**Educators Learn STEM Skills at Teachers Institure on Wireless Technology**

All Hams have a story about how they were first introduced to amateur radio. For some it is a family tradition handed down from generation to generation. For others their interest in radio began in the military or a first responder service. For me, and lots of first generation Hams, I was first introduction to amateur radio by one of my teachers. My high school chemistry & physics teacher, Ed Hohenbrink (N8IZL) invited a small group of us to his shack to check out his station. Mr. Hohenbrink’s radio was set up to for CW, which seemed like a completely different language. The radios and equipment looked really cool, but I could never imagine myself learning the code. It wasn’t until years later, after I had been teaching for more than a decade, that I was reintroduced to Ham radio. A STEM program called Drones in Schools has been taking off in Ohio and is spreading to other states. One of the requirements for schools to participate is that the teacher or coach has to be licensed to use the amateur radio frequencies. This is due to the fact that several of the frequencies used for the video link with the drone to the first person view (FPV) goggles transmit in the Ham bands (5650 - 5925 MHz). I ordered a copy of the Technician’s manual and began studying for the test. Through the process of studying, I learned about all of the fascinating fascets of the hobby, and my interest expanded beyond the drone progam. In late December of 2019 I passed and on January 2, 2020 I received my initial call sign KE8NRO.

Recently I travelled to the Amateur Radio Relay League (ARRL) Headquarters in Newington, Ct. I was selected to participate in the Teachers Institute on Wireless Technology (TI). This professional development opportunity for educators, is a technology focused, week long course on electronics and radio communications. TI is ideal for STEM teachers looking to update their knowledge and collaborate with colleagues from around the country. This group had participants from 11 different states. There are three sessions of TI 2022 with class sizes capped at 12. The goal of Steve Goodgame (K5ATA), Education and Learning Manager at ARRL, is to increase the number of TI sessions to 20 in 2023. Entry to TI is competitive and all teachers k-12 & professors at community colleges & technical schools are encouraged to apply. All expenses are paid by ARRL and participants are given a significant package of supplies & books worth hundreds of dollars to use in their classrooms. Cost are covered by donations to ARRL to promote amateur radio. Several of the participants are Amateur Radio Enthusiasts but it is not required to be a practicing Ham to qualify for TI. ARRL offered participants the opportunity to take the test to obtain their Technician’s license or upgrade to the General or Amateur Extra classes and waived the testing fee. Six of us obtained or upgraded our licenses. Three others already had their Amateur Extra license.

The TI instructor was Larry Kendall (K6NDL). He is a veteran middle school STEM teacher from California who truly has been there and done that when it comes to technology education. Often in technology education, it feels like you are constantly trying to learn the next new thing, and just trying to stay one step ahead of our students. TI was an opportunity to take a deep breath and a deep dive in to the fundamentals like electronic components and the next big thing, like coding an ESP32 with Thonny. Larry taught us how to solder a radio receiver “the right way!” I understand there are other TI instructors, but Larry comes highly recommended.

I have been teaching grades 8-12 at Patrick Henry Local School in Hamler, Ohio for 20 years, where I have a dual program teaching Engineering Technology and Vocational Horticulture. I utilize radio communications in my Horticulture classes in order to help manage outdoor labs where students are studying conditions of the Turf & Landscaping on the school grounds. For this application I applied for a GMRS (WRPG642) license and purchased 10 radios for students to practice operating. My Robotics class utilizes radio controls for their robotics projects and students study electronic components and build a power supply in my manufacturing class. Topics like circuit design, soldering, multimeter & oscilloscope use, and coding are the types of skills covered at TI that I will use in my classes. Currently I have one student, KE8TKD, who has passed his Technician’s test and more who are interested.

Several years ago I started the Technology Club for my students to work on robotics, 3D printing, drones and socialization. The club meets every Wednesday, and it is normal to have two dozen students actively engaged in all sorts of technology related activities. This year we will be adopting the ARRL sample constitution and electing officers so that we can apply for ARRL affiliation. This will allow us to apply for a school station grant and participate in the School Club Roundups and other on the air youth activities.

During TI, we had the pleasure of meeting David Minster (NA2AA), CEO of ARRL. He shared his journey into amateur radio, which (spoiler alert) involved a teacher. He still has a radio transmitter he built under the supervision of his teacher and several books he was reading on the topic of radio technology at the time. One idea I took away from our time with NA2AA that I plan to try to implement, was likey just an afterthought from Mr. Minster. He mentioned that his teacher had convinced the school to allow him to teach a class on amateur radio for credit. This was offered after regular school hours to students who were interested in learning about radio technology and in preparing for the licensing exam. I am planning to suggest this type of class offering with my school. I am fairly confident that if I can show interest from students, that I can convince my administration to approve the of class.

While at ARRL headquarters, several of the licensed teachers were able to get on the air and work W1AW. I did not know that W1AW is open to any licensed amateur operator (preferably an ARRL member) every day from 10-noon and 1-3:45 M-F. Several amateurs including my local radio club (W9OU) President (W9GOO) & Vice President (KB9QG) answered my CQ call. The legendary station honors Hiram Percy Maxim, the founder of the ARRL, who’s callsign was 1AW. The radio station was built in 1938, but it’s contents are far from antique. W1AW can accommodate up to 9 operators simultaneously on every band and mode available to radio amateurs. I made my contacts on 40m single side band phone, and also made DX contacts using FT8. If you are planning a trip to Newinton, I would definitely recommend taking the time to get on the air. W1AW Station Manager, Joseph Carcia (NJ1Q) or one of his many volunteers will help get you up and running on one of the many fine transceivers in their inventory.

TI was a fun and exciting program. I left with all of my expectations thoroughly exceeded and my batteries fully charred and ready to start the next school year. I passed my Amateur Extra exam and worked W1AW on the same day. My head was thoroughly in the clouds. I would definitely recommend this professional development event to any STEM teacher. If you are a teacher interested in applying to TI check out the website. <http://www.arrl.org/teachers-institute-on-wireless-technology>.

You never know how a seed planted by a teacher can influence a child even after the passing of a generation.

73 de XX8GO (I have applied for a new vanity callsign. It should be processed by July 23)