Garden School Amateur Radio Club Newsletter

4th Quarter - 2017-2018

Welcome to the Garden School Amateur Radio Club!! Our club was started in 2016 with some generous donations from an alumnus and in conjunction with the Hall of Science Amateur Radio Club serving as our mentors.

Scholastic News Features the Radio Club

Scholastic worked with the Garden School Amateur Radio Club back in October to do a story about our students work with helping the victims of Hurricane Maria by sending emergency messages to Puerto Rico. The article was just published in the March Edition of Scholastic MATH.

Scholastic was founded in 1920 as a single classroom magazine. Today, Scholastic books and educational materials are in tens of thousands of schools and tens of millions of homes worldwide, helping to Open a World of Possible for children across the globe. Their mission is to encourage the intellectual and personal growth of all children, beginning with literacy.

It is an honor that they choose to work with us to help showcase what students can do when they put their mind to it. The article is found to the right.

Radio to the Rescue

Teens using amateur radios sent messages to Puerto Rico after Hurricane Maria

After Hurricane Maria hit Puerto Rico in September 2017, the entire island lost power. Family and friends in the U.S. couldn't contact their loved ones in Puerto Rico using phone calls, texts, or emails.

That's when John Hale got an idea. He's a science teacher at Garden School in Queens in New York City and the faculty sponsor for K2GSG, the school's amateur radio club station. Amateur radio operators bounce radio signals from tower to tower to communicate with one another as opposed to professional radio stations you can tune in to.

Hale taught the club to send radiograms to Puerto Rico using the century-old technology. A radiogram is a short message—25 words or less—relayed by amateur radios.

It's important to Hale that his students perform community service. "Part of amateur radio is helping others," explains Hale. During disasters, amateur radio operators can be particularly helpful. Radios need very little power to send messages. This makes radios one of the best ways to communicate when the power goes out.

Amateur radio communication relies on a series of nets to move messages—through a city or around the world. A net is a group of amateur radio operators who join a specific radio channel at a set time to share messages. Nets usually meet weekly or monthly. But during emergencies like a hurricane, they meet more frequently to send messages faster. Depending on the distance, it can take a few hours or a few days for a radiogram to travel from a sender to its recipient.

People in Queens who wanted to contact family in Puerto Rico emailed their radiogram messages to K2GSG. After receiving the request, K2GSG members called into their local net. Then the message was sent from region to region down to Florida. In Miami, radio operators reached Puerto Rico via the local net. Finally, an operator in Puerto Rico living near the recipient then told the message in person. All told, K2GSG sent about 25 radiograms.

When Jasmine Petrov, 18, joined K2GSG, she had no idea she'd be able to help during a disaster such as Hurricane Maria. "I thought we were going to broadcast our own messages about sports and maybe fashion," she says. Now helping others is one of her favorite things about being in the club. "It was stunning to know that I would be able to help and affect lives positively in Puerto Rico without leaving this room," she says.

—*Jennifer Hackett*

THERE ARE **801,424** AMATEUR RADIO OPERATORS ACROSS THE U.S.

See a slideshow of K2GSG Radio Station!

Jasmine Petrov (left) and Tyler Tian send amateur radio messages from Garden School in Queens in New York City.

6 MARCH 12, 2018

FINDING DISTANCE ON A MAP

YOUR TURN

Use the map below and its scale to answer questions about sending radiograms. A map scale is a ratio that compares a measurement on a map to the real-world distance it represents. The scale on this map is 1 inch = 400 miles.

1 **A.** Using the map's scale, find the distance between the pairs of cities in the chart on the right. Then find the total distance between Queens and San Juan.

STARTING POINT	END POINT	DISTANCE
QUEENS, NY	WASHINGTON, D.C.	
WASHINGTON, D.C.	RICHMOND, VA	
RICHMOND, VA	WILMINGTON, NC	
WILMINGTON, NC	SAVANNAH, GA	
SAVANNAH, GA	MIAMI, FL	
MIAMI, FL	SAN JUAN, PR	
TOTAL DISTANCE:		

1B. An average radio tower can receive messages from up to 125 miles away. How many towers would you need to relay a message this total distance?

2 **A.** What's the distance between Garden School in Queens, New York, and San Juan, Puerto Rico, if you were to travel in a straight line?

2B. If you could place radio towers along this direct path, how many would you need?

3 A radio tower in Richmond, Virginia, can receive messages from up to 100 miles away. Could this tower receive a message from Washington, D.C.? Explain.

4 Why do you think Garden School relied on passing messages between regions to relay its radiograms?


CANADA
NEW HAMPSHIRE
VERMONT
MAINE
MASSACHUSETTS
NEW YORK
RHODE ISLAND
CONNECTICUT
PENNSYLVANIA
Queens
NEW JERSEY
Washington, D.C.
DELAWARE
MARYLAND
WEST VIRGINIA
VIRGINIA
Richmond
UNITED STATES
NORTH CAROLINA
ATLANTIC OCEAN
Wilmington
SOUTH CAROLINA
GEORGIA
Savannah
ALABAMA
FLORIDA
Gulf of Mexico
Miami
BAHAMAS
PUERTO RICO
San Juan
CUBA
DOMINICAN REPUBLIC
HAITI
VIRGIN ISLANDS
JAMAICA
Caribbean Sea
0 100 200 300 400 500 Mi
AMATEUR RADIO REGIONS
New England
Hudson
Atlantic
Roanoke
Southeastern
Local net

Garden School is Honoring Amateur Radio

First held in 2010, the Garden Gala is one of Garden School's three major fundraisers. It is a yearly event attended by all members of the Garden Community including alumni, parents, alumni parents, faculty, administration, members of the senior class and friends of the school. The Garden Gala helps support the school's mission of offering the finest education in Queens at the lowest tuition of any NYSAIS accredited, Queens independent school. This year the Gala Committee has decided to honor the work the Amateur Radio Club has done with their work with Emergency Communication and educating the public about Amateur Radio.

The Garden School Amateur Radio Club started in September of 2016 because of the vision of a member of Garden's Family, Mike Ricatto. While he was attending a meeting with the Hall of Science ARC in early 2016 he heard that they were looking for a place to put their radio station. Mike attended Garden from 1962 to 1972 and it was his memories of Garden that led him to start the talks about putting the radio station at Garden School. Once Mike sets his mind on something he sees it through to the end. The next day he was at Garden negotiating with Dr. Marotta about putting the station at Garden. There was little negotiating as Dr. Marotta loved the idea and sought out a member of the Faculty to moderate it. After a short conversation, Mr. Hale became the Trustee of the new Garden School Amateur Radio Station.

From there things started to move, at the June's Hall of Science ARC meeting, Mr. Hale and Mr. Ricatta pitched the idea to the club and the new President, Gerard Pilate, jumped on board. The next week, Jerry, Mike, and John started the work on installing the station in the Garden School Library's old Reference Room. Over the summer with Mike's drive and determination and Jerry's educational expertise, the radio station became a reality and we were on the air as K2GSG by the beginning of school in September 2016.

Once the students got involved things got more interesting. We competed in our first contest and place 14th place in the nation on our first try and 12th place on our second competition. By our third competition, we placed 4th in the nation. With this, we caught the eye of the ARRL, the national organization for amateur radio in the United States. Tom Gallagher, the CEO and Mike Lisenco, the Director of the Hudson Valley Division, called to visit our club. Mike, Jerry, and John met with Tom and Mike and discussed a collaboration between us and the ARRL for a booth at the NYC World Maker Faire. Working with our mentors, the Hall of Science ARC and the ARRL, the Garden School ARC was able to win the Editor's Choice Award for innovation, creativity, and ingenuity. This is the highest award offered at the Faire. The exhibit was on the far end of a field

dotted with hundreds of tents and tables, but that didn't deter a steady throng of enthusiastic visitors of all ages who wanted to participate in the workshop provided by the club. Members distributed free Morse Code kits and helped faire-goers assemble them at the table. For a solid eight hours on Saturday in 90 degree September sun, the Radio Club's table was surrounded with visitors waiting for a seat to assemble their kits. Wearing protective goggles and wielding soldering irons, club members mentored over 240 visitors who then assembled their own kits, taking home Morse Code keys that can transmit by sound and light. Attendance at the table was so strong that the club literally ran out of kits at the end of the first day.

A week after the Maker Faire Hurricane Maria hit and out students want to see what they could do to help out. With the help of Mr. Pilate, the Section Traffic Manager, our students were able to take messages from our community and relay them to Puerto Rico. This got the attention of Katie Honan from DNAinfo who wrote an article about our efforts and once published other news organizations took interest.

- TV & Radio Reports
    - WPIX, ABC, NY1, CBC Radio, Huffington Post, Amateur Radio Newsline, The Weather Channel,
- News Reports
    - DNAinfo, TimesLedger, New York Metro Parents, Queens Gazette, the Cut, the Week, i-D Vice, Queens Chronicle, North Greenwich Congressional Church, QST, and Scholastic News.
- Social Media
    - ARRL Facebook, YouTube, ICQ/Amateur Ham Podcast, KB6NU's Ham Radio Blog, eHam.net

It is because of all these accomplishments in just a year and a half that the Gala committee decided to honor our club. They will be honoring the three founding members of the club are Mike Ricatto, Gerard Pilate, and John Hale as well as the students who made all this happen. We look forward to seeing what the club will do in the future.

Garden School ARC Creates Garden School Traffic Net

By - John Hale, KD2LPM

The Garden Schoo ARC is joining forces with the Hall of Science ARC to help create a NTS Student TrafficNet and a Skywarn Student Net. This will be one of the first of its kind in the United States. The net will be hosted by the K2GSG station and will run 2 times a week. The nets will be open to any licensed student, school, or youth club in the area. We will be training the students to take and deliver NTS traffic using Radiograms and practice giving Skywarn reports for the NWS. Students will be trained to the the Net Control Stations, always under care of a trained adult station just in case of emergencies. Once traffic is taken by the net we will work with the students to take that traffic to the larger nets like the Big Apple. This will be a great learning experience for the students and will give them a real world application to emergency communications.

SKYWARN

Radio in the Classroom

Amateur Radio has a few goals in mind for its operators. The first is emergency communication and we have be very active in that for the past school year. The second in educating the public and trying to get more people involved and understand the function of amateur radio. We wanted to spend some time explaining what the Garden School ARC is doing for education and helping the public understand radio. Below is a list of what we are doing.

Getting our Students and the public Licensed

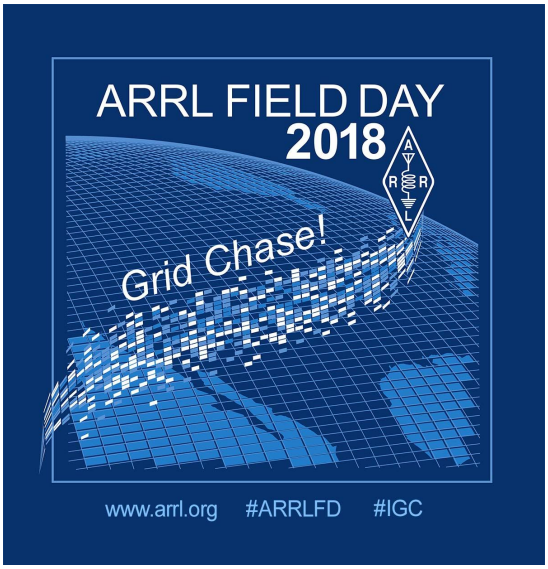
- We have been working this the Hall of Science ARC providing our students, parents, and community with radio classes to help them earn their Amateur Radio License. To date we have offer two Technicians course and 1 General course. Our classes are taught by Gerard Pilate and John Hale and we have helped the following people get their license.
    - Earned their Technician Licenses
        - 8 Students
        - 2 Teachers
        - 2 Parents
        - 11 Members of our Community
    - Earning their General License
        - 5 Students
        - 1 Teacher
        - 5 Members of our Community

In the Classroom

- The 4th, 5th, and 6th graders have spent time during the 4th quarter learning and building electrical circuits and how to send messages via Morse Code. The 4th graders have focused on transmitting and receiving the numbers while the 5th graders have focused on the alphabet. The sixth graders have been transcribing morse code, numbers and letters at 5 wpm with about half of them starting to work at 15 wpm.
- Members of the 8th grades have been hard at work building Tape-Measure Yagi's. These are directional antennas that will allow of students next year to go on Fox Hunts, learning how to find a hidden radio signal.

Field Day and Science Expo

John Hale, KD2LPM



Field Day is ham radio's open house. Every June, more than 40,000 hams throughout North America set up temporary transmitting stations in public places to demonstrate ham radio's science, skill and service to our communities and our nation. It combines public service, emergency preparedness, community outreach, and technical skills all in a single event. Field Day has been an annual event since 1933, and remains the most popular event in ham radio.

The Hall of Science ARC will be running 3 transceivers. People are welcomed to see their operations and if you like get a chance to make a contact with the help of our licensed operators.

Operating Hours of the Transceivers

- Saturday, June 23rd – 2:00 PM to 7:00 PM
- Sunday, June 24th – 10:00 AM to 2:00 PM

The Garden School ARC Science Expo will be part science fair, part county fair, and part something entirely new. The expo is an all-ages event for tech enthusiasts, crafters, educators, tinkerers, hobbyists, engineers, science clubs, authors, artists, students, and commercial exhibitors.

science expo

Some of the stations that the Garden School ARC will run are

- Learn to Solder to make LED Candles
- Demonstration of a 3D Printer
- Free Build Legos
- Program a Lego Mindstorms Robot
- Make Morse Code Bracelets
- Build a Crystal Radio

If you are a science enthusiast and would like to run your own station please let us know. Send your proposal to jhale@gardenschool.org and we will review your request and get back to you as soon as possible.

Science Expo Hours

- Saturday, June 23rd – 12:00 PM to 4:00 PM
- Sunday, June 24th – 10:00 AM to 2:00 PM

A Guide to Ham Radio

Kiger, Patrick J. “A Guide to Ham Radio.” *National Geographic Channel*, National Geographic, 26 Oct. 2016, channel.nationalgeographic.com/mars/articles/a-guide-to-ham-radio/.

Can Ham Radios Really Talk To Space? And Other Answers.

Our digital short film Before MARS provides background on two of the lead characters in the upcoming global event series MARS—teenage twin sisters Hana and Joon Seung who find an old radio transmitter-receiver in their attic and successfully use it to communicate with an astronaut on the International Space Station (ISS). In the story, that feat helps inspire the sisters to pursue careers in space exploration—one as an astronaut on the Mars mission, the other as an official at Mission Control.

The idea of an ordinary person sitting at home and talking to someone in space might seem crazy. But devotees of ham radio, as such amateur communication traditionally is called, have been doing it for decades, ever since NASA astronauts began taking compatible transmitter-receivers with them on space shuttle flights as part of the Shuttle Radio Experiment, or SAREX. A 1995 Baltimore Sun article described Samuel T. Durance, a research scientist, talking with a group of middle school students—including his own son and daughter—as he orbited 200 miles above the earth on the Shuttle Endeavour.

More recently, in a fashion similar to what Before MARS describes, ham radio operators have been talking with astronauts on the ISS. The orbiting facility has an ongoing program, Amateur Radio on the International Space Station (ARISS), which allows operators to schedule time to chat with the station’s staff. In addition, some astronauts who are ham radio enthusiasts spend some of their free time chatting with random amateurs who manage to make contact with them. A 2015 article in the Telegraph, a British newspaper, details how a 52-year-old man named Adrian Lane, who keeps a radio set in his garden shed, spent weeks trying to contact ISS astronauts, and finally managed to have a conversation with them that lasted nearly a minute, in which they described how Earth looked from orbit.

Communicating with someone in space is just one of the attractions of ham radio, a hobby in which operators communicate with others in distant places, using frequencies that the Federal Communications Commission (FCC) and other regulatory agencies around the world allocate for use by amateurs.

To be a ham radio operator in the U.S., all a person needs is to obtain some inexpensive equipment—beginning sets cost less than $200—and pass an FCC licensing exam to demonstrate basic knowledge and an understanding of government regulations.

There are more than 600,000 ham radio operators in the U.S. alone and about 2 million worldwide, according to the website of the American Radio Relay League (ARRL), an association that has been promoting ham radio for more than a century. (Interestingly, according to one census of ham radio operators, the country with the most enthusiasts is Japan, with about 1.3 million. The U.S., Thailand, South Korea, and Germany round out the top five.)

"Amateur Radio operators come from all walks of life—doctors, students, kids, politicians, truck drivers, movie stars, missionaries and even your average neighbor next door," explains a primer on the ARRL website.

Ham radio dates back to the late 1800s and early 1900s. Around the time that an Italian inventor Guglielmo Marconi pioneered wireless communication and used high-powered transmitters and giant antennas to communicate across the Atlantic Ocean for the first time, amateur tinkerers figured out how to build smaller, low-powered radio transmitters and receivers that could communicate over distances of as much as 100 miles.
In those days, radio communication was unregulated and largely chaotic. Amateurs sometimes jumped onto frequencies used by commercial or government stations and essentially jammed them—a phenomenon which led the professionals to deride the amateurs as "hams." That name stuck, though over time it lost its negative meaning.

In 1912, Congress passed a law reserving longer wavelengths for professional communication, and restricted amateurs to shorter wavelengths that experts considered to be of little value for long-distance communication. But the amateur radio operators figured out an ingenious way to get around that hindrance. They organized themselves into networks and helped each other by relaying signals, which allowed them to stretch their capabilities. They got another boost from an inventor named Edwin H. Armstrong, who developed a receiver with vacuum tubes that was far more sensitive than the crystal sets that amateur operators were using at the time.

In the decades that followed, ham radio continued to grow. The 1950s saw the advent of transistors and other technology which gave amateur radio sets more capabilities, and in the 1960s, they began to extend their range by using small satellites such as OSCAR (Orbiting Satellite Carrying Amateur Radio) that NASA had launched into orbit to assist them. They also increasingly began repurposing old equipment from FM commercial radio stations to set up repeaters—basically, relay stations, usually located on buildings or hillsides, which receive signals from amateur operators and re-transmit them on different frequencies with higher power.

Unlike commercial or government radio stations, ham

enthusiasts don't have to stay on the same fixed frequency all the time. Instead, they can jump around within the part of the radio spectrum that's allocated to amateurs, and utilize any channel that's clear at the time. As an ARRL primer explains, operators use call signs—such as "RickKU0W" or "Gayle KG7ZZZ" to identify themselves and establish communication with other hams.

If an operator is looking for another specific operator, they'll call out something such as: "W1AW (the station you want to contact), this is KC2ABC, Kilo Charlie Two Alpha Bravo Charlie, over." If the person doesn't respond, an operator can keep trying on that channel. When the operator is done, he or she will utter a message such as "This is KC2ABC clear" to inform other operators who may want to use the channel that it is available.

Since they have to share the networks and frequencies that allow them to communicate, ham radio operators are big on etiquette. As the website of one amateur radio club explains, "nothing is more annoying than someone that 'keys up' in the middle of another conversation without first checking to make sure the repeater is free. If the repeater is in use, wait for a pause in the conversation and simply announce your call sign and wait for one of the other stations to acknowledge your call."

Ham radio continues to thrive, even in the age of the Internet and mobile phones. As a recent Ars Technica article noted, ham radio has survived wars, dictatorships, and even natural disasters that disrupt other communications systems. The medium's appeal is that it remains free, non-commercial and largely organized and controlled by users, and that it allows people to communicate with others all over the planet—and even in space.

Amateur Radio Operator's Code of Conduct

The Radio Amateur is

CONSIDERATE...He/[She] never knowingly operates in such a way as to lessen the pleasure of others.

LOYAL...He/[She] offers loyalty, encouragement and support to other amateurs, local clubs, the IARU Radio Society in his/[her] country, through which Amateur Radio in his/[her] country is represented nationally and internationally.

PROGRESSIVE...He/[She] keeps his/[her] station up to date. It is well-built and efficient. His/[Her] operating practice is above reproach.

FRIENDLY...He/[She] operates slowly and patiently when requested; offers friendly advice and counsel to beginners; kind assistance, cooperation and consideration for the interests of others. These are the marks of the amateur spirit.

BALANCED...Radio is a hobby, never interfering with duties owed to family, job, school or community.

PATRIOTIC...His/[Her] station and skills are always ready for service to country and community.

- adapted from the original Amateur's Code, written by Paul M. Segal, W9EEA, in 1928

Local Public Service Nets

from "New York City District ARES." *New York City District ARES*, New York City District ARES, 2017, aresnyc.org/public-service-nets/.

If you have a favorite net, know of net that should be included or ones that should be left out please contact us. This list can be very useful if we all help to make it great.

Public Service Nets

- NYC District ARES Net
    - Monday @ 8:30PM on NC1 – W2ABC (VHF) 147.270Mhz +600Khz 141.3 PL
    - (Back-up repeater: CW1 – KC2LEB / 440.550 / +5Mhz / 141.3 PL)
- County ARES Nets
    - Bronx: TBA
    - Kings: Sunday @ 8:00pm on WA2JNF 446.675 Mhz, -5 Mhz, 114.8 PL Tone
    - Queens: (Day/Time TBA) on N2NSA 443.300 +5Mhz, 123.0 PL Tone
    - New York: Tuesday @ 8:30pm on W2ABC 147.270 Mhz, +600 Khz, 141.3 PL Tone
    - Richmond: (Day TBA) @9:00pm on WA2IAF 146.880 Mhz -600Khz 141.3 PL Tone
- New York City / Long Island Skywarn Net
    - Sunday @ 19:00 on W2ABC (VHF) 147.270Mhz +600Khz 141.3 PL

National Traffic System (NTS) Nets

- Big Apple Traffic Net: Daily @ 8:00pm on 440.600 +5Mhz PL 141.3
- New Jersey: VHF (Early): Daily @ 7:30pm on 146.895 -600 kHz PL 151.4
- Hudson Valley: Daily @ 7:30pm on 146.970 -600 kHz PL 100.0
- Nassau County: Daily @ 7:30pm on 146.805 -600 kHz PL 136.5
- Southern District: Daily @ 9:30pm on 147.060 +600 kHz PL 114.8
- New Jersey: VHF (Late): Daily @ 10:30pm 146.700 -600 kHz PL 141.3

Garden School Amateur Radio Club

Scholarship Opportunities

There are many opportunities for students who are Licensed Amateur Radio Operators out there to help with college tuition. Below is a list just some of these opportunities that are available to students in our area. Most do require that the student is a Licensed Operator. We are offering a class in February to help students get those licenses. If you are interested please contact Mr Hale at kd2lpm@jrhaleteacher.me.

- Androscoggin Amateur Radio Club Scholarship- $1,000
- The ARRL General Fund Scholarship- $2,000
- The Ernest L. Baulch, W2TX, and Marcia E. Baulch, WA2AKJ, Scholarship- $3,500
- The Richard W. Bendicksen, N7ZL, Memorial Scholarship- $2,000
- The Henry Broughton, K2AE, Memorial Scholarship- $1,000
- The L. B. Cebik, W4RNL, and Jean Cebik, N4TZP, Memorial Scholarship- $1,000
- The Dayton Amateur Radio Association Scholarship- $1,000
- The Alfred E. Friend, Jr., W4CF Memorial Scholarship- $5,000
- The Ted, W4VHF, and Itice, K4LVV, Goldthorpe Scholarship- $500
- The K2TEO Martin J. Green, Sr. Memorial Scholarship- $1,000
- The Dan Huettl, WZ7U, Memorial Scholarship- $1,000
- The Dr. James L. Lawson Memorial Scholarship- $500
- The Scholarship of the Morris Radio Club of New Jersey- $1,000
- The Victor Poor, W5SMM, Memorial Scholarship- $2,500
- The Don Riebhoff Memorial Scholarship- $1,000
- The Bill, W2ONV, and Ann Salerno Memorial Scholarship- $1,000
- The Carole J. Streeter, KB9JBR, Scholarship- $1,000
- The Robert D., W8ST, and Donna J., W9DJS, Streeter Scholarship- $1,000
- The Alan G. Thorpe, K1TMW, Memorial Scholarship Fund- $1,000
- The W1FDR Scholarship- $1,000
- The Betty Weatherford, KQ6RE, Memorial Scholarship- $1,000
- The William C. Winscott, N6CHA, Memorial Scholarship- $2,500
- The YASME Foundation Scholarship- $3,000
- Yankee Clipper Contest Club Youth Scholarship- $1,200

Our Contacts - Worldwide, USA & Canada