

Michael Kendall
Electronics Technician and Operations and Maintenance Instructor
Chief Petty Officer (E-7)
United States Navy, Ingleside, Texas

Job Description

In this position, an experienced technician teaches operations and maintenance on the navigation, command and control systems on ships, teaching both the operators who use the system as well as the maintenance technicians who will maintain and repair it. The system taught includes a tactical display console, a global positioning system navigational unit (GPS), a computer, a gyro system, a LORAN navigation system, a radar system, a sonar, a fathometer, a degassing coil, and other devices.

CONCEPT: Mathematics/Algebra -- Working with formulas

As an electronics technician, I use math in understanding the concepts and the theory behind the electronic circuits. An example of mathematics that could be used as an electronics technician and a communicator would be to figure out the resident frequency of an antenna using a known formula.

A dipole antenna is an antenna that will resonate on a specific operating frequency. When the antenna is resonant, it has better sending and receiving properties. [We use a formula to calculate how long the wire in the antenna should be to optimize for the frequency that's being used.] We also use a formula for radar, which is used to figure out the range of a target on the radar display. The radar signal propagates at the speed of light and the time to travel to the object [being detected], then reflect off of it must be calculated. This can be expressed as a constant in microseconds [and can be used] for determining ranges in nautical miles. [This answers the question, how far away is the object being detected.]

WORK SKILLS: Working with Technology -- Troubleshooting

What interested me in electronics when I joined the Navy was, I was technically oriented and I already knew that I either wanted to be an electronics technician or a computer programmer. I had taken classes in computer programming in college. When I talked to my recruiter, he offered me either electronics technician, data systems operator, data processor or radioman.

One of the classes we teach is operations and the other class that we teach is maintenance. The operations class may have mine men going through it and electronics technicians. The maintenance class will have the electronics technicians only.

Troubleshooting is part of the technician's job. Troubleshooting is fault isolation using logical, known troubleshooting techniques, what we call in the Navy seven-step troubleshooting. The nature of troubleshooting is going to be first locating the faulty unit and from there, locating the faulty assembly, the faulty circuit card, and the faulty component.

The key to troubleshooting is following a logical sequence making measurements with test equipment using a technical manual that has known parameters in it and isolating the fault.

The skills required to be an electronics technician in the Navy are knowing the electronics, having a lot of common sense, and being persistent. Occasionally, you don't have just the easy troubleshooting problem that is required to be solved. Occasionally, it requires troubleshooting in excess of 12 hours straight. In other words, when there's a difficult problem that needs to be solved, you keep on going until it's up.

When I was on the U.S.S. Beaufort, a smaller ship, we didn't have redundant equipment and the ANWSC-3 satellite communications transceiver broke. The ship lost all of its communications. I was off the coast of Japan. Everybody from the commanding officer down to the operations officer would come by and ask me how I was doing as I troubleshoot. Once I identified the fault, when we pulled into the next port, we received the part and replaced it and fixed it. When we pulled out of port, it was back in a working condition. It took me approximately 12 hours [to find the problem].

WORK SKILLS: Working with Technology -- The display console

There's a tactical display console that the operator sits at and through a keyboard interfaces into the computer. The navigation input, the sonar input--each of these is connected to the computer and the display console. The SYQ-13 interfaces to GPS navigation, computer, a gyro navigation system, a LORAN navigation system, a radar system, a sonar, a fathometer, and the degassing coil, just to name a few.

The operator will take all the input from the sensors and the tactical action officer will process the contacts and log them on the computer When the operator sees a mine on the display from the sonar, it's logged on the computer. Later on the contact can be processed and an explosive charge can be put on the mine and the threat will be eliminated.

If you're going through mine-infested waters, the scene is similar to that of any warfare ship in a combat situation. There's going to be watch standers, and there's going to be a tactical action officer and each watch stander will be performing his duty in relation to the mission of the ship. You'll have radiomen, quartermasters. A quartermaster is a person who helps the ship navigate.

You'll have electronics technicians who fix the equipment. You'll have electronic warfare technicians who operate the systems and maintain the systems for the electronic warfare. There'll be boatswain mates who may be up on the bridge driving the ship. There'll be officers in charge of the bridge navigation.

WORK SKILLS: Working with Technology -- High-frequency communications

One of the most challenging things I've done in the Navy was learning high-frequency communications. When I was at the special warfare commands, I was required to do a lot of research and studying on my own, operating and maintenance.

High-frequency communications is similar to amateur radio in the civilian world. It's used for talking all around the world. Also, at the same time, you're required to set up and operate satellite circuits

It was very challenging because everybody was counting on you. Once communications were established, then you knew you did your job.

We could set up the communications not only on a ship. We could embark on a ship that we weren't even stationed on normally, but also you could get on a plane and fly somewhere and set up communications in the desert. In the Navy you're not just on a ship. You can be on shore duty. You could be stationed overseas.

WORK SKILLS: Working with People -- Teaching

When I'm teaching, I try to relax, make sure that I'm presenting the material that the students need to learn, and I keep it simple. Let me correct myself. I keep it as simple as possible.

I enjoy teaching. I especially enjoy teaching the maintenance. When I'm teaching maintenance, I know that I'm teaching the technicians below me to someday be my replacement. Some of the people that I'll be teaching I know someday will be Chiefs also and will be passing it on.

When we teach the operation, we first teach the theory behind how it works that student will understand what he's doing. After he understands what he's doing, then we go down to a lab where there is a training unit set up with the simulator and student sits in front of an actual console and operates it as if he's on the ship.

We're teaching to the operator, we're teaching the fundamental parameters of each system. An example, when we teach the racks that have all the equipment, we teach how they interface. The SYQ-13 computers interface into the plotter, printer, detect sonar, fathometer, doppler velocity sonar, radar, wind indicator, gyro, ship's degaussing coil, gps, and loran.

JOB/CAREER: Job overview

I'm Chief Kendall and I'm at the Mine Warfare Training Center located in Ingleside, Texas. My present job is, I teach operations and maintenance on the navigation command and control system located on the mine warfare ships.

The operators actually use the system. Maintenance is for upkeep and when it breaks, somebody has to fix it. It's otherwise known as NAV C², Navigation Command and Control. It's the eyes and ears of the ship. When you're navigating a mine field, you don't want to run into any mines, and you want to be able to process the contacts. The SYQ-13 is the system that allows the mine warfare ships that are hunting the mines to go into the mine field and locate the mines. You'd want to locate the mines before you go into an area that is suspected to have mines laid.

JOB/CAREER: Career Path in the Navy

My position is an electronics technician. When I enlisted, I talked to my recruiter and signed a contract for the advanced electronics field. After I graduated boot camp, I went through basic electricity and electronics school, which is approximately three months. I went through Electronics Technician Class A School, which is approximately nine months, then I went through Class C schools for the equipment that I had to maintain throughout the years, which has been several different types. [In my career,] I've had to maintain radar systems, sonar systems, computer systems, and communication systems. [The navigation command and control system] includes a little bit of everything. There's a computer in there. There's radar interfaced into it, navigation, and communications.

I became interested in the Navy when I looked at all the career opportunities available to me. The Navy seemed most appealing. The Navy not only offered a good retirement program, career path, a technical training path, but also it was offering a lot of travel around the world. I've traveled all over the world. I was stationed overseas at one point for six years. I was stationed in the Philippines for three and a half. I was stationed in Japan for two. I've been in the Navy for 18 years.

I also receive a lot of job satisfaction when I repair a piece of electronics equipment and know that the ship is capable of doing its mission because the equipment has been repaired. There is a lot of satisfaction behind that. Knowing that I'm serving my country at the same time. I've essentially fulfilled all my desires in the 18 years that I've been in the Navy. I'm eligible to retire at 20 years, and at that point I'm going to go into the civilian job market and be an electronics technician there.

JOB/CAREER: Training in the Navy

While I've been in the Navy the learning has never stopped. I'm always learning something new. By the time you graduate ETA school, Electronics Technician Class A School, you will have gone through so much training, that there will be a discipline behind you that will help you throughout your career and the rest of your life. Electronics technicians are highly successful in both the civilian world and the military world.

What helped me learn to study and succeed as an electronics technician was essentially the desire to succeed. One of the drives for me to succeed as an electronics technician was knowing that I would have a great career path after I got out of the Navy. Technicians in the civilian world get paid quite a bit of money. When you're going through electronics schools, the instructors are always available to help you if you have problems. There's always an extra study available in the evening.

Communication skills are extremely important in the Navy. Not only in my present position as an instructor, but also in a leadership position. If you can't communicate well to the people under you, then the job's not going to get done. My leadership and teaching skills were mostly learned through on-the-job training and experience. However, the Navy also has schools for leadership and teaching.

In the 18 years I've been in the Navy, the training has never stopped. I've been to so many schools I couldn't even think of all of them right now. I've been to a school that has college credits to learn how to teach. It's called Instructor Training, IT School. As you advance in pay grades, there's training that's given for each pay grade. When you get stationed at a new command, inevitably it'll have different types of equipment and you'll be sent to schools to learn how to maintain those individual pieces of equipment and you're awarded what's called NECs, which are four-digit number and they classify you as a person on what you need – what you know how to teach. The Navy is based on everybody teaching everybody else. Something since I've been in the Navy that I've gained from is all the education that the Navy has given me. It's going to allow me to succeed in the civilian world, in the civilian job market and job placement. What that will also give me is better pay.

The characteristics that have helped me since I've been in the Navy have been discipline when it comes to studying, when it comes to performing my job in a professional manner, leadership, a drive to succeed.

JOB/CAREER: Travel in the Navy

One of the great rewards on a ship is when you pull into a foreign port and you get to go on what's called liberty. You get to go out in town in a foreign port and meet a lot of incredibly interesting people and do fun things. My favorite port city is Hong Kong. Hong Kong is an incredible city. The malls are interconnected from the different buildings with crosswalks over the streets, very high tech. When I was stationed in the Philippines virtually everybody there enjoyed it. Very friendly people, a lot of fun things to do. The Philippines is very close to a tropical paradise.

The Navy has really helped me understand how the entire world is. Many people who live in the United States don't understand how it is in other countries. When you're in the Navy, you have a chance to see all that. One of the things that shocked me the most when I was in the Navy and I visited other countries was how good people in the United States really do have life. I before took it for granted that I could get in a car and drive to work, that I could go to a grocery store and buy everything I needed at one or two stores.

Since I've been in the Navy, I've been in Japan, Philippines, Indonesia, Hong Kong, Singapore, Bahrain, Saudi Arabia, Kuwait, Africa, just thinking of a few.

JOB/CAREER: Military Operations

When I was stationed over in the Philippines we had a coup and it was very tense time because at one point they thought the President had been overthrown and everybody was locked and loaded on the base that we were at. My background is actually special warfare.

That's Special Forces--as a technician to support the SEALs and Special Boat units. My first command that I was stationed with after I got out of Electronics Technician A School was SEAL delivery vehicle team one. At that command we maintained the SEAL delivery vehicles that the SEALs used. The other special warfare command I was at was Special Boat Unit 22 in Louisiana, which is a riverine warfare unit. I was in charge of communications and repair of the radios. When I was in California, I was at Special Warfare Group 1 at a mobile communications team. The mobile communications team, I was both an operator and a technician. We at a moment's notice would be required to fly in a plane anywhere in the world and provide communications to the Special Forces. [For example,] I went to the Middle East.