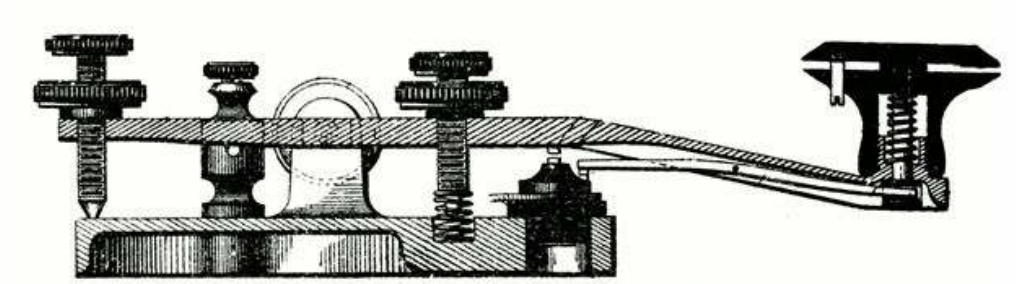

Drumlins Amateur Radio Club, Ltd.

May 2019 **Drumlins' Rumblins** Volume 9, Issue 5

THE PRESIDENTS CORNER

KD2DNO

Hopefully the snow at Hamfest will be the last of the season. I want to repeat my thanks for everyone involved in making another successful Hamfest. We really appreciated the Wayne County Sheriff's Dept Explorer Post and Deputy Paul Montemorano for their help with the parking. I keep thinking at least it wasn't rainy and sloppy, but I sure did not expect snow all day!

We are getting into the season of activities. Please try to find time to help with at least one activity this year. We need YOU to give us a hand.

Here are the May activities: (We also need to complete painting and work on the trailer at some point in the very near future.

Wed May 15 WORK DAY AT EMO 1pm prior to Club Meeting at 7 pm. We need to program the radio's, do some wiring for new equipment and put our name labels on brochures. Something for everyone to help out.

Wed May 15 Club Meeting Doors open 7 pm, meeting starts at 7:30 pm. Remember, meetings are upstairs in the EMO, doors unlocked from 7pm-8pm only.

Sat May 18 11am-5pm Williamson Apple Blossom Festival. Set up a demonstration table and hand out info regarding Ham Radio. Please contact me (reply to this email) if you can help.

Sun May 19 7am-1pm Pancake Breakfast at Williamson Airport. Set up demonstration table and hand out info regarding Ham Radio. Please contact me (Reply to this email) if you can help.

Mon May 20 6pm Tour de Cure planning meeting at Webster Recreation Center. Very important to attend if you are helping with Tour de Cure. Register for the event at Rochesterham.org, click on Public Service, then click on Tour de Cure to register. There is something for everyone to volunteer for, even non-Hams. If you would like to just ride along with someone to get experience, let me know.

Bill, KD2DNO

The member price on the 2019 Field Day T-shirts is $13 each.
If you haven't ordered there's still time.... I'm placing the order later this week. Please email me with your size and quantity. Will collect money at the May/June meetings or on Field day.
High quality cotton pocket t-shirt featuring the 2019 ARRL Field Day artwork on front and back.
Color: Charcoal. Sizes: S-6XL.
73 Rich

RACES-ARES MAY 2019

The May flowers have sure made their way out- finally! It was a big 'IF' for all the rain and cool weather we have had. At least none of the 'white stuff' has been around so far. (I won't even mention the real name of AF2F's, Doc's, nickname for fear of what could happen.) Remember Mother's Day 1989? 11.5” of that 'stuff.' Hi. What a surprise! Happy Mother's Day to all the moms out there even if you are ready this after Sunday. None of us would be here without mothers. No joke there.

I am having a treat will I type. Jan, the XYL, is over to Scott Miller's hairdo place across from Pittsford Plaza getting her hair done. Jan doesn't like diamonds or jewelry or getting her nails professionally done. Our daughter, Megan, told her she should treat herself with a professional hairdo. She deserves it. Not that Jan needs any help looking lovely. Her wonderful smile and the kindness showing through that smile from her soul got my attention going on 56 years ago now. She makes my heart skip a beat every time even now!, when I see her blued eyed smile. The only thing that has changed since my getting my new lenses after my cataract is, I can't take off my glasses and get away with saying, “Honey, you look just as young and pretty as when you were 18.” Remember I was almost blind as a bat before the cataract operation. Hi. But that 18-year-old-smile is still there! Ooooops! I guess I better stop the ird walking. Hi.

Anyway, I am at the Barnes & Noble bookstore in Pittsford Plaza, sitting at the computer counter station, with my chai tea and I got a free cookie at Starbucks. Yes, I got a cookie for Jan too!, if you are wondering. I got a buy-one-get-one-free cookie coupon for buying a book. I love books!, especially nonfiction history. Yes, forever the history teacher even if retired. Hi. I just sent off to Lew, WE2LEW, a text that I am running behind in this month's article but on it now. (TNX, Lew.)

First off! DO NOT FORGET the May 15th work day at the EMO starting at 1:00PM. As you can tell from the emails from KD2DNO, President Bill, we're starting to get-finally-some RACES-ARES cooperation from Monroe County for a tri-county effort to really help each other. Refreshing to see! We have long had wonderful cooperation from our southern Ontario County friends-thank the electronic gods. To see Monroe County get serious is an answer to many attempts to 'shake hands' with our western neighbor. All the radios need reprogramming for all the new frequencies especially with counties far to our Southerntier as well. We're experimenting with area repeaters where all of the counties can keep in touch in case of an emergency. This of course is what we should be doing and have been done! But time, events and thinking have heads turning and finally hands are outstretched for “lets help each other.” The day will be spent getting the EMO go-kits checked and readied for the Ginna drills this year. This year we have the State and FEMA graded exercises. Of course afterwards we can reward ourselves with all that fun time with a meal and comradeship.

Speaking of Ginna exercises! As your RO/EC it is unfortunately a fact, I have a hard time just getting the bare minimum ops out for the exercises. Yes! It is true. The State exercise is also a good training exercise where extra helpers can be present to see what and how it is all done. Hopefully the Dose Assessment crew will have training sessions before hand and if John O'Toole notifies me ahead we can coordinate our training with them. All are welcome again! Please, let me know when you see the emails coming out if you will volunteer your time and skills. No one person can do it all. It is a cooperative effort! Each one of us has skills to help in the effort. Never think you have nothing or little to offer. You and each one of us has a skill or talent. After all we all are FCC licensed amateur operators and a very select part of the US population with knowledge that 99% of the US doesn't have. That is no joke. You have a “ticket”-you are skilled and have a talent.

If I have a chance of a “harmonic” maybe interested in ham radio, here she is. This is our daughter Megan's youngest daughter Maryn. If you have been to a DARC picnic you may have met Maryn with her older sister Willow. Bompa was out to the farm in Scottsville after a night before band and chorus concert with one of the grandkids.

Sometimes I make it up early enough to get on the morning weekday 715 repeater net at 7:30AM. This week I did manage and Bompa and Mimi also could take Maryn later to school than her usual early 7:20. So Bompa had Maryn give the weather report on the net along with W2UAD, AB2F, K2SRF and N2HEG. Kinda a smaller group this morning for a Friday as K2MPE and W2EVU were out to their Friday breakfast at the Alton diner. K2JJT was off doing something too. Maryn is one of the un-shy grandkids. She is the outward talking one and can converse with just about anyone. She is my best candidate for being a ham. She is a “ham.” Hi. And she is truthful! “Bompa, you are fat.” “Bompa you are old.” Hi, very truthful.

Bill, KD2DNO, is trying to get those youngsters interested in ham radio by getting us out to the Williamson Apple Blossom Festival and maybe out front at a WalMart or Wegman's to advertise. So pay attention to those emails for volunteering some time to help with the enrolling new 'younger' hams to our DARC. Even my daughter Megan says every body in my QST and CQ magazine pictures look just like me or older. That is the truth. Hi. Maryn's Mom tells the truth too! The apple didn't fall too far from the tree there. Hi hi. Please, volunteer and pay attention to Bill's recruitment effort!

DARC HAMFEST 2019

THANK YOU!, to all who worked helping with this year's DARC hamfest! It was a good crowd as the pictures will tell.

It was great to see KJI Electronics to be able to be with us. As you know either Gene, the OM, or Mary Ann, the XYL, have had health problems the past year and didn't make it last year's hamfest because of problems. Keep both the OM and XYL in your prayers so they can continue to be with us in 2020! Mary Ann especially enjoyed the hamfest talking with our DARC members XYLs including my XYL, Jan. Gene sent me a text as late as May 8th stating: “Mary Ann still talking about our adventure and hopes we can join all next year.”

We have several upcoming activities and need Drumlins members to help out. These events are all important so please help out wherever you can.. Thank you

Wed May 15 Club Meeting Doors open 7 pm, meeting starts at 7:30 pm.

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Sat June 8 Tour de Cure bike event. Contact RARA at Rochesterham.org and click on PublicService to register.

Sat-Sun June 22-23.Amateur Radio Field Days. See Amateur Radio operators in action. 8am

Sat-noon Sunday. Location to be announced

Tue July 23., State Ginna drill 8am. Contact Dave at kb2kby@rochester.rr.com

Sat Aug 17. Drumlins Picnic Free to all members and their family's. Palmyra VFW 4 pm.

Contact Rich at Tinker@rochester.rr.com

Tue Aug 20. Federal GINNA Drill 8 am. Must have attended previous drill to participate Contact

Dave at kb2kby@rochester.rr.com

Sat Aug 24. ROC the Ride for MS. Contact Rochesterham.org at select Public Service to register.

EVERY TUESDAY 7PM.DARC NET on 146.745 (pl 71.9)

repeater. Friendly rag chew and weather reporting.

EVERY SUNDAY 8:35 pm. WAREC RACES NET 146.685

EVERY SUNDAY 8pm SIARC NET 145.450

Repeaters

Repeater Report April 2019

146.685- Talked with Jim Lee @ the county about the potential FM transponder and the new Emergency response van. He is going to look into this some more… as to the potential interference to this and Fire band repeaters.. The repeater has been working well but we will be looking at putting up a new antenna and repeater in the future..
146.745- Newark had a power outage … which im not sure if the repeater went on battery backup or not or if it didn't last long.. have to check to see if the marine battery is any good… but I had to make a trip to the site as all the internet stuff was on UPS and that didn't work… im guessing the UPS has a bad battery as well…. Never ending… Justin is working on a new router for Russ as he is seeing some latency issues with the link…
224.900- There has been much activity lately here as the repeater is linked into many 220 repeaters aka, New Jersey, Syracuse, Stanley ….
444.750- Haven't heard much activity ,, no Dstar or Wires-x

Repeater Report May 2019

146.685- Been working well. Had a discussion with Mark Humphrey regarding installing a talk radio translator on the same tower as .685. This will be on 96.9mhz as WACK has been having a hard time covering the community with their AM transmitter. A 2 cavity band pass filter will be installed on their transmitter.
146.745- Nothing to report. DARC net continues at 7pm on Tuesdays.
224.900- Appears the repeater has been working well linked with other 220 repeaters.
444.750- Steve noticed that Wires-x was down, Justin fixed it remotely. May need to look into why it keeps crashing .

The following article is re-printed courtesy of ARRL.

Amateur Radio Club Contacts

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Fisherman's Net Amateur Radio Club	
Jim Sutton, N2OPS	jim@atrym.org
Genesee Valley Amateur Radio Association	
Bill Boyd, N3DSP	n3dsp@lafireline.net

Drumlins Leaders 2019

President	Bill Tegtmeyer, KD2DNO	315-744-0434
Vice President	Rich Hamill, KC2TNJ	315-986-8589
Secretary	Nila DeLeo-Ellwanger	315-310-1717
Treasurer	Walter Dutcher II, W2WBD	585-224-5581
Program	Jay Hamill, KC2TCM	315-210-8078
RACES/ARES	Dave Taylor, KB2KBY	315-597-4293
3yr Director	Lew Ellwanger, WE2LEW	315-587-3509
2yr Director	Al Cook K2MPE	315-398-0936
1yr Director	Russell Harris W2JPT	585-738-0321
Repeater Chair	Jeff Jensen, N2MKT	315-879-1588
PIO/Membership	Lew Ellwanger, WE2LEW	315-587-3509
Newsletter	Lew Ellwanger, WE2LEW	315-587-3509
Club Trustees	Jeff Jensen, N2MKT Sabrina Hamill, WD2STK	315-879-1588 315-210-8078
Website	Rich Hamill, KC2TNJ Justin Toramino, W2JPT	315-986-8589

SKYWARN

OFFICIAL SKYWARN Storm Spotter

A US National Weather Service and Amateur Radio Volunteer Program

Club Address:
Walter Dutcher W2WDB
144 Berg Rd.
Ontario, NY 14519
Email: drumlinsarc@gmail.com

WAYNE COUNTY RACES VHF NET

TIME-FREQUENCIES

SUNDAY EVENING 8:35PM

PRIMARY:
146.685 (PL 71.9)
WA2EMO REPEATER

Secondary
146.745 (PL 71.9)
WA2AAZ REPEATER
Voice and Digital
FLDIGI MT63-2KL

Emergency Communications * Friendship * International Goodwill * Public Service * Education

WA2AAZ

Figure out which house in your neighborhood may be causing radio frequency interference using a small, simple HF loop antenna.

Identify and Track Down RFI

Randy E. Standke, KQ6RS

Dealing with radio frequency interference (RFI) from neighborhood sources is unfortunately a part of the ham radio hobby, especially on the HF bands. On your home receiver, it is usually easy to distinguish between Amateur Radio signals and interference. What is difficult is locating the source of the interfering signal, and that is the first step in getting RFI corrected. Here's how I put together and applied off-the-shelf components to track down the location of RFI sources in my neighborhood. The key components include a portable SSB-mode radio with an external antenna connection. Also needed (see Figure 1) are a broadband amplifier and an un-tuned receive-only magnetic loop antenna that is approximately 23 centimeters in diameter, a 12 V power inserter, and a 12 V power source. The radio's built-in whip antenna gets you within several houses, and the directional loop pinpoints the location.

RFI Basics

Often, the RFI source is in your own home, and you should eliminate that possibility first. To do that, power your receiver from a battery and shut off the main circuit breaker to your home. Also, if you have an uninterruptable power supply (UPS) for your computer and internet equipment, be sure to shut that down too, because digital equipment and switching mode power supplies are often sources of RFI. These will continue to run from a backup power source. You are then left with signals outside of your home.

The biggest source of RFI from my neighborhood, and that of many other hams for the last few years, are SolarEdge solar power systems within 700 feet or less of my station. See "The SolarEdge Story" sidebar for more information on this specific RFI example. While I do use "solar power RFI" as my example, the same methods apply to other RFI sources such as non-FCC compliant grow lights, string lights, power-line noise, and so on.

Once you have identified a signal as RFI, make a note of its characteristics such as the frequency, how it varies with time, and how the audio sounds. Also take note of the time of day when you hear it. For example, solar power RFI will be off when it is dark outside, and grow lights are often controlled with a 24-hour timer.

Using my solar power example, most of the RFI appears at 200 kHz intervals, which are likely the harmonics of a 200 kHz switching frequency.

The SolarEdge Story

Tony Brock-Fisher, K1KP, describes what he found was required to quiet the radio frequency interference (RFI) from a SolarEdge system. See his article, "Can Home Solar Power and Ham Radio Coexist?" in the April 2016 issue of *QST*. It is worth pointing out that solar power can be RFI-free with no modifications to the normal installation — I have such a system. SolarEdge has told me that they plan to make low-RFI components for new future installations. But, as of December 2018, installers are still setting up systems with high-RFI components and installation methods. In addition, even after SolarEdge distributes components with lower emissions, there will be the older high-RFI installations all over the country that new hams or hams who move are likely to encounter. In fairness to SolarEdge, they have been working with ARRL. They have also come out and fixed the installations near me — seven so far, with two more scheduled — after I reported them. However, the job of finding the addresses of each new installation falls on me.

Figure 1 — An un-tuned receive-only magnetic loop, a broadband amplifier, a 12 V power inserter immediately below the pre-amplifier, and a 12 V power source (to the left) are needed, in addition to an SSB-mode receiver.

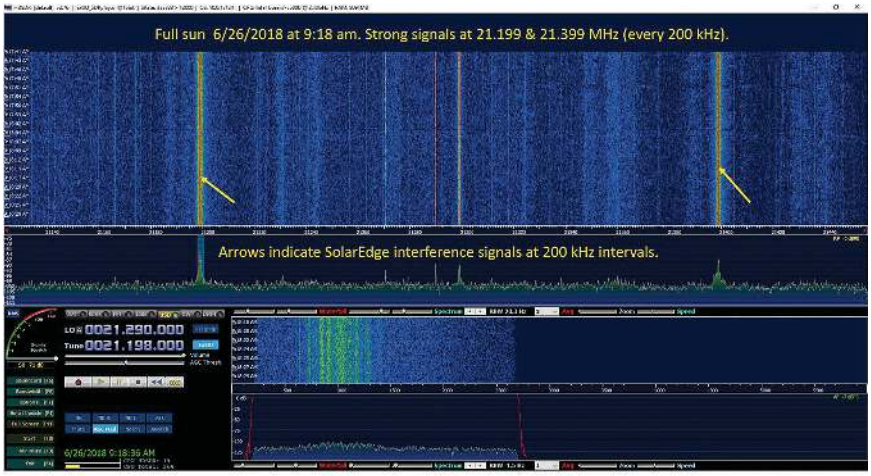


Figure 2 — Solar power system producing RFI on 21.199 and 21.399 MHz.

See the examples at 21.199 and 21.399 in Figure 2. To hear these frequencies using upper SSB mode, tune 1 kHz lower to hear 21.199 MHz at around 1 kHz audio frequency.

If the solar power installation is less than 200 feet away, you may see many signals in addition to the 200 kHz harmonics spread through the band. Note the "squiggly" signals seen in Figure 3. Some of the stronger ones in this example are at 14.040, 14.140, 14.210, and 14.310 MHz.

Searching for RFI

You will need a portable radio that has an SSB mode and an external antenna input in addition to the built-in whip antenna. You will also want an indication of signal strength, such as a bar graph or numerical display.

At home, determine if the AM or SSB mode works better for the RFI you are looking for. That will help you determine the mode to use with the portable radio. I use the Tecsun PL-660 radio seen in Figures 4 and 5, but different models may now be available.

Connect your station antenna to the portable radio and note the frequencies, sounds, and strength of the RFI signals you wish to locate. These are the same signals that you will receive on the built-in whip antenna and on the directional loop. Due to the lower gain of portable antennas, you may not hear weaker signals outdoors at your location. But when you get close to the source they will be easily heard, and perhaps even be strong.

The next step is to narrow down the search area. If you have a directional HF beam antenna, use the peak and nulls in the radiation pattern to get an approximate direction of the signal. Depending on the antenna, this could be ±30° of the exact direction. Combine any directional information you have with a map of your neighborhood. Depending on the neighborhood, that could narrow your search down to just a few houses on one or two streets.

I found that searching for RFI with the built-in whip antenna will get you within a few houses, but it is difficult to be exact. Effects such as signal reflections and how the RFI exits the house can throw you off by one or two houses. If you are looking for solar power RFI and there is only one house with solar panels where the signal peaks, your search may be over. However, if you find solar RFI and you see that the nearby houses also have solar panels, you need a portable directional antenna.

A Portable Loop Antenna

The portable loop antenna I built started as the magnetic loop antenna sold by W6LVP. It normally includes a 1-meter diameter loop, a broadband amplifier, and power connected to 12 V. I replaced that loop with a wire 70 centimeters in circumference, which results in a loop diameter of

"Once you have identified a signal as RFI, make a note of its characteristics such as the frequency, how it varies with time, and how the audio sounds."

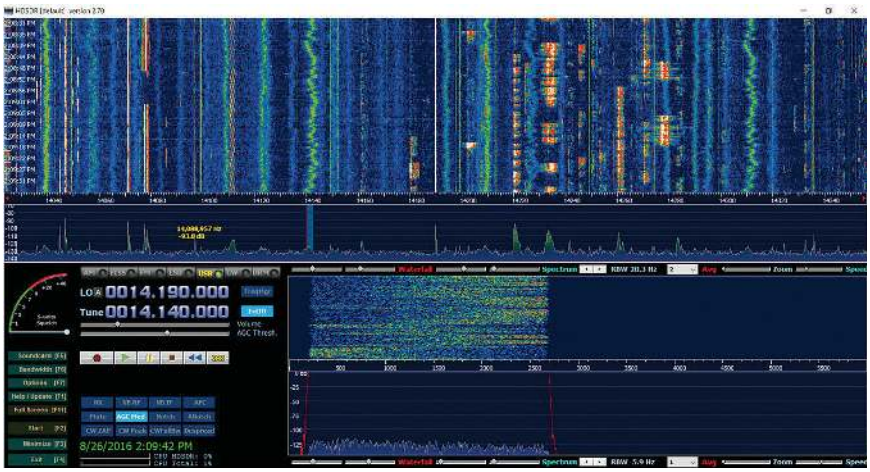


Figure 3 — Solar power system RFI spread throughout the 20-meter band.

Figure 4 — Loop antenna maximum gain is in the plane (edge) of the loop, and results in the full signal strength indication on the SSB-mode receiver.

Figure 5 — Loop antenna null is on the axis of the loop and results in a zero-indicated signal strength with axis pointed toward the house.

23 centimeters. This same modification could have been done to any of the other wide-band magnetic receive loop antennas on the market. [The exact loop size is not important as long as it is electrically small enough. The null depth is $-20\log(2C_\lambda)$ dB and will be shallow if the loop circumference C_λ wavelength is too large. Furthermore, the electric field in the null direction is cross-polarized compared to the main loop response, perhaps complicating the interpretation of the source direction. — *Ed.*]

Small un-tuned loops are often used outdoors on a rotator as low-noise receive antennas for the 160-meter and 80-meter bands. The W6LVP loop covers from 135 kHz – 30 MHz without tuning. The 23-centimeter diameter loop has less gain than the original 100-centimeter loop, but still more than enough once you are close. I found the signal strength readings to be about equal for the built-in whip and this small loop. This gives you plenty of sensitivity. In addition, a smaller loop size has a deeper null than a larger loop, which makes determining direction even more precise.

Take another look at Figure 1 as we get into the details of setting up this small loop antenna. The wire loop connects to the amplifier. I used solid #12 AWG wire, and the stiffness is more than adequate to keep its shape. It will make little difference if the loop isn't perfectly round. Below the loop amplifier in Figure 1 is the 12 V power inserter connected with a male-to-male BNC coupling. I used a small 0.8 Ah 12 V battery, shown to the left of the amplifier. An option is to connect the amplifier to the power inserter with a short coax and place the battery and power inserter in your pocket. This leaves one hand to hold the radio, and the other to hold the loop antenna.

Tracking Down RFI

Now that you have your map, radio, and loop antenna, you are ready to walk the area with your portable receiver's built-in whip antenna, or you can drive down the street using a mobile antenna connected to the external antenna input of your portable receiver. Just be aware that some cars have high levels of ignition noise and that may cover up the RFI you are listening for. Finding where the signal peaks should get you within one or two houses of the RFI. Now it's time to pinpoint the exact house with your loop. The radiation pattern of the loop peaks in the plane of the loop, and the null is on the axis of the loop. Figure 4 shows a full-scale reading on the radio (vertical bars on the upper left of the display) when the house is in the plane of the loop. Figure 5 shows zero indicated signal when the axis is facing the house.

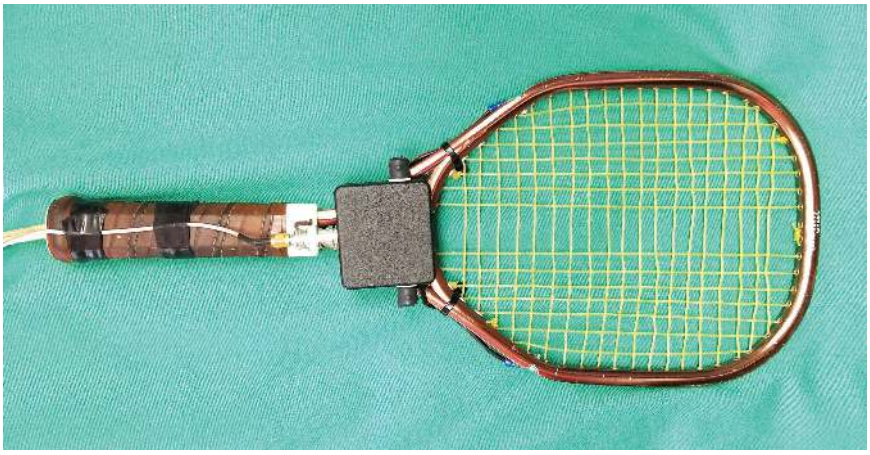


Figure 6 — The loop antenna and amplifier mount constructed from a repurposed racquetball racquet.

Loop antennas have a null on the axis in both directions. So, if you are standing in the middle of the street between two houses, you would not be able to determine which house is the source of RFI. To remedy this, start walking along the street from about 100 feet away from the house, to in front of the house, to 100 feet beyond the house. Keep rotating the loop (change its azimuth) and notice the direction that produces a null as you walk. In addition to the indicated signal strength, the volume of the audio also indicates signal strength and you will be able to clearly hear the dip in signal strength as you rotate the loop's null through the direction of the signal source. The direction of the null will stay pointed at the source of RFI as you walk. Keeping the loop about 1 foot away from your body may produce a deeper null. Also, it is normal to see some variations in the direction of the null as you walk due to reflections. I hope this material will help you reduce your RFI levels.

For extra credit, I turn a racquet into a loop and an attachment for the amplifier. Figure 6 shows what was my former racquetball racquet. I cut away a portion of the frame that would have shorted out the loop. There is no connection across the metal frame in the handle.

Photos by the author.

Randy Standke, KQ6RS, has been a licensed Amateur Radio operator since 1972. He holds a MSEE degree, has authored 10 patents, and has over 40 years experience with antennas and RF systems for military and commercial applications. You can reach Randy at **r55stan@gmail.com**.

For updates to this article, see the *QST* Feedback page at www.arrl.org/feedback.

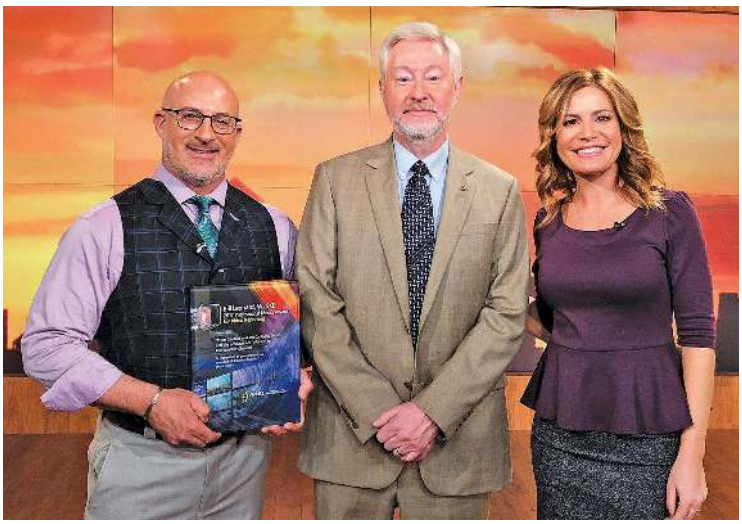
Strays

Live on The Weather Channel

ARRL Southeastern Division Director Greg Sarratt, W4OZK, travelled to Atlanta on Friday, February 15, to make a live, on-air presentation of the ARRL's 2017 Bill Leonard, W2SKE, Professional Media Award for Video Reporting to The Weather Channel's Jim Cantore and Jen Carfagno, of The Weather Channel's AMHQ program.

The award was given to The Weather Channel's AMHQ program co-hosts in recognition of their interview of former ARRL Emergency Preparedness Manager Mike Corey, KI1U, about the organization's efforts to assist the American Red Cross with the response to the devastation caused by Hurricane Maria in Puerto Rico.

Sarratt also presented The Weather Channel co-hosts with a $250 check, as part of the award. The award check has been donated by The Weather Channel to the American Red Cross.



Jim Cantore (left) and Jen Carfagno (right), co-hosts of The Weather Channel's AMHQ program, were presented with ARRL's 2017 Bill Leonard, W2SKE, Professional Media Award for Video Reporting by ARRL Southeastern Division Director Greg Sarratt, W4OZK (center).