September 28, 2023

# Final Report of the Andrew Johnson Amateur Radio Club to the ARRL Foundation Club Grant Program

## **Project Summary**

The Andrew Johnson Amateur Radio Club (AJARC), located in Greeneville, Greene County, Tennessee, used the ARRL Foundation grant of \$5,750 to meet our goal of enriching the lives of Greene County Tennessee youth, their families, and the community by providing STEM classes and experiences that lead to a technician class license and creating an inviting space to explore electronics and get on the air. The grant funded instructional supplies, test equipment and an amateur radio station. Our efforts resulted in a 9-year-old girl and 4 adults getting technician class licenses and 4 more children almost ready to take the exam.

## **Executive Summary**

This project was successful because of the \$5,750 grant. It allowed the club to buy materials and equipment to help our local community to understand the science behind amateur radio. Details of the purchases are in the **Financial** section.

The project directly served 52 youths ages 8-18 years old, and 50 adults from June 2022 to August 31, 2023 through 40 STEM class sessions, events and meetups. Details in the **Accomplishments** section.

The offering of 8-week class sessions allowed us to break up the larger curriculum into two 8-week sessions. We taught a total of three 8-week sessions over the course of this grant. These sessions, which included adding a practice license exam, helped students learn what they needed to qualify for a license. (Details in **Curriculum Development** section.).

Execution of the project let the club develop new relationships in the community, including:

- Building a strong relationship with the <u>Greene County Makers</u>, a non-profit organization, which provided space for classes and meetups and contributed promotional support.
- Fostering new partnerships with the <u>Niswonger Foundation</u> and <u>Walters State Community</u> <u>College</u>. These partnerships, including the one with the Makers Space, will allow the project to continue. Details are in the **Future Work** section.

Duplication of the project is likely because of the new relationships. In addition, two clubs have expressed interest in offering similar courses. We are available for presentations and can offer the necessary paperwork so others can duplicate the STEM classes or meetups. Our project manager and instructor are willing to work with others to promote the project and the grant's benefits.

## Accomplishments

With this seed grant, the AJARC:

- Offered three 8-week courses for 20 children ages of 8 to 18 years old. Each two-hour class was created to reflect a STEM focus, using topics needed to get a technical license as a guide. Many students used multimeters, electronics kits, and amateur radio equipment for the first time. Students also could borrow books specifically on the Technician exam and related topics from the grant-funded library or from the local public library where the club had donated amateur radio books.
- Promote ARRL and its foundation by including its name in all publicity and invitations to potential students and audiences. We also mentioned the foundation during classes, meetups, and other events.
- Completed eight Electronics and Computer Club Meetups for 50 people. Participants included 10 families and 12 AJARC members. Sessions offered hands-on learning such as soldering, building robots, and programming Arduino microcontrollers.
- Funded a radio station that will give future young students more hands-on experience in STEM classes. The club also will use the station for GOTA at public events to interest the community in amateur radio. Licensed people without a radio can arrange to use the station.
- Reached 10 youths 8 to 12 years old for one Introduction to Robotics session.
- Completed an Electronics and Programming session for 4 students aged 12 to 18.
- Offered an Electricity class for 18 rising High School Juniors and Seniors through the Niswonger Foundation's <u>CareerConnect</u> Summer Experience.
- Provided students an extra opportunity to get on the air (GOTA) with a radio station and interact with many club members at Field Day. Students could hunt a fox transmitter, see a variety of radios, and hear stories.
- Staffed a booth at the AJARC-sponsored <u>Greeneville Hamfest</u> to present the program to show attendees our outreach efforts. The Hamfest gave students and their parents a popular amateur radio activity (fox hunt) to participate in.
- Executed three fox hunts where students used tape measure antennas that they constructed and hand-held radios.

Please see list of accomplishments from June 2022 through February 2023 in the "*Mid-Term Report of the Andrew Johnson Amateur Radio Club to the ARRL Foundation Club Grant Program.*"

#### March 2023

March 8 – Electronics and Computer Club Meetup – We discussed building an electronics workbench using grant-funded equipment.

March 25 – We showcased our outreach program and grant to the Lakeway Amateur Radio Club (LARC) Morristown TN. See LARC's Facebook post.

March 27 – We concluded the second 8-week STEM course which started January 9<sup>th</sup>, 2023. The course attracted 11 youths and 4 adults. We continued to hold review sessions through April leading up to the licensing exam at the Greeneville Hamfest on April 15, 2023.

#### April 2023

April 12 – Electronics and Computer Club Meetup – We held a learning to solder class using the solder stations, solder, and tools purchased by the grant. It was very popular with 23 adults and youths.

April 15 – The AJARC held its annual Greeneville Hamfest.

One adult student from the STEM classes took and passed the Technician and received her callsign KQ4HYI.

We had a booth at the Hamfest to showcase and answer questions about what we were doing with the grant. One neighboring club in Sevier County would like to do something similar in their county. This gives us a chance to coach and help them put together their own program. Our club's project manager can help seed their projects.

Finally, a fox transmitter was placed on the grounds at the Hamfest. Tape measure antennas and radios were offered to attendees to hunt the fox. This was a great opportunity to introduce radio to youth and their parents alike.

#### IN TO OUR WEEKL **GREENEVILLE TN HAMFEST** AMATEUR RADID AND ELECTRONICS S April 15", 2023 r Flea Market and Inside Vendors ed by Anthew Johnson Amateur Radio Club Pargound, 10 hispound Ro 12785 000 100 5 km STO PER PERSON, DOIL DRIVE UNDER 12 VILL OUTSIDE FLEA MARKET SPACES 55 EACH INSIDE BOOTHS/TABLES STOEACH IL SANCTIONED EVENT OPEN TO GENERAL PUBLIC AT 8 AM VETESTING RESIDENT 16 AM PUTAL BUILDING OPPOS AT THE ARE P ON PROOF APTERIADES 3 PM 18 PM

#### <u>May 2023</u>

May 10 – Electronics and Computer Club Meetup – We taught a class on how to use fritzing, a free and opensource computer program that can prototype an electronic circuit, schematic capture, and layout a printed circuit board (PCB). We breadboarded a simple counter with LED lights in this project. Two youths from our STEM classes soldered their kits successfully on their own.







May 25 – The Lakeway ARC in Morristown, TN, offered a licensing exam. Two students, father and daughter, from the STEM class, really knuckled down and studied and passed their technician exams (KQ4IVQ and KQ4IVR). The student's surprise and enthusiasm was captured by her mother in a video that the club and ARRL shared on Facebook and Twitter. As of August 18, 2023, the video has been viewed over 16.5 thousand times on Facebook.

#### June 2023

June 14 – Electronics and Computer Club Meetup – We taught how to control servomotors with an Arduino. The purpose of this class was to set up future meetups where participants build a project using servomotors.

June 17 – An adult student from the Electronics Meetup's passed (KQ4JPV) at the Tri-Cities (Johnson City, TN) exam session.

June 24-25 – At the AJARC field day, we set up a GOTA station. It was a great opportunity for youngsters (and adults) from our STEM class. We also gained new students for our class in July. We had 6 under 18 participate. They also spoke with club members and saw a variety of radios and observed some work on radios being repaired.

A fox transmitter was hidden in the park where we set

up our field day station. Tape measure antennas and radios were offered to attendees to hunt the fox. Again, another great activity that introduces potential students to the magic of radio.

#### <u>July 2023</u>

July 6 – We began our third 8-week STEM course with 10 children, 5 returning students.

July 16 – Electronics and Computer Club Meetup – Participants could choose a servomotor project (6axis robot arm, 2-axis pan-and-tilt, and Skittles color sorter). Each project lacked detailed instructions, so the participants had to reason through how to assemble and program the projects. Mentors were assigned to each group to assist. It was a great opportunity for everyone.

July 19 – We taught 18 rising High school Juniors and Senior about Electricity for the Niswonger Foundation's <u>CareerConnect</u> Summer Experience. CareerConnect in partnership with Greeneville City and Greene County schools, is a program designed to provide students with the opportunity to explore career opportunities and gain real-world work experience.



Screen capture 2023-08-18



#### August 2023

Aug. 9 - Electronics and Computer Club Meetup – This session saw participants continue working on their servomotor projects.

Aug. 31 - We completed the third 8-week STEM course. At the last 2-hour class, we gave a practice exam and reviewed each question. It was a good opportunity to introduce the students to the exam and to learn from the missed questions.

## **Curriculum Development**

A fundamental part of the grant program was to establish a reusable curriculum. The philosophy behind curriculum development was to create a STEM learning experience using the technician license as a guide. The goal was to create a cohesive set of topics that build on one another by grouping the questions from the pool.

We categorized the 411 exam questions in the pool. Then we structured the course to reflect this breakdown:

Category	Number of questions	Percentage
Electricity/Electronics	111	27%
Radio	98	24%
<b>Operating Procedures</b>	118	29%
<b>Rules and Regulations</b>	52	13%
Safety	32	8%

There are two possible flows of instruction. The first flow is a top-down approach. The course begins with instruction covering operating procedures, rules and regulations. That material can answer the question "what is amateur radio?" and leads into the technical side of amateur radio. The second flow starts with the technical aspects such as electricity, electronics, and propagation. Then the material leads into operating procedures, rules and regulations, and ends with safety.

Classes were 2 hours with a 20-minute break. They were offered for 8 weeks during the early afternoon during the week. We followed the first flow in the first round. We discovered we could not cover all of the material. We used the second flow in the next 8-week course, revisiting some of the material. This method will work well as we can alternate sessions throughout the year and students can retake sessions to bolster their knowledge.

After each class session, we gave handouts and exam questions that were pertinent to the lesson taught. This way students are learning and studying in small sections at a time so that they will not be overwhelmed.

A key element to the students' success is that they must study between classes. Classes consisted of children with their parents, with parents participating in the class. Having parents encourage their children is also key to passing the technician license exam.

## **Example Lesson**

One lesson, **Build a Battery from a Lemon**, illustrated the flow of our philosophy. The lesson starts with a battery to introduce electricity and the fact that batteries are chemical devices. We use historical elements to help students remember concepts such as current (Andre-Marie Ampere). The lesson had students build their own batteries from the lemons and use multimeters to measure values (voltage, current, and resistance) as a hands-on exercise. We continue with ohm's law and end with explanation of power. This lesson covers numerous questions in the Electricity/Electronics category.

## Impact

Our project has positively impacted our local community as attested by the Testimonials in our Mid-Term and this Final report. The parents of the families have expressed their appreciation for the STEM classes. Several of the children are very excited to gain their amateur license. There are a lot of smiles on their faces during activities such as the fox hunt and robotics class.

The grant also provided the project manager with the opportunity to discuss the reasons why STEM efforts benefit amateur radio. Although the club discussed and approved the submitted proposal, we learned that more discussion was needed as grant funds were allocated. Some members believed purchases needed to directly benefit current club members instead of focusing on a long-term advantage of recruiting youth and other potential amateur radio enthusiasts. Healthy discussions soon let the program spending continue. It also led to reviving our dormant club education committee. Course observers often took a more active role during hands-on activities. Clearly, these Greeneville members represent other enthusiasts. This is an opportunity for more discussions and articles in ARRL events and publications. The debate clarifies why the foundation's grant needs to continue to appear on (or near) the radio station and the purchased equipment. Such signage serves as a reminder of the link between STEM education and producing holders of amateur radio licenses.

What has surprised us is that there are two families that live one hour away that are attending our robotics classes. These parents have said they will attend any classes we put together. This is another confirmation that what are doing is making an impact in our rural area.

Through our work this past year the project manager has developed 7 mentors, 6 of which are members of AJARC.

Our work is only beginning...

## **Future Work**

At this point, we have four children who are close to passing the technician license exam. They do need to study more. We are planning to hold review sessions in October and provide support to help them pass the exam.

The last item on our list of things to do for the grant is to install the amateur radio station at the Greene County Makers. The radio, power supply, coax, and antenna were purchased in June. However, volunteer schedules meant that the club will finish the station this fall.

The grant also has opened doors for AJARC and neighboring clubs. We have two neighboring clubs, Lakeway ARC in Hamblen County, and the American Legion ARC in Sevier County that have expressed interest in starting classes using our grant curriculum as a model. This means the club needs to create written documents such as a course syllabus, required equipment, a model for replicating instruction that includes the ideal number of people, and guidelines for hands-on modules. We, of course, are available to coach and make presentations.

#### Greene County Makers

We will continue partnering with Greene County Makers to teach STEM courses and hold Electronics and Computer Meetups to lead to amateur radio licenses. We are planning to add "exploring radio technology" weekly meetings in October.

#### Walters State Community College

We look forward to partnering with <u>Walters State Community College</u>. We are slated to teach a class on radio technology for its <u>Talented and Gifted Program 2024</u> in January 2024. Enrolment information is available at: <u>https://ws.edu/\_resources/pdfs/workforce/youth/tag/tag-packet-2024.pdf</u>

The college designed this instructional program to provide enrichment activities geared toward gifted students in the upper East Tennessee area. We will offer the STEM focus.

Now in its 42nd year, T.A.G. 2024 – with a projected enrollment of 500 from 13 area public school systems, private schools and home school cooperatives – consists of approximately 35 programs that are offered multiple times designed to stimulate and challenge East Tennessee's gifted students from the fifth, sixth, seventh and eighth grades.

#### **Niswonger Foundation**

The <u>Niswonger Foundation</u> was established in 2001 to make a positive and sustainable difference in education in Northeast Tennessee.

As mentioned in our **Accomplishments** section, we taught a class on electricity in July for its Summer Experience program which is part of its <u>CareerConnect</u> Program.

We will continue to work with the Niswonger Foundation for its <u>STEM.LD</u> grant to bring radio technology as a STEM activity to partner rural schools.

The major components of this STEM.ID grant are: 1) strengthening the teaching/learning classroom experiences with engaging materials for students and professional development of teachers; 2) offering experiential out-of-school time opportunities to explore STEM content; and 3) expanding participation in rigorous STEM and dual enrollment courses.

## Financials

The grant enabled the club to buy equipment and supplies. All equipment is stored at the Makers Space. Here is a list of items purchased.

Activity	Order Date	Item	Vendor	Qty	Unit Price	Tax (9.75%)	Total
Classroom							
	6/8/2022	Elenco Snap Circuits Jr. SC-100 Electronics Exploration Kit	Amazon	1	\$ 20.99	\$ 2.05	\$ 23.04
	6/8/2022	Snap Circuits Pro SC-500 Electronics Exploration Kit	Amazon	1	\$ 68.74	\$ 6.70	\$ 75.44
	6/8/2022	The ABRI Operating Manual	Amazon	1	\$ 24.95	\$ 2.43	\$ 27.38
	6/10/2022	ARRI Ham Radio License Manual 5th Edition (Softcover)	ARRI	2	\$ 32.95	\$ -	\$ 65.90
	6/10/2022	ARRI Shinning	ARRI	1	\$ 10.50	¢ ¢	\$ 10.50
	6/13/2022	22 Pack Dry Frase Lanboards	Amazon	1	\$ 16.00	\$ 158	\$ 51.57
	6/12/2022	Sharpin 22478 Elin Chart Markers, Bullet Tin, Colors may yany, 8 Count, Colors may yany (Box)	Amazon	1	\$ 40.99	\$ 0.07	\$ 10.06
	6/13/2022	Sharple 22478 Filp Chart Markers, Bullet Filp, Colors may vary, 6-Count, Colors may vary (Box)	Amazon	1	\$ 9.99 ¢ 18.00	\$ 0.97 ¢ 1.95	\$ 10.90
	0/13/2022	Extern - 045018 MiNSS Digital With Midle Meter	Amazon	1	\$ 10.99	\$ 1.6J	\$ 20.04
	6/13/2022	EXPO Low Odor Dry Erase Markers, Chisei Tip, Assorted Colors, 12 Count	Amazon	1	\$ 8.97	\$ 0.87	\$ 9.84
	6/13/2022	Texas Instruments TI-30Xa Scientific Calculator	Amazon	1	\$ 10.82	\$ 1.05	\$ 11.87
	6/13/2022	DARKBEAM Multimeter lest meter Leads with Banana Plug	Amazon	1	\$ 8.99	\$ 0.88	\$ 9.87
	6/13/2022	Post-it Super Sticky Portable Tabletop Easel Pad w/Dry Erase Panel, 20x23 inches, 20 sheets, 2 pads	Amazon	1	\$ 51.74	\$ 5.04	\$ 56.78
	6/19/2022	Ham Radio For Dummies	Amazon	1	\$ 19.89	\$ 1.94	\$ 21.83
	6/29/2022	ARRL Ham Radio License Manual 5th Edition (Softcover) [Coupon Special]	ARRL	4	\$ 23.07	\$ -	\$ 92.28
	6/29/2022	ARRL Shipping	ARRL	1	\$ 10.50	\$ -	\$ 10.50
	7/13/2022	Amazon Basics Low-Odor Chisel Tip Dry Erase White Board Marker, Assorted Colors -Pack of 12	Amazon	1	\$ 7.13	\$ 0.70	\$ 7.83
	7/20/2022	Science Kits Electronic Physics Experiments : Elementary Magnet Electricity Electromagnetism	Amazon	1	\$ 33.29	\$ 3.25	\$ 36.54
	7/22/2022	(2" x 4") 30 Sheets, Printable White Sticker Labels, Laser/Inkjet Printing - Matte, 10 per Page	Amazon	1	\$ 6.59	\$ 0.64	\$ 7.23
	7/22/2022	Crayola Ultra Clean Washable Markers For School, Back To School Gifts For Kids, 40Classic Colors	Amazon	1	\$ 13.44	\$ 1.31	\$ 14.75
	7/22/2022	HORLIMER 9x6x4 inches Shipping Boxes Set of 25, White Corrugated Cardboard Box	Amazon	1	\$ 28.99	\$ 2.83	\$ 31.82
	9/23/2022	Calculator	Staples	2	\$ 8.92	\$ 0.87	\$ 9.79
	12/17/2022	SMA Dummy Loads. SMA barrel connectors	Amazon	1	\$ 34.87	\$ 3.40	\$ 38.27
	12/17/2022	Snap Circuits Extreme SC-750 Electronics Exploration Kit	Amazon	1	\$ 94.49	\$ 9.21	\$ 103.70
	12/30/2022	3-Ring Rinders	Amazon	1	\$ 27.77	\$ 2.71	\$ 30.48
	12/30/2022	Post-it Suner Sticky Portable Tableton Facel Pad w/Dry Frace Panel 20v23 inches 20 sheets 2 nads	Amazon	1	\$ 53.05	\$ 5.17	\$ 58.22
	1/16/2022	ADDI. Ham Padia Liconco Manual Eth Edition	Amazon	2	\$ 53.05 ¢ 59.20	¢ 5.17	¢ 62.00
	2/10/2023	AKKL Halli Kaulo License Malidai Sul Edition	Amazon	2	\$ 58.50	\$ 5.06	\$ 03.96 ¢ 427.04
	3/10/2023	Ontario Furniture 4 Foot Folding Utility Table - 48 X 24	Amazon	6	\$ 72.99	Ş -	\$ 437.94
	6/13/2023	Post-It Super Sticky Portable Tabletop Easel Pad	Amazon	2	\$ 57.02	Ş -	\$ 114.04
	6/13/2023	Snap Circuits Pro SC-500	Amazon	3	\$ 85.99	Ş -	\$ 257.97
	6/18/2023	ARRL Ham Radio License Manual 5th Edition	Amazon	1	\$ 29.66	Ş -	\$ 29.66
	6/26/2023	ARRL Ham Radio License Manual 5th Edition	Amazon	3	\$ 29.66	\$ 8.67	\$ 97.65
	6/26/2023	Texas Instruments TI-30Xa Calculator	Amazon	3	\$ 10.82	\$ 3.15	\$ 35.61
	8/15/2023	Snap Circuits Pro SC-500	Amazon	1	\$ 85.99	\$ 8.38	\$ 94.37
						Total	\$1,968.47
Fox Hunt							
	8/12/2022	Kaunosta SMA Cable 6.5ft SMA Male to SMA Male RF Coaxial Extension Cable RG316	Amazon	2	\$ 16.38	\$ 1.60	\$ 17.98
	8/17/2022	Hose clamps, PVC Tee, Cross, Cap, Pipe (10-feet)	Lowe's	1	\$ 51.25	\$ 5.00	\$ 56.25
	8/21/2022	Hose Clamps, PVC Cross, Cap, Tee	Lowe's	1	\$ 41.56	\$ 4.05	\$ 45.61
	8/21/2022	Tape Measure. 1-inch	Harbor Freight	2	\$ 3.98	\$ 0.39	\$ 4.37
	9/7/2022	Byonics MicroFox 15 USB Combo	Byonics	1	\$ 105.00	\$ -	\$ 105.00
	9/7/2022	Byonics Shipping	Byonics	1	\$ 10.00	\$ -	\$ 10.00
	9/10/2022	SMA Male to Female RE Coaxial DC Attenuator 3 Pcs DC-6 0GHz 500 Constant Attenuation (30dh)	Amazon	1	\$ 20.33	\$ 1.98	\$ 22.31
	5, 10, 2022		741102011	-	¢ 20.00	Total	\$ 261 52
Workbench						rotai	Ş 201.52
WORDERCH	0/10/2022	Pack Safaty Classes in 7 Colors (Bulk Pack of 24+4)	Amazon	1	¢ 21 E0	¢ 2.11	¢ 22.70
	5/15/2022	Fack Salety Glasses III 7 Colors (Bulk Fack Of 2474)	Amazon	1	\$ 21.39	\$ 2.11	\$ 23.70
	12/1//2022	Large Silicon Soldering Mat	Amazon	1	\$ 26.99	\$ 2.63	\$ 29.62
	12/24/2022	Sponges for soldering, 20 pack	Amazon	1	\$ 8.99	\$ 0.88	\$ 9.87
	3/8/2023	SUXXAN 71" Tall Metal Tool Storage Cabinet	Amazon	1	\$ 169.99	Ş -	\$ 169.99
	3/8/2023	Shipping and Handling on order: 114-1948679-4847468	Amazon	1	\$    79.99	Ş -	Ş 79.99
	3/8/2023	Extech - 645618 MN35 Digital Mini MultiMeter	Amazon	4	\$ 20.99	\$ -	\$ 83.96
	3/8/2023	Shipping and Handling on order: 114-7955615-6573867	Amazon	1	\$ 5.99	\$ -	\$ 5.99
	3/10/2023	DC Power Supply Variable	Amazon	2	\$ 49.99	\$ -	\$ 99.98
	3/10/2023	Kester 331 Organic Core Solder 63/37	Amazon	1	\$ 34.99	\$-	\$ 34.99
	3/10/2023	Shipping and Handling on order: 113-9409180-2042655	Amazon	1	\$ 5.99	\$-	\$ 5.99
	3/11/2023	Weller Digital Solder Station - WE1010NA	Amazon	5	\$ 104.99	\$ -	\$ 524.95
	3/13/2023	Fedmax Work Bench - 61"	Amazon	1	\$ 299.99	\$-	\$ 299.99
	3/13/2023	Hi-Spec 39pc Electronics Repair Tool Kit	Amazon	5	\$ 39.99	\$ -	\$ 199.95
	6/18/2023	Tekpower Analog Display TP30SWI 30 Amp DC 13.8V Switching Power Supply	Amazon	1	\$ 109.99	s -	\$ 109.99
	6/18/2022	Siglent Technologies SDS1202X-F 200 MHz Digital Oscilloscone 2 Channels	Amazon	1	\$ 379.00	\$ -	\$ 379.00
	3/ 10/ 2023	Spent reaningles sourcer e zoo mine orgital oscinoscope z channels		-	÷ 375.00	Total	\$2 057 OF
Padic Statis						Total	J 2,037.35
Nauro Statio	6/12/2022	Alaba 75ft BCSu Caay Cable with BI 250c Attached	Am2707	r	ć 70.05	ć	¢ 100.00
	0/15/2023	Aipina = 75it Nool Codx Cable With PL2595 Attached	AIIId200	2	> /9.95	ې - د	\$ 102.05
	6/14/2023	Kadiowavz DX80 UCF Dipole	GigaParts	1	\$ 103.95	> -	\$ 103.95
	6/13/2023	Yaesu FI-991A All Mode Transceiver	MIC	1	\$ 1,244.00	Ş -	\$1,244.00
						Total	\$ <b>1,507.85</b>
							1
						Grand	\$5,795.79

#### **Testimonials**

For list of testimonials from the June 2022 to March 2023 period, please see "Mid-Term Report of the Andrew Johnson Amateur Radio Club to the ARRL Foundation Club Grant Program."

**Greene County Makers** 310 S. Cutler St Greeneville, TN 37743 To Whom it may concern, With the completion of the grant, I wanted to take a moment to talk about the positive impact the AARL has had on our community beyond successfully running two eight week courses and having a number of successful licensees passing tests. We developed a monthly electronics enthusiast club, with a good number of youths attending alongside seasoned professionals. These professionals have taken to a role of mentorship, with each class pairing experience and inexperience into various workshops exploring hardware and software engineering. Additionally, a small introduction to robotics course was given, consisting entirely of youth. Our space welcomes both, and am proud to be in a position to provide the secure space to encourage continued personal growth, and to spark further interest in the children. The availability of the equipment made possible by your grant has been invaluable in teaching various electronics basics such as soldering, continuity, current, waveforms, and everything in between. It has been our pleasure to partner with AJARC to spread this love of HAM and electronics in general, and we look forward to harnessing the momentum created by this program into extended programming. We have many future plans for a continued partnership. Antennas are to be erected, a permanent transceiver to be hosted, allowing the newly licensed operators a place to participate on-air. We will be continuing electronics classes and clubs, and hope to offer software programming classes in between. Thank you for providing us this opportunity! Kind Regards. Peter Higgin President 423.278.8279 01 Sept 2023

FOUNDATION LEARN-RETURN "		
August 21, 2023		
To whom it may conce	m,	
In July of 2023, Steven participate in the Caree CareerConnect is a pro- development and provi	Bible conducted an activity with a group of high school students that rConnect program housed within the Niswonger Foundation. gram dedicated to creating access career exploration and soft skill des programming to support out-of-the-box learning experiences; Mr.	
Bible's activity is a per	fect example of this.	
The activity that Mr. Bi critical thinking and pro presented with a lemon definitely see a puzzlin, were able to conduct th program coordinator's j activity and the connect students who held conv concluded.	ible conducted with CareerConnect students required students to apply oblem solving skills through a different lens. When students were and wires and were told they were going to conduct electricity, you could g look on their faces. With Mr. Bible's guidance and assistance, students is experiment successfully. What I appreciated about this activity from a perspective is that Mr. Bible thoroughly explained "the way" of the tivity (literally and figuratively) of it all. Additionally, there were a few versations with Mr. Bible about how to join in his activities once camp	
Overall, this was a grea something that our stud definitely enjoyed.	it experience for our students to take part in. It was out-of-the-box and not lents were expecting, but once they were able to dive in, one they	
With Gratitude,		
Gabby Billiot Program Coordinator, 1	Viswonzer Foundation	
ground to ever constitution a		

I learned a lot thank you for your time and patience with is Jo day hatelyn (18 year old Wednesday July 19, 2023 Niswonger Foundation Summer Experience part of Career Connect Program