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Amateur Radio

COMMUNICATIONS & TECHNOLOGY

JANUARY 2018



Morse Code Mini Special!

- Hearing Weak CW Signals Better, p. 16
- The \$10 Keyer, p. 20
- A Most Unusual Morse Key, p. 28

Results, 2017 CQ WW VHF Contest, p. 36

On the Cover: Neil Foster, N4FN, of Marietta, Georgia, with "A Most Unusual Morse Key," one designed for use in radio silence! Story on page 28.



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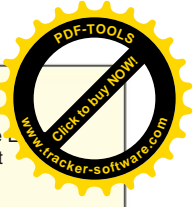
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announcements

JANUARY 2018

BROOKVILLE, NEW YORK — The Ham Radio University Amateur Radio Club, Radio Central Amateur Radio Club, and WCWP will hold the 19th Annual Ham Radio University and 2018 ARRL New York City / Long Island Section Convention on Saturday, January 6 at the Hillwood Commons Student Center, 720 Northern Boulevard. Email: <info@hamradiouniversity.org>. Website: <http://hamradiouniversity.org>. Talk-in 146.85- (PL 136.5). VE exams, special event station: W2HRU.

WAUKESHA, WISCONSIN — The West Allis Radio Amateur Club will hold the 46th Annual Midwinter Swapfest on Saturday, January 6 at the Waukesha County Expo Arena, 1000 Northview Road. Contact: Erwin, W19EV, (262) 271-0630. Email: <wi9ev@wi.rr.com>. Website: <www.warac.org>. VE exams.

WHITE PLAINS, TENNESSEE — The Lakeway Amateur Radio Club will hold its 26th Annual Hamfest and "Builders Fest" on Saturday, January 6 at Walters State Great Smokey Mountains Expo Center, 1615 Pavilion Drive. Email: <lakewayarcboard@gmail.com> or <gapritikin4128@aol.com>. Website: <www.morristownhamfest.com>. VE exams.

GREENWOOD, SOUTH CAROLINA — The Greenwood Amateur Radio Society will hold the Greenwood Hamfest on Saturday, January 13 at Piedmont Technical College-James Medford Family Event Center, 620 North Emerald Road. Contact: Tedd Davison, AI4WN, <ai4wn@arrl.net> or <wj4x@arrl.net>. Website: <www.w4gwd>. Talk-in 147.165+ (PL 107.2) or 443.900+ (PL 107.2). VE exams.

PHOENIX, ARIZONA — The Thunderbird Amateur Radio Club will hold the Thunderbird Hamfest 2018 on Saturday, January 13 at the Northwest Community Church, 16615 N. 43rd Avenue. Email: <hamfest@w7bc.org>. Website: <www.w7bc.org>. Talk-in 146.700+ (PL 162.2) or 446.150- (PL 100). VE exams, DXCC card checking.

SCHERTZ, TEXAS — The San Antonio Radio Club will hold the 2018 San Antonio Radio Fiesta on Saturday, January 13 at the Schertz Civic Center, 1400 Schertz Parkway. Contact: J.C. Smith, N5RXS, (210) 522-6167. Email: <n5rxs@gmail.com>. Website: <http://w5sc.org>. VE exams and card checking.

NELSONVILLE, OHIO — The Sunday Creek Amateur Radio Federation will hold its 22nd Annual Hamfest on Sunday, January 14 at the Tri-County Career Center, 15676 State Route 691. Contact: Jeremy Duncan, KC8QDQ, (740) 767-2554. Email: <duncan30@yahoo.com>. Website: <www.qrz.com/db/kc8aav>. Talk-in 147.150+ VE exams.

FOREST HILL, TEXAS — The Cowtown Amateur Radio Club will hold the 10th Annual Cowtown Hamfest and 2018 ARRL North Texas Section Convention on Friday, January 19 and Saturday, January 20 at the Forest Hill Civic & Convention Center, 6901 Wichita Street. Phone: (605) 269-8696. Email: <info@cowtownhamfest.com>. Website: <www.cowtownhamfest.com>. Talk-in 146.94 (PL 110.9). VE exams.

FORT MEYERS, FLORIDA — The Fort Myers Amateur Radio Club will hold the Southwest Florida Hamfest 2018 on Friday, January 19 and Saturday, January 20 at Riverside Church, 8660 Daniels Parkway. Contact: FMARC, P.O. Box 061183, Fort Myers, FL 33906-1183. Email: <pio@fmarc.net>. Website: <www.swflhamfest.info>. Talk-in 147.345 (PL 136.5). VE exams, ARRL card checking.

HAMMOND, LOUISIANA — The Southeast Louisiana Amateur Radio Club will hold the 37th Annual Hammond Hamfest on Saturday, January 20 at the Pennington Student Activity Center, 1350 North General Pershing Street. Contact: Tyrone Burns, N5XES, <n5xes@arrl.net>. Website: <www.selarc.org>. Talk-in 147.000- (PL 107.2), 145.130- (PL 107.2), or 444.250+ (PL 107.2). VE exams.

QUARTZSITE, ARIZONA — The 21st Annual QuartzFest will be held from Sunday, January 21 through Saturday, January 27 at Bureau of Land Management property off Highway 95. Website: <www.quartzfest.org>. VE exams.

ST. CHARLES, ILLINOIS — The Wheaton Community Radio Amateurs will hold the WRCA 51st Annual Mid-Winter Hamfest on Sunday, January 21 at the Kane County Fairgrounds Expo Center, 525 S. Randall Road. Contact: WCRA, P.O. Box QSL, Wheaton, IL 60187-1055. Phone: (630) 923-5447. Email: <info@w9ccu.org>. Website: <www.w9ccu.org>. Talk-in 145.31- (PL 107.2). VE exams.

JACKSON, MISSISSIPPI — The Jackson Amateur Radio Club will hold the Capital City Hamfest and 2018 ARRL Delta Division Convention on Friday, January 26 and Saturday, January 27 at the Jackson MS Trademart, 1207 Mississippi Street. Contact: Gary Young, K5GYC, <k5gyc@att.net> or <hamfest@msham.org>. Website: <http://hamfest.msham.org>. Talk-in 146.16+ or 146.34+. VE exams, DXCC / WAS / VUCC card checking.

COLLINSVILLE, ILLINOIS — The St. Louis & Suburban Radio Club will hold Winterfest 2018 on Saturday, January 27 at the Gateway Center, One Gateway Drive. Contact: Rebecca Carroll, KC9CJ, (314) 496-7271. Email: <kc9cjr@srlsrc.org>. Website: <http://winterfest.srlsrc.org>. Talk-in 146.970 (PL 141.3). VE exams, DXCC / WAS / VUCC card checking.

ODENTON, MARYLAND — The Maryland Mobileers Amateur Radio Club will hold the MMARC 2018 Post Holiday Hamfest on Sunday, January 28 at the Odenton Volunteer Fire Department, 1425 Annapolis Road. Contact: Frank, N3SEO, (410) 647-3335. Email: <n3seo@aol.com>. Website: <http://bit.ly/2y4rX3w>. Talk-in 146.805- (PL 107.2). VE exams, card checking.

FEBRUARY

NEGAUNEE, MICHIGAN — The Hiawatha Amateur Radio Association will hold its annual Swap Meet on Saturday, February 3 at the Negaunee Township Hall, 42 Highway M-35. Contact: John Veight (906) 458-1708. Email: <carczar52@gmail.com>. Talk-in 147.27 (PL 100).

NORTH CHARLESTON, SOUTH CAROLINA — The Charleston Amateur Radio Society will hold the 45th Annual Charleston Hamfest and 2018 ARRL South Carolina State Convention on Saturday, February 3 at the Armory Park Community Center, 5000 Lackawanna Boulevard. Contact: Steven Lamendola, KE4THX, (336) 740-4382. Email: <steven.lamendola@gmail.com>. Talk-in 146.790-. VE exams.

RICHMOND, VIRGINIA — The Richmond Amateur Telecommunications Society will hold Frostfest 2018 on Saturday, February 3 at the Richmond Raceway Complex, 600 East Laburnum Avenue. Contact: RATS/Frostfest, P.O. Box 70613, Henrico, VA 23255. Website: <www.frostfest.com>. Talk-in 146.880- (PL 74.4). VE exams.

WORLDWIDE — The 2018 AM Rally is scheduled for 0000 UTC, Saturday, February 3 through 0700 UTC, Monday February 5. Website: <www.amrally.com>.

ORLANDO, FLORIDA — The Orlando Amateur Radio Club will hold the Orlando HamCation and 2018 Florida State Convention from February 9 through Sunday, February 11 at the Central Florida Fairgrounds, 4603 West Colonial Drive. Phone: (407) 841-0874 or (800) 214-7541. Email: <info@hamcation.com>. Website: <www.hamcation.com>. Talk-in 146.760- (PL 103.5), 146.820- (D-STAR), or 145.015- (PL 103.5). VE exams, special event station: K1AA.

YUMA, ARIZONA — The Yuma Amateur Radio Hamfest Organization will hold the Yuma Hamfest and 2018 ARRL Arizona State Convention on February 16 and Saturday, February 17 at the Yuma County Fairgrounds, 2520 East 32nd Street. Email: <info@yumahamfest.org>. Website: <www.yumahamfest.org>. Talk-in 146.780- (PL 103.5). VE exams, DXCC card checking, transmitter hunt.

BRIGHTON, COLORADO — The Aurora Repeater Association, the Cherry Creek Young Amateur Radio Club and Rocky Mountain Ham Radio will hold the ARA Swapfest on Sunday, February 18 at the Adams County Fairgrounds, 9755 Henderson Road. Contact: Wayne Heinen, N0POH, (303) 699-6335. Email: <info@n0ara.org>. Website: <http://n0ara.org>. Talk-in 147.15+ (PL 100). VE exams.

LIVONIA, MICHIGAN — The Livonia Amateur Radio Club will hold its 48th Annual Swap-N-Shop on Sunday, February 18 at the Civic Park Senior Center, 15218 Farmington Road. Contact: Livonia ARC, P.O. Box 51532, Livonia, MI 48151-0532. Phone: (734) 941-5043. Email: <k8uns@arrl.net>. Website: <www.livoniaarc.com>. Talk-in 145.35 (PL 100).

WINTERHAVEN, FLORIDA — The ARRL West Central Florida Section will hold its 4th Annual TECHCON on Friday, February 23 and Saturday, February 24 at the Polk County Emergency Operations Center on County Road 540. Website: <http://arrlwcfl.org>.

BIG FLATS, NEW YORK — The KA2LIM Contest Site will hold its Winter Hamfest on Saturday, February 24 at the Big Flats American Legion, 45 Olcott Road S. Phone: (607) 739-7305. Website: <www.ka2lim.com>. VE exams.

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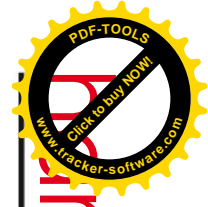


CQ Communications, Inc.
17 West John Street
Hicksville, NY 11801 USA.

CQ Amateur Radio (ISSN 0007-893X) Volume 74, No. 1. Published monthly by CQ Communications, Inc., 17 West John Street, Hicksville, NY 11801, Telephone 516-681-2922. E-mail: <cq@cq-amateur-radio.com>. Fax 516-681-2926. Web site: <www.cq-amateur-radio.com>. Periodicals Postage Paid at Hicksville, NY 11801 and at additional mailing offices. Subscription prices (all in U.S. dollars): Domestic one year \$38.95, two years \$70.95, three years \$102.95; Canada/Mexico one year \$51.95, two years \$96.95, three years \$138.95; Foreign Air Post one year \$63.95, two years \$120.95, three years \$177.95. Single copy \$6.99. U.S. Government Agencies: Subscriptions to CQ are available to agencies of the United States government including military services, only on a cash with order basis. Requests for quotations, bids, contracts, etc. will be refused and will not be returned or processed. Entire contents copyrighted 2017 by CQ Communications, Inc. CQ does not assume responsibility for unsolicited manuscripts. Allow six weeks for change of address.

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POSTMASTER: Send address changes to:
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ARRL Board Censures Director

ARRL Southwestern Division Director Dick Longtin, N6AA, has been publicly censured by the League's board of directors for telling members that he opposes a board policy that prohibits directors from criticizing board policies. Last January, the board adopted a code of conduct for its members that included a prohibition on speaking publicly about votes on issues before the board and on criticizing board actions. According to the ARRL, Norton repeatedly violated this and other provisions of the code, even after being warned to stop. His actions, the board ruled, drew "the Board's collective decision making into disrepute" and "caused harm to the League." The resolution stated that "Mr. Norton is admonished by the Board that no further, similar behavior will be tolerated." [See this month's "Zero Bias" editorial on page 10 for CQ comment on this action.]

Federal Appeals Court Affirms Dismissal of W3JY's Suit Against ARRL

The U.S. Court of Appeals for the Third Circuit has upheld a District Court ruling that threw out a lawsuit against the ARRL by Joe Ames, W3JY, the former Eastern Area Manager for the National Traffic System and former Eastern Pennsylvania Section Manager. Ames had sued the League for defamation after it removed him from his NTS post for allegedly making commitments on behalf of the ARRL's message-handling system to the Federal Emergency Management Agency (FEMA) without authorization, and posted an article explaining the action on its website.

According to "Law360," a federal judge dismissed Ames's suit last summer on the basis that the statements in the article were "true on their face." Ames appealed and the third circuit agreed with the district court judge in November, noting that "(t)ruth is an affirmative defense to a defamation claim under Pennsylvania law."

FCC Chairman Thanks Hams for Relief Work in Puerto Rico

Amateur radio operators were among the many people and groups praised and thanked for their help by FCC Chairman Ajit Pai during a two-day visit to Puerto Rico last fall. According to *RadioWorld*, Pai came to the U.S. territory for a first-hand look at recovery efforts still underway more than a month after the island was ravaged by Hurricane Maria. According to the report, "Pai praised the efforts of the individuals and companies that have been a part of the recovery effort, including amateur radio operators, broadcasters, cable operators, fixed wireless companies, wireline carriers, and mobile providers." The hurricane wiped out virtually all of Puerto Rico's electrical and telecommunications infrastructure.

FCC Denies Reconsideration of Petition for Greater Advanced Class Privileges

The FCC has turned down a petition for reconsideration filed by Jeffrey Siegell, WB2YRL, after it denied his original petition to grant Extra Class CW privileges to Advanced Class license holders. The Virginia amateur's logic behind the request was that all holders of Advanced Class licenses (which have not been issued since 1999 but may be renewed) have passed Morse code exams, while Extra Class licensees no longer need to prove code proficiency in order to earn all amateur operating privileges.

The Commission said in its initial denial, and reiterated in its November decision not to consider the petition for reconsideration, that back in 1999, it specifically rejected suggestions to automatically upgrade Advanced Class licenses to Extra Class, "concluding that it would be inappropriate for these licensees to receive addition-

al privileges without passing the required examination elements."

The current decision said the question had been revisited in 2005 and that the basic reasoning behind it had not changed then and has not changed now. "Consequently," the decision continued, "we conclude that the (Mobility) Division correctly dismissed your petition for rulemaking, and we deny your petition for reconsideration." The Mobility Division of the Wireless Telecommunications Bureau has responsibility for amateur service rules under the current FCC organizational structure.

ARRL to Seek Expanded HF Privileges for Technicians

Even though the FCC has refused to consider giving more operating privileges to Advanced Class hams, the ARRL is hoping it will agree to consider expanding the HF privileges currently available to Technicians. According to the *ARRL Letter*, League officials will be working on specific proposals for additional HF phone and digital privileges for Technicians, to be presented to the board of directors for consideration at its January meeting. The League's Entry Level Licensing Committee has been looking at ways to further increase the appeal of amateur radio.

Fox-1B Satellite Launched, Now AO-91

AMSAT's newest amateur satellite — Fox-1B (also known as RadFxSat) — was launched on November 18 from Vandenberg Air Force Base in California, and successfully entered orbit and started transmitting. It has been designated as AMSAT-OSCAR 91.

According to the AMSAT News Service, the cubesat carries a scientific package — developed by Vanderbilt University — designed to measure the effects of space radiation on electronic components. It also includes an amateur FM transponder with an uplink on 70 centimeters and a downlink on 2 meters.

K6WAO Elected AMSAT-NA President, Announces New Satellite Program

The board of directors of AMSAT-NA has elected Joe Spier, K6WAO, of Reno, Nevada, as the amateur satellite organization's new president. He succeeds Barry Baines, WD4ASW, who stepped down after nine years at the helm. The AMSAT News Service says Spier has previously served as the group's executive vice president and VP for educational relations.

Immediately after assuming office, Spier announced the next phase of AMSAT's cubesat program, abbreviated GOLF for "Greater Orbit, Larger Footprint." Tiny cubesats typically are launched into low Earth orbit and have limited coverage areas. The goal of the GOLF program, according to ANS, is to use and build on proven cubesat technology for satellites to be launched "to a wide variety of orbits, including LEO, Medium Earth Orbit (MEO), Geosynchronous Orbit (GEO), Highly Elliptical Orbit (HEO), or beyond."

ARRL Launches International Grid Chase

Building on the success of its 2016 National Parks on the Air (NPOTA) program, the ARRL has launched a year-long grid square competition. The goal will be to make contacts during the course of 2018 with stations in as many Maidenhead grid squares as possible, using all amateur bands except 60 meters. The program requires the use of the League's Logbook of the World (LoTW) online contact confirmation system. Grid squares will not need to be exchanged on the air, since each station participating in LoTW enters its grid locator into the system upon registration. Full details are in the December 2017 issue of *QST*.



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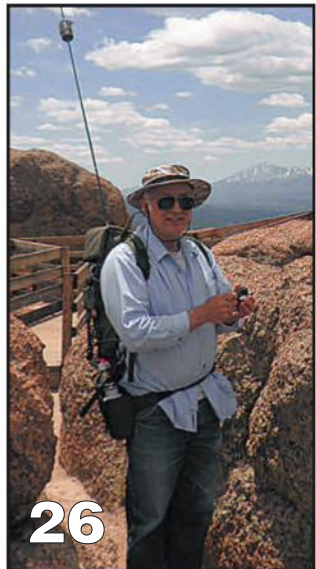
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On The Cover: Neil Foster, N4FN/GØNBJ, is as much of a Spitfire fighter enthusiast as a ham radio enthusiast. He managed to combine both passions with his acquisition of a code key used by Spitfire pilots during World War II to communicate during periods of radio silence. See his story on page 28. (Cover photo by Nancy Foster)

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*A Note
from the
Publisher...*

What Happened to November and December?

Dear Readers, Authors and Advertisers,

For nearly 75 years, *CQ* has been a partnership of sorts between the staff, the writers, the advertisers and the readers. Each group plays a critical role in helping to produce a top-quality independent magazine to inform, educate and occasionally entertain. So it is only appropriate for us to update you, our partners, on what's been happening over the past several months.

As readers of our print edition are well aware, we have been behind schedule on printing and mailing our issues on a timely basis. The last issue you received before this one was October. We apologize for these delays, which resulted from a variety of little things going wrong, all at the same time.

Rather than trying to play catch-up over the course of the next several months, we have made the painful decision to allow the November and December 2017 issues to remain as digital-only issues, and to jump-start our print edition with this, the January 2018 issue. This will enable us to get back and stay on schedule as we move toward our 75th anniversary of serving the amateur radio community.

All print subscriptions are being extended by two months to make up for these missed issues. In addition, **PDF versions of our November and December issues** have been posted on our website for **free download**.

We greatly appreciate the patience and loyalty of all of our partners - readers, writers and advertisers - and hope that you will stay with us and continue to support *CQ* as the primary independent voice in amateur radio today.

73 for a very happy new year from all of us at *CQ*,

Dick Ross, K2MGA
Publisher

News Bytes

The "Battle" for Bir Tawil

It isn't on the CQ countries list or the ARRL's DXCC list, but the radio is involved with a growing list of people who are trying to claim a patch of barren desert between Egypt and Sudan as their private country.

Britain's *Daily MailOnline* newspaper reported in November on a man from India laying claim to Bir Tawil, an 800-square-mile area wedged between Egypt and Sudan that neither country claims. The article says Suyash Dixit proclaimed the Kingdom of Dixit on the land after planting and watering a seed there, but noted that he acknowledged the existence of several previous claims to the territory.

One of those previous claimants is Russian amateur Dmitry Zhikarev, RA9USU, who was part of African DXpedition teams in Libya (5A7A) in 2006 and South Sudan (STØR) in 2011. Zhikarev operated from Bir Tawil in 2016, using the self-assigned call of 1U4UN.

The *Daily MailOnline* story reports that Dixit, the self-proclaimed king of Dixit, believes his claim will prevail over the others, noting that "this is my land now...and if they want it back, there will be a war (over a cup of coffee at the Starbucks probably)!"

A previous news report indicated that current international law allows only states, not individuals, to claim territory, and that, while neither Egypt nor Sudan apparently wants to administer the area, neither country wants to agree to give it up to someone else.

Your Local RadioShack Might (Maybe) Be Coming Back

Even though RadioShack closed all of its retail outlets last year, the company continues to operate an online retail presence and distribution center, and now appears to be licensing independent dealers to open stores using the RadioShack name.

The *Citizen-Tribune* of Jefferson City, Tennessee, reported in October that four former RadioShack locations in the area were re-opening under private ownership, carrying stock both from the main RadioShack distribution center and from other vendors.

The newspaper article focused on a store that was re-opening in Jefferson City, its plans to turn part of the store into a makerspace and on its links with the local Lakeway Amateur Radio Club, which will use the store to conduct licensing classes. The club also promotes building through its "We Can Hams Builders Group" <www.wecanhams.com>, which pairs new builders with experienced ones to work on a common project, currently the Arduino-based Bitx-40 QRP SSB transceiver from HF Signals <hfsigs.com>.

"NCIS" Annoys America's Hams

An early November episode of the popular crime drama, "NCIS," featured amateur radio and two ham operators (one a murder victim), but did so in a way that managed to offend just about every ham who watched it.

While the writers gave lip service to amateur radio's essential role in emergencies and disasters, one of the hams (the living one) was portrayed as a paranoid, chronically-unemployed, 40-something unmarried man who still lived with his parents and had his station in their living room. In addition, one of the investigators, who claimed to have been a ham in the past, got on the air from the deceased ham's station, using that person's "handle" to identify himself (and handles turned out to be key elements in solving the murder).

Of course, this was a TV drama, not a documentary, so it isn't realistic to expect complete accuracy in the portrayal of amateur radio, but what most actual hams seemed to find objectionable was the clearly negative stereotype presented of the ham involved, even though he (well, his dog) played a key role in solving the murder.



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Criticized for (Allegedly) Criticizing a Ban on Criticizing...

It's beginning to look like we're living in a ham radio version of a third-world dictatorship, at least as far as our national association is concerned. Last March, we took the ARRL to task for adopting a new code of conduct for board members. Among other things, it prohibited directors and vice-directors from publicly criticizing board actions and/or from disclosing individual votes on specific matters — even their own votes! — unless the board has specifically voted to make the votes public (got that?). At that time, we criticized this move toward institutionalized secrecy, noting that secrecy breeds suspicion and that, in a membership organization, the dues-paying members have a right to know what their elected representatives are doing on their behalf and with their money.

We later got an editorial “slap on the wrist” in *QST* for wondering just what goes on in League board meetings that requires such secrecy, noting that the ARRL is essentially a big ham radio club, not the National Security Council.

Now, it seems that longtime Southwestern Division Director Dick Norton, N6AA — who voted against the adoption of this code of conduct last January — has been formally censured by the League board for allegedly criticizing the code and its mandate of secrecy “at a public Amateur Radio gathering,” an action reportedly taken in response to a complaint by an unidentified League member. (Other members attending the same public gathering reported that this never happened and that, in fact, Norton said he supported the League’s policy.) The vote, taken in a special telephone session on November 14, was 11-to-3, with one abstention. (The full report of the meeting, including individual votes, is at <http://bit.ly/2jOJ3Zu>.)

The board said that Norton, by allegedly stating his opposition to the new policy, was “criticizing publicly the collective action of the Board of Directors adopting said Code of Conduct and drawing the Board’s collective decision making into disrepute.” The board resolution continued to say that Norton’s criticism of this policy had “caused harm to the League” and constituted “unacceptable behavior as an ARRL Board member.”

Bull.

This action by the League board — not any statement by an individual member — is what is causing “harm to the League” and “drawing the Board’s collective decision making into disrepute.” This is America, folks. Our nation is built on traditions of free speech and the freedom to dissent, to publicly criticize the government and to speak truth to power.

Imagine if votes in Congress were secret and members could be censured for speaking out in opposition to a bill once it had been passed and signed into law. This is the equivalent on a smaller scale.

No, the ARRL is not a government body, so the free speech and dissent protections of the Bill of Rights do not strictly apply. But it is, in theory at least, a democratic organization governed by the members’ elected representatives. The members have an absolute right to know how their representatives are voting on matters that come before them. How else would you know whether your representative is voting in your best interest and whether you should vote to re-elect that person when his/her term is up?

(Interestingly, it has been pointed out to us that a majority of the current League board members have not actually been elected, but rather have been either appointed to fill a vacancy or put into/kept in office by virtue of potential opponents being disqualified from running, sometimes on very questionable grounds and, again, shrouded in secrecy.)

*Email: w2vu@cq-amateur-radio.com

We will say this again, at risk of being censured ourselves: The ARRL is not the National Security Council. None of the matters that come before the League board are so sensitive that they require absolute secrecy. Prohibiting dissent, and prohibiting elected representatives from discussing their views and their votes with their constituents is un-American. Elected representatives should, in nearly all cases, be elected rather than appointed. And if there are questions about a candidate’s qualifications to seek elective office, the candidate needs to be presented with those questions and given an opportunity to respond; and if he/she wishes to continue seeking the office, the questions ought to be made public and the decision on that person’s qualifications to serve should be made by the members he/she seeks to represent.

Excessive secrecy and punishment for dissent are undemocratic and un-American; they should not be tolerated by the members of an organization that operates in that manner.

Looking in the Mirror

Many of us were up in arms in early November over the generally negative portrayal of hams in an episode of *NCIS*, one of the most popular programs on TV today. If you didn’t see it, a key element of the show revolved around a murder victim who was a ham, and his connections to another ham who (through his dog) ultimately helps solve the crime. And while the writers did note hams’ important roles during emergencies and disasters, they also made all the usual mistakes about procedures and — in my sister’s words — rolled up every negative stereotype they could find about hams into the two characters portrayed in the episode. The one who hadn’t been murdered was an unmarried, chronically unemployed, 40-something male, still living in his parents’ house, with his station set up in their living room. And if that wasn’t enough, he was paranoid and when the agents knocked on the door, he told them they’d need to wait a minute to come in so he could put on some clothes. Ugh.

Of course, our first inclination was to join in the chorus of condemnation for the way in which ham radio operators were portrayed on a program viewed by millions of people. And we agree that it did clearly go beyond the usual (and expected) confusion of ham radio with CB (Truth: Only hams really care about that). But we also need to take advantage of this opportunity to look in the mirror.

This is how hams were portrayed to viewers because this is the perception of hams in the writers’ minds. Where did they get this perception? Out of thin air? Doubtful. Most likely, it was from their personal interactions with hams over the years. And that should prompt us to ask some questions of ourselves.

How do we present ourselves to the general public? At public events, do we look like the professional-caliber communicators that we are? Or do we show up either in a ripped T-shirt and sweatpants or in a self-assembled “uniform” that tries to make us look “official” and important? Do we explain our hobby to friends, relatives, and neighbors in terms that the average person can understand or do we get lost in a sea of technospeak? Do we respond to confusion between ham radio and CB with a polite explanation of both their similarities and their differences or do we get angry and suggest that the person asking must be really stupid?

Portrayals of hams in the media are based, at least somewhat, in how hams present themselves to the public. So, yes, let’s try to educate TV writers on some of the finer points, but more importantly, let’s make sure the impression that we give the public is one of competence and professionalism.

73 for a happy new year!

— Rich, W2VU



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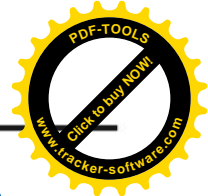
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A Historic and Memorable Opening Night/Week on MF and LF!

BY JOHN LANGRIDGE,*

It's been about 100 years since U.S. amateurs operated in the spectrum below what we call today the AM broadcast band, but all that changed on Friday, October 13, 2017, when the Utilities Technology Council (UTC) began releasing notifications to amateurs in the U.S. indicating whether their proposed antenna locations would harmonize with existing power line communication (PLC) systems. It was a big day for amateur radio and particularly for those hams who have been fighting this battle for a very long time (see *Figure 1* for an example).

The notifications were released in waves and, by the end of the day, seemed to largely be concentrated in the eastern half of the U.S. (although a few notifications were reported in the west).

Almost immediately, stations were taking to the airwaves. WSPR stations that had only been providing reception reports for experimental stations were now transmitting their own signals and experimental stations were following suit, finally using their amateur radio callsigns. I stopped-down my otherwise busy afternoon to turn on the receiver and listen for 630-meter CW signals. I heard a number of them on ground-wave paths just below the noise floor, testing and tuning their systems. It was great to hear the activity and I was excited for sunset to arrive when the band would be better for skywave openings. (As a side note, there were a few signals observed early from operators who could not stand the wait, probably thinking that they were "hiding in the weeds," as they say. We all knew they were there and, in many cases, accurate measurements of their activities were made. In one instance, someone drove up into an operator's driveway, even making visual contact with the alleged offender.)

The 2200-meter band was a bit less optimistic for mid-afternoon as I tuned the 2.1-kHz-wide band for any signals. I briefly heard one signal early in the morning before any notifications were reported to have been dispersed so someone must have been testing their system early. As it turned out, there were no reports of 2200-meter amateur activity during this opening night operating session. That doesn't mean there was no activity, only that any activity went unreported. This could have meant that seasoned 2200-meter operators were awaiting notification or prospective 2200-meter operators were largely taking advice that I gave some months back, starting on 630-meters to gain experience likely necessary for long-term success at LF.

The 630-meter band *did* open as the terminator washed across the continent, but those openings were accompanied



Figure 1. WØRW's opening night QSL offering for 630-meters. Paul was one of many stations using experimental licenses to discover the potential of these new bands prior to their general opening for amateur use. (Courtesy of WØRW)

by high terrestrial noise levels from a variety of sources, in addition to a G2 geomagnetic storm that was the result of a solar wind stream from a geoeffective coronal hole that was beginning to move out of view. The problem was that the damage was already done and the possibility of additional enhancements from this solar event was waning rapidly. This meant that long-haul DX paths would possibly be limited to stations on the east or west coast and that domestic openings would favor north and south paths significantly over those to the east and west. All of this turned out to be true and was evidenced by the difficulty I had in working ZF1EJ in the Caribbean from my location in north Texas, compared to operators located in the east like NO3M and K4LY. The other factor, noise, is a common feature in mid-October, but what we were observing was old-fashioned late summer lightning crashes from storms ranging from southwest Texas into the Midwest. That is *not* typical. If an operator had directional receive antennas and quality filters, they were probably both in use.

A Tough But Successful Opening Night

I won't try to sugarcoat the session: It was a tough first night but many QSOs were completed on CW and a variety of digital modes, including FT8 and JT9¹. I would not have changed a thing. WSPR was also in the mix and a number of opera-

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<kb5njd@cq-amateur-radio.com>



tors chose to use that mode to take advantage of their transmitting capabilities. In the coming weeks and months, hopefully those operators won't be afraid to venture out of their comfort zones and make a few contacts.

Many stations operated through the night, looking for whatever opening they could find to someone they had not worked already on the other end of the path. A number of openings were observed to the Pacific Northwest, but those don't often open until very late in the evening and possibly never when a geomagnetic storm is in progress. One thing about medium wave and long wave is that operators have to be patient, allowing openings to develop if they will. I had my fill of night-one just prior to local midnight and, since I was planning on being on the air around 0900 UTC, going to bed for a few hours was a good idea.

When I returned to air after a few hours of sleep, rather than going directly to CW as usual, I checked in with Eden, ZF1EJ, to see if he was available for a quick JT9 QSO. Fortunately he was, and the path to the east had improved, in part due to lower noise in that direction and better propagation compared to just a few hours earlier, so we made

Figure 2. Friday the 13th ended up being a very lucky day for many MF digital operators. This image from PSKReporter.com shows the magnitude of opening night digital mode activity. Note the number of stations in the east compared with the west as UTC released only a portion of the notifications before the 30-day deadline.

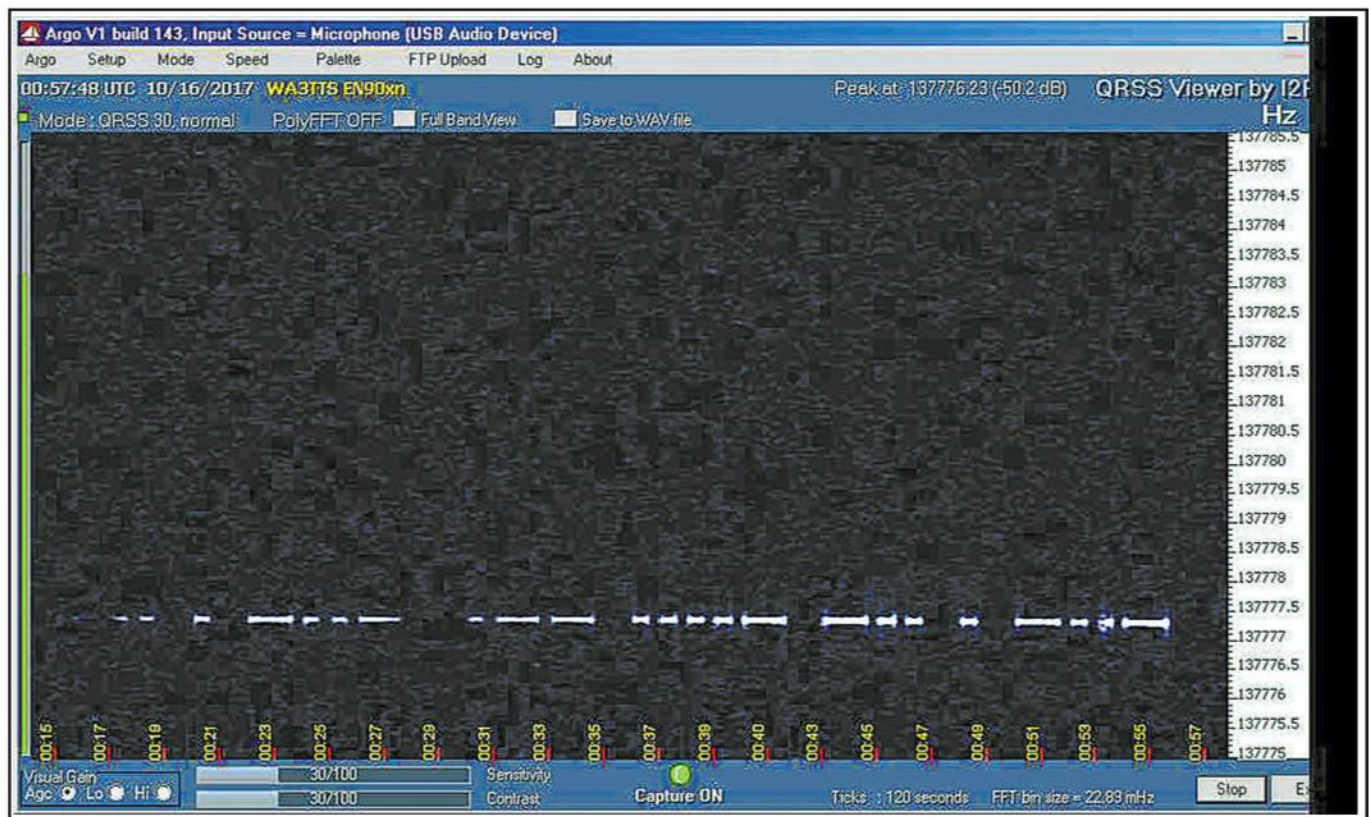


Figure 3. "Dex" McIntyre, W4DEX, QRV on 137 kHz QRSS30, as reported by Mike Sapp, WA3TTS, on October 16, 2017. (Courtesy of WA3TTS)



port work of a QSO. Other operators, such as K4LY and K5DNL, were also beginning to stir, alternating between CW and digital as quickly as they could find stations interested in working a new mode. I settled in on 474.5 kHz for a few CQs on CW and could hear several weak signals returning but the strongest of the pack at the time was K4LY, who was significantly weaker than usual (remember what I said about east and west paths during geomagnetic storms?). Doug and I had worked just a few days earlier under experimental rules at easy, armchair CW copy levels. We struggled to complete this QSO but finally it was in the log.

As we signed, Eric, NO3M, in western Pennsylvania checked in at a true RST 599 just prior to twilight in the east. I would argue that this was an all-time top five signal from Eric as reported at my station. We chatted a bit and compared notes from the previous night, signing just before signals faded out for the day.

Some of the notable CW QSOs from this first night include but are not limited to K9SLQ/K9MRI, K4LY/N4PY, K4LY/KB5NJD, and NO3M/KB5NJD. Because there were numerous digital mode QSOs, I am limiting reports to those which came across my desk, including JT9 and FT8 QSOs for K4LY, N1DAY, K5DNL, NO3M, KB5NJD, ZF1EJ, K9SLQ, and K9MRI. See *Figure 2* for a visual representation of some of the stations on the air.

Beyond Night One

While this session was the first night for many stations, many others have since received their notification or the thirty-day waiting period has passed with many new stations entering the bands for the first time. Since that first night, 630 meters has been packed with signals in a variety of modes ever since. Even 2200 meters has since sprung to life as a few former experimental sta-

tions that have been in dry-dock for a number of years have finally returned to the air with normal and QRSS CW (see *Figure 3*).

I expect these bands to flourish even if there is a perception of a slow start. If emails are any indication, there is a significant number of stations working to prepare their stations for air; in fact, many more than anyone might have expected. As I like to tell them in closing from our discussions, “operators are standing by for their calls.”

A Growing Population

As I am writing this article in mid-October, there are stations in 28 states that have completed two-way QSOs on 630 meters in the couple of weeks since the band opened. Countless Canadian stations have joined their American counterparts as real QSOs are now legal to complete without operating cross-band. It’s only a matter of time

A Few Operating Tips for Success at MF and LF

While recent years have seen the development and proliferation of beaconing modes such as WSPR, in some ways changing the landscape of amateur radio and how many amateurs spend their operating time, two-way communication remains a vital cornerstone of the amateur radio discipline. Operating at medium wave and long wave frequencies can be very different from HF, leaving many new operators disappointed at their early operating experiences. Weak signal operating skills can be learned and the benefits can extend to other areas of interest within the greater amateur radio discipline. Here are a few operating tips to help enhance the MF and LF operating experience for new and old operators alike:

1. If you are a CW operator, use headphones or ear buds. A wise man once told me that doing so provides 10-12 dB of improvement when signal-to-noise is poor. Additionally, don’t turn the volume up too high. Less really is more.

2. Turn off the receiver’s preamp and decrease the RF gain or use attenuators as necessary. Noise does nothing to help you receive, but many operators choose to run the gain wide open, which only masks the desired signal.

3. Digital operators sometimes incorrectly set their audio levels too high, leading to distortion on transmit *and* receive. Some think that they can hear weaker signals or achieve higher power outputs with maximum levels but it only leads to false decodes and harmonic generation. Watch the ALC on the transceiver and audio level meter in the software!

4. If you are calling a station and the desired station only CQs in your face, keep calling, as appropriate. Many stations use directional receive antennas with omnidirectional transmit antennas, resulting in big signals that may not be listening in your direction. I prefer operators making long calls. Additionally, QSB can do crazy things and call signs can sometimes disappear.

5. JT modes, including JT9 and WSPR, require accurate time synchronization and the Windows® time service just

doesn’t do a very good job of keeping system time accurate. This is becoming more of a problem for some reason, but it may involve simply more stations being on the air. Use Meinberg NTP², Dimension4³ or something comparable to keep your computer clock accurate.

6. When listening conditions are poor and lightning crashes are frequent, sometimes using wider filters can be helpful. This is particularly true for CW.

7. There are times when tight filters and DSP are beneficial, so stations should carefully zero-beat signals in order to not fall outside of the receive passband. This one is very common and can be very problematic if separate transmitters and receivers are used. It’s as much the responsibility of the transmitting station as it is the receiving station.

8. Don’t get too long-winded, particularly on 630 meters. While fades (QSB) on 2200 meters tend to be long and slow burns, 630 meters can present very fast fades, so much so that elements of individual Morse characters can be lost. When this type of instability is observed, you are better off saying 73 because the bottom is preparing to drop out. Many of the more persistent fades exhibit periodicity, which can vary from one situation to the next. It is possible in some cases to determine the period of the fade using modes such as WSPR and timing the distance between peaks or valleys for your contacts.

9. Make scheduled contacts (a sked) where appropriate. Check in with the ON4KST MF/LF chat⁴ page, which many active operators use to discuss band openings or announce operating activities. Just be sure that QSO details remain on the air *only* until the QSO is completed so no one gets the impression that you are fishing for QSO details via an internet chat room, resulting in QSOs that didn’t really happen.

10. Such tools as the Reverse Beacon Network⁵, PSKReporter⁶, and WSPRNet⁷ can help you evaluate your station performance on CW and digital modes.

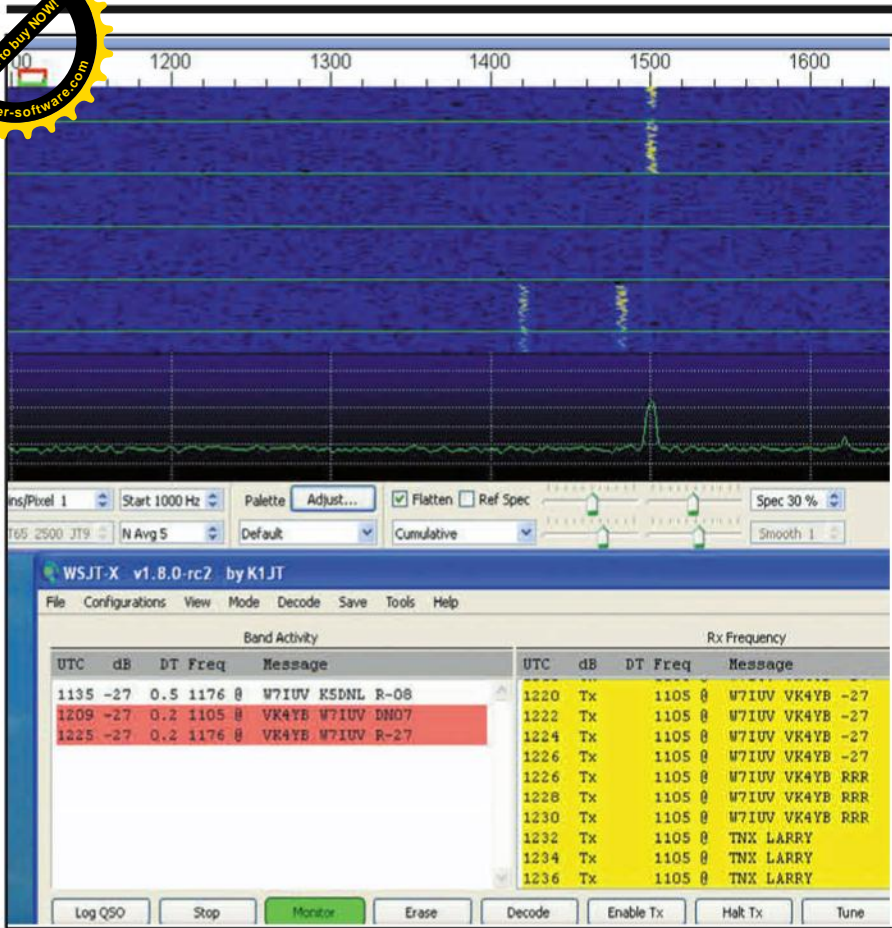


Figure 4. A historic and very long JT9 QSO between Lawrence Molitor, W7IUV, and Roger Crofts, VK4YB, on 630 meters in the early morning of October 18, 2017. (Courtesy of VK4YB)

before regular QSOs with European stations will become commonplace, given some recent transatlantic WSPR reports. Many DX contacts *have* already been completed, including 14 digital QSOs in 10 states and provinces for ZF1EJ. Perhaps the most exciting of all — so far — is the historic QSO between W7IUV in Washington State and VK4YB in Queensland, Australia, using JT9 (Figure 4). This QSO, at a distance of 12,002 kilometers (7457.7 miles) is likely, at the time of writing, the longest two-way contact ever completed on 630 meters. This record stands to be broken by many stations in the U.S. and the rest of North America as we progress towards solar minimum. However, it is still a significant accomplishment on a band that some have maintained cannot support contacts even “down the street” while using short antennas and low power levels.

That’s all for this time. Get on the air and have fun working these new bands. There is nothing like them anywhere else in the amateur spectrum.

Questions? Comments? Email me at <KB5NJD@cq-amateur-radio.com>.

Notes:

1. WSJTx software <<http://tinyurl.com/hg6rnxm>>
2. Meinberg NTP <<http://tinyurl.com/m8jwuh2>>
3. Dimension4 <<http://tinyurl.com/btw4s>>
4. ON4KST MF/LF chat <<http://tinyurl.com/ybkpsyh9>>
5. Reverse Beacon Network <<http://tinyurl.com/ya6ma5o2>>
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Photo A. Using a rig's dual VFO to tune in one signal at slightly different frequencies can enhance your ability to copy a weak CW signal in noise.

Copying a weak CW signal can be a big challenge, especially if there's a lot of noise on the band. N8PR has applied some musical theory to help you better hear the melody of a Morse signal.

A Novel Way to Hear Weak CW Signals

BY PETE RIMMEL,* N8PR

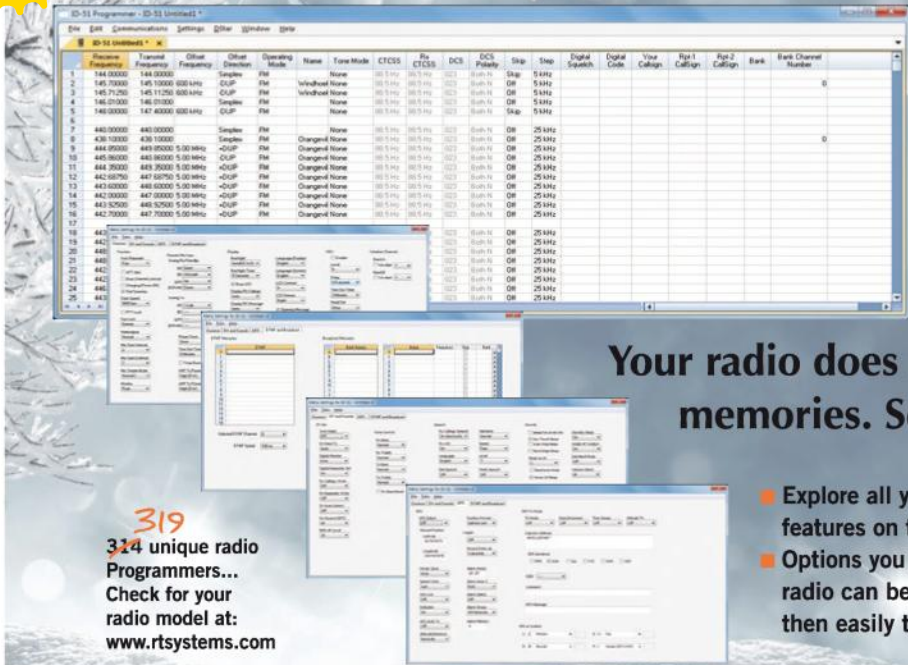
One of my interests in ham radio is working DX. One difficulty we encounter is trying to hear weak signals, especially when they are right at the noise level. Frequently this happens during gray line conditions, especially on the low bands, when signals are at ESP+ levels — that is, weak enough that you nearly need extra-sensory perception (ESP) to copy them.

We listen and think we hear the DX, then, it fades away. Then it comes back, and fades again. Sometimes the signal comes up to where we can read our callsign but barely enough to make a complete QSO. Of course, we can use narrow bandwidth filters in our radios to eliminate nearby signals, digital RF, and audio peaking filters to hear better, and techniques to eliminate common mode noise, but we can only do so much. Sometimes, filters limit what we hear due to distortions caused by the filters

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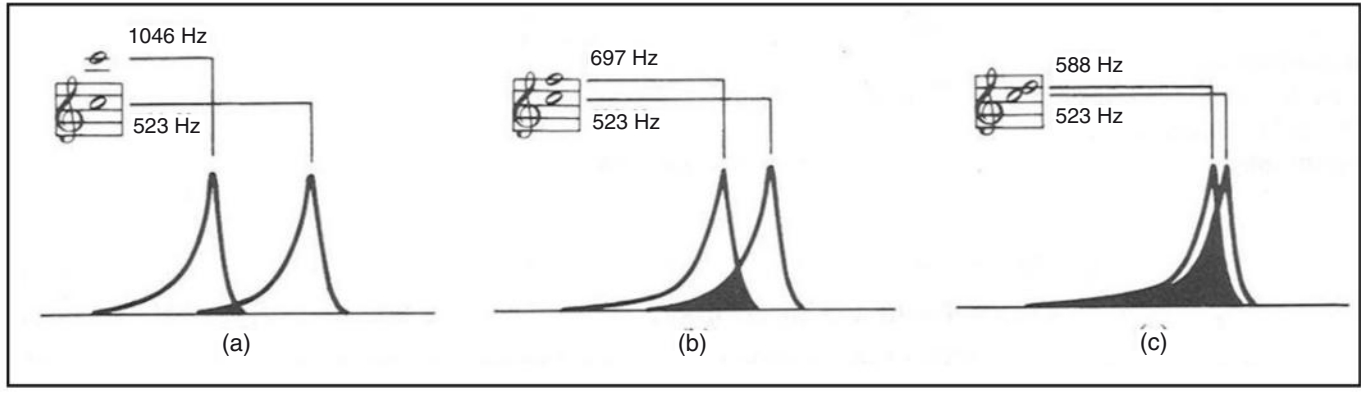
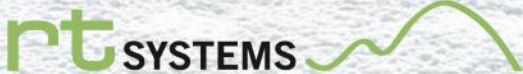


Figure 1. Frequency response curves for pairs of pure tones. As the interval between them decreases, their response curves show increasing overlap (shaded areas). Frequency separations are (a) 523 Hz, (b) 80 Hz and (c) 63 Hz. (Source: Lecture notes, Acoustical Physics of Music, University of Illinois at Urbana-Champaign. Used with permission. See note 3.)

and sometimes they just are not effective enough to let us hear the DX.

What I will show in this article is that by hearing two slightly different CW tones at the same time, the properties of the ear can be utilized to hear weak CW signals better than by just hearing a single CW tone.

The Best CW Filter

An old radio operator's adage states that the best CW filter is the brain. What if there is another way to let the brain hear even more clearly into the noise? That is what I am suggesting. Let's give the brain another way to hear the weak ones. How? By producing two simultaneous tones which complement each other to be more pleasing to the ear.

Being a musician, it occurred to me that perhaps two CW notes that create a harmony would be more pleasing to the ear, and be more recognizable in the noise than a single note. Playing with this idea, I found that two CW tones about 65 to 80 Hz apart do seem to be more readily heard. Signals with two tones suddenly are more readable than those with just one tone.

Musician to the Rescue

Many of today's radios have two receivers or the ability to have dual receive on the same band (Photo A). If the two receivers are properly tuned to one signal and spaced about 65 to 80 Hz apart, they can enhance what the ear hears by putting the two received CW tones into both ears with a



Table 1

Note Name	Freq, Hz	Half Note Difference (Hz)
D ₄	293.665	—
D# ₄ /Eb ₄	311.127	17.46
E ₄	329.628	18.5
F ₄	349.228	19.55
F# ₄ /Gb	369.994	20.76
G ₄	391.995	22
G# ₄ /Ab	415.305	23.3
A ₄	440.000	24.7
A# ₄ /Bb	466.164	26.16
B ₄	493.883	27.7
C ₅	523.251	29.37
C# ₅ /Db	554.365	31.1
D ₅	587.33	32.97
D# ₅ /Eb	622.254	34.92
E ₅	659.255	37
F ₅	698.456	39.2
F# ₅ /Gb	739.989	42.53
G ₅	783.991	44.0
G# ₅ /Ab	830.609	46.62
A ₅	880.000	49.39

speaker or headphones. Do not put one received frequency in each ear. That will not work as well as hearing both tones in both ears, because we need to tickle each ear with both notes. We normally listen to CW tones in the range of 400 to 800 Hz. This corresponds approximately to the D₄ to G₅ notes on our chromatic (western) scale of music. In *Table 1*, the left column shows the name we give to each note in the scale, the second column is the frequency in Hertz for that note, followed by the frequency difference between each two notes.

Notice that the frequencies between any two notes a “full step” (two half notes) to two full steps (a Major third) apart in the table result in a difference of 65 to 80 Hz in that tonal range. These are *consonant* pairs of tones; they are pleasing to our ears. Sure, they are not as pleasing as a Major 4th or Major 5th pair, but those pairs of tones are too wide to fit into the ear’s equivalent rectangular bandwidth (ERB)¹, a receive bandwidth of 100 Hz for those notes. This is called the *critical bandwidth* where tone pairs wider than 100 Hz are treated differently in the ear. You will notice as you try pairs in higher pitches that the “pleasing” pairs will get too wide for the ear’s 100-Hz ERB CW filter.

The ear’s ERB gives an approximation of the bandwidths of the filters in human hearing. Those spikes and exponential decays seen in *Figure 1* represent the noise in that response, stated as a simplified model of rectangular *band-pass filters*. This bandwidth for filtering of sounds in the ear is approximately 100 Hz wide at the tones of 400-800 Hz that we typically use for Morse code reception.

The Physics of Sound

There is a science called the Physics of Sound. In studying the plentiful available material^{2,3}, I found that inside the ear, there are thousands of hair follicles that each respond to only one or two notes on the scale. When we listen to music, we recognize pleasing sounds and harmonies. Groups of the inner ear hairs respond to the individual tones in different ways. It has been found that groups of those “tonal” hairs respond to individual notes. As the notes get closer together, that response is similar to the octave spacing response. However, when the tones get close enough to each other,

not only do the hairs for the individual tones get excited but groups nearby respond as well. This effect helps explain why, when we hear those two CW notes 65 Hz apart, they jump out of the noise a bit more than one would expect. More nerves are excited by the ear hairs, and more tonal recognition occurs relative to the same amount of background noise. This corresponds roughly to the dark areas under the curves in *Figure 1*. The tone differences in (a) are 523 Hz, (b) 80 Hz and (c) 63 Hz.

The perceptions of sound in our brain seem to support this idea. Two tones will be approximately 6 dB louder than one tone. The background noise will also increase, but only by about 3 dB. Plus, since our brains like to hear what we could call more pleasing sounds, or consonant pairs of tones, it will recognize them more readily in the white noise of the background than a single CW note. This gain is an improvement in our hearing of up to 3 dB. The pairs that are approximately 65-80 Hz apart will be a bit rough and not pure due to phasing of the two notes, and our brains will pick this up in more readily in the noise.

Battling Hearing Fatigue

I have also found, that when listening for long periods, waiting for a weak signal to rise out of the noise, I experience a certain amount of hearing fatigue. Using narrow CW filters helps to eliminate many frequencies around the bandwidth of audio that we want to hear. Eliminating the highs and lows helps eliminate some hearing fatigue while waiting to hear an actual CW station come through. Sometimes, though, even when the one tone comes up out of the noise, it is not readily heard. I have noticed, however, that when two simultaneous adjacent tones come up out of the noise, or start to fade back into the noise, my brain hears at least one of the two tones — if not both — at what I perceive to be lower signal-to-noise levels. That gives me an advantage when working the weak ones.

Conclusions

We can conclude that the natural ERB of the ear works like a 100-Hz filter on a 700-Hz Morse tone and establishes the SNR. A second tone within that same ERB — 65 to 80 Hz away — further enhances the perception of the Morse signal and further improves the apparent SNR as detected by the ear. These effects allow us to hear more discretely into the noise to detect the weak signals we desire to work.

Give it a try, if you have a way of hearing two signals at one time. You might find that this system works for you. Not everyone’s hearing is alike. I suggest that you might hear slightly different gaps better than I do. Some people are not musical, or may be more accustomed to different scales than the western chromatic scale. Different spacings may work better for you. Try spacings between 60 and 90 Hz apart. You will find what works best for you. Good luck and go get the weak ones!

NOTES:

1. *Spectral Audio Signal Processing*, 2011 (online book) Julius O. Smith; <<https://ccrma.stanford.edu/~jos/sasp/>>
2. *The Science of Sound*, Thomas D. Rossing, Northern Illinois University; 2nd Ed. 1990 Addison-Wessley Publishing Company, Inc.
3. UIUC Physics 406 Acoustical Physics of Music lecture notes by Professor Steven M. Errede, Department of Physics, University of Illinois at Urbana-Champaign, Illinois, <<http://bit.ly/2zXQA2A/>>. Used with permission.



Announcing:

The 2018 CQ World-Wide WPX Contest



SSB: March 24-25, 2018
Starts: 0000 UTC Saturday

CW: May 26-27, 2018
Ends: 2359 UTC Sunday

The CQ World-Wide WPX Contest is the world's largest everyone-works-everyone radio contest. The contest offers a realistic opportunity to work enough unique prefixes to qualify for CQ Magazine's prestigious WPX award in addition to earning a contest certificate.

Contest Basics

Each contest mode is a separate event running from 0000 UTC Saturday until 2359 UTC Sunday. SSB is the last full weekend of March and CW is the last full weekend of May.

Amateurs worldwide try to contact as many amateurs and prefixes as possible during the period of operation. Single Operator stations may operate 36 of the 48 hours — **off times must be a minimum of 60 minutes** during which no QSO is logged. Multi-operator stations may operate the full 48 hours.

Contacts are only valid on the 1.8-, 3.5-, 7-, 14-, 21-, and 28-MHz bands. Exchange an RS(T) report plus a progressive contact serial number starting with 001 for the first contact. Note: Multi-Two and Multi-Unlimited entrants use separate serial number sequences on each band.

Scoring

The final score is the result of the total QSO points multiplied by the number of different prefixes worked. A station may be worked once on each band for QSO point credit.

Contacts with your own country are worth one point on each band. Contacts between stations on different continents are worth three points on 28, 21, and 14 MHz and six points on 7, 3.5, and 1.8 MHz.

Contacts between stations on the same continent, but different countries, are worth one point on 28, 21, and 14 MHz and two points on 7, 3.5, and 1.8 MHz. Exception: For North American stations only — contacts between stations within the North American boundaries (both stations must be located in North America) are worth two points on 28, 21, and 14 MHz and four points on 7, 3.5, and 1.8 MHz.

The prefix multiplier is the number of valid prefixes worked. Each prefix is counted only once regardless of the band or number of times the same prefix is worked. Special event, commemorative, and other unique prefix stations are encouraged to participate. Prefixes must be **issued or permitted** by the licensing authority of the country of operation. See the full rules for a description of what constitutes a prefix.

Entry Categories

The competition is divided into Single Operator and Multi-Operator categories. Single Operators may also enter an Overlay category.

Single Operator (all bands or any single band): Only the one operator finds, makes, and logs all contacts. If you want to use a DX spotting network or CW decoder, enter the Single Operator Assisted category, below.

- High power: Up to 1,500 watts
- Low power: 100 watts or less
- QRP: 5 watts or less

Single Operator Assisted (all bands or any single band):

The one operator may use the DX Cluster or other tools to help find contacts. The one operator must make and log all contacts.

- High power: Up to 1,500 watts
- Low power: 100 watts or less
- QRP: 5 watts or less

Single Operator Overlay Categories: Entrants in Single Operator categories may **also** submit their log for **one** of the overlay categories shown below. No distinction is made between assisted and unassisted in the overlay categories. All Overlay entries are grouped into high power and low power in the results.

Tribander/Single Element Overlay: During the contest an entrant shall use only one tribander (any type, with a single feed line from the transmitter to the antenna) for 10, 15, and 20 meters and single-element antennas on 40, 80, and 160 meters.

Rookie Overlay: To enter this category the operator must have been licensed as a radio amateur three years or less on the date of the contest

Multi-Operator Categories (All Band only): More than one person can contribute to the final score during the official contest period.

Single-Transmitter: Only one transmitted signal is permitted at any time. The station may change bands up to 10 times per hour. This category has specific restrictions on band changes so please read the full rules carefully.

- High power: Up to 1,500 watts
- Low power: 100 watts or less

Two-Transmitter: Two bands may be transmitted on simultaneously. Each station may change bands up to 8 times an hour.

Multi-Transmitter (Unlimited): One transmitted signal is allowed on each of the six contest bands.

Checklog: Entry submitted to assist with the log checking. The entry will not have a score in the results and the log will not be made public.

Awards

Electronic certificates will be made available for download for everyone who submits an on-time entry. Plaques are awarded to recognize top performance in a number of categories. The current list of plaques and sponsors is at <www.cqwpw.com/plaques/>.

Club Competition

Many clubs around the world compete vigorously for the plaque awarded to the club making the highest total combined score in the SSB and CW weekends.

Submitting Your Log

Electronic logs should be in the Cabrillo format. Upload your log on the Web at <www.cqwpw.com/logcheck/>. The website also includes a utility to convert your ADIF format log file if needed. See full rules for instructions regarding paper logs.

All entries must be emailed or postmarked **WITHIN FIVE (5) DAYS** after the end of the contest: SSB logs no later than 2359 UTC **30 March 2018**, CW logs no later than 2359 UTC **1 June 2018**. Any log submission will replace any previous submissions. Resubmitting an entry after the deadline will result in it being considered as a late log.

Full Rules Online

The complete rules of the CQWW WPX Contest are available in several different languages on the Web at <www.cqwpw.com/rules.htm> and in English only on the CQ magazine website. Please review the rules and frequently asked questions before the contest. Questions pertaining to the CQ WPX Contest may be emailed to <director@cqwpw.com>.



What started out as a quest to build a cheap and reliable code practice oscillator with paddles turned into a full-featured keyer with connections for a rig and a computer, and oh, yes, it'll also work as a code practice oscillator!

The Ten-Dollar Keyer

A Keyer, Paddle, and Computer Interface

BY PAUL YOUNG,* K1XM

The idea for this project came from Chuck Counselman, W1HIS. A few years ago, he was teaching a Morse code class and he wanted to use paddles. He asked on the Yankee Clipper Contest Club reflector if anyone knew of an inexpensive paddle and the answer was "no." I decided to try and find a solution. I wanted something easy to build, reliable, and cheap.

A good mechanical paddle is not easy to build with common tools. So I investigated capacitive or "touch" paddles. I had owned a Heathkit SA-5010 touch-sensitive keyer years ago and I gave it away because the paddle was always flaky. But technology has changed a lot since then.

I searched for a capacitive sensor integrated circuit (IC) that had fast response time, was inexpensive, and available in a package that did not require surface-mount soldering. I found one that had adjustable response time and sensitivity. It was available soldered to a small break-out board for less than two dollars including shipping from China. The disadvantages of this IC are that it requires 3.3 volts and the output is I²C.¹ I could not connect it to a keyer. I would need a microprocessor and that would add to the cost.

If I needed a microprocessor, then maybe I could program it to be a full keyer. That would better justify the expense. Ideally, it would also connect to a computer to provide other capabilities, such as operating with logging programs and code practice programs. So I searched for an inexpensive microprocessor board which had USB and I²C.



Photo A. The author's prototype of his \$10 keyer.

The least expensive processor I found had the improbably long name of STM32F103C8T6. It is a 32-bit ARM chip² with 64K flash and 20K RAM. It comes on a board with the crystals and connectors and can be powered from USB. The processor runs on 3.3VDC. The board has a voltage regulator that could also power the capacitive sensor. It was also less than two dollars. The programmer for it is a USB device which also costs less than two dollars.

Since this was intended for code practice, it should have a sidetone. I didn't want a square wave output and I wanted a volume control. The processor does not have a digital-to-analog converter but it could generate variable width pulses. I could use simple DSP to generate a waveform. This would require an audio amplifier. I found a stereo amplifier that runs on USB power. I could use one half

for the speaker and the other half for headphones. And it cost, you guessed it, less than two dollars.

The keyer also needed a speed control and a volume control. I considered potentiometers but rotary encoders are available on a board for about 50¢ each. And there is a pushbutton built-in.

A keyer should be able to drive a radio so I added key and PTT outputs. And for people who have a mechanical paddle, I added an external paddle input.

Design

The overall schematic is shown in Figure 1. The microprocessor is the core of the keyer and everything else connects to it.

R1, R2, Q1, and Q2 are the keyer and PTT outputs. They are connected to J1, a stereo mini-phone jack. A pair of RCA jacks could be used instead.

* email: <k1xm@k1xm.org>

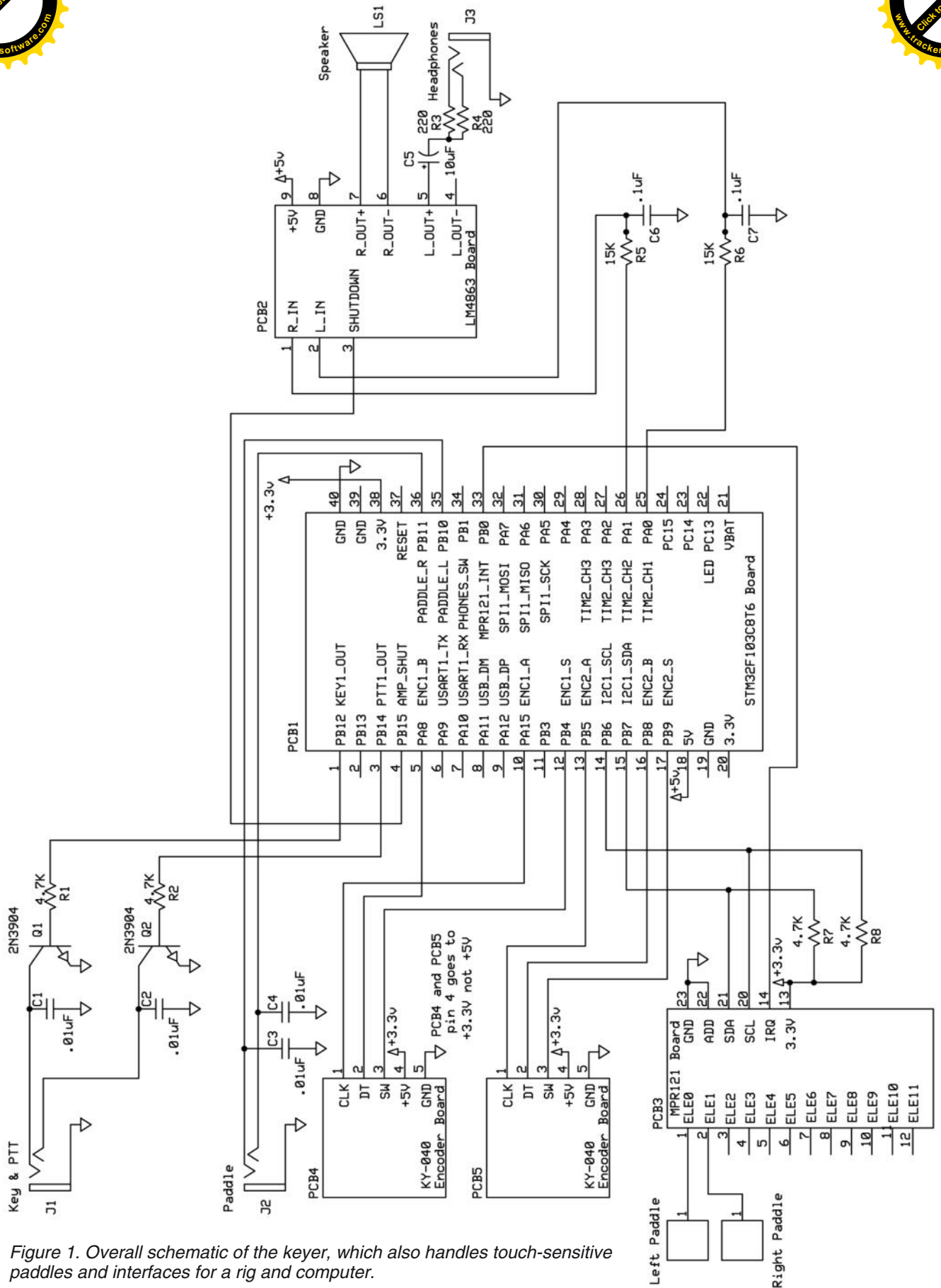


Figure 1. Overall schematic of the keyer, which also handles touch-sensitive paddles and interfaces for a rig and computer.



main unit	
C1, C2, C3, C4	.01µF 50V ceramic
	10µF 10V electrolytic (any larger value is OK)
C6, C7	.1µF 50V ceramic
J1, J2, J3	1/8" (3.5mm) mini stereo phone jack
LS1	Speaker
PCB1	STM32F103C8T6 Board
PCB2	LM4863 Board
PCB3	MPR121 Board
PCB4, PCB5	Encoder Board
Q1, Q2	2N3904
R1, R2, R7, R8	4.7K 5% 1/4 watt
R3, R4	220 ohm 5% 1/4 watt
R5, R6	15K 5% 1/4 watt
Audio board (PCB2) modification	
R3	4.7K 5% 1/4 watt
R6	10K 5% 1/4 watt (or two 4.7K in series)
Programmer (only needed during construction)	
PROGRAMMER	STLINK V2

Table 1 - Parts list

J2 is the external paddle input. R3 and R4 isolate and reduce the headphone volume. If the maximum volume is not loud enough, these can be replaced by lower value resistors or even no resistors at all. R5 and C6 form a low-pass filter for the PWM output of the microprocessor for the speaker sidetone. R6 and C7 do the same for the headphones. The microprocessor has plenty of memory and power for this application.

It supports lmbic A and B modes, Ultimatic, Dit and Dah priority, bug, and straight key. It also supports the K1EL Winkey protocol (although not all of the Winkey features) and it will interface with common logging programs.

Obtaining Parts

Table 1 is the parts list. The boards come from China, where they are apparently popular with electronics enthusiasts or "makers." Shipping takes

several weeks. There are U.S. suppliers for most of these parts but the prices are higher.

The PCB parts can be obtained from eBay <www.ebay.com> or from Ali Express <www.aliexpress.com>. To find the correct boards, search for the following:

PCB1: Search for "STM32F103C8T6 Board". The board you are looking for is probably blue, with a micro-USB connector at one end, a four-pin connector at the other, and a row of 20 holes along each side. It will come with pins that can be soldered into the 40 holes.

PCB2: Search for "LM4863". The board you are looking for is probably green with a label "SFT-S863". There are places for connectors but no connectors are installed. J1 is at one end. J2, marked +DC5V-, is at the other end near an electrolytic capacitor. J3 and J4 are along the sides.

PCB3: Search for "MPR121". The board you are looking for has 12 holes along one side labeled 0 through 11 and six holes along the other with various power and signal names. It is probably blue, black, or red. It will come with pins that can be soldered into the 18 holes.

PCB4, PCB5: Search for "KY-040". The board you are looking for has an encoder with a shaft and a five-pin connector.

PROGRAMMER - The programmer for the microprocessor is not part of the keyer but you'll need one to program it.

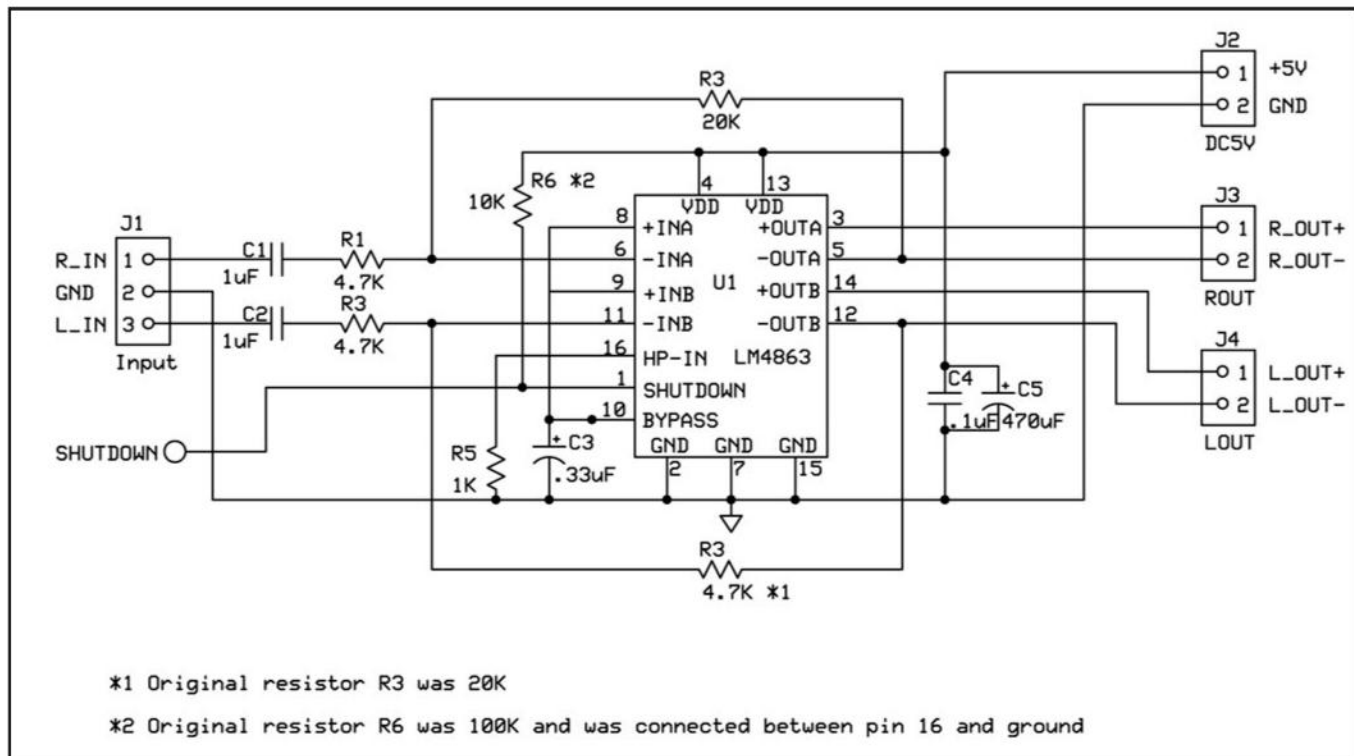


Figure 2. Detailed schematic of PCB2, the amplifier board, on which two modifications have been made (and noted).



Ultracompact Communication-Grade Switching Power Supply with Digital Display

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DM-30T

2 pairs Power poles & 1 pair Binding posts



DM-430T

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Convenient for radio users, the Noise Offset Circuit moves unwanted switching noise to another frequency. Other features include a large illuminated digital Volt/Amp meter, rear panel binding posts (30A peak), front panel Anderson power Poles, voltage adjust or fixed at 13.8V, ripple less than 80mVp-p and triple circuit protections!

SPECIFICATIONS

Input Voltage	120VAC 50/60Hz (220VAC versions available)
Output voltage	13.8V DC (rated) variable 9~15VDC(30T)/ 5~15VDC(430T)
Output current	Max./Cont.@13.8V: 20A / 30A
Output voltage regulation	Less than 2% (All)
Ripple voltage	Less than 80mVp-p
Protection	Over current shut down / Temperature protection / Short circuit
Dimensions WxHxD inches approx.	6.10 x 2.80 x 8.07 (30T) / 4.92 x 2.36 x 6.3 (430T)
Weight Approx.lb with AC cord	3.53

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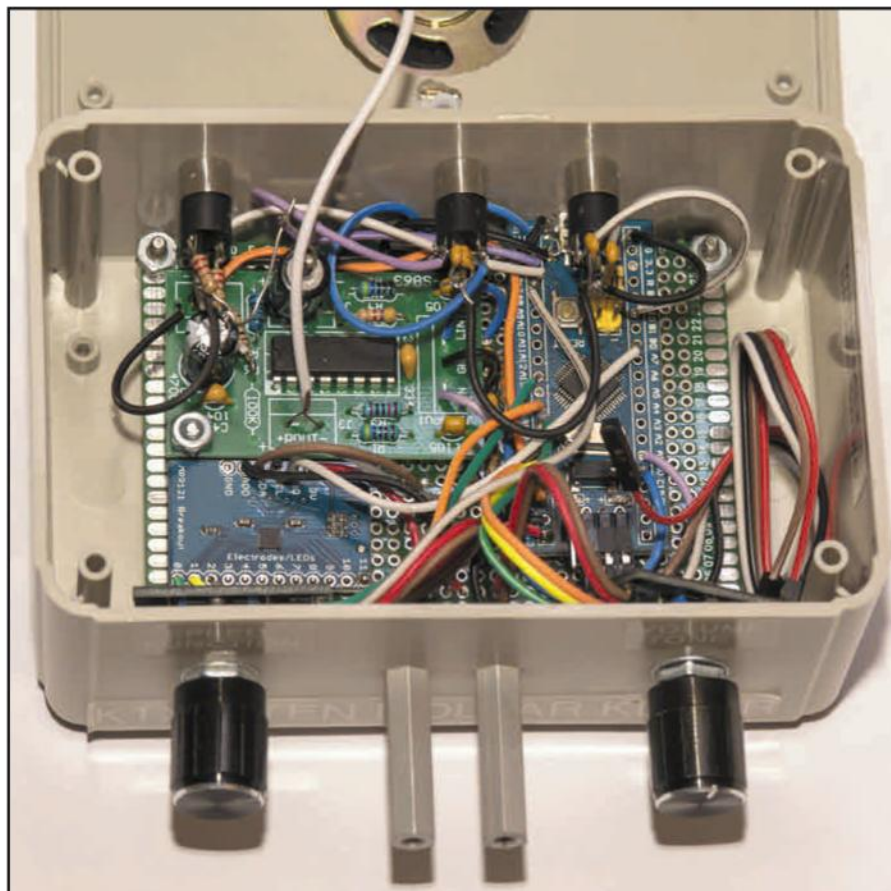


Photo B. All of the keyer's parts mounted in the enclosure. The author recommends providing more space to the left and right of the touch-paddles than he provided in this prototype.

If you don't have one and can't borrow one, search for "STLINK". The unit you are looking for has a USB plug on one end and a connector with two rows of pins on the other. It will also come with a multiconductor cable which is used to connect it to the four pin connector on PCB1.

You can order the other parts from these sources too. To find the 0.01- μ F and 0.1- μ F capacitors search for "capacitor 103" and "capacitor 104". They can be almost any voltage. The electrolytic capacitor can be any voltage above 5 volts.

Construction

The prototype (Photo A) was built in a plastic enclosure that was left over from another project. PCB1, PCB2, and PCB3 were mounted on a 7- x 9-centimeter perf board. PCB1 and PCB2 have pins which can be used for this. I used only a few pins near the corners of the boards. This made it easier to



removing and re-install the boards during development. PCB3 has a single mounting hole. I drilled a hole in the perf board and inserted a bolt, nut, and spacer. The resistors, capacitors, and transistors are also mounted on the perf board. There is enough space for all of the boards and parts but if the enclosure is large enough, an 8- x 12-centimeter or even 9- x 15-centimeter perf board would make construction easier.

I bought a piece of multiconductor cable “jumper wire 20 centimeter” and pulled off wires and cut connectors off the ends as I needed them. This wire has the advantage of providing many colors, which makes it easy to trace wires.

The paddles can be anything metal. The prototype has a pair of hex spacers just because I had them in my junk box and they were convenient. Pieces of bent metal would look nicer. Copper-clad PC board material would work, as would metal foil glued to a small wood board.

The encoders, PCB4 and PCB5, were mounted through holes in the plastic enclosure. There was not a lot of room around them, so I removed the right-angle connectors and soldered wires directly to the board. In the prototype, the encoders are too close to the paddle — people who are used to sending on a mechanical bug like to have room to “swat” the paddle and the encoder knobs are in the way. If I were building another, I would consider putting the encoders on a different side of the enclosure.

The +5V pin on the encoders is connected to +3.3V. That’s not a mistake. *Do not connect the encoders to +5V.*

There is both analog and digital circuitry in close proximity which, if not handled carefully, can result in noise in the speaker and headphones. I was able to eliminate this by con-

necting the ground leads of the low-pass filters (C6 and C7) to the ground connection at the center of J1 on PCB1 by running a short ground wire between PCB1 and the ground connection on J2 of PCB2.

There are two changes to the amplifier board, PCB2. The headphone gain was too high and some noise was heard in the headphones. R3, a 20K resistor, is replaced with a 4.7K resistor. And the amplifier IC has a pin that can be used to turn it off. This pin is connected to ground through R6. Remove R6 and instead connect the pin to +5V through a 10K resistor. This is shown in the amplifier schematic in *Figure 2*. If you don’t want to make these modifications, you can leave out the connection between PCB2 and pin 4 of PCB1.

I used a small speaker that came in a plastic housing. It was intended as a “pillow speaker” for a cell phone. I removed the bottom plastic cover and cut the cable. I cut and filed a hole in the enclosure for this speaker. This produced a nice looking result without having to drill a large round hole or a circle of smaller holes. And it cost less than a dollar.

Photo B shows the parts mounted in the enclosure. PCB1 is on the right side of the board with the USB connector at the edge so it is accessible through a hole in the box. PCB2 is at the left rear. The low-pass filters are between PCB1 and PCB2. PCB3 is at the left front. The PTT and CW transistors are behind PCB2. The wires at the far right are used to connect the programmer — they don’t need to be left in when the keyer is complete.

Programming

There are several free development environments for the STM32F103C8T6. One is an add-on for the Arduino environment. I chose this one because it had most of what I needed and it was simple. It is available for Windows and Linux. The Arduino download is available from <www.arduino.cc> and the STM32 library is available from <www.stm32duino.com>. The STM32 library also includes the software to support the STLINK programmer in the Arduino development environment.

The code is written as an Arduino sketch. Each piece of hardware has a separate C++ class. It uses a simple message queue. All input is interrupt driven. The hardware interfaces are mostly separated from the keyer logic. For more information, read the keyer.ino and keyer_queue.cpp source files.

All of the source code is provided for download. You can modify it and fix bugs or add features as you wish. Or you can upload it to the keyer without reading or changing it.

Connecting the Keyer

The keyer runs on 5 volts. It can be powered from a USB charger, a USB battery of the sort meant for charging a cell phone, or it can be connected to a computer. If it is connected to a computer, it will appear as a USB serial device. The USB serial device will accept K1EL Winkey commands.

Keyer and PTT outputs are both available on J1. A custom cable can be made with the tip going to the radio PTT input and the ring going to the radio CW key input. For many radios, you can use a stereo mini phone-to-dual RCA cable and an RCA-to-phone adapter to connect to the radio.

Using the Keyer

The two encoders offer many functions.

If you turn encoder 1 (PCB4), the speed will change. The range is between 5 and 50 WPM. If you press the encoder and quickly release it, then the keyer will announce the

SPURIOUS SIGNALS

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spuriouscomic.blogspot.com



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peed of you press the encoder and hold it, the keyer will reverse the paddle (which side sends dits and which sends dashes). If you press the encoder and turn it while pressed it will change the keyer type between Iambic A, Iambic B, ultimate, synchronous ultimate, dit priority, dah priority, bug, and straight key.

If you turn encoder 2 (PCB5), the sidetone volume will change. The range is between 0 (off) and 60 (maximum). If you press and turn the encoder, the frequency will change. The range is between 300 Hz and 1200 Hz in 10-Hz steps. If you press and release the encoder, it will announce the volume and frequency. If you press and hold the encoder it will toggle between speaker and headphones.

If you press both encoders at once, the keyer will enter setup mode. Rotating encoder 1 will select the item to be changed. Rotating encoder 2 will change the value. Pressing encoder 1 will exit setup mode. Pressing encoder 2 will announce the value and may cause the change to have an effect, depending on the item.

You can use setup to change the values that the keyer will use at startup, to restore these values, or to use the default values. In setup, rotate encoder 1 until the keyer announces "save", "restore", or "default." Turn encoder 2 until it sends "On". Then press encoder 2.

Sending Practice

This keyer can be used to practice sending. I wrote a small Windows® application for this. It displays a five-letter word. You send that word on the paddle and it tells you how you are doing. It will send the word if desired. The application source code is available and it is compiled using Visual Studio 2017 Community Edition, which is available free from Microsoft.

Modifications

It is easy to leave things out. For example, if the sidetone is not needed, PCB2 and the low pass filters could be left out.

It is also possible to add capabilities. If memories are desired, they could be added by installing a few pieces of metal (such as nuts and bolts) in the enclosure and wiring them to unused inputs on PC3. The keyer could easily be programmed to use these inputs as memories.

You could add a display. Among the unused pins of PCB1 are a serial port and an SPI interface. Many displays use one of these interfaces. And of course, a display can be purchased for, all together now, less than two dollars!

Notes:

1. I²C (inter-integrated circuit) is a way of communicating between ICs using two wires. When transferring data, it acts like a synchronous serial line — one wire provides a clock and the other provides the data. The IC sending data sets the data line to high or low and then flips the clock line. There is a protocol that is used to allow bidirectional communications and to allow several ICs to share one pair of wires. It is complex enough that the only practical way to use it is to have a microprocessor.

2. ARM stands for Advanced RISC Machines. RISC is an acronym for Reduced Instruction Set Computer. ARM processors are 32-bit microprocessors (there are now 64-bit versions, too). ARM Holdings owns the intellectual property and designs cores. Many companies use these designs in their processor chips. The Raspberry Pi uses an ARM processor. There's a good chance your cell phone does too. The processor used in the keyer is a low-end ARM chip using a core design STMicro licensed from ARM Holdings. ARM chips may be the most common microprocessors in existence because they are embedded in so many devices.

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Many people who learn the Morse code seem to hit an upper speed limit as they progress. Here is the reason and one way to overcome it.

The Secrets of High-Speed Morse

BY PAUL SIGNORELLI,* WØRW

There is a secret to busting through your Morse code speed limit and learning to copy high-speed Morse (HSM) — transmissions at 30 words-per-minute (WPM) or higher. Here is what I have found during my Morse lifetime and you have probably heard it before, but I have to emphasize it: **Copy words, not letters.**

Receiving HSM is like playing an anticipation game in your brain.

You probably have already learned how to do that for many words at slower speeds and your Google Search engine does it all the time with its auto completion program.

When you do a Google Search and type in “Indianap”, Google brings up ‘Indianapolis’ before you can finish typing

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the word; “Moorest” brings up “Moorestown”; “Camd” brings up “Camden”, “Wheel” brings up “Wheel of Fortune”.

Your brain does this when you are receiving Morse. When you copy someone sending “Missi..”, you probably say to yourself, “I know he is going to send ‘Mississippi’, why can’t he just send MS?”

This is not cheating; it is just how your brain completes the missing elements. It’s similar to the old FCC “fill in the blank” Morse code tests. They had partial sentences to complete, like “My _____ is in a tree.” The answer was “antenna.”

HSM requires that the anticipation game extend from words to common phrases. The phrases are common sayings or clichés frequently used in TV gameshows like Wheel of Fortune. You already intuitively know all these phrases; you only need to practice them on HSM.



The author operating high-speed Morse code (HSM) while pedestrian mobile at the Devil’s Head fire lookout tower, elevation 9,748 feet, in Colorado’s Pike National Forest. (Photo by Sharon Signorelli, NØOPM)



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Like “The XYL has...”, the anticipated phrase is going to be: “Called me to dinner,” “come home and I have to QRT,” etc., or “I am really out on a...” Limb.

Here is a link to some common ones: <www.knowyourphrase.com>.

Words, Then Phrases

When you begin copying HSM, you may immediately hear such words as: “and,” “the,” “good,” and “you,” plus your call, name, QTH, etc. It may surprise you that you already know a lot of words and that should encourage you to listen more. This process has been taking shape — perhaps unconsciously — ever since you started using Morse code.

HSM can be like the “butterfly of love” that will gently land on your shoulder after you quit pursuing it. HSM begins differently for each person, but it should begin at a speed that is faster than you can write down. If you are still writing, you are probably copying letter by letter. You need to learn to copy words and then entire phrases in your head.

Obviously, the Morse word sounds cannot be deciphered this way if they are sent slowly and letter-by-letter with big spaces in between. The Farnsworth method (bless him), which uses fast letter speed and wide letter spacing, does not allow word recognition. You have to learn the common words, but there will always be some that will not be in your HSM vocabulary...yet...such as “Poughkeepsie,” unless you practice it. (If you live in Poughkeepsie, please send your QTH as New York.)

After you become proficient at HSM, slower speeds and Farnsworth reception will be like riding with a teenager who is learning how to drive a stick shift automobile. [See *QST* or the ARRL website for the W1AW fast code practice operating schedule.]

Sending HSM

Your manual dexterity or typing skills will probably be the limit to your manual sending speeds. You can’t send 40 WPM on a CW keyboard for very long if your typing speed is only 20 WPM.

If you know how to “touch type,” you probably know that the typing becomes a hand movement pattern routine. The hand typing patterns get hard-wired into our brains (and fingers) after we practice them enough.

A CW keyboard will allow you to send great CW, but the outgoing CW speed will still be limited by your typing skills. Using a bug or a paddle will also have manual dexterity limits, but you don’t have to send as fast as you can receive.

I use a single-lever paddle when I am operating pedestrian-mobile (see photo) and find it better for HSM. I have also noticed that if I forget what I am sending or get distracted, my words can be completed automatically by my repetitive hand motion pattern. When I send my callsign, it has a definite pattern and that pattern is never broken. If my brain sends a priority interrupt message (Like: “BALANCE! You Are Falling”) as I am walking along on a trail, I re-balance my body and my hand keeps sending whatever word I am sending without me thinking about it. (Yes, you *can* send and receive HSM while you are out hiking on the trails).

Why Operate HSM?

- It is really easier and more conversational.
- It allows you to send more information or make more QSOs.
- It saves energy, (important if you are operating on a battery).
- I know you can do it.



Photo A. A Spitfire Mk V fighter in 1944. (U.S. Army Air Force photo, via Wikimedia Commons)

Here's a World War II-vintage code key that was never intended to send messages over the radio or even a wired telegraph network ... it found its use *IN* the air rather than *ON* the air.

A Most Unusual Morse Key

BY NEIL FOSTER,* N4FN/GØNBJ

My interest in and affection for the Supermarine Spitfire fighter (*Photo A*) started in September 1941 when my dad, Edward, who was in the Army Air Corps and flew Boeing B-25 Mitchells in the Pacific during World War II, made a model airplane for me (*Photo B*) that was not a Spitfire but appears to be a British Defiant.

Growing up during the war led me to the Spit and also caused me to get in trouble at school since I was drawing pictures of the Spitfire when I was supposed to be doing other classwork.

Many years passed before I saw my first Spit "in the flesh." My friends, Tom Southwell, G4FEU (SK), and his wife, Rhoda G1UOX (SK), traveled with me to Wales on holiday. When we crossed the border from England to Wales, we came upon the Royal Air Force (RAF) base at Sealand. At the main entrance was a beautiful Spitfire on a pedestal on gate guard duty. Tom had his old RAF card and, thanks to him, I was able to get inside the gate to take photographs. Tom and I kept a weekly sked for over 30 years until he passed away a year ago.

Several years ago, another friend named Tom, Tom Calvanelli, a retired Delta Airlines Senior Captain — who knew of my long-time affection for the Spitfire and that I was

an avid and active ham radio operator — presented me a small gift-wrapped box at Christmas. When I opened the wrapping, I could not believe what I saw: A brand-new, in-the-original box, unused Spitfire Morse code key. (*Photo C*; I have, of course, saved the box as all hams should do with their equipment)

This led me to do some research on the key and its usage. In my collection of numerous framed large photographs and books, manuals and many models, I have several original and copies of Spitfire Pilot's manuals.

I thought I knew quite a bit about the Spits (see sidebar for the history of the plane and its designer) and, much to my surprise, I found in the manuals a reference to the key (*Photo D*). It was never meant to key a transmitter (although I did temporarily wire it to key my Yaesu FT-5000 just for fun). Rather, it keyed two light fixtures on the fuselage, one just aft of the radio aerial mast, and one under the belly of the airplane. That explained why our British cousins marked the selector switch as "Upward Morse" and "Downward Morse" (look closely at *Photo C*).

The key was mounted on the starboard side of the cockpit just above the "Chassis" (landing gear) selector switch (*Photo E*). The key itself was adjustable for pressure and it was mounted out the side of the switch box so that, even with gloves on, the pilot could easily key it (*Photo F*). The design

*e-mail: <archernf@earthlink.net>



Photo B. The author in September 1941 holding the model my Dad made for me. (Photos B-J courtesy of the author)

Photo C. The Morse key atop the original box as given to me.

A Bit of History ... of the Spitfire and its Designer

The Spitfire — commonly known as the Spit — was designed as a short-range, high-performance interceptor aircraft by Reginald J. Mitchell, chief designer at Supermarine Aviation Works, which operated as a subsidiary of Vickers-Armstrong after 1928. In his early work career at the age of 16, Mitchell gained an apprenticeship at Kerr Stuart & Co. of Fenton, a locomotive engineering works. At the end of his apprenticeship, he worked in the drawing office at Kerr Stuart and studied engineering and mathematics at night school.

In 1917, Mitchell joined the Supermarine Aviation Works at Southampton. Advancing quickly within the company, he was appointed Chief Designer in 1919, was made Chief Engineer in 1920 and Technical Director in 1927. He was so highly regarded that when Vickers took over Supermarine in 1928, one of the conditions was that Mitchell stay as a designer for the next five years.

Mitchell pushed the Spitfire's distinctive elliptical wing (designed by B. Shenstone) to have the thinnest possible cross-section, helping give the aircraft a higher top speed than several contemporary fighters, including the Hawker Hurricane. Mitchell continued to refine the design until his death from cancer in 1937, whereupon his colleague, Joseph Smith, took over as chief designer, overseeing the development of the Spitfire through its multitude of Mark variants. If the movie about Mitchell and the Spit is accurate, he only saw the prototype fly and passed away shortly after that.

During the Battle of Britain, from July to October 1940, the

Spitfire was perceived by the public to be the main Royal Air Force fighter, though the more numerous Hawker Hurricane models shouldered a greater proportion of the burden against Nazi Germany's air force, the Luftwaffe. Spitfire units, however, had a lower attrition rate and a higher victory-to-loss ratio than those flying Hurricanes because of their higher performance. Spitfires in general were tasked with engaging Luftwaffe fighters (mainly Messerschmitt Bf 109E series aircraft, which were a close match for the Spitfire) during the battle.

After the Battle of Britain, the Spitfire superseded the Hurricane to become the backbone of the RAF Fighter Command, and saw action in the European, Mediterranean, Pacific, and Southeast Asian theaters. Much loved by its pilots, the Spitfire served in several roles, including interceptor, photo-reconnaissance, fighter-bomber and trainer, and it continued to serve in these roles until the 1950s.

The *Seafire* was a carrier-based adaptation of the Spitfire that served in the Fleet Air Arm from 1942 through to the mid-1950s and it had a folding wing. Although the original airframe was designed to be powered by a 12-cylinder Rolls-Royce Merlin engine producing 1,030 horsepower (768 kilowatts), it was strong enough and adaptable enough to use increasingly powerful Merlins and, in later marks, Rolls-Royce Griffon engines producing up to 2,340 horsepower (1,745 kilowatts). As a consequence, the Spitfire's performance and capabilities improved over the course of its service life.



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of the box was that of a clamshell, so by loosening a thumb screw the box would swing open to show the wiring diagrams and key tension adjustment (Photo G). In my research, I found that the two lights were used for identification and for pilots to contact each other via flashing the lamp in Morse code due to wartime radio silence conditions. There

was also provision to use either one or both lights at the same time, or them stay on steady.

The Rest of the Story...

Recently, purely by accident, I stumbled upon a gentleman in England who had the complete light fixture listed on eBay. That was the piece that was missing. I

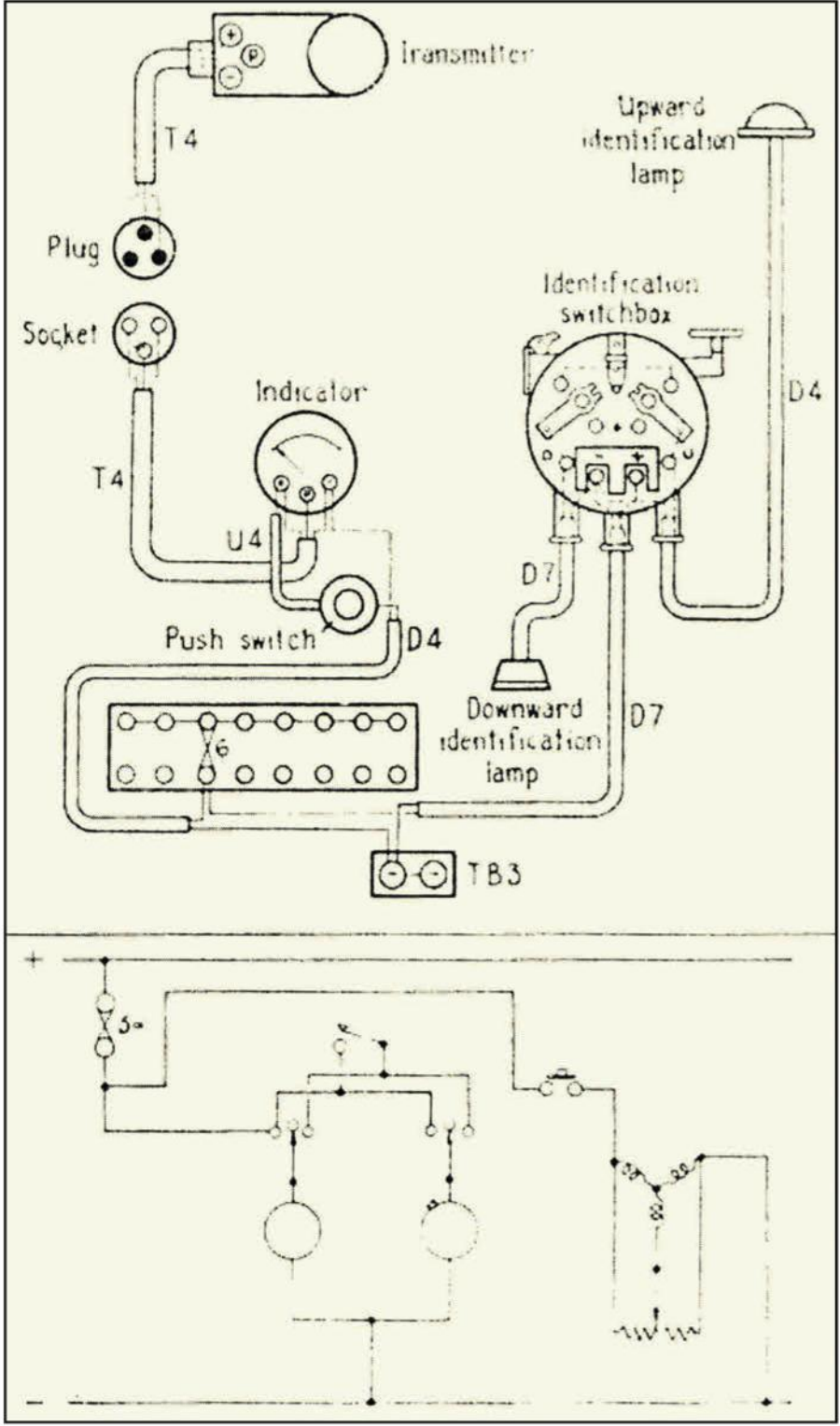


Photo D. Spitfire key and lamp wiring diagram from the Air Ministry Pilot's Manual.



Photo E. Key mounted on the starboard side of the cockpit. Note that the key itself was mounted on the outside of the switchbox (very top of photo) to let the pilot use it, even with gloves on.



Photo F. Key mounted on the starboard side of the cockpit above the chassis, or landing gear, selector.

bid, and was the winner. About 10 days later, a well-wrapped registered mail parcel arrived, and to my surprise, although it was listed as "used," it was actually new in the box, still wrapped in the wax paper that was in use originally (*Photo H*). Consulting an Air Ministry parts listing and the A/M markings and part numbers on the box and lamp I could indeed verify it was new surplus from a Spit.

My friend and woodworking wizard Jim Stafford, W4QO, helped me with the display base mounting of the key and identification lamp (*Photo I*).

Wait, There's More...

I had some email correspondence with the gent in England and he informed me that he had numerous instruments and

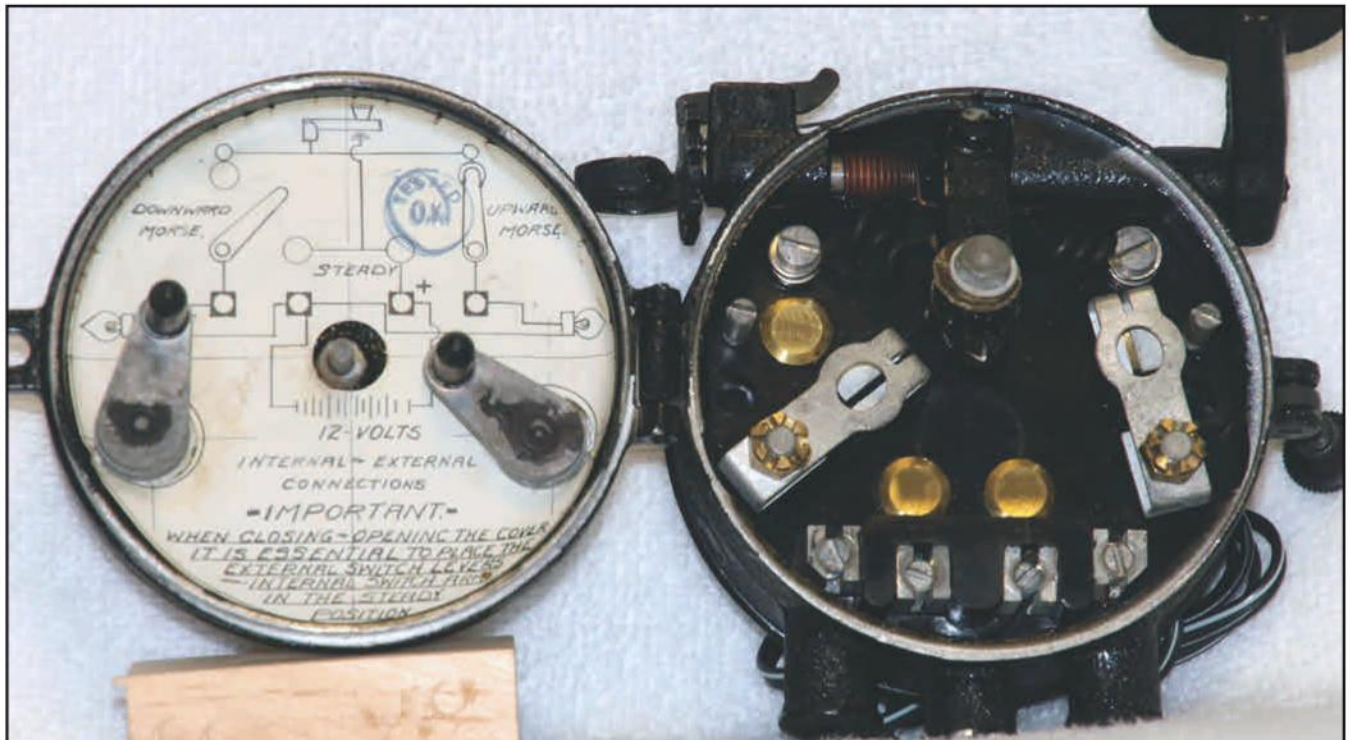


Photo G. Inside view of the key showing circuit switch diagram.



...parts for the Spit and that some of the instruments were a problem to ship since they had radioactive dials on them. I think my wife, Nancy, who supports my radio interest, would question my sanity if I had a Spitfire canopy or rudder shipped to me. As it is, she is convinced that all we do is talk on the radio and meet to have lunch/dinner all the time. She is probably correct. It took several years after we married to convince her of the importance of saving gear boxes. After 57 years in the hobby, I have a mountain.

If having the Morse key and lamp (*Photo J*) were not enough, I just acquired an artificial gyro horizon from a Spit. This is one of the instruments that did not have "glow in the dark" coating.

Now, does anyone know where I can find a Rolls Royce Merlin or Griffon engine?

References:

1. Supermarine Spitfire Pilot's Flight Operating Manual, Air Ministry, July 1940
2. July 1940 Air Publication 1565B, Pilots Notes, Air Publication 2280 A, B & C Wikipedia
3. Great Britain Air Ministry 1918-1964



Photo H. Original identification lamp (one of two mounted on the Spitfire) operated by the key inside the cockpit.



Photo I. Finished key and lamp assembly mounted; it is lit using a 12-volt DC supply.

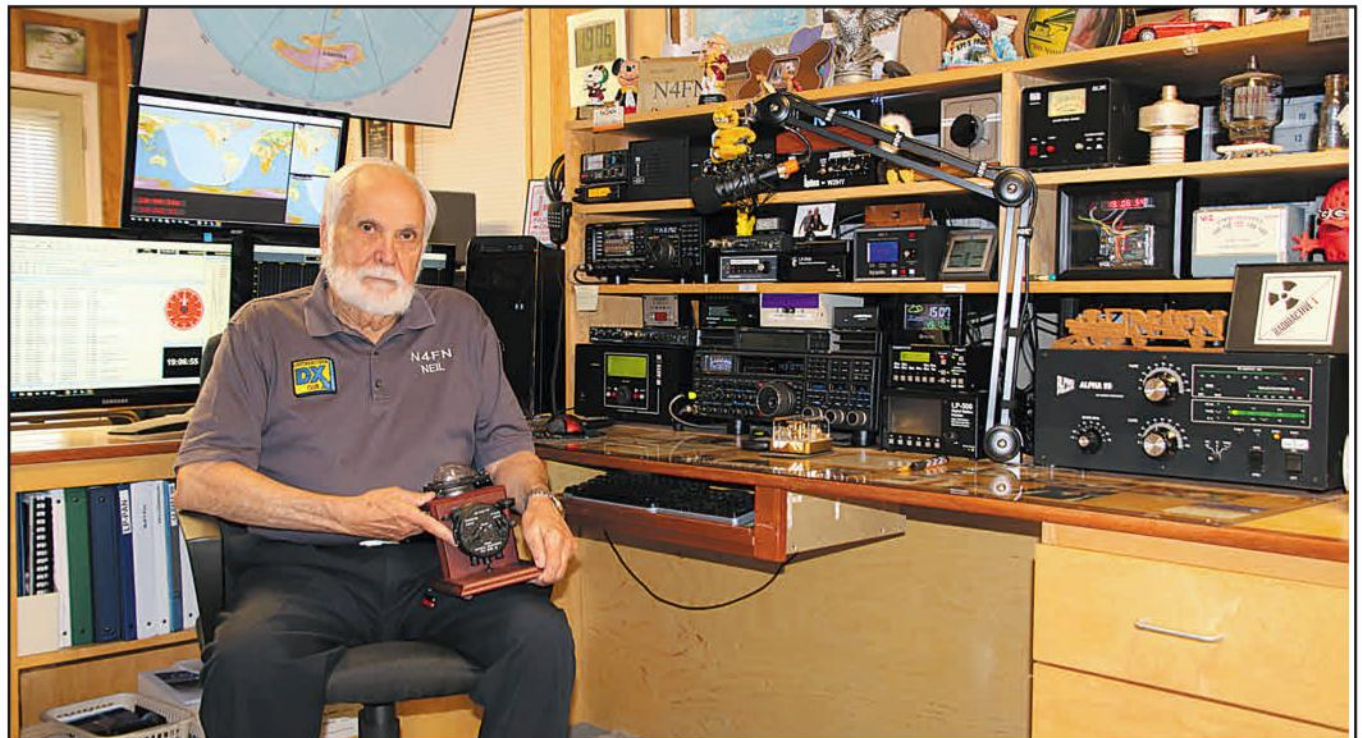


Photo J. The author in his well-appointed shack with his mounted Spitfire key and signal lamp.



Reader Feedback

Responding to News Bytes and Amateur Radio Parity Act Reporting

Our October issue included a follow-up article on the Amateur Radio Parity Act (HR 555/S 1534) and introduced a new occasional feature called "News Bytes," in which we devote a little more space than in our regular news column to a few stories of interest. Reader Howard Reynolds, WA3EOQ*, had thoughtful responses to both...

News Bytes:

I'm glad that at least the military is keeping HF communication capability available. One of these days (actually Puerto Rico is a good example), there will be widespread failure of "infrastructure-based" communication systems. There used to be many government-operated, i.e., Civil Defense, etc., HF stations, but they are gone now. It was a pleasure to see the military HF stations still in operation during the crossband tests recently.

Over-the-air television really is alive and well; however, it faces many hurdles. I live in the boonies of western Maryland. When the switch went from analog to digital television, using a fringe area all-channel antenna, I went from receiving 12 stations (some were a little snowy but watchable) to one, the local PBS station's transmitter 10 miles away. (The FCC said that nothing would change - hi.) Using the new antenna setup in the attached photo, I can now get three channels (plus their sub-channels). Looking at a signal strength meter, there are many more stations' signals around, they just aren't quite strong enough to be decoded. Furthermore, the main television antenna manufacturers (Channel Master, Blonder-Tongue, and Winegard) have quit making many deep-fringe antennas¹. Channel Master used to make an 8-foot dish for UHF - no more. And soon, the switch to ATSC 3.0 will take place, making all receivers obsolete. No wonder many people believe OTA television doesn't exist. All this, plus many real estate developers have made outdoor antennas a no-no. So, gradually, everyone was led to believe that cable or satellite was the only way to receive television signals and antennas could be completely eliminated from the face of the earth. Which leads me to:

ARPA - the Amateur Radio Parity Act:

First, where were these people (N3JT, K1VR, and probably others) when this bill was first proposed in the last Congress? Why weren't they presenting their concerns then? I'm no legal eagle, but I figure most legislation can be nit-picked to death. The two amateurs raising concerns may have some good points and maybe the bill should be tweaked a bit. However, I have to believe that the ARRL's general counsel and legal staff, plus the bill's sponsor, have put together something that - while not perfect or covering all bases - will get through Congress without too much scrutiny. (No, the ARRL is not perfect - remember incentive licensing - but no one else is attempting to rein in HOAs.) Then, hopefully, the ARRL and the amateur community can work with the FCC to address the finer points. I have no idea if this scenario will play out in our favor or not. Hopefully, the FCC will give more weight to amateur radio than to HOAs; a chance we may have to take. "Getting it right" the first time is a noble ambition, however, the final result will most likely not give the ham community everything it wants. On the other hand, if this bill is killed because it is not perfect, we may never get another chance to ever start this process again.

One other note demonstrating that you will never know what HOAs will try to pull: I used to rent a house in an HOA development. The rules read that the HOA had to approve any outdoor antennas. Well, they insisted that all television antennas (this was before cable arrived) had to be placed in the attic; no outdoor antennas allowed. However, when OTA scrambled pay television arrived, it suddenly became ok to mount the UHF antenna outside. I put up some VHF Yagis and dipoles which were not seen from the front of the house, got a lot of flack, but they eventually left me alone because the house backed up to an area outside the development.

Enough rambling. I really enjoy your magazine. It's a very nice complement to QST (or vice versa - hi).

Note:

1. Not just television antennas: I recently had to replace my Channel Master 9-element Yagi for FM broadcast but it is not made anymore. Nor does anyone else manufacture this type of FM broadcast antenna. Fortunately, I found an old Winegard antenna in another ham's garage.

* <wa3eoq@gmail.com>

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Photo A. MFJ Code Tutor on author's pillow. (Photos by the author)

There is an effective way to improve your Morse code and get a good night's sleep in the process ... pillow talk with the MFJ Code Tutor!

Better Code Speed ... and Better Sleep!

BY GEORGE AVERILL,* K4EOR

There are many devices sold for helping you sleep. Most involve playing soothing sounds of rain or surf or just "white" noise. All of these devices help, but none of them requires the intense concentration needed to decipher Morse code. It's this concentration that makes listening to code so much better for forgetting your problems and gently falling asleep. You just can't think of anything else! Of course, taking a radio to bed with you probably isn't practical, but a practice device such as the MFJ Code Tutor may be a perfect option.

Whether you're learning the code or trying to increase your speed, maybe you can try what I do: Just insert ear buds, set your MFJ Code Tutor to "Call Signs," then lean your head back on your pillow (Photo A). Not only will you gain a few minutes of code practice every night, but also you will eventually grow tired of listening to code, decide to turn it off, and then fall fast asleep!

An automatic shutoff would be nice, but this isn't included and really isn't needed. As an added bonus, your bedmate won't hear a thing.

Plenty of Options

There are other modes on the Code Tutor that work just as well. You can lis-

ten to QSOs, random characters, short words or characters you select if you are just learning code. All of this is possible using MFJ's wonderful little Code Tutor.

The selection of options is presented in a "circular" fashion, repeating each option one after another. You use the



Photo B. Control end of MFJ Code Tutor.

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Photo C. MFJ Code Tutor ready for a good night's sleep.

two black buttons to go clockwise or counterclockwise in order to select an option. Once you see an option you want to change, you press the red button. Then you use the same two black buttons to make the changes. Finally, you press the red button again to select your choice. (Photo B)

Most importantly, the device lets you select an overall speed and a different

faster Farnsworth character speed. Setting the character speed higher than the overall speed lets you gradually increase your overall speed by simply decreasing the time (overall speed) between the faster characters with which you are already familiar.

The final selection you need to make is to use the black buttons to select "repeat play" (Photo C). Now, when you

press the red button, the code will begin to play. If you press the red button once again, the play will pause. If you press and hold the red button, the play will stop and you can make changes to options again (increase or decrease code speed, for instance) using the two black buttons. You can also stop the play by simply turning the device off.

So that's all there is to it. I can't say enough good things about the MFJ Code Tutor. It's as small as a pack of cigarettes (and a lot healthier!) and fits snugly in your shirt pocket. The 9-volt battery lasts almost forever. You can take it with you wherever you go, inside or outside. You can even connect it to most new automobile sound systems. Morse code will never sound so good! The device sells for \$89.95 at MFJ and is well worth the cost if you want an easy way to learn Morse code or just improve your proficiency. Getting a good night's rest is just another plus. For more information, visit <<http://bit.ly/2ymQVLM>>.

MFJ also sells an older but still current book, *Morse Code: Breaking the Barrier*, by Dave Finley, N1IRZ, which describes the development of telegraphy and explains the use of the Code Tutor in more detail. It's \$19.95. See <<http://bit.ly/2A8owXc>>.

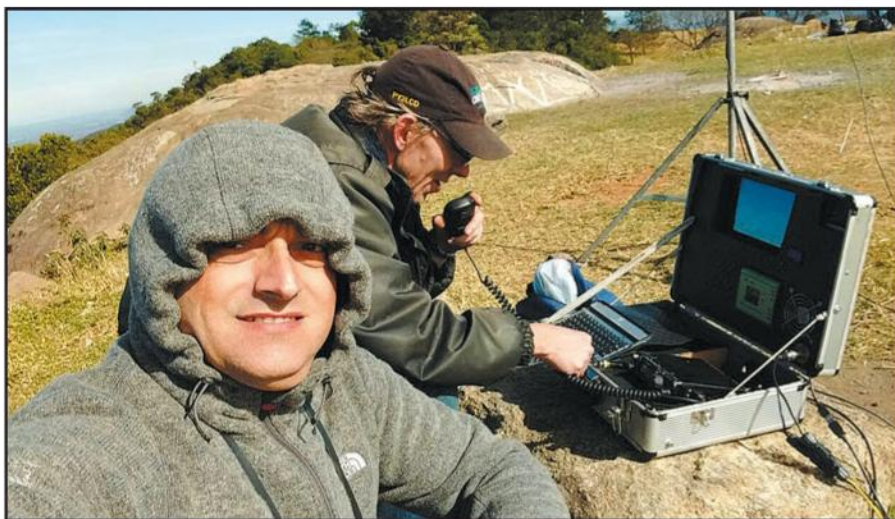


Results of the 2017 CQ World Wide VHF Contest

BY STEVE BOLIA,* N8BJQ

What will the 2017 CQ World Wide VHF contest be remembered for? Certainly not stellar band conditions or a record number of entries (I wish). It will, however, be remembered as the first contest to use K1JT's FT8 software, which some believe (and some don't) will revolutionize VHF contesting.

The jury is still out on that, but it certainly made things much more interesting and generated lots of comments after the contest. I probably spent a couple more hours on the air making contacts with FT8 and MSK-144 than I normally would have. My Qs were almost evenly split between CW, SSB, and digital modes. Don't give up on the tradi-



email: n8bjq@cq-amateur-radio.com

PY2CDR and PY2LCD did a QRP multi op from Pico do Olho D'água (GG66rq).



Here's PY2CDR operating. The station consists of: FT-817ND, MOXON 6 meter antenna, DK7ZB Light 6-element 2 meter antenna, 60-watt solar panel 12 volts, 18-watt solar panel 5 volts, and 18-Ah batteries.



...onal modes yet; CW and SSB will be around for a long time. Hopefully, the new digital modes may attract some new blood to the game.

As most of you noticed, entries are down from the record we set in 2016 — 719 vs. 905 the prior year. U.S. and other North American entries were just a few less than last year. European and Asian entries, however, were down by almost 200. Hopefully, 2018 will bring much better conditions and more activity. There were another 100 or so who made multiple Qs but didn't submit a log. Please send in a log, even if it is a check log. While I'd like all submitted logs to be computer-generated, paper logs are accepted and, as long as I can decipher your handwriting, they will be converted to Cabrillo. If you have access to a computer, there is a link on the CQWW VHF website where you can use the form that WA7BNM has created to send your paper log as Cabrillo.

Speaking of the CQWW VHF website <www.cqww-vhf.com/>, a big thanks goes to Randy, K5ZD, for bringing the site into the current century and consistent with the other CQ Contest websites. If you haven't visited it yet, please do so. You can search the results from 2000 forward. Results

articles from 2005 are also available. If you are missing certificates, those can also be downloaded.

USA

K2DRH wins, but without Bob. Bob had to be out of town for the contest and asked Wyatt, ACØRA, if he would like to operate the station. Wyatt was planning a major rover operation (maybe next year) and decided he couldn't pass up the opportunity. When it was all over, Wyatt had about 30 more Qs and a healthy 73-grid lead over 2016 winner Jeff, K1TEO. Both of their scores were up quite a bit from 2016. Bruce, KG6IYN, put in a good effort from Los Piños Mountain to finish third. You can read about Bruce's weekend in the Unofficial West Coast Report (see sidebar). There is also a link to a neat time-lapse video. John, N3HBX, finished fourth and John, K1OR, rounded out the top five.

On 6 meters, Jay, W9RM, dominated the field. Tom, WD5K, was second and Vince, KØSIX, finished third. Bill, W4GRW, turned in a great 2-meter score to take first place (and win a new plaque sponsored by Chuck, W5PR). Dick, K1HC, was second and AA2TT third. In the QRP Hilltopper category,

TOP SCORES WORLD

All Band		EM3U .....456
EA8DBM .....56,615	E7ØAA .....399	
IT9XTF .....12,870		
OK1DC .....8,610		
VE3DS .....8,384		
EA1ASC .....7,006		
6 Meters		
XE2X .....28,635		
9H1AE .....26,136		
VE3MMQ .....13,320		
XE2JS .....13,202		
AM625VQ .....12,512		
2 Meters		
S56P .....23,280		
E24QND .....21,510		
OK1GTH .....16,376		
SM4GGC .....16,000		
UXØFF .....10,560		
Hilltopper		
HA1ZH/P .....5,863		
HA2VR/P .....4,420		
I2ZJNN/IN3 .....1,032		

USA

All Band		W9SZ .....779
K2DRH .....144,534	W1QK .....420	
K1TEO .....101,084	AB1YK .....416	
KG6IYN .....62,640		
N3HBX .....41,132		
K1OR .....39,269		
6 Meters		
W9RM .....116,736		
WD5K .....65,037		
KØSIX .....43,952		
N5JR .....35,464		
K7CW .....34,410		
2 Meters		
W4GRW .....15,080		
K1HC .....3,444		
AA2TT .....2,318		
N4QWZ .....1,518		
W1XX .....1,482		
Hilltopper		
K1ZK .....3,168		
WA7JTM .....1,848		

2017 CQWW VHF TROPHY WINNERS AND DONORS

WORLD: Dr. Gene Zimmerman, W3ZZ Memorial. Won by: **Aleksandr Maksimov, EA8DBM**
USA: Steve Bolia, N8BJQ Trophy. Won by: **K2DRH operated by Wyatt Dirks, ACØRA**

SINGLE OPERATOR, SINGLE BAND

World 50 MHz: Dennis Motschenbacher, K7BV Trophy. Won by: **Jorge Alvarado, XE2X**
USA 50 MHz: Dennis Motschenbacher, K7BV Trophy. Won by: **Keith Morehouse, W9RM**
WORLD 144 MHz: Bostjan Sever, S56P Trophy. Won by: **Bostjan Sever, S56P**
USA 144 MHz: Chuck Dietz, W5PR Trophy. Won by: **Bill Fisher, W4GRW**

ROVER

USA: Northern Lights Radio Society Trophy. Won by: **Darryl Holman, WW7D/R**

MULTI-OPERATOR

World: Dr. Gene Zimmerman, W3ZZ Memorial (Joe Devenyi, HAØLC donor). Won by: **Station HA6W operated by: HA6ZFA, HA6WX, HA5OKU, HAØMK, HAØLZ, HAØMP, HAØLO, HAØLC**
USA: Bob Striegl, K2DRH Trophy. Won by: **Station K5QE operated by: K5QE, N5NU, N1XS, N5YA, AE5VB, K5MQ, W4KXY, K7RSM**

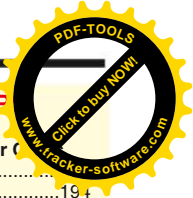
CLUB

USA: Won by: **Potomac Valley Radio Club**

**Denotes awarded to runner-up in category*

ROVERS & GRIDS OPERATED

4S7JL/R	.....MJ96, MJ97, NJ07, NJ06, NJ09
ABØYM/R	.....DM79, DM78, DM88, DM89, DN70, DN71
AC7MD/R	.....CN78, CN77, CN76, CN86, CN87
AE5P/R	.....EM21, EM22, EM32, EM31, EM20, EM30, EL29, EL39
E22EXA/R	.....OK03, OK04
E27DIX/R	.....OK02, OK03, OK04, OK05, OK06
HS3NJP/R & E23JMM	.....OK03, OK04, OK15, OK14
K2JB/R	.....EM96, EM85
K7ATN/R	.....CN85, CN95
K9JK/R	.....EN52, EN51, EN62, EN61
K9PW/R	.....EN62, EN52
KK6MC/R	.....DM65, DM64, DM74, DM75, DM63, DM73
KT5TE/R	.....EM21, EM22, EM32, EM31, EM20, EL29, EL39
N2DCH/R	.....FN22, FN12, FN21, FN11
N2SLN/R & KC2SFU	.....FN11, FN12, FN22
N6GP/R	.....DM13, DM03, DM14
N6JET/R	.....CM88, CM98, CM97, CM86, CM87,
N9GH/R	.....EN61, EN51, EN60, EN50
VA2NQ/R	.....FN45, FN35
VE3JAR/R & VE3CRU	.....FN04, FN13, FN14, FN03, EN93, FN02, EN92
W1RGA/R	.....FN42, FN33, FN43, FN32, FN41, FN31
W3DHJ/R	.....DM88, DM87, DM77, DM78
WA5GVQ/R	.....EM21, EM22, EM32, EM31, EM20, EM30, EL29, EL39
WB2SIH/R	.....FN33, FN32
WD5RAH/R	.....EM21, EM22, EM32, EM31, EM20, EM30, EL29, EL39
WW7D/R	.....CN98, CN88, CN87, CN97, CN86, CN96, CN76, CN77, CN85



Mike, K7ULS, operated from Powder Mountain (9,000-foot elevation) in DN41.

QSO & GRID LEADER

6-Meter QSOs		2-Meter QSOs	
W9RM	608	E24QND	194
K2DRH	448	S56P	178
WD5K	399	OK1GTH	178
K1TEO	355	K1TEO	164
KØSIX	328	W4GRW	145
K7CW	310	KG6IYN	106
KG6IYN	310	9A9I	103
K1TO	300	K2DRH	103
N5JR	286	SM4GGC	100
N1\$SG	279	OK1DC	98
N\$SKE	275	K1OR	91
EA8DBM	271	K1HC	82
NR7T	270	UXØFF	80
W5PR	270	N3HBX	65
WA5DM	254	PY2NF	64

6-Meter Grids		2-Meter Grids	
W9RM	192	SM4GGC	80
K2DRH	169	UXØFF	66
WD5K	163	S56P	60
EA8DBM	140	W4GRW	52
KØSIX	134	K2DRH	52
WA5DM	129	OK1GTH	46
N5JR	124	E24QND	45
9H1AE	121	UR3EE	45
NØKE	116	K1OR	43
XE2X	115	K1TEO	42
WB2FKO	115	R6CS	40
KØ9A	113	RD3FD	39
K7CW	111	RK1AS	34
K1TO	111	OK1DC	34
NR7T	111	R3CT	34

Zach, K1ZK, operated from the top of Mount Equinox in Vermont to take first, with Pete, WA7JTM, operating from W7A/MN-147 (Summits on the Air designator for Hedgepeth Hills, Minnesota) in second and Zack, W9SZ, third. N4SVC (operated by Steve, N2CEI) is the QRP champion with Bruce, WA2TMC, second and Curt, K9AKS, finishing third.

K5QE and teammates N5NU, N1XS, N5YA, AE5VB, K5MQ, W4KXY and K7RSM are the U.S. Multi-Op champions. They survived a failure of their rotatable 2-meter antenna and losing the 6-meter station for a couple of hours. The crew at K2LIM (ops: KA2LIM, W9KXI, and KB2YCC) were second, followed by K8GP (ops: W8ZN and K1RA), W3SO (ops: W3IDT, WA3TTS, W3BTX, W3XOX, W3BC, and W3YOZ) and NN7AZ (Ops: AA7A, KC1BB, KC7V, and WO7R).

WW7D tops the USA rovers with a fine 43,000 score. You can read about Darryl's rove at <<http://bit.ly/2zBgEAq>>. N2SLN

with KC2SFU finished second, KK6MC was third with Jonesy, W3DHJ, in fourth, which is his best finish since 2006; and Army, AE5P, finishing fifth. There were a total of 20 rovers active this year. I'd like to thank all those who provide many Qs and multipliers from grids that may not normally be active.

In the Club category, the Potomac Valley Radio Club submitted 33 entries to finish first with 378,734 points and win the first USA Club champion plaque. The North East Weak Signal Group was second with 235,883 points (10 entries) followed by the Society of Midwest Contesters with 228,523 points (20 entries) and the New Mexico VHF Society with 228,037 points (14 entries).

DX

Aleksandr, EA8DBM, remains at the top of the DX Single-Operator, All-Band category with 56,615 points. Salvatore,

CLUB COMPETITION

(Minimum of 3 entries required for listing)

UNITED STATES

Club Name	# Entries	Score
POTOMAC VALLEY RADIO CLUB	33	378,734
NORTH EAST WEAK SIGNAL GROUP	10	235,883
SOCIETY OF MIDWEST CONTESTERS	20	228,523
NEW MEXICO VHF SOCIETY	14	228,037
PACIFIC NORTHWEST VHF SOCIETY	22	144,077
ARIZONA OUTLAWS CONTEST CLUB	18	134,651
GRAND MESA CONTESTERS OF COLORADO	9	114,770
FRANKFORD RADIO CLUB	5	82,533
DFW CONTEST GROUP	5	58,564
NORTHERN LIGHTS RADIO SOCIETY	7	51,827
NACOGDOCHES AMATEUR RADIO CLUB	5	50,170
FLORIDA CONTEST GROUP	11	49,558
MT AIRY VHF RADIO CLUB	6	28,870
GEORGIA CONTEST GROUP	3	26,396
SOUTH EAST CONTEST CLUB	4	21,952
CAROLINA DX ASSOCIATION	7	19,966
BADGER CONTESTERS	4	16,093
SOUTHERN CALIFORNIA CONTEST CLUB	6	15,030

ROCHESTER VHF GROUP	4	12,319
YANKEE CLIPPER CONTEST CLUB	8	9,489
NORTHERN CALIFORNIA CONTEST CLUB	7	7,676
WESTERN WASHINGTON DX CLUB	3	5,828
PORTAGE COUNTY AMATEUR RADIO SERVICE	4	4,633
NORTH COAST CONTESTERS	3	1,979
CTRI CONTEST GROUP	3	1,827

DX

CONTEST CLUB ONTARIO	11	53,935
HA-DX-CLUB	3	17,357
UKRAINIAN CONTEST CLUB	5	14,743
EA CONTEST CLUB	4	10,809
CROATIAN CONTEST CLUB	3	8,166
CDR GROUP	11	2,690
BLACK SEA CONTEST CLUB	3	2,463
YO DX CLUB	3	1,112
ASOCIACION DE RADIOEXPERIMENTADORES- DE NUEVO LEON AC (Mexico)	3	1,106
CSM CRAIOVA (Romania)	3	402



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4	2	2	QJ03	9M4COK	M	990	33	15	JJ00	FINLAND		MALTA														
4	2	2	PM97	9M4CRX	M	28	5	4	OJ05	0FBV/9	6	504	24	21	KP46	9H1AE	6	26,136	216	121						
0	0	0	PM95	EUROPE					FRANCE		MOLDOVA															
2	1	1	PM84	AUSTRIA					F6HZZ	6	690	30	23	JN23	ER2RM	6	30	6	5							
55	11	5	PM96	OE1SOW					2	108	9	6	JN88	NETHERLANDS												
1	1	1	PM96	OE3MDB					Q	451	22	11	JN88	PASWT	A	399	21	19	J022							
924	64	11	PM95	BALEARIC ISLANDS					DL3JJ		6	7,200	100	72	J060	PASKT	A	330	19	15	J011					
16	4	4	PM95	AM625VQ					6	12,512	136	92	JM19	NORWAY												
9	3	3	PM95	EU4AX					2	220	11	10	K013	LA9BM	6	1,435	41	35	JP40							
12	3	3	PM84	BELARUS					J42T		6	792	33	24	KN00	POLAND										
SI LANKA										SV4RRK		6	20	5	4	KN09	SP3UR					6	418	22	19	J092
660	33	10	5	BOSNIA AND HERZEGOVINA					SV1NZX		6	9	3	3	KN17	SPTAWG	6	36	6	6	J091					
THAILAND										J48KEF		M	14,080	159	88	KN08	SP9RCX	2	648	27	12	J090				
21,510	239	45	OK16	E7TT					6	9,315	115	81	JN92	PORTUGAL												
324	18	9	OK14	E71W					6	154	14	11	JN93	CT7AIX	A	352	22	16	IM59							
306	17	9	OK14	E70AA					H	399	21	19	JN93	CT1BOL	6	4,263	87	49	IN51							
210	15	7	OK17	BULGARIA					HABXI		A	9,776	109	52	JN96	CT1GVN	6	3,978	78	51	IM67					
200	25	4	OK16	LZ2ZY					A	1,600	40	20	KN13	ROMANIA												
174	29	3	NJ99	LZ1YE					6	460	23	20	KN22	YO2GL	A	2,244	43	34	KN05							
132	22	3	NJ98	LZ2JOW					Q	12	3	3	KN34	YO7LYM	A	364	17	13	KN14							
128	16	4	OJ06	CROATIA					HA2KSD		6	16	4	4	JN97	YO5BRE	A	330	16	15	KN07					
114	19	3	OK03	9A1CBM					A	2,562	52	42	JN83	YO7LDT	A	8	2	2	KN14							
102	17	3	NJ98	9A3CJW					A	42	6	6	JN83	YO2NAA	6	828	36	23	KN05							
90	15	3	OK14	9A9I					2	5,562	103	27	JN85	YO7AWZ	6	272	17	16	KN14							
64	16	2	OJ07	9A0V					M	13,940	170	41	JN95	YO2LEL	6	54	9	6	KN05							
36	6	3	OK03	CZECH REPUBLIC					HA2VR/P		H	4,588	79	37	JN87	YO7CKP	6	30	6	5	KN14					
WEST MALAYSIA										HA5KDD		Q	24,621	191	87	JN97	YO3GNF	6	20	5	4	KN34				
1	1	1	OJ12	OK1DC					A	8,610	107	42	JN69	YOSCUQ	6	20	5	4	KN16							
EUROPEAN RUSIA										OK1GTH		2	16,376	178	46	JN69	YO6MT	6	12	4	3	KN26				
DENMARK										OU3U		6	16	4	4	J045	Y0BSAO/P	H	18	6	3	KN26				
ENGLAND										G0FPU		6	1	1	1	I092	Y0SAXF/P	Q	176	14	11	KN16				
EUROPEAN RUSSIA										R6KA		6	825	33	25	KN75	SCOTLAND									
FINLAND										RD3FD		2	4,368	56	39	L005	GM0V	A	588	28	21	I085				
FRANCE										R6CS		2	4,320	54	40	KN95	Op: GM00V									
GERMANY										R3CT		2	3,196	47	34	KN86	SERBIA									
GREECE										UA1ANA		2	2,340	39	30	K069	YU1AHW	6	1,302	42	31	KN13				
HUNGARY										RK1AS		Q	2,720	40	34	KN40	Op: YT2TA									
IRELAND										R03DKQ		Q	162	9	9	K085	YU1RA	6	108	12	9	KN04				
ITALY										UA6AH		M	168	12	7	KN94	YU1BFG	M	11,084	128	68	KN04				
JAPAN										EUROPEAN TURKEY		TA1D		6	4,655	95	49	KM39	SICILY							
NETHERLANDS										Z3K		6	16	4	4	KN02	IT9XTP	A	12,870	143	90	JM68				
NORWAY										LATVIA		YL3CAAC		H	2	1	1	K006	IT9NAN	6	986	34	29	JM77		
POLAND										LY2FN		2	40	5	4	K014	SLOVENIA									
ROMANIA										MACEDONIA		S59A		6	6,633	99	67	JN76								

The “Unofficial” Left Coast Report for the 2017 CQWW VHF Contest

BY BRUCE KRIPTON, KG6IYN

It was the analog of times. It was the digital of times. As would be the norm for my operating in any contest, I started this event about two hours after the starting gun. With work and family obligations (both of those are also important), there wasn't time to stage and build a day in advance as I normally try to. All work to set up and run the event happened Saturday morning with subsequent teardown Sunday afternoon, once the contest was over (for those interested, a “complete” time lapse video of the event from beginning to end is available here: <<http://bit.ly/2zkOnLv>>.

Radios turned on, computer running, time synced to WWV and it's off to the races. Coming out of the gate, it's all local traffic, with a few exceptions 300 miles east in Arizona on 2 meters.

About an hour in for me (close to three hours in from the official start time) propagation on 6 meters starts up to the Pacific Northwest: Oregon, Washington, Idaho and various parts of Canada. As the next couple of hours progress, Es starts a slow, clockwise rotation towards the Midwest and Great Lakes region and some odd hits to the Northeastern U.S. that became more of a persistent “path” for well over two hours.

After that, on 6 meters, it was random contacts in the 500- to 1,000-mile range to the Texarhoma region. As we got into the late afternoon hours and rolling in to early Saturday evening, it

was back to the Pacific Northwest again, which is where the evening ended.

Sunday morning, all was quiet on the 6-meter side, but it was time again to catch the “early birds” in Arizona and Nevada on 2 meters (Thanks to the Desert Rats and other clubs that are encouraging activity during these events). As midmorning progressed, 6 meters came to life in a big way to the southern central states again [with shorter and longer hops via Sporadic E (Es) mixed in] and stayed that way until the closing bell at end of the contest.

And now for the weird and Left Coast-related observations: If you happened to “watch” the contest on the propagation reporting sites on the internet, it was clear that almost all of the reported activity was from the central states to the east coast or thereabouts. Way off to that infamous lower left-hand corner of the continental United States, there was only a small group of operators working the openings on 6 meters. Here is where I describe why I opened the ULCR for 2017 with “It was the analog of times. It was the digital of times.”

If you happened to participate in the ARRL June VHF Contest a month earlier, there was a big “game changer” that happened with the latest release of WSJT X and its JT65 updates right before the contest. Effectively it made contacts possible even when there was no apparent propagation mechanisms avail-



3,280	194	60	JN76		
7,098	31	23	JN75		
SPAIN					
A	7,006	104	62	IN70	
A	4,459	88	49	IN52	
EA1HRR	A	2,914	56	47	IN83
EA3HJO	A	962	37	26	JN11
EA4DE	6	6,528	102	64	IN80
EA51DQ	6	4,674	82	57	IN98
EA1DHB	6	2,948	67	44	IN82
EA4AA	6	2,820	60	47	IN80
EA3AYQ	6	1,666	49	34	JN11
EA3KN	6	64	8	8	JN01
EA4CU	Q	180	14	12	IN80
SWEDEN					
SM6WET	6	49	7	7	JO68
SM4GGC	2	16,000	100	80	JO69
UKRAINE					
US1Q	A	6,751	99	43	KN86
Op: UT11C					
UY1HY	A	4,230	61	47	KO60
UT70F	A	2,204	50	29	KN77
UY7QN	A	1,632	40	24	KN77
UT8LE	A	1,232	31	22	KN79
UT70B	A	765	31	17	KN77
UT3UA	A	648	27	24	KO50
UZ5Q	A	319	20	11	KN77
UX2QL	A	208	13	8	KN87
UY5QO	A	104	9	8	KN77
UT2QQ	A	99	11	9	KN77
UY5YA	A	28	7	4	KN87
UT5EL/A	A	18	3	3	KO31
UR5LEH	A	8	2	2	KN89
UW7LL	6	1,656	46	36	KN79
UW1HM	6	1,400	40	35	KN69
UT81O	6	1,140	38	30	KN87
US8ZAL	6	660	30	22	KN66
UX4UA	6	285	19	15	KO50
UY9VY	6	121	11	11	KN68
UT6U	6	108	11	9	KO50
UT4XU	6	99	11	9	KO40
UZ5U	6	72	9	8	KO71
UT5CB	6	16	4	4	KN59
UR5OW	6	6	3	2	KN77
UX0FF	2	10,560	80	66	KN45
UR3EE	2	5,220	58	45	KN88
UT7EL	2	1,560	39	20	KN77
UX0QQ	2	990	33	15	KN87
UY7LO	2	900	25	18	KO80
UT8LN	2	736	23	16	KN89
UR3GS	2	420	21	10	KN66

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US5IUF	2	418	19	11	KN88
UT2UB	2	408	17	12	KO50
UR8QE	2	252	18	7	KN77
UR7QDO	2	160	16	5	KN77
UR0QA/P	2	150	15	5	KN77
UR7QDU	2	14	7	1	KN77
EM3U	H	456	19	12	KN59
UT1ZZ/A	H	4	2	1	KN48
UT6EY	Q	2,924	48	34	KN77
UR8GZ	Q	1,875	40	25	KN66
UY5ON	Q	1,512	37	24	KN89
UX41J	Q	1,218	29	21	KN88
UT3G/P	Q	1,088	32	17	KN76
Op: US0GB					
UR6QW	Q	256	16	8	KN77
UZ7W	M	3,108	60	42	KN18
UT7E	M	2,346	44	34	KN78

SOUTH AMERICA					
BRAZIL					
PU2TRX	A	220	30	4	GG66
PY2ZZ	A	168	28	3	GG66
PY2AXH	A	51	9	3	GG66
PU1XZU	A	32	4	4	GG77
PP5EK	A	2	1	1	GG43
PV8DX	6	63	9	7	FJ92
PV8AZ	6	15	5	3	FJ92
PY2NF	2	768	64	6	GG66
PU2TYA	2	30	15	1	GG66
PY2KS	2	30	15	1	GG66
PU2NAX	2	28	14	1	GG66
PY2TTE	2	20	5	2	GG76
PU2MVE	2	16	8	1	GG66
PY2RBN	2	10	5	1	GG66
PU2PSP	Q	111	21	3	GG66

PY2BI	Q	16	4	2	GG67
PU2MMP	M	1,192	77	8	GG66
PY2LCD	M	200	27	4	GG66
VENEZUELA					
YV6CR	A	168	14	8	FJ78
CHECK LOGS					
These logs were used for cross-checking. Checklogs are always appreciated. AB3AI, CT1AVR, E72U, EA8BPX, FP/KV1J, GW6KLO, IK7LMX, K0GU, K3MEC, LY2X, LZ1VO, N1FD, PY2SHF, RN6MA, SP2HHX, UR11, UR4LIN, UR5WMM, UT4UFZ, Y050HO.					
DISQUALIFIED					
E24QND - Excessive unverified QSOs and grids.					

able on 6 meters. So, for that event, there were more folks on digital than I have ever seen ... either on the radio by listening, or on the computer via the waterfall. The humorous note for me was seeing 20 to 30+ traces (or more) going by on the computer screen, all of them more than strong enough (many were S-9+) to have easily been worked by phone. So, for those of us on the Left Coast, we were taking advantage of slow, but solid runs, as well as search-and-pounce operations, without contention on phone and CW (analog), while others were fighting it out on digital with lots of other folks and making a digital Q every three to four minutes at best.

Jumping back to the current CQWW VHF Contest, the previous week saw the release of WSJT X and its improved FT8 mode. Now clearly there's an advantage that FT8 can potentially make a valid contact and exchange in about 30 seconds, instead of three to four minutes with JT65, but we observed the same challenges noted in the June ARRL VHF Contest. Twenty to 40 signals at a time on the waterfall, most signals over S-9, and many stations running more power than needed while causing interference to other stations also trying to make contacts. The folks out here on the Left Coast once again leveraged phone and CW to work the spotty Es conditions that prevailed for the duration of the contest, where often there was only a short window for a full exchange of information to make a valid contact entry. For much of the contest, the propagation did not support second chances.

The other interesting aspect was that so many participants were playing with digital, the calling frequencies and spots adjacent to them on CW and phone were often dead quiet. No one calling CQ, no local chatter, etc. So while all was quiet here, there were huge pileups in the central states and eastern seaboard on phone, CW, and digital. If you weren't calling CQ from the Left Coast, you weren't making contacts, despite

reports several of us were in "solid" to Texas for several hours, we heard no traffic on our side — just CQ replies from random grid squares that the Es was kind enough to "light up" for us.

Lessons Learned

We observed and "eavesdropped" on many PSK-31 and WSJT-X based QSOs. It was interesting, but it was clearly a detractor that so many were learning the ropes in a contest venue. It was also interesting to "see" a signal jump from a mid-S "something" to S9+20 or more when the operator got frustrated and didn't think he was getting out. The point again was that there was a lack of folks using more conventional modes (CW, phone) when the propagation supported it. For those on the Left Coast, jumping on the radio and listening to the calling frequencies for a few moments, hearing nothing and turning off the radio was an opportunity lost. Call CQ for at least several minutes, spin the dial up beyond 50.200, and at least to 50.350, to see if you can "hear" any digital activity, which could be an additional indicator the band is open to somewhere.

For the folks doing digital — if you're getting chewed up in the dogpile or pileup and the propagation is good, go back to CW or phone where you'll likely make loads of contacts with those who do not have digital capabilities, then fall back to digital modes when the propagation enhancement starts to fade.

As always, I want to thank to folks at CQ Magazine for sponsoring and supporting this event each year as well as the operators who also played on the airwaves over the weekend. To date, and having enjoyed this contest for over 10 years, from here on the Left Coast, this was a new high-water mark for new and longtime operators participating in the contest — a trend I hope will continue to grow.

Comments and feedback are always welcome, you can email here: <kg6iyn@arrl.net>.
- 73, Bruce, KG6IYN



We hope you got the gift(s) you wanted this holiday season ... but no matter what you got, AA2AV guesses it won't compare with the gifts of Christmas past.

A Heathkit Christmas

BY PAUL A. SCIPIONE,* AA2AV / NØAI

The Christmases of our youth tend to remain in our memories...not just for the brightly decorated Christmas tree, caroling, and good eats, but more likely for the presents we either got or went without. Christmas 1956 is particularly memorable for me because I got the Heathkit CR-1 crystal radio I lusted for. It turned out to be just the first of dozens of radios that I have had during a lifetime of amateur radio and AM radio DXing.

My father, mother, younger sister and I had just moved 35 miles from Medina, New York to Lewiston, a historic little village on the Niagara River, just six miles north of Niagara Falls. When we looked across the river from the foot of Center Street, we were looking at a different country, Canada. We lived in a modest, one-story ranch-style home in a new development of growing families like ours. The neighborhood was full of other kids our age and was a great place to grow up.

For some reason I developed an early interest in radio. It must have been the big Magnavox console radio/record player in our living room. It had magnificent speakers protected by fancy, crisscross mahogany wooden grills, but the main attraction for me was the large, green cat's-eye that helped you tune in distant AM stations with 100% accuracy. What a revelation I got from 50-kilowatt clear-channels like WKBW, WLS, WLW, WBZ, WCBS, WSM Nashville, even distant KMOX in St. Louis. I used to turn down the lights in the living room and just sit for hours listening to all the magic DX coming in through the green glow of the cat's-eye tuner.

The Catalog...

I think it was another fifth grader at school who handed me a dog-eared Heathkit catalog. I went through it from cover to cover, looking for something I could build that my parents could give me for Christmas. I quickly homed in on Heathkit's CR-1 crystal radio, complete with twin gray knobs in a black Bakelite case. As I can recall, the cost was about \$7.95 which would be about \$70 in today's dollars.

So it was with both trepidation and wild-eyed hope that I opened my presents that snowy Christmas morning. Although my parents gave me the usual utilitarian stuff like new blue jeans and winter boots, I focused on the present that seemed the most likely size and weight. It was nearly out-of-sight behind the tree. My heart was beating fast as I carefully removed the wrapping paper (which my ever-frugal Mom insisted that we reuse) and there it was — in all of its electronic glory!

Enter the Elmer

Worried that I wouldn't be able to put the radio together on

* <scipione@geneseo.edu>

Blog: <www.nationofnumbers.com>

** KB2LWI is a retired journalist and still lives in Lewiston, NY.



The Heathkit CR-1 crystal radio. (Photo courtesy Rob Mavis, AE6GE, of the Old Tube Radio Network <www.oldtuberadio.com>)

my own, my parents asked me to call a high school student who went to our church — Don Beehler, (currently) KB2LWI.** I called Don and he promised to stop by after 3 p.m.

For once, I actually hurried through my Mom's delicious Christmas feast. I took my Heathkit down to the basement and arranged the few tools that we had. Fortunately, Don showed up with a soldering gun and the right type of solder. We opened up the four-page instruction book and he said, "This is a piece of cake, but watch everything that I do so that you can learn how to put other kits together. Remember, this is just a crystal radio receiver that only gets AM stations. If you want to be a licensed ham radio operator like me, you have to take a government test and spend at least \$75 to \$100 for a separate shortwave transmitter and receiver."

We worked atop the painted plywood ping-pong table that Dad had given the previous Christmas. I noticed that Don took great care to first lay out and inventory every item from the kit. I wasn't crazy about the strong, metallic smell of the solder, but I watched every step that Don took. As he finished each, I crossed off that item in the instruction booklet. We started around 3:15 p.m. and were all finished before 4 p.m. Don had already made a simple wire antenna ("Don't call it an "aerial!") that we poked out my bedroom window and then strung to a maple tree about 15 or 20 feet away. Don gave me a much smaller wire to use as the ground wire, by attaching it to the metal screen over the forced-air heating duct in my bedroom floor.



"Ok, let's give her a listen," Don smiled conspiratorially. First he attached the simple black headphones that had come with the kit. Next he used the left knob to maximize the crystal set to the antenna length for the AM band. Finally, he used the right side tuning capacitor to see what stations my little crystal radio would pick up.

"Hey, we got WGR 550 from Buffalo!" Don yelled proudly. "Here, you listen. I put the headphones over my ears and — wow — yes there it was, WGR, all the way from Buffalo, 30 miles away. And my new radio worked without batteries.

Don and I spent another 30 minutes, checking up and down the AM dial and discovered that my CR-1 could also pick up five other stations — WBEN (5,000 watts) on 930, also from Buffalo, my Dad's favorite station; two from Niagara Falls, NY — WHLD, a 2,500-watt station at 1270 that ran a bunch of ethnic programs I couldn't understand; and WJLL, a 1,000-watt at 1440, the station that would air my monthly youth show a few years later; WKBW, Buffalo's 50,000-watt screamer at 1520, that was just at the cusp of the rock-n-roll revolution with its iconic DJ George "Hound Dog Lorenz," a white guy who played "Black" music; and a 2,500-watt station at 1600 from Niagara Falls, Ontario.

I was having a ball listening on my nifty new crystal set when, suddenly at 4:45, three of the six stations disappeared. "Oh, no, something is wrong!" I shouted.

Don checked out the three remaining stations and then smiled: "Nothing is wrong. It's dark outside now and three of the stations are daytime-only stations that only broadcast sunup to sundown. That way people can hear distant, more powerful DX stations when nighttime propagation happens."

Don handed the CR-1 back to me and left for home as my Mom handed him a plateful of homemade Christmas cookies. "Thanks for helping Paul put the radio together, Don. I know he is going to have lots of fun with it."

Building on the CR-1

Wow, what an understatement! Two years later, I was able to put together a much more sophisticated pocket transistor radio from the Lafayette Radio catalog all by myself. Then in 1959, I inherited a 7-tube Emerson tabletop radio that featured a smaller green tuning eye and I was really hooked on nighttime DX stations from all over the United States, Canada and even a few 100,000-watters from Cuba that carried Fidel Castro spewing his "commie propaganda" for hours at a time. I used

my Dad's Wollensack tape recorder to capture those recordings in Spanish that I then took to my high school history teacher for extra credit. At 17, I went up to Buffalo and passed the scary FCC test to get my Novice ham license, but it was only good for one year. I quickly picked up the Morse code and enjoyed working hams in half a dozen states on 40 meters. But then I graduated from high school and left for college. When I came home on Christmas break, I was shocked to find that my parents had turned my tiny bedroom into a dining room and sold off both my Heathkit CW-only transmitter and 4-tube Heathkit receiver. My modest wire antenna was still connected to one of my Mom's clothesline posts in the backyard, but what good was an antenna without my ham rigs!?

Postscript

It was 25 years later (1989) before I got relicensed, thanks to my Army MARS friend from Vietnam, Dennis Vernacchia, N6KI, who introduced me to his lifelong ham friend from Newark, New Jersey, Don Ippolito, K2OK, who lived near me. I quickly relearned the code and got back on the air within weeks as Novice station KB2IPY from my then home in Metuchen, New Jersey. I became an enthusiastic member of the Piscataway Amateur Radio Club (PARC) and the much larger Electronic Technology Society of New Jersey (146.94 Green Brook Repeater), that I later served for four years as president.

I passed my Tech test (N2KCH), then my General and Advanced (KE2SW) exams, all at 2-month intervals. Then, six months later, I passed my Extra Class. Since I have always been a 99% CW operator, it was a hard decision to turn in my Advanced callsign, KE2SW, with its nice CW cadence and "Keep Every 2 Short Waves" on phone. But when the FCC assigned me my new Extra Class callsign AA2AV, I instantly recognized it as a rare gem. It sounds nice on phone because of all its alphas, but its CW cadence is perfect because every dash equals three dots and "V" is a great closing letter. "AA2AV" is on the license plates on my wife's car and "NØAI" on mine, since I am the longtime trustee of the "American Italian" Radio Club. But Tech/STEM types always get annoyed because they think my license plate mocks the field of artificial intelligence!

Every Christmas, I think how lucky I was that Don Beehler took the time to help me build the little Heathkit CR-1. What was the first radio that got you addicted to amateur radio?



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DXCC and Kosovo

'Only Donkeys Don't Change'

Personal Opinion by CQ Contesting Editor David Siddall,* K3ZJ

One of ham radio's benefits is that it provides a safe haven. The daily stress of headlines that dwell upon the complexities and worries of geopolitical disputes and threats melt away as one enters "ham radio land." We can talk with any ham in any country without regard to, or even knowing, their ideology, political beliefs, social status, gender, race, or anything else. We meet our fellow hams on the common ground of our avocation.

The allure of DX for many hams around the world is enhanced by earning one of the premier ham radio operating awards, the ARRL's DX Century Club (DXCC). The primary DXCC award is earned for making contact with, and receiving confirmation from, hams in 100 or more "countries" or "entities." This award also can be earned in many variations of bands, modes, and country count. Achieving "DXCC status" denotes meaningful

accomplishment. In that respect, the award has acquired out-sized importance within the ham community.

The DXCC Countries List

Like ham radio itself, the DXCC list of "countries" upon which the award is based historically has been administered neutrally and based on facts free of political statement or ideology. Although administered by the American Radio Relay League (ARRL), the U.S. national amateur radio organization, even during the "McCarthy" and "Cold War" years, countries generally viewed as unfriendly or worse, some not even recognized by the U.S. government, nevertheless were on the DXCC list without regard to the political situation.

The foundation for today's DXCC list is traceable to Clinton B. DeSoto, W1CBD, a former ARRL staffer. In an article published in the October 1935 issue of *QST*, DeSoto laid out the basis for determining DXCC "countries" or "entities." "The

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An international amateur radio delegation consulted with officials of the Kosovo Telecommunication Regulatory Authority (TRA) on Kosovo's amateur radio regulations as the regulations were being finalized. The regulations were released on September 17, 2012, heralding the return of amateur radio for former YU8 holders and new applicants alike. Shown at the rear of the working group are (from left): Hans Blondeel Timmerman, PB2T, then-President of IARU Region 1; Martti Laine, OH2BH, Coordinator of "Mission Goodwill Kosovo"; Nikola Percin, 9A5W, IARU R1 Executive Committee Member; and Robert Barden, N2BB/MDØCCE. TRA Chairman Ekrem Hoxha conducted the meeting with his regulatory team (on the left). (Photo credit: OH2BH)



Basic is simple and direct," he wrote. "Each discrete geographical or political entity is considered to be a country¹." A couple of years later, a specific listing of countries was published in *QST*, and this list became the standard among radio amateurs around the world.

DeSoto clearly never intended that every DXCC "country" would be a "nation state" in the traditional sense of international diplomacy. It is equally clear that, as DXCC was being formulated during times of international tension that shortly would culminate in World War II, the intent was to include every legitimate "country" whether friend or foe. For the following 80 years, the ARRL promulgated and amended various criteria and rules to guide which countries or entities should be on the list, and the criteria evolved over time. The list changed as countries changed.

The "no geopolitics" tradition served our country and the worldwide radio amateur fraternity well for eight decades. Unfortunately, however, owing to what might best be described as an ill-advised rules change followed by adherence to form over substance, today — for the first time — the DXCC list can be viewed as politicized and unfair in its treatment of the hams in Kosovo.

Kosovo's DXCC Status

The treatment of Kosovo may well be unintentional, but that is not an excuse for allowing political ideology to be felt within our "ham radio land." By adhering to the letter of the ill-advised DXCC rules rather than changing or amending them to agree with the list's underlying purposes and traditions, those who currently administer the list at the ARRL needlessly politicize the list and discourage the more than 100 hams in Kosovo who also desire to participate in the DXCC program and in ARRL contests that are based on DXCC multipliers.

Kosovo is recognized by the vast majority of nations — 111 of the 193 United Nations member states at this writing. Unlike many DXCC entities, hams in Kosovo are on the air every day. Their national society, SHRAK, is a member of the International Amateur Radio Union (IARU). They sit and vote with all the other IARU Region 1 national societies.

Yet their QSLs are not creditable for DXCC. They are radio amateurs without a DXCC country. Worse, too often, operators are disparaged over the air as "pirates" and reminded of their non-acceptance into the ham radio world of DXCC. See, for example, the accompanying table of comments selected

from recent spots distributed worldwide on the spotting network. Historically, insofar as I can determine, this is the only time that there has been excluded from the DXCC list a generally-accepted actual, populated country with active ham radio operators.

Politics, or the Perception of Political Influence

In this case, no action by the DXCC administrators has transformed into action with consequences. The perception has been created that amateur radio and DXCC are susceptible to

political influence in a fashion that is harmful to amateur radio's important mission of fostering person-to-person contact and friendship beyond borders.

Oddly, Kosovo is being kept out of the DXCC and related programs even as political leaders in the area, notably including Serbian President Vucic, have vowed to regularize in some fashion Serbia's relationship with Kosovo notwithstanding the enmities that exist among many citizens on both sides of the border². For those who have gone through war, as Serbia and Kosovo residents experienced less than 20 years

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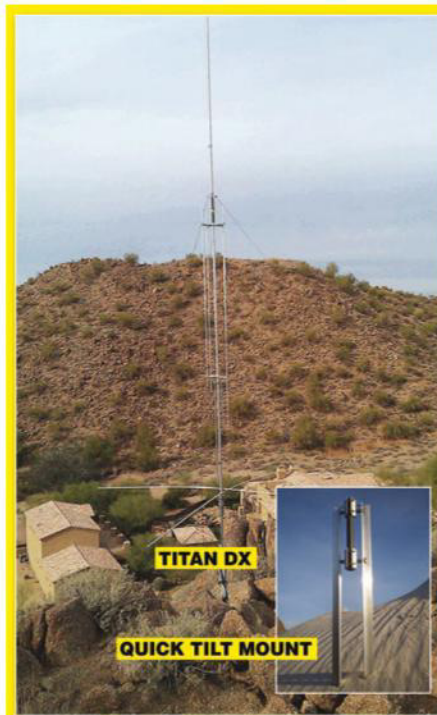
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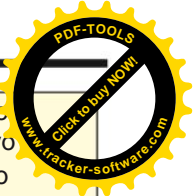


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EA4C	C-@	7016.5	Z68BB	20:23 29 Sep 17	Z6??? not on DXCC	Kosovo
G4Z		7015.6	Z68BB	18:00 19 Sep 17	Boris KOSOVO not yet DXCC	Kosovo
	FWM	7019.7	Z61KR/P	19:14 13 Sep 17	witch Country???	Kosovo
YU3EEA		7016.2	Z68BB	19:41 01 Sep 17	PIRATE CALL	Kosovo
EUDX-	@	21000	Z6DX	14:00 25 Jun 17	pirate	Kosovo
YU3EEA		14005	Z61DX	13:27 25 Jun 17	PIRATE	Kosovo
YU8DX-	@	7000	Z68BB	19:51 11 May 17	Sorry guys Pirat Pirat Pirat	Kosovo
YU8DX-	@	7000	Z6BB	19:16 11 May 17	Pirat station	Kosovo
YU3EEA		14015	Z68BB	14:48 11 May 17	PIRATE PIRATE	Kosovo
YU3EEA		7012.5	Z68BB	20:52 09 May 17	PIRATE	Kosovo
YU3EEA		7017.5	Z68BB	19:47 08 May 17	PIRAT	Kosovo
YU3EEA		7017.5	Z68BB	19:33 08 May 17	PIRATE	Kosovo
YU8DX-	@	10104	Z6/DF8AN	10:47 30 Apr 17	Sory gays, pirat station	Kosovo

This table, excerpted from DX spots available at <<http://dxsummit.fi>>, is a non-inclusive collection displayed by DXSummit when Kosovo stations appeared on the bands last year. These are selected from among the more than a thousand spots made during the first 9 months of 2017 for the 26 stations. Some of them here must be less than inspiring to the operators of Kosovo.

Note: The well-known, web-based DX spotting website distributes spots worldwide via the internet. The designation “-@” means that the spotting station was connected directly to DXSummit. A callsign without the “-@” indicates that the user was logged into a DX spotting system different from DXSummit, but is connected to DXSummit for the purpose of repeating DX spots to a wider audience. The second-to-last column allows “spotters” to add comments about the station being reported. Many operators have the spotting network alerts integrated into their logging software and see the alerts within a second or two when they are busy operating. You can view and do a similar search of DXSummit without logging into it at the above link.

ago, the scars of battle on both sides must heal if peace and progress are to be attained. Ham radio should be a help to healing, not a hindrance.

Until now, a populated territory with an organized political authority and borders generally observed by its neighbors and significant recognition among other nations always was quickly added

to the DXCC list. Over a decade ago, however, the DXCC criteria based upon political separation was narrowed to what can be, in fact, a single political criterion — UN membership. The result is that as written, the DXCC rules now provide that only if a new country is admitted to the United Nations or obtains a callsign assignment from the

International Telecommunications Union (ITU) — which itself is a subservient United Nations agency — will a country be added to the DXCC list as a political entity.

Few radio amateurs are experts in international diplomacy and capable of determining what attributes constitute a “state” or “nation” in international law. Nor should they have to be. For amateur radio purposes, we would get far beyond our competence were we to debate the finer points of Article 1 of the Montevideo Convention as compared to Opinion No. 1 of the Badinter Arbitration Committee in order to establish the DXCC list.

Merely relying on United Nations membership or, what is functionally identical, actions of the UN agency ITU, politicizes the DXCC list no matter the original intent of the rule makers. The change in DXCC rules may have seemed perfectly reasonable at the time, but its application results in an unreasonable outcome now. The problem has been exposed for years, but remains unaddressed by the DXCC administrators.

To be specific, the problem is that United Nations membership in and of itself is a political indicator of “sovereignty” or status as a nation or state. Membership requires a super-majority vote both of the UN Security Council and the General Assembly. UN mem-

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ership is determined by a political process that can — and has — been used for purposes that should be irrelevant to amateur radio awards and contest purposes. And the additional ITU criterion is of little help, since the ITU itself is a UN agency.

Consequently, adding a country to the DXCC list today has gone from a common-sense type decision to one that relies solely on technical rules that may not make any sense when applied to amateur radio purposes. Some judgment must be applied. This is all the more so as there are other disputed areas in the world, some of which may eventually gain the attributes of nations.

But all this should be fairly irrelevant to an avocation that seeks to foster new hams and amateur radio activities throughout the world. The DXCC objective as commonly understood is to encourage operating in diverse political and geographic areas everywhere. Meeting this objective is fairly easy, since DXCC decisions do not bear the burden of deciding sovereignty or statehood. There are many geographic areas on the DXCC list that are, in fact, uninhabited and with no attributes of states or nations. DXCC is, after all, important to DXers and contesters, but of no import outside of our little corner of ham radio.

Conclusion

In closing, compare the absence of Kosovo on the DXCC list to earlier times. Consider, for example, that as the 1962 CQWW SSB contest began, USSR Premier Krushchev was sending his response to U.S. President Kennedy that would determine whether our nations would be engaged in nuclear war before the contest was over. But even on the eve of what, at least in retrospect, many considered our most dangerous period, hams in suburban Washington, DC, were busy exchanging their “59 05” for “59 16” with operators around Moscow.

The ham radio tradition of openness and acceptance has helped to look past points of political disagreement to find areas of agreement and mutual interest in amateur radio activities. We see each other as individuals rather than faceless government actors. And in that aspect, our avocation may contribute in some manner to a better world.

Inevitably, what is or is not a “country” can be disputed, but acceptance into amateur radio and DXCC activities should be open to all hams operating from generally accepted political states. A criterion such as recognition by at least one-quarter of UN states (currently this would be 49 states) would

help remove the influence of political consequences that are irrelevant to our purposes and are corrosive to the underlying traditions of amateur radio and the DXCC program.

Notes:

1. See Clinton B. DeSoto, Assistant to the Secretary, A.R.R.L.: “How to Count Countries Worked: A New DX Scoring System,” *QST* October, 1935. Available at: <www.arrl.org/desoto>
2. For example, see “Vucic Says Serbia Must Resolve Dispute With Kosovo ‘Together.’” Available at: <http://bit.ly/2zkUR0a>. “Serbia must resolve its relations with its break-away former province of Kosovo in order to move forward, Serbia’s president wrote in an opinion piece Monday.” Available at: <https://yhoo.it/2B6EPUJ>.
3. Serbian President Aleksandar Vucic quoted by Robert Tait, *The Guardian*, March 1, 2017. Available at: <http://bit.ly/2AhpvYo>

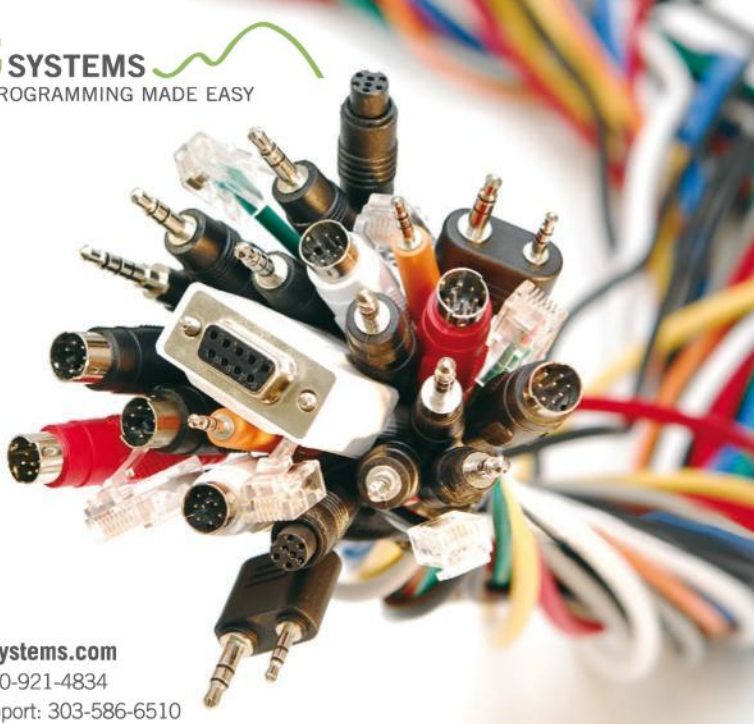
The DXCC administrators should take the time to hear the Serbian idiom quoted in an interview by Serbian President Vucic in early last year: “Only donkeys don’t change³.”

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When K8BYP tried to re-create his mentor's 1960s ham station, the project turned into much more than he'd bargained for, and it's not for the faint of heart or weekend tinkerer! Here's his story...

Remanufacturing a Boat Anchor

BY DAVID R. CAMPBELL,* K8BYP

The Drake TR-3 transceiver was produced around 1963 and was my Elmer, K8BYP's, rig so upon earning my Extra Class license a couple of years back, I set out to get both his call and his rig. The last year-plus was devoted to reverse-engineering and remanufacture of a Drake TR-3 (Photo A), AC-3 power supply, and RV-3 VFO (Photo B), which my friend Perry, KK4LZF, found for me at a hamfest.

Due to the lack of service information and general knowledge of the Drake B-line, difficulty in parts sourcing and technical problems, the project became a complete reverse-engineering and remanufacture. "Remanufacture" goes beyond an ordinary restoration — to "just get it back on the air" with largely cosmetic work. Rather, the goal here is to make the radio as new as possible with some circuits redesigned for better performance. Determining what "like new" is requires a reverse engineering of circuits and mechanisms to find design details and intent of the engineers who originally designed the rig.

Proper operation of the transmitter is required as it operates in a licensed radio service with technical regulations governing transmitted signals. The transmitter must be restored to ensure frequency stability and purity of output.

A Daunting Proposition

Significant technical and engineering knowledge, as well as hands-on experience with tube circuits, was necessary. Over the last 45 years, I've gained knowledge and experience in designing, manufacturing, testing and high-volume repair of electronics equipment, but still found it a daunting task to rout out all of the B-Line gremlins and find part's sources. Experience in everything from old tube-type TVs to modern fine-pitch SMT (surface-mount technol-



Photo A. Front view of the author's remanufactured Drake TR-3 transceiver.



Photo B. The AC3 power supply and RV3 remote VFO were also rebuilt as part of the author's restoration project.

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... (y) circuitry helped, but these Drakes have a peculiar set of problems, some taking weeks of research and testing to resolve.

The following is a general discussion of what's required to properly and completely rework old rigs, using this TR-3 as an example. Again, this type of work requires significant knowledge and experience working with tube gear, as well as access to professional-grade equipment and materials.

Safety!

Modern solid-state circuitry operates on low voltages. Lack of knowledge and experience with high-voltage tube circuits creates the risk of carelessness around HV power supplies and circuits that can cause injury or death. Familiarity with high-voltage safety procedures is vital. Resist the urge to plunge your fingers into a chassis — work slowly, probe deliberately. High voltages can “reach out and touch us” — direct contact is not required. Beware of energized sharp points such as stranded wire ends, that can penetrate the skin while energized. Microampere-level current is dangerous if applied internally¹.

This project required a list of 11 chemicals, taken from years of high-volume electronics service and manufacturing experience. Special industrial and consumer chemicals were used, so following safety precautions is mandatory.

It is not sufficient to spray a little contact cleaner in a pot, switch or mechanism; it must be disassembled, have the old dried grease base and metal fragments removed, then be lubricated and reassembled.

Some parts — such as NOS (new old stock) tubes, new state-of-the-art capacitors, panel meters and crystals — were readily available. Two inductors were destroyed during this work; one was repaired, the other rewound. Large air-variables are generally unavailable, but they usually work except for oxidized grounds. New local oscillator (LO) and SSB filter crystals were supplied by ICM. All of three resistor values were out of tolerance, and were replaced. The plate meter was replaced after losing damping. The T/R relay

is not available, but unless badly damaged, can be restored. Two pots were rebuilt with new resistive elements.

Cosmetic Cleaning

First, clean the front panels, knobs, cabinets, plastic VFO window, dial (*Photo C*) and meters. Doing this first eliminates scratching when handling these parts due to debris on them. The VFO dial and window came out like-new (*Photo D*), thanks to a special industrial cleaner. Distilled or highly filtered rinse water was used to prevent water-spotting.

Cleaning and Lubrication of Functional Parts

Moving mechanical parts must be cleaned of grease and metal fragments, damage from insufficient lubrication repaired, then lubricated with the proper grease. It is *never* sufficient to spray CRC in a pot or switch. Spray from outside cannot remove dried grease-base and metal fragments from inside an assembly. This old grease base, containing metal wear particles, once softened by contact cleaner, makes an excellent grinding compound that can damage bearing surfaces. The ball bearings on the input shafts of the air variables are pressed assemblies and are not repairable; they require careful cleaning and lubrication.

The large air-variable capacitors have spring “fingers” to make contact between the stator and the frame. Open grounds on the load capacitor caused the large power amplifier (PA) RF choke to explode into fireballs. These air variables cannot be disassembled to restore a bad ground, so the shafts were grounded with flexible braid.

The TR-3 has 15 wafer-switch segments with silver flashed contacts. The flashing is very thin and was badly oxidized. Tarn-X was found to both remove surface oxidation *and the silver flashing*.

The nylon gears in the VFO dial mechanism were yellowed from age and contact with oil from the grease used to lubricate the VFO shaft bearing. Nylons and many plastics are

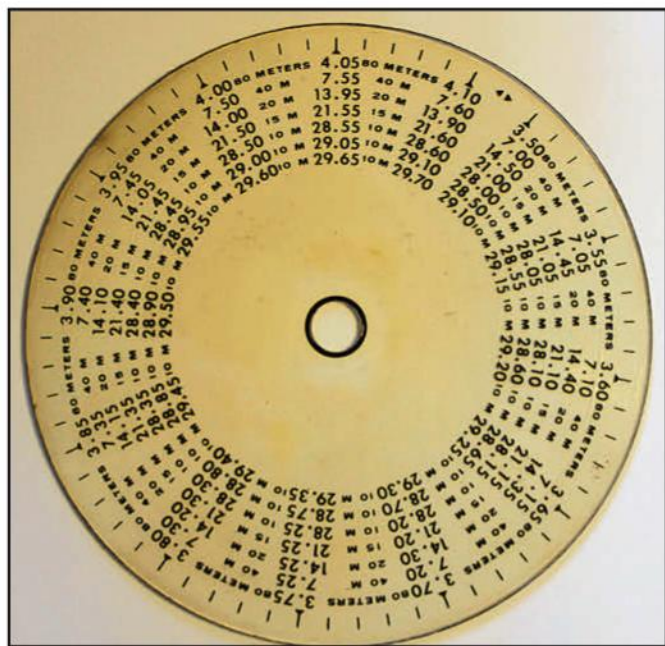


Photo C. The VFO dial before cleaning. It was yellowed from age and contact with grease used to lubricate the VFO bearings.

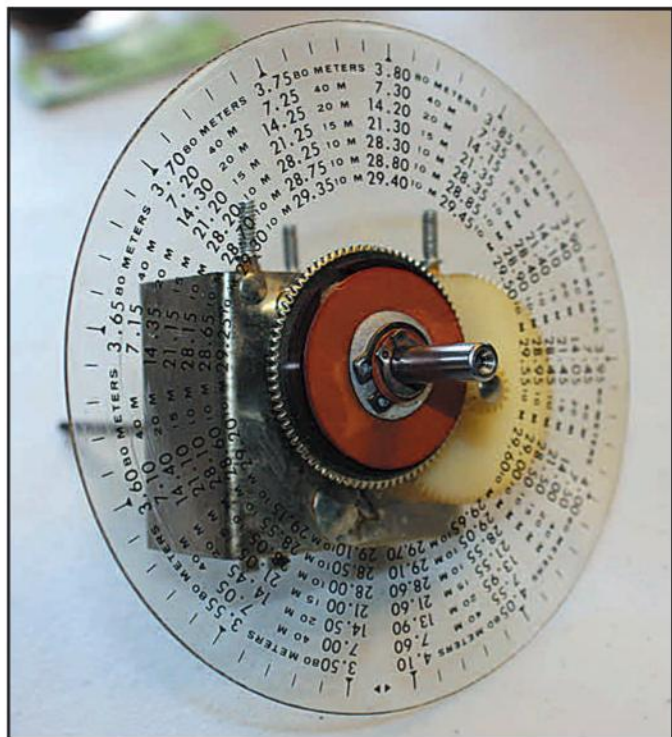


Photo D. VFO and dial after cleaning with special cleaner. Everything looked like new!



Photo E. An old 650-volt electrolytic capacitor, totally dried out inside. A cap in this condition cannot be “reformed.” It must be replaced.

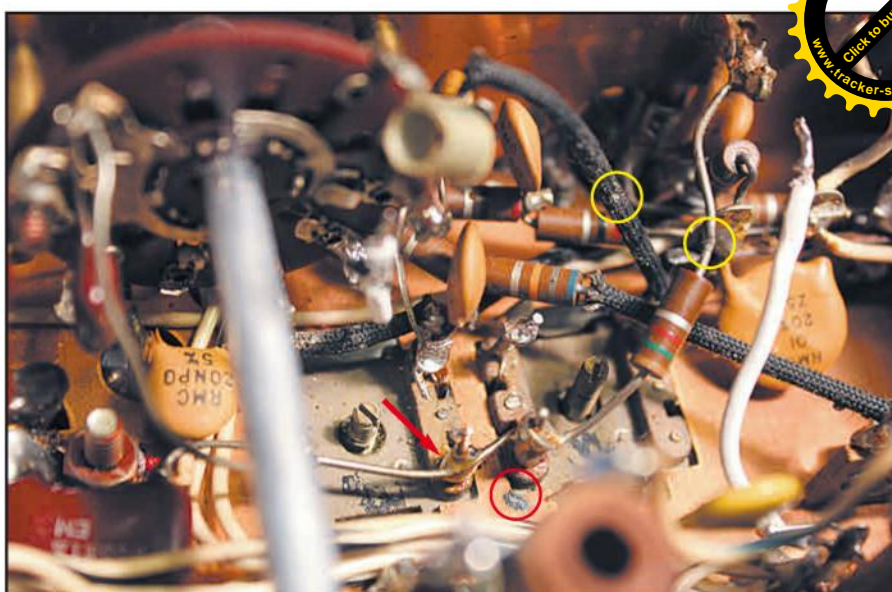


Photo F. Two simultaneous wiring arcs put 250 volts across a winding on an RF transformer, destroying it.

self-lubricating², and additional lubrication is usually not required. Clean the gears and let the low coefficient of friction of nylon do the rest since there is very little speed or force in these gears.

Mechanical inspection, cleaning and lubrication must be done early to find damaged or missing parts that cannot be replaced and may make repair or restoration impractical.

Electro-Mechanical Connections

Electro-mechanical connections, non-moving, moving and soldered, are the biggest failure areas in electrical and electronic equipment. Oxides are electrical insulators that make soldering difficult. The terminal strips in the AC-3 power supply were so badly oxidized they could not be resoldered. Old tube pins exposed to age and heat have a hard black oxide coating that must be removed with sandpaper. The T/R relay was disassembled and contacts polished, but a weak RX cathode contact caused the S-meter to be unstable. One contact was bent, which corrupted the relay contact timing.

Passive Component Testing and Replacement

All electrolytics, high-voltage ceramics, and plate-to-grid coupling capacitors in the TR-3 were replaced. Avoid using NOS capacitors in new work. New capacitors are superior in size, price, product-CV, and leakage. According to Kemet³, new electrolytics have an 18-month storage life before reforming is needed. New

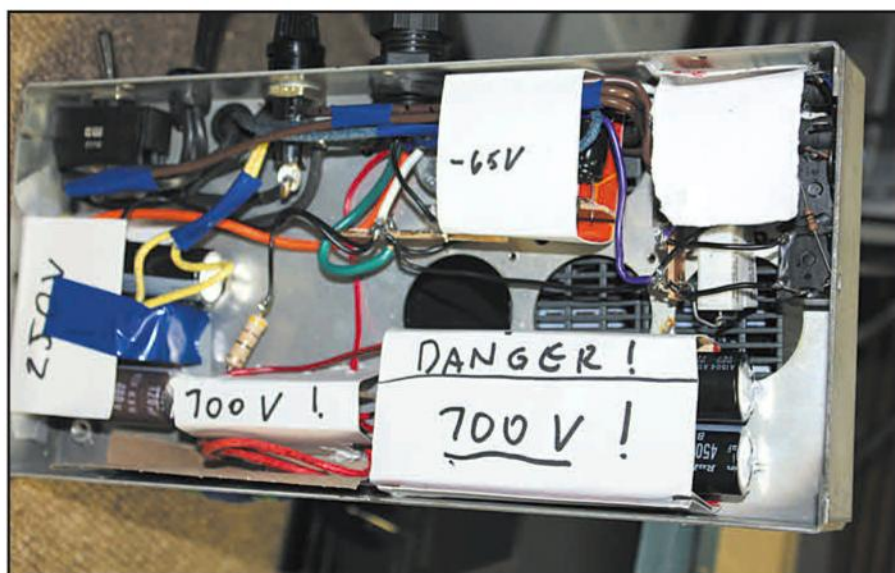


Photo G. Under-chassis view of the redesigned AC3 power supply. See text for details.

electrolytics are about half the size of originals, have higher voltage ratings, and are inexpensive. Modern ceramic caps are “ideal” components — the original poly-dielectric precision caps in my HW-7 were replaced with SMT (surface-mount technology) ceramics having zero capacitance change and 0.33-ppm temperature coefficient, and its FET VFO now has no measurable drift. There is no reason to waste space and money on inferior SM units, especially since modern ceramics are available in very small packages at high voltages. Old ceramics had inferior dielectrics that could leak and just microampere amounts of leakage

current from a plate circuit can upset grid bias on the next stage.

Replace Old Filter Capacitors

Never use the procedure of “bringing it up on a Variac to test the filter caps.” This procedure is not for testing or reforming old capacitors, it was to partially power up equipment with a hidden short circuit for circuit tracing. Old electrolytics (Photo E) cannot be reformed and can explode, risking personal injury. Reuse of old or leaky NOS units may cause power transformer damage if an old capacitor breaks down and becomes a heavy resistive load.



Measuring resistor values in tube circuits is easier than in solid-state circuits because most tube pins are open circuit when not operating. Resistance tests in the Drake operator's manual failed to reveal the out-of-tolerance parts. Every one of three values were out of tolerance and were replaced. Several were under-rated in wattage; the correct values were calculated for replacements. The correct types of resistors must be used in circuits like the LO. A replacement resistor of the incorrect type was installed in the LO, causing a reduction in oscillator RF voltage.

There were severe problems in this rig with wiring. The chassis wires are covered with 0.015-inch thick plastic insulation. Several wires had arced to and

left burns on the chassis. Cloth braid was used over solid hookup wire, but the braid is not an electrical insulator. A wire arced through this braid to B+, and at the same time, a plastic-coated wire arced to the chassis, placing 250 volts across an RF transformer winding, vaporizing it (Photo F). Several wires were too long and poorly routed and were shortened. All the high-voltage wiring in the rig was replaced.

Tubes

This rig contains 20 tubes and a few solid-state diodes. The 0A2 regulator was replaced with an avalanche regulator. The 12JB6 PA tubes were replaced with 17JB6s. The tube pins were sanded to remove oxides. The PA plate

suppressors were rebuilt and modified to eliminate side-force that caused the plate caps loose from the envelope (Photo G). Contrary to popular belief, these TV tubes used in ham transmitters were not "sweep tubes" and are well-suited for RF PA service. They were horizontal output tubes (low-power vertical output tubes were "sweep tubes") and were used to amplify high-power, fast rise-time RF pulses.

Power-Up and Initial Testing

With the power supply completely rebuilt, the rig was powered and circuit testing begun. Significant work was needed to test and repair defects in the transmitter, so the PA tubes were removed to prevent damage to them. Correct RF output from the LO is required for proper signal levels in the rig. Avoid adjustment of interstage transformers and coils, as this rig can be put so far out of alignment that the manual's alignment procedures cannot put it back.

Also, don't remove six-volt filament tubes while the rig is operating. This raises the filament voltage on other tubes to an unsafe level.

Test Procedures and Alignment

Test and alignment procedures in the manual are crude, relying mainly on S-meter readings. Test and alignment procedures were developed that, for example, resulted in zero SSB carrier leakage. RF waveforms were calculated from tube data sheets. Some circuits were too sensitive for direct connection of test equipment, so indirect measurement procedures were developed.

A sweep test fixture and procedure were designed to use a PC and wide-band oscilloscope to sweep test the transmitter. Sweep testing was done on the PA circuits to find unknown resonances and to verify the values of the PA Tee network (Photo H).

Several unusual problems were noted in the TR-3 transmitter. The PA stage would not neutralize due to defective tubes and a deliberate design flaw in the neutralization circuit that covers up a problem in another circuit. If it won't neutralize, the tube's gain is either too high or too low.

The TR-3 transmitter can produce odd frequency components due to improper alignment. The load capacitor ran out of range on 80-meter transmit, so the entire PA stage was reverse-engineered and sweep-tested with a TDR (time-domain reflectometer) to calculate the correct plate circuit values. This transmitter has

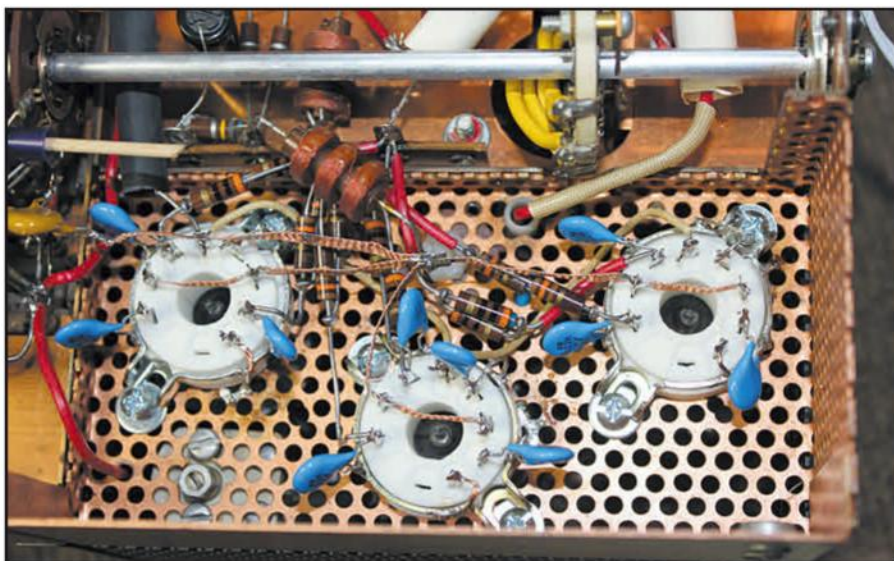


Photo H. The power amplifier was rebuilt with new tube sockets and an improved wiring layout.

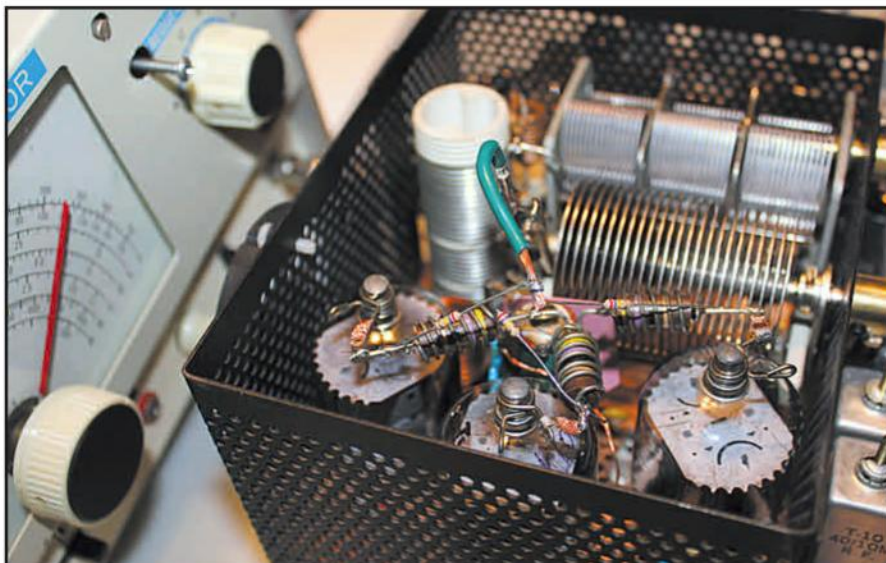


Photo I. RF sweep testing on the power amplifier to determine if its T-network values are correct.



to TX. I've gain control feedback circuits and several RF filtering circuits, all of which were analyzed for correct operation. Due to PA oscillation from incorrect wiring, the PA meter had to be replaced and was replaced.

Several wiring runs in the rig were shortened and re-routed to improve RF isolation. The PA tube sockets were replaced with Compactrons and related wiring and layouts were redesigned to reduce conductor lengths. Chassis ground connections around the PA circuits were soldered. The T/R relay assembly was rewired to make the layout neater with shorter wires. Avalanche regulators were used in the 245 and 150-volt circuits and the sub supply dropping resistors were located atop the chassis as the originals had melted wire insulation below the chassis.

The CW carrier shift circuit was replaced with a TR-4 style relay. The PA grid and plate blocking capacitors were doubled, two in series, so if one leaks, the other will maintain DC isolation. A DC blocking cap isolates the 650-volt plate voltage from the neutralization capacitor.

what's new

Winter 2017-2018 International Shortwave Broadcast Guide Out Now

Teak Publishing has released the Winter 2017-2018 International Shortwave Broadcast Guide (ISWBG) electronic book by Gayle Van Horn, W4GVH. This semi-annual information resource is your electronic guide to the world of shortwave radio listening.

The ISWBG is a 24-hour station/frequency guide to "all" of the known longwave, selected medium-wave and shortwave radio stations broadcasting at the time of publication. This unique resource is the only radio hobby publication that has by-hour station schedules that include all language services, frequencies, and world target areas.

New in this ninth edition of the ISWBG is a feature, "North Korea, leading the march to a Second Cold War," by guide author Gayle Van Horn. This timely article will guide you through the various broadcast media from the regime in Pyongyang. Other authors in this edition include *The Spectrum Monitor's* Fred Waterer, former *MonitoringTimes* columnist Loyd Van Horn, and Hans Johnson.

There is also an expanded special feature on Who's Who in the shortwave radio spectrum by former *Monitoring Times* editor and *Spectrum Monitor* e-zine columnist/feature writer Larry Van Horn, N5FPW. This story covers services and frequencies outside the regular broadcast and amateur radio bands, and includes the book's new, exclusive Hot HF 1000+ non-broadcast frequency list.

Also included in this edition is increased frequency and station coverage of longwave broadcasters, selected medium wave broadcast frequencies used by international broadcasters, all known international standard time and frequency stations transmitting worldwide, and some selected spy numbers broadcasts.

The 9th edition of the semiannual International Shortwave Broadcast Guide (winter 2017-2018 edition) is out now and is available for \$7.99 from Amazon.



AC-3 Power Supply

The AC-3 is a transformer operated power supply with two outputs, especially the heater supply, vary with AC line voltage. The ANSI limits for AC line voltage⁴ are about 110-127 VAC and when the AC line voltage is below 116 or above 121, the heater voltages are beyond tube data sheet limits.

The AC-3 was rebuilt (*Photo 1*) with new wiring, modern rectifier diodes and larger, long-life, filter capacitors placed inside the chassis. Electrolytic capacitors were upgraded to full-calculated value at higher voltage; tubular caps were replaced with ceramics. The rig's off-on switch originally switched the AC line, which is a shock and noise hazard; the AC-3 is now turned on via a switch in its chassis. DC-to-DC converters provide clean heater power regulated to 2%, a 16.5-VDC supply for the 17JB6 PA tubes and cooling fan, and a 12.6-VDC supply to the rest of the rig. The DC-DC supplies include time-delay circuits to eliminate high cold current.

RV-3 Remote VFO

This VFO is the same as the one in the rig and similar work was done to mechanically restore it. The AC-3 power cable was extended to place it on a shelf, instead of inside the RV-3 cabinet so its heat doesn't affect the remote VFO.

Operational Testing

The receiver, compared to a Yaesu FT-857 on the same antenna, appears to be as or more sensitive. The tube circuits lack that harsh "digital sound." The transmitter output around 200-watts CW and 300-watts SSB peak with excellent audio quality reports. The VFO is stable after about 30 seconds of warmup. Most of the VFO drift has been eliminated and, oddly enough, is not caused by the VFO itself. The SSB transmitter has a full power passband of 550-2300 Hz.

Additional Modifications

I have also added a switching circuit for CW and AM to give the radio full transceive operation, without needing to manually flip (and wear down) the mode switch between transmit and receive. CW and SSB both operate from the SSB position and AM operates from the AM position. On the CW side, I've added a semi break-in and sidetone circuit. Still ahead, a remotely-controlled power turn-on relay will be added to the AC-3, controlled by the rig's off-on switch.

A detailed journal of about 250 pages was created, with 2 GB of photos to preserve this hard-won information. With this data, future work can be much more quickly and efficiently done after compiling a check-list of work to be performed.

Thanks to Perry, KK4LZF, for bringing this rig home from the Dalton Hamfest, and to Perry and Don, WB2OHR, for consulting on various technical problems.

Notes:

1. National Association of Broadcasters *Engineering Handbook*, 10th Ed., p. 354
2. Toray Plastics website, technical information on wear properties of Nylon <<http://bit.ly/2zfWH1t>>; Of particular interest is "initial wear rate." The metal (steel) tends to wear very little as it is very hard, so it tends to "polish." Nylon (assume 6/6 un lubricated for these old gears) has a high "initial wear rate" but that ceases quickly, so as long as the gear teeth are not loaded to break off (gear teeth load in compression and shear, sliding/frictional wear is not the major factor), the steel and nylon gear teeth should last indefinitely without lubrication.
3. Kemet website, ELH series aluminum electrolytic datasheet <<http://bit.ly/2zdFlzW>>
4. ANSI C84.1 cited on the Pacific Gas and Electric website, Voltage Tolerance Boundary Range <<http://bit.ly/2j24Znf>>



2018 WPX Crossword Puzzle

BY ANTHONY LUSCRE,* K8ZT

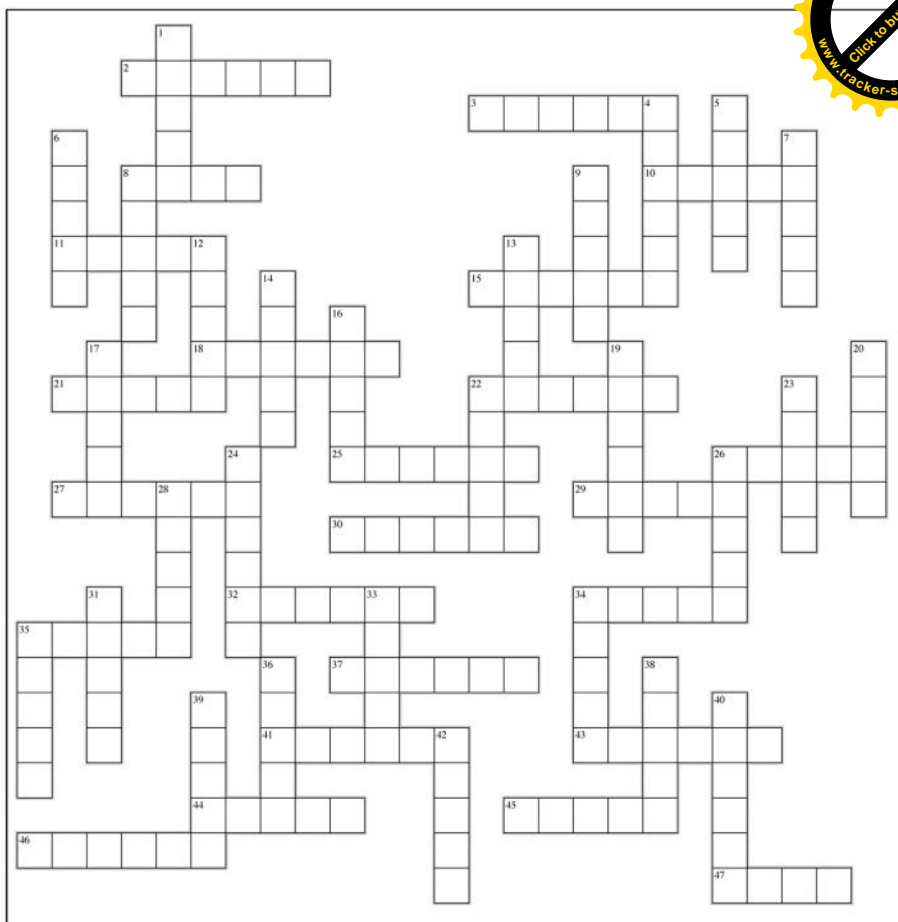
You probably have seen it before...you write down the callsign of a station you just worked and then do a double-take when you realize it looks like a familiar word, such as K1LT, MØOSE, SK1RT, etc. This puzzle takes this a step further.

In this puzzle, each word is actually an amateur radio callsign in which most numbers represent letters. Specifically:

- 1 = I
- 5 = S
- 9 = N
- Ø = O

Clues contain hints to both the word and the country that might issue the callsign. Some are real calls and some are not, but none are meant as comments on possible current, past, or future holders. Some of the prefixes used in the puzzle are authorized by international allocations but have not as yet been issued. Some answers may include more than one number/letter substitution. Answers are on page 79.

* email: <k8zt@arrl.net>
Web: <www.k8zt.com>
Blog: <k8zt.blogspot.com>



Across

2. Spirits that haunt the Channel Islands
3. The oil _____ passed through the Bosphorus Strait
8. Norse god in Beirut
10. Box, finishing, roofing, etc. in the Zagreb hardware store
11. For his history _____, the student wrote about the smallest of the Baltic countries
15. North Atlantic saltwater bivalve mollusk from Tórshavn
18. Not innocent in a Channel Island
21. Jayhawker proboscises
22. Dorothy to Toto, "I've a feeling we're not in _____ ..."
25. Female Collie dog along the Fjord
26. The St. Paul Islander who believed that humans are selfish and that they only do something if it will benefit themselves.
27. Why _____ hard to work the Spratly Islands?
29. The ham in St. John's had to quit the WPX SSB because he lost his
30. Can cause "rusty" metals in Kalaallit Nunaat
32. Gilgamesh, an example of an _____ poem, was set north of here
34. Decreases in Wisconsin Moon
35. Extremely improbable precipitations in Lagos
37. If Borat had only one leg
41. The yacht left Tripoli and _____ east to Alexandria
43. Around 2500 BC, his ancestors worshipped Ra, the _____
44. Core muscle connecting the lumbar vertebrae to the femur in Pyongyang
45. The Halifax phlebotomist needed these
46. Scandinavian grins
47. Wildcat across the border from UA2

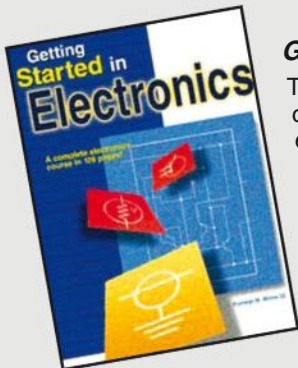
Down

1. A stop order placed on a check in Mariana Islands
4. Fast jogger in Omskaya oblast
5. The Yukon musher was _____ for first place
6. Disorder that causes you to stop breathing briefly, while you're asleep in Karachi
7. "Quattro meno tre è uno" or in English – Four minus three _____
8. First two words of USA national anthem played in Helsinki
9. Parts of three piece suits
12. Not yangs in Baghdad
13. One if by Land, Two if _____
14. He was not _____, Vilnius Baroque architecture was beautiful
16. Even though two rivers — the White and the Blue Nile — converged, the water was relatively _____
17. _____ grazed on the Yorkshire grass
19. Without reason or pattern in Sverdlovskaya oblast
20. A pair of Glasgow rodents
22. Illinois cutlery
23. Old school Amazon computer data cards
24. Became a member of JARL
26. Pocket change for penguins
28. Adjusts the dial in Ivory Coast
31. The calls at home plate where so bad you would have thought there was _____
33. Declare invalid in Bahrain
34. Pine and oak in Iowa Home Depot
35. Not cloudy in Niger
36. Two contradictory answers to a simple question in Jakarta
38. Not yings in Kabul
39. Bus rides from Libreville to Franceville
40. "preserved remains, impression, or trace of any once-living thing" in Tahiti
42. Covered with fine particles of matter in Manila



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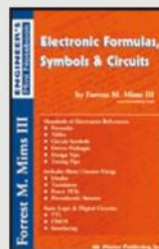
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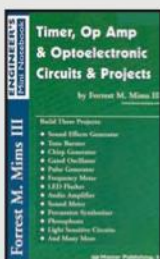
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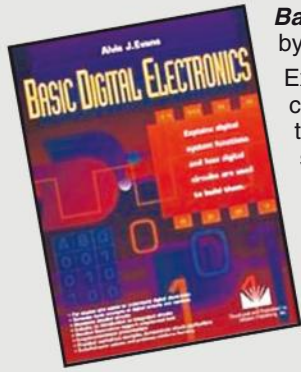
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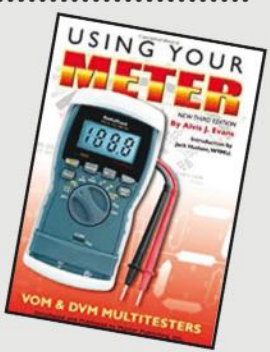
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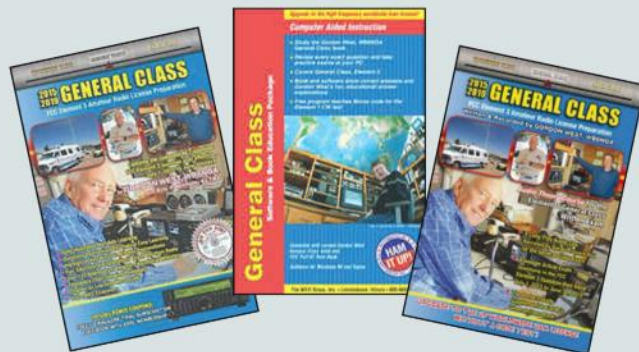
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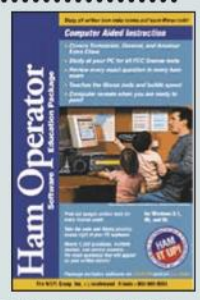
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Creating the Future Today

First, as always, a very happy and healthy New Year to all readers of this column and especially to those who have been able to bear with me for more than the past 40 years. I sincerely thank you for your continued support and hope to share the many exciting new developments (as well as my thoughts) that will most certainly occur as time marches on.

I find it hard to believe that we are now approaching the year that the science fiction stories that I read as a youngster called “the far distant future.” Although we cannot really predict where our technology will take us in the months and years to come, rest assured it will continue to truly be amazing. It is my hope, however, that the experimenter and “inventor” portion of the amateur radio fraternity can continue to make the same sort of technical contributions that were made in the early part of the 20th century.

Although at first glance it may seem an almost impossible task to develop anything technologically significant today without a high degree of expertise in solid-state physics and a major research lab, consider what was known and what was developed in the early 1900s. The analogy is really the same since those future developments were just as “impossible” to predict at that point in time. In fact, our modern technological base is infinitely more broad than the oatmeal-box coil forms, cat’s whiskers and Model-T spark coils of the 1900s so, in theory at least, an individual should be able to develop (or “invent”) much more sophisticated devices. Remember, the human mind has not yet been replaced with artificial intelligence (although sometimes it seems that it is getting there) and a whole plethora of components that could not even be imagined in 1900 are routinely available today, so all of the necessary “ingredients” are there as is the vast amount of knowledge available from the internet. It is only up to us to take advantage of this. It’s fun to dream about the role we might have in the future though so let’s take a moment and try to identify some possible starting points.

Artificial intelligence has brought us to the point where a computerized operator answers most of our telephone directory assistance questions using both voice recognition and synthesis techniques. Although not perfect, it does a pretty good job for a machine! You can even buy a software package that lets you dictate letters in many of the popular word processor formats as well as have written documents read back to you. I can also “talk” to my cell phone when composing text messages or switching applications. Does this mean that with a little bit of additional processing we will be able to actually have “intelligent” conversations with our machines? Will the computers of the science fiction movies become reality in the next few years? Watch out — it could and I believe it will happen!

*c/o CQ magazine

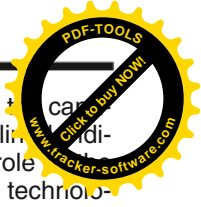
For the experimenters in our midst, all of this is really only clever software — you probably have the computing power and the microphone/speaker I/Os in your possession already to experiment in this area. I don’t really think you need the equivalent of a Silicon Valley research lab to make a significant contribution. It would be interesting to come home and ask the computer, “what’s on 20 meters?” and get an accurate verbal answer to boot while your rig is tuned up and ready to go wouldn’t it?

Cellular telephone technology has shown us just how reliably an 800- to 900-MHz (and 1-2 GHz) line-of-sight full-duplex HT (remember, a cell phone is really just a complex HT) can operate. Can amateurs develop similar computer/RF links that can evolve into the next generation of “intelligent” repeaters? Will you someday be able to either simply speak someone’s call or call “CQ (some country)” into a microphone and be connected directly to them or at least to a group within the selected country, no matter where on the earth that might be?

Also, do other frequencies, including those readily available to amateurs, exist that can achieve similar (or even better) results than in the 80- to 2,000-MHz area? Less than 100 years ago anything above 1-2 MHz was considered a wasteland. Today, the spectrum from 100 GHz to light (and then beyond) is virtually unknown, so there is plenty of virgin territory for experimentation. How does one operate at 250, 500, or 1,000 GHz? The amateurs of the past didn’t ask how to push the technology into the “short waves,” they just experimented and eventually figured out how to do it. Sometimes the fact that they did not have an extensive technical education (that “proved” that something like shortwave was useless) was actually a blessing. Try something, you might be surprised! And don’t be afraid of the ultra low frequencies either. The military has been communicating with submarines under the ocean, on the opposite side of the earth, at RF frequencies well below 200 kHz for years.

Lighting Up the Airwaves

In the same light (forgive the pun) how about optical communications? Consider the advantages of very narrow beamwidths (less than a fraction of a degree). You could make an optical beam antenna with a front-to-back ratio of better than 100 dB using mirrors, or reflections, or who knows what! Sure, the laser diodes that might be used for optical transmitters today can only put out milliwatts, but why limit yourself to a laser when you can get a 1,000-watt projector lamp, connect your newly-designed external optical modulator that works directly on the beam from the lamp (well, you have to do something clever), connect your lens- or mirror-based optical “antenna” and come up with an optical kilowatt!



Why? Perhaps you can start a new chapter at amateur radio (or should we rename it "amateur wireless") communications will become.

Modulation Techniques

Then there is the whole world of modulation techniques. We now know of and routinely use AM, FM, SSB, spread spectrum, and a wide range of digital pulse rate/width/position encoding methods of all kinds. What else is lurking around the corner? At a trade show last year, we saw a start-up company transmitting signals by some sort of pulse method using modulated harmonics of a single frequency. It claimed long range with high peak power but very little average power. The pulse method also assured a high degree of immunity to interference. In addition, so-called "quantum communications methods" are being experimented with. Possibly you may find the next mode. Remember, when AM was king, E.H. Armstrong (in a lab that was a joke compared to what exists today in even a modest experimenter's shack) developed FM! And the list goes on. You should notice, by the way, that all of the above does not really require any large-scale expenditure in exotic equipment. It does, however, require a significant investment in brain power.

If you are fortunate enough to have a modest budget, the possibilities extend even further. By way of example, Thomas Edison was able to manufacture light bulbs with the type of vacuum pump that could be found in any high school physics lab today and could easily have made simple vacuum tubes well before Lee De Forest if he only realized what they would be capable of if he thought "out of the box." While you might have a hard time making transistors or integrated circuits in your shack, galena crystals, which were our first elementary semiconductors, made pretty good detectors of low frequency RF at the dawn of radio. Do similar devices exist today to detect "whatever"? I'll bet that in the year 2100 there will be many who will look back and say "gee, why didn't I think of that?" If you read about the work of Heinrich Hertz in turn-of-the-century scientific journals, you will see that he actually generated and demonstrated many of the characteristics of 150- to 450-MHz VHF RF before the word "radio" was even coined — and that was using a spark coil plus some well-machined mechanical components. There were no synthesizers, MOSFETs, diplexers or, for

that matter, anything at that time that even looked like an RF component at any frequency.

Remember when we spoke about generating microwave signals with a doorbell buzzer and a surplus cavity in a previous column? Very elementary, it is true, but it worked. Even the simple Branly coherer would inefficiently detect RF. Could you generate and detect crude "futuristic signals" by some similar technique? I'll bet you can!

I have a lot of faith in human ingenuity. I also truly believe that the basis of most if not all future technology exists

today and that it is well within the capabilities of the technically-inclined individual to play a significant role in the development of some of that technology. It is really only your state of mind. To paraphrase an old Chinese proverb, "if you want to develop something badly enough, be careful you may find that you actually can!" If you want the entire amateur radio experience to continue through the 21st century, you might find that you have to convince the FCC and the powers that be that there is a valid reason that it should.

— 73, Irwin, WA2NDM

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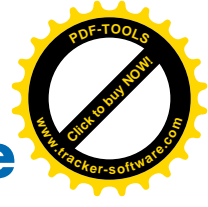
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A Chilean Pirate Returns to Life

And...KBS Radio Changes Schedule, Fire at Wantok Radio Light

Let's swing in the New Year with some Old Year shortwave-lets:

~ A Chilean pirate (now it may be a semi-pirate), Radio Triunful Evangelica, has been resurrected on 5825, running Monday through Saturday from 2200-0000 UTC. It is supposedly now using somewhat higher power and would certainly be worth checking out.

~ KBS World Radio has made a major schedule change. It has adjusted its schedule to include a 2-1/2-hour program beginning at 0800 UTC on 9770, directed to Southeast Asia. Additionally, its broadcast to Europe on 9515 expands to two hours and the KBS broadcast to India will expand to three hours beginning at 1400 on a new 9785 frequency.

~ The news is a bit unclear as of presstime, but there seems to have been a fire at Papua New Guinea's Wantok Radio Light. It may have "just" been the 7325 Port Moresby outlet that was damaged and is now off the air. This is not good news for shortwave broadcasting from Papua New Guinea, which is already reeling from the loss of another broadcaster.

~ Progress is occurring at those two new 300-kilowatt shortwave broadcasting sites in Algeria. The new sites at Bechar and Ourgla are under construction. The pair of new broadcasting sites in Algeria will possibly replace the Issoudun site in France.

*c/o CQ magazine

D'Angelo got this much-used QSL from KNLS, appropriate for this time of year don't you think?

~ Oxy Music Radio in Australia has taken to the air on 5045.

~ It's confirmed: That 5935 Bolivian is, indeed Radio Yura, in Yura, formerly active on 4717.

~ Armenian Public Radio is now active. It's scheduled to be on 6155 at 0200-0500 UTC, 7320 at 0630-2100, 7520 at 0230-2100 UTC, and 9580 at 0800-1800 UTC — all in various unspecified languages, as well as in Armenian.

~ Opposition broadcaster Radio Publique Africaine has apparently given up its shortwave efforts against the government of Burundi.

~ Apparently reactivated (again!) is the just recently begun Somali Regional State Radio from Jijigwa on 5940.

~ I'll remind you again (as I was through a news release) that Universal Radio has completed its move to 651 Lakeview Plaza Blvd. (Suite B), Worthington, Ohio, 43085. Universal's operational hours and phone numbers are unchanged.

Leading Logs

Remember, your shortwave broadcast station logs are always welcome. Please be sure to double or triple space between the items, list each logging according to the station's home country and include your last name and state abbreviation after each. Also needed are spare QSLs, station schedules, brochures, pennants, station photos, and anything else you think would be of interest. The same holds



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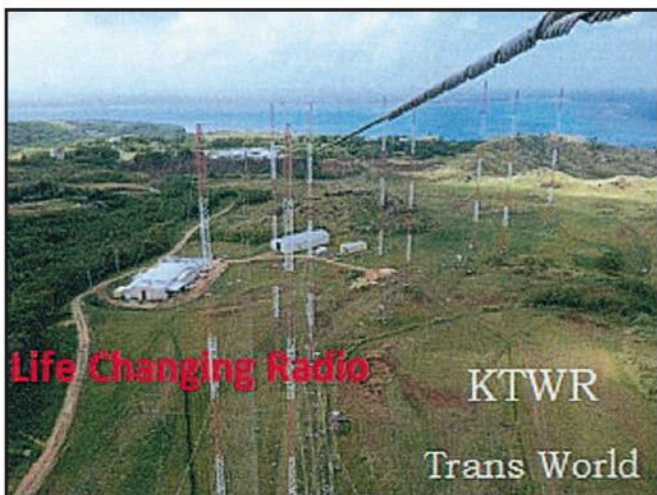
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KTWR replied at D'Angelo with this nice view of their antenna site on Guam.

for you amateur radio operators who also tune for shortwave broadcasts. You, too, are also welcome to contribute.

Here are this month's logs. All times are in UTC. If no language is mentioned English is assumed. After you've read the printed logs, you'll find more online at: <http://cqpluslisteningpost.blogspot.com>.

BOLIVIA—Radio Pio Doce, Siglo Viente, 5952 in Spanish at 0213. (Cooper, PA)

Radio Santa Cruz, Santa Cruz, 6134.8 in Spanish at 0200 with ID by man, music interval, another ID. (Cooper, PA)

CHINA—Xizang PBS, 6200, Tibet at 1215 with male/female announcers at 1248 followed by music, 7450 at 1253 in Mandarin with woman talking. (Taylor, WI)

Firedrake music jammer, 9745 at 1940 with usual music jamming sound, rather than the usual CNR-1 jammer. (Taylor, WI)

ERITREA—Voice of the Broad Masses, 7140 (INTRUDER) with a tone at 0247. A Canadian amateur tried to make contact with VOBM, not realizing it was a broadcast, later he had a QSO with a guy in Kansas on 7143. VOBM IS followed with a tone then went into guitar IS, a carrier came on 7140. Seemingly this was the white noise jammer. VOBM 7180 (INTRUDER) at 0247 which ended at 0300 a possible low level IS, noted later, male announcer at 0300, then HOA music. instrumental HOA and apparent sign on, ID announcement, very little audio making it through the jammer by 0320. (Valko, PA)

GUINEA—RTV Guineenne, 9650 in French at 2050 with man/woman speaking in French, music interval at 2100 and an interview. (Cooper, PA) 2117. (Brossell, WI)

IRAN—IRIB, 17420, (Sirjan), in Spanish at 0042. (Brossell, WI) 3610, Zahel with interview in Arabic at 1411. (Taylor, WI)

LIBERIA—ELWA, Monrovia, 6050 at 0533. Weak music, shouting preacher, more music and bits of audio. (Sellers, BC)

MADAGASCAR—Madagascar World Voice, 11610 in Mandarin at 2118 with familiar "SMG.org" electronic address at 2129 during ID break. (D'Angelo, PA) 2140. (Brossell, WI)

World Christian Radio, 9600 at 0200, mixing in some pop things with their Christian message. (Gavaras, MN)



What's new



ICOM Releases IC-7610 Transceiver

Faint signals will be much less of a challenge for DXers and contesters with the new IC-7610 from Icom. The transceiver includes new high-performance RMDR (reciprocal mixing dynamic range) circuitry, which gives it the ability to pick out the faintest signals even in the presence of stronger, adjacent signals. The IC-7610's dual RF direct sampling receivers can achieve 100dB RMDR. The IC-7610 also comes with a high-speed, high-resolution, real-time spectrum scope on a 7-inch color display. Transmitter power is 100 watts (23 watts on AM) and the receiver covers 0.03-60 MHz.

The IC-7610 employs an RF direct sampling system, in which RF signals directly convert to digital data and are then processed by the FPGA (field-programmable gate array). This process reduces distortion that naturally occurs in the various mixer stages found in traditional superhetrodyne receivers. In addition, two separate DIGI-SEL preselectors and two separate bandpass filter networks feed two separate A/D (analog-to-digital) converters into the FPGA.

The DIGI-SEL preselectors are RF filters with sharp, narrow passband characteristics preventing A/D converter overflow from large out-of-band signals when sampling the RF signals. Additionally, the third and higher order IMD (intermodulation distortion) components are reduced. This is ideal when strong signals are received in a contest pile-up or from broadcast stations on adjacent frequencies or bands.

Large Color Touch Screen

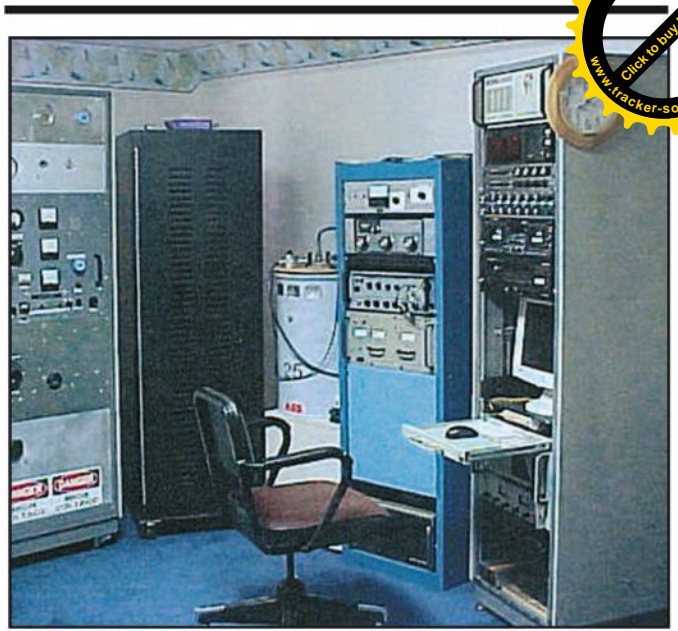
The large 7-inch color TFT touch LCD offers intuitive operation of functions, settings, and various operational visual aids such as dual spectrum scope aligned vertically or horizontally, simulated analog meters and RTTY, PSK31/63 mode decoded messages.

The combination of the touch screen and the multi-dial knob offers quick and smooth operation. When you push the multi-dial knob, menu items are shown on the right side of the display. You can select an item by touching the screen and can adjust the levels by turning the multi-dial knob.

Additional Features:

- Built-in automatic antenna tuner
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The ICOM IC-7610 is available now and has a suggested retail price of \$4278. For more information, contact: ICOM America, 12421 Willows Road NE, Kirkland, WA 98034.



Transmitter control at WJHR, in Florida. (Thanks D'Angelo)

WJHR

International Radio

Milton, FL 32570

15.550 mHz

Hours of operation: 9:00AM-5:00PM CST

Broadcasting fundamental Bible doctrine

WJHR, Milton , Florida operates on 15555 using USB.

African Pathways Radio, 17640 at 1830 with preacher on *Better Way* program, program ID and *This Day in History* feature. (Cooper, PA) 2020 on raising children in a Godly home. (Brossell, WI)

MYANMAR—Myanmar Radio, Yangon, 9730 and getting audio at 1125 with same female announcer as heard in the past. They went off just before 1134. Some slop from CRI on 9725. (Sellers, BC)

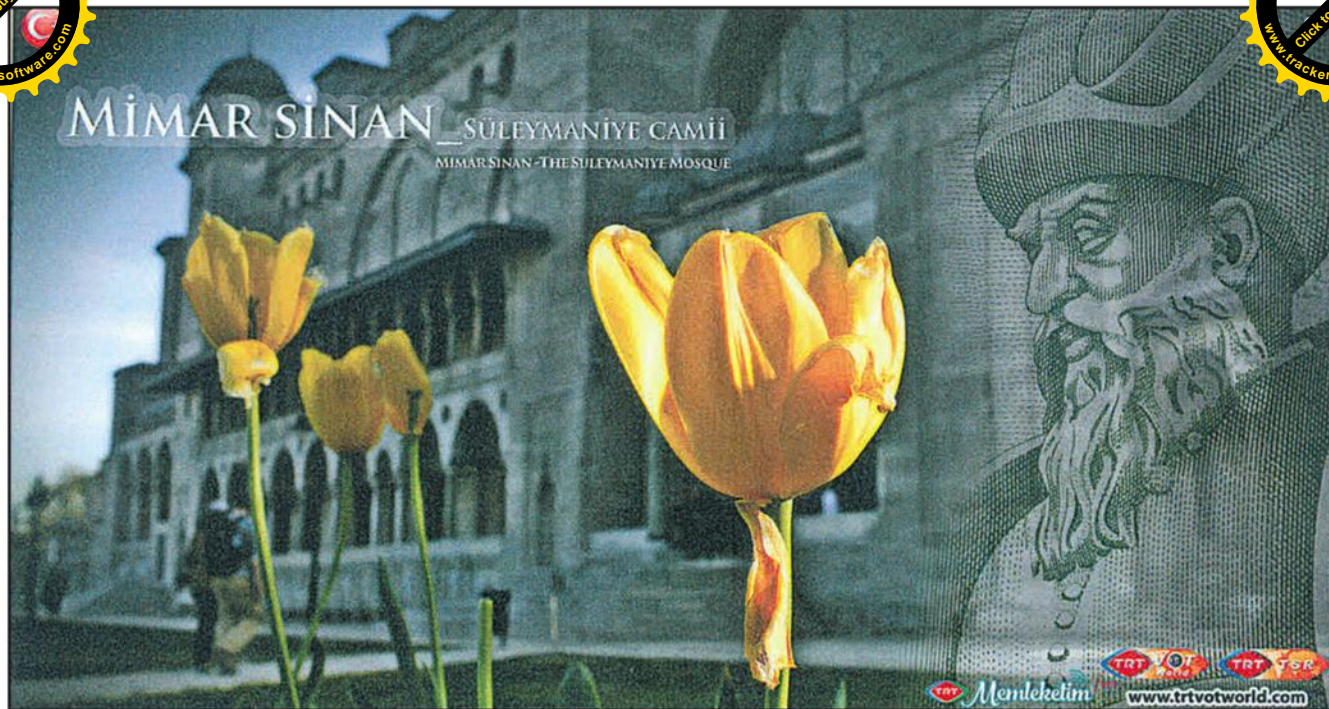
PERU—Radio Tarma, Tarma, 4775 at 1018 with man speaking and ID in Spanish, lively song with male singer. (Cooper, PA)

SOMALILAND—Radio Hargeisa, 7120 (INTRUDER), already on with IS and repeated ID, but too weak to discern anything more. (Sellers, BC)

MORE LOGS AT:
<<http://cqpluslisteningpost.nlogspot.com>>.

QSL Quests

The Italian Broadcasting Corp. has announced a new QSL



A Turkish mosque is featured on this QSL from The Voice of Turkey, received by D'Angelo.

policy. It promises to confirm all correct reports via email. "Donations" are required to get a QSL via the mail.

RTM Sarawak on 9835 offers a new QSL design. Reports should be addressed to the Head Assistant Director of the Technical Network Section.

Rich D'Angelo (PA) notes replies from KNLS-Alaska from their Nashville HQ, KTWR in Guam, Voice of Turkey's Emirler site on 980, and WJHR in Milton, Florida on 15555.

Who Goes There?

Possible Fu Hsing, Taiwan, 9410 with a weak signal going off and on. The display on the SDR matched 9410. Went off for good at 1156. (Valko, PA)

7320 at 1950 with ME/Turkish-style music continuing to past top of the hour. Armenian Public Radio listed here, but nothing definite yet. (Steven Wood, MA)

Another mystery on 15140, appearing just after 1400 in possible Chinese, then it vanished at 1402.

Back in the Day

Radio Enga, Enga, Wabag, Papua New Guinea's domestic service in Tok Pisin on 2410 at 1237 UTC running 2.5 kilowatts on February 28, 1983.

Just Sayin'

I seem to have let some stray abbreviations enter the fold lately. Let me round up these few wonderers; "SMG" stands for Vatican Radio's Santa Maria de Galeria site, which is also used by such broadcasters as Radio Veritas Asia, "misc" is obviously "miscellaneous". Also, you may encounter a parenthetical site following a frequency (note

Turkey, Iran above). In such cases I've added the site that the reporter didn't include.

Thanks for Your Logs

High fives, touchdown signals, and man hugs to all who checked in this time: Harold Sellers, Vernon, BC; William Hassig, Mt. Pleasant, IL; Jerry Strawman, Des Moines, IA; Dave Valko, Dunlo, PA; Tom Gavaras, Minnetonka, MN; Art Delibert, North Bethesda, MD; Steven C. Wood, Harwich, MA; Rich D'Angelo, Wyomissing, PA; Ralph Perry, Wheaton, IL; Bob Brossell, Pewaukee, WI; John C. Cooper, Lebanon, PA; and Rick Barton, El Mirage, AZ.

Until next month...keep on keepin' on...and celebrate shortwave!

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BY WALT PALMER, * W4ALT

We, The People

“Emergency communications” sparks thoughts of disasters, mayhem, overloaded public communications, and chaos. It brings to mind amateur radio, on-air nets, antennas, transceivers, power supplies, go-kits, and protocols. But the one thing that makes it all work is the *people*. Without the support of the people, the ham operators, the support staffs and managers, there is no EmComm.

Following this past summer’s assortment of meteorological events in and around the United States, I conjure thoughts of the many ham nets that were activated to provide valuable first ground truth information, followed by health-and-welfare messaging.

Hurricanes Harvey, Irma, and Maria caused the activation of many local, regional, national, and international nets. A couple of the better-known are the Salvation Army Team Emergency Radio Network (SATERN) and Hurricane Watch Net (HWN).

Leaders like Bill Feist, WB8BZH, and Ken Gilliland, AG6SV, along with their SATERN teams, staffed international nets 24 hours per

day. The following SATERN synopsis was provided by Ken, AG6SV:

SATERN

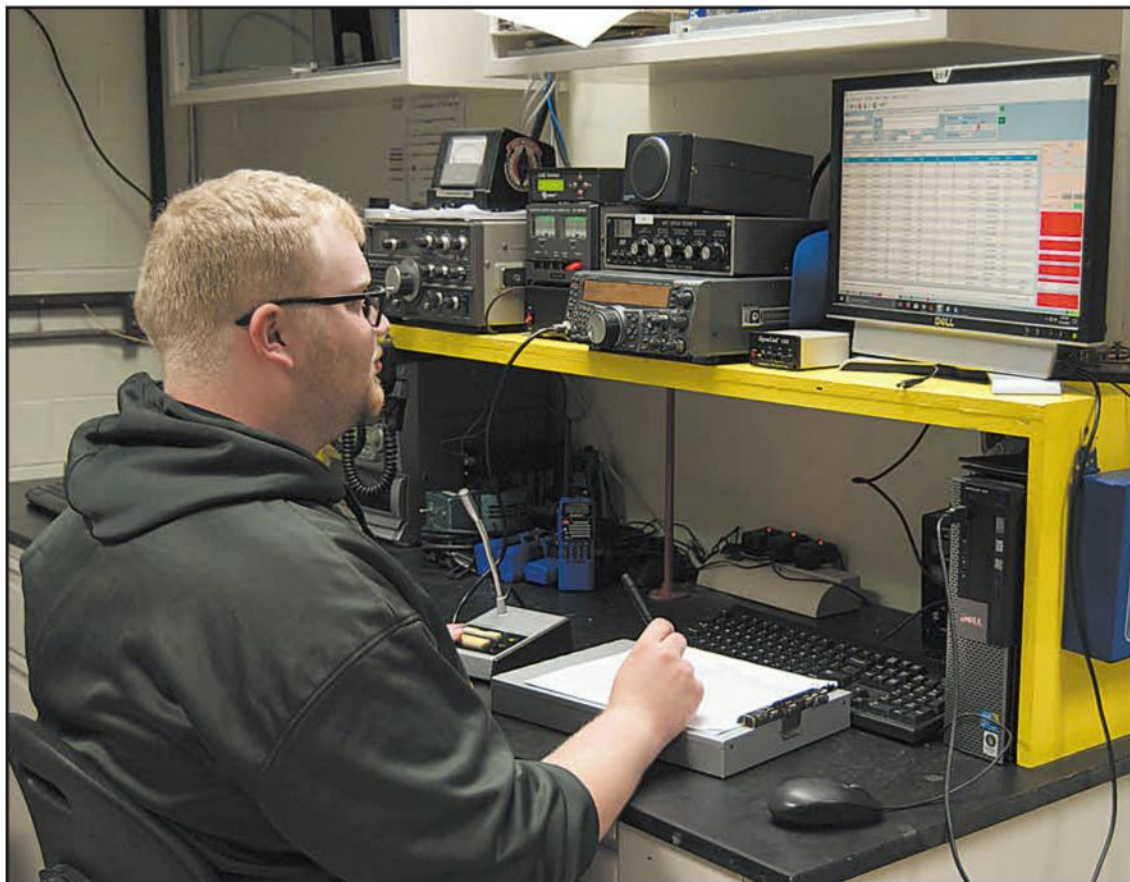
Net Controls & the many relay stations have passed many Health & Welfare messages from the Caribbean back to families and friends in the United States.

Several of us who have relayed messages to loved ones in the U.S. have heard the called party break down and cry. Another lady said the news that she received was the first word she had heard from her family in five days. Another relay station had the privilege of notifying a family who was overjoyed to hear that, just after hurricane Maria had passed, they got word of a new baby boy (grandchild) that was born in Puerto Rico and that the parents were doing well. SATERN has made many people in Puerto Rico, the other Caribbean islands, and their relatives in the U.S. very happy.

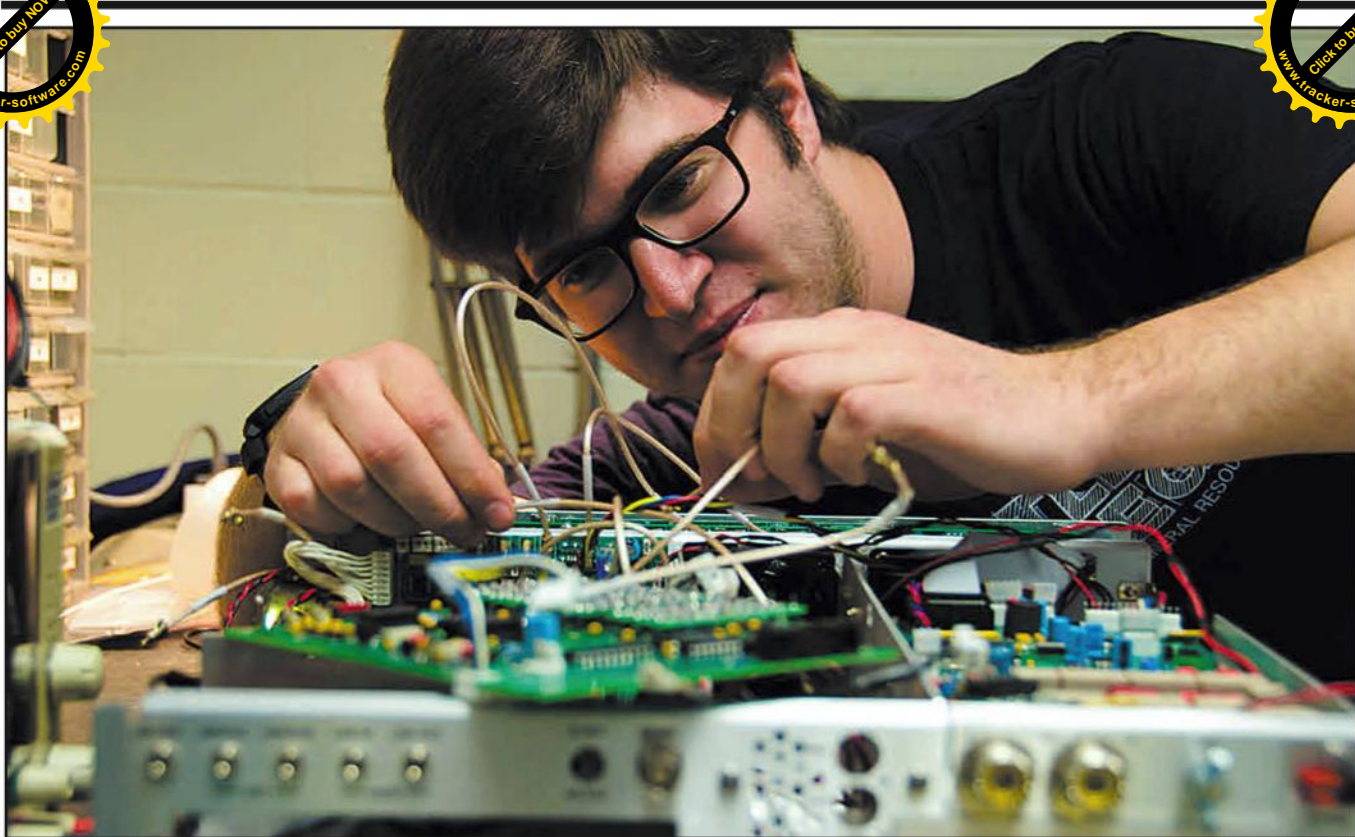
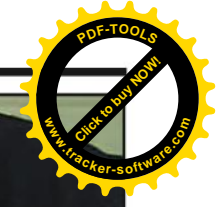
The SATERN Team:

With each of the activations, we have only about a day to setup a schedule of net controls. To minimize the burden on any one individual, net con-

* email: <w4alt@cq-amateur-radio.com>



Cameron Hale, KN4CFI, at the West Virginia University Amateur Radio Club station, W8CUL. The club station became involved in Hurricane Maria communication efforts after a graduate student asked the hams to help her contact family members in Puerto Rico. (Photos courtesy of WVUARC)



W8CUL Vice President William Howard, WV8WH, works on a piece of gear at the West Virginia University ARC shack.

trols are asked to spend no more than 1 hour a day running the net. This has required a large group of volunteer net controls on very short notice.

To get these volunteers, SATERN, ARRL, MARS, Hurricane Watch Net, Maritime Mobile Service Net, and several ARES groups broadcast a request to their members.

We finally received a pool of about 50 volunteers, some seasoned professionals and some with very little experience. All have performed very well, have always showed up on time, and handled many messages.

I am very proud of this diverse group of "professional" (not amateur) radio operators. The net controls are assisted by perhaps a hundred or more relay stations from all over the United States, Canada, and a couple of south-of-the-border hams. It was these dedicated relay stations that generally picked up passed the traffic from the Caribbean. Most the messages were received by stations in Florida, Georgia, Arkansas, Texas, New York, and even here in California. On two different evenings, Puerto Rico was received in Northern California at S9 +10 dB.

We have also managed to recruit several hams who also speak Spanish, so our calls into Puerto Rico and the rest of the Caribbean are often broadcast in two languages.

SATERN has received many comments from individuals and other amateur radio operators expressing gratitude for the professional and beneficial operation SATERN provided to those in need during this disaster. This is a testament to the hundreds of hams who have volunteered their time, equipment, and talents.

Thanks to Ken for providing SATERN information in between his hurricane nets and wildfire nets in California. As Ken noted, it was the people who made the system work.

Bobby Graves, KB5HAV, manages the Hurricane Watch Net and reports:

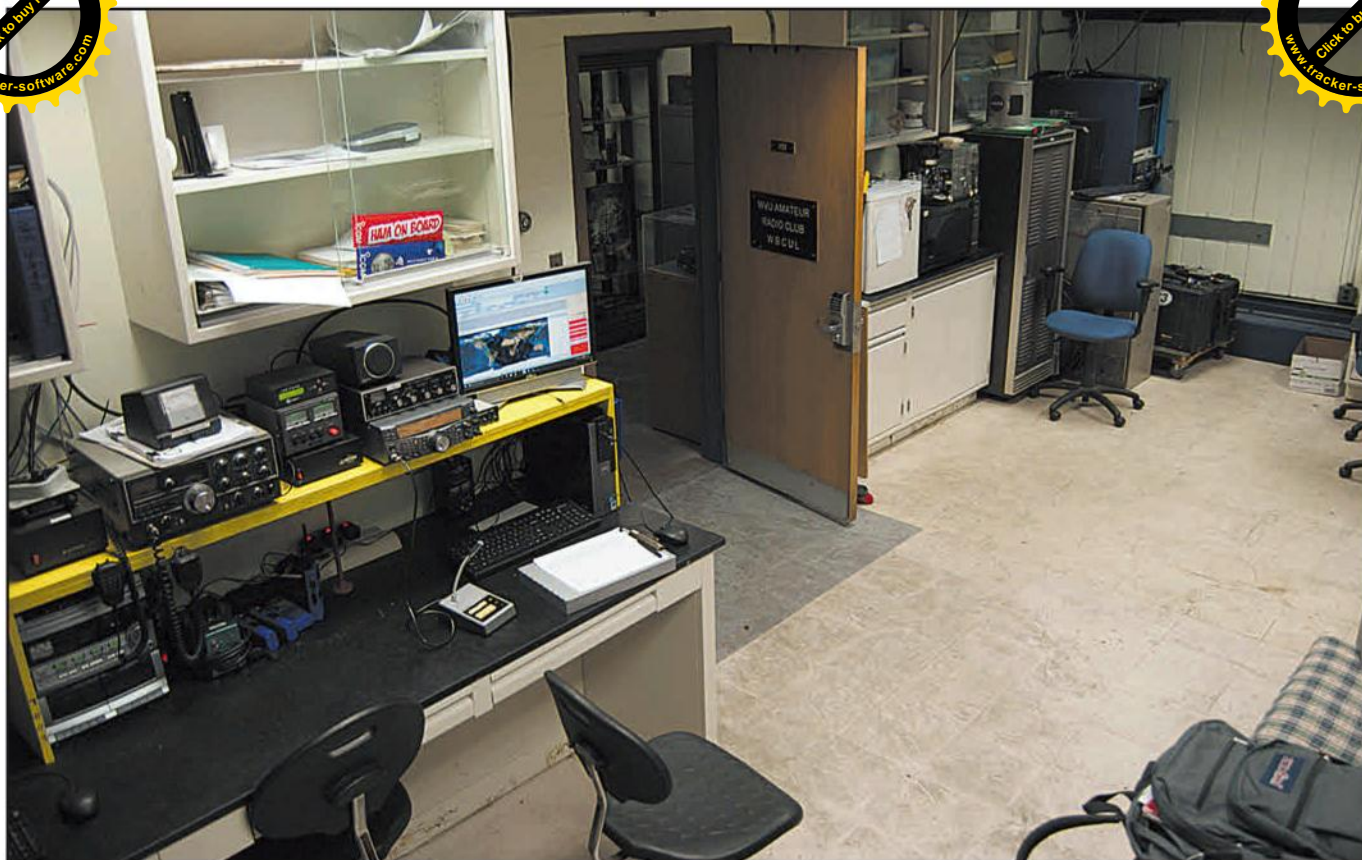
The Hurricane Watch Net began operation for Hurricane Maria at 0700 (7 a.m.) EDT Monday, September 18. The net maintained operation, alternating between 20 and 40 meters, throughout the storm's impact, taking reports for the National Hurricane Center and disseminating information and bulletins. This net session served the impacted area for 60 hours.

We sincerely thank those nets, which make way for HWN, and those operators who stand by to provide relay assistance. Without your cooperation, we couldn't operate listening for weak signals and reports from the area. We thank our partners and served agencies for their tireless work helping to restore such a vast area of damage — from Texas to Florida, and now to the Islands. We will stay alert for the balance of this storm season, ready to convene when needed.

Thanks to Bobby and his team of dedicated volunteer operators.

The tiny island nation of Dominica was devastated, but hams like Brian Machesney, K1LI, and Michelle Guenard gathered over \$30,000 in donated radio and solar power equipment and flew via private airplane to get local hams back on the air.

Other groups, such as the ARRL, ARES, and RACES also met the challenges. Nearly 100% of power and communication utilities were destroyed in Puerto Rico. The Red Cross put out the call looking for ham radio operators to deploy to San Juan. The ARRL established the "Force of 50" radio operators consisting of 22 licensed hams under the leadership of the League's Emergency Coordinator, Mike Corey, to fly to San Juan and establish ham radio communications



The W8CUL radio room in the engineering and science building at West Virginia University. The Kenwood HF rig is connected to a Yagi and inverted-V on the roof; the club also operates repeaters on three VHF/UHF bands. Radio clubs are growing again at high schools and colleges, and most would welcome involvement from their local ham communities.

within the island and worldwide. Hams were deployed with Red Cross teams to communicate need of small outlying towns, paired with distribution teams, power crews, medical facilities and hospitals. A task of this magnitude could not have been successful without hams willing to volunteer their time for humanitarian needs.

Local ARES and RACES teams in Harris County, Texas, and Monroe County, Florida, worked overtime transmitting ground truth and health-and-welfare messages to their served agencies. As reported in the November issue of *CQ*, ARES PIO Mike Ulrich, KA5CHV, was stationed on-duty at the Harris County, Texas, EOC for 44 hours. His relief operators could not get to the EOC due to extreme flooding in the Houston area.

Other groups were also involved in passing health-and-welfare messages. Students of the West Virginia University Amateur Radio Club, W8CUL, were approached by a fellow Ph.D. student with family in Puerto Rico, inquiring if the club could pass a message asking about the well-being of her parents and family. They were able to send a message via

the National Traffic System. Fortunately, the student was able to speak to her family via commercial means.

According to Troy Palley, KE8HYU, the club's communications director, the club has 27 members, 24 WVU students and 3 university staff, consisting of 19 licensed hams. Eleven of them hold Technician licenses, and there are five Generals and three Extras. Club assets include a Kenwood HF transceiver, a tri-band Yagi, inverted-V dipole and their 3-frequency club repeater, all located high atop the 11th floor of the university's engineering and science building. The lesson learned by the club members is that they are a community service organization and they need to publicize their existence and capabilities to their local community and beyond. Hear more

about the WVU Amateur Radio Club by visiting *CQ* Overtime at http://www.cq-amateur-radio.com/cq_ot.html.

Help a School Club Near You

Many colleges and universities, as well as local high schools, have established ham radio clubs. A quick Google search will reveal clubs nearby to you. Take some time to consider these organizations and perhaps volunteer as an Elmer or take training to help staff a club station should your services be required during a time of need. Even if emergency communications is not your primary ham radio interest, your expertise and talent can help save lives, ease uncertainty, and sustain the faith, nature, and reliability of emergency communications through ham radio.

There are many other organizations involved in helping during times of need. Some of these include:

- The American Legion Amateur Radio Club <http://bit.ly/2z1gyEf>
- AMSAT <https://www.amsat.org/>
- Young Ladies Radio League <http://bit.ly/2jrojuh>
- Radio Amateurs of Canada <http://wp.rac.ca/>
- Caribbean Emergency Weather Net <http://cewn.org>
- Friendly Nets <http://bit.ly/2zC0fLx> (a full list of nets)



January 2018 Reader Survey

We'd like to know more about you...and especially what's important to you in ham radio and how we at CQ can help serve you better. There are two ways to respond to this survey:

- **Respond online** at <www.surveymonkey.com/r/CQJan18> [From the digital edition, just click on the link].
- OR -
- **Cut out or photocopy** this page
- **Circle the numbers** that correspond to your answers
- **Mail your completed survey to:** January Reader Survey, CQ magazine, 17 West John St., Hicksville, NY 11801.

We will continue to select one respondent to each survey to receive a free one-year subscription (or extension) to CQ. This time, we'd like to ask about the role (if any) that ham radio plays in your non-ham activities.

What You've Told Us...

Our April survey coincided with the introduction of our new MF/LF operating column, which started nearly six months before the FCC opened the 630- and 2200-meter bands for amateur use in the U.S. (see our report on the bands' opening night on page 12). At that time, the majority of CQ readers who responded were either not very aware (42%) or not at all aware (20%) of what it takes to get on the air on these new bands in term of equipment, antennas, and operating techniques. On the other hand, 29% reported being somewhat aware and 9% were very much aware.

On the question of how likely you would be to plan to operate on 630/2200 meters once they became available, 1% reported already being active on the bands under an experimental license, 10% were very likely and 12% were somewhat likely, while 39% said they were not very likely, 14% weren't sure and 23% had no interest.

Crossband QSOs (transmitting on 160 or 80 meter and receiving on 2200 or 630) were one way to get a head start on the band opening ... 14% of respondents said their stations were already equipped to do this, 26% said no but they'd like it to be, 22% weren't sure, and 38% had no interest. Unsurprisingly, 46% of respondents are currently active on both 160 and 80 meters, 34% are active on 80 but not 160, 1% are on 160 but not 80, and 19% are not active on either band.

We next asked whether learning more about activity, equipment and propagation on 630 and 2200 meters would make you more likely to want to operate on them ... 20% said definitely and 39% said possibly; 17% responded "doubtful," 4% said "don't know," and 19% said no.

Finally, we asked about your general interest in learning about new and specialized technologies that make possible long-distance communications on these bands using low power, very narrow bandwidths and compromise antennas ... 23% replied that they were very interested, 39% were somewhat interested, 25% were a little interested and 13% were not interested.

This month's free subscription winner is **Robert Kissel**, W8KPU, of Swartz Creek, Michigan.

1. Do you use ham radio as part of another (non-radio) activity – hobby or otherwise?
 Yes1
 No2

2. If you answered "yes" to question 1, in what types of activities do you participate in which ham radio plays a role (select all that apply)?

Bicycling	3
Birdwatching/Wildlife watching	4
Camping	5
Church/civic group activities	6
Disaster preparedness (e.g., "prepping")	7
Education	8
Exercise walking/running	9
Hiking/Backpacking	10
Hunting/Fishing	11
Motorcycling	12
Professional driving (e.g., bus or truck)	13
RVing	14
Sailing/Flying	15
Work-related activities (e.g. public safety or hospital backup communications)	16
Other (what?)	17

3. What is the most common role for which you use ham radio in these other pursuits?

Communicating with other participants in this activity	18
Communicating with non-participating friends/family members	19
Communicating with hams in general during activity down-times	20
On standby for emergencies or a need to communicate outside the range of commercial services	21
Other (what?)	22

4. What kind of ham rig do you bring to non-ham activities?

HF	23
VHF/UHF	24
Both HF and VHF/UHF	25
Depends on activity and setting	26

5. How has ham radio changed your experience in the activity/activities in question?

It makes me feel safer	27
It lets me share experiences with fellow group members	28
It lets me share experiences with family/friends	29
It allows me to enjoy two hobbies at the same time	30
Other (what?)	31

Thank you for your responses. We'll have more questions next time.



Survey Response for Issue: January 2018

Name _____ Call Sign _____

Address _____

City _____ St/Prov _____ Zip/PC _____

Country _____

E-mail _____



Amateur Radio Highlighted at Disaster Conference in India

Ham radio numbers up in some countries, down in others; new regulations and bands, conferences, a hamfest you may not have heard about yet; plus training for disaster service, Ofcom (non)-enforcement and more.

Andhra University in Visakhapatnam, India, was the site of the International Conference on Remote Sensing for Disaster Management-2017 (ICRSDM-2017) which was held last October. This event coincided with the third anniversary of Hudhud cyclone, which hit Visakhapatnam on Oct 12, 2014, and with the 2017 International Day for Natural Disaster Reduction on October 13.

The National Institute of Amateur Radio (NIAR) in Hyderabad participated as an exhibitor to create awareness about our hobby to the event participants. Jose Jacob, VU2JOS, and Tom K. Jose, VU2TO (Photo A), who participated in the Hudhud cyclone providing ham radio emergency communications, were on-hand to speak with the many people who visited the booth. A special event sta-

tion was set up, using the special callsign 8T3HUD (Photo B).

VU2TO was interviewed by All India Radio, for broadcast in its *Yuv Vani* (Voice of Youth) program about his experiences in amateur radio (Photo C), and NIAR's participation in the event was also covered by *The Eenadu* newspaper. Tom's ham radio emergency communications activities during the Hud Hud cyclone disaster are now taught in Class IX English Work Book in the schools of Andhra Pradesh and Telangana states.

There was also a mock drill by NDRF (National Disaster Response Force) at the venue. [Southgate Amateur Radio News]

Indian Government to Help Hams Train and Organize for Disaster Service

The impressive response of ham operators in India to disaster situations throughout the year has prompted government leaders to establish a program to

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Photo A. Tom K. Jose, VU2TO, participating in a panel discussion at the International Conference on Remote Sensing for Disaster Management, held last October in India. (Photos A-C courtesy National Institute of Amateur Radio)



Corporate hams into more of their disaster planning. The National Disaster Management Authority is asking officials in all states to allocate agencies and arrange for the training of volunteers. Once organized and trained, hams in India would be deployed through district "collectorates" during such emergencies as landslides, earthquakes and floods, and to assist in public safety support during cultural functions when traffic levels are high, such as religious pilgrimages.

According to a report in *The Times of*

India, the project still is unfunded, but officials were hoping to move forward by the end of 2017.

There are an estimated 50,000 active ham radio operators throughout India.

[Amateur Radio Newsline]

Ofcom Speaks on Ham Radio Repeater Abuse Enforcement

A freedom of information (FOI) request was sent to UK communication regulator *Ofcom* by someone named Mike, asking what action the agency takes

against amateur radio repeater abuse.

When asked how many times *Ofcom* has prosecuted amateur radio repeater abusers using hate crime legislation (i.e., "harassment without violence") by a public communication network since *Ofcom* started in 2003, the answer was "none." When asked how many times *Ofcom* has prosecuted VHF/UHF amateur radio repeater abusers since 2003, the answer was also "none." When asked how many amateur radio repeaters *Ofcom* has closed down temporarily due to abuse since 2003, the answer was "none."

In addition, *Ofcom* replied that it could not answer how many field officers it has without searching through electronic and paper archives, and some archives have been destroyed due to standard information retention policies. *Ofcom* also stated in reply to the FOI request that it does not monitor amateur bands.

[From: www.whatdotheyknow.com]

Europe's Other Big Hamfest

By now, many of you are familiar with Germany's HAM RADIO, held in Friedrichshafen each June. In another part of the continent, the third annual "IberRadio" was held in Avila, Spain, on September 16th and 17th. The organizers report record attendance for the event, which is drawing wide international participation.

The event featured presentations, workshops, exhibitors and vendors, QSL card checking, a swap meet that was expanded from previous years, and license examinations that included FCC license testing by ARRL VEs. Besides amateur radio, the event also featured CB radio and topics of general interest to electronics enthusiasts.

Planning for next year's event has begun, but a date has not yet been announced.

[IberRadio website and Amateur Radio Newsline]

Exciting Changes in Licensing for Tunisia

After a long process that began in 2011, it is now possible for Tunisian hams to apply, pass an exam, and get their own amateur radio licenses. Those who already have a foreign license can be granted licenses without passing an exam. Resident foreigners may also apply.

According to a post on the IARU Region 1 website, prior to 2011, amateur radio had been regarded with some suspicion by the previous Tunisian regime. Only a few organizations were



Photo B. Jose Jacob, VU2JO, speaking with visitors to the NIAR booth at the disaster management conference. The booth included a special event station, 8T3HUD.



Photo C. Tom, VU2TO, being interviewed by All India Radio.



Photo D. VERON General Chairman Remy Denker, PA3AGF, gives the opening address at the Netherlands' 57th Radio Amateur Day celebration. VERON is Holland's national ham radio association. (Photo courtesy VERON)

granted permission to open club stations Individual licenses were not available. Several attempts to create an amateur radio association failed.

After the Jasmine Revolution which led to the overthrow of longtime president Zine El Abidine Ben Ali in January 2011, Tunisian youth were able to create the *Association des Radio Amateurs Tunisiens* (ARAT), which was recognized by the new government as an official association under Tunisian law. Other radio associations have since been created. ARAT was accepted as the IARU member society for Tunisia.

Amateur radio in Tunisia involves three ministries, Telecommunications, Defense, and Interior. There have been a number of changes in these ministries since 2011, which has meant that ARAT has had to re-initiate discussions a number of times. Finally, with all of the work concluded, the Ministry of Telecommunications approved and issued a decree in September 2017, organizing amateur radio activity in Tunisia. The decree allows individuals to obtain their own amateur radio licenses. We wish to congratulate Tunisia for this achievement and thank ARAT for all of its hard work in the process.

[IARU Region 1]

New Frequencies for Spain and Argentina, But Not Yet for South Africa

Spain and Argentina are the latest countries to jump on the 60-meter band using the global secondary amateur radio allocation of 5,351.5-5,366.5 kHz, as agreed upon at World Radiocommunication Conference 2015.

In addition, after a decade of effort by the Radio Club of Argentina, the Argentina National Communications Agency (ENACOM) approved a new regulation for extended allocations on three HF bands: 1,800-2,000 kHz in the 160-meter band; 3,500-4,000 kHz in the 80/75-meter band; and 10,100-10,150 kHz in the 30-meter band. This frequency allocation now matches the U.S. allocation. A new 630-meter allocation was also added at 472-479 kHz, also matching the U.S. band boundaries.

The approval was given at the ENACOM board held October 26, 2017, and will become effective 90 days from that date (this January 24).

The Radio Club of Argentina is now working on making it easier for foreign hams to operate in that country during times of national disasters.

Meanwhile, the South African Radio League (SARL) tells us that last June, the Minister of Telecommunications and Postal Services (DTPS) issued a statement in which the cabinet approved access to part of the 5-MHz amateur band, but a few days later cancelled the approval and instructed the Independent Communications Authority of South Africa (ICASA) to hold back publication until certain aspects of the plan had been discussed between DTPS and ICASA. As of the publication date for this month's column, the allocation is still on hold, but SARL promised me that we will be among the first to know when the allocation is approved, and I will share the information with you.

[ARRL News, The Radio Club of Argentina website <lu4aa.org>, and SARL]

Number of New Dutch Hams Declines

On November 4th, the Netherlands' 57th Radio Amateur Day celebration took place in Apeldoorn. In his opening speech (Photo D), Remy Denker, PA3AGF, General Chairman of the Dutch amateur radio society VERON, mentioned that he recently received from the secretary of the *Radio Examens Foundation* the numbers of applications and successful candidates, which shows a decline in new hams over the past several years.

In 2015, there were 444 applications with 322 successfully passing and obtaining a license. By 2017, the numbers were down to 410 applications and 270 new amateurs registered.

Denker was quoted in a transcript of his speech on the VERON website (translated by Google) as encouraging hams to be more proactive in recruiting new amateurs. "I think the power of the small numbers can play a big role in promoting our hobby. If every radio ambassador shows friends and acquaintances in his area to who show interest what a wonderful hobby he has, then this can be a positive effect, which affects more people. And those others express their enthusiasm again. Perhaps that will also (increase) interest in examinations." Denker called for members to "spread the word."

[VERON]

In Closing

I want to thank all of the clubs and organizations — including AMSAT, Essex Ham, G4CRC, IARU, NIAR, NRRL, PARA, PARC, SARL, SSA, VERON, and YOTA — that have graciously submitted information and photos over the almost five years I have been writing this column.

There are many other clubs and organizations that I haven't heard from yet. If your group has some information or photos to share about an interesting ham radio event in your area, please don't assume that someone else will contact us with the information. Take it upon yourself to share your news through our magazine. I spend a lot of time checking with clubs, organizations, and news services around the world each month, but I certainly miss a lot of what is happening and need to rely on people like you — members, not officers!

In this world of unrest, no matter what your background or beliefs, we are all brothers and sisters because we are united in the passion we share for this radio hobby. Don't you think the rest of the world would like to see what a good example we all set? Please send your stories and photos to me at <aa6ts@cq-amateur-radio.com>. — Thank you and 73 de AA6TS!



Am I Going To The Dark Side? – Part II

BY JOE EISENBERG, *KØNEB

Building

In the November 2017 issue, I introduced the process of restoring the Heathkit SB-200 power amplifier (going over to the “dark side” after focusing mostly on QRP kits in the past). Now it is time to assemble the three kits I have from Harbach Electronics. The instructions in these kits advise the builder to thoroughly read and re-read the instructions, so you are very familiar with the steps you are about to take in assembling and installing these three boards. The first kit is the power supply.

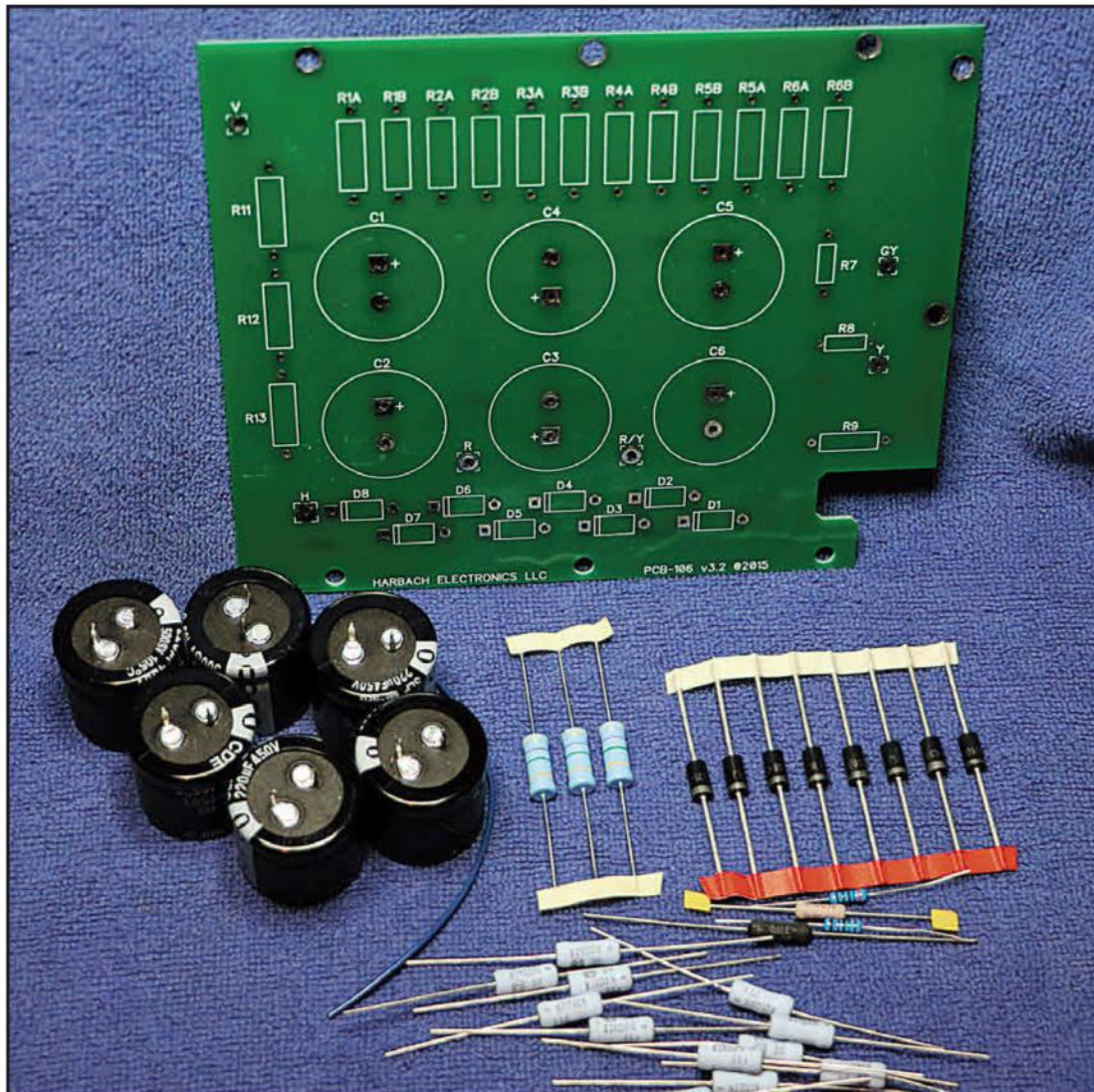
An important note of caution before digging into the amplifier. This may seem obvious, but be sure the power cord is unplugged before beginning. In addition, be sure to discharge the capacitors before touching anything inside, in case a bleeder resistor has failed. Capacitors can hold a charge for a very long time, and at the voltages involved, they can be deadly!

Power Supply

A far cry from the phenolic PC boards of the past, the Harbach kits utilize fiberglass circuit boards that are double-sided, plated through and pre-tinned. After all, we are talking about 50 years of progress in PC board technology. That same can be said for the essential components on this board, including electrolytic capacitors, load resistors, and rectifier diodes. Fifty years have brought tremendous breakthroughs in component durability, reliability, and performance.

Assembly of the power supply board has only a few specialized instructions, mainly having to do with the mounting of the load resistors. These resis-

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e-mail: <k0neb@cq-amateur-radio.com>



The Harbach SB-200 Power Supply kit parts ready for assembly.



ers do get hot, and must be spaced about 1/4-inch above the PC board to avoid damaging the board due to heat as well as allowing for airflow to cool them. I simply inserted the leads and bent them outwards to allow the resistor to hang below the PC board so I could adjust the height spacing and make them appear to be evenly spaced. When I assembled my board, I discovered right away that the leads, especially on the diodes, were quite large, and so I used my 63/37 .031-inch thickness solder.

In soldering these larger parts, I turned up the heat setting on my soldering station as the very thick wires as well as the larger pads on the PC board required more heat to allow the solder

to flow evenly. Thicker wires and larger pads and leads on the PC board absorb more heat and so more heat needs to be applied so the solder can flow quickly and thoroughly and not overheat the component. It seems like the opposite should be true, that having the temperature lower on the soldering iron would reduce the heat exposure to the component. However, using a bit more heat allows the solder to flow faster on these larger components, thus reducing their total heat exposure.

The power supply bridge rectifier circuit has eight diodes, two in series on each of the four legs of the rectifier bridge. There are some resistors in the amplifier that are replaced by the cir-

cuitry in the Harbach power supply board, so the old resistor assembly on the amplifier is removed and discarded. I found that it took maybe 45 minutes to assemble this board, and it went together quite easily. There is a 15K resistor that is left over after the board is assembled, and it will be used later when the board is installed in the amplifier. Be sure to save that 15K resistor in a safe place.

Soft-Start Board

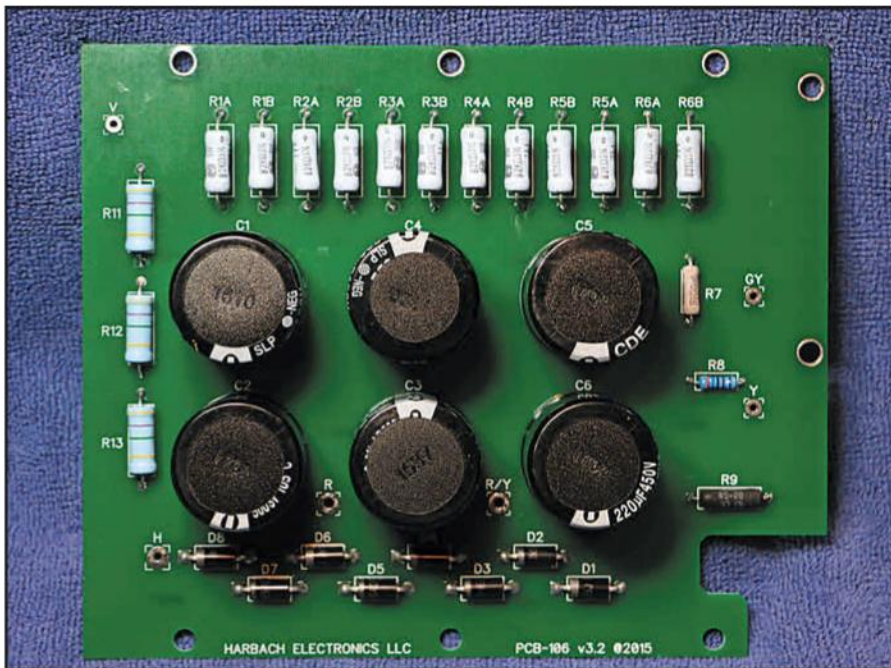
The next board that I assembled was the Soft-Start board. The purpose of this board is to prevent damage to the components on the amplifier caused by the sudden application of power when the amplifier is first turned on. This kit allows the voltage to be applied a bit more gradually before this board removes itself from the circuit. There also are a small number of components on this board, but many of them also have larger leads, again needing a bit more heat from your soldering iron. When ordering the Soft-Start kit, be sure to specify whether your amplifier is using 220VAC or 120 VAC, as the value of certain components will be different on this kit depending on the AC voltage you are using.

The parts on the Soft-Start board mounted quite easily, and can be mounted in any order, in a similar fashion to the power supply kit. I mounted the two large load resistors last to give me space to work with other components first. I suggest double-checking your parts orientation on each of the boards as errors with high voltage applied can be quite consequential.

Soft-Key Kit

The Soft-Key board is needed to safely interface this amplifier with current solid-state radios. When this kit was designed, most amateur transmitters or transceivers utilized heavy-duty relays to key an external amplifier. Nowadays, there is either a very small relay or a solid-state switching arrangement to key an external power amplifier. With well over 100 volts present on the keying circuit of the SB-200, a change had to be made to allow the amplifier to be keyed without damaging the radio. The Soft-Key board is different from the other two boards in that it is much smaller and has a much higher density of components. Using a smaller soldering tip as well as thinner solder is very helpful as there are many places on this board where a solder blob could cause a short.

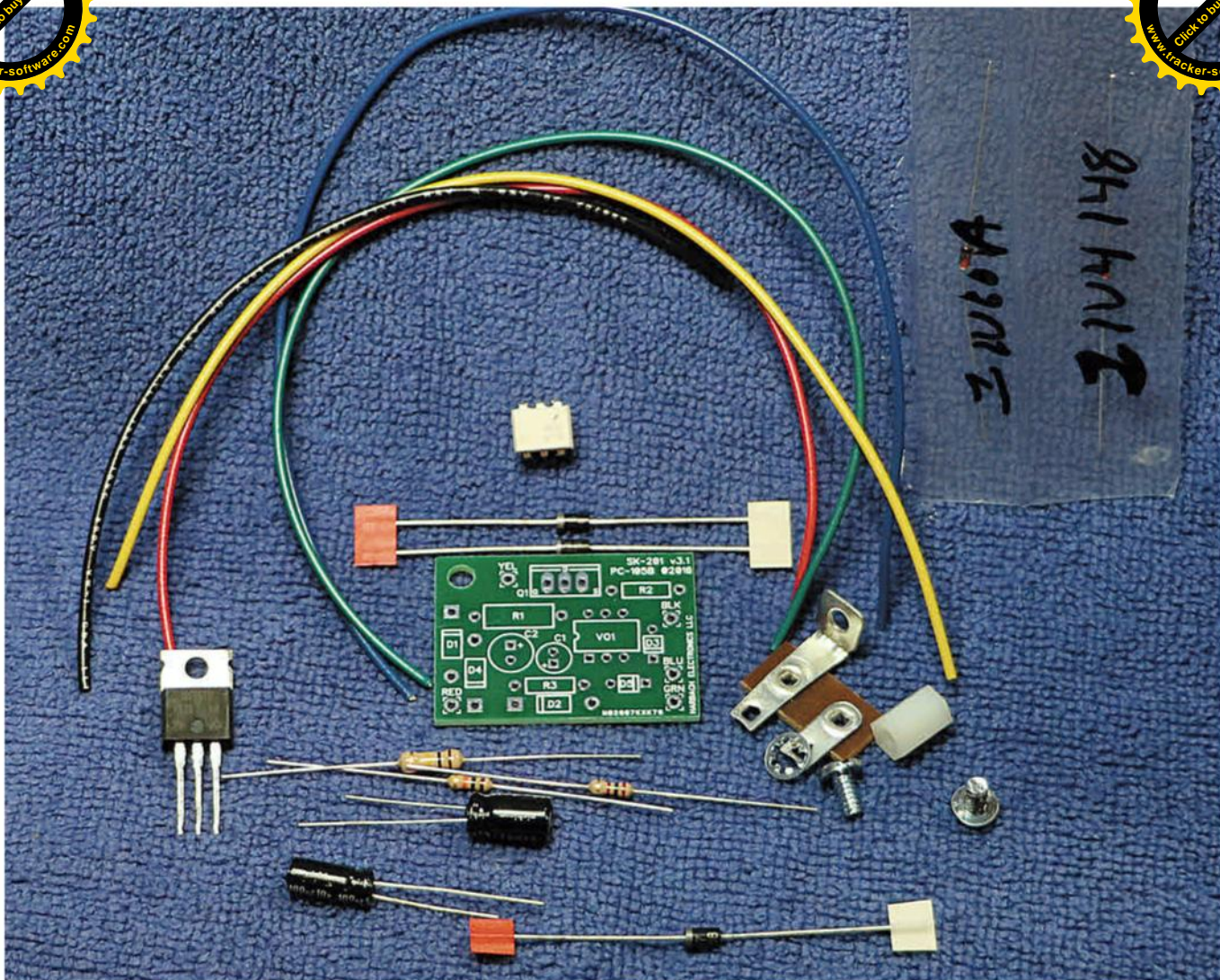
The Soft-Key board isn't really any denser than the boards on many of the kits I have presented in this column in the past, but relative to the other two



The completed power supply kit ready for installation.



The Harbach Soft-Start kit assembled. The low parts count makes assembly of this kit easy.



All of the parts making up the Harbach Soft-Key kit.

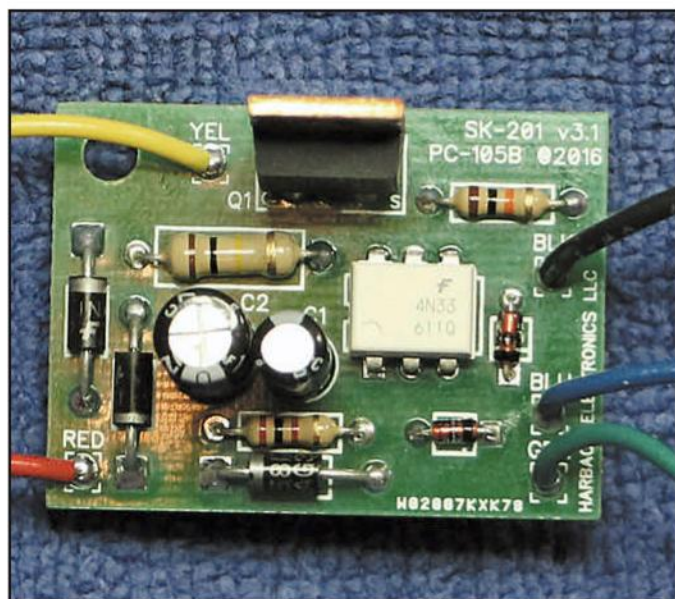
Harbach boards, it presents a much more dense array of parts. There is a 6-pin IC on this board that is an opto-isolator, which allows the high voltage to be isolated from the much lower voltage being offered to your radio by this board. Be sure that the dot on the IC is placed with its associated pin on the square hole of the six holes for this IC. The dot is also on the end that is marked by the notch on the board component outline. There is no notch on this IC, but the dot is on that end of the IC. There are five wires supplied with the Soft-Key board. Be sure to double-check the placement of these wires on the board.

Connector Upgrade

Another change I am putting into my SB-220 is to replace the original RCA connector on the back panel, which is for the RF input, with a BNC connector. The RCA connector is fine for things like relay or ALC, but I like my RF connections to be a bit more secure. I will be using a threaded chassis mount BNC connector, as it fits exactly in the same hole as the old RCA jack, so no drilling is necessary.

The Harbach kits are available from Harbach Electronics at <www.harbachelectronics.com>. Next month, I'll install these three kits and finish my restoration of the SB-200.

– Until next time, 73 de KØNEB



The Soft-Key kit ready to be incorporated in the SB-200 amplifier.



Shopping at the Swap Meet and Ham Radio Creativity

I am writing this month's column on a nice and sunny fall afternoon. The weather was the same the previous weekend, so I got out of bed early and drove to one of my favorite activities: The world-famous TRW radio, electronics, and computer swap meet.

The event takes place on the last Saturday of every month, rain or shine. I am lucky to live within a reasonable driving distance from this place, and try to go as often as I can. Interestingly, the radio club (W6TRW) is located in the Northrop Grumman office complex in Redondo Beach, California, but still retains the TRW name. The club is open to anyone with an interest in ham radio. I have been going to the swap event since I was a teenager.

According to the group's official website, the event draws an average of 130 to 150 sellers and approximately 2,000 to 3,000 buyers. The club also holds ham radio exam sessions every month.

Speed Walking or Slow Browsing?

When going to any swap meet, I will either go into my "procurement mode" and move quickly through the aisles to buy what I want, or slowly browse each aisle to find something interesting or something useful for a potential new project.

Usually, an old friend will be doing the same thing, so we usually chat about what has happened to our lives and other friends, or our latest projects. Maybe we'll even set a time and place to have a nice breakfast after shopping or browsing.

When in my procurement mode, I am focused on filling a particular need for my current or next project. Sometimes I have a list of part or model numbers (such as a 12AX7 tube or 7485 comparator chip), or something that describes an item

in general terms, such as 50-volt electrolytic capacitors, or some kind of transistor tester.

This is sometimes surprisingly successful (see Photo A). I spotted a transistor tester in fairly good condition, which included all the probes, and can test transistors in- or out-of-circuit. For \$20, I thought it was a good deal.

It's an Attitude or a Philosophy

When I am in my browsing mode, I have a different attitude, something I usually have whenever I am looking at surplus — or any other type of item — *I may or may not buy an item for what it is, but rather for what it can become.*



Photo A. An item on my wish list for a recent swap meet visit included some kind of transistor tester. This is what I found, including all probes ... and the meter works. A great bargain for \$20!

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LinkedIn:
<http://www.linkedin.com/in/wayneTyoshida>



Photo B. I have no idea what this item is or does, but neither did the seller, which helped me land a good deal. The handles on either side look like a great feature.



This is an interesting philosophy I have had for quite some time. It comes in very handy because this attitude can help me complete a project with some unique or unusual twist on a common or boring theme.

For example, I am always looking for portable test instruments or other interesting-looking electronic products (see *Photos B and C*). It usually does not matter what the item is or does. In fact, not knowing what it is can come in



Photo C. Another unknown item, but it does look interesting.

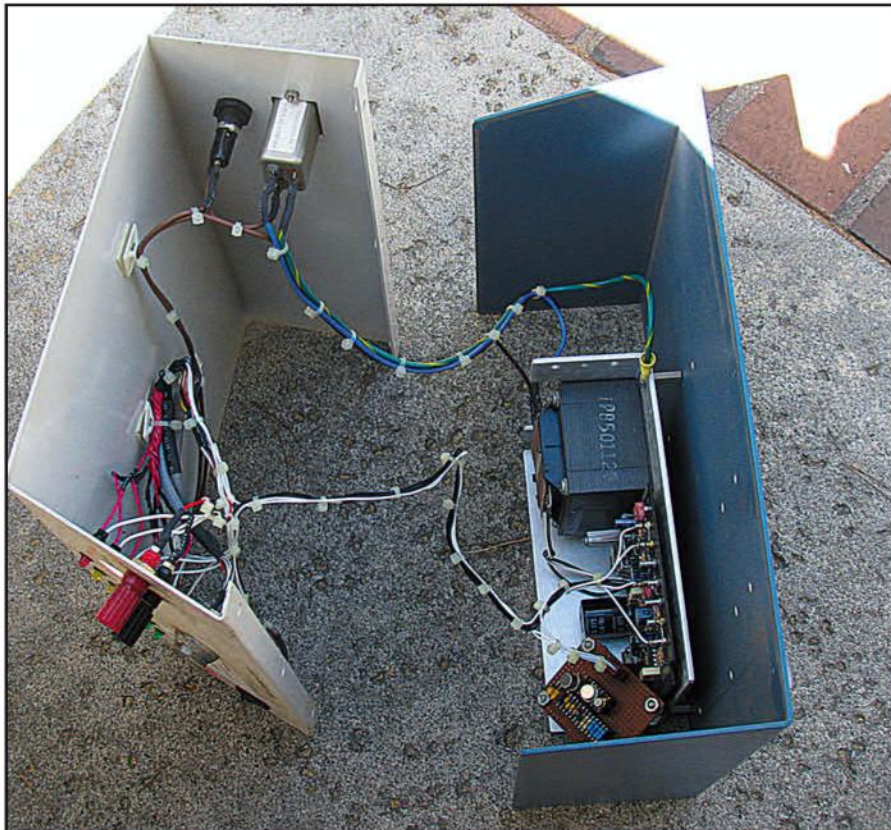


Photo D. The power supply, logic board, and other parts inside the whatever in Photo C are only bonus items to re-use or recycle.

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...andy because sometimes the seller does not know anything about it, either, which helps when establishing a price. Instruments like the whatever-it-is in *Photos C* and *D* because of its cabinet or housing. The power supply, logic board, and other components (as seen in *Photo D*) are bonus items. Sometimes, serious products can have very humorous features or controls or labels when taken out of context. For example, many tube testers have an analog meter with an indicator or parameter called “Gassy.” This could be a funny measurement for something. Can you imagine a signal report comment like this?

“You are three and nine, Old Man. Sorry to say your modulation seems a bit gassy.”

The thermostatic control (*Photo E*) has a funny name on its dial. It makes me think about some kind of demonstration instrument for Maker Faire. It could be used for testing a couple’s attraction for each other, similar to an arcade game I saw at a fisherman’s wharf many years ago.

Some patching and re-finishing will produce beautiful project cabinets for my next homebrew projects. The best part about obtaining project boxes this way is their quality and price. There is no way anyone could make or buy new or used project boxes like this for just a few dollars.



Photo E. Sometimes funny things can become endearing and inspire a new project.



Photo F. I built a lightning detector for Maker Faire and put it into a used but re-finished cabinet obtained for free.

My lightning detector (300-kHz receiver; *Photo G*) is an example of recycling cabinets. The circuit is very simple and all parts were already in my junk box, so the circuit cost me zero. As I started to look for a suitable cabinet for this project, it just didn’t feel right to spend way too much for a box. So I am glad I had a stack of these sloping cabinets found in a garbage bin a while ago. I patched the holes with epoxy and re-painted the white section of the box. The blue paint was in good shape. The price was certainly right — zero for the entire lot.

Yet Another Bonus

Since buying any used item includes a risk, most sellers at swap meets never guarantee what they sell. But since this is almost never my concern when surplus-shopping, I consider this philosophy a great way to minimize disappointment and loss of cash. In fact, I always seem to be very pleased with the objects I purchase at these events.

Sometimes, radio parts can be obtained for free. Often, this happens because someone is doing some cleaning or inventory reduction. This is a great way to exercise some creativity. For example, I picked up a WR-284 (2.60 to 3.95 GHz) waveguide slotted line at a recent radio club meeting. Although I had no immediate use for this piece of equipment, I thought it was an interesting piece of microwave radio technology. One day, I decided I needed a new desk lamp, but I didn’t want to buy one. Instead, I remembered the slotted line thing in my garage. After some lubrication and polish, I turned it into a new desk lamp by adding a line cord, switch, lamp socket, and an LED bulb. I made a plug at one end with a piece of scrap pine to create a base for the lamp socket (see *Photo G*).

I always cherish my outings to radio swap meets. I get to catch up with some old friends face-to-face, enjoy some fresh air, and discover something to inspire my next project.

– 73, Wayne, KH6WZ



Photo G. Instead of buying a boring desk lamp, I decided to make one out of a waveguide slotted line. It is energy efficient, since an LED bulb is used.



Answers to the WPX Crossword Puzzle on page 55.

Across

2. GHØSTS—Spirits that haunt the Channel Islands
3. TA9KER—The oil _____ passed through the Bosphorus Strait
8. OD1N—Norse god in Beirut
10. 9A1LS—Box, finishing, roofing, etc. in the Zagreb hardware store
11. ES5AY—For his history _____, the student wrote about the smallest of the Baltic countries
15. OY5TER—North Atlantic salt-water bivalve mollusk from Tórshavn
18. GU1LTY—Not innocent in a Channel Island
21. NØSES—Jayhawker proboscises
22. KA9SAS—Dorothy to Toto, “I’ve a feeling we’re not in _____”
25. LA5SIE—Female Collie dog along the Fjord
26. CY9IC—The St. Paul Islander who believed that humans are selfish and that they only do something if it will benefit themselves.
27. 1S1T5O—Why _____ hard to work the Spratly Islands?
29. VO1CE—The ham in St. John’s had to quit the WPX SSB because he lost his
30. OX1DES—Can cause “rusty” metals in Kalaallit Nunaat
32. EP1CAL—Gilgamesh, an example of an _____ poem, was set north of here
34. WA9ES—Decreases in Wisconsin Moon
35. 5NØWS—Extremely improbable percipitations in Lagos
37. UN1PED—If Borat had only one leg
41. 5A1LED—The yacht left Tripoli and _____ east to Alexandria
43. SU9GOD—Around 2500 BC his ancestors worshipped Ra, the _____
44. P5OAS—Core muscle connecting the lumbar vertebrae to the femur in Pyongyang
45. VE1NS—The Halifax phlebotomist needed these
46. SM1LES—Scandinavian grins
47. LY9X—Wildcat across the border from UA2

Down

1. AHØLD—A stop order placed on a check in Mariana Islands
4. RU9NER—Fast jogger in Omskaya oblast
5. VY1NG—The Yukon musher was _____ for first place
6. AP9EA—Disorder that causes you to stop breathing briefly, while you’re asleep in Karachi
7. ISØNE—“Quattro meno tre è uno” or in English - Four minus three _____
8. OH5AY—First two words of USA national anthem played in Helsinki
9. VE5TS—Parts of three piece suits
12. YI9GS—Not yangs in Baghdad
13. BY5EA—One if by Land, Two if _____
14. LY1NG—He was not _____, Vilnius Baroque architecture was beautiful
16. ST1LL—Even though two rivers - the White and the Blue Nile - converged, the water was relatively _____
17. GØATS—_____ grazed on the Yorkshire grass
19. RA9DOM—Without reason or pattern in Sverdlovskaya oblast
20. 2M1CE—A pair of Glasgow rodents
22. K9IFE—Illinois cutlery
23. PU9CH—Old school Amazon computer data cards
24. JO1NED—Became a member of JARL
26. CE9TS—Pocket change for penguins
28. TU9ES—Adjusts the dial in Ivory Coast
31. NØUMP—The calls at home plate where so bad you would have thought there was _____
33. A9NUL—Declare invalid in Bahrain
34. WØODS—Pine and oak in Iowa Home Depot
35. 5U9NY—Not cloudy in Niger
36. YE5NO—Two contradictory answers to a simple question in Jakarta
38. YA9GS—Not yings in Kabul
39. TR1PS—Bus rides from Libreville to Franceville
40. FO5SIL—“preserved remains, impression, or trace of any once-living thing” in Tahiti
42. DU5TY—Covered with fine particles of matter in Manila



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Ham Radio ... or Ham Radio?

The many different pursuits available to amateur radio operators are as diverse as the offerings at a high-end smorgasbord. While many of us have a “favorite” operating mode, each of us has a tableau of other choices that offer the opportunities for fun, learning, new skills, and satisfaction.

So with the depths of winter upon us, what better time is there to explore a new mode or other operating activity?

There’s no rule saying you can’t continue to enjoy your favorite, be it HF roundtable ragchews, an FM repeater contact during your commute or working CW with a distant location. To offer but a few ideas:

- Digital modes, including the many HF narrow-band varieties — old and new — such as RTTY, PSK31, AMTOR, PACTOR, etc.
- “Non-traditional” FM repeaters on 6 meters, 10 meters, or maybe 1.2 GHz
- Moonbounce, anyone?
- ATV
- APRS
- Satellite operations, including the “easysats” and the International Space Station
- “Paper chasing” like WAZ, DXCC, Worked All States (choose your band), or even the USA-County Award
- Explore a band or mode you’ve ignored — it’s probably already in your HF radio. You paid for it, so why not use it?
- Build something. Start with an easy project, maybe a monoband dipole?
- Want to build an easy and nearly private local communications network? Check out the 222-MHz band

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“Let’s consider what other distractions there are during the winter months. As you’ll see, none of them really can compete with ham radio!”

- Want a fun and educational challenge? Explore the 6-meter band

The list above is just the tip of the iceberg. Each of them presents lasting challenges that are intriguing.

Alternatives

But in fairness, let’s consider what other distractions there are during the winter months. As you’ll see, none of them really can compete with ham radio!

Professional basketball: Each team gets 150 timeouts that are used in the last two minutes of the game. Most of the three-hour game time features players, coaches, and refs standing around, the latter watching replays or maybe another game because they’re bored with this one. Each time-out is an opportunity for a commercial break, followed by a very loud horn that everyone ignores. A minute later, they blow the horn again and the refs say, “OK, this time we mean it.” Then a guy takes a foul shot and they blow the horn again to replace one or more of the guys who were standing around looking at the foul shot. After the second foul shot, one of the coaches calls a time out to draw up a new play that no one has ever seen before on his whiteboard. It makes you wonder what he did all the previous week. But this stroke of genius is so intense, he gets to ignore the loud horn two more times. Result: The play doesn’t work but the last 60 seconds of the game takes 55 minutes. You could have been on the radio because the real pro basketball season begins when the playoffs start. They begin in April and run through the following September, when a new season gets under way.

College basketball: See above and don’t bother trying to remember the names of the players as they only stay in school a year or less. As evidence, in recent years, I am not aware of any good player who got a four-year degree in Basketballology. The real season begins with “March Madness” that strangely now runs through April. I think that’s because they need the extra days for all those time-outs. You could have been on the radio.

Pro football: I’ve learned that pro football is 3 hours and 30 minutes of TV commercials interrupted by an occasional football play. The big championship game is 4 hours and 45 minutes of commercials (that the viewers really tuned in to see) and a concert, with sporadic references to large people standing on the field hoping that confetti will land on them when they run out of commercials. Maybe you can watch the game and talk on the radio during the commercial breaks. Using that method, you should be able to earn your “Worked All States” before halftime.

Auto Racing: People used to watch it to see which manufacturer made the fastest car, so they could



buy at brand of car on Monday. I can only guess what they did with that car when a different brand won the following week. Then they made the cars all the same and put stickers on them to make you think they had real headlights. So instead, you'd then root for your favorite driver and go buy his T-shirt on Monday. Then they made all the drivers the same (except for one lady who never finishes above 20th) and the only reason to watch was to witness 40 evenly matched cars running in a pack and have "the big one," which they schedule to happen while you're watching a commercial. You could have been on the radio. Admit it — do you really care if the crew chief added a half pound of air to the left front tire during the mid-race pit stop?

Golf: Unless you're an avid golfer, watching TV golf is like watching snow melt. And if you're an avid golfer, you're not likely to be a ham radio operator. I say this because, just based on my experience, I have never worked a golf cart mobile, nor have I been asked by a golfer-ham radio friend using the local repeater, what club he should use on a 220-yard par-3 tee shot. Besides, golf is futile. What's a perfect round of golf, an 18? You can't even do that on a course that features a carpeted playing surface and windmills, unless maybe you're the dictator of a small country with an over-worked press secretary.

Tennis: Quick, who won the Davis Cup in 2012? Hah! Trick question! They've been playing for the Davis Cup for 63 years and it still hasn't been awarded. Instead of waiting them out, you could be on the radio.

Hockey: Lots of action, guys running up and down the ice and once a month, someone scores a goal and they blow a horn, I think to awaken the spectators to the notion that something noteworthy happened. For part of the game, there are rules against impaling your opponent with a stick or punching him until you both fall down that sometimes sends a player to the slammer, or penalty box; but toward the end of the game, there are no rules. Rather than be confused by all this, you could be on the radio, because this winter sport doesn't settle its championship until June, when they have to stop because the playing surface has become a puddle.

Figure Skating: Really? Instead of watching sequined dancers fall victim to judges who made up their minds who should win before the skating starts, you could be on the radio. Can you really tell if that was an amazing triple flummitz or was it maybe just so-so because his or

her toe landed pointing out instead of in? The sport could be livened up with perhaps allowing full contact figure skating among the participants. Or maybe that takes us back to hockey (above)?

Skiing: What's the difference between a slalom and a giant slalom? Only your wax provider knows for sure. They start with the first one down the hill, who sets a mark everyone who follows beats. In between, they show a few people falling down. Then one of the last skiers wins. You could be on the radio, maybe with someone from Switzerland who gave up skiing for ham radio. Now ski-jumping is cool, because some guy can fly 80 meters, or one wavelength of a good HF signal. But

they never show it here because the U.S. is never any good at it.

Bowling: This sport was invented so the players could drink beer between shots. No one knows how to keep score, they just trust a computer. Instead, you could be on the radio, and like a bowler, assuming you're not mobile, you can drink your favorite beverage when you're not transmitting.

So there you have it. As we celebrate a new year, you can enter it knowing that ham radio is obviously the best, most fulfilling and amazing winter activity this side of a honeymoon under the Northern Lights. Between that event and your on-the-air activity, both represent true Magic In The Sky.

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RFI: The Bane of Ham Radio

One Ham's Account

Stay in this hobby long enough and it's bound to happen... The bane of ham radio, namely, dreaded RFI (radio frequency interference). Broadly defined, RFI is interference to an electrical circuit from an external source generating an electromagnetic wave. Basically, there are two types of RFI: Narrowband RFI such as broadcast stations, mobile phones, personal computers, etc. The other is broadband RFI that emanates primarily from electrical power transmission and distribution lines. Broadband RFI can affect the entire ham radio spectrum, but it often rears its ugly head in the high-frequency (HF) bands.

Broadband RFI

Broadband RFI will be this month's focus. I had not experienced severe broadband RFI at my former QTH (location), which was in a subdivision outside of St. Louis, Missouri. The subdivision was serviced with buried electrical lines, which went a long way to suppressing broadband RFI.

Now I live about 75 miles northeast of St. Louis in rural Macoupin County, Illinois, where buried electrical lines are uncommon. Listening to my mobile HF rig, my new home seemed to be RFI-free. When I first moved here, I thought my spectrum analyzer didn't survive the move. Although

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my analyzer's CRT (cathode ray tube) had a display and a static floor, I didn't find any discernable signals. Back in St. Louis, there would have been blips across the analyzer's entire frequency range. Then it dawned on me to check the broadcast portion of the spectrum and, sure enough, there were signals on the analyzer.

Joy! My analyzer had survived the move and it confirmed what my ham radio transceiver told me. I was living in a relatively interference-free RF (radio frequency) environment. Although I moved from a subdivision with underground electrical utilities to one without, I was still in a quiet area. Life was good, and it continued to be so until about a year ago.

Trouble in Paradise

That's when my HF transceiver began to pick up a broadband buzzing noise. First it was on 20 meters and later I found it also on 40 meters, but it didn't last more than a few hours. The WARC bands (12, 17, and 30 meters) didn't seem to be affected, so I wasn't too concerned.

At this point, it appeared to be an intermittent annoyance. Whenever there was a new DX country on, the RFI was either not present or it wasn't too strong. I was wondering if the RFI was being created by a nearby faulty doorbell transformer or perhaps a noisy "wall wart" in my own home. The bottom line was, at this point in time, it was nothing more than an occasional annoyance. Some days the RFI was louder, but then it would disappear for a week or more before returning. I was able to live with it.

Just my luck, though, the RFI returned with a vengeance and just in time for contest season. I now had S-9 or louder signal levels on all the HF bands and it was also bleeding into the 2-meter band. The RFI was strongest on HF, but still very noticeable on VHF, which proved to be helpful later.

What made matters worse is that this intermittent RFI was now always present and just in time for the ARRL RTTY Roundup, a contest that both my wife and I enjoy operating very much. I hoped against hope that the RFI would diminish, but Lady Luck wasn't with us on the contest weekend. The RFI was affecting my ability to hear signals and to log Qs (contacts), which affected our score. Now I was ticked off and ready to do something about it.

Taking Action

The first step I took was to get a notebook to record RFI times, frequencies, signal levels and weather conditions. For example, is the RFI present and on which bands? How strong is the signal level on each band? Is it raining outside and what is the temperature? Is it windy? Does weather seem to

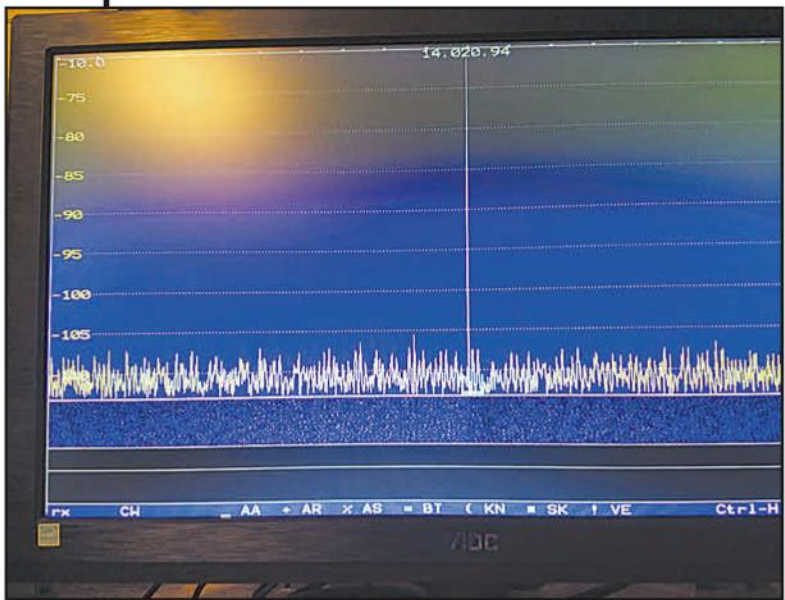


Photo A. Elecraft Panadapter provides a visual representation of the RFI. Notice the repeating waveform pattern. (All photos by KO0Z, except where noted)



Photo B. An oscilloscope can help determine the frequency of the RFI embedded in radio signals.

Photo C. A typical wall wart power supply can be a source of RFI; although in my case it wasn't.

have an impact on the RFI? If the RFI wasn't present, I would record that observation as well. Anything that I thought was RFI-relevant, I would record. Accurate and timely data collection is essential to finding a solution.

The next big question was to determine whether the RFI was emanating from my QTH or from an external source. To make that determination, I powered up my transceivers with a deep-cycle marine battery and then shut off the electricity to my home via the circuit breaker. If the RFI went away, I knew the interference was being generated inside my home. If it did go away, then I would flip on each breaker, one by one, to isolate the offending circuit. In my case, the RFI was still there after turning off the household electricity, strong as ever, which meant that the RFI source was external to my home. Could it be a nearby neighbor or was the offending source farther away?

Armed with this new information, I donned my walking shoes and took my HT and portable AM radio on a walk around the block with no noticeable RFI indication on either radio. So I returned to my shack and started using my HF Yagi, which is a directional antenna. I noticed that the RFI seemed to be 2 S-units louder to the west. When I turned the beam in the opposite direction, the signal was just a bit weaker, but not by a large margin. Then it hit me. My VHF Yagi antennas (6-2 meters) have sharper directional patterns and the RFI isn't as strong on those bands. Perhaps the sharper directional pattern that a 14-element Yagi offers over a 4-element Yagi will be of some help by giving me



Photo D. Ameren RFI engineers outside my QTH discussing my interference problem.

a more accurate beam heading. Sure enough, the sharper patterns of the VHF Yagis allowed me to not only confirm that the RFI was coming out of the west, but I also have a definite beam heading of 300°.

Going Mobile

Armed with a heading, I proceeded to take my car, equipped with a Yaesu FT-857 transceiver, out to do a little RFI hunting. Although I knew a heading, at this point, I didn't know exactly where

along that heading the RFI was being generated. When DFing (direction finding), it's a good idea to get a bearing from one location, a, then move to a new location and, using a directional antenna, find another new heading. Plot them on a map and where the two headings intersect is a great place to search in earnest for the RF source.

Being somewhat lazy, I decided to drive along the beam heading, listening to my FT-857 and making note of the RFI signal levels on the various bands.



As the signal became weaker, I drove back in circles, a few blocks at a time, tracing my route back towards my QTH until I found the city block with highest signal level. I was down to a one-block area where the RFI levels were highest. About three blocks west of my QTH, I narrowed my search to a half block area. Again, I was keeping accurate notes in my RFI logbook.

Using my smartphone, I made audio and video recordings of the RFI at my QTH. My Elecraft K3 and panadapter display provided the photos, video, and audio for the recording (Photo A). In addition, I fed the audio from the K3 to my oscilloscope on my workbench and measured the RFI frequency (Photo B).

Between the panadapter and my oscilloscope, I had visual representation of this particular RFI's signature.

Knowledge is Power

Knowing that the RFI source was most likely three blocks away from my location, I began to suspect a powerline issue and not a neighbor's wall wart (Photo C) or doorbell transformer. I was hoping that my "RFI arsenal" contained objective, quantifiable data that I could present to the power company. Hopefully, they wouldn't think that I was a "crank" with imagined problems. The next big hurdle, I needed to clear was to locate someone in the utility company who could help me.

As luck would have it, my friend Dave WA9OEX, had also had powerline issues and he already had a name and a number for the RFI engineer at our utility, Ameren Illinois. I called the engineer and he was very understanding. Within a few days, Ameren UE Illinois sent a team up to examine my RFI issue (Photo D). I assured them that I wasn't a "crank" and they assured me that I wasn't. In fact, when I had mentioned that I had turned off the power to my household and my battery-powered rig could still hear the RFI, that lent more credibility to my complaint and it also told them this was a more involved RFI issue.

I mentioned that I wasn't sure if the utility company's line was at fault, but they told me that it didn't matter, for they were interested in finding the source just as much as I was. One of the engineers, Chris, brought a commercial Model 240 A RFI Locator (1.8 to 1000 MHz) with him (Photo E) and we could not only see the RFI, but hear it as well. I invited Chris and Richard into my shack so they could hear and see the RFI for themselves. What I was hearing matched what they were hearing. I told them about my DFing (direction finding) efforts and they immediately checked out the area.

The RFI Culprit

About 30 minutes after Chris and Richard left to search for the RFI, I noticed that it stopped. It turns out my beam heading and DFing proved to be very helpful. They found the offending utility pole and sent a lineman up to inspect it. Chris told me later that as the lineman was climbing up the pole, the RFI intensity was varying in strength and that immediately told Chris that they'd found the culprit.

Long story short, nuts and bolts connecting a cross arm loosened over time and there was some minor arcing. When the hardware was tightened, the RFI went away. Chris and Richard told me that my DF search really helped them narrow down their search, which made their job easier and saved a lot of time. Just goes to show, sharing objective data, combined with team work, solves problems.

WA9OEX and his wife Judy, KA9ACM, (Photo F) live in Hillsboro, about 30 miles away from my QTH. Dave's RFI problem was more involved. Ameren Illinois had to enlist the big guns. The utility company brought in Michael Martin, K3RFI, from Maryland. K3RFI owns and operates RFI Services. He helps train utility company engineers in analyzing RFI problems.



Photo E. Ameren's commercial model 240 A RFI locator operates from 1.8 to 1000 MHz. Note the RFI signature on the display.



Photo F. Dave and Judy Reynolds, WA9OEX and KA9ACM, were very helpful with contact information.



Photo G. Jerry Knowlton, W1IE's, August 21, 2017 solar eclipse photo taken with his Nikon camera. (Photos G-I courtesy of W1IE)

In Dave's case, he experienced 30-over-S9 signal levels on most of the ham bands. In effect, Dave was almost off the air. WA9OEX's RFI was especially difficult to locate. With K3RFI's help, the utility's engineers found the RFI culprit ... a faulty lightning arrestor about a block southeast of Dave's QTH. The powerline outside of Dave's house was basically acting like an antenna. Replacing the faulty arrestor cured the problem and both Dave and Judy are again happily making contacts.

Network and Share Data

As soon as you notice an RFI problem, begin to take notes with times, dates, frequencies, S-levels, rig information, antennas, beam headings, and weather information such as low or high humidity, rain, sun, hot or cold temperatures, etc. All of this information can prove to be useful. Eliminate your home as the RFI source by putting your rig on battery power and turning off the AC to your home.

Pass your observations onto other hams. WA9OEX heard my tale of woe and passed what he knew on to me, which saved me a lot of phone calls to locate the right person within the utility company who could help me. As power line infrastructure continues to weather and age, it is inevitable that some arcing will cause RFI to happen from time to time. Utility companies do want to know about it because the arcing can lead to more serious equipment failure. Teamwork is the key.

Happy New Year

Happy New Year and, hopefully, ridding your QTH of RFI won't become one of your resolutions. If it does, remember all is not lost and through careful obser-



Photo H. W1IE took part in the Solar Eclipse QSO Party by sending PSK31 on 20 meters.

vation, data recording, networking, and teamwork, a solution can be found.

With this new year, I'd like to thank all my readers who took time to email me. I enjoy hearing from you. A case in point, a few months ago, Jerry Knowlton, W1IE, enjoyed the article over the solar eclipse. He wanted to know more about solar filters for his Nikon camera. I advised him to go to a professional camera store, which he did, and the results speak for themselves. Jerry sent me

some of his pictures that he took during the eclipse (Photo G). W1IE was part of a group during the eclipse transmitting PSK31 (Photo H) using only 5 watts on 20 meters using a homebrew antenna (Photo I). Jerry copied signals coast-to-coast and he sent in his data to Virginia Tech. Thank you, Jerry, for the story and the photos. Happy New Year and thank you for reading CQ! I hope to hear you on the air. Please keep the emails coming my way. – 73 es GL, Ron, KOØZ



Photo I. W1IE's homebrew 20-meter vertical antenna he used during the solar eclipse party.



Alacrity (RTTY and FLDIGI)

One of the oldest digital modes is RTTY, a mode that I have not yet (in 21 years) discussed on these pages. This, then, is an introduction to one of the most popular digital modes in use today.

RTTY, which is short for Radio TeleTYpe, is a keyboard-to-keyboard mode used for major contests, casual ragchews, and everything in between. It is also an ancient mode, dating to the late 19th century.

Way back in the day, teletype was a commercial endeavor, an alternative to Morse code telegraphs that dispensed with the need for highly-trained operators. Once radio was invented, it wasn't long before radioteletype became a thing — and hams got into it not long after.

Like many modern digital modes, RTTY is most often used as a keyboard-to-keyboard mode. It is somewhat less robust than PSK31 in the case of a noisy radio channel, but it is fair to compare both modes and find them roughly the same. Neither uses error-correction, so noise can allow random characters to appear.

When I was a kid, working RTTY required the ownership of a Teletype (or Telex) machine, a finicky electromechanical contraption used to send and receive teletype (see *Photo A*). Today, instead of re-purposing an electromechanical tele-

type machine, we use computers to encode and decode the 5-bit Baudot code at 45.45 baud — both named after Émile Baudot. There are several programs to operate RTTY: A quick internet search will identify these, and you'll also find several web pages naming the merits of each.

Let's talk about FLDIGI, which is a new-old software application written by Dave Freese, W1HKJ, (and *several* others: <<http://bit.ly/1K3Hyyn>>), that is an outstanding program for digital communications enthusiasts in its own right. I say new-old because this application has been around for several years — indeed, I first wrote about it in the August 2011 issue of *CQ*, and then twice more, and will again be repeating today some of what I said back then.

The first very unusual thing about FLDIGI is that it capably works with so many digital modes, from CW, PSK31 and RTTY to Throb, Domino EX11, and Olivia. See the FLDIGI help page mentioned previously for a complete listing of the modes FLDIGI operates.

The second very unusual thing about FLDIGI is that it is available for Linux, Unix, and Mac OS X, along with the usual Windows® (including Windows 10) versions. Those of us using Microsoft's operating systems are a bit spoiled, since virtually everything is available for Windows. Our friends using Apple computers and Linux often are not so fortunate. FLDIGI and its related components are a welcome exception. *Figure 1* shows a partial screen shot of the download page where the various ver-

* c/o *CQ* magazine
Email: <N2IRZ@cq-amateur-radio.com>



Photo A. A Siemens T100 desktop Teletype machine from the late 1950s. At the left is the paper tape machine, which punched holes into a paper tape to be used as a storage medium. This is well before floppy disks. Messages were punched into tape offline, and fed back on the air (through the tape reader, at right) to minimize the time it took to send the message. Image courtesy of Night-flyer from the German-Language Wikipedia (de.wikipedia.org).

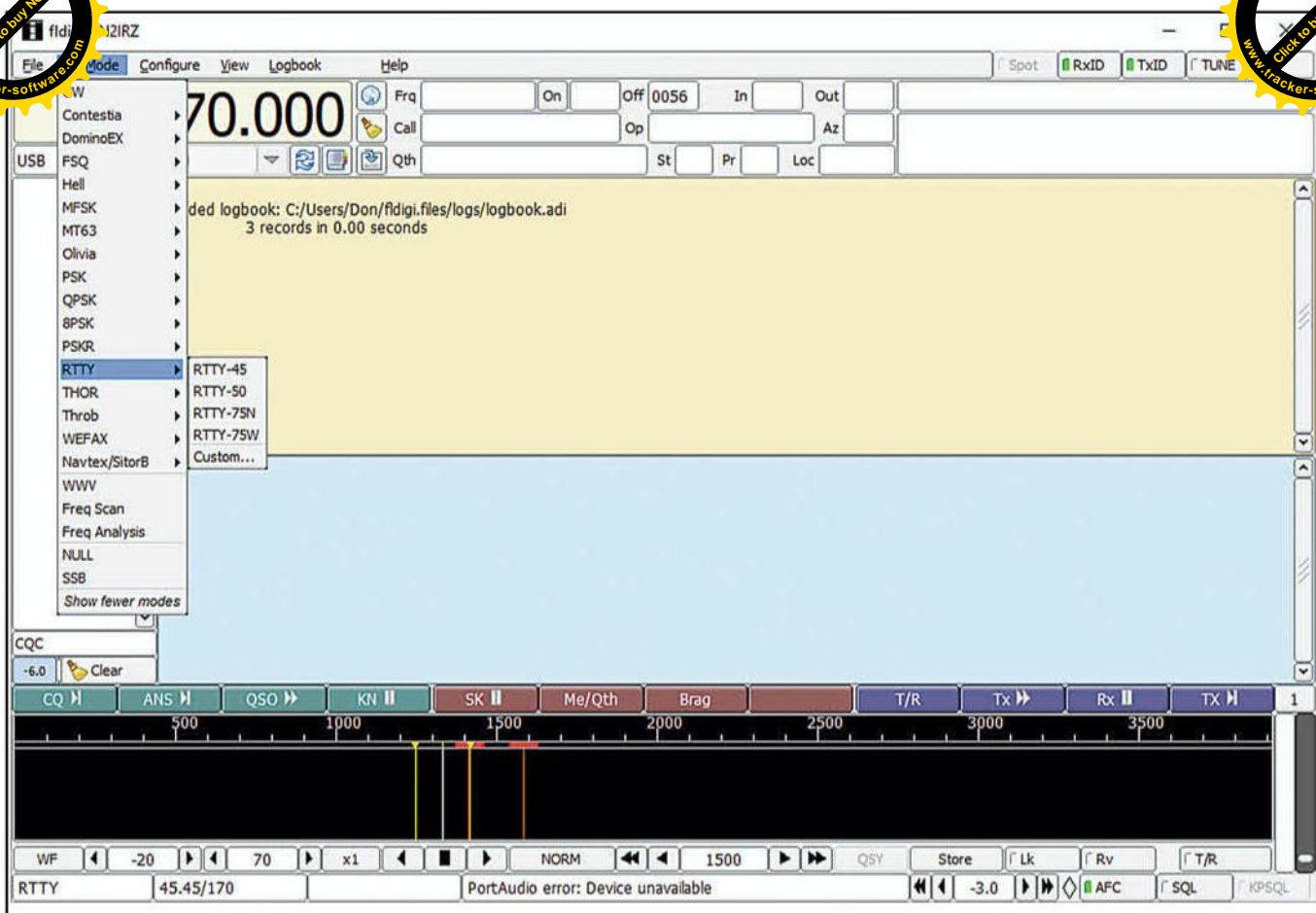


Figure 1: The main FLDIGI window in RTTY mode (Version 3.22, about a year old, is shown. A newer version is available). I've expanded the Op Mode menu so you can see the RTTY choices: You want to use RTTY-45 for normal operations. Yellow is the RX window, blue is TX. The waterfall display at the bottom lets you see signals and tune them in.

sions are shown. Note that source files (in C++) and several individual FLDIGI components are also available separately.

As described on the FLDIGI help page <<http://bit.ly/2heVf4x>>, FLDIGI supports a large number of digital modes. And to say that it does each of them elegantly is a fair statement. I'd written about NBEMS (Narrow Band Emergency Messaging Software) in 2011, a system which uses several FLDIGI features for emergency communications, which is one use for FLDGI. For some specialized tasks, there are a few additional programs that would surely come in handy. Oh, and they are all offered for free. In fact, on his website, W1HKJ answers the question "How can I support FLDIGI?" with this eloquent text:

I have received several requests for information on providing support for fldigi. I have been blessed with good health and sufficient income to allow me to enjoy our great hobby for over 54 years. I consider fldigi and all of the other software as my gift back to all of the great hams with whom I have QSO'd over the years and to those I still hope to catch on the waterfall. So monetary support is not needed or solicited. Instead I request that you make a contribution to your favorite charity. Name me in recognition or simply make an anonymous contribution; either suffices. You would do me great honor if your contribution were made to the Gideons International <<https://www2.gideons.org/>> through their gift Bibles recognition program.

Thanks, Dave, for your generous gift to the amateur radio community.

From my point of view, FLDIGI is simply a great everyday program to operate digital modes — and that's what we're here for, right?

Connecting your radio is either easy or trivial. If you have a digital interface already, for example for PSK31, you're all set. If you don't, you can either buy one (there are many under \$100) or build one (see <www.aa5au.com/rtty/fsk-interface/> for some ideas). Essentially, you need a cable to go from the radio's receive audio into your computer's sound card, another cable for the transmit audio, and something to control the transmitter, a PTT circuit.

RTTY can be transmitted as Audio Frequency Shift Keying (AFSK), which uses audio tones (usually 2125 and 2195 Hz, which are 170 Hz apart) to modulate a transmitter. Other tones can be used, as long as they are 170 Hz apart (although some systems, such as my PK-232, use 200 Hz, which can generally be decoded), but the tones are selected to be in the sweet spot of the audio passband of most radios.

You can also directly key your radio if it is equipped with an FSK input. Here, we on-off key the radio directly, avoiding the need to set the transmit audio level. Many radios don't allow the use of narrow audio filters in single-sideband mode, which has a significant impact on your receive sensitivity, while in FSK mode these narrow (250 Hz is typical) filters are available, greatly reducing the effects of noise.



Software - Mozilla Firefox
 File View History Bookmarks Tools Help
 W1HKJ Software

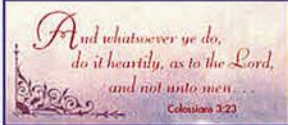
www.w1hkj.com

Software By W1HKJ & Associates

All source, dmg, and Windows setup files are now available on this [site](#) and at [Source Forge](#) 1 Nov 2017

- [fldigi / flarq](#) - modem / arq - [Sights & Sounds of Digital Modes](#)
- [flamp](#) - Amateur Multicast Protocol - file transfer program
- [flwrap](#) - file encapsulation / compression
- [flmsg](#) - Forms manager
- [flrig](#) - rig control program, cooperates with [fldigi](#)
- [flwkey](#) - modem program for the K1EL Winkeyer series
- [fllog](#) - can use same data file as [fldigi](#)
- [flnet](#) - voice net controller database / check-in application
- [flcluster](#) - telnet client to remote DX cluster servers
- [kcat](#) - Kachina 505DSP controller
- [kcts](#) - Kachina 505DSP test suite
- [test suite](#) - includes [linsim](#), [comptext](#) and [comptty](#)

Support [fldigi](#)
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to your favorite charity



Software	Version	Date	Download @ W1HKJ	On-Line Help @ W1HKJ
fldigi/flarq	4.0.12 / 4.3.6	10/28/2017	fldigi	fldigi help
flrig	1.3.36	11/01/2017	flrig	flrig help

Figure 2: W1HKJ's software page at <www.w1hkj.com>. This lists all of the various applications for the supported operating systems, including Windows, Mac OS X, and Linux. Here is also where you'll find the documentation and, if you're interested, the source code as well. Version 4.0.12 (current as of early November 2017) includes the RTTY application.

Alas, my ICOM IC-706 MK2G is not equipped with a direct FSK input, so AFSK is my only real choice. If your radio does have an FSK input (see a list at <www.aa5au.com/rtty/rty-radios/>), you are generally better off using that instead of AFSK. The exception is if you're already fully set up for audio-based digital modes, because, well, you're already all set up.

Oh, just a short plug for AA5AU's web page, a wealth of RTTY (and other) information, at <aa5au.com>. Don is a big fan of MMTTY software, which I have never tried, but as I mentioned at the start of this month's column, there are several RTTY programs, and all of them has its unique merits.

RTTY Operating

Operating RTTY somewhat depends on your intent: If you're joining the CQ WPX RTTY Contest (on the second full week-end of February each year — this year, the 10th and 11th) or the CQWW RTTY DX Contest (held each year on the last full weekend of September), your operating procedure will be quite different from a casual ragchew.

Not being a contester, I feel it would be unfair (and probably a bit dumb) for me to describe how to operate. That being said, I will refer you to two places: The first is The CQWW RTTY Contest home page at <www.cqwwrtty.com/index.htm>. The second is the home of RTTY Contesting, the aptly-named <www.rttycontesting.com/>. Between these two, anything you'd ever want to know can be found.

One thing I need to mention whenever I talk about digital soundcard modes: It really is critically important that you set your transmit audio (when using AFSK of course — FSK has no such need) and (to a lesser extent) RF power levels properly. Search YouTube <www.youtube.com> for "PSK31 Level K7AGE" for a nice video explaining how to do this. Although this shows PSK31, it's valid for all sound card digital modes. As for RF power, since RTTY is a 100% duty cycle mode, transmitting at greater than 50% power (50 watts for my IC-706) will unnecessarily stress your radio, possibly overheating or damaging it.

Some digital modes, such as MT63 and Olivia, depend upon accurate sound card clock frequencies to tune and decode signals. Sound cards don't generally hold the kind of frequency accuracy desired for optimal performance, so it's a good idea to calibrate your sound card. You only have to do this once. In a pinch you can get away without it, but best to do it if you can.

I'm not going to describe in detail how RTTY works — you can look that up if you like — instead a brief note on making a call. The first step is to tune to RTTY activity and listen. Frequencies include the areas around 3580, 7080, 14080, and 21080. In your listening — watching, really — look for how others are operating, and copy them. My typical RTTY call looks like this:

<CR>CQ CQ CQ CQ DE N2IRZ N2IRZ PSE K<CR>



The coding and following Carriage return help to make your call stand out from the typical noise on the channel. Some may include a few more CQs or call-signs, but if band conditions seem good, you can cut back a few. The PSE (please) is just good manners, which you'll find far more common here than on phone.

On the air, you'll also find many CW procedures and abbreviations used, like DE for "from," Q-signals and the like. If you see something you don't understand, it is OK to ask. We were all beginners at one time. And finally: Most text uses uppercase, but RTTY can send lowercase, numbers, and several symbols. The reason you don't see them often is that it takes a little longer to transmit those characters. Look up Figures Shift and Letters Shift to learn why!

Have I convinced you to try it? If you are already into digital modes, there's a good chance you are already using FLDIGI, and perhaps just need to download a new version. But if you are one of the 26 CQ readers who have not yet tried to operate a digital mode (aside from CW, perhaps), then FLDIGI is absolutely an excellent and versatile program, and worth your time to load, configure and get on the air.

As with most other digital software, if you're not sure you really want to commit, try using the software to listen only: All you need is an audio patch cable from the speaker or headphone output of your radio to the input of your computer's sound card. Be sure to turn the volume way down, at least until you determine there isn't too much audio.

Of course, step one is to get the software, install and configure it. Getting the software is as easy as visiting the download page <<http://bit.ly/2zprokp>>. I recommend downloading all of the applications that apply to your operating system (see Figure 2). You might not need them now, but it doesn't hurt to have them handy. They're small, too, so disk space shouldn't be an issue. For Windows, they are self-installing .EXE files, so installation is as easy as a double-click. If you encounter trouble, read the documentation, as some older versions of Windows might need a tweak or two.

Also, allow the program to install the desktop shortcuts; otherwise you have to go to C:\My Programs and select the runtime.exe file. When FLDIGI first runs, the automatic configurator starts, which is a handy way to set up the program with minimal effort. Of course, you can also configure or change everything from the Configure menu at any time.

All of the installation files can easily fit

on a CD or memory stick for on-the-fly installations on just about any computer. Once installed, the applications don't consume a lot of resources, and are easy to uninstall later without a trace.

When I set up the various displays and modes, I used the information on the FLDIGI "Configuration" page <<http://bit.ly/2hdhh7Z>> and everything is working just fine.

As for support for RTTY, the web is teeming with resources. I'd be very surprised if those websites I've mentioned above didn't have all the information you want, but a web search will bring up hundreds more.

So that's RTTY in a nutshell. Although

I touched upon a few important points with the installation and configuration, for two reasons, I'm not going to go in detail how to install, configure, and use the software. The first reason is that I'm simply out of space this month. The second reason is that the on-line resources are quite good. To find out how to get the FLDIGI software programs, install, configure, calibrate, use and troubleshoot them, check out the web pages mentioned in the article.

This month's column idea came from a reader just like you. Got an opinion on what you'd like to see here? Drop me a line.

– Until next time, 73 de Don, N2IRZ.

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and tough
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Beacons at 1 GHz and Above Help Stave off Reallocation

VHF Plus Calendar

Quadrantids meteor shower:	January 3 rd & 4 th
ARRL January VHF Contest:	January 20 th – 22 nd
DUBUS EME Contest 144MHz & 432MHz:	February 24 th & 25 th
DUBUS EME Contest 13cm:	March 24 th & 25 th
144 MHz Spring Sprint:	April 9 th 7-11 p.m. local
222 MHz Spring Sprint:	April 17 th 7-11 p.n. local
DUBUS EME Contest 1296 MHz:	April 21 st & 22 nd
Lyrids meteor shower:	Predicted peak April 22 nd & 23 rd
432 MHz: Spring Sprint:	April 25 th 7-11 p.m. local
Microwave Sprint – 902 MHz & Up:	May 5 th 8 a.m. to 2 p.m. local
50 MHz Sprint:	2300z May 12 th – 0300z May 13 th
Dayton (Xenia) Hamvention VHF/UHF/Microwave Forum:	May 19 th

Long time Midwestern VHFer Ron Stefanski, W9ZIH, has activated a 10-GHz beacon in EN51nv. It runs 250 milliwatts on 10,367.909 MHz and is located 70 feet above ground on a nearby silo. Signal reports are welcome.

Speaking of beacons, Tom Williams, WA1MBA, announced at Microwave Update 2017 that he intends to begin a 47-GHz beacon project.

Beacons provide a valuable service as band opening indicators as well as aids to receiver and antenna performance measurement. Additionally, beacons can serve as reference points for azimuth calibration for both home and portable stations.

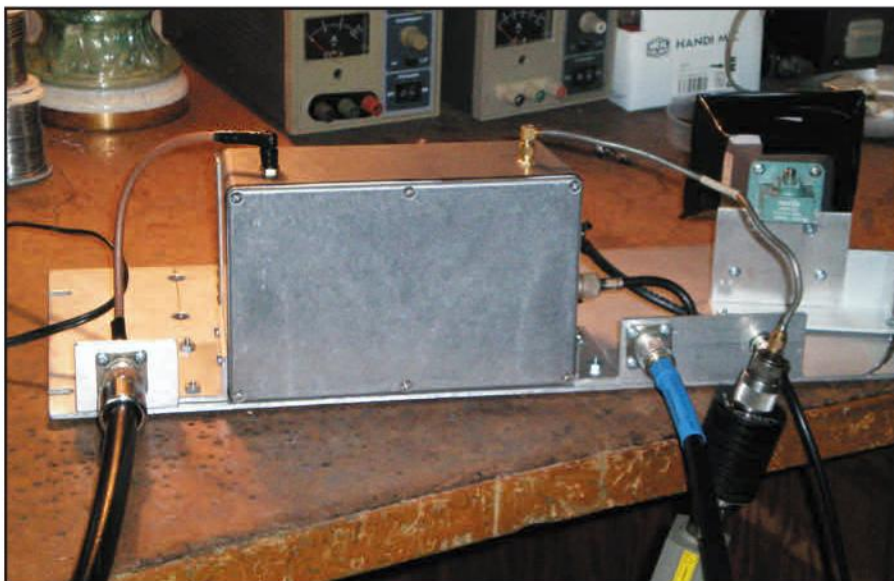
At first thought, the idea of a beacon transmitting callsign, location, or other information 24 hours a

day might seem to be of interest only to those amateurs who the beacon serves. However, an important and often overlooked benefit is that it demonstrates to other interests that the band is in use. It should be assumed that every amateur radio allocation, particularly those above 1 GHz, is under the watchful eyes of commercial interests looking for additional spectrum space and trying to make the case that the general population could be better served by reallocating spectrum space at the expense of amateurs.

On any given day, how many signals will the casual observer hear on 2 meters and above? When a spectrum survey is conducted, all signals are logged, including beacons. It is one thing for amateurs to claim the use of a particular band but the real evidence is the presence of amateur signals on the band — beacon or otherwise. It would benefit the entire VHF/UHF/microwave amateur community if bea-

c/o CQ magazine
email: <k8zr@cq-amateur-radio.com>

W9ZIH's 10-GHz beacon on bench during testing. It's important to use the allocations amateurs are granted or else we may lose them.





cons were established on as many bands above 1 GHz as possible in as many major metropolitan areas as p

Call for Papers

Summer 2018 may seem far off but it is not too early to be thinking about submitting a paper for the Central States VHF Society Conference to be held in Wichita, Kansas from July 26th through 29th. Just about any topic related to weak-signal activity on 50 MHz and above would be of interest. Most people don't think of themselves as authors but a very large portion of our amateur radio community has technical expertise and/or operating experience that is worth sharing. So put pen to paper or fingers to keyboard and get started. Submissions long and short are welcome. If you are interested, contact Donn Baker, WA2VOI, Program Chair at <wa2voi@minter.net> for submission guidance.

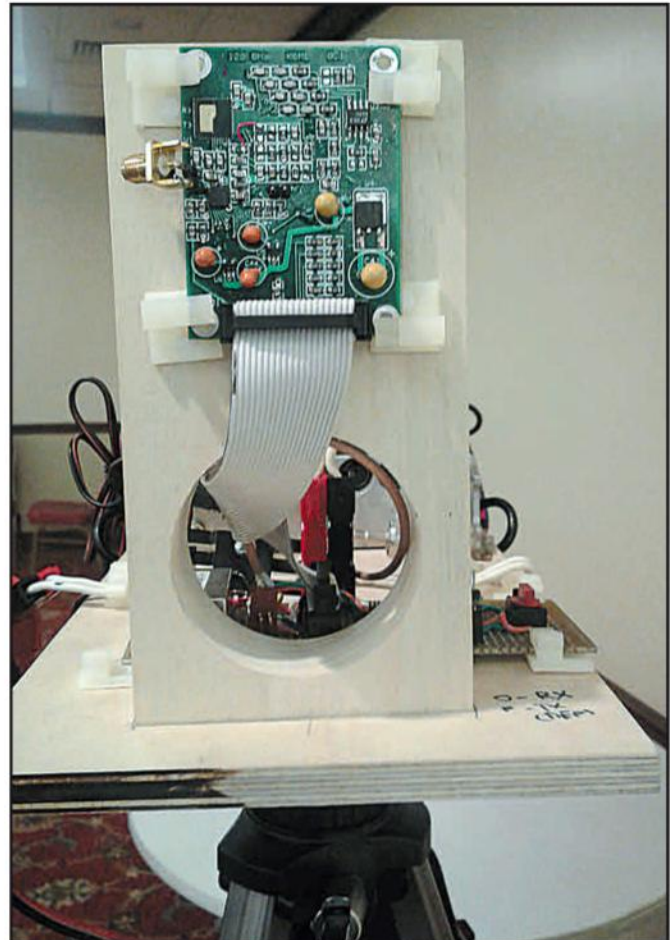
Successful VE Session in Kentucky

Recently, the Morehead Amateur Radio Society in Morehead, Kentucky conducted an amateur license testing session at the Morehead State University Space Science Center. Students in the Space Science and Engineering program are required to obtain Technician class licenses as part of the freshman course, "Introduction to Electronic Processes." The course is primarily a practicum to introduce lab work and problem-solving to the freshmen students. Under the guidance and tutelage of Jeff Kruth, WA3ZKR, and Bob Kroll, N3QED, 25 students passed the Technician

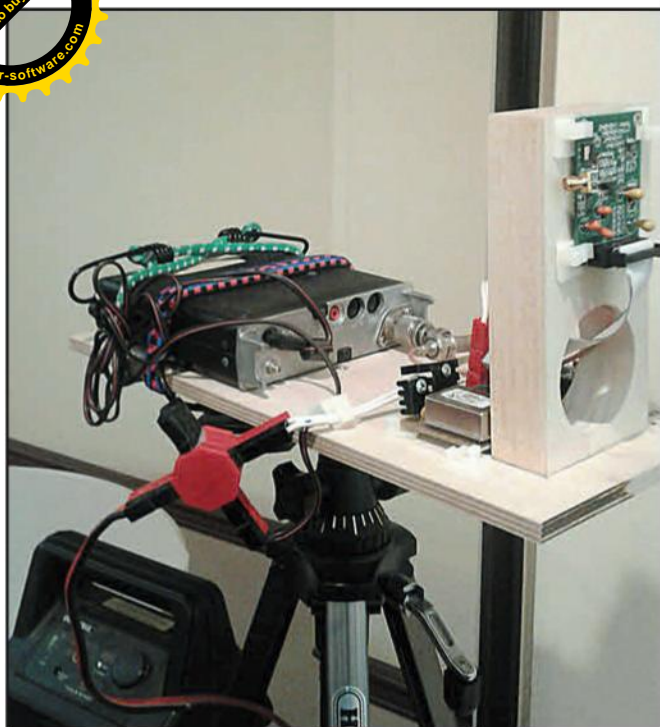
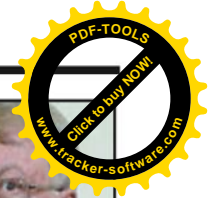


Hilliard Award during the Microwave Update 2017 was Sergei Zhutyaev, RW3BP, for his many contributions to VHF/UHF radio.

Sergei Zhutyaev, RW3BP, in November 2017.



Mike Lavelle's, K6ML, 122-GHz transceiver as seen on the business end.



A complete view of K6ML's 122-GHz transceiver.



K6ML standing next to his 122-GHz transceiver.

exam with one student earning a General class license during the testing session. Jeff reported that close to 50 new amateurs would be licensed by the end of the fall semester. Congratulations to all.

On the Bands

In November, two teams of mm-wave (millimeter wave) operators, one team located in Canada and the other in the U.S., set out to make a 100-kilometer QSO on 78 GHz. Since nothing is given or can be assumed at these frequencies, team Canada members René Barbeau, VE2UG, and Ray Perrin, VE3FN, located in FN35ja, worked team U.S.A. members Mike Seguin, N1JEZ, and Henry Ingwersen, KT1J, in FN34jx at a distance of 5 kilometers (~3 miles) as an equipment check. Contacts were easily made on SSB with huge signals at both ends but unfortunately KT1J suffered a local oscillator (LO) failure. Mike and Henry then moved to FN34It, where Mike easily worked René and Ray over the 27-kilometer (~17 mile) path. N1JEZ was 59 on SSB at VE2UG and 599 on CW to VE3FN. VE2UG was 59 on SSB and VE3FN was 339 on CW at N1JEZ's end. Mike noted that he was seeing some sort of wideband signal on the panadapter that was affecting his 432-MHz IF so his noise floor was at least 10 dB higher than usual. He speculated that the FAA radar site in nearby St Albans, Vermont was the cause. Breaking the 100-kilometer barrier will necessitate access to Whiteface Mountain in New York.

Atmospheric absorption at 78 GHz is very high, with water vapor content a significant factor. The dew point at the time of the QSOs was near -2°C ($\sim 28^{\circ}\text{F}$) which corresponds to an *additional* path loss of approximately $0.25\text{dB}/\text{km}^1$. Therefore long-distance attempts usually take place in "dry" areas such as the desert southwest. Attempts elsewhere, in New England for example, take place during periods of low humidity which generally occur during late fall and winter. One of the additional challenges that presents itself in regions such as New England during times when atmospheric losses are low is that access to mountaintops may be restricted due to

weather. And therein lies the rub: Conditions are favorable but access to the site is not possible due to snow.

The equipment used by N1JEZ consisted of a 1/3-meter (~10 inch) PROCOM dish with LX1DU feed, DL2AM mixer to a WA1MBA LNA/AMP and an FT-817 as the 432-MHz IF with panadapter. At VE2UG, the gear was a 30-centimeter (~12 inch) MTI 71- to 86-GHz dish, a homebrew mixer, Pcom 39-GHz multiplier with DB6NT synthesized MKU as the LO and FT-817 as the IF. Ray, VE3FN, used a 30-centimeter dish, an Axtal OCXO² at 101.25 MHz driving a PLL brick to 12,960 MHz to a sub-harmonic mixer based on a DB6NT board. The IF radio used was the venerable ICOM IC-402A 432-MHz portable transceiver.

The current North American 78-GHz DX record is held by AD6IW, operating from CN90fl, and KF6KVG and K6GZA, both at CM97av, operating on the same day over a 289-kilometer (~180 mile) LOS (line-of-sight) path in June 2014³. Mike, N1JEZ's, own best DX on the band is a 205-kilometer (~127 mile) LOS QSO while at FN44ig with WA1MBA in FN42bl in September 2014. Significant paths have been achieved on this band dating back to 1999 when W2SZ, FM07fm, worked WA4RTS, FM08ia at 60 kilometers (~37 miles) in May of that year.



...still higher in frequency Mike Lavelle, K6ML, presented an interesting paper at Microwave Update 2017 titled *A Simpler 122-GHz Transceiver*. Taking advantage of commercially available Doppler radar sensors used for liquid level monitoring, tool depth, and other range finding applications in the 122-GHz ISM band (shared with amateurs), Mike developed a simple transceiver based on the Silicon Radar TRX120 transceiver IC. At 122 GHz, the device runs 0.5-milliwatt (-3 dBm) output with a DSB NF of approximately 10 dB. To date, Mike's best DX has been 2 kilometers using the on-chip 10-dBi patch antennas at both ends of the path. His next challenge is figuring out a way to place the transceiver at the focus of a dish for more system gain which would result in greater DX. In case you are wondering, the current North American 122-GHz DX record is an amazing 114-kilometer (~70 mile) LOS contact by WA1ZMS/4 in EM96ur and W4WWQ/4 in FM07fm that took place in January 2005.

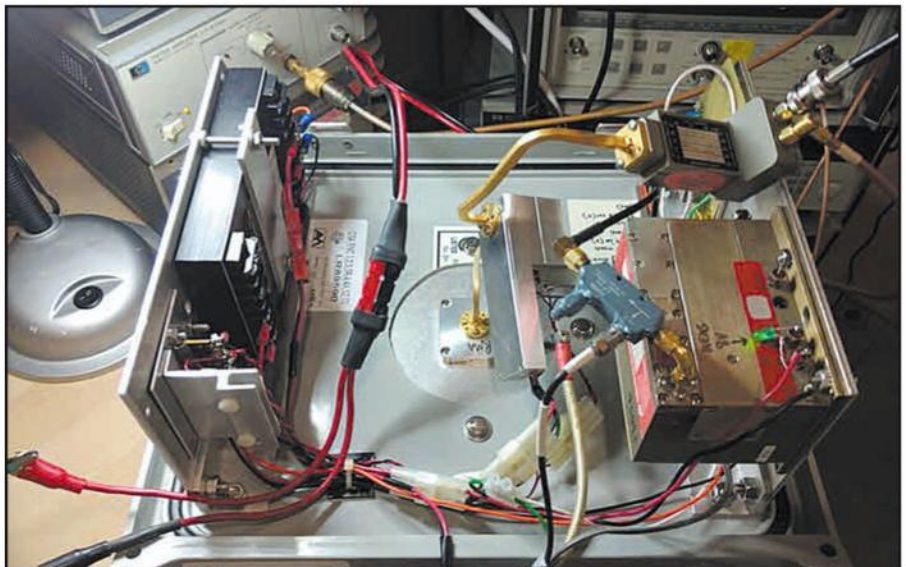
Speaking of Microwave Update 2017, the Don Hilliard Memorial Award was presented to Sergei Zhutyaev, RW3BP, for his many technical contributions to the amateur radio microwave community. First licensed in 1961 at the age of 16 as UA3ATG, he has been an innovator since the 1960s, starting with his all-transistor 2-meter and 70-centimeter receivers and, more recently, notable EME firsts on 10 GHz, 24 GHz, and 47 GHz. His most recent efforts have been directed at 77-GHz EME, recently designing a liquid nitrogen cooled LNA⁴ resulting in a noise figure improvement from 6.5 dB (in 2013) to an astonishing 0.85 dB today.

Usually we think of the RF challenges associated with the LNA when pushing limits of the design to achieve the best noise figure but mechanical design of Sergei's LNA was anything but trivial. In order to keep heat inflow to the LNA at a minimum, a vacuum enclosure was designed with two "radiation" windows to couple the 77-GHz energy in and out of the LNA. The LNA output uses a 77-GHz horn to horn transition with a 1-millimeter gap — no physical connection — to couple the received energy to the next stage in the receive chain. On transmit, the vacuum enclosure with the liquid nitrogen cooled LNA is slid out of the focus of the dish and the transmit feed is mounted in its place. A mechanical and RF marvel.

73 and wishing everyone good DX in 2018 on their favorite band, be it 50 MHz, 122 GHz or anywhere in between.
- Tony, K8ZR



During an attempt to record a 100-kilometer QSO between the U.S. and Canada, N1JEZ set up his 78-GHz station on the side of the road.



On the Canadian side, VE3FN's 78-GHz transverter sits on the bench for testing.

Notes:

1. See: <<http://bit.ly/2my6o60>>. The path loss is ONLY the part due to atmospheric attenuation/absorption. Based on Lieb formulations. Prepared by Brian Justin, WA1ZMS. Calculated for Sea Level (standard pressure). In comparison at 12°C (~55°F) the *additional* path losses due to water vapor doubles to 0.5dB/km.
2. Oven-controlled crystal oscillator.
3. ARRL Website. <<http://bit.ly/2AOFtVP>>
4. LNA: Low Noise Amplifier sometimes called preamplifier or preamp.



Monaco's and Hungary's Award Offerings



Monaco is one of the world's smallest countries and is renowned for being part of the French Riviera and for the casino at Monte Carlo. The Association des Radio-Amateurs de Monaco awards program consists of two colorful certificates, which have recently been revised and simplified. It's up to you now to find the somewhat rare stations from this tiny entity. Remember, for the first award, you can't use portable or DX operations, only resident stations.

All awards are free of charge, and are emailed to the address that you provide. All bands and modes are accepted; however the use of repeaters is prohibited. For any questions or to apply, contact the award manager: Jean-Claude Stravato, 3A2ND, 73, Bd du Jardin Exotique, MONACO 98000, Monaco. To apply for the award, you need to email a simple list of QSOs. You can also request endorsements for band and mode by email.

Email: jeanclaustravato@monaco.mc
Internet: <http://bit.ly/2j37fKH>

Principality of Monaco Award

This award is granted to amateurs who have worked or heard three 3A2 stations from Monaco since January 1, 1980. Other special event or older calls that are also valid for this award are: 3AØCW, 3A2ARM, 3A4ØARM, 3A25ØARM, 3A6ØARM, 3A7A, 3A8A, 3A9A, 3A7JO, 3A5ØR, 3A2CWG, 3A7G, 3A9ØIARU, and other members of the 3A-CW-Group or ARM.

Worked All Small European Countries

The award is also offered for working (or hearing) small European countries on or after January 1, 1980. There are two classes of the award: Class II requires contacts with just three countries plus Monaco for a total of four contacts. Class I requires all eight countries. The small European countries are C31, HBØ, LX, 9H, 1AØ, 3A, T7, and HV.

Internet: <http://bit.ly/2j37fKH>

Hungary's Awards Program

Here is a sampling of three very varied awards issued by the Hungarian Radio Amateur Society (MRASZ), which also lists about nine other awards. Hungarian amateur operators are well-represented on the air in many DX contests, and the average award hunter will likely have a great collection of cards from this small country. Many Hungarian awards come from smaller clubs, which MRASZ will promote on its website, so expect a different sponsor for each award.

*12 Wells Woods Rd.,
Columbia, CT 06237
E-Mail: k1bv12@charter.net

USA-CA Honor Roll

500

HB9DDO.....3729

The total number of counties for credit for the United States of America Counties Award is 3077. The basic award fee for subscribers is \$6.00. For nonsubscribers it is \$12.00. To qualify for the special subscriber rate, please send a recent CQ mailing label with your application. Initial application may be submitted by a PC-printed computer listing which is in alphabetical order by state and county within the state. To be eligible for the USA-CA Award, applicants must comply with the rules of the program as set forth in the revised USA-CA Rules and Program dated June 1, 2000. A complete copy of the rules may be obtained by sending an SASE to Ted Melinosky, K1BV, 12 Wells Woods Road, Columbia, CT 06237 USA. DX stations must include extra postage for airmail reply.

The first award listed is a little unusual, but offers the chance to tie in locations where a famed citizen traveled while engaged in exotic hunting.

Big Hunter Award

The Radioclub of Kaposvar issues this award, which commemorates the exploits of Szchenyi Zsigmond, a famous big-game hunter from Kaposvar. The applicant must submit proof of contacts made on or after April 24, 1967, the date of his death, with stations in the following countries where he hunted:

- | | |
|-------------------------|----------------|
| 1. 5H-Tanzania | 8. I-Italy |
| 2. 5X-Uganda | 9. KL-Alaska |
| 3. 5Z-Kenya | 10. ST-Sudan |
| 4. 9A-Croatia | 11. SU-Egypt, |
| 5. GM-Scotland | 12. VU-India |
| 6-7. HA3 + HA4-Hungary, | 13. YO-Romania |
| 2 QSOs | |

Class I = HA3 + HA4 plus 11 countries. (Total of 13 QSOs)

Class II = HA3 + HA4 plus 7 countries. (Total of 9 QSOs)



Monaco's amateur radio association recently re-designed its awards. This award is granted to amateurs who make contacts with stations located in Monaco.



Zsiche Zsigmond was a famous hunter from Hungary who traveled the world to hunt. Make contacts with countries that Zsigmond traveled to and earn this certificate. →



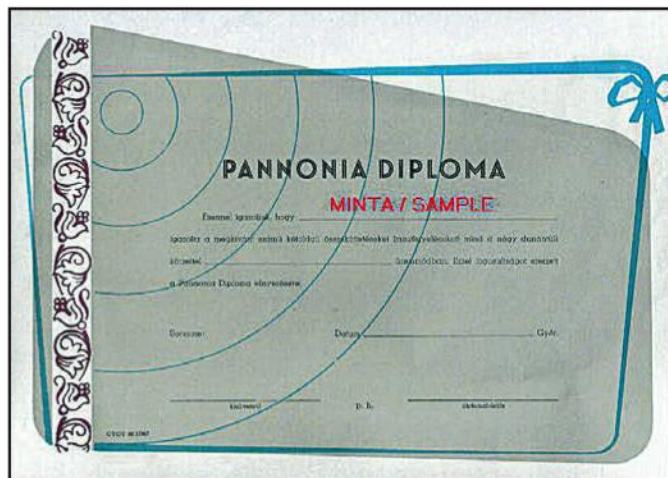
This award is granted to amateurs who make contacts with stations located in Budapest, Hungary's capital city.

Contacts may be on CW, SSB, or mixed modes. No WARC band contacts. Shortwave listeners are also OK. Send a GCR list and fee of 5 IRC or 5 € to the award manager: Borsfldi Ferenc HA3GE, H-7401 Kaposvár PF. 271, Hungary. Internet: <<http://bit.ly/2j3duhJ>>

New Budapest Award

This award is issued by the Radioamateur Society of Budapest (MRASZ BSZ) for contacting stations residing and operating in Budapest on or after January 1, 1990. Shortwave listeners are OK. In order to be eligible for the award, Hungarian stations need to contact 75 different HA5 stations. Stations located in other EU countries need 50 HA5 stations. DX stations need 25. Stations only count as one, no duplicates. Contacts may include all bands and modes, except there is no use of repeaters. GCR list and fee of 6 IRCs to: Attila Komantinger HA5JP, MRASZ Budapesti Szovetsege, PO Box 603, H-1374 Budapest, Hungary.

Email: ha5jp@mraszbsz.hu
 Internet: <<http://bit.ly/2hgrjce> or <http://bit.ly/2AbZUfi>>



Pannonia was once a Roman province and encompasses land in three different countries. Make contacts with stations located in the Pannonia region and receive this award in your inbox.

Pannonia Award

The name Pannonian comes from Pannonia, a province of the Roman Empire. Pannonia is an ancient land that encompasses parts of present-day eastern Hungary, western Romania, and northern Serbia. It has seen many conquerors and boundary shifts throughout the ages. This award is issued by the Mttosz Club of Gyor and counts contacts made on or after January 1, 1966.

Hungarian stations need a total of 12 contacts, 3 from each of the HA/HG1, 2, 3, and 4 call areas, using at least two bands. DX stations need a total of eight contacts, 2 from each of the above four call areas, using at least two bands. To apply, send a GCR list and fee of HUF800, \$5 U.S., or 10 IRCs to: MTOSZ Radioclub Gyor, H-9027 Gyor, Nagysandor J. u. 27, Hungary.

Email: mttoszr@eninternet.hu
 Internet: <<http://bit.ly/2j6jaaR>>

We're always interested in the discovery of new awards, whether it is offered by your club or by those you've run across while exploring the internet. Send me the URL and I'll take it from there.



BY BOB SCHENCK, N200

Bouvet 3YØZ

Very soon, we will be hearing excitement on the bands when 3YØZ starts transmitting from the most remote place on earth, Bouvet Island. Bouvet lies at 54°25' South latitude and 3°22' East longitude (*Photo A*). It's the product of a volcanic eruption that last occurred in 4,000 B.C. Bouvet is 97% ice-covered, and with surrounding rocks and small islands, has an area of 19 square miles, with 18.4 miles of coastline (*Photo B*). Its location, ice, rock cliffs, high seas, harsh climate, and surrounding pack ice and icebergs isolate it from human presence (*Photo C*).

Jean-Baptiste Charles Bouvet de Lozier first saw the island in 1739 (thus its name). The island was not seen again until 1808, when there was a disputed landing by Benjamin Morrell. The first documented landing was by the Norvegia expedition in 1927, which named the island Bouvetoya, and claimed it for Norway. Sometime between 1955 and 1958, a landslide occurred, creating a rock-strewn, ice-free area on the northwest coast. The area was named Nyroyssa, and subsequently became a Norwegian scientific and research site, which was decimated by an earthquake in 2006. A new research facility was erected in 2014. Bouvet became a nature reserve in 1971. Several weather stations have been placed on the island, and a number of Norwegian expeditions have visited in the last 50 years. The island has hosted several previous DXpeditions, including:

- LH4C by W4BPD in 1962 — No documented landing
- 3Y3CC and 3Y1VC by LA3CC and LA1VC in 1977

*Email: <n200@comcast.net>



- 3Y5DQ and 3Y1VC 1978-79 by LA5DQ and LA1VC
- 3Y5X by LA2GV, LA1EE, JF1IST, F2CW, and HB9AHL in 1989
- 3Y2GV by LA2GV in 1997
- 3YØC by N4BQW in 2000
- 3YØE by ZS6GCM in 2008

Bouvet is currently number two on the DXCC most-wanted list.

Needless to say, planning a trip — and then GOING — to a place that is so remote, and in a part of our world that is home to such inhospitable weather, is beyond most of our wildest imaginations. But the team that is heading there this month is very familiar with mounting DXpeditions to such remote places. Team members have gone to some very cold places in the Antarctic regions, such as South Sandwich (VP8SSI and VP8THU), Peter I (3YØPI and 3YØX), Heard Island (VKØIR), South Georgia (VP8GEO), South Orkney (VP8ORK), and Amsterdam (FT5ZM). They have also gone to some pretty “warm” places as well, such as Malpelo (HKØNA), Desecheo (K5D), Navassa (K1N), Swains (NH8S), and Wake (K9W), just to name a few.

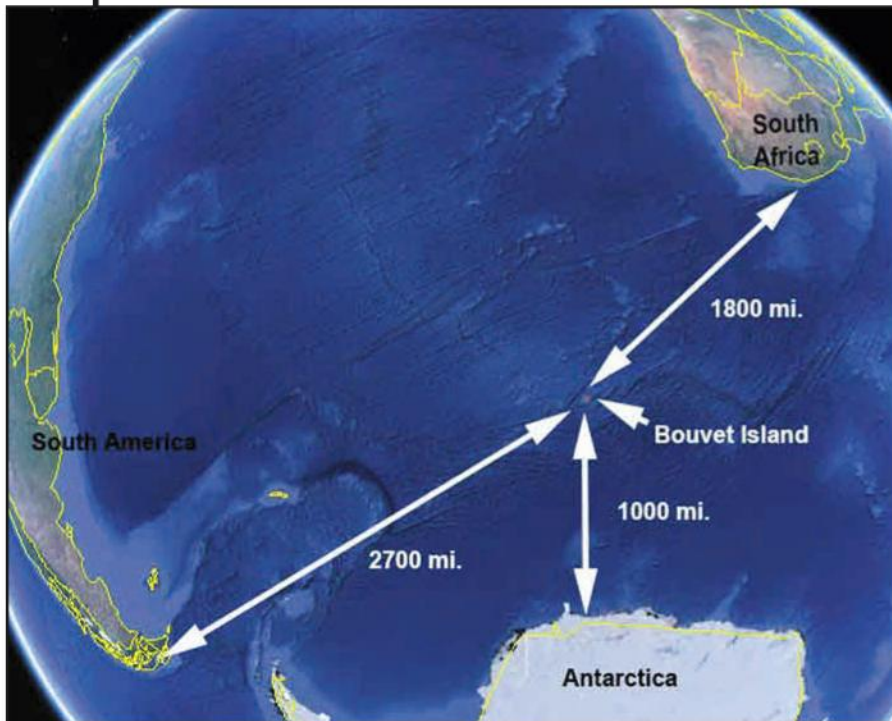


Photo A. Miles from nowhere ... this Google Earth view of Bouvet Island makes it clear just how far this little speck of land is from virtually everything else on Earth! (Map and photos courtesy 3YØZ website, <www.bouvetdx.org>)



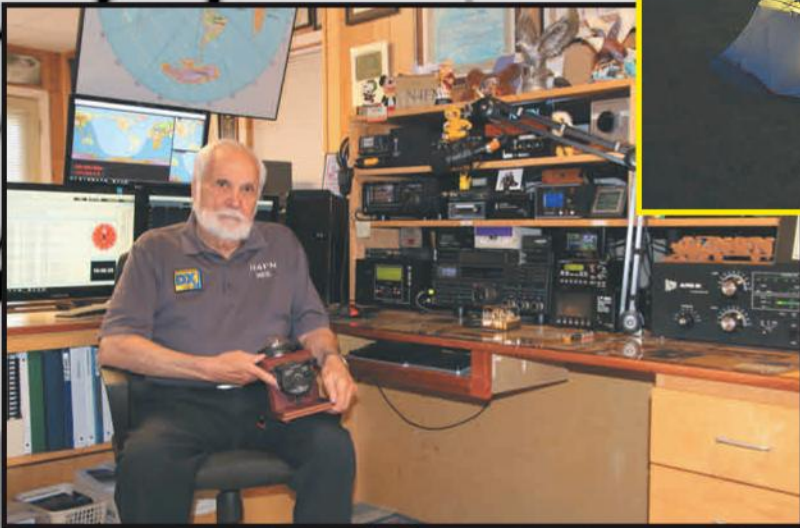
2018-19 calendar

Fifteen spectacular color images of some of the biggest, most photogenic shacks and antennas from across the country and...also this year... a number of favorite shots from CQ magazine thrown in for good measure!

Calendars include dates of important Ham Radio events, major contests and other operating events, meteor showers, phases of the moon, and other astronomical information, plus important and popular holidays. CQ's 15-month calendar (January 2018 through March 2019) is truly a must have!



*15 months of value
January 2018
through March 2019*



\$12.95
plus shipping

Shipping charges: USA \$3; Canada/Mexico \$5; All other countries \$10.



CQ Communications, Inc.



25 Newbridge Road, Hicksville, NY 11801 • <http://store.cq-amateur-radio.com>



But this one is "off the charts," so to speak. Logistically, Bouvet is just hard to get to. Financially, it is incredibly expensive "do it right" in order to make it available to the largest number of DXers worldwide, and to do it safely. Yes, this will be a mammoth effort by 20 DXpeditioners utilizing helicopters plus the Chilean ship's crew in order to mount this three-week-long effort to put Bouvet into as many logs as possible around the world. Please consider a contribution. If you have already contributed, the team thanks you. Even if you have already contributed, please consider adding something extra with your QSL request. Remember, this is an almost million-dollar adventure. Many hands make light work ... and many dollar bills make DXpeditions like this happen. This one is most deserving of our support.

I invite you all to keep watch on the team website,



Photo B. An aerial view of Bouvet shows just how much of the island is covered with ice ... it's officially 97% but we're having trouble seeing where that other 3% might be. →



Photo C. This sea-level photo by Dolph Kessler shows a little bit of land that's clear of ice ... but a lot of that is vertical — sheer cliffs! Good luck to the 3YØZ crew in its travel, landing, setup, operation and teardown.

CQ DX Field Award Honor Roll

The CQ DX Field Award Honor Roll recognizes those DXers who have submitted proof of confirmation with 175 or more grid fields. Honor Roll listing is automatic upon approval of an application for 175 or more grid fields. To remain on the CQ DX Field Award Honor Roll, annual updates are required. Updates must be accompanied by an SASE if confirmation is desired. The fee for endorsement stickers is \$1.00 each plus SASE. Please make all checks payable to the Award Manager, Keith Gilbertson. Mail all updates to Keith Gilbertson, KØKG, 21688 Sandy Beach Lane, Rochert, MN 56578-9604.

Mixed

K2TQC.....287	N8PR.....226	N4MM.....205	BA4DW.....188
W1CU.....258	VE3ZZ.....223	OK1AOV.....205	HB9DDZ.....188
HAØDU.....253	K8OOK.....222	VE7SMP.....204	K1NU.....187
VE7IG.....252	KØDEQ.....221	RW4NH.....203	K2AU.....186
IK1GPG.....245	HA1AG.....218	K9YC.....203	K8YTO.....186
HA1RW.....239	W18A.....218	IV3GOW.....201	W3LL.....185
VE3XN.....239	HA9PP.....213	N5KE.....200	K2SHZ.....182
W6OAT.....237	JN3SAC.....211	ON4CAS.....194	KJ6P.....180
K8SIX.....236	WA5VGI.....209	OM2VL.....192	W5ODD.....177
OM3JW.....235	W4UM.....209	N4NX.....192	NØFW.....176
NI6T.....230	HA5WA.....206	NIØC.....191	WA9PIE.....176
HA5AGS.....228	F6HMJ.....206	W3LL.....191	HB9BOS.....175
9A5CY.....227	KF8UN.....205	HA1ZH.....190	

SSB

W1CU.....236	KØDEQ.....198	N4MM.....187	NØFW.....176
W4ABW.....202	W4UM.....194	WA5VGI.....185	DL3DXX.....175
VE7SMP.....201	JN3SAC.....188	W3LL.....182	

CW

W1CU.....243	JN3SAC.....208	WA5VGI.....192	N4MM.....181
DL6KVA.....233	DL3DXX.....203	NIØC.....189	N4NX.....177
KØDEQ.....214	W4UM.....199	HB9DZZ.....186	N7WO.....175
DL2DXA.....209	OK1AOV.....196	OK2PO.....184	

Digital

W1CU.....190

CQ DX Awards Program

New Award SSB

KE2Q2650

Endorsement RTTY

N4MM290

The basic award fee for subscribers to CQ is \$6. For non-subscribers, it is \$12. In order to qualify for the reduced subscriber rate, please enclose your latest CQ mailing label with your application. Endorsement stickers are \$1.00 each plus SASE. Updates not involving the issuance of a sticker are free. All updates and correspondence must include an SASE. Rules and application forms for the CQ DX Awards may be found on the <www.cq-amateur-radio.com> website, or may be obtained by sending a business-size, self-addressed, stamped envelope to CQ DX Awards Manager, Please make checks payable to the Award Manager, Keith Gilbertson. Mail all updates to Keith Gilbertson, KØKG, 21688 Sandy Beach Lane, Rochert, MN 56578-9604 USA. We recognize 341 active countries. Please make all checks payable to the award manager. Photocopies of documentation issued by recognized national Amateur Radio associations that sponsor international awards may be acceptable for CQ DX award credit in lieu of having QSL cards checked. Documentation must list (itemize) countries that have been credited to an applicant. Screen printouts from eQSL.cc that list countries confirmed through their system are also acceptable. Screen printouts listing countries credited to an applicant through an electronic logging system offered by a national Amateur Radio organization also may be acceptable. Contact the CQ DX Award Manager for specific details.



www.cq-amateur-radio.org, for full details on this Expedition. You will also find appropriate links to their pilots in case you need any assistance. And of course, there will be links to the Log Search. I offer my sincere traveling mercies to this fine team of DX-peditioners. Be safe.

The CQ DX Field Award Program

Endorsements – CW

NIØC189

Endorsements – Mixed

NIØC191

The basic award fee for subscribers to CQ is \$6. For non-subscribers, it is \$12. In order to qualify for the reduced subscriber rate, please enclose your latest CQ mailing label with your application. Endorsement stickers are \$1.00 each plus SASE. Updates not involving the issuance of a sticker are free. All updates and correspondence must include an SASE. Rules and application forms for the CQ DX Awards may be found on the <www.cq-amateur-radio.com> website, or may be obtained by sending a business-size, self-addressed, stamped envelope to CQ DX Awards Manager, Keith Gilbertson, KØKG, 21688 Sandy Beach Lane, Rochert, MN 56578-9604 USA. Please make all checks payable to the award manager.

The WAZ Program

ALL BAND WAZ

EME

18 PA1GYS, 40 Zones 20 I2RV, 40 Zones
19 IK1UWL, 40 Zones 21 I1ANP, 40 Zones

EME Updates

12 JHØBBE, 32 Zones 10 UT6UG, 40 Zones

Mixed

9397 IZ7AUH 9398 SP5NZZ

SINGLE BAND WAZ

6 Meter Updates

90 JHØBBE, 39 Zones

160 Meter Updates

VØ1HP349, 33 Zones R7FK361, 40 Zones

Rules and applications for the WAZ program may be obtained by sending a large SAE with two units of postage or an address label and \$1.00 to: WAZ Award Manager, John Bergman, KC5LK, 125 Deer Trail, Brandon, MS 39042-9409. The processing fee for all CQ awards is \$6.00 for subscribers (please include your most recent CQ mailing label or a copy) and \$12.00 for nonsubscribers. Please make all checks payable to John Bergman. Applicants sending QSL cards to a CQ checkpoint or the Award Manager must include return postage. KC5LK may also be reached via e-mail: <kc5lk@cq-amateur-radio.com>.

5 Band WAZ

As of November 15, 2017

1962 stations have attained at least the 150 Zone level and 967 stations have attained the 200 Zone level

As of November 15, 2017

The top contenders for 5 Band WAZ (Zones needed on 80 or other if indicated):

CHANGES shown in BOLD

Callsign	Zones	Zones Needed	Callsign	Zones	Zones Needed
DK8MCT	199	1	W6DN	199	17
EA7GF	199	1	W9XY	199	22
H44MS	199	34	9A5I	198	1, 16
HA5AGS	199	1	AK8A	198	17, 22
I5REA	199	31	DK2LO	198	2, 19
IKØFVC	199	1	DM5EE	198	1, 31
IK1AOD	199	1	EA5BCX	198	27, 39
IK8BQE	199	31	F5NBU	198	19, 31
IZ3ZNR	199	1	G3KDG	198	1, 12
JA1CMD	199	2	G3KMQ	198	1, 27
JA5IU	199	2	JA1DM	198	2, 40
JA7XBG	199	2	JA3GN	198	2 on 80 & 40
JH7CFX	199	2	K2EP	198	23, 24
JK1BSM	199	2	K2TK	198	23, 24
K1LI	199	24	K3JGJ	198	24, 26
K4XP	199	23	K4HB	198	24, 26
K7UR	199	34	K4JLD	198	18, 24
K9KU	199	22 on 15	K5FUV	198	18, 23
KZ4V	199	26	K6FG	198	17, 18
N3UN	199	18	KØEO	198	22, 23
N4NX	199	26	KZ2I	198	24, 26
N4WW	199	26	N2QT	198	23, 24
N4XR	199	27	N4GG	198	18, 24
N8AA	199	23	OK1DWC	198	6, 31
RA6AX	199	6 on 10M	UA4LY	198	6 & 2 on 10
RU3DX	199	6	US7MM	198	2, 6
RWØLT	199	2 on 40M	W4UM	198	18, 23
RX4HZ	199	13	W5CQW	198	17, 18
RZ3EC	199	1 on 40M	W6OUL	198	37, 40
S58Q	199	31	W9RN	198	26, 19 on 40
SM7BIP	199	31	WA2BCK	198	23, 24
VE2TZ	199	23	WC5N	198	22, 26
VO1FB	199	19	WL7E	198	34, 37
W1FJ	199	24	WO7R	198	21, 22
W1FZ	199	26	ZL2AL	198	36, 37
W2LK	199	23			
W3NO	199	26			
W4DC	199	24			
W4LI	199	26			

The following have qualified for the basic 5 Band WAZ Award:

5BWAZ #	Callsign	Date	# Zones
1962	IKØXB	2017-11-08	179

Updates to the 5 Band WAZ list of stations:

5BWAZ #	Callsign	# Zones
1242	KY6AA	161

New recipients of 5 Band WAZ with all 200 Zones confirmed:

5BWAZ #	Callsign	Date	All 200 #
none			

*Please note: Cost of the 5 Band WAZ Plaque is \$100 shipped within the U.S.; \$120 all foreign (sent airmail).

Rules and applications for the WAZ program may be obtained by sending a large SAE with two units of postage or an address label and \$1.00 to: WAZ Award Manager, John Bergman, KC5LK, 125 Deer Trail, Brandon, MS 39042-9409. The processing fee for the 5BWAZ award is \$10.00 for subscribers (please include your most recent CQ mailing label or a copy) and \$15.00 for nonsubscribers. An endorsement fee of \$2.00 for subscribers and \$5.00 for nonsubscribers is charged for each additional 10 zones confirmed. Please make all checks payable to John Bergman. Applicants sending QSL cards to a CQ checkpoint or the Award Manager must include return postage. KC5LK may also be reached via e-mail: <kc5lk@cq-amateur-radio.com>.

The WPX Program

CW

3832 LB9LG 3835 SP5AMN
3833 IK7FMQ 3836 9A3CW
3834 XE2V 3837 ØK1NF

SSB

4073 DF8AB 4079 ACØDQ
4074 W8MGM 4080 IZØOTV
4075 AB9LF 4081 IW3QRM
4076 LW5DPG 4082 N1HO
4077 KC3HJP 4083 W2MJP
4078 AD7MM

Mixed

3479 AB9LF 3491 PT8DX
3480 LW5DPG 3492 N3VJ
3481 N5PD 3493 IW3QRM
3482 AG1A 3494 OM2AGN
3483 DL4DZL 3495 KE4PLT
3484 VA2CZ 3496 BG2QMO
3485 IKØWMJ 3497 GW6VEI
3486 ADØWVG 3498 AB1NS
3487 W2HTS 3499 KG4ØLG
3488 JA4SSM 3500 VK2AKB
3489 KC3HJP 3501 W5QQ
3490 ACØDQ 3502 DO3GE

Digital

677 N5PD 686 N4LKB
678 AG1A 687 IW2FLB
679 WU6G 688 IW3QRM
680 IKØWMJ 689 KN4BBC
681 JK1XUI 690 BG2QMO
682 ADØWVG 691 KG4ØLG
683 W2HTS 692 VK2AKB
684 3D2TS 693 VK2EHQ
685 PT8DX

CW: 350: XE2V, SP5AMN, 9A9CW. 400: AC8AZ. 450: ØK1NF. 600: NE1RD, IK7FMQ. 800: JR3UIC. 1200: KN1CBR. 4000: IZ3ETU.

SSB: 350: W8MGM, TF5B. 400: W6WF, KC3HJP, IW3QRM, AC8AZ, KE4PLT, W2MJP. 450: LW5DPG, KQ4BR, IZØOTV. 600: AB9LF. 700: PA1P. 800: KØ9V, W6HY. 850: SV1XV. 900: KØ9V. 950: ACØDQ, YØ3HOT. 1250: NE1RD. 2300: ØA9PP. 2650: PT7ZT. 2800: W6AFA.

Mixed: 400: CT7ANG. 450: LW5DPG, WU6G, KQ6BR, BG2QMO,

N1HO, AB1NS, KG4ØLG, VK2AKB. 500: 4F3BZ, VA2CZ, KE4PLT. 600: AB9LF, NØRQV, W6WF, N4YCI, PT8DX. 650: W2HTS. 700: PA1P, IW2FLB, EA5MB, JA3MAT. 750: JA4SSM, AC8AZ. 850: CT7ANG, K4ØY. 1000: DL4DZL, ACØDQ, IW3QRM, YØ3HOT. 1100: OM2AGN. 1200: W8RLS, K2QQ. 1250: N6PM. 1450: NE1RD. 1500: JR3UIC. 1550: SV1XV, KØ9V. 1650: TF5B. 1700: N7ZO. 3800: HA9PP.

Digital: 350: 4F3BZ, IKØWMJ, ADØWVG, N4LKB, BG2QMO, KG4ØLG. 400: NH6T/W4, WA9ØNY, IW2FLB, VK2AKB. 450: W8RLS, WA9ØNY. 500: K4ØY. 550: CT7ANG. 600: NØRQV, W2HTS, 3D2TS, PT8DX. 650: IW3QRM, JA3MAT. 900: KC1UX. 950: KØ9V, N7ZO. 1000: N6PM, K2QQ. 1050: JR3UIC. 1650: TF5B.

160 Meters: AG1A, W8RLS, W2HTS, K4ØY
80 Meters: NØRQV, W8RLS, W2HTS, K4ØY, DO3GE
40 Meters: N6PM, W8RLS, W2HTS, PA1P, 3D2TS, K4ØY, KE4PLT
30 Meters: NØRQV, W8RLS, 3D2TS, K4ØY
20 Meters: N6PM, NØRQV, W6WF, W8RLS, PA1P, KQ4BR, IW3QRM, OM2AGN, HA9PP, W6HY, BG2QMO
17 Meters: W8RLS
15 Meters: N6PM, W8RLS, PT8DX, OM2AGN, W6HY
12 Meters: OM7CA, W8RLS
10 Meters: LW5DPG, W8RLS, W6HY

Africa: W8RLS, OM2AGN, YØ3HOT, JR3UIC
Asia: CT7ANG, N6PM, W8RLS, 3D2TS, IW3QRM, OM2AGN, EA5MB, W6HY, BG2QMO, VK2AKB

Europe: LB9LG, CT7ANG, N6PM, AB9LF, LW5DPG, SP5AMN, N4JJS, W8RLS, W2HTS, PA1P, PT8DX, IW3QRM, OM2AGN, HA9PP, BG2QMO, W2MJP, GW6VEI, AB1NS, 9A9CW, VK2AKB, DO3GE

Oceania: N6PM, W8RLS, OM2AGN, BG2QMO
North America: W8MGM, KB7JG, CT7ANG, N6PM, LW5DPG, XE2V, N5PD, AG1A, WU6G, W8RLS, ADØWVG, W2HTS, KC3HJP, HA9PP, 3D2TS, PT8DX, N4LKB, IW3QRM, OM2AGN, KN4BBC, KE4PLT, AB1NS, KG4ØLG

South America: N6PM, W8RLS, W6HY

Award of Excellence with 160 Bar: W8RLS

30M Bar: W8RLS, NH6T/W4

17M Bar: W8RLS, NH6T/W4

12M Bar: OM7CA, W8RLS

Digital Bar: W8RLS

Complete rules and application forms may be obtained by sending a business-size, self-addressed, stamped envelope (foreign stations send extra postage for airmail) to "CQ WPX Awards," P.O. Box 355, New Carlisle, OH 45344 USA. Note: WPX will now accept prefixes/calls which have been confirmed by eQSL.cc. and the ARRL Logbook of The World (LoTW)

*Please Note: The price of the 160, 30, 17, 12, 6, and Digital bars for The Award of Excellence are \$6.50 each.



The following is from the 3YØZ DXpedition team leader, Ralph Redor, KØIR:

...write this at a time in our DXpedition planning when our sleep is suddenly interrupted when a new "What if..." flashes into our consciousness, and sends a chill down our spine. What if our sea container, with all our equipment, is lost? What if we have a death or major injury on this trip? What if we have a major solar flare? What if our generators begin to fail? A new one of these demons comes to call almost every

...night. If the visit presents us with a situation we cannot fix it, we reason how we will adapt. ...this chill, we are feeling warmth from the tremendous support of the amateur radio community. Individuals, clubs, foundations, and commercial sponsors have stepped forward like never before. Their overwhelming support has enabled us, and charged us, to make this DXpedition to Bouvet a solely amateur radio project, with no interfering enterprise to exploit the time we owe you. You have told us what you expect. We have listened. We will do our best, nothing less.

The WPX Honor Roll

The WPX Honor Roll is based on the current confirmed prefixes which are submitted by separate application in strict conformance with the CQ Master Prefix list. Scores are based on the current prefix total, regardless of an operator's all-time count. Honor Roll must be updated annually by addition to, or confirmation of, present total. If no up-date, files will be made inactive.

MIXED

8604.....9A2AA	4303.....IK2ILH	3099.....N6FX	2003.....W7CB	1500.....N6PEQ	1276.....XQ7UP	1016.....W9QL	741.....K6KZM	653.....KK3Q
7454.....K2VV	4298.....VE3XN	3073.....IK2DZN	2003.....VE6BMX	1497.....JR3UIX	1272.....KA5EYH	1012.....NØVVV	736.....JA3MAT	650.....N3YZ
7173.....W1CU	4290.....I2PJA	3007.....W2WC	1995.....HK3W	1487.....N7QU	1269.....K5WAF	1010.....VE3RZ	726.....K5IC	649.....RA900
6814.....9A2NA	4236.....WB2YQH	2866.....AG4W	1906.....HA8QC	1484.....FG4NO	1259.....I2ØFUW	1007.....AA4QE	725.....WK3N	647.....NY4G
6371.....EA2IA	4201.....YO9HP	2678.....NXØI	1828.....K7LV	1480.....K4JKB	1265.....N6PM	1003.....PT2AP	723.....KØDAN	647.....PAØQRB
5975.....KF2O	4129.....S58MU	2673.....N3RC	1821.....PY5FB	1462.....DL4CW	1246.....W9RPM	1002.....IK8YFU	716.....NA1DX	644.....KWØH
5440.....N4NO	4114.....W900	2634.....VE6BF	1803.....NKØS	1447.....K3XA	1219.....K6HRT	976.....KM6HB	712.....ISØEBO	636.....ZS2DL
5404.....ISØFD	3863.....N1RR	2575.....W60UL	1747.....K6UXO	1446.....DF3JO	1217.....AB1QB	964.....K8ZEE	711.....AG1T	634UA3LMR/QRP
5366.....W9OP	3855.....KC9ARR	2562.....DG7RO	1711.....NS3L	1422.....I2VGVW	1201.....IT9ABN	924.....IW9HIH	710.....WS5J	629.....WB4SON
5320.....VE1YX	3827.....JN3SAC	2550.....K6ND	1700.....N7ZO	1408.....NH6T	1167.....WA9PIE	919.....KC1UX	707.....W1/E740F	620.....PI4DHFV
5296.....S53EO	3821.....N6QQ	2476.....K5UR	1667.....SØ7B	1394.....K4CN	1137.....YØ5BRZ	912.....SP8HKT	706.....OE8TLK	616.....DL5JH
5134.....ON4CAS	3809.....SM6DHU	2423.....AK7O	1667.....AD3Y	1383.....IWØHOU	1136.....KØ9V	908.....K4JC	700.....N4FNB	615.....AC6BW
5098.....YU1AB	3741.....K9UQN	2355.....AB1OC	1666.....K3CWF	1368.....LU5OM	1116.....YU7FW	889.....WU1U	696.....KG4JSZ	616.....KØBAM
5039.....KØDEQ	3720.....W3LL	2274.....AE5B	1650.....K4HB	1366.....AC7JM	1107.....PY2MC	867.....G3YFE	694.....KG4HUF	606.....JP1KHY
4889.....I2MQP	3611.....W200	2210.....NE6I	1647.....9A2GA	1361.....VA3VF	1100.....WA3GOS	836.....N6MM	682.....N8HM	605.....IW2FLB
4778.....YU7BCD	3538.....9A4W	2133.....KØKG	1643.....SV1DPI	1329.....DK8MCT	1075.....N6OU	825.....KØ4W	682.....A18P	604.....WH7DX
4768.....N8BJQ	3432.....W9IL	2111.....PA2TMS	1626.....N5KAE	1322.....AA4FU	1074.....WU9D	815.....KL7FAP	680.....JA6JYM	604.....K4ZGV
4728.....WA5VGI	3427.....AB1J	2109.....W2FKF	1617.....YB1AR	1314.....KØKL	1069.....IZ4MJP	808.....W6PN	670.....WW3QB	602.....K4MLD
4681.....JH8BOE	3425.....N3XX	2101.....K11U	1616.....TA1L	1301.....KB9OWD	1066.....JA1CKE	761.....F1MQJ	662.....KJ4BIX	601.....K9OHI
4583.....N6JV	3395.....WD9DZV	2097.....W6XK	1570.....PY5VC	1301.....K1DX	1066.....9A3ST	759.....W1FNB	662.....JA7ØXR	601.....W8LMG
4561.....NN1N	3265.....ØZ1ACB	2016.....N2WK	1568.....N3AIU	1295.....NIØC	1046.....YB1TJ	757.....WB3D	661.....W4KK	600.....WA3QWA
4462.....K1BV	3250.....4L1MA	2005.....V51YJ	1559.....NH6T/W4	1280.....WF1H	1032.....DG5LAC	751.....YB2TJV	656.....N4JJS	

SSB

6276.....ØZ5EV	3249.....W3LL	2623.....W200	2098.....K5UR	1646.....VE7SMP	1258.....N1KC	1042.....IZØBNR	854.....K6HRT	694.....KG4HUF
5679.....K2VV	3172.....YO9HP	2595.....EA1JG	2094.....I8LEL	1641.....AE9DX	1230.....N5KAE	1032.....DG5LAC	846.....W6XK	690.....W6PN
5499.....9A2NA	3108.....I4CSP	2568.....SM6DHU	2093.....W2WC	1623.....VE9FX	1222.....YF1AR	1031.....K4CN	833.....DK8MCT	684.....KØ9V
5297.....IØZV	3090.....WA5VGI	2508.....W9IL	2076.....K2XF	1622.....K5CX	1187.....IZ1JLG	1031.....IK8ØZP	802.....N6OU	681.....N6MM
5198.....VE1YX	3084.....W900	2497.....S58MU	2050.....AE5B	1611.....W2ME	1171.....HK3W	1022.....NW3H	801.....K3XA	675.....F1MQJ
4771.....KF2O	2986.....I3ZSX	2451.....EA3GHZ	2002.....AB1OC	1587.....N3XX	1150.....VE6BMX	1012.....KØ4BP	766.....I2VGVW	655.....VA3VF
4700.....EA2IA	2985.....KF7RU	2362.....AG4W	1984.....N3RC	1550.....IK2RPE	1148.....K11U	1004.....K4HB	763.....K4JKW	640.....UA9YF
4513.....I2MQP	2984.....K17AO	2335.....KG1E	1973.....NXØI	1463.....I2EAY	1146.....SQ7B	1004.....WA5UA	758.....IV3GOW	637.....K5WAF
4208.....I2PJA	2975.....DL8AAV	2326.....CX6BZ	1955.....EA3NP	1434.....DG7RO	1112.....NH6T	978.....EA7HY	724.....WF1H	630.....W6US
3704.....KØDEQ	2939.....N8BJQ	2209.....IK2QPR	1935.....SV1EOS	1410.....S55SL	1099.....N6PEQ	957.....W9QL	724.....W3TZ	625.....4L1MA
3690.....N4NO	2936.....N6QQ	2201.....NQ3A	1879.....K3IXD	1386.....IK4HPU	1098.....K4CN	931.....YB1AR	717.....KØDAN	624.....K6KZM
3555.....SV3AQR	2903.....IN3QCI	2200.....N6FX	1848.....AB5C	1375.....NKØS	1096.....JA7HYS	929.....NS3L	717.....N3JUN	606.....KJ4BIX
3433.....NN1N	2857.....4X6DK	2134.....JN3SAC	1825.....KØ8D	1371.....VE6BF	1089.....IZ8FFA	919.....KA5EYH	714.....YB2TJV	604.....GØBPK
3323.....CT1AHU	2840.....N1RR	2111.....PA2TMS	1812.....K6ND	1334.....EA3EQT	1089.....IT9ABN	893.....W9RPM	710.....WA9PIE	600.....WU1U
3322.....I8KCI	2679.....PTZ7T	2109.....W2FKF	1800.....W6OUL	1299.....NE6I	1083.....KX1A	889.....N3AIU	700.....N4FNB	600.....WA3PZO
3274.....YU7BCD	2650.....IK2DZN	2107.....K9UQN	1747.....WD9DZV	1262.....K7LV	1043.....K3CWF	875.....K7SAM	700.....JA1PLL	

CW

7474.....K9QVB	4067.....WA5VGI	3149.....N1RR	2424.....W2WC	1727.....K6UXO	1295.....NIØC	905.....AE5B	752.....K6HRT	608.....W9RPM
6869.....WA2HZR	3937.....I3ZETU	3041.....YO9HP	2357.....W9HR	1680.....N3RC	1295.....AG4W	891.....DK8MCT	743.....JA5NSR	605.....NH6T/W4
6541.....K2VV	3702.....I7PPX	2948.....IK3GER	2295.....EA7AAW	1658.....NE6I	1223.....KX1A	890.....NS3L	732.....SQ7B	600.....NY4G
5117.....9A2NA	3676.....S58MU	2895.....KA7T	2291.....N3XX	1638.....K11U	1220.....AA4FU	889.....N3AIU	722.....WA9PIE	600.....IK2SGV
4989.....N4NO	3584.....NN1N	2811.....ØZ5UR	2212.....AC5K	1600.....DG7RO	1210.....DL4CW	864.....YØ5BRZ	720.....K4CN	
4949.....EA2IA	3504.....YU7BCD	2685.....W200	2029.....W6OUL	1595.....PY5FB	1200.....KN1CBW	846.....AB1OC	695.....S55SL	
4734.....KF2O	3317.....JN3SAC	2661.....W9IL	2022.....AF5CC	1505.....R3IS	1196.....N3AIU	829.....K3CWF	673.....HK3W	
4634.....YU7LS	3308.....K9UQN	2615.....N6QQ	2010.....K5UR	1480.....WØ3Z	1125.....W6XK	821.....HB9DAX	652.....IK2DZN	
4583.....N6JV	3236.....W900	2575.....WD9DZV	2007.....W3LL	1443.....WA2VQV	1098.....LU5OM	813.....VE9FX	631.....N5KAE	
4489.....W8IQ	3234.....4L1MA	2531.....I2MQP	1900.....NXØI	1389.....IT9ELD	1062.....K3XA	783.....YB1AR	629.....IV3GOW	
4206.....KØDEQ	3214.....SM6DHU	2490.....N6FX	1848.....I2EAY	1348.....VE1YX	962.....K7LV	782.....F5PBL	620.....AF5DM	
4147.....N8BJQ	3185.....IØNNY	2477.....VE6BF	1762.....K6ND	1342.....VE6BMX	908.....NH6T	780.....N6PEQ	615.....JH6JMM	

DIGITAL

2481.....W3LL	1734.....AG4W	1250W2/JR1AQN	1074.....AB1OC	1009.....GØUSUP	918.....W9IL	810.....HK3W	670.....IV3GOW	611.....KØ9V
2361.....N6QQ	1704.....IK2DZN	1240.....JN3SAC	1047.....RW4WZ	966.....NS3L	917.....K7LV	807.....EA2IA	668.....KA5EYH	600.....ADØFL
2242.....N8BJQ	1352.....KØDEQ	1121.....NXØI	1043.....K3CWF	963.....AC7JM	898.....K9UQN	800.....WA3GOS	665.....NE6I	
2234.....YO9HP	1326.....N3RC	1112.....AB1QB	1035.....N6PM	957.....K11U	866.....SQ7B	798.....KC1UX	656.....N4JJS	
2174.....KF2O	1325.....W200	1110.....WA5VGI	1021.....NN1N	947.....I2VGVW	858.....WU9D	783.....YB1AR	654.....JA3MAT	
1898.....WD9DZV	1299.....W6XK	1091.....VA3VF	1016.....KH6SAT	941.....NKØS	811.....WF1H	672.....K9AAN	636.....W9RPM	



World Wide 160-Meter and ARRL DX Contests Headline Contesters' January and February Calendars

CQ160 CW and SSB weekends set for record participation; ARRL DX Contest implements rules changes; WRTC2018 participants ranging in age from 14 to 77 will compete on the same field

If logs received is any indication, both the CQWW 160-meter CW and SSB weekends reached peak activity levels last year. With sunspots still declining, we expect (and hope) for even better propagation this year. Last year, some participants got on even when they didn't have a 160-meter

antenna, so get on with whatever you have. One used his 6-meter beam, and another managed over 100 contacts with a dipole strung just four feet high.

Several weekends after the CQWW CW weekend, the ARRL DX CW weekend will liven up the bands. This competition provides an opportunity for smaller stations to work a lot of DX. Around the world, all participants are beaming stateside and looking for your signal.

email: <k3zj@cq-amateur-radio.com>

Calendar of Events

All year	CQ DX Marathon	http://bit.ly/vEKMWD
Jan. 1	SARTG New Year RTTY Contest	www.sartg.com/contest/nyrules.htm
Jan. 1	AGCW Happy New Year Contest	http://bit.ly/1v6x2N1
Jan. 3	UKEICC 80 Meter Contest SSB	http://bit.ly/2cv97YF
Jan. 3-4	AWA Linc Cundall Memorial Contest	http://bit.ly/1DEIKTK
Jan. 6-7	ARRL RTTY Roundup	www.arrl.org/rtty-roundup
Jan. 6-7	EUCW 160m Contest	www.eucw.org/eu160.html
Jan. 6-7	WW PMC Contest	http://bit.ly/2zj1hwR
Jan. 6-7	AWA Linc Cundall Memorial Contest	http://bit.ly/1DEIKTK
Jan. 13-14	YB DX Contest SSB	http://ybdxcontest.com/dx-station-rules/
Jan. 13-14	North American CW QSO Party	http://ncjweb.com/naqp/
Jan. 14	DARC 10-Meter Contest	www.darc.de/home/
Jan. 14	NRAU –Baltic SSB Contest	www.nrau.net/nrau-baltic-contest/rules.html
Jan. 14	NRAU –Baltic CW Contest	www.nrau.net/nrau-baltic-contest/rules.html
Jan. 19	LZ Open Contest	www.lzopen.com/index.htm
Jan. 20-21	ARRL January VHF Contest	www.arrl.org/january-vhf
Jan. 20-21	Hungarian DX Contest	www.ha-dx.com/HADX/
Jan. 20-21	North American SSB QSO Party	http://ncjweb.com/naqp/
Jan. 26-28	CQWW 160 Meter CW Contest	http://cq160.com/rules.htm
Jan. 27-28	BARTG RTTY Sprint	http://bit.ly/Snijln
Jan. 27-28	Montana QSO Party	www.fvarc.org/?q=MT-QSO-Party
Jan. 27-28	REF CW Contest	http://concoeurs.ref-union.org/contest/?page_id=2
Jan. 27-28	UBA SSB Contest	http://bit.ly/W0gZIE
Jan. 27-28	Winter Field Day	www.winterfieldday.com/rules
Jan. 31	UKEICC 80m Contests CW	http://bit.ly/2cv97YF
Feb. 3	FISTS Winter Slow Speed Sprint	www.fistsna.org/operating.html
Feb. 3	AGCW Straight Key Party	http://bit.ly/1jKUszA
Feb. 3	Minnesota QSO Party	www.w0aa.org/index.php/rules
Feb. 3-4	10-10 Int'l Winter Contest	http://bit.ly/1FrFeBc
Feb. 3-4	Black Sea Cup Int'l	http://bit.ly/10qlpGu
Feb. 3-4	British Columbia QSO Party	www.orcadxcc.org/bcqp_rules.html
Feb. 3-4	Mexico RTTY Int'l Contest	http://bit.ly/1MI59qF
Feb. 3-4	Vermont QSO Party	www.ranv.org/ranv.html
Feb. 4	North American CW Sprint	http://ncjweb.com/north-american-sprint/
Feb. 7	UKEICC 80m Contests SSB	http://bit.ly/2cv97YF
Feb. 10-11	CQWW RTTY WPX Contest	www.cqwpwxrtty.com/
Feb. 10	Asia-Pacific Spring Sprint (CW)	http://jsfc.org/apsprint/
Feb. 10	FISTS Winter unlimited Sprint	http://www.fistsna.org/operating.html
Feb. 10-11	Dutch PACC Contest	http://pacc.veron.nl/
Feb. 10-11	OMISS QSO Party	http://www.omiss.net/Facelift/qsoparty.php
Feb. 10-11	SARL Field Day Contest	http://bit.ly/H0lqQf
Feb. 12-16	ARRL School Club Roundup	http://www.arrl.org/school-club-roundup
Feb. 17-18	AWA Amplitude Modulation QSO Party	http://bit.ly/1DEIKTK
Feb. 17-18	ARRL CW DX Contest	http://www.arrl.org/arrl-dx
Feb. 21	AGCW Semi-Automatic Key Evening	http://bit.ly/1OmoGv8
Feb. 23-25	CQWW 160 Meter SSB Contest	http://www.cq160.com/rules.htm
Feb. 24-25	REF SSB Contest	http://concoeurs.ref-union.org/contest/?page_id=2
Feb. 24-25	South Carolina QSO Party	http://scqso.com/rules/
Feb. 24-25	UBA CW DX Contest	http://bit.ly/W0gZIE
Feb. 24-25	North American RTTY QSO Party	http://ncjweb.com/naqp/
Feb. 25	High Speed Club CW Contest	http://www.highspeedclub.org/
Feb. 25-26	North Carolina QSO Party	http://rars.org/ncqsoparty/index.php?id=rules
Feb. 28	UKEICC 80m Contests CW	http://bit.ly/2cv97YF



We wrap up with some notes from the 2018 World Radiosport Team Championship (WRTC2018) organizing committee. They found that the competitors in Germany next summer will be pretty evenly spread out by age. Congratulations to the two competitors who will anchor the ends. The youngest to land a spot is Bryant Rascoll, KG5HVO, who will be age 14 during the event. On the other end of the age spectrum is Marvin Bloomquist, N5AW, who will enter the competition at age 77. The other participants are pretty evenly distributed between these two.

Our CQ contests draw participants even younger and older, but of course, participation doesn't require 24 continuous hours of operating under pressure in a small tent as do the WRTCs. Last year, XYL Patricia Murray, NW2I, entered the CQWW 160 meter CW event at age 93. We will be looking for her signal from New York again this year, too.

CQWW 160-Meter CW and SSB Contests

The CQ World Wide 160-Meter Contests will return on schedule again this year to the amateur spectrum that sits just above the medium wave AM broadcast band. The CW weekend will run from 2200 UTC on Friday, January 26, through 2159 UTC on Sunday, January 28. The SSB weekend will follow from 2200 UTC on Friday, February 23 through 2159 UTC on Sunday, February 25.

Competitors need to take the "early" start for this contest, a full two hours before most other contests commence. This applies to both the January CW and February SSB portions of the CQWW 160. As often is the case, those first two hours frequently produce many more QSOs per hour than are possible later in the evening. So in this contest it usually is worth

the effort to get home from work a little earlier than usual and settle in for a few fast hours at the beginning.

Last month, we mentioned that logs are due no later than five days after the end of the contest. This year, the **CW deadline** is no later than 2200 UTC on **Friday, February 2**. **Phone logs** must be submitted no later than 200 UTC on **Friday, March 2**. Many participants now submit their logs within hours of the contest's end. This is a good practice if you might get busy during the week and forget to submit your log.

If for any reason you need to change any information — such as to correct your category or address or to add soap-box comments — you can upload the log with the corrected information at any time during the 5-day submission window. The later-submitted log will automatically replace the earlier log, so no other action is required. But remember that this must be done during the 5-day submission window, or your entry will be deemed late even if you submitted the log earlier. Only the last submitted log is considered, so don't submit anything after the deadline. If something is important, email the information to <director@cq160.com>. Missing the deadline completely makes one's entry ineligible for awards, but your log is still welcome for checking purposes and will be scored and published unless it arrives after those functions have been completed.

Last year a record number of logs were received for both the CW and the SSB weekends. With sunspots declining and low band conditions improving, expect even more activity and logs this year.

On CW, last year's scores were up substantially. An unprecedented 25 stations passed the 1 million point mark. Not in order and without regard to category, the stations amassing more than a million points were: VY2ZM, CS2C, ZF9CW, C6AGU, CN2AA, PJ2T, S51V, HG8DX, UA7K, EIØR, OL7M, TM6M, PI4DX, HB9CA, OL3Z, P4ØAA, P33W, HK1R, LX7I, G5W, 9A5CW, OM3GI, UW2M, OM7M, and UA2FZ. Look for these stations in this January's contest.

Unfortunately, last year's SSB weekend was widely reported to have suffered from below normal propagation, and no station exceeded 1 million points. Nevertheless, a record 1,224 logs were submitted, 71 more than the previous high number that was reached back in 2011. We look forward to better conditions and even more logs this year.

What is the most popular category in the 160 CQWW contests? Single Op assisted, low power. And many entrants persist in getting on and having fun no matter what kind of antenna is available. Don't let the lack of large antenna stop you from joining the fun. W1DYJ in Maine reported having no 160-meter antenna, so he got on with his 6-meter Yagi and low power to work 63 QSOs. W7MEM managed to feed high power into his 160-meter dipole, but the dipole itself was only 4 feet off the ground. The 111 QSOs he made from Idaho were very welcome, I'm sure.

And a well-deserved acknowledgement to NW2I, Patricia Murray. Patricia got on the air and made 27 QSOs from her New York QTH. Her son Ray, AI2S, let us know that Patricia is 93 years young and still enjoys CW contesting at 35 wpm. Say "hi" if you hear her on again this year.

There are a couple of changes to the rules to be noted. The only "major" change is that electronic submission of Cabrillo logs is now **REQUIRED** for scoring and awards. Nearly all participants have been submitting electronic Cabrillo logs for years, but this year they are required for scoring and awards eligibility. Submit CQWW 160 Meter CW Contest logs by email to: <160CW@cq160.com>, and to <160SSB@cq160.com> for SSB. A list of all CW logs received can be viewed at <http://bit.ly/2ziGutd>; and all SSB logs can be viewed at:

Contest Errata

We've got a couple of corrections to make in the results of two recent contests:

2017 CQWW 160 Meter CW Contest

On page 20 in the August 2017 *CQ*, the "top ten" box for CW single operator DX was in error. While individual scores were reported correctly elsewhere in the contest report, the top scores were not carried over correctly to the box. The top ten box is corrected to read as follows.

DX	
ZF9CW	1,743,792
CS2C	1,218,780
*C6AGU	1,103,556
GU4YOX	887,985
TA3D	864,652
KP2M	861,120
XE2X	853,180
OK7K	803,565
EI5KF	767,016
TM5X	650,839

2017 CQ WPX SSB and CW Contests

The disqualification of 4U1WB (AJ3M, operator) in both the SSB and CW portions of the 2017 CQ World Wide WPX Contest was reversed by the contest director on appeal. Updated score listings are online at <www.cqwpw.com/results.htm>.

In addition, the contest rule involved, which was subject to multiple interpretations, has been revised to prevent this situation from recurring in the future. (The 2018 WPX Contest announcement appears elsewhere in this issue and the complete rules are online at <www.cqwpw.com/rules.htm>.)



<http://www.cq160.com/2zWg9yd>>. Paper logs are helpful, but will be accepted as check logs only. If on paper and you can't generate a Cabrillo log and email it, mail your log to this address (which is new this year): CQ 160 Contest, c/o N2NT, P.O. Box 25, Dayton, NJ 08810. Please indicate CW or SSB on the envelope.

A small change also was made to the list of Canadian multipliers. Multipliers for the CQWW 160 contests are each contiguous U.S. State (48), the District of Columbia (DC) (1), Canadian Call Areas (14): NF (VO1), LB (VO2), NB (VE1, 9), NS (VE1), PE (VY2), QC (VE2), ON (VE3), MB (VE4), SK (VE5), AB (VE6), BC (VE7), (NWT) VE8, YT (VY1), NU (VY0); and DXCC entities plus WAE entities not on the DXCC list: IT, GM (Shetland Islands), JW (Bear Island), TA1 (European Turkey), 4U1VIC, Z6 (Kosovo); and IG9/IH9 (Lampedusa and Pantelleria).

This year, CQWW 160 Contest Director N2NT had some words of advice in last year's contest report that bear repeating. Titled "A Few Words About Competition and Sportsmanship," Andy noted "...many complaints from stations, especially in Europe, about key clicks and dirty signals. Many accusations were made, including intentional QRM, excessive power, self-spotting, and out-of-band operation. There were many warnings issued, and in some cases disqualification or reclassification." As Andy went on to say, "It is up to the com-

munity to keep the contest field honest, as our resources are limited. We appreciate your help, and continue to strive for an accurate and honest result for all competitors."

For the phone weekend, Andy also noted numerous complaints about Europeans operating below 1.810 MHz. For most (if not all) amateurs in Region 1, transmitting below 1810 is not allowed. No CW, and certainly no SSB. First and foremost, be sure not to transmit outside of the frequencies authorized by your license.

In addition, some SSB participants were found to have signals with excessive bandwidth. Warning letters were issued and disqualifications are possible in the future if the problem continues. Some self-spotting also was noted and action taken.

Let's keep our participation within the rules so that everyone is competing fairly. The complete rules for the 2018 CQWW 160 are available at: <www.cq160.com/rules.htm>.

ARRL DX CW and SSB Contests

The annual ARRL DX Contest, CW version, will begin at 0000 UTC on Saturday, February 17 and continue until 2400 UTC on Sunday, February 18. The phone portion begins at 0000 UTC on Saturday, March 3 and continues until 2400 UTC on Sunday, March 4.

This is a good contest for stateside DX seekers because, unlike CQWW — in which the world works the world — in

Young Ops at This Summer's WRTC

The three youngest competitors scheduled to operate at this year's World Radiosport Team Championship (WRTC2018) in Germany hail from three different continents.

Bryant Rascoll, KG5HVO, is an avid CW and DX enthusiast. He sports CWops #1795 and was a winner of the Dave Kalter Memorial YDXA Essay Contest, earning a ham radio trip to Costa Rica this past August. He also plays baseball and is a Boy Scout. Bryant's teammate will be Matthias Acevedo Von Frey, CE2MVF.

Xenia Berger, ZL4YL, is a high school student from New Zealand. She was first licensed in 2015, although she started learning CW when she was 10 years old. "I grew up in a radio amateur family as both my parents, Holger, ZL3IO, and Birgit, ZL2YL, as well as my sister, Saskia, ZL2GQ, are all radio amateurs. My favorite thing about ham radio is contesting — mostly in CW. I am very much looking forward to participating in the WRTC and meeting the best contesters and organizers of our radio community." Xenia's teammate will be her father Holger, ZL3IO.

Tomi Varro, HA8RT, from Hungary, has been licensed

since 2012 and started contesting in 2014, including in high-speed telegraphy (HST) competitions. "I love mixed mode contesting, have done multi-operator contests many times. I am a university student and programming engineer at a software company." Tomi's teammate will be Philipp Springer, DK6SP.



The three youngest competitors at WRTC2018 hail from three different continents: (A) Bryant Rascoll, KG5HVO; (B) Xenia Berger, ZL4YL; and (C) Tomi Varro, HA8RT.



The ARRL DX contests the world works North America (U.S. and Canada). This means that many stations that struggle on one of the bands in CQWW do better in the ARRL DX. All stations outside North America (“NA”) are focusing their antennas in this direction and looking for you. Especially on the low bands, QRM is less for the DX because strong locals are not working locals. Many of the DX stations are hunting states and provinces on the various bands. Others just enjoy directing their signals over here and running W/VE stations.

Even from Asia, while propagation is very restricted, there always are stations that fire up at the time that North American signals are expected to be heard and lie in wait. Depending upon conditions, we may or may not hear them. But I’ll bet you that during the contest there will be a new crop of operators waiting for the band to open so that they can work us, whether or not propagation is favorable.

There are some new rules this year that pertain to both the CW and SSB weekends. First and foremost, as mentioned in last month’s column, the ARRL has made a number of important changes to the administrative aspects of its contests, including to the rules governing the ARRL DX contests.

First of all, logs are due five (5) days after the contest ends. This is the same as for the CQWW contests, but don’t get caught forgetting the ARRL now has adopted the identical log deadline. Whenever possible, logs for the ARRL DX (and all other ARRL) contests should be submitted using the web tool found at <<http://bit.ly/1ObqDOj>>. Paper logs will be accepted, but are eligible for awards only at the discretion of the Contest Branch Manager.

Also, this will be the first year for which all logs will be published on the ARRL website. CQ has been making all scored CQWW logs public since 2005. Check logs have not been included. Having access to the previous years’ logs will be a useful tool if next year you want to compare your log to those of others in your area. What bands were they on when, and where were you? Do they have an especially effective antenna or location for this or that band that you do not, and therefore you should NOT necessarily be on the same band? Or are your antennas comparable, and maybe you missed a good part of the band opening? One can learn important lessons by studying logs of nearby stations.

Sometimes, reviewing the logs of non-comparable stations, such as K3LR and W3LPL, also is useful. For example, even though my antennas are not at all comparable to those at either of these two superstations, when I enter single-band I will look at their logs for the same band to gain an idea of what I missed, or if in the future, to get an idea of when I should expect openings.

Notable differences exist between ARRL and the CQWW requirements for top operators. First, ARRL encourages logging specific frequencies when available, whereas CQWW requires that the specific frequency be in the log for top competitors. ARRL also does not require recordings for any category, whereas the CQWW requires that all single operator entrants competing for top-five positions in any category have recordings available upon request.

Finally of note, eligibility for the club competition is more restricted in ARRL competitions than for CQWW. To submit your score for your club in an ARRL competition, your club must be an ARRL-affiliated club in good standing, you must live and operate with the club’s defined 175-mile radius circle, and you must be listed as a club member on a list submitted to the ARRL before the contest. CQWW, on the other hand, does not require an official list of eligible club members, has a larger defined club circle of 250 miles, and if you are a club member living within your club’s 250-mile circle,

your score will count even if you go outside of the club’s circle to operate.

The effect of these differences in club rules is that counting at a location outside your club’s defined area but within the U.S. or Canada will count for CQWW contests but not for the ARRL contests. The same applies if you operate a remote station outside your club area: Counts for CQWW, does not count for ARRL DX. However, both CQWW and ARRL DX contests do count your score for your club if you operate from outside of the U.S. and Canada on a “DXpedition.”

For remote stations, any valid contest entry for ARRL contests is limited to a single entry from that physical station regardless of different callsigns being used by different operators. For example, a remote station may be time-shared separately by three operators during the ARRL DX (or other ARRL) contest. Maybe one operator is particularly interested in working on 80 meters single-band, while another wants to operate Saturday only on 10 meters. A third operator may want to operate “the best band” when neither of the other two are operating.

Under the described scenario, only one of the operators may make a valid entry to the ARRL DX contest, whereas all three may submit their respective entries in the CQWW contest. The only way around this rule that applies to all ARRL contests would be for the three operators to use the station as a multi-operator station under a single callsign. This is because of an ARRL rule that prohibits multiple entries using the same transmitter unless the operators are family members sharing the same station. See Section 3.5 of the ARRL’s General Rules for All ARRL Contests:

“A transmitter used to contact one or more stations may not be subsequently used under any other call during the contest period, except for family stations where more than one call has been issued, and then only if the second callsign is used by a different operator. (The intent of this rule is to accommodate family members who must share a rig and to prohibit manufactured or artificial contacts.)”

This rule was adopted decades ago to prohibit multiple callsigns from being “fed” a favored station. For example, if a club member on a DXpedition works a multi-operator station back home, there might be five friends at that station with up to 10 authorized callsigns (counting club station licenses). A situation was observed in which multiple operators took turns working their friend with all of their authorized callsigns. One QSO became 9 or 10 within just a few seconds. The ARRL adopted the above-quoted rule and applied it to all of its contests. The CQWW did not adopt a specific rule, but today any such action surely would be viewed as prohibited unsportsmanlike conduct.

Participating in the ARRL DX contests is fun. Let’s get it on

WRTC2018 Competitors

Amateur radiosport is something special. Last month we shared WRTC2018’s announcement that teams have been selected for next July’s event in Germany. Biographical sketches of each team member are now published on the WRTC website. Click on the “selection area” — <<http://bit.ly/2ytjGp6>> — to see pictures and bios of each competitor.

The WRTC2018 organizers have announced that the youngest participant at this year’s event will be Bryant Rascoll, KG5HVO, who will be 14. The oldest will be Marvin Bloomquist, N5AW, who will enter the competition at age of 77. In between, all age groups are represented almost equally. Amateur radiosport will be experienced not only as a global sport, but also as a generation-connecting one and unlike other sports, all participants at WRTC2018 will compete in the same competition and on the same level regardless of age.

— Until next month, 73, Dave, K3ZJ



Space Weather

BY TOMAS HOOD, * NW7US

propagation

A Quick Look at Current Cycle 24 Conditions

(Data rounded to nearest whole number)

Sunspots:

Observed Monthly, October 2017: 8
12-month smoothed, April 2017: 15

10.7 cm Flux (current):

Observed Monthly, October 2017: 76
12-month smoothed, April 2017: 78

A_p Index:

Observed Monthly, October 2017: 11
12-month smoothed, April 2017: 12

One Year Ago: A Quick Look at Solar Cycle Conditions

(Data rounded to nearest whole number)

Sunspots:

Observed Monthly, October 2016: 20
12-month smoothed, April 2016: 29

10.7 cm Flux (current):

Observed Monthly, October 2016: 86
12-month smoothed, April 2016: 95

A_p Index:

Observed Monthly, October 2016: 16
12-month smoothed, April 2016: 12

For thousands of years — perhaps since the dawn of human perception of the sky above — the Sun has held our interest, sparking curiosity if not devout worship. In the days of antiquity, Chinese observers noted spots on the Sun, and many cultures had stories about the powerful influence of the Sun over all of life.

When the enterprising Italian physicist, mathematician, astronomer, and philosopher Galileo Galilei improved the telescope and began exploring the visible solar disc with his scientific discipline, he launched a journey of discovery about the Sun that has become a critical part of modern science and technology. Today, a number of universities offer degrees and courses in solar physics, space weather, radio propagation, and related topics. There are scientific journals and magazines devoted to nothing else. Many governments have organizations funded and tasked to study space weather, and to provide forecasting and live reporting of the Sun-Earth connection. Even in the private sector, commercial enterprises have been launched to leverage the science of space weather.

Yet, with all of the monumental discoveries about our life-giving star, myth and legend permeate our culture and conscience, with a seemingly increased infatuation with fantastic rumors and explanations of current terrestrial storms, the human condition, and the fragility of our modern infrastructure. Movies such as "Frequency" and the Canadian made-for-TV sci-fi thriller, "Exploding Sun," perpetuate pop-science but do little to educate the masses with solid, well-grounded understanding of our solar system's dynamic star.

This column has a mission: To educate, inspire, and report on the Sun, the Sun-Earth connection (often referred to as "space weather"), and the geophysical aspects of the Earth's magnetosphere, geomagnetic field, and the ionosphere. Radio sig-

nal propagation, with an emphasis on ionospheric propagation, is more than a passing topic for the radio communicator, as this science is the foundation of the hobby. Space weather directly affects how our radio signals get from transmitter to receiver, even above the shortwave radio spectrum. Space weather affects satellite communications, VHF weak-signal communications, and more.

Your columnist first became aware of space weather in the early 1970s, when a chance tuning of the shortwave radio dial landed on the United States National Institute of Standards and

LAST-MINUTE FORECAST

Day-to-Day Conditions Expected for December 2017

Propagation Index	Expected Signal Quality			
	(4)	(3)	(2)	(1)
Above Normal: 6-7,11-13,17-22,25-27	A	A	B	C
High Normal: 5,8,23-24	A	B	C	C-D
Low Normal: 3,9-10,14,16,30	B	C-B	C-D	D-E
Below Normal: 4,15,31	C	C-D	D-E	E
Disturbed: 1-2,28-29	C-D	D	E	E

Where expected signal quality is:

- A--Excellent opening, exceptionally strong, steady signals greater than S9
- B--Good opening, moderately strong signals varying between S6 and S9, with little fading or noise.
- C--Fair opening, signals between moderately strong and weak, varying between S3 and S6, with some fading and noise.
- D--Poor opening, with weak signals varying between S1 and S3, with considerable fading and noise.
- E--No opening expected.

HOW TO USE THIS FORECAST

1. Find the **propagation index** associated with the particular path opening from the Propagation Charts appearing in *The New Shortwave Propagation Handbook* by George Jacobs, W3ASK; Theodore J. Cohen, N4XX; and Robert B. Rose, K6GKU.

2. With the propagation index, use the above table to find the expected signal quality associated with the path opening for any given day of the month. For example, an opening shown in the Propagation Charts with a propagation index of 2 will be non-existent on January 1 and 2, poor to fair on January 3, poor to non-existent on January 4, then fair on January 5, and so forth.

3. Alternatively, the *Last Minute Forecast* may be used as a general guide to space weather and geomagnetic conditions through the month. When conditions are **Above Normal**, for example, the geomagnetic field should be quiet, and space weather should be mild. On the other hand, days marked as "**Disturbed**" will be riddled with geomagnetic storms. Propagation of radio signals in the HF spectrum will be affected by these conditions. In general, when conditions are **High Normal to Above Normal**, signals will be more reliable on a given path, when the path is supported ionospherically.

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Figure 1. One of the earliest known drawings of sunspots, this one in the Chronicle of John of Worcester, sometime prior to 1128 AD (see text). (Courtesy of Creative Commons)

Technology's radio station, WWV, in Fort Collins, Colorado. At 18 minutes after the top of each hour, a solar and geophysical report is broadcast that provides the latest sunspot count, the 10.7-cm radio flux, and the condition of the Earth's geomagnetic field, followed by a solar forecast. WWV's broadcast began a lifelong interest in space weather, as well as how it affects radio communication.

While this might seem to be a topic requiring the brain power necessary to understand rocket science, this column dispels such notions with an approachable discussion that brings the complexity of physics and theory into an everyday application of facts and figures. Each month, space weather concepts and the science of radio wave propagation are explored, and a report of recent conditions and events is pro-

vided, so that you gain a working knowledge that translates to better radio communications as well as an appreciation of the science behind our hobby.

Additionally, you will be able to hold your own during heated discussions around the water coolers and hamfest tables when the topic of X-ray flares, coronal mass ejections, and solar storms capture the imagination of the community. With the edge you gain through the monthly study of this column, your experience with daily on-air radio communications will be enhanced in new and exciting ways.

Space Weather and History

A Chinese astronomer, Gan De <<http://bit.ly/2zYoNMI>>, made notations about sunspots in a star catalogue in 364 BC. By 28 BC, Chinese astronomers included sunspot observations in the official government records. In Western records, the earliest observation mentioned was around 300 BC, as detailed by the Greek scholar Theophrastus (a student of Plato and Aristotle) in his book on predicting terrestrial weather. He wrote in "De Signis Tempestatum" about black marks on the Sun, as signs of rain. In A.D. 807, Adelmus reported on a black spot on the Sun that remained visible for eight days.

In the "Chronicles of John of Worcester," the first known Western drawing illustrated "two black circles" appearing on the Sun on December 8, 1128. Thomas Harriot, Johannes and David Fabricius, and Galileo Galileo were among the first Europeans to make telescopic observations of sunspots in 1610.

The study of the Sun that ensued in 1610 shook the scientific world because it revealed our nearest star was rotating. This implied that our solar system might be more dynamic than ever imagined, contrary to the long-held theory of Aristotle that all celestial bodies were perfect, unchanging spheres.

Heinrich Schwabe discovered a cyclic variation in the number of sunspots between 1826 and 1843, inspiring Rudolf Wolf to begin systematic observations of the solar disc and sunspots in 1848. The "Wolf number" became a measure of individual spots and spot groupings. Solar observations have been made nearly every day since. The cyclic nature of sunspots was confirmed, and we now have 24 such cycles on record, all of which reveal that the Sun has a sunspot cycle that lasts approximately 11 years from a period of no sunspots, through a peak period with many daily sunspots, back to a period

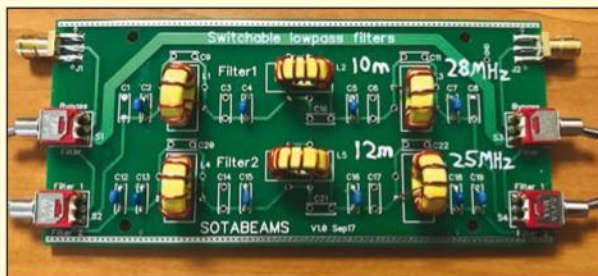
what's new

SOTABEAMS Debuts New Low Pass Filter Kit

SOTABEAMS has introduced a new low pass filter kit that allows one of two filters to be selected and incorporates a "bypass" mode as well. It has been designed to complement the WSPRlite Classic HF antenna testing system. To give users the most flexibility, the filter components are available separately to allow filters from 160-10 meters to be constructed. The kit includes a high quality double-sided PC board, two SMA sockets, and four switches.

The board is designed for all through-hole components (toroids and capacitors not included). You can use your own toroids and capacitors or buy frequency dependent parts kits separately from SOTABEAMS.

For users who like to modify their kits, SOTABEAMS designed the filter board to accommodate a standard 7-element low-pass filter. The design size for the toroids is T50 but T68 will also fit (not in enclosure). The capacitor footprint is for a 5-millimeter lead spacing. For good performance, C0G or NP0 dielectric capacitors should be used (silver mica or polystyrene are also good). For flexibility, there are footprints for two capacitors in parallel as well as footprints for capacitors to be placed in parallel with the inductors to allow more complex filter designs to be implemented.



Plated-through holes with cleared roller-tinned copper have been placed along the sides of board. There are also five cleared pads on the ground-plane that can be used for sprung earth contacts if required.

An optional enclosure kit includes: Heavy-duty milled aluminum case, laser-cut and engraved end-plates (plastic), eight fixing screws, and four self-adhesive feet.

The low pass filter kit is available now with a suggested retail price of \$19.55 (in Europe); \$16.29 (everywhere else). For more information, contact: SOTABEAMS, Unit 1 The Green, Fountain Street, Macclesfield, SK10 1JN. Phone: +44 (0) 1625 501643. Website: <www.sotabeams.co.uk>.



of no sunspot activity. This is known as a "Sunspot Cycle" or "Solar Cycle."

Radio Wave Propagation and History

At the dawn of the modern industrial revolution, the idea of wireless communication held the fascination of inventors and scientists. Experiments involving inductive and capacitive induction in different media such as the ground, water, and even railroad tracks, were tried. James Clerk Maxwell theorized through mathe-

matics that electromagnetic waves could move (propagate) through the air. It is possible that the first experimental transmission of an electromagnetic wave (a radio wave) was in 1880, by David Edward Hughes, though at the time, this was considered induction rather than free-space transmission. In 1888, the famous Heinrich Rudolf Hertz conclusively proved Maxwell's theory was true, by transmitting electromagnetic waves through the air. We now measure the cycles per second of an alternating current of electricity, and also of radio

waves, in a unit known as the Hertz, in honor of his contribution. (One Hertz is one complete cycle; the shortwave spectrum is all radio frequencies between 3 and 30 million Hertz; One million Hertz is one Megahertz, abbreviated, MHz).

It is commonly held that the first amateur radio hobbyists discovered long-distance communication with radio waves when they were able to communicate far beyond the reach of ground-wave and line-of-sight distances. Such communications caused many to speculate on how these radio waves propagated over such long paths.

Oliver Heaviside and Arthur Edwin Kennelly, in 1902, described a model for a layer above the Earth by which a radio wave could be "reflected" back to Earth, allowing for the propagation of that wave far beyond the reach of ground-

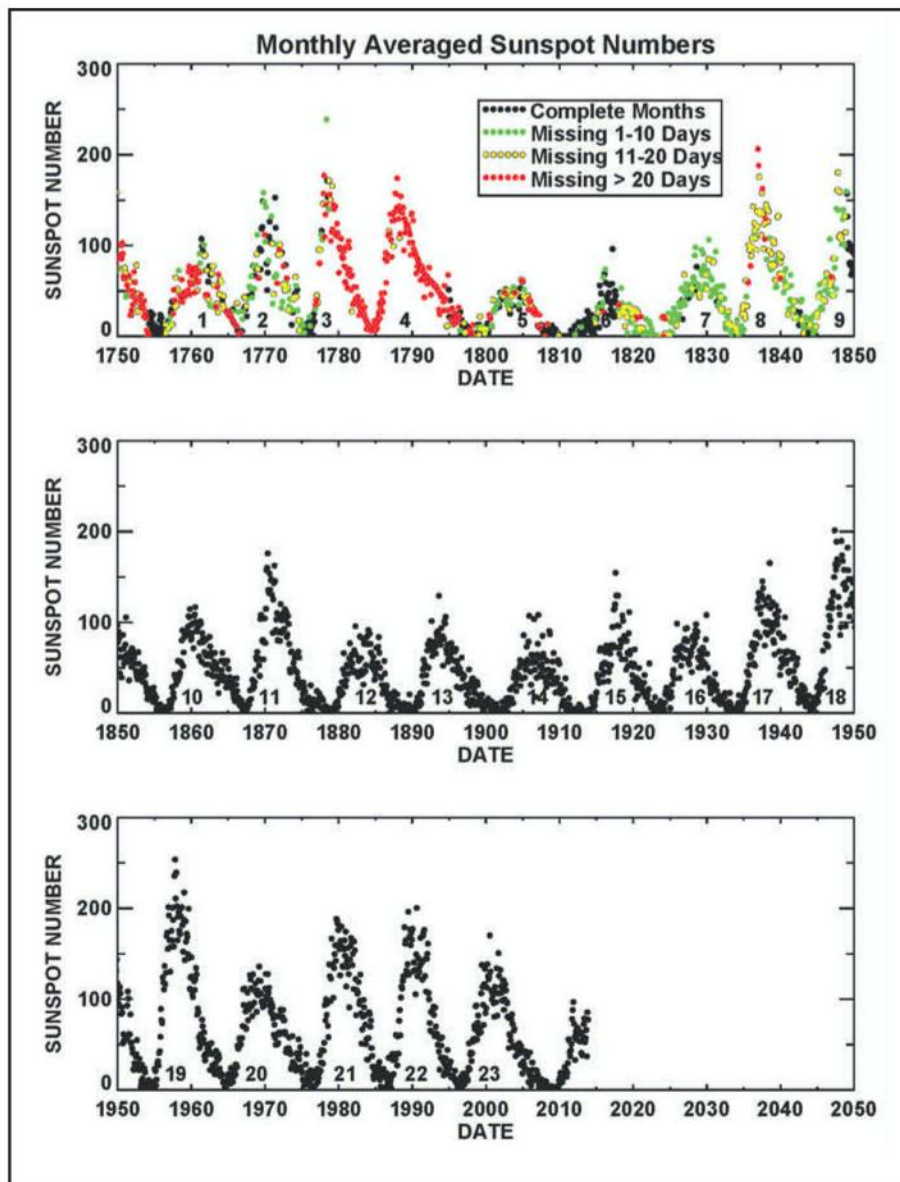


Figure 2. In 1610, shortly after viewing the sun with his new telescope, Galileo Galilei (or was it Thomas Harriot?) made the first European observations of sunspots. Continuous daily observations were started at the Zurich Observatory in 1849 and earlier observations have been used to extend the records back to 1610. Monthly averages (this graph) show that the number of sunspots visible on the sun waxes and wanes with an approximate 11-year cycle. (Graphs by David Hathaway/NASA Marshall Space Flight Center)

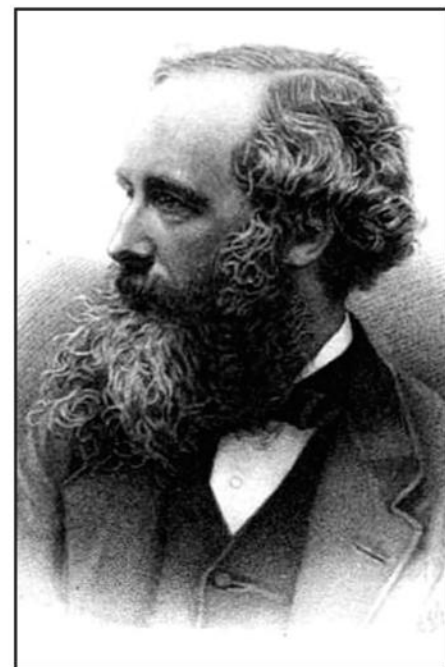


Figure 3. James Clerk Maxwell (1831–1879), a Scottish theoretical physicist and mathematician, postulated that electromagnetic waves (radio waves) could propagate through the air. This was the birth of the "radio age" at least in theory (see text). Maxwell demonstrated that electric and magnetic fields travel through space in the form of waves and at the constant speed of light. In 1864 Maxwell wrote "A Dynamical Theory of the Electromagnetic Field", in which he proposed that light was in fact undulations in the same medium that is the cause of electric and magnetic phenomena. (Courtesy of Harvard University)



...have a line-of-sight transmissions. This layer was known as the Kennelly-Heaviside Layer.”

...ers postulated about the existence of an “ether” by which this kind of propagation was possible. Edward Appleton was awarded a Nobel Prize in 1947 for confirming the existence of the ionosphere in 1927. Scottish physicist Robert Watson-Watt introduced the term, “ionosphere” in a letter published only in 1969, in the publication, Nature. Lloyd Berkner first measured the height and density of the ionosphere.

Many scientists joined the quest for an understanding of the ionosphere, and to this day, research continues. Even amateur radio hobbyists lend their efforts to reveal new aspects of radio wave propagation by ionospheric propagation.

The Modern Scientific Landscape

Since the 1950s, models have been created and refined that provide an understanding as well as analysis and prediction of ionospheric characteristics and variations. Software that relies on various models has found a place in the toolset of many amateur radio communicators.

Institutions such as NASA provide live and historical data on the Sun-Earth connection, from solar wind conditions to the X-ray flare and coronal mass ejection data collected by dedicated spacecraft. This information is available to anyone interested, easily accessible through various internet resources.

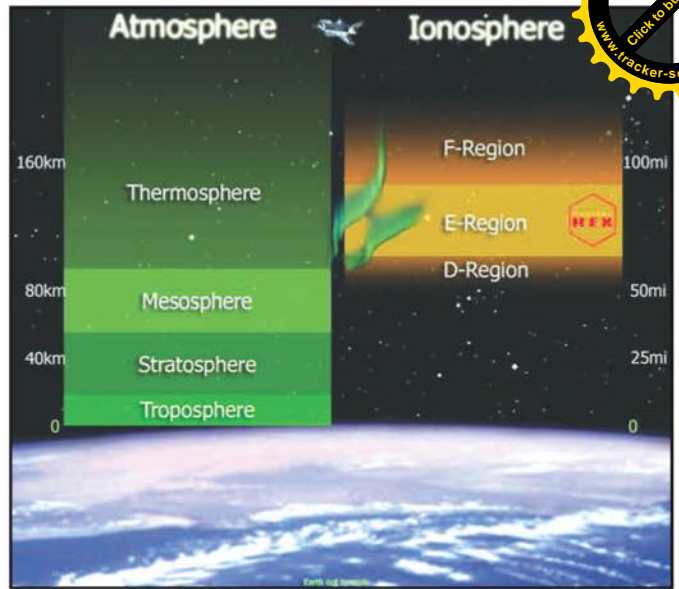


Figure 4. The ionospheric regions in relation to Earth's atmosphere. The ionosphere is composed of three main parts: the D, E, and F regions. (Courtesy of Horizontal E-Region Experiment)

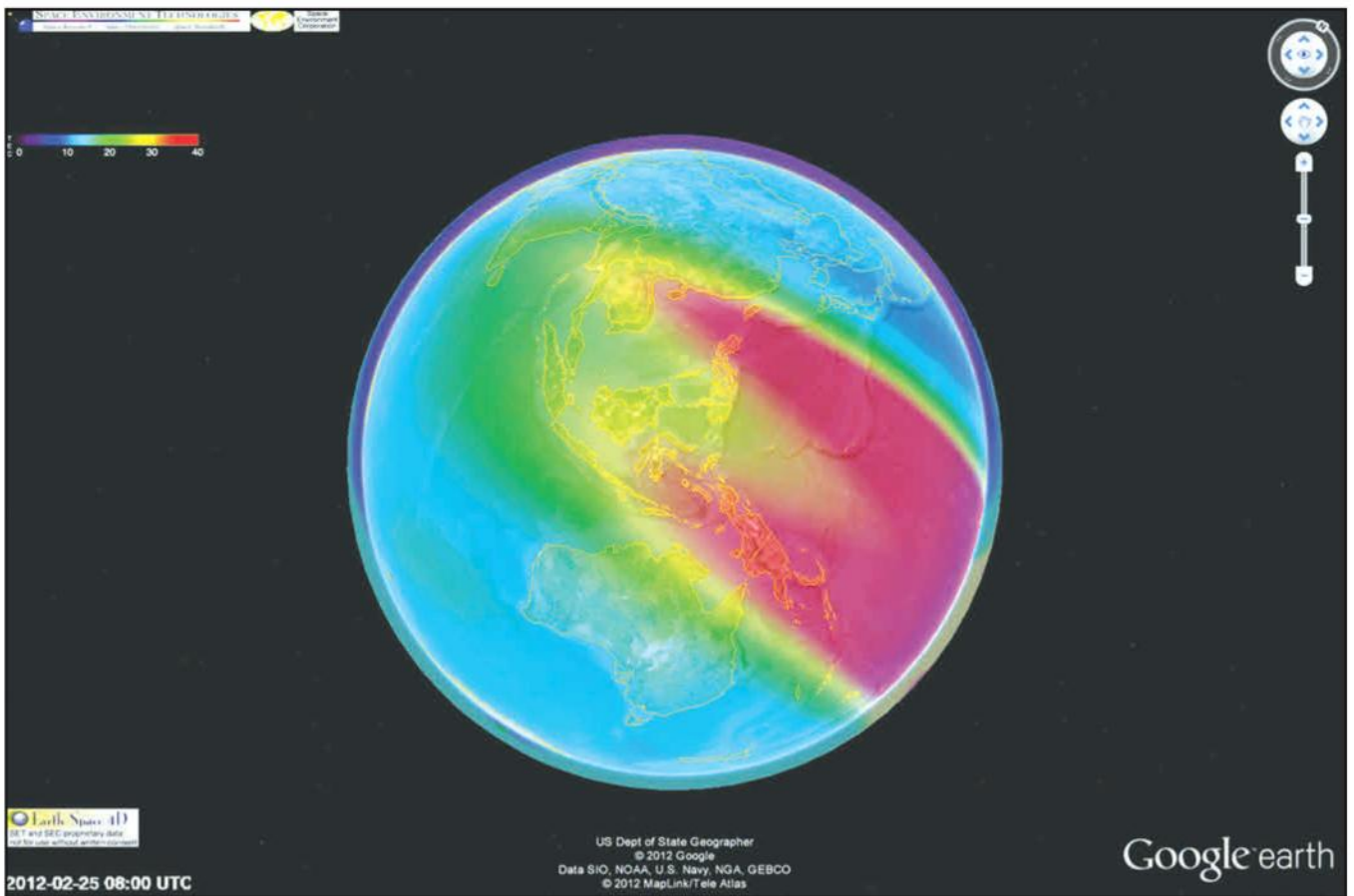


Figure 5. A screen-shot of the 4-D ionosphere as modeled by NASA and Google Earth®. Colors represent electron content. Bright red is high density; that's where radio communications are restricted to few or no frequencies. Blue denotes low density; Using the intuitive Google Earth interface, users can fly above, around and through these regions getting a true 4D view of the situation; the fourth dimension is time. This is a real-time system updated every 10 minutes. See: <<http://g.nw7us.us/xs3Zwz>> (Courtesy of Google Earth/NASA)



Figure 6. The Sun captured on December 10, 2013, by the Solar Dynamics Observatory (SDO) in extreme ultraviolet light (at 171 Angstroms). The bright regions are areas of magnetic activity, most of them originating in sunspot regions. (Courtesy of Solar Dynamics Observatory)

Digital radio modes such as WSPR, PropNET, JT65A and JT9, and networks of stations using these modes have been created to help the amateur scientist explore daily propagation conditions.

This column is your gateway into this world of scientific research, reporting, and leverage of the wealth of knowledge and data. Each month, a topic will be explored to help you gain a better understanding of this information. Current sunspot cycle activity is reported and put into perspective. Feedback from you is also considered; your questions will be answered, and your observations shared. Join in, each month, as the journey in this exciting world marches forward.

Current Solar Cycle Progress

The Royal Observatory of Belgium, the world's official keeper of sunspot records, reports a monthly mean sunspot number of 7.9 for October 2017, significantly down from 26.2 for September. The mean value for October results in a 12-month running smoothed sunspot number of 14.9 centered on April 2017. Following the curve of the 13-month running smoothed values, a smoothed sunspot level of 17 is expected for January 2018, plus or minus 14 points.

Canada's Dominion Radio Astrophysical Observatory at Penticton, British Columbia reports a 10.7-cm observed monthly mean solar flux of 76.4 for October 2017, down from 92.0 in September. The 12-month smoothed 10.7-cm flux centered on April 2017 is 78.4. A smoothed 10.7-cm solar flux of about 76 is predicted for January 2018.

Geomagnetic activity as measured by the Planetary-A index (A_p) for October 2017 is 11, a sizable decrease from September's 19. The 12-month smoothed A_p index centered on April 2017 is 11.5. Geomagnetic activity this month should vary quite a bit, with possible geomagnetic storm conditions 25% of the month. Refer to the Last-Minute Forecast for the

outlook on what days we might witness degraded propagation (remember that you can get an up-to-the-day Last-Minute Forecast at <<http://SunSpotWatch.com>> on the main page).

Don't forget to check out this columnist's educational tweets on Twitter.com; you can follow @hfradiospacewx <<https://Twitter.com/hfradiospacewx>> for hourly updates that include the K index numbers, as well as @NW7US <<https://Twitter.com/nw7us>> which will provide the daily dose of educational tidbits about the Sun and propagation. You can also check <<http://SunSpotWatch.com>> for the latest numbers. Additional educational material is at <<http://SunSpotWatch.com/swc>>.

I welcome your thoughts, questions, and experiences regarding this fascinating science of propagation. You may email me, write me a letter, or catch me on the HF amateur bands.

If you are on Facebook, check out <www.facebook.com/spacewx.hfradio> and <www.facebook.com/NW7US>. Speaking of Facebook — check out the CQ Amateur Radio Magazine fan page at <www.facebook.com/CQMag>.

I will be keeping my ears to the radio, hoping to hear you on the air. Happy DX!

– 73, Tomas, NW7US

Notes:

1. Early Astronomy and the Beginnings of a Mathematical Science, NRICH (University of Cambridge), 2007
2. The Observation of Sunspots, UNESCO Courier, 1988

Looking Ahead in



Here are some of the articles we're working on for upcoming issues of **CQ**:

QRP Special in February!

- QRP Rig Disguised as a BC-221
- A QRP Current Limiter
- Building a Chassis from PC Board

Plus...

- Results, 2017 CQ WW Foxhunting Weekend

Upcoming Special Issues

- June:** Take it to the Field
- October:** Emergency Communications
- December:** Technology

Do you have a hobby radio story to tell? Something for one of our specials? **CQ** now covers listening and personal two-way services in addition to amateur radio. See writers' guidelines on the CQ website at <http://www.cq-amateur-radio.com/cq_writers_guide/cq_writers_guide.html>.



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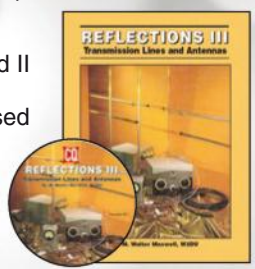
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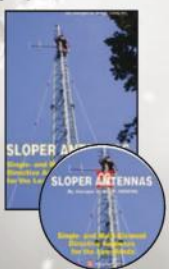


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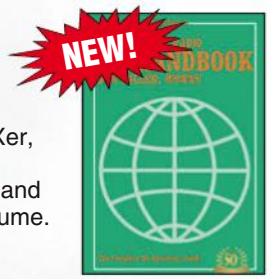
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