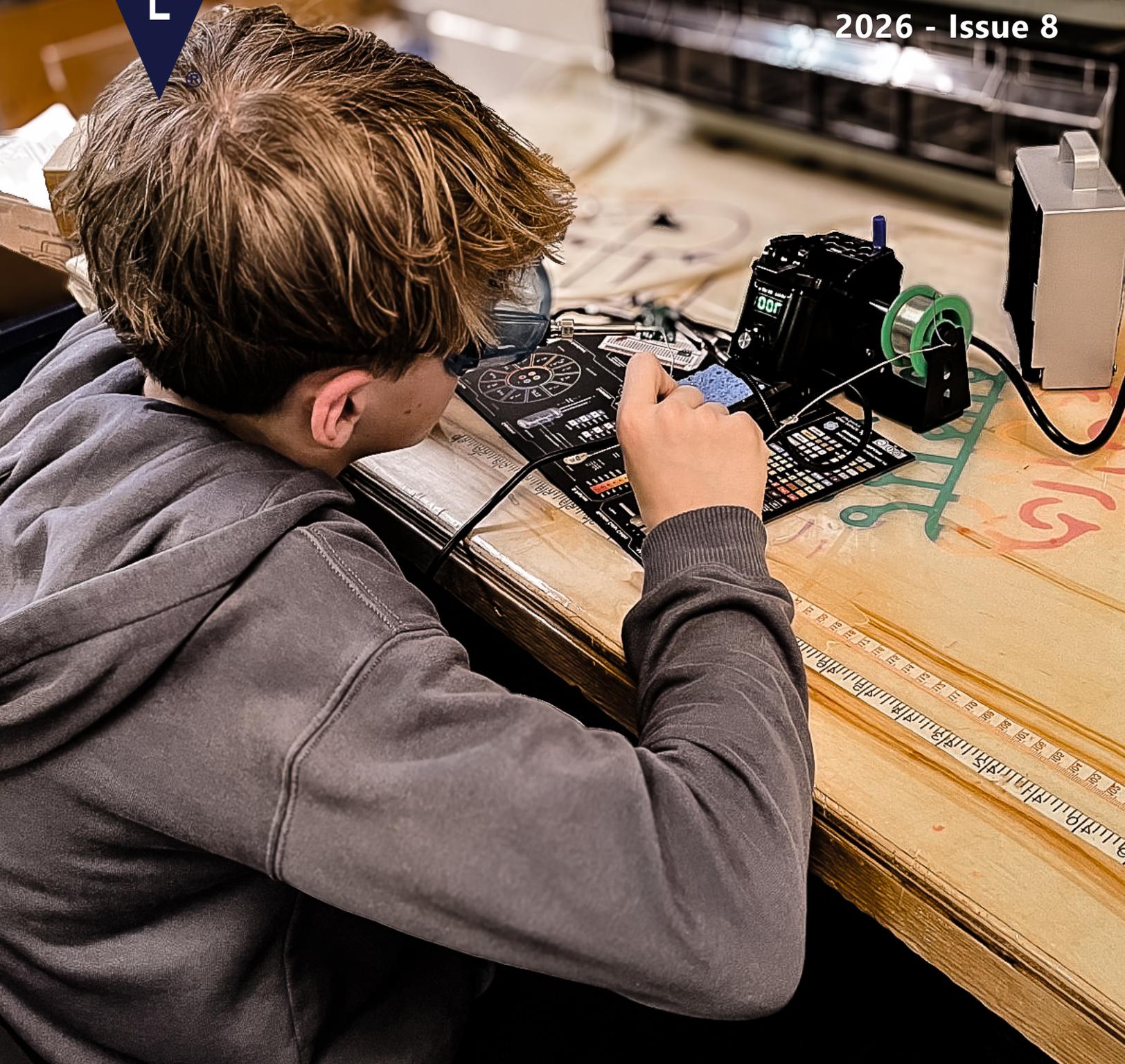


RADIO WAVES

News you can use for license instruction
and radio science education
2026 - Issue 8



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Submitted by Gordon West, WB6NOA

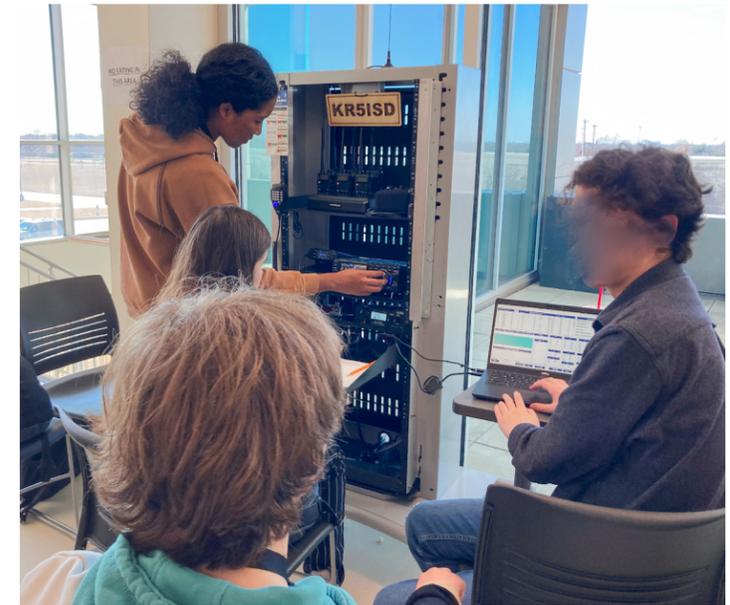


Randolph School ARC, KR4ND, students after unboxing and initial station setup (above).

Middle school students practicing basic soldering skills (left and bottom of page 1)

Education & Technology Program (ETP) 2025 Grant Recipient Showcase

We share these grant progress reports in our newsletter to inspire educators. We encourage them to try to incorporate amateur radio and wireless technology into their STEM (Science Technology Engineering and Mathematics) classrooms, clubs, and curricula. The academic benefit and student enthusiasm generated from these grant projects are easy to see from these reports. Below are 2025 ETP School Station Grant and Progress Grant recipient reports outlining the status of current projects. Applications were accepted last fall, and the recipients were shipped their materials in the winter.



During Spring 2026 School Club Roundup, students worked together to make and log contacts with the KR5ISD portable station with ZUMspot and power supply. (above).

The ETP School Station Grant is awarded to schools that provide a detailed plan to use amateur radio as part of a school enrichment program or club and/or as part of classroom learning. The ETP Progress Grant is intended for teachers who are already using amateur radio in their classrooms, as well as for teachers who need resources to facilitate teaching wireless technology and electronics topics as part of a longer-range plan to incorporate amateur radio. To find out more about this annual grant cycle held



Grantee: Scott Valenta, W9DU

Our project was all about making ham radio more accessible in my classroom. So far, our project has done exactly that. Our classroom now has a power supply connected to our G90 (no more interruptions to stop and charge the battery), and our new DigiPi ensures that students can operate without even getting up from their seat. Our *On the Air Special Edition* and Band Chart allow an easy introduction to operations. Our goal is that, during the 2026 – 2027 school year and onward, both license pass rates and post-graduation license use will increase.

Grantee: Jackie Blumer, KC9LEH

We are hitting the ground running for Spring 2026 with the arrival of our new pico balloon supplies! Students are currently exploring high-altitude flight through collaborative research and class discussions. This foundational phase is building excitement for the upcoming assembly and testing of our tracking equipment. We look forward to our spring launches, where students will take the lead in deploying and tracking real-time atmospheric data. Our goal is to achieve successful launches while building student proficiency in wireless technology and data analysis. Ultimately, we aim to inspire a new generation of hams, sparking a measurable increase in students pursuing their amateur radio licenses.

Grantee: Zoe Rodriguez, KE9ENO

My project aims to integrate amateur radio into my 7th and 8th grade STEAM curriculum by connecting hands-on activities to classroom content. Seventh graders will simulate a fox hunt (or in our case, a rover hunt), inspired by our novel study, *A Rover's Story*, to practice radio direction finding, while eighth graders are learning soldering and will explore radio

wave basics to enhance their physics-focused curriculum. This grant provided the necessary equipment to bring these real-world experiences to the classroom. The 7th grade will complete their project in April/May to take advantage of the warming weather, with the goal of sparking interest in radio art. The 8th grade will complete their unit this month, acquiring basic soldering skills and a better understanding of radio waves to support their education and interests in high school.

Grantee: Cunzhi (Francis) Zhao, PhD

We plan to set up the shortwave HF station for the Ham Radio Club and begin demonstrating the equipment during E-Week. This will provide students with hands-on exposure to real-world communication systems and highlight the practical applications of radio technology in emergency response, public service, and engineering practice. Our objective is to attract more students to join the Ham Radio Club, support them in obtaining their amateur radio licenses, and improve the overall exam pass rate. We also hope this initiative will strengthen student engagement in STEM activities and create opportunities for interdisciplinary collaboration across campus.

Grantee: Brian Casey, KC1OOH

We were honored to receive the grant for equipment to get our station up and running (Swampscott High School Amateur Radio Club, N1SHS). We had antennas donated already, but we didn't have transceivers; fortunately, the grant provided us with an HF transceiver, a VHF/UHF transceiver, and a suitable power supply. With our setup, the students have made lots of US contacts and a few fun DX QSO's to Europe and South America. We also had our first ISS repeater contact. They have also gotten a bit of the contesting bug

after a couple of operating sessions for the ARRL School Club Roundup.

As we look forward to the growth of the club, we are in the process of setting up Technician license classes for the students and hope to be ready for the test in May. The club members are already talking about antenna upgrades to get more DX and satellite contacts.

Grantee: Dr. Philip Taylor, KT4AY

Members of the Randolph School ARC, KR4ND, were excited to get started and assembled our station with the new transceiver, power supply, and automatic antenna tuner. So far, we have made contacts in several US states and across Canada and Central and South America. Some students have recently gotten interested in CW and have been monitoring live QSOs during meetings and study halls. These hands-on sessions have provided fun inspiration for several members to begin preparing for their license upgrades, and we've had a lot of guest students tag along to the new shack with members. For the remainder of the school year, we will continue to meet after school and work towards getting students licensed and upgraded. We are very grateful for the support of the ARRL and EPT Grant program!

Grantee: Marisela Lujan Coble

This year we launched our Radio and Electronics class. Students learned essential radio communication skills, including proper procedures and the phonetic alphabet for clear transmissions. They used directional antennas to track signals and explored how radio waves travel through the air. Students also built foundational electronics knowl-

edge by working with resistors, LEDs, capacitors, and basic circuits. Through safe soldering practice, they constructed hands-on projects such as an electronic bug, a light-up fidget spinner, and a basic radio. Students are learning to set up antennas and operate radios, and they participated in the ARRL School Club Roundup in February, where they listened to other schools and tried to make contacts. The knowledge gained from the ARRL Teacher Institute is being implemented in our classroom, helping students build problem-solving skills, confidence, and excitement for technology.

Grantee: Joe Betterton, KQ4WAY

The Hartselle Tigers Amateur Radio Club (KR4GJH) at Hartselle High School, Hartselle, AL, received the Icom IC-7300, power supply, and desk mic from the grant in mid-January of this year. The students and club members were amazed at the capabilities of the 7300, particularly the internal tuner — no more dialing around the old B&W manual tuner — and the waterfall, which took a bit of explaining but was big hit with the kids. In fact, the 7300 has been dubbed "The Cool Radio" by the younger kids in our club. Before this, we had been using an older Icom IC-735 with a cracked display that was donated by a local Elmer, Rudy, K2MMX, and I had brought in an older TEN-TEC Omni D I had in my garage. While the older radios still work fine and are useful for teaching students the basics, the Icom IC-7300 allows the students to quickly tune, switch bands, and locate stations with the waterfall. The result has been an increase in the number of QSO's after our weekly meetings, when the students take turns on the radio, and more interest from the students. We just finished participating in the February 2026 School Club Roundup, which resulted in two new members coming to our club meet-

ing and making QSOs!

We are looking forward to increasing the interest in our club, particularly among the Engineering students, and increasing the number of students attaining their ham license. We just had our first student pass his Technician license test!

Grantee: Joachim Ladwig, W9NVY

This spring, the Stars ARRC, W9BNL, will install our rooftop antenna upgrades to improve our school station's daily abilities. This semester, we are soldering various practice kits to improve our soldering and circuit board skills. One student has assembled a CW keyer Code Practice Oscillator (CPO) device and is working toward CW proficiency. We are assembling a sensor sled for inflight, rocketsonde use. Our intent is to launch a sensor suite a mile high in the Indiana sky and collect the atmospheric data for later climatological/meteorological analysis. We have just minted two new FCC Technician-class licensees, and we have two Generals preparing for testing. In addition to our routine weekend POTA® activations and daily in-school simplex "VFO Net" operations, our goal is to provide students with regular early-morning and lunchtime access to the HF bands from our school shack, made possible by the upgraded rooftop antenna system. The added excitement of frequent, hands-on HF operations is already energizing the program — student enthusiasm, after all, is the most convincing recruitment tool we have.

Looking ahead, our homebuilt atmospheric sensor sled is slated to fly aboard three rocket sondes to approximately 2,000, 3,000, and 5,000+ feet on April 19, 2026, at LDRS 44 in Pence, IN. These launches will represent the highest and most ambitious achievement in our club's history to date.

Grantee: Kay Orr

The grant equipment is enabling us to integrate ideas we learned at the TI Balloons and Amateur Radio elective session in 2025. We have started integrating a balloon launch into our engineering curriculum and amateur radio school club (KR5ISD), with students currently building the payload (tracker, solar power, soldering, antennas). We received a Zumspot (digital radio internet gateway/hotspot) to communicate with other classrooms/school clubs who are also doing balloon launches and a power supply to replace one that failed.

We hope to launch balloons this spring! We have started configuring the Zumspot and hope to communicate with other schools soon. The power supply is in use, and we recently participated in the spring 2026 ARRL School Club Roundup. An overarching goal is to grow our club and license more students, and we recently had two students earn licenses during School Club Roundup — one Technician, and one upgrade to General!

Grantee: Dustin Royer, KG5AFX

We have decided to build our station in the school library, ensuring high visibility and access for students. Our librarian, who is also a licensed amateur (Laura Manuel, KJ5LNS) has information available for curious students wandering through the library. We plan to have antennas erected and the station functional by the end of March and hope to have an open house on either April 17 or 18 for World Amateur Radio Day. The ideal final outcome of the grant project is the establishment of a school-based amateur radio and electronics club by October 2026. Once the station is on the air, we hope to have interested students licensed and able to run the station both casually and during contests.

The Club Connection: Teaching, Testing, & Club Training

A Note from ARRL National Instructor Gordon West, WB6NOA

You might be the top Technician Class instructor in the Division, with the most students and most 100% passing rates!

For many of us, a few years ago, Technician Class was an 8-week, 3-hour evening course, offering plenty of time for fun real-radio demonstrations and student third-party traffic. But today's busy students can now choose other methods and, at most, a weekend class. A weekend class? No way! Two days to teach 400+ questions — it's done all the time. With pre-study materials, at least licensees can read the book and see some explanations before the test, so the two-day class may work... to just pass the test.

Instructors are permitted to test their own students with fellow VEs, ideally on tablets, where the 35 test questions are administered in a random order, different for each student, from a VEC working with Exam.Tools software. Your ARRL VEC can assist you in offering classroom tablet

electronic testing, as well as remote testing. Remote testing is offered by an ARRL-affiliated test team, WM7X, one of the largest VE testers in the Country (See <https://arrl.org/VEC>).

You need to send each student on to higher real-radio RF education, and that involves their local club, looking to grow their dwindling membership and help new hams get on the air! Students can visit <https://arrl.org/clubs> to find a club that suits them. Bring your local clubs into your teaching sessions, and get to know the club's specialty. If most of your students live close by, start a list of clubs that may match your students' interest areas.



A table with lots of demonstration gear is always popular in the classroom. CW is a hit, too!

A new ham “needs a local, real ham who will help them get on the air with a mission that matches their interest.”

***- Gordon West,
WB6NOA***

In my class, I ask students to write down their most interesting hobby on the sign-in sheet. Then I can promote a specific club looking for more members and get those students on the air. I also contact local clubs and invite them to a “graduation party” outside the test room, and I encourage them to set up with a display to show off their club’s mission/specialty. These are excellent recruitment possibilities, with fresh new hams. I make sure these booths have a ham ambassador that will bond with a student interested in joining a specialty club. If your new licensees just want to start off with a dual band HT to sample local club nets on the air, find a club or ham ambassador of any club that can help program their HT. Then you can show them how to come in as a visitor to a club net.

- Engineers — Send them to a technical club that has on-air data and FT-8 activities.
- Police and Fire — Send them to the local ARRL ARES director.
- Students — Send them to a club that works regularly with NASA and AMSAT, and who work the ISS crossband repeater.
- Pilots — Send them to a local APRS team looking for members, ideally one that actively tracks weather balloons.

However, if you send a new ham to “try out” a local club dedicated to Work All Counties on SSB/CW Moonbounce, and all the other nets just give them a courtesy check in without a warm invite, we will lose another new ham. They need a local, real ham who will help them get on the air with a mission that matches their interest. New hams who study at home have no clue how to get on the air properly, or even how to program their new HT or mobile. Of the 100% who passed the test, we will never hear 80% of them on the air.

If the new ham gets a dual bander and the ARRL Repeater Directory, they may still need help programming their new rig, whether it be an import or a top notch rig with APRS, Bluetooth, DMR/FUSION/D-STAR/ALL-STAR... and don’t forget the repeater CTCSS/DCS, encode/decode/no code, and turning automatic offset on, none of which they learned by merely passing the test.

Remember, this year, ARRL is celebrating the “Year of the Club,” and clubs will welcome your new ham graduates with gusto! The right club will hopefully have that one ham ambassador who will have the time and patience to meet a new ham and get their HT loaded with local clubs that may match their interest. Your local ham club is the new ham’s future for higher RF education after they pass the tests, so get that club tied into your classes!



As seen in this issue of Radio Waves...

The Teachers Institute: Introduction to Wireless Technology (TI-1) is a 4-day professional development workshop where teachers will be introduced to the basics of electronic principles, radio frequency propagation, and antennas. Successful completion of TI-1 and being in possession of an active ham radio call sign are the only prerequisites to apply for any TI Elective including Balloons and Amateur Radio, Space Comms & Radio Astronomy and Remote Sensors & Data Gathering. Read all elective descriptions in our newly expanded [2026 TI Brochure](#) and apply today at arrl.org/ti

A big thank you to all those who made this edition possible.

Radio Waves aims to showcase how educators and license class instructors are getting their students and local communities involved in ham radio. These efforts deserve to be documented and shared. The contributors are teachers and instructors who are currently bringing amateur radio into the classrooms and beyond, just like you.

Many instructors and teachers made mention of materials and resources created by ARRL. Click any bullet to learn more about the item.

- [ARRL Teachers Institute](#)
- [ARRL Scholarships](#)
- [ARRL Instructor Resources](#)
- [ARRL Teaching Lesson Plans](#)

Add Your Voice: Write a short narrative about a specific teaching struggle, success, or learning breakthrough. We are seeking submissions of 300 – 500 words, and you are highly encouraged to send any pictures of yourself, your students, and the activities you introduced. Submissions can be sent to our email: radiowaves@arrl.org. Please use our [Model Release Form](#) for photos. Explore our [previous publications](#).

By submitting writing or photographs with completed model release forms, you grant ARRL permission to edit and use these materials for any publication purpose.

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