This provides an opportunity to store everything properly before it can become a problem.

**Why was there red lighting in some spaces?**

The primary purpose was to protect night vision. When going from white lights to darkness – in this case up on the Bridge or looking through the periscope – we are practically blind for 15 seconds or more. We were sending men up to the Bridge in darkness. We would prefer that they didn’t hurt themselves getting there. When going from red lights to darkness, we usually avoid the time that we are completely blind.

It also reduces the time to get full night vision. Although some people claim that it takes hours to get our full night vision, we can get most of it in about 20 minutes if we come from white lights. If, however, we come from red lights we get most of our night vision back in about 10 minutes.

The lookouts in WW2 were looking for smoke on the horizon, usually the first indication of enemy ships. There may not have been a moon up yet, or maybe the sky was clouded over. They were looking for smoke in a dark, grey night. We needed to give the lookouts the best chance of seeing enemy activity that we could.

When getting ready for a watch on the Bridge, sailors would usually be given red glasses or goggles to help preserve their night vision. This would prevent a stray flashlight or match from doing any damage to someone’s night vision. However, all flashlights used in red-light spaces should have a red lens for the same reason.

It also prevents white lights from giving away our location. White lights can show a beam for a great distance. If you remember the first 9/11 memorials in New York City, you know what this means. The memorials were just lights shining up to the sky from where the towers had stood. Those beams of light were visible for miles all around. Submarines don’t want to show something like that.

**How much of the boat was “rigged for red”?**

Most of the boat would be rigged for red. Only Maneuvering and the engine rooms would still be using white lights. The After Torpedo Room would be rigged for red for sleeping purposes. Crew there would have to go through the machinery spaces to get to the bridge where they are exposed to white lights unless they are wearing red glasses.

**Did the red lights cause any difficulties?**

No serious difficulties. It is a bit harder to see gauges and labels in red lights, but we get used to that quickly. The most famous issue is that it was briefly impossible to play cards. If you have a deck in true red light, the red numbers and spots (hearts and diamonds) completely disappear. Sub sailors are quite resourceful and quickly solved the problem. They outlined the hearts and diamonds, and repeated the numbers, in black. Soon there was a deck of cards printed for submarines. Google “submarine playing cards” at [Submarine Cards — Submarine Playing Cards — The World of Playing Cards (wopc.co.uk)](https://www.wopc.co.uk/usa/brown-and-bigelow/submarine) for examples of how they solved the problem.

**How can I avoid an issue like this at home?**

We experience this most commonly when coming out of the bathroom at night. We turn off the lights and open the door, and we see nothing for 15 seconds or so. One solution would be to install red lights in the bathroom. However, that’s not likely to happen.

Another option is to do the “pirate thing.” (What on earth are we talking about here? Is this person nuts?) You have probably noticed that nearly all depictions of pirates include an eye patch. Certainly, you didn’t think that **every** pirate has lost an eye to injury. Pirates wear the eye patch when they are inside their lighted ship. Then, when they go up on deck, they flip the eye patch out of the way. Now they can see out of the eye that had been covered while the other is still adjusting to the dark. We don’t need to use an eye patch. Just close one eye about 15 seconds before we turn out the lights. It looks strange for a bit, but it works.

**What messages did the crew get from home?**

Very few, if any. Unlike today, there was no way to call or text the family back at home. There were also significant concerns about security. Finally, there were concerns about servicemen getting bad news when they couldn’t do anything about it. There was no sense letting someone know about serious problems at home when he couldn’t do anything at all about it.

Letters were the obvious means of communications with families. Sailors might write regularly, but there was no incoming or outgoing mail when at sea. Large surface ships might get or send mail occasionally using replenishment ships. Since submarines operated separately or in small groups, there were no postal deliveries. As a result, sailors would receive mail from home and friends in batches. They would also mail their letters out in batches.

Outgoing mail would be censored. It would normally be read by one of the officers and there might be some holes where sensitive information was cut out. Naturally, some sailors would develop code words or phrases that would provide some very basic information about what was happening. However, orders were secret before departure and the crew would not normally know where they would be patrolling next. There wasn’t much they could give away.

This is still mostly true today. There are family grams, a limited number of messages that could be sent from home to the crew, particularly for the missile boats. However, they are screened for security and to make sure they wouldn’t upset a sailor who couldn’t do anything about a problem.

**How do you get exercise when on a submarine?**

On the WW2 boats, it is often claimed that the only exercise the men got was jumping to conclusions or playfully harassing each other. The fact is that there wasn’t the room, and often not the time, for regular exercise. There was usually some work going on during the day in the few compartments with space. As a result, the only real exercise would come from whatever manual work you had to do or going up and down ladders.

**Where are the offices?**

There are only the two offices on the boat. There is the Log Office, which is the tiny space in the Maneuvering Room for the Engineering Department. The ship’s office, for the Yeoman, is a bit larger and is located across from the Goat Locker in the Forward Battery. The captain’s cabin has a desk and a bit more storage, but isn’t really an office.

**Did the captain get the fancy room with only one bunk?**

The captain did get the separate cabin all to himself, although it isn’t that fancy. It did allow a minimum of privacy, although there was only a curtain instead of a door. He did have his own desk as well as course and depth indicators. It should also be noted that he would probably be awakened often, in accordance with his night orders. He would want to know of any potential enemy contacts as soon as possible. He would also want to know when the battery charge was completed and when the boat was prepared for the activities of the next day. In peacetime, the captain would also want to know whenever any ship was expected to come within five miles of the boat. He would expect to know what the OOD was doing to stay clear of the other ship.

**Did captains always get credit for ships they sank?**

They didn’t always think so. The first issue is that captains often overestimated the type of ship that was attacked, the damage done and the tonnage sunk. This estimate would be more accurate if the target was positively identified and then sunk. It helped if some of the wreckage with the ship’s identification could be recovered.

Then there were reviews of the claims by the individual captains by the submarine commanders for the area – the Central Pacific and the Southwest Pacific. Monitoring Japanese radio traffic could often confirm sinkings and the identities of those ships. That could increase the captains’ claims but most often reduced them

The final review, after the war, was by the Joint Army–Navy Assessment Committee (JANAC) which audited Japanese naval losses in WW2. This almost always resulted in captains losing credit for some ships sunk. Japanese records may not have been complete, particularly with regard to smaller vessels, those under 500 tons. Many submarine captains believed that they did not get full credit for the ships they sank.

**What was JANAC?**

JANAC – “Joint Army–Navy Assessment Committee was a United States inter-service agency set up to analyze and assess Japanese naval and merchant marine shipping losses caused by U.S. and Allied forces during World War II.” (From Wikipedia.) This committee reconciled American and Japanese records to try to confirm sinkings.

**What was “Liberty”?**

Liberty was, and still is, time off for sailors when not on duty overnight or when visiting a port. Usually, one third of the crew will remain on board at all times so that the ship can get underway if needed during an emergency. The other two thirds may have liberty. Liberty is usually just overnight or over a weekend assuming the sailor isn’t part of a duty section. It is not time off counted against leave.

**What was “Leave”?**

Leave is extended time off, similar to vacations in the civilian world. It was earned at a consistent rate and an individual’s leave balance was tracked. There was a limit during peacetime as to how much leave could be accrued without losing the days over the limit. Leave not taken would be paid out when the sailor leaves the Navy.