OH-KY-IN Amateur Radio Society

January, 2017
Volume 57, Issue 1

Q-FIVER

The Official Newsletter of the OH-KY-IN Amateur Radio Society

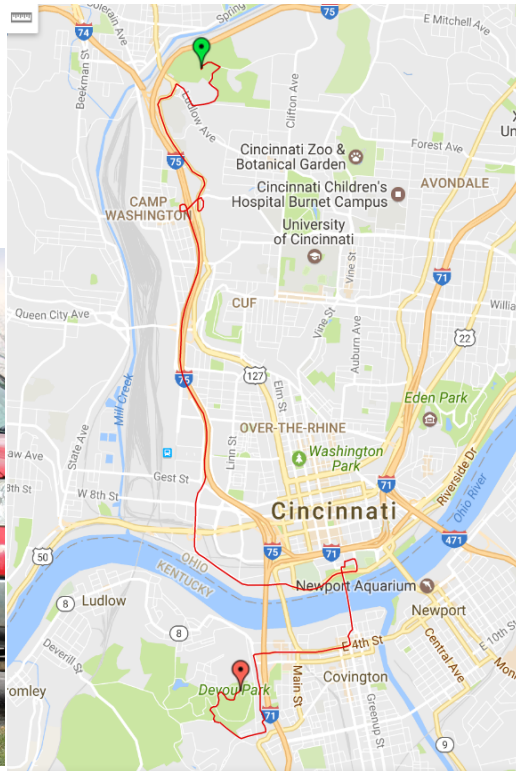
K8SCH

December Foxhunt

The December foxhunt had four teams searching for the fox of Dick WB4SUV, Bob WA6EZV, Bill KA8TWB and myself. Justin KC8COY came to the hunt and rode along with Bob. Of course, I was trying out my new Doppler so whenever I have a new gadget, I do not win—true dat. But the Doppler is a fine piece of equipment and I highly recommend it.

We all had good signals from the start indicating it was 210 degrees from Mt Storm park. We all took off towards I75 south. Shortly after the start of the hunt, Bill's antenna suffered a catastrophic failure and he had to drop out of the hunt. I wanted to determine if he was in Ohio or across the river in KY. For some stupid reason, I thought the hills I was seeing were in Ohio and I was looking at Mt. Echo park—so we went that way and my heart sank when I finally figured out we were looking at KY. Trying to get back across the river, we of course run in to a footrace that has the bridges closed to vehicle traffic, so we head all the way over to Newport to get into KY and then swing back past I75 to get to Devou park. Heading up into the park, we go by the big overlook, scoot over to the big parking lot, and there is Phil! Dick was already there, so we claimed second place. Another good learning experience.

73—Brian, K4BRI



2017 Board of Directors

President
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Fred Schneider K9OHE..... (513) 729-0945 ..... fschneider@fuse.net

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Gary Coffey KB8MYC ..... (513) 382-3879 ..... kb8myc@fuse.net

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Fred Schneider K9OHE..... (513) 729-0945 ..... fschneider@fuse.net

OH-KY-IN Repeaters

146.670 (-) Clifton

146.625 (-) Edgewood, KY

146.925 (-) Colerain Twp

443.7625 (+5) Clifton

A CTCSS (PL) tone of 123.0 Hz is required for access to all OH-KY-IN repeaters. All repeaters also transmit a CTCSS (PL) tone of 123.0 Hz

APRS on 144.390 mHz

K8SCH-10 Edgewood WIDEn

K8SCH-9 Clifton WIDEn

Packet on 145.010 mHz

K8SCH-7 Digipeater

For membership information, please contact Nathan Ciufo KA3MTT, 6323 Cinnamon Ridge Dr, Burlington KY 41005, (859) 586-2435 or Email membership@ohkyin.org. Renewals of Club Memberships are due by the end of March.

THE Q-FIVER is now mailed & e-mailed, it's hoped, a week before the club meeting.

Normally copy deadline is the weekend before that. Please send your submissions for THE Q-FIVER (including notice of upgrades & callsign changes) to Brian K4BRI

These may be: snail-mailed to or dropped off at 6901 Backus Drive, Alexandria KY 41001 or telephoned to (859) 635-3095 any time

SPECIAL SERVICE CLUB

Oh-Ky-In Life Members

John Phelps N8JTP

Kenneth E Wolf N8WYC

John W Hughes AI4DA

Karl W Kaucher KJ4KWR

Howard Hunt NG8P

2017 Committee Chairs and Appointments

Newcomers/Elmers Net..... Robert Gulley AK3Q
Technical Committee .....Brian DeYoung, K4BRI
ARPSC Representative.....Jerry Shipp W1SCR
Volunteer Examiners .....Brian DeYoung K4BRI
QCEN Representative..... Pat Maley KD8PAT
Membership ..... Nathan Ciufo KA3MTT
Fundraising ..... Bruce Vanselow N8BV
Education ..... Michael Niehaus KD8ZLB
Repeater Control Ops Mgr..... Bruce Vanselow N8BV
PIO .....Ted Morris NC8V
Librarian .....Howard Alban KD8WOY

Q-Fiver Editor ..... Brian DeYoung, K4BRI
Field Day.....Eric Neiheisel N8YC
Historian ..... Dale Vanselow KC8HQS
Special Publications ..... Jo Haltermon KD4PYS
Fox Hunters ..... Dick Arnett WB4SUV
Equipment Mgr .....Fred Schneider K9OHE
WebMaster ..... Ryan Williamson W1RYN
Silent Key .....Bruce Vanselow N8BV
Tech Talk Net Mgr .....Bruce Vanselow N8BV
K8SCH QSL Mgr .....Bob Frey WA6EZV
TV/RFI .....Dick Arnett WB4SUV

The Newcomers and Elmers Net has a new start time—tune in at 6:30 PM on Sundays for this great net!

January Calendar

Sun Jan 1		No net
Tue Jan 3	7:30 PM	Club Meeting in St Bernard - State of the Club—Discussion meeting
Wed Jan 4	9:00 PM	Tech Talk, NCS Robert AK3Q
Sun Jan 8	6:30 PM	Newcomers/Elmers Net, 146.67, Topic: Repeater Etiquette - a Refresher! —NCS Robert AK3Q
Tue Jan 10	7:00 PM	Technical Committee meeting at My Neighbors Place
Wed Jan 11	9:00 PM	Tech Talk, NCS Brian K4BRI
Sat Jan 14	10:00 AM	Monthly Mobile Foxhunt—start at Mt. Storm park in Clifton—setup 9:30—talk in 146.670
	1:00 PM	Brunch Bunch at **Giovanni's Family Italian Restaurant in Cheviot**
Sun Jan 15	6:30 PM	Newcomers/Elmers Net, 146.67, Topic: North American QSO Party SSB —NCS Robert AK3Q
Wed Jan 18	9:00 PM	Tech Talk, NCS Dale, KC8HQS
Sun Jan 22	6:30 PM	Newcomers/Elmers Net, 146.67, Topic: What Can I Do with a General License? —NCS Robert AK3Q
Tue Jan 24	7:00 PM	Board of Directors meeting
Wed Jan 25	9:00 PM	Tech Talk, NCS George N3VQW
Sun Jan 29	6:30 PM	Newcomers/Elmers Net, 146.67, Topic: Reading Up on the Hobby! —NCS Robert AK3Q

Brunch Bunch

The next Brunch Bunch will be held Saturday, January 14th**, at 1pm. The location for January is Giovanni's Family Italian Restaurant in Cheviot. Giovanni's is located at** 4050 North Bend Road, 45211. **It is at the corner of North Bend Road and Alpine Place. Giovanni's is very near Harvest Home Park however on the opposite side of the street.**

I understand that Giovanni's has a website on Facebook. The menu can be found on several websites, just do a Google search to find them.

Remember that the Brunch Bunch always meets the second Saturday of every month at 1pm at a location to be announced each month. If you can't join us this month, maybe you'll be available to join us in the months ahead.

I'm always looking for suggestions on what restaurant you think might be a good place for the Brunch Bunch to visit soon.

73, ……..Bruce, N8BV

November Board Meeting notes

Secretary's Notes, November 22, 2016 OHKYIN Board Meeting

Five members and the club's Trustee attended this meeting.

The treasurer presented a Preliminary Draft of the Treasurer's Report.

K4BRI discussed the status of the Club's Repeaters. The 2 meter repeaters are on the air. 146.625 needs a control receiver. 146.925 needs a programming update. With the return of cold, wet, windy conditions, there is uncertainty about the issues that appeared last winter on the 146.670 repeater– will they return. We have been unable to arrange an approved climber to repair the feed line. The 440 repeater is ready but won't accept touch tones for control functions; the repeater itself works fine.

There was discussion of door prizes for the Dec. Club meeting. Specific prizes were chosen and will be purchased.

The group discussed the Silent Auction procedures. Prices for each unit were set.

A Club member asked the President if he could donate an HF rig to the Club with the intention that the Club would donate the rig to a specific person. IRS Regulations prohibit a 501(c) qualified organization from doing this; if it was done that would put our tax exempt status at risk.

It was agreed to repeat the donate to the Church that owns the building where the Board meets.

It was agreed to fund food for Winter Field Day not to exceed $300.

Respectfully, Fred Schneider, K9OHE, Secretary Elect

The Elmer's Corner : Learning Should Never End

The opportunities to learn are always around us if we will take notice of them. One of the saddest things to me is to see someone who has stopped learning. By this I do not mean folks need to take classes at a university or study a foreign language (although these are great options). Rather learning should follow interests, and interests should follow curiosity. And while learning itself *can* become an addiction, there are not many folks it seems for whom this is a danger!

I have been a book-aholic for most of my life, including childhood. I still buy books even though at my age, I will probably shuffle off this mortal coil long before they are all read. Not too long ago the librarian of our club contacted me about some books which had been donated to the club and for which he had no more room in the library. Would I be interested in five old ARRL handbooks for the princely sum of $2.50? You bet I would!!

Now I have five well-preserved handbooks from 1957, 1963, 1968, 1969, and 1972 which I can add to my ever-growing collection of American and British handbooks. "But," you say, the information is so outdated by now how can they be of any use?"

Well, beauty is in the eye of the beholder, as the saying goes, and so is the value of older texts. Maybe because I am likewise a relic of the past, these books speak to me in way which is unlike many modern books. I cannot explain how more formal language tends to communicate concepts better to me, but they do. I was reading a section on vacuum tubes in the 1963 version and it was so clear I believe anyone could understand it, while still using concise language and without being condescending.

This is hardly the first time I have run across such a thing, and I am sure it will not be the last. Learning from the past helps shape our understanding of today. Reading different authors on a similar subject has always proven valuable to me, like light being shined on the planes of a facet-cut diamond. If my high school English teacher could hear my thoughts now no doubt she would get a good chuckle at my words—having to source and document all those reference cards for my term papers seemed like the biggest waste of time back then!

Oddly enough, if even only on a subconscious level, it taught me the value of seeing the same topic from multiple perspectives. One source does not adequately cover a topic. Just do a search on Google for something like a magnetic loop antenna and you will find numerous articles talking about loops, each with something unique to contribute.

The Internet

Speaking of the Internet the learning possibilities are in a very real sense, endless. With a little bit of common sense and some time exploring, one can learn to filter out the useless quickly, as well as avoiding getting caught up in the "cute cat" videos which seem to occupy an awful lot of bandwidth and time. (I wonder how much faster the Internet would be for everyone if those videos were banned . . . .)

In recent months, I have been exploring about a half-dozen radio and antenna related topics, with a mixture of book references and Internet sources. This is common for me because I have an insatiable thirst for knowledge, but with a practical side: I want said knowledge to allow me to enjoy the radio and antenna hobby all the more.

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I do not say all of this to "toot my own horn," but rather just as an example of how fortunate we are to have so many resources available to us almost instantaneously. One of my recent explorations has been tied in with the large number of satellite launches—something like a dozen or more satellites have been launched, and a buddy of mine spurred me on by actually hearing one of those satellites on its first pass over the Americas. Yes, I was jealous and envious and all those ugly things, but I was also excited for my friend!

This led me to look up the satellites which had been launched, download some of the telemetry software, and set up my computer and radios to capture the signals. I also wanted to be able to provide feedback to the schools and services which had launched the birds, and so I enabled data transfers over the Internet to provide real-time data reports. Not only is it fun to hear these signals, but I also get to be a part of the science behind the scenes.

What does such activity teach? Well if one experiments with the satellite side of the hobby one has to learn a little bit about antenna design, aiming, polarity, azimuth and elevation, Doppler shift, satellite tracking, filtering and amplifying signals, and computer/software workings, if we want to do more than just listen. And this does not touch the transmit side of things for those satellites which have repeater functions.

Granted, once everything is in place sometimes the machines can be left unattended to receive and transmit the data back to the scientists studying the data, but I like watching the numbers pop up on the software. I do also find it interesting just to see something has happened overnight while I slept which has allowed me to be a part of the bigger process. Reminds me of the days when I used to let my computer work overnight on the SETI project.

Another related topic of interest lately has been packet operation, as it is something I did not participate in years ago when it was all the rage. The advantage to looking into something like this is there are many resources out there which represent, collectively, years of experience, and which also means I do not have to reinvent the wheel.

The downside of looking into an older technology such as packet also means there may not be as many helpful current resources as one might like. It took a while for me to find some modern software which worked properly with my radio and computer combinations. But is that not half the fun of the challenge?! And when things were finally working and I sent that first successful message, there was a lot of satisfaction in it.

The added benefit is now if an emergency arises I have another tool in the toolbox with which I might be able to help out. That is, assuming I periodically work the packet mode so as to remain sharp—the problem with learning new things is if we are not careful we push out other things we used to know!

In this hobby there are countless things we can learn, and many ways to expand our horizons. Pick up a good book on amateur radio, or peruse back issues of radio magazines for inspiration and for knowledge, and then put that knowledge to good use!

73, Robert AK3Q

The Music of Radio: **The Synthesis of Speech Part 2—SIGSALY**

By Justin Patrick Moore, KE8COY

This edition of the Music of Radio continues to explore developments around electronically generated speech. Homer Dudley, an engineer and acoustics researcher who worked for Bell Telephone Laboratories (BTL), made significant contributions to this field beginning with his invention of the Vocoder and Voder. The development of these two instruments was detailed in last month's column. Now I will turn my attention to how the Vocoder was employed in encrypting the transmissions of high ranking officials during WWII for the SIGSALY program. SIGSALY, by-the-way, is simply a cover name for the system and is not an acronym.

In 1931 BTL had developed the A-3 scrambler that was used by Roosevelt and Churchill, but the security of this device was eventually compromised by German's at a radio post in South Holland who had been intercepting the Prime Ministers telephone calls. The A-3 had worked with the Trans-Atlantic Telephone by splitting speech up into different bands, but it wasn't difficult to reassemble as the Germans proved in 1941, making the situation surrounding communications security to become intolerable to the Allies.

In 1942 the Army contracted BTL to assist with the communication problem and create "indestructible speech" or speech that could withstand attempts at code breaking. From this effort the revolutionary 12-channel SIGSALY system was born. To create SIGSALY workers sifted through over 80 patents in the general area of voice security. None of these fit the needs of the allies, but Homer Dudley's Vocoder did and formed the basis of the system. For SIGSALY a twelve-channel Vocoder system was used. Ten of the channels measured the power of the voice signal in a portion of voice frequency spectrum (generally 250-3000 Hz). Two channels were devoted to "pitch" information and whether or not unvoiced (hiss) energy was present. The Vocoder enciphered the speech as it went out over phone or radio. In order to be deciphered at each end of the conversation an audio crypto-key was needed. This came in the form of vinyl records.

From the standpoint of music history it is interesting to note, as Dave Tompkins did in his book *How to Wreck A Nice Beach: The Vocoder fromWWII to Hip-hop*, that the SIGSALY system employed two-turntables alongside the microphone/telephone. The classified name for this vinyl part of the operation was SIGGRUV. The turntables were used to solve the problem of needing a cryptographic key. They played vinyl records produced by the Muzak Corporation, a company famous for the creation of elevator music. The sounds on these records weren't aimed at soothing weekend shoppers or people sitting in waiting rooms. Muzak had been contracted into pressing vinyl that contained random white noise, like channel 3 on an old television set. The noise was created by the output of very large mercury-rectifier tubes that were four inches in diameter, and over a foot high. These generated wide band thermal noise that was sampled every twenty milliseconds. The samples were then quantized into six levels of equal probability. The level information was converted into channels of a Frequency Shift Keyed audio tone signal recorded onto a vinyl master. From the master only three copies of a key segment were made. If these platters had been commercial entertainment masters thousands would have been pressed from its blueprint. If any SIGGRUV vinyl still exists, and for security reasons they shouldn't have, those grooves are critically rare.

It had to be insured that no pattern could be detected so the records had to be random noise. If the equipment had somehow been duplicated by the Axis powers, the communications would still be uncompromised as the they required the crypto key of the matching vinyl, required at each terminal. This made the transportation of these records, via armored truck, the most secure since Edison invented the Phonograph. Just as the masters were destroyed after making three keys, each vinyl key was only ever to be played once, as operators were instructed to burn after playing. The official instruction read, "The used project record should be cut-up and placed in an oven and reduced to a plastic biscuit of 'Vinylite'". As another precaution against the grooves falling into enemy hands the turntables themselves had a self-destruct mechanism built into them that could be activated in case a terminal was compromised. Thinking of all this sheds new light on the idea of a DJ-Battle.

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Keeping the turntables at two different terminals across the globe synchronized was another technical hurdle that BTL overcame. If a needle jumped or the system went out of synch only garbled speech was heard. At the agreed upon time, say 1200 GMT, operators listened for the click of the phonograph being cued to the first groove. The turntables were started by releasing a clutch for the synchronous motor that kept the turntable running at a precise speed. Fine adjustments were made using 50-Hertz phase shifters (Helmholtz coils) to account for delays in transmission time. The operators would listen for full quieting of the audio as synchronization was established. Oscilliscopes and HF receivers were also used to keep systems locked to international time.

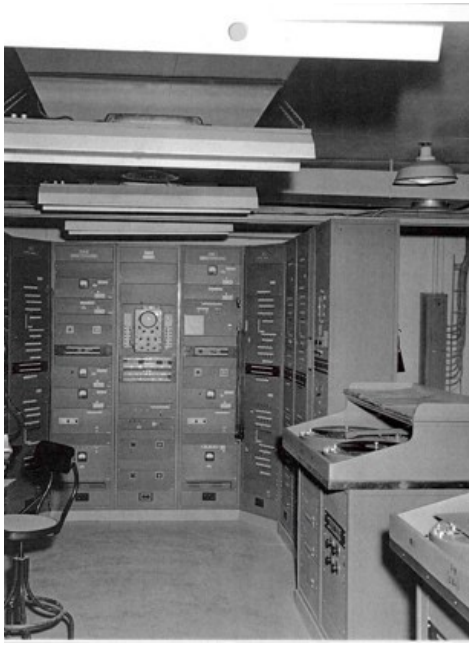
A complete SIGSALY system contained about forty racks of heavy equipment composed of vacuum tubes, relays, synchronous motors, turntables, and custom made electromechanical equipment. In the pre-transistor era all of this gear required a heavy load of power so cooling systems were also required to keep it all from getting fried. The average weight of a set up was about 55 tons.

The system passed Alan Turing's inspection (if not his test) as he had been briefly involved with the project on the British side. On July 15, 1943 the inaugural connection was established between the Pentagon and a room in the basement below Selfridges Department Store in London. Eventually a total of twelve SIGSALY encipherment terminals were established, including some in Paris, Algiers, Manila, Guam, Australia and one on a barge that ended up in the Tokyo Bay. In the year 1945 alone the system trafficked millions of words between the Allies.

To keep all of this operational a special division of the Army Signal Corp was set up, the 805th Signal Service Company. Training commenced in a school set up by BTL and members were sent to various locations. Their tasks required security clearances and a firm grasp on cutting edge technology which they were tasked to operate and maintain. For every eight hours of operation the SIGSALY systems required 16 hours of maintenance.

In putting the system together eight remarkable engineering "firsts" were achieved. A review conducted by The Institute of Electronic and Electrical Engineers in 1983 lists them as follows:

1. The first realization of enciphered telephony
2.The first quantized speech transmission
3.The first transmission of speech by Pulse Code Modulation (PCM)
4.The first use of companded PCM
5.The first examples of multilevel Frequency Shift Keying (FSK)
6.The first useful realization of speech bandwidth compression
7.The first use of FSK - FDM (Frequency Shift Keying-Frequency Division Multiplex) as a viable transmission method over a fading medium
8.The first use of a multilevel "eye pattern" to adjust the sampling intervals (a new, and important, instrumentation technique)



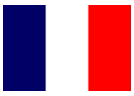
To do all these things required precision and refinement in new technology. SIGSALY has left the world with a rich inheritance that spans developments in cryptology, digital communications, and even left its mark on music.

Sources:

How to Wreck A Nice Beach: The Vocoder from WWII to Hip-hop: The Machine Seaks by Dave Tompkins, Melville House, 2010

SIGSALY: The Start of the Digital Revolution by J.V. Boone and R.R. Peterson, retrieved at:
https://www.nsa.gov/about/cryptologic-heritage/historical-figures-publications/publications/wwii/sigsaly-start-digital.shtml

January 2017 DX Spots de KA3MTT

Sun	Mon	Tue	Wed	Thu	Fri	Sat
1 A70X - Qatar thru 1-7 ——————— P49X - Aruba thru 1-9 	2 8Q7AZ - Maldives thru 1-11 	3 XW4 - Laos thru 1-21 	4 V63 - Micronesia thru 1-22 	5	6	7 ZS8Z - PE & Marion Isl thru 1-30
8 PJ4B - Bonaire thru 1-25 	9	10	11 ZC4SB - Cyprus SBA Thru 1-25 ——————— E51AMF - N. Cook Is Thru 2-6	12 T8 - Palau thru 1-18 	13	14 ZF2PG - Cayman Is Thru 1-22 
15	16	17	18	19 TO7D - Guadeloupe Thru 3-9 	20 YJ - Vanuatu thru 2-23 ——————— TF - Iceland thru 1-26 ——————— J5UAP - GuineaBissau Thru 3-3	21
22 TU5MH - Ivory Coast Thru 2-2 	23	24	25 HI1UD - Dominican Republic thru 2-1 	26	27	28
29	30	31				

The next meeting of the Oh-Ky-In Amateur Radio Society will be Tuesday, January 3rd at 7:30 PM

OH-KY-IN Amateur Radio Society

Regular monthly meetings are held the first Tuesday of each month at 7:30PM local time at the St Bernard Recreation Hall, 120 Washington Avenue (corner Washington & Tower Aves) in St Bernard, just east of Vine St. Please come in the doors at street level, facing the high school. Visitors are ALWAYS welcome!

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