

W9JOZ

Volume 11, Issue 5

May 2021

**Next Meeting is on the Air
May 20th at 7 pm.
145.410 repeater**



Meetings are at the Henry F. Schricker Library on the third Thursday of each month, with the exception of December.

The library is located on west Culver Road, two blocks west of Highway 35.



Are you on the air?

Library Door locks at 7:00 p.m. so if you are late, knock loud.

**Still no in-person meetings.
But, we do meet on the
repeater.**

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Events

**Meeting is on the air, May 20th at 7:00 pm
on the 145.410 repeater**

Birthdays

May 6 - Linda, KC8PKY

May 24 - Bart, KC9FQA

If your birthday has not been listed, it is because I do not have the date for it. If you would like it to be included in a newsletter, please email me the date. Thanks w3ml@w3ml.com

**Starke County Amateur Radio Club Weekly 2 Meter Net is
on every Saturday at 8:00 p.m. Central time.**

DAY OF WEEK: Saturday 8:00 p.m. Central time

HOST: KN9OX Repeater

FREQUENCY: 145.410 - 600

PL TONE: 131.8

New Items Listed From Last Collection of K9QA Gear.

See all the For Sale Items at

<http://www.w9joz.org/forsale.htm>

There are a lot of them there. Updated regularly.

See the For Sale Page on the Club website. If you have items to sell email me a list with prices and contact information.

***** There are several items on Doc's SK Listing that should be on someone's want list. NEW PRICES! NEW ITEMS!**

If you see item on there that you are interested in, contact me and we can work out deal on it.

Notice for 2021

Even though we are not meeting in person at this time, it is imperative that we keep the Club together and active. We have commitments that the dues are used to pay.

There is a 2 meter net every Saturday at 8 p.m. on the 145.410 repeater. President David, KC8OBH also runs a net on the repeater on the evening of the Club Meeting at 7 p.m.

****** Dues for 2021 remain at only \$12.00 a year. ******

Paid Members for 2021:

Bill, K9BZM
Richard, K9ILU
Chester, KA9FAW
Nita, KC9PM
Tom, W9QN
Levi, WB9CAO
Wayne, K9KFT
Steve, KB9GPW
Brian, W9BPD
Ed, KD9MVW

David, KC8OBH
John, W3ML
Bart, KC9FQA
Lenny, KQ9A
Jack, WA9ZTP
Bob, KD9IHY
Jim, WB9UAR
Paul, N9QYK
Linda, KC8PKY

Please stay a member and pay your dues for 2021. Hopefully, before too long we will be able to meet again at the library.

Dues may be mailed to John Poindexter 204 South Main St. Knox, IN 46534
Checks can be made out to the Starke County Amateur Radio Club. \$12.00

If you want to pay via PayPal, you will need to send it as Friends and Family so no fees are taken out. \$12.00

Are you ready for the new RF exposure evaluation regulations?

By Dan Romanchik, KB6NU

On Tuesday, April 27, Dan, W1DAN, ARRL Eastern Massachusetts Section Technical Coordinator, gave a Zoom presentation on the latest FCC regulations on RF exposure evaluation. These are spelled out in FCC-1926A1 (<https://www.fcc.gov/document/fcc-maintains-current-rf-exposure-safety-standards>), "Proposed Changes in the Commission's Rules Regarding Human Exposure to Radiofrequency Electromagnetic Fields; Reassessment of Federal Communications Commission Radiofrequency Exposure Limits and Policies." The document is as long as the title might suggest—159 pages—but W1DAN boiled it down, focusing on what these changes mean for radio amateurs.

A recording of the presentation can be viewed by going to https://drive.google.com/drive/folders/1_qIGZhHyMrha-axJt87Dcu0UZuJO0t8F.

After explaining how RF exposure can be harmful, Dan explained how the rules are changing: The biggest change, he notes, is that amateur radio's categorical exclusion has been eliminated. What this means is that now every radio amateur will have to perform an RF exposure evaluation of their stations. This now includes mobile and portable stations, including HTs, SOTA/POTA stations, and Field Day and special event stations.

He noted that you must be able to prove that your station is safe. This includes not only performing the evaluation, but also documenting these evaluations, should this data be requested by FCC personnel.

One thing that's not changing are the maximum permissible exposure (MPE) limits. These are spelled out in FCC OET Bulletin 65 (https://transition.fcc.gov/Bureaus/Engineering_Technology/Documents/bulletins/oet65/oet65.pdf), "Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields." The FCC published this document in August 1997, but it's still the Bible when it comes to RF exposure. If you don't have a copy, or have never taken a look at it, you really should do so.

Be careful, though, when reading it. It contains a table (Table 1 on p. 21) that contains a list of output powers at various frequencies. If your station exceeded those limits, then you were required to perform an RF evaluation. Now, however, all amateurs (and other radio services, for that matter) must perform RF exposure evaluations if their output power exceeds 1 mW. We are no longer categorically excluded from performing these evaluations.

OET Bulletin 65 goes on to give guidance on how to calculate or measure exposure levels. Explaining how to do this is outside the scope of this article, but again, you'll want to refer to the bulletin for more information.

Besides the elimination of the categorical exclusion for amateur radio stations, what else is new is the dates on which amateur radio stations must perform evaluations. They are:

- ⑩ **May 3, 2021(!)** for new and modified stations
- ⑩ May 3, 2023 for stations that complied under the old rules.

Having said all that, the ARRL's RF Exposure page (<http://www.arrl.org/rf-exposure>) has a lot of resources to help you understand this topic and perform your own RF exposure evaluations:

- ⑩ An RF-exposure FAQ (<http://www.arrl.org/files/file/Technology/RFsafetyCommittee/RFXFAQ.pdf>) to help hams understand the new rules.
- ⑩ "Learning to Live with RF Safety" (http://www.arrl.org/files/file/protected/Group/Members/Technology/tis/info/pdf/QST_Mar_2009_p70-71.pdf)." *QST* March 2009 pp. 70-71.
- ⑩ RF Safety at Field Day (<http://www.arrl.org/files/file/Technology/tis/info/pdf/9906048.pdf>) *QST*, June 1999, pp. 48-51. A case study of Field Day with NSRC in a public park
- ⑩ RF Exposure Station Evaluation and Exemption Worksheets (http://www.arrl.org/files/file/Technology/tis/info/pdf/rfex1_2.pdf)
- ⑩ *RF Exposure and You* (<http://www.arrl.org/files/file/Technology/RFsafetyCommittee/RF%20Exposure%20and%20You.pdf>) This 8 Mbyte PDF file contains the text of the entire book by Ed Hare, W1RFI.
- ⑩ Chapter 5 References (<http://www.arrl.org/files/file/Technology/tis/info/pdf/RF%20Exposure%20Chapter%205.pdf>) needed for filling out worksheet.

There are also links to FCC web pages with information on RF exposure.

I'm sure we'll all be hearing more about this in the days ahead. Hopefully, someone will come out with a simple way to do the modeling or make the calculations. As always, play safe.

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Dan Romanchik, KB6NU, is the author of the KB6NU amateur radio blog (KB6NU.Com), the "No Nonsense" amateur radio license study guides (<https://KB6NU.Com/study-guides/>), and often appears on the ICQPodcast (<https://icqpodcast.com>). When he's not RF exposure evaluations, he teaches online ham radio classes and operates CW on the low end of the HF bands.

Contest University and Propagation Summit:

Registration is now OPEN for Virtual Contest University 2021 on [May 20](#), 2021 and for 2021 Hamvention Forums on [May 21](#), 2021. Both events are being held live through Zoom Webinar and are free. You must register to be included in the webinars. You need to register for each event (2) separately. Four Icom radios will be given away at each (2) virtual events (8 radios total). The radio drawing times are random and you must be registered and on Zoom present at the time of the drawing to win. Both events (2) will be recorded and available on YouTube at the conclusion of the events (2).

For more information please go to:

<https://www.contestuniversity.com/>

<https://hamvention.org/forums-2021/>

73,

Tim K3LR, Contest University Chairman

Russian Robinson Club Announces Activation of Rare IOTA Islands in the Aleutians

05/03/2021

The Russian Robinson Club ([RRC](#)) has resumed its plans to activate rare Kiska Island (IOTA NA-070) and Adak Island (IOTA NA-039) in Alaska's Aleutian Islands chain in July for Islands on the Air (IOTA) enthusiasts. Plans to activate these islands in 2020 were called off because of COVID-19 concerns.

The uninhabited Kiska Island (52.06° N, 177.57° E) lies in the North Pacific's treacherous Bering Sea, which RRC calls one of the most intense patches of ocean on Earth and where strong winds, freezing temperatures, and icy water are the norm. The island also features the prominent conical Kiska volcano. Kiska Island is a National Historic Landmark and part of the Aleutian Islands World War II National Monument and the Alaska Maritime National Wildlife Refuge (AMNWR). Permission to visit is required from both Alaska's Maritime National Wildlife Refuge and the US Fish and Wildlife Service.

The KL7RRC team plans to have a minimum of two stations on the air on 40 – 6 meters, SSB, CW, and FT8. Operators will place special emphasis on the difficult trans-polar path to Europe.

The 56-foot aluminum sailing vessel *Seal* will make the 1,000-mile journey along the Aleutians to Kiska with a stop at Dutch Harbor to pick up Tim, NL8F, and the gear sent in advance to his location. The team will continue sailing west to Adak Island, where some team members will activate Adak Island on June 30 – July 3. The SV *Seal* will pick up the entire crew there, which will have flown in by July 3. Then, they hope to arrive at Kiska and be on the air as KL7RCC on July 7 – 12, before the return sail to Adak and flights home. Additional KL7RRC activity may take place from Adak July 14 – 16.

Donations are welcome. QSLs for KL7RRC (Kiska Island NA-070) and KL7RRC (Adak Island NA-039) are via N7RO. All donors will receive direct QSLs.

A slot is open for a fifth operator. Contact team leader [Yuri, N3QQ](#) if interested.

Updates will be posted on the Russian Robinson Club website. — *Thanks to Hal Turley, W8HC, via [The Daily DX](#)*

Repairing the lightning rods on Christ the Redeemer Statue in Rio de Janeiro.

Click here and hang on tight: [What A View](#)

72nd International DX Convention

For those that enjoy DXing, or want to learn about DXing, registration (free) is now open for the 72nd International DX Convention. This is what was previously known as the Visalia DX Convention. This year's event will be conducted via Zoom (surprise!). Sessions run from 1400 - 2300 UTC (10:00 am to 7:00 pm EDT) on both [May 15](#) and 16. Registration for this free event is open now. Go to <http://dxconvention.com/index.html> to register and see the program line up. There will also be some impressive door prizes awarded at two drawings each day.

NCDXF/IARU DX Beacons

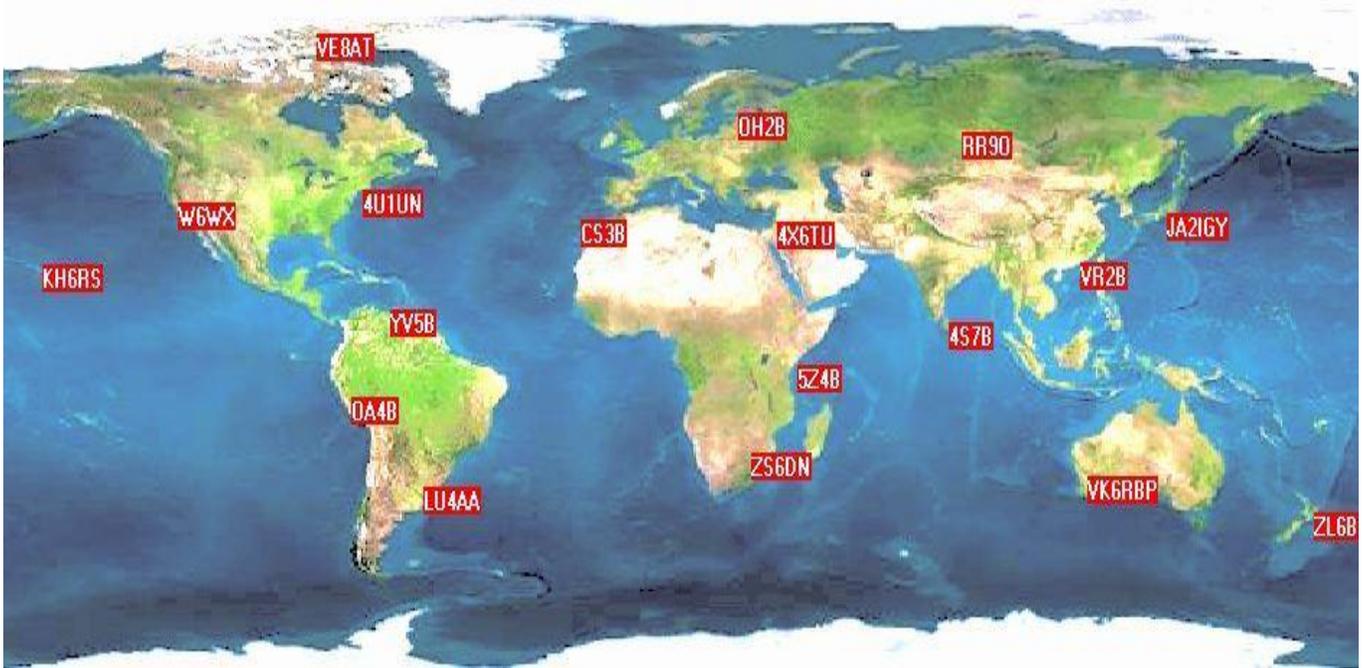
By

Ned Stearns-AA7A, and Kevin Rowett-K6TD

Our goal for this article is to cover the Version 2 (V2) update program to the DX beacons, additions to the beacon program, and the development of a new antenna, well suited for the DX beacons, both transmitting and receiving, and for, ahem, FT8.

The DX beacons are familiar to most DXers. They are a group of 18 stations, transmitting a CW call sign and tones on all the high bands 20 Meters on up. Through a lot of international work, the frequency in each band has been licensed to operate automatic, unattended beacons. These frequencies generally remain clear of other signals. The DX beacons all share the frequency on each band using a timing scheme such that only one DX beacon is transmitting on the frequency at a time, worldwide.

The DX beacons were created on the idea to help a DXer get an idea when a band is open in a specific direction. Turn your radio on, pick a beacon frequency (i.e., 14.100 MHz), point your Yagi where you want to work, and copy the CW signals for the beacons heard. You will hear the CW call sign of the beacon at 22 WPM, then a series of four dashes, one second in duration, at power levels of 100 watts, 10 watts, 1 watt and 1/0th of a watt. You're observed S-meter reading will give you an idea of DX signals you might hear in that direction.



Version 2 program: The DX beacon stations are operated by volunteers — which could be an individual operator or a club — and the equipment at each site consists of an antenna, transmit radio, custom controller, power supply and a GPS receiver. These units were first distributed and installed in 1995, and 20 years later, the equipment reached the end of its life. In 2013, we began the V2 program.

A new custom controller was designed, based on an Arduino Leonardo MCU board. The custom shield contained circuits to interface to ICOM CI-V, power, display, and a 12-channel GPS receiver.

The remainder of the equipment consists of an Astron PSU, an ICOM IC-7200, a MA5V antenna, a GPS timing standard antenna plus various cables and coaxes. The units were tested, burned in, and shipping commenced to each of the 18 locations.

As of this writing, the V2 units have been installed at 15 of the 18 locations, with shipments completed to 17. The last location, RR90, will complete shortly.

When the V2 program was started, we looked at alternatives, such as WSPR (FT8 hadn't been invented), but all the alternatives required specialized software to hear, decode and track the signals. CW is the "universal" mode, easy to decode with just a radio, yet software can decode and track. Hence, the V2 program was designed to replace failing hardware, yet keep the same program and concept.

The development of V2 involved a team of operators: Leigh Klotz, WA5ZNU; Lance Ginner, K6GSJ; Tom Berson, ND2T; Peter Jennings, VE3SUN; Charlie Mason, W4NJK; Walt Wilson, N6XG, and Don Greenbaum, N1DG, along with the authors, Ned Stearns, AA7A and Kevin Rowett, K6TD.

One particular note is the support from ICOM and Ray Novak, N9JV. Ray was able to locate plenty of used IC-7200 radios, have them refurbished and supplied to the program at no cost. This was especially important and helpful, as we'd designed the V2 program around the IC-7200, and then ICOM discontinued the product in favor of the IC-7300. This program couldn't have gone forward without Ray's support and efforts. Thanks Ray!

N6XG took on the task of final testing finished units, and the logistics of V2 packages to existing ops. This involved considerable coordination with the ops, learning their issues and shipping communications equipment into some countries. Walt excelled at getting each site running.

DX beacons sites and ops: Each operator has taken great care of their beacons, doing a significant amount of repair and upkeep as the beacons aged, or were affected by environmental issues, such as antenna corrosion and lightning strikes. We also had some problems with the V2 controller, but local operators often jumped in and helped us diagnose or even repair the issue. Ruwan Abeykoon, 4S6RUA, was able to repair a V2 controller failure; Marcelo Duca, LU1AET, completely rebuilt the software, converting it to work with a different model of ICOM radio after the original 7200 failed and couldn't be repaired and there was no way to ship in a new radio. Frank Schneider, ZS6GE, repaired the LCD for the ZS6DN beacon, and Thomas Worthington, NH6Y and Alan Maenchen, AD6E, adopted KH6RS when the prior operator retired and moved off Oahu

If it weren't for the volunteer operators the beacons would not be on the air, nor would they stay on the air. The 4U1UN beacon has been off the air since January 2020, due to an antenna failure, and COVID-19 has made it impossible to gain access to that site. A new V2 package was shipped to the 5Z4B in 2019, but the DX beacons team has lost all contact with the operator for this beacon. If you can help, please contact www.ncdxf.org/beacons.

Monitoring tools and resources: Here is a list of monitoring tools available for the beacons. Intended for spotting DX stations is www.reversebeacon.net. It is also used extensively to spot CW and RTTY stations during contests, and has a menu dedicated to spotting for the DX beacons. Using the Spot Analysis tool, you can learn info about band openings. VE3SUN has written several tools for the DX beacons (visit ve3sun.com).

KiwiSDR is a wide band HF monitoring receiver with over 500 sites deployed. Peter wrote an extension for the KiwiSDR webpage, providing direct timing and monitoring of DX beacons, at a specific receiver. Peter has gone on to organize a webpage that is very helpful in tracking where the DX beacons are heard (ve3sun.com/KiwiSDR).

All of these programs provide real time audio reception of DX beacons at the location of the receiver. Much can be learned about propagation at your location, by setting up a FAROS-based monitoring station. Peter also has a webpage providing step-by-step instructions to create a monitoring station and post the info to a webpage.

FAROS software was created by Alex Shovkoplyas, VE3NEA, and it is still available; however, Alex has not updated the software to work on WIN10. The application seems to work on WIN10 but may not survive some future update to the operating system.

Antenna development: An extensive search for alternatives to the beacon network's standard MA5V antenna took place in 2017. Slow, steady degradation of electrical and mechanical features in deployed antennas have been observed in many of the installations. Replacement antennas and parts are no longer available, so the NCDXF beacon team was tasked to find, or create, replacement antennas, with the challenge being to provide a reliable, maintainable antenna that can be shipped commercially, and will also provide acceptable technical performance that supports the beacon network's mission.

Following the exploration of alternatives, AA7A created a unique antenna concept called the Dual Band Discone (DBD) that appears to meet all of the requirements for the beacon network. The footprint of the antenna is slightly larger than the MA5V, but the electrical bandwidth is extremely wide, and the radiation pattern is superior to that of a trapped vertical. The challenge of making a single antenna that has both good SWR and low angle radiation pattern over a 2:1 frequency range (e.g., 14 to 28 MHz) is extremely high. A single discone antenna will present a good SWR over an octave frequency range but the radiation pattern at the high end is very poor.

The novelty of the DBD approach is that there are essentially two discone antennas in the same location fed by a single feedline. One of the two discones essentially covers the 20 Meter band, while the second covers

the 17M through 10M bands. This approach provides good SWR on all the beacon network bands while also producing very good, low-angle radiation patterns.

A prototype DBD was built in the AA7A antenna lab and tested on a small antenna range. Side-by-side comparisons of the DBD prototype and the last MA5V antenna in the inventory were performed using WSPR transmissions conducted over a time span of several weeks. The results of received signals on all the HF bands using data collected on WSPRNet indicated that the DBD's performance was consistently better than the MA5V and the favorable performance difference of the DBD got better on the higher HF bands. The initial DBD prototype was delivered to the W6WX beacon site in November 2018 and, for a period of time, was operated with the prototype. The signal strength comparisons between the previous MA5V vertical were compared to those using the DBD and after only a short time it was quite clear that the DBD was a superior antenna. Soon after the installation of the DBD at W6WX, a strong winter storm with 100 mph winds blew through the site and demolished the MA6V; the DBD was unaffected. As a result, the decision was made in February 2019 to operate this beacon site with the DBD and move forward with the development of a production antenna drawing package.

Five production DBD antennas have been built and are ready to ship. Clearly, this antenna requires some installation techniques that are different than those for a small trapped vertical, but the performance and reliability of the antenna will likely make the investment in time to install this antenna at remote beacon sites worth the effort.



Dual Band Discone Antenna

The future: The value of the DX beacons is in using the beacon signal to learn about current propagation and how it is changing (are signals building or fading?) compared to the recent past. This is especially useful at the operator's location.

Now that the V2 program is well on its way to completion and improvements to the antennas are in progress, the DX beacons team is moving on to providing direct aids for the use of an operator at each location.

The most helpful is a real time graph showing signal strength, per band, over a period of time. FAROS, with a local DX beacon receiver is the premier tool for that information. These days, most Ops would prefer to get relevant information via a webpage.

Our team is looking at regional, or local receiver options, methods and software for data collection, and access to the information via a webserver. One of the areas of investigation is the work done by HamSci —

especially the personal space WX station — as a local receiver. The team will also join the upcoming HamSCi Workshop on 19-20 March.

Cycle 25 is upon us. One NCAR solar scientist is predicting a cycle like Cycle 19 in 1959. HF propagation models, including VOACAP and ITU tell us what might happen. Knowing today, and last week, locally can also provide some insight to when and how to work those rare DXpeditions that should start to peak about the time Cycle 25 peaks.

Over the next year, look for the DX beacons to provide info about what has actually happened on the bands.

Ed Stearns-AA7A, is an avid Dxer and a retired electrical engineer.. He has operated as AA7A/VP2A, 9G5NS, 3B9R op, T32R op, AA7A/KH5, AA7A/KH5K, K5K (KH5K) op, ZF2ES, TZ6NS, TZ5A op, 3X5A op, 9L7NS, 9L5A op, 9L5VT op, EL2A op, EL2ES, KH2/AA7A, 5B/AA7A, P3F op, 9K2HN op, C6ANS, C6ATA op, VP8STI (South Sandwich) op, VP8SGI (South Georgia) op, 6Y5AZ, PZ5Z (op), KH1/KH7Z (op). He resides in Scottsdale, AZ.

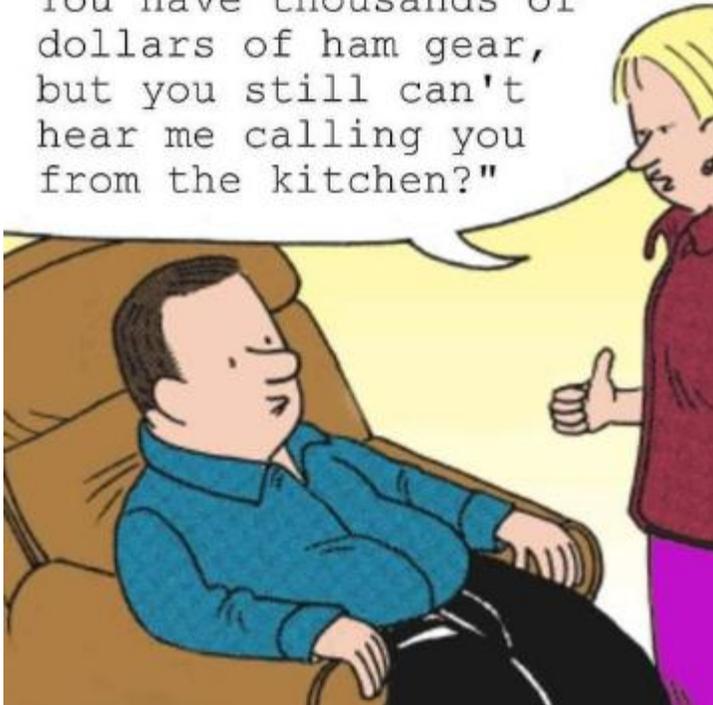
Kevin Rowett-K6TD, is a design engineer for Elecraft and an avid Dxer. He has operated as K4M - Midway 2009, C82DX - Mozambique 2013, TX3X 2015 -Chesterfield Island and KH1/KH7Z - Baker Island. He resides in Cupertino, CA.

This article is published with the permission of the Northern California DX Foundation (NCDF). The NCDXF relies upon the generosity of contributors to fund various projects including Dxpeditons and the Beacon Network.

They ask you to consider making an annual contribution of US\$50 or its equivalent in foreign currency. If \$50 is not within your budget, then please give what other amount you can. Naturally, they welcome contributions in excess of \$50! NCDXF is an organization described in Section 501(c)(3) of the Internal Revenue Code and all contributions are tax-deductible to the extent permitted by law for U.S. taxpayers. Send your contribution to: NCDXF, PO Box 2012, Cupertino, CA 95015-2012, USA. You may also contribute and order supplies online via their secure server, visit www.ncdxf.org/donate.

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"Let me get this straight:
You have thousands of
dollars of ham gear,
but you still can't
hear me calling you
from the kitchen?"



If you have something for the newsletter, please send it to me before the 25th of the month.

See you at a meeting.

Sometime in the Future

73

John, W3ML

