Hamming from the Swedish Arctic, p. 36

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CQ Amateur Radio

COMMUNICATIONS & TECHNOLOGY

JULY 2014

Celebrating Our 70th Year!

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- Results, 2014 CQ RTTY WPX Contest, p. 24
- "An Inexpensive 75-Watter" Revisited, p. 42
- "Making" the Scene at Dayton, p. 130
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On the Cover: A typical operating site for this month's World Radiosport Team Championship, being held in New England. Details on page 82. WRTC articles on pages 12 and 103.

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On or off the road, Kenwood's TM-281A is a mobile radio you can always count on.

As tough as nails, this MIL-STD-compliant transceiver delivers powerful performance, excellent audio clarity, and a host of advanced features. It offers superb operating ease day or night thanks to the large backlit LCD and illuminated keys. So the next time you take off, take the TM-281A.

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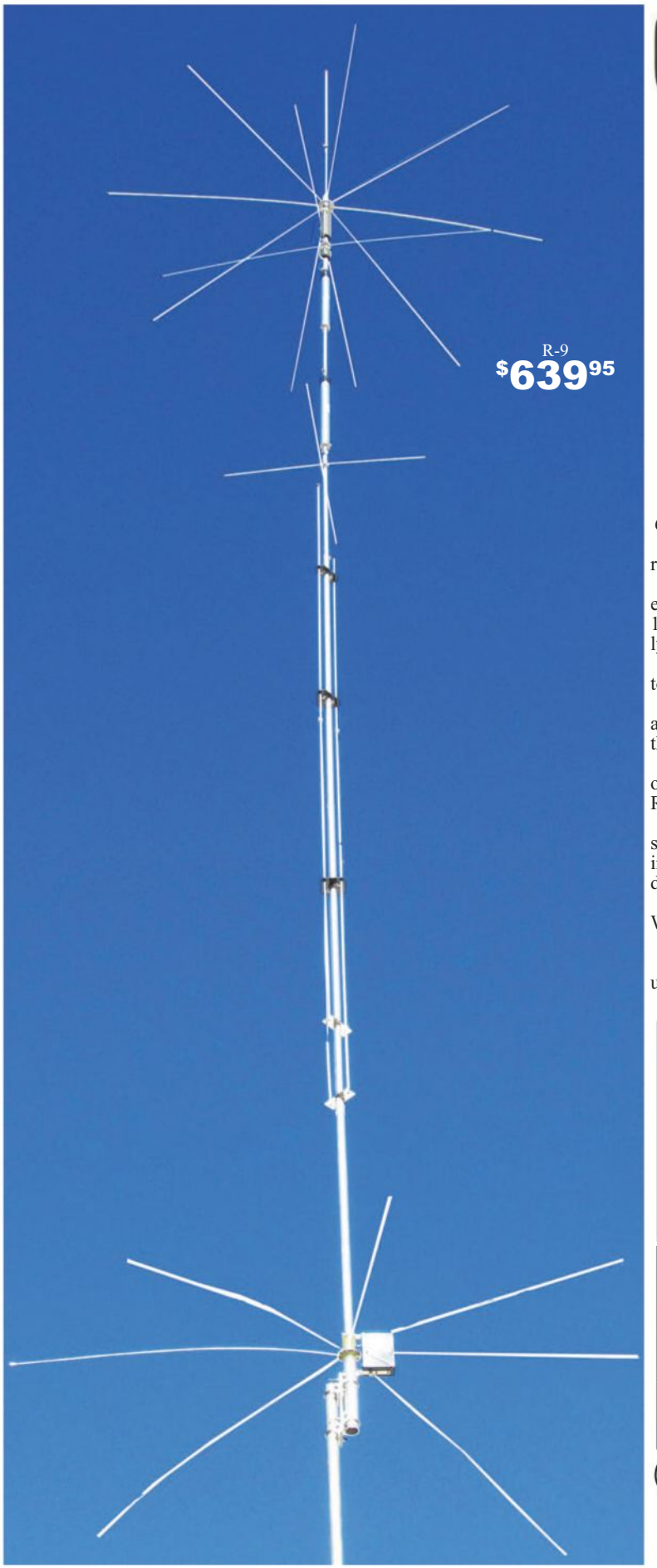

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Big Brother R9 now includes 75/80 Meters for local ragchewing and worldwide low band DX *without radials*!

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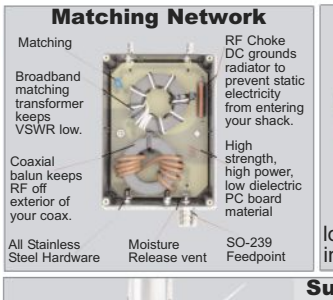
R-8GK, $59.95. Three-point guy kit for high winds.

Matching Network



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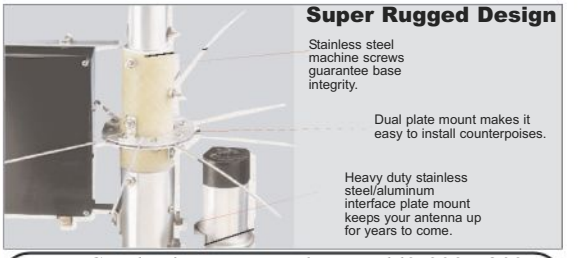

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FCC Opens Door for Return of "Expired" Hams, Remote Exam Sessions

Acting on several long-pending rulemaking proposals, the FCC in early June made it easier for former hams to regain their licenses, and for hams/prospective hams in remote areas to take license exams.

When the new rules take effect (likely in mid-July), ex-hams who held General, Advanced or Extra Class licenses will be given credit for Element 3 and/or Element 4 (as appropriate) … BUT they will still need to retake and pass the Element 2 Technician exam. This puts them on the same footing with people holding expired pre-1987 Technician licenses (which then required passing the Element 3 written exam).

In addition, the FCC gave the green light to Volunteer Examiner Coordinators — at their discretion — to offer remote exam sessions, with VE supervision via audio/video links. This should increase exam opportunities in hard-to-reach locations. The Commission also decided against its own proposal to reduce the minimum number of Volunteer Examiners at a test session from three to two, to grant lifetime credit for Certificates of Successful Completion of Examinations (CSCEs), and to change the license renewal grace period and the timetable for making expired callsigns available to the vanity call system.

Finally, the FCC approved the ARRL's request to specifically permit certain TDMA (Time Domain Multiple Access) modes on amateur frequencies.

NASA/NOAA Agree that Solar "Mini-Max" is Here

Members of the joint NOAA/NASA Solar Cycle Prediction Panel are in agreement that we are currently at the peak of Solar Cycle 24, and that, according to *NASA Science News*, "it is not very impressive." In fact, says the report, "there are only a few Solar Maxima weaker than this one," and many researchers, it says, are calling this a "Mini-Max."

Nonetheless, the panel warned that significant solar events, "such as strong flares and significant geomagnetic storms," can be expected during the downward slope of any solar cycle, regardless of its strength.

WRTC Awards for the Rest of Us!

The main competition in this month's World Radiosport Team Championship (WRTC 2014) is among the 59 teams from 38 countries who will be operating with special 1x1 callsigns on the weekend of July 14-15. But recognizing that those teams need to work the rest of us, the WRTC organizing committee has put together a series of awards to encourage the general ham population to join in the fun.

Included are several levels of activity awards for contacting at least 30 of the 59 team stations, as well as an "Assistant Judge" award for hams who submit logs within six hours of the end of the contest to help in log-checking. For more information, visit <http://www.wrtc2014.org>. *[Also see "Those Flying Finns…," Contesting, and "On the Cover" in this issue. - ed.]*

FCC Again Going After 14.313

Two hams who frequent the frequently-unruly activity on 14.313 MHz have been cited by the FCC for violations related to station identification, and four others were told they would face enforcement action if they did not comply with formal requests to stay off of certain repeaters.

FCC Special Counsel Laura Smith cited Larry King, KI8NGS, of Michigan for operating on 14.313 for at least 20 minutes without identifying (FCC direction-finding was used to identify his station); and Tennessee ham Daniel Churovich, N9RSY, was cited for repeatedly communicating with a station on 14.313 who failed to properly identify himself. Smith noted that it is also a rule violation to communicate with an unidentified station, as that station may not be a licensed amateur.

In addition, according to the *ARRL Letter*, four hams in three states were warned in late March that the Commission expected them to "abide by the request of the trustee and/or control operator" of specific repeaters (or any others) not to operate on them.

Spain's Ham King Stepping Down

King Juan Carlos of Spain, known on the ham bands as EAØJC, announced in early June that he would be abdicating the throne, thus making his son, Crown Prince Felipe, the new king. The announcement came via the office of the President of the Government. In accordance with the country's constitution, Spain's parliament must pass a law implementing the change. At press time, no date had been given for the transition.

Juan Carlos assumed the throne in 1975 after the death of former dictator Francisco Franco, and helped guide the country successfully into democracy. He is 76. *(Maybe we'll be hearing EAØJC on the ham bands more frequently! - ed.)*

(Continued on page 102)

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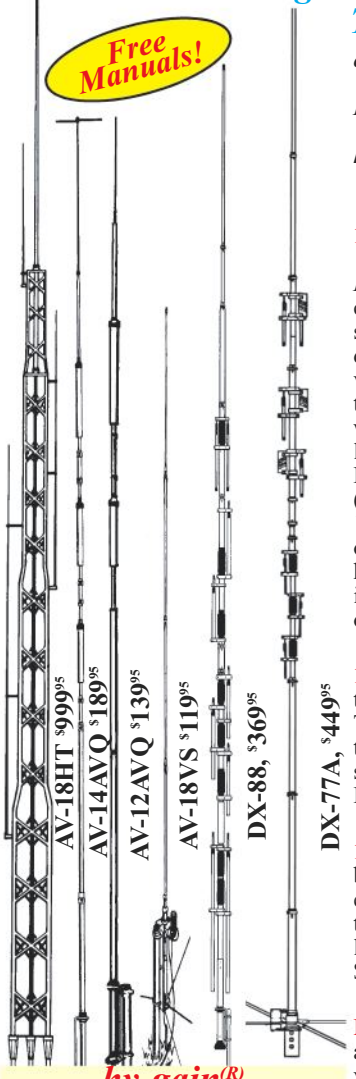

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AV-18HT, $999.95. (10,12,15,20,40,80 M, 160, 17 Meters optional). 53 ft., 114 lbs.

Standing 53 feet tall, the famous *Hy-Gain HyTower* is the world's best performing vertical! The AV-18HT features automatic band selection achieved through a unique stub-decoupling system which effectively isolates various sections of the antenna so that an electrical 1/4 wavelength (or odd multiple of a 1/4 wavelength) exists on all bands. Approximately 250 kHz bandwidth at 2:1 VSWR on 80 Meters. The addition of a base loading coil (**LC-160Q, $109.95**), provides exceptional 160 Meter performance. **MK-17, $89.95**. Add-on 17 Meter kit. 24 foot tower is all rugged, hot-dip galvanized steel and all hardware is iridited for corrosion resistance. Special tilt-over hinged base for easy raising & lowering.

AV-14AVQ, $189.95. (10,15,20,40 Meters). 18 ft., 9 lbs. **The** Hy-Gain AV-14AVQ uses the same trap design as the famous Hy-Gain Thunderbird beams. Three separate air dielectric Hy-Q traps with oversize coils give superb stability and 1/4 wave resonance on all bands. Roof mount with Hy-Gain AV-14RMQ kit, $89.95.

AV-12AVQ, $139.95. (10, 15, 20 Meters). 13 ft., 9 lbs. **AV-12AVQ** also uses Thunderbird beam design air dielectric traps for extremely Hy-Q performance. This is the way to go for inexpensive tri-band performance in limited space. Roof mount with AV-14RMQ kit, $89.95.

AV-18VS, $119.95 (10,12,15,17,20,30,40,80 Meters). 18 ft., 4 lbs. **High** quality construction and low cost make the AV-18VS an exceptional value. Easily tuned to any band by adjusting feed point at the base loading coil. Roof mount with Hy-Gain AV-14RMQ kit, $89.95.

DX-88, $369.95. (10, 12, 15,17,20,30,40,80 Meters, 160 Meters optional). 25 ft., 18 lbs.

All bands are *easily* tuned with the DX-88's *exclusive* adjustable capacitors. 80 and 40 Meters can even be tuned from the ground without having to lower the antenna. Super heavy-duty construction. DX-88 OPTIONS: 160 Meter add-on kit, KIT-160-88, $199.95. Ground Radial System, GRK-88, $99.95. Roof Radial System, RRK-88, $99.95.

DX-77A, $449.95. (10, 12, 15, 17, 20, 30, 40 Meters). 29 ft., 25 lbs.

No ground radials required! Off-center-fed Windom has 55% greater bandwidth than competitive verticals. Heavy-duty tiltable base. Each band independently tunable.

Model #	Price	Bands	Max Power	Height	Weight	Wind Surv.	Rec. Mast
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AV-14AVQ	**$189.95**	**10,15,20,40**	**1500 W PEP**	**18 feet**	**9 pounds**	**80 MPH**	**1.5-1.625"**
AV-12AVQ	$139.95	10,15,20 M	1500 W PEP	13 feet	9 pounds	80 MPH	1.5-1.625"
AV-18VS	**$119.95**	**10 - 80 M**	**1500 W PEP**	**18 feet**	**4 pounds**	**80 MPH**	**1.5-1.625"**
DX-88	$369.95	10 - 40 M	1500 W PEP	25 feet	18 pounds	75 mph no guy	1.5-1.625"
DX-77A	**$449.95**	**10 - 80 M**	**1500 W PEP**	**29 feet**	**25 pounds**	**60 mph no guy**	**1.5-1.625"**

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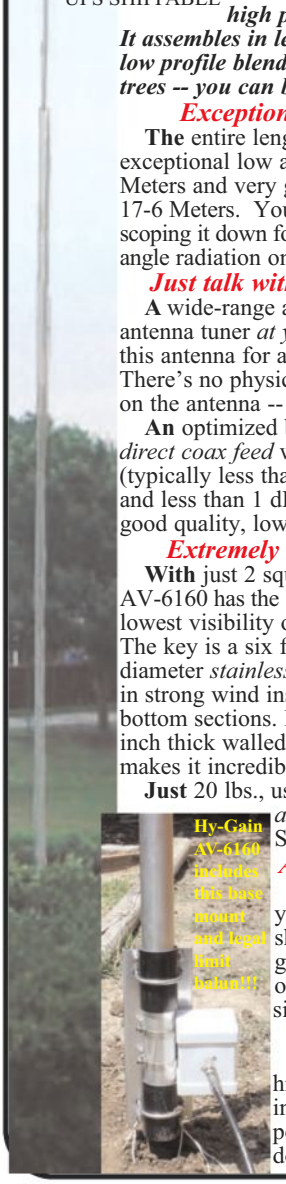
Full 1500 Watts, 43 feet, includes base mount

New! AV-6160 **$399.95** UPS SHIPPABLE

Operate all bands 160-6 Meters at full 1500 Watt with this self-supporting, 43 feet high performance vertical! It assembles in less than an hour and its low profile blends in with the sky and trees -- you can barely see it . . .



Exceptional Performance

The entire length radiates to provide exceptional low angle radiation 160-20 Meters and very good performance on 17-6 Meters. You can shorten it by telescoping it down for more effective low angle radiation on higher bands.

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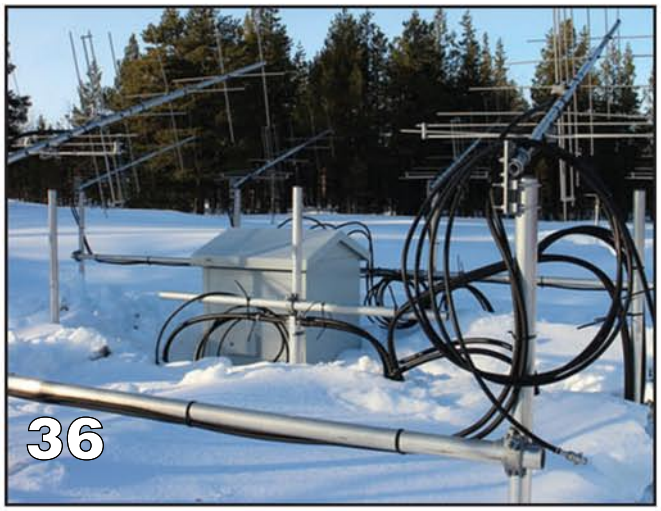

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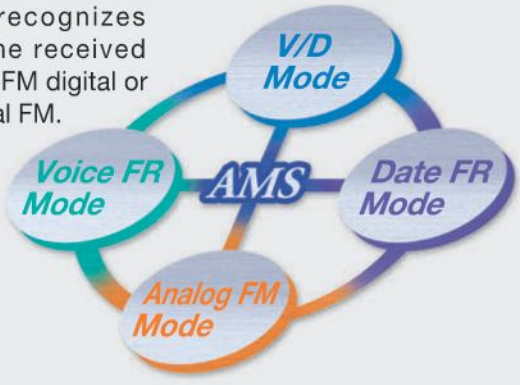
System Fusion delivers integrated operational functionality that enables you to communicate with other Amateur Radio operators using conventional FM mode while you enjoy advanced digital communication features, such as image, text data and GPS position data using C4FM digital. System Fusion is designed to enable seamless communication between conventional FM and C4FM Digital Communication using a single unified platform.

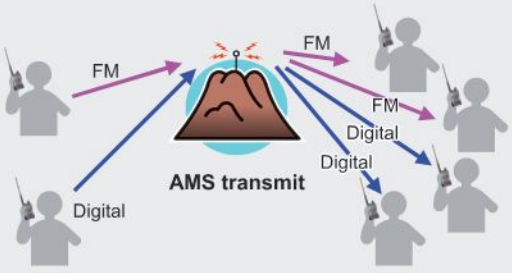
AMS (Automatic Mode Select)

- Instantly recognizes whether the received signal is C4FM digital or conventional FM.



FM Friendly Digital

- System Fusion can be used in multiple ways, for digital communication, for conventional FM communication and even internet communication.



New Functions Enabled by C4FM Digital Communication

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DR-1X

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C4FM Clear and Crisp Voice Technology

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- Automatic Mode Select (AMS) Function
- Snapshot Picture Taking Capability
- Digital Group Monitor Function
- Smart Navigation Function

Equipped with advanced touch panel operation and full-color TFT large-scale display

C4FM Clear and Crisp Voice Technology

C4FM FDMA 144/430 MHz DUAL BAND
50W DIGITAL/FM TRANSCEIVER

FTM-400DR

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- Automatic Mode Select (AMS) Function
- 3.5-inch Full Color Touch Panel Operation
- Snapshot Picture Taking Capability
- Digital Group Monitor Function
- Smart Navigation Function

Advanced VoIP wireless WIRES-X

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HRI-200

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zero bias – a CQ editorial

BY RICH MOSESON,* W2VU

Miscommunication Emergency

"We need you." I can't count the number of people who said that to us at Dayton this year, in our frank discussions with readers and industry colleagues about the recent difficulties we've been experiencing and the actions we've been taking to get things back on track. "Amateur radio needs more than one voice," they would often continue. "It can't just be the ARRL."

There is nothing new about this sentiment. Seventy years ago, according to *CQ* founder Sanford Cowan, then-FCC Chairman James Fly approached him about publishing an amateur radio magazine (since he and John Potts had purchased *CQ*'s predecessor, *Radio*, which was beginning to focus more on audio and what would become hi-fi). The ARRL can't be amateur radio's only voice, the chairman told him[1].

For the past seven decades, *CQ* has been providing an independent voice, never hesitating to call the ARRL on the carpet when it does something foolish. And as if to prove that nothing has changed, the ARRL has gone and done something not only foolish, but downright dangerous to amateur radio.

Hidden away on page 75 of the June issue of *QST* is an essay in the magazine's Public Service column by ARRL Emergency Preparedness Manager Mike Corey, KI1U. Innocuously titled "Amateur Radio Is Public Service," the article goes on to describe a conscious, ongoing, effort within ARRL to *de-emphasize* the use of the term "emergency communications" in describing what we do in times of need and replace it with what he considers the broader and more inclusive term, "public service communications."

"The problem begins with the definition of 'emergency communications,' " writes Corey. "One does exist and can be found on the FCC's website (www.fcc.gov/guides/emergency-communications)… Amateur radio is not mentioned in this description of emergency communications… To put it simply, we can help support emergency communications, but we are not an *emergency communications service*."

He then goes on to discuss the distinctions between public service communications (which he estimates - without citing a source - accounts for about 80% of our community-focused communications), disaster communications (19%) and life-and-death emergency communications (1%). Our terminology, he says, should not focus on that 1% of our activities, but rather on the bigger picture.

Further, he notes that amateur radio's service to our communities is not limited to providing public service communications, but also includes serving the public "with our technical expertise, educational programs and through our experimentation with and advancement of the radio art."

Corey also says that "EmComm" has been a divisive term within the amateur community while "public service," he believes, "is a term that most amateurs can rally behind … Our service to the public includes all amateurs, not just a select few set apart by an acronym."

Foolish and Harmful Actions

We believe this change in terminology by the ARRL is not only foolish but harmful. Indeed, rather than protecting the interests of amateur radio - which is its primary responsibility - the ARRL in this case is actively endangering our frequencies and future standing with government officials. Let's take a look at each of the arguments presented in Corey's essay.

*e-mail: <w2vu@cq-amateur-radio.com>

An Amazing Experience

I would like to personally thank all of the hundreds and hundreds of our readers, fellow hams and industry colleagues who talked with us at the Dayton Hamvention® for your amazing levels of support and understanding as we move ahead with the changes we are making to get our print editions back on a regular schedule and to get everything back on a more solid footing.

I lost count of how many of you told us to "hang in there" and reassured us that virtually every small business goes through rough periods. Here and there over the past few months, we've wondered if all the changes we've been making to get through this difficult period are worth it. Your tremendous support and words of encouragement have shown us without a doubt that they are, and that *CQ* is an important part of your ham radio lives. Our promise to you is to continue doing what needs to be done to make sure we can continue to be there for you for many years to come. Thank you again.—W2VU

#1: *The definition of emergency communications*: The definition that he cites was cherry-picked from a brochure written for the general public that focuses on the ways in which the average person might have contact with the EmComm system, such as by calling 9-1-1 or listening to an emergency alert on broadcast radio. Assuming that this "definition" excludes everything else is absurd, since by that standard, radio communications between police officers or firefighters responding to an emergency also would be excluded.

In addition, this narrow "definition" from a consumer brochure completely ignores the focus on emergency communications that is an essential part of the FCC's rules for the Amateur Service, starting with the very first item at the very beginning of Part 97 in the Basis and Purpose of the Amateur Service: "*(a) Recognition and enhancement of the value of the amateur service to the public as a voluntary noncommercial communication service, particularly with respect to providing emergency communications.*"

That's "emergency communications," not "public service communications." The rules also specifically address emergency communications in several other areas, including limited authorization to communicate with non-amateur stations ("*while providing emergency communications*"), authorization to pass international third-party traffic without regard to having an agreement in place ("*when transmitting emergency or disaster relief communications*"), and an entire subpart devoted to "*Providing Emergency Communications*." If there is any confusion regarding the definition of emergency communications, it appears to be in Newington, not in Washington, and not in communities around the United States.

Amateur radio's value to the public, "*particularly with respect to providing emergency communications*," is at the core of our justification for having either exclusive or shared access to a greater swath of frequencies across virtually the entire RF spectrum than any other service besides the military. De-emphasizing our role "with respect to providing emergency communications" undermines the basis and purpose of our service and endangers our continued access to the frequency bands we use every day.

#2: *Drawing distinctions between public service, emergency and disaster communications* is a distraction and "a solution in search of a problem." Corey says that in his law enforcement days, he was told that the difference between a disaster and an emergency is that "a disaster happens

to you; an emergency happens to me." This is just plain wrong. Police respond to other people's emergencies every hour of every day, and very few of them occur within the context of a disaster.

Amateur radio emergency communications is not limited to calling in auto accidents, as Corey suggests. A perfect example of this can be found right on the ARRL's website. A May 6 posting titled "Ham Radio Volunteers Shift Gears to Handle Mountain Bike Event Emergency" described how members of the Yavapi Amateur Radio Club in Arizona, providing public service communications for a 50-mile bike race, quickly shifted into emergency communications mode when the weather turned bad and some of the 2000 riders began showing signs of hypothermia. "Net control worked with race, search-and-rescue, and other emergency personnel to coordinate transportation to evacuate these riders," the article reported, noting that after the weather cleared, "the net shifted back into its accustomed role of gathering race updates from the checkpoints." This was an *emergency*, not a disaster, and hams provided *emergency communications* until the situation improved.

Likewise, when last year's Boston Marathon was disrupted by a terrorist bombing, hams providing public service communications for the race instantly began providing *emergency communications* - helping authorities make sure that remaining runners were escorted off the course safely and efficiently, and connected with transportation to meet up with their families. Thankfully, the marathon bombing did not rise to the level of a disaster, but since it was considered possible in those early minutes that there might have been additional bombs along the route, securing the course and getting the runners safely off of it was considered an emergency. Once again, the hams did what they've always done.

Part of the ARRL's supposed rationale for changing its terminology is that most of the communications that we provide on behalf of the public (80%, according to the article, but with absolutely no substantiation) falls under the category of public service events, such as a bike race or a marathon. But why do we do this? For the t-shirts? For the enjoyment of getting up at 5 AM on a weekend in order to be in position with our gear before a course is closed to vehicles? Hardly.

There are two primary reasons: 1) to be able to provide emergency communications in the event that one or more of the participants become ill or injured, or the safety of participants is threatened (see examples above), and 2) to train and practice in a relatively low-pressure environment so that in the event of an emergency or disaster, we are prepared to quickly deploy our stations, assemble our networks and provide effective, efficient communications, whether to replace or to supplement normal communication channels. (See example in this month's "Emergency Communications" column on page **XX** - discussion of this issue made us realize that we needed to rename our "Public Service" column as "Emergency Communications," because as column editor KI6SN writes this month, "It's All Emergency Communications When You Think About It.")

Corey says correctly that we are not an emergency communications service, but in the first critical minutes or hours after a significant event, hams often provide what is many times the only communication link to a stricken area - and much of the communication that we provide relates to bringing emergency response to places where it is needed. Hurricanes Sandy and Katrina and the 9/11 attacks are but three examples of ham radio providing vital *emergency* communications in the earliest hours of what became disasters for which we later provided more routine disaster-relief communications. But there was nothing routine about those early hours.

Without the training and practice provided by our activity in "public service events," we would not be nearly as well-prepared or as effective in providing either emergency or disaster communications. Separating these functions, as the ARRL is doing, is wrong. It paints an inaccurate picture of what we do and why we do it, and will cause long-term harm to our service.

#3: *Amateur radio public service is not limited to communications*, but includes helping our communities "with our technical expertise, educational programs and through our experimentation with and advancement of the radio art." Sorry, but this simply doesn't fly. Sure, we do all this, but we are hardly alone in offering technology-based educational programs, and the vast majority of the general public views amateur radio technology as old-fashioned, not cutting-edge. A recent Fox News story on ham radio was titled "Old Technology Gets New Respect." This is the public perception of ham radio. The public is wrong in many cases, but perceptions are what they are. And what the public perceives - correctly - as amateur radio's unique value to the community is its ability to get through "when all else fails" (a term coined and promoted by the ARRL)… in other words, *emergency communications*. This is what sets us apart and we must not dilute that message or that image.

#4: *Corey says that " 'EmComm' has been a dividing term, and this does not help Amateur Radio*." I guess we haven't been paying enough attention because we were not aware of any significant conflict within the amateur community over the use of the term "EmComm" or even its root, "emergency communications." Are all amateurs involved in emergency communications? No, just as not all amateurs are involved in "public service," contesting, DXing, moonbounce or any of the myriad of different activities and specialties that come under the umbrella of amateur radio.

The difference with EmComm is that it is an integral part of our culture, and when the you-know-what hits the fan, any ham with a working radio or the ability to get to one will make himself or herself available to help (those who have trained via public service events will be more effective). We all recognize that emergency communications is the 1% of what we do that gives us the special privileges that allow us to do the other 99%. The value and importance of amateur radio emergency communications cannot be underestimated and must not be diluted.

#5: *Finally, we must wonder about the ARRL's motivations* in a) promulgating this ill-advised and dangerous change in philosophy and terminology, and b) what appears to be an active effort to divert attention from it while reporting on it in, of all places, *QST*'s Field Day issue. ARRL CEO Dave Sumner, K1ZZ's, editorial for June focuses on interference from "grow lights" - discussed on page 72 - and FCC actions at 5 GHz - discussed on page 73 - but ignores a significant change in ARRL's approach to a major underpinning of our hobby that is introduced on page 75. Did Dave stop reading this issue at the end of page 73?

Is it possible that ARRL's senior leadership is unaware of this change and that a mid-level manager is making unilateral decisions that affect our future without their knowledge? Hardly. The ARRL is a hierarchical organization whose senior management and board of directors are deeply involved in every aspect of its operation. It is virtually impossible that such far-reaching changes could be put into place without the knowledge and approval of the ARRL's top leadership.

What Next?

The ARRL's board of directors meets this month. The directors need to re-examine the change in policy and philosophy expressed by this new approach to public service vs. emergency communications, consider the short- and long-term damage it will cause to amateur radio's future, and reverse course immediately. (The very fact that this essay was published in *QST*, written by the League's Emergency Preparedness Manager, gives ammunition to those who seek our frequencies. We hope it is not too late to reverse that damage. Perhaps it's best from that perspective that the essay was buried on page 75.)

ARRL members need to contact their directors and make sure they know how you feel about this issue. You may agree or disagree with the views expressed here, but your elected representatives need to know their constituents' opinions on such a significant matter.

Finally, the ARRL needs to please, please, stop trying so hard and so consistently to prove the ongoing need for an independent voice to point out when the emperor has no clothes. —73, W2VU

Note:
1- See 50th anniversary issue of CQ, January 1995, for complete interview.

HARRISBURG, PENNSYLVANIA — The Harrisburg Radio Amateurs' Club will hold the **42nd Annual Firecracker Electronics Expo and Hamfest** and the **ARRL Eastern Pennsylvania Section Convention** Saturday, July 5. General contact: Tim Lehman, KB3OZA, P.O. Box 453, Hummelstown, PA 17036. Phone: (717) 982-8550. Email: <kb3oza@arrl.net>. Website: <http://www.w3uu.org>. Talk-in 146.16+ (PL 100). Special event station, **W3W**, and VE exams.

LEHMAN, PENNSYLVANIA — The Murgas Amateur Radio Club will hold the **35th Annual Wilkes-Barre Hamfest and Computerfest** Sunday, July 6. Contact: Bill, KB3KUJ, (570) 510-1680 or Herb, K2LNS, (570) 829-2695. Website: <http://www.murgasarc.org>. Talk-in 146.61 (PL 82.5). VE exams.

DUNSEITH, NORTH DAKOTA — The 51st International Hamfest will be held Friday, July 11 and Saturday July 12. Contact: Richard Holder, VE4QK, P.O. Box 1011, Beausejour, Manitoba, Canada R0E 0C0. Phone: (204) 268-1702. Email: <ve4qk@mts.net>. Website: <http://www.mts.net/~holderr/ihf.htm>. VE exams.

MILTON, FLORIDA — The Milton Amateur Radio Club will hold the **19th Annual Ham Fest** Friday, July 11 and Saturday, July 12. Contact: Milton ARC, P.O. Box 4072, Milton, FL 32570-4072. Phone (850) 390-1665. Talk-in 145.490 (PL 100). VE exams.

AUSTINTOWN, OHIO — The 20/9 Radio Club will hold the **20/9 Radio Club Tailgate/Hamfest 2014** Saturday, July 12. Contact 20/9 Radio Club, (330) 651-8420. VE exams.

CEDAR FALLS, IOWA — The Northeast Iowa Radio Amateur Association (WØMG) will hold **WØMG Swap Meet 2014** Saturday, July 12. Email: <swapmeet2014@w0mg.net>. Website: <http://www.w0mg.net>. Talk-in 146.94– (PL 136.5).

ERIE, PENNSYLVANIA — The Wattsburg Wireless Association will hold the **13th Annual Northwest Pennsylvania Hamfest** Saturday, July 12. Contact: NW PA Hamfest, 9333 Tate Road, Room #114, Erie, PA 16509. Email: <hamfest@wattsburg-wireless.us>. Website: <http://www.wattsburg-wireless.us>. Talk-in 147.315. VE exams.

INDIANAPOLIS, INDIANA — The Indianapolis Radio Club will hold the **44th Indianapolis Hamfest and Communications Expo** Saturday, July 12. Contact: Indianapolis Hamfest, P.O. Box 1672, Noblesville, IN 46061. Phone: (317) 261-6658. Website: <http://www.indyhamfest.com>. Talk-in 146.76–. VE exams.

KIMBERTON, PENNSYLVANIA — The Mid-Atlantic Radio Club will hold the **Valley Forge Hamfest and Computer Fair** Saturday, July 12. Contact: MARC, P.O. Box 557, Fagleville, PA 19408. Email: <hamfest-info@marc-radio.org>. Website: <http://www.marc-radio.org>. Talk-in 145.13– or 147.06+ (PL 131.8). VE exams.

NORTH BEND, NEBRASKA — The Pioneer Amateur Radio Club will hold its **17th Annual Flea Market** Saturday, July 12. Contact: Rich Mehaffey, KBØARZ, 230 W. 11th Street, North Bend, NE 68649-4011. Phone (402) 652-3410. Email: <4randjme@futuretk.com>. Website: <http://www.k0jfn.com>. Talk-in 146.67–. VE exams.

OAK CREEK, WISCONSIN — The South Milwaukee Amateur Radio Club Inc., will hold its **Swapfest '14** Saturday, July 12. Contact: Robert (414) 764-3871. Email: <wb9tik@arrl.net>. Talk-in 146.52 simplex.

SAINT PAUL, MINNESOTA — The Minnesota Amateur Group of Independent Communicators will hold its **11th Annual Magic Repeater Yard Sale** Saturday, July 12. Contact: George, NØSBU, <n0sbu@arrl.net>. Website: <http://www.magicrepeater.net>. Talk-in 145.170– (PL 100).

SALISBURY, NORTH CAROLINA — The Rowan Amateur Radio Society will hold the **29th Annual Firecracker Hamfest** Saturday, July 12. Contact: Ralph Brown, WB4AQK, (704) 636-5902. Email: <rkbrown5902@bellsouth.net>. Website: <http://www.rowanars.org.> Talk-in 145.41 (PL 136.5) or 146.52. VE exams.

TEXAS CITY, TEXAS — The Tidelands Amateur Radio Society will hold **Hamfest 2014** Saturday, July 12. Contact: Tidelands Amateur Radio Society, P.O. Box 73, Texas City, TX 77592. Email: <aa5op@yahoo.com>. Talk-in 147.14 (PL 167.9) or 442.025 (PL 103.5). VE exams.

AURORA, ILLINOIS — The Fox River Radio League will hold its **Hamfest** Sunday, July 13. Contact: Dawn Williams, KC9LQS, (630) 531-1670. Email: <hamfest@frrl.org>. Website: <http://www.frrl.org>. Talk-in 147.210+ (PL 103.5). VE exams.

CICERO, NEW YORK — The Radio Amateurs of Greater Syracuse will hold the **RAGS 2014 Hamfest** Sunday, July 13. Contact: Roger Hamilton, WA2AEW, <hamfest@ragsclub.org>. Website: <http://www.ragsclub.org>. Talk-in 146.91– (PL 103.5). VE exams.

AUGUSTA, NEW JERSEY — The Sussex County Amateur Radio Club will hold the **35th Annual SCARC Hamfest** Sunday, July 13. Contact: Dan Carter, N2ERH, 8 Carter Lane, Branchville, NJ 07826. Phone: (973) 948-6999. Email: <hamfest@scarcnj.org>. Website: <http://www.sussexhamfest.org>. Talk-in 147.30+ (PL 151.4). VE exams.

HARTFORD, CONNECTICUT — The American Radio Relay League will hold its **ARRL National Centennial Convention 2014** from Thursday, July 17 through Sunday, July 19. Contact: ARRL, 225 Main Street, Newington, CT 06111. Phone: (860) 594-0200. Email: <expo@arrl.org>. Website: <http://www.arrl.org>.

WILLIAMS, ARIZONA — The Amateur Radio Council of Arizona and the **City of Williams** will hold the **2014 ARCA/Williams Hamfest** and **ARRL Arizona State Convention** Thursday, July 17 to Sunday, July 20. Contact: ARCA, (602) 881-ARCA (2722). Website: <http://www.arca-az.org>. Talk-in 146.78- (PL 91.5). VE exams.

ESSEX, MONTANA — The 80th Annual Glacier-Waterton International Peace Park Hamfest will be held Friday, July 18 through Sunday, July 20. Contact: Hamfest Registrar, P.O. Box 1763, Great Falls, MT 59403. Website: <http://www.gwhamfest.org>. VE exams.

ALEXANDER, NEW YORK — The Lancaster Amateur Radio Club, Inc. will hold the **Batavia Hamfest** Saturday, July 19. Contact: Luke, N2GDU, (716) 481-5747. Talk-in 147.285 (PL 141.3). VE exams.

ALLISON PARK, PENNSYLVANIA — The North Hills Amateur Radio Club will hold its **29th Annual Hamfest** Saturday, July 19. Contact: John Fowler, KB3YBS, 200 Lee Avenue, Pittsburgh, PA 15237. Phone: (412) 366-3133 or (412) 496-3720. Email: <johnr.fowler@gmail.com>. Website: <http://www.nharc.org>. Talk-in 147.090 (PL 88.5). VE exams.

ATHENS, TENNESSEE — The McMinn County Amateur Radio Club, Inc. will hold the **10th Annual MCRAC Hamfest** Saturday, July 19. Contact: MCARC (423) 263-1989. Email: <kg4fzr@yahoo.com>. Website: <http://www.mcminnarc.com>. Talk-in 147.060– (PL 141.3) or 145.150– (PL 141.3).

CARY, NORTH CAROLINA — The Cary Amateur Radio Club will hold the **Annual Cary NC Mid-Summer Swapfest** Saturday, July 19. Email: <n4nc@arrl.net>. Website: <http://www.qsl.net/n4nc>. VE exams.

ELYRIA, OHIO — The Northern Ohio Amateur Radio Society will hold **NOARSFEST 2014** Saturday, July 19. Contact: NOARS Hamfest Committee, 161 Herrmann Drive, Avon Lake, OH 44012. Darlene Ohman, KA8VTS, (216) 398-8858 (before 11 p.m.) Email: <noarsfest@noars.net>. Website: <http://noars.net>.

FRANKFORT, NEW YORK — The Utica Amateur Radio Club, Inc. will hold **Radiocom 2014 Hamfest and Computer Fair** Saturday, July 19. Contact: Bob Decker, AA2CU, (315) 797-6614. Email: <tbd2626@yahoo.com>. Website: <http://www.uticaarc.com>. Talk-in 146.76–. VE exams.

NORTH BEND, OREGON — The Coos County Radio Club will hold its **Annual Hamfest and Swapmeet** Saturday, July 19. Contact: Zane Albertson, WA7OXM, Coos County Radio Club, P.O. Box 698, Coos Bay, OR 97420. Phone: (541) 404-6908. Email: <zane.albertson@gmail.com>. Talk-in 146.610– (PL 110.9) or 147.280+ (PL 146.2). VE exams.

OTTUMWA, IOWA — The Ottumwa Amateur Radio Club will air special event station, **W4H**, from 0400 to 1000 UTC, Saturday, July 19. Frequencies include 14.250 and 7.250. QSL a #10 SASE to Paul Cartwright – W4H, 8431 215th Avenue, Blakesburg, IA 52536. Website: <http://w4h.wa0dx.org>.

SLIDELL, LOUISIANA — The Ozone Amateur Radio Club will hold the **2014 Slidell EOC Hamfest** Saturday, July 19.

Contact: Paul Strickland, WB9SUG, (985) 373-8093. Email: <hamfest@w5sla.net>. Talk-in 147.270+ (PL 114.8). VE exams.

WARRENSBURG, MISSOURI — The Warrensburg Area Amateur Radio Club, Inc. will hold the **Warrensburg Hamfest** Saturday, July 19. Contact: Ken Smith, (660) 441-0007. Email: <hamfest@waarci.org>. Website: <http://www.waarci.org>. Talk-in 146.880 (PL 107.2). VE exams.

CAMBRIDGE, MASSACHUSETTS — The Harvard Wireless Club, MIT Electronics Research Society, MIT UHF Repeater Association, and **MIT Radio Society** will hold the monthly **Flea at MIT** Sunday, July 20. Contact: MIT Radio Society, W1GSL, P.O. Box 397082, Cambridge, MA 02139-7082. Phone: (617) 253-3776 (9-5, Monday-Friday). Website: <http://www.swapfest.us>. Talk-in 146.52 or 449.725– (PL 114.8).

PEOTONE, ILLINOIS — The Kankakee Area Radio Society (W9AZ) will hold **KARSFEST 2014, the 31st Annual Hamfest** Sunday, July 20. Contact: Craig Cahan, N9FD, 7 Franklin Drive, Manteno, IL 60950. Phone: (815) 474-2237. Email: <karsfest@gmail.com>. Website: <http://www.w9az.com>. VE exams.

SOMERSET, PENNSYLVANIA — The Somerset County Amateur Radio Club will hold the **Somerset County PA Hamfest** Sunday, July 20. Contact: Stew, AK3J, (814) 444-0637. Email: <ak3j@arrl.net>. Website: <http://www.k3smt.org>. Talk-in 147.195+ (PL 123) or 443.250+ (PL 123). VE exams.

VAN WERT, OHIO — The Van Wert Amateur Radio Club will hold the **27th Annual Van Wert Hamfest** Sunday, July 20. Contact: Steve Kouts, WA8WKF, (419) 771-8152. Email: <secretary@w8fy.org>. Website: <http://w8fy.org>. Talk-in 146.850.

WASHINGTON, MISSOURI — The Zero Beaters Amateur Radio Club will hold the **52nd Annual Zero Beaters ARC Hamfest** Sunday, July 20. Contact: Bruce Serbus <kd0kcf@sbcglobal.net>. Website: <http://www.zerobeaters.org>. Talk-in 147.24+. VE exams.

WEST FRIENDSHIP, MARYLAND — The Baltimore Radio Amateur Television Society will hold the **Maryland Hamfest and Computer Fest** Sunday, July 20. Email: <hamfest@bratsatv.org>. Website: <http://www.bratsatv.org>. VE exams.

AUSTIN, TEXAS — The Central States VHF Society will hold the **48th Annual CSVHFS Conference** from Thursday, July 24 through Sunday, July 27. Website: <http://www.csvhfs.org>.

OKLAHOMA CITY, OKLAHOMA — The Central Oklahoma Radio Amateurs will hold **Ham Holiday** Friday, July 25 and Saturday, July 26. Contact: CORA, P.O. Box 1103, Nicoma Park, OK 73066. Vendors email: <vicepresident@hamholiday.org>. Website: <http://www.hamholiday.com>. Talk-in 146.82– (PL 151.4). VE exams.

CHEHALIS, WASHINGTON — The Chehalis Valley Amateur Radio Society will hold the **16th Annual Indoor/Outdoor Electronic Tailgate Swapmeet** Saturday, July 26. Contact: John, (360) 273-5929. Email: <k7osk@boatanchor.com>. Website: <http://www.cvars.org>. Talk-in 146.07 (PL 110.9). or 146.52 simplex. VE exams.

COVINGTON, GEORGIA — The Newton County Radio Club will hold the **2014 Covington Hamfest** Saturday, July 26. Contact: Del Davis, W4DEL, (404) 229-7555. Email: <w4del@att.net>. Website: <http://ncrcga.org>. Talk-in 146.925 (PL 88.5). VE exams.

LANSING, MICHIGAN — The Central Michigan Amateur Radio Club will hold the **2014 CMARC "Outdoor" Hamfest** Saturday, July 26. Contact: Julie McLain, KB8ZXR, (517) 694-0812. Email: <kb8zxr@aol.com>. Talk-in 145.390 (PL 100). Special event station, **K8H**, and VE exams.

MONUMENT, COLORADO — The Pikes Peak Radio Amateur Association, Inc. will hold the **PPRAA Ham Radio Megafest** Saturday, July 26. Contact: PPRAA, P.O. Box 16521, Colorado Springs, CO 80935. Email: <megafest@ppraa.org>. Website: <http://ppraa.org>. Talk-in 146.970- (PL 100). VE exams.

WAYNESVILLE, NORTH CAROLINA — The Western Carolina Amateur Radio Society (W4MOE) will hold its **Hamfest** Saturday, July 26. Contact: WCARS, P.O. Box 1488, Asheville, NC 28802. Website: <http://www.wcars.org>. Talk-in 146.910– (PL 91.5) or 147.390+ (PL 94.8). VE exams.

OSHKOSH, WISCONSIN — The Fox Cities Amateur Radio Club will air a special event station from 1500 to 0000 UTC daily, from Wednesday, July 30 to Sunday, August 3. Frequencies include 14.250, 7.250, 50.150 SSB. QSL a large SASE to FCARC AirVenture 2014, P.O. Box 2346. Appleton, WI 54912.

The "Olympics" of ham radio contesting will be held this month in Massachusetts. While N2GA has short profiles of several teams in his Contesting column in this issue, OH2BH gives us a more in-depth look at two teams of Finnish hams, including what he's calling the "Oldies Team" and some of the unique technology they'll be using to compete.

Those Flying Finns Gearing Up for WRTC 2014

BY MARTTI LAINE,* OH2BH/CU2KG

The World Radiosport Team Championship (WRTC) is an invitation-only amateur radio contest, the ham radio world's equivalent of the Olympic Games, held every four years in different parts of the world. The first-ever WRTC was staged in 1990 in the state of Washington in the United States, coinciding with the Goodwill Games held that summer in and around Seattle. Ted Turner, founder of the Cable News Network (CNN), had a dream: He conceived of Goodwill Games as a rival to the Olympics. In the end, however, that did not come to pass, but WRTC emerged as a major competitive amateur radio event and has been here ever since.

In this competition, each of the participating two-person teams represent their own country and aim for the best score just like in any ordinary amateur radio contest. WRTC 2014 takes place outside Boston, Massachusetts, within the IARU HF World Championship from July 12–13. The idea is that all teams are provided with a level playing field—essentially the same QTH, the same propagation conditions, similar antennas and transmitter output power. The aim is to gauge operating skills and single out the best of the best. A demanding selection process for each country's team starts with the choice of captains, who fight for their spots in contests held in the years immediately prior to each WRTC. The captains then pick their teammates.

As in all modern sports, equipment and rules interpretations will add to the overall performance of WRTC teams.

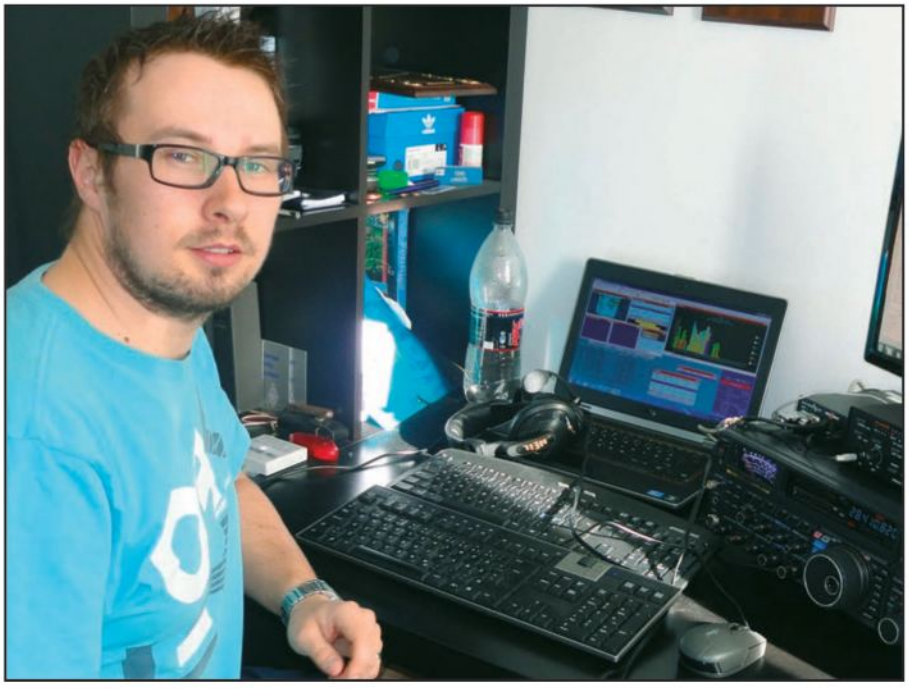


Photo A. Toni Linden, OH2UA, 34, comes to WRTC with nine CQ WW SOAB EU wins. He was part of a duo designing and building the efficient CR2X contest machine. He repeatedly broke his EU record before passing the baton to his team mate. With his military academy background, he enjoys successful attack more than marginal defense.

For this reason, many teams of non-native English speakers are left at a disadvantage, which underlines the importance of advanced technical solutions to ensure greater balance. Each station is furnished with only one triband beam which must be operational for transmit and receive on two bands simultaneously.

Going to Boston will be as many as 59 teams, including youth and YL teams and four sponsored teams. From a random draw, a callsign is designated for each team only moments before the start of the race, and all will be working on SSB (in English) or CW. These procedures are designed to make sure that no team will be able to benefit unduly from selective help from supporters "back home."

Finland Lagging in WRTC?

Finland certainly is a front-runner in radiosport (contesting) if measured in terms of contest results in relation to the

*Savasundintie 4C, 02380, Espoo, Finland
e-mail: <martti.laine@kolumbus.fi>

size of its ham radio population. For some strange reason, however, Finland has not been up to standard if the country's achievements are examined in the context of its WRTC standings over the past 25 years. In general, Finland has not gone about the business of "racing" with an intent to fight for victory, but rather with the idea of joining a happy gathering as many teams have done in the past. The only exception was made by OH1JT and OH6UM in San Francisco back in 1996 where they suffered a hard-disk crash and the immediate prospect of a top score vanished into the Bay Area mists. If you do not join a

Photo B. Kim Östman, OH6KZP, 35, is a current holder of CQ WW SOAB EU SSB and CW records gained with his first two shots. Kim's forte is a balanced act between runs and mults. His new 30-minute nap theory for a 48-hour run divides the medical community. Kim earned his Ph.D. in the humanities and now works in the field of RF microelectronics.

Photo C. Author Martti Laine, OH2BH, 67, is what he terms "an over-seasoned contester" with 50 years at it from the world over. He has six CQ WW SOAB World wins, each one record-breaking. Finally settled at OH2BH and CU2KG, he's one of those who brought the WRTC to life in 1990 as competition chairman. An experienced business executive, he plans to play his cards smartly at WRTC 2014.

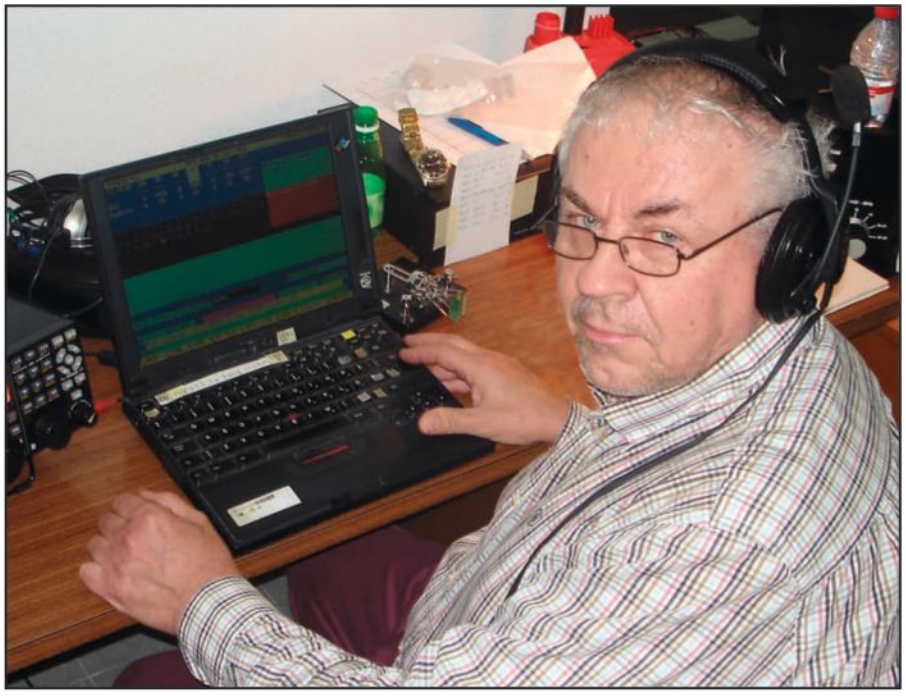


Photo D. Ville Hiilesmaa, OH2MM, 70, is an evergreen contester with victories spanning over four decades. Twelve CQ WW SOAB World victories place him in the CQ Contest Hall of Fame (along with his WRTC teammate, OH2BH—ed.). *A friendly appearance gives a wrong impression; his smile only conceals his competitiveness. Retired at PY2ZEA, Ville keeps up his medical practice during summer in his native Finland.*

Photo E. The logo of Azores Radio Team makes the most of the age of its members!

race with the intent to win, you are outclassed from the outset. For instance, at the WRTC held in Finland in 2002, the Finnish teams commanded the best knowledge of local circumstances and propagation conditions but only finished in 27th and 39th place, falling far short of reasonable expectations and causing considerable disappointment.

Could the Finnish racers wearing classic-style northern fur hats with ear flaps fight their way to the podium in 2014 or even win the gold medal? Perhaps aiming for gold under the 2014 rules is impossible, but how about targeting a position as the best non-American team?

A Close Look at the Finnish Teams

The official Finnish team is captained by Toni Linden, OH2UA (photo A), partnering with Kim Östman, OH6KZP (photo B). In terms of age (35), both are at the peak of their radiosporting performance, with multiple victories under their belts. They make for a particularly close-knit team, given their individual achievements and joint Multi-2 practice runs. One of the team's most important characteristics is the ability of both operators to work with a high degree of efficiency on both CW and SSB ,since both modes are used at the same time. If we examine the latest successful non-American WRTC top scorers, we will see that that the teams often have been handicapped by poor performance on one mode or the other. Both Finnish team members have unquestionably dominated in European competitions over the course of several years, gaining many European wins and still holding European CQ WW SSB and CW records. Now their combined know-how is their major asset. If the technology does not fail and if the teammates keep their nerve, we have every reason to expect the best Finnish WRTC performance of all time.

On top of it all, adding a surprise element to the picture will be two old contesting stalwarts—your author, Martti Laine, OH2BH (photo C), and Ville Hiilesmaa, OH2MM (photo D)—as members of Azores Radio Team (photo E), a sponsored team from the Azores. The sponsors are the Azores Tourism Authority (ATA) and the Azores international airline (SATA).

The two Old Timers are in or approaching their seventies, but according to some opinions still full of energy for their age. This elderly team boasts some significant strengths—for instance, eighteen single-op all-band (SOAB) world wins. Both OTs have earned them on CW as well as SSB. It is noteworthy that the two seniors first met in 1970 and since then have worked together to gain single-op success with their always unique concepts, be it from ZD3-land, EA8-land, CT3-land, OHØ-land, or now individually from the Azores (CU2KG/CR2X) and Brazil (PY2ZEA/PS2T). Significantly, too, they have not missed a single CQ WW contest over the past 50 years or so. Racing and winning is in their blood, but is the blood already too thick? OH2MM, being a medical doctor, may know the tricks of making the blood circulate faster.

In order to compensate for their short and shaky steps, the two have decided to take on board all permitted ancillary equipment to catch up with the lost years. Would it be possible for these aging champs to emerge from the back row to challenge the youngsters of today? That does not usually happen, since no one has yet figured out how to live forever. However, it reasonably must be accepted that, at best, this Old Timer duo will arouse everyone's attention in the Boston area, at least enough to make sure that the true-blue Finnish team can concentrate on the upcoming race in peace and quiet. The targets set by the OT team have already turned the tables by enabling the Azores Radio Team to aim for a position among the top scoring non-American teams.

Areas in Focus for the Oldies Team

The World Radiosport Team Championship is also a major social event. Participants live and socialize together in the "WRTC Village" for several days

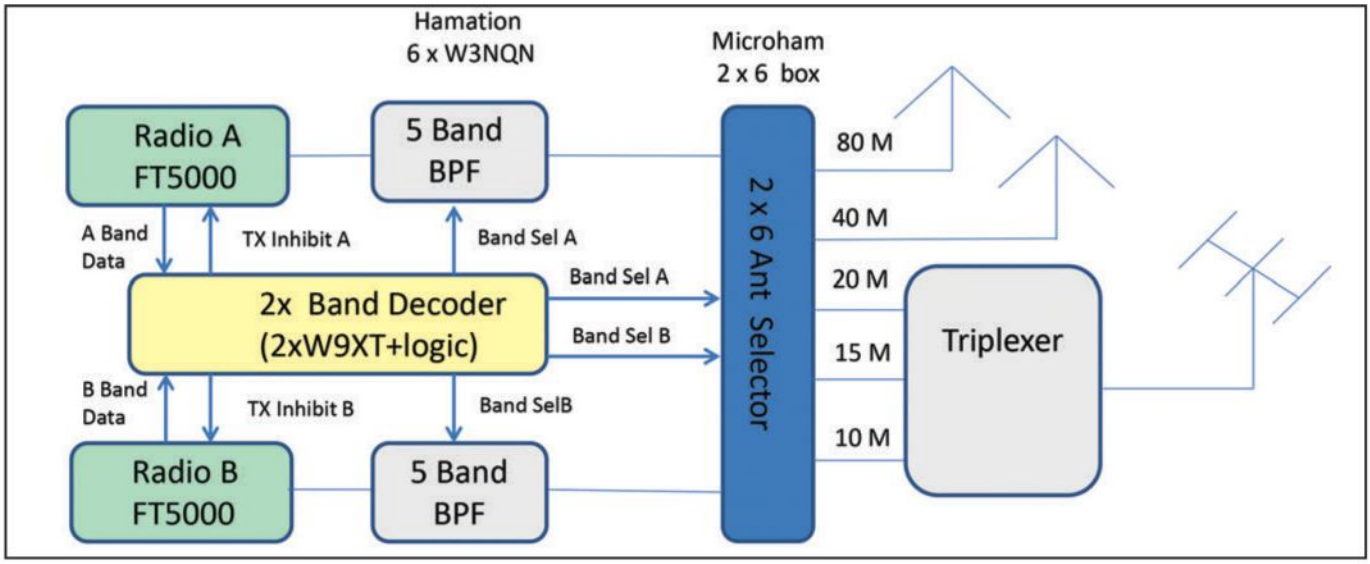


Fig. 1. Block diagram of station setup allowing simultaneous monitoring of two bands while using one antenna. The WRTC setup represents state-of-the-art technology for a Multi-2 contest configuration using multi-band antennas and fewer towers. Triplexers are commercially available for up to three kilowatts of power.

prior to the race, singing and chatting long into the night, enjoying happy reunions and good camaraderie. We have heard that at these championships even the local brew can be sampled at the WRTC Village. The two venerable Old Timers see in this their first opportunity. They will arrive in the United States well before the games and will check into their own "WRTC Village" at the station of Jim Kane, W1DF, to concentrate and overcome the jet lag. Their technical staff will assemble and test the contest setup, leaving the operators enough time to prepare for the race in peace in line with what to most Finns is the familiar F1 (Formula 1) car-racing concept. Overall, the two OTs have been influenced by the behavior of F1 luminary Kimi Raikkonen, who was for many years blamed for arrogant reticence but who, in the wake of his 2007 Formula 1 Drivers' World Championship, has won the sympathy of many car-racing enthusiasts as an ordinary Finn noted for a familiar snarl: "Made in Finland," that is.

The idea now is to turn this type of social or (asocial) behavior preceding the race into a success factor for Azores Radio Team. All in all, this team has identified four areas where the two oldies wish to act differently from other teams.

One important factor is the team's physical endurance. The two elders have been implementing their own physical fitness program since Christmas 2013. This includes the hiring of personal trainers, close monitoring of fat levels and of course pursuit of weight loss. The team will have shed 20 kilos (44 pounds) of body weight by the time they board the flight for Boston. They may walk with a lighter step and the aim is to stay in the race for 24 hours with no pain. The team's head coach is Juha, OH8NC, and under his guidance, we each now are headed for a slimmer waistline and more close-fitting race attire.

Four Focal Areas

1. Building a Boston social package different from others
2. Getting more out of the station than other teams can
3. Helping the operators with intelligent aids
4. Implementing an operating strategy different from others

How to Get More Out of It?

In the choice of radios and ancillary equipment, most teams probably aim for light weight and portability with radio "dust bunnies." Tiny radios would no doubt be most suitable for the two OTs, too, but for their radio they have selected the biggest and heaviest high-performance model (FTdx5000)—that is, a radio that is not suited for airline baggage shipping and that is too bulky to rest firmly on a folding camp table in an operating tent. However, that's not all: The radio's original, sharp

European Radiosport Team Championship "Virtual Reality" Contesting

It is possible that no organizers will be found for yet another WRTC in its current format. Therefore, a new virtual version of "WRTC" (the European Radiosport Team Championship, or ERTC) is scheduled to undergo testing at a youngsters' gathering to be organized in Finland this summer. It is called YOTA—Youngsters on the Air—and is due to be held under the auspices of the European Union and IARU Region 1 during the weekend immediately following WRTC 2014.

For the ERTC event, teams of young hams from 15 European countries will get together to compete under WRTC-like rules. The only difference will be that equipment and technology will be harmonized to an even greater extent than at the present-day WRTC, as the games take place locally but in *virtual reality,* within a framework that is exactly the same for all teams and that allows participants to concentrate fully on the secrets of operating prowess. However, how about understanding the behavior of radio propagation on various bands? Not to worry, since the ERTC platform simulates existing VOACAP-based propagation profiles on a real-time basis. This knowledge remains real even in Virtual Reality.

A virtual WRTC will make it easier to deal with logistical requirements; you only need to have access to sufficient Internet bandwidth. In a virtual environment, it is possible, for example, to set up qualifying races with no need to establish 50 radio stations for the purpose of singling out the teams that will ultimately enter the actual serious race. This kind of "ERTC radio game" is also in line with the need to reach out to young people comfortable in their own element as a potential source of newcomers to the wonderful world of amateur radio.

Finns at Radio Arcala have drafted a roadmap for the revitalization of amateur radio based on the concept of linking the past with the present and the future. For details, see <www.radioarcala.com/ ?page_id=217>.

filters are replaced with even sharper ones. The bands are going to be overcrowded, and an even partly splatter-free receive capability may make all the difference for the team's performance.

At their station, every team will have to use a triplexer (a battery of 20/15/10m bandpass/stop filters) to allow for simultaneous listening on two bands with the same beam (see fig. 1). That amounts to a real tour-de-force in implementing RF technology. It ensures a harmonious balance between band-to-band attenuation and filter battery loss.

The team's key technical wizard, Veijo, OH6KN, together with Pekka, OH1TV, and Jaska, OH8NJ, represent Finland's top RF expertise, having left a mark on Radio Arcala's high-performance operating sites at OH8X and CR2X.

In many countries, contest stations equipped with multiple antenna towers are few and far between. This being the case, the use of triplexer technology to transmit and receive with the same triband antenna beaming in multiple directions is today's most logical approach. Its usefulness will likely extend far beyond the WRTC.

Finnish Technical Know-How Even For Old Timers?

Hearing loss tends to increase with advanced age, and good hearing obviously is essential for CW and SSB contesting. For a complete hearing evaluation, Martti and Ville visited a local hearing-care professional at the start of the training period. Research into various types of hearing-control technology have demonstrated that by balancing and amplifying the needed audio segment, comprehension of the heard signal is enhanced significantly. An optimum sound profile can be constructed for the desired audio environment. The same technique is used for "slice processing" transmitter audio. Modern radios come with a limited capability of adjusting transmitter audio, but the possibility of adjusting receiver audio is more or less nonexistent. The Azores Radio Team struck a deal with the Danish company, ReSound, harnessing the latter's best audiologists and technical experts for this project.

The LiNX system chosen connects directly to an Apple 5S smartphone, and the user is able to select the most suitable profile for each sound environment; such as a RESTAURANT profile that clarifies nearby sounds and attenuates more distant sounds, or NATURE, which brings faraway small birds within the user's hearing range, and even grasshoppers "return" to their natural habitat. Of course, a WRTC profile accentuates harmonic overtones and the radio's AF response is emphasized. It should be remembered that nowadays exact comprehension of what you hear is important, in addition to the quality of hearing itself. By attenuating or accentuating different segments of the sound environment, it is possible to create optimum circumstances to satisfy the user's requirements. In contrast to other competitors, the Azores team tasked their audiologists to be in charge of keeping low UBN numbers as key to the team's success. *(UBN is short for "Unique, Broken, or Not-in-Log" contacts, which are responsible for score reductions in some contests.—ed.)*

With an aging contester profile, it is expected that hearing-

Relevant Web Links

WRTC 1990: <www.youtube.com/watch?v=HlzNGBdUfEA>
WRTC 2002: <www.youtube.com/watch?v=RJeTFFc-a2w>
WRTC 2014: <www.wrtc2014.org/>
Radio Arcala: <www.radioarcala.com/>
Azores CR2X: <www.qrz.com/db/cr2X>
Visit Azores: <www.visitazores.com/en>
LiNX hearing aid: <www.resoundlinx.com/en/international/welcome>

aid experts will soon be part of the amateur radio world, trying to come to grips with scenes of bedlam and chaos where the Code of Conduct runs out of steam.

Adapting Finnish Rally Driving Techniques

Many types of logging software allow operators to communicate with each other via the PC by tapping the TALK command. Virtually all multi-op stations today use this feature. In rally racing, could the driver and his co-driver communicate using a PC keyboard? A stillborn idea. A rally driver must be able to engage in real-time communication with the co-driver, with helmets on, and intonation and articulation are just as important as content.

In Boston, the two Finnish Old Timers will no doubt be the only team to make use of the sound technology that is familiar to us from rally racing. Both operators can talk to each other with their speech mixed to the radio's audio. By the same token, both operators can listen in to each other's receiver audio. There are potentially dozens of situations where this can be helpful; for instance, when planning a multiplier move, it makes sense for the operator of the receiving station to hear exactly when the mult is expected to show up and to get an idea of what his voice or CW signal sounds like.

This technique would be quite useful to all multi-op stations, and there is every reason to use it in future contests. It will make the job of moving mults more efficient and will add a definite fun element to the whole operating event. It is to be hoped, however, that the two aging Old Timers coming from the darkness of the Far North will not have to use the device to wake one another up from their afternoon naps!

As with many other sophisticated contest station accessories used over the years, this system is of a special design—not an off-the-shelf product favored by many competitors.

Operating Strategy

Each success-oriented team must have its own strategy. The assumption is, however, that nearly half the teams arrive at the contest venue with no clear understanding of propagation conditions that exist at different times of day or night and thus without even the most rudimentary pacenotes. In this regard, both Finnish WRTC teams can fall back on strategy elements that they have always reviewed together prior to an actual race. Jari, OH6BG, of VOACAP fame, has prepared a specific WRTC map for use by the Finnish teams. With the help of these advanced strategies, the most progressive-minded contesters are usually prone to point out that the end results of a race are already known by the time the strategy and targets are finalized. In the present case, the strategy elements are carefully hidden from public view, out of sight for other contesters. Nothing is divulged in any public forums.

In Summary

Equipped with this arsenal of skills, know-how, and hardware, the Finns are determined to compete in earnest with the aim of scoring well. The two old stalwarts come with their own accessories and their international track record spanning more than five decades. Who will win—those with young enthusiasm and a youthful skillset or those long in years but short of pace and abundant with time-honored wisdom? The ultimate leaderboard standings will not as such be all that is important; what matters most is not who is wins, but how to fly the flags high and convey the spirit of the North from the Old World wastelands.

They are U.S. possessions … so why are they all so high up on DXers' "most wanted" lists? This month, we continue W4YO's report on the results of his research.

America's Off-Limits Islands: No More DXCC Credits?

Part II: Johnston and Kure Atolls, Baker and Howland Islands

BY EDMUN B. RICHMOND,* W4YO

Six of the top 25 "most wanted" DX entities are islands that technically are part of the United States. I did some research to find out why our government limits access to them. In Part I,[5] we looked at Navassa Island (KP1, #2 on *The DX Magazine* "Most Wanted" list), Palmyra Island (KH5, #11), and Kingman Reef (KH5K, #12). In our conclusion, we'll look at the unique history, geography, and ecology of Johnston Atoll (KH3, #18); Kure Atoll (KH7K, #20), and Baker and Howland Islands (KH1, #25), as well as our chances for future expeditions to these remote locations.

As explained in Part I, most of these islands are national wildlife refuges, administered by the U.S. Fish and Wildlife Service (USFWS), an agency of the Department of the Interior. The exception among the islands we'll be looking at in Part II is Kure Atoll, which is part of, and administered by, the State of Hawaii. Let's head to the Pacific…

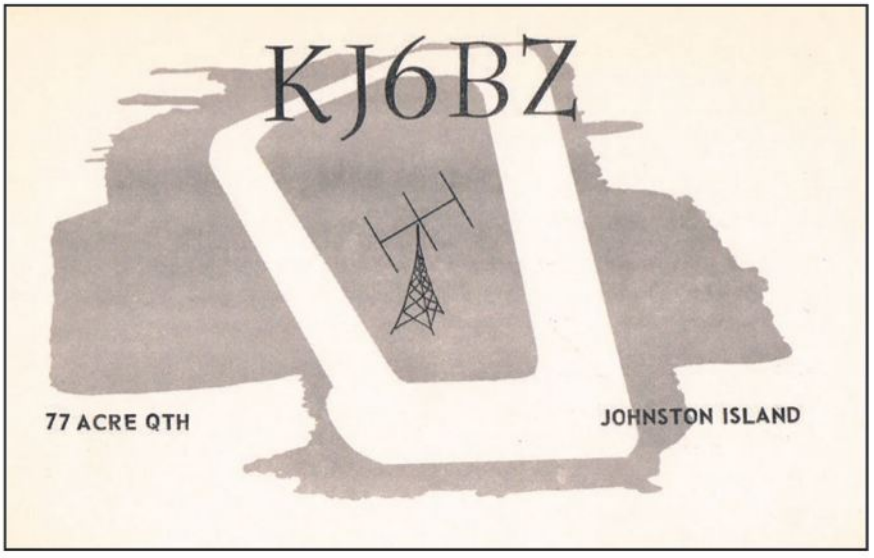


Photo D. Johnston Atoll is probably the most-studied island in the Pacific Ocean, as environmental monitoring continues a decade after it was abandoned by the U.S. military, which used it as, among other things, a nuclear and biological weapons testing site and a storage and disposal site for Agent Orange. The most recent amateur operation from there was in 2001.

Johnston Atoll (Most Wanted #18)

Johnston Atoll is an unincorporated territory of the United States. It is part of the Remote Islands Marine National Monument and is currently administered by the U.S. Fish and Wildlife Service. The atoll is visited yearly by the USFWS. *Public access to the atoll is only by special-use permit and is generally restricted to scientists and educators.*

It is located in the North Pacific Ocean at coordinates 16°4'N 177°22'W. The atoll is about 750 nautical miles (860 statute mi, 1,390 km) southwest of Hawaii, and is grouped as one of the United States Minor Outlying Islands. There are four islands in the atoll. The climate is tropical, but generally dry. There are constant trade winds, and there is little variation in temperature. The islands contain some low-growing vegetation and palm trees. There are no sources of fresh water.

The atoll was under military control for nearly 70 years. During that time, it had several uses, some of which were quite nefarious. These included being a bird sanctuary, airbase, naval refueling depot, nuclear and biological weapons testing site, a station for space recovery, a secret missile base, and a chemical weapon (Agent Orange) storage and disposal site. Some of these activ-

*11 Ocean Marsh Lane, Harbor Island, SC 29920
e-mail: <w4yo@arrl.net>

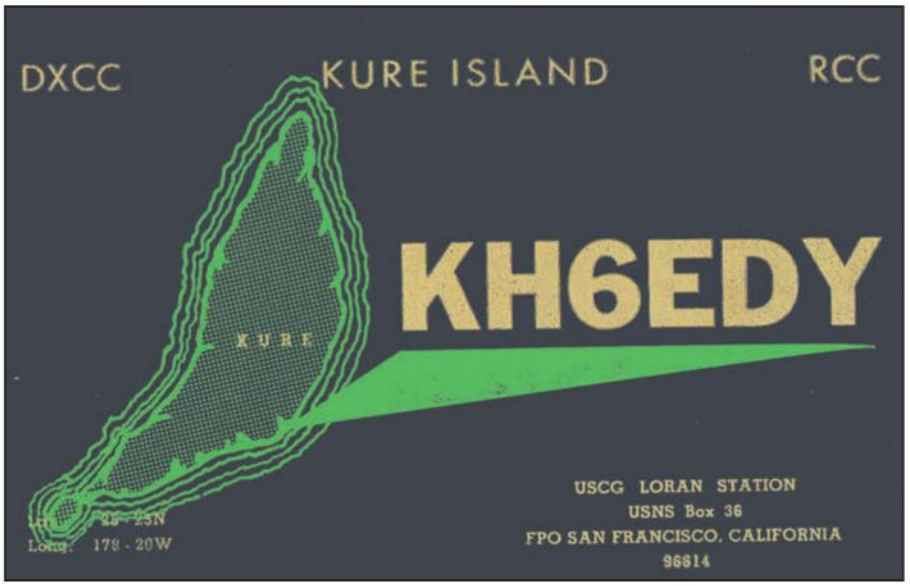


Photo E. Kure is the northernmost coral atoll in the world and, unlike all of the other islands profiled here, is under the jurisdiction of the State of Hawaii rather than the federal government or a non-governmental organization.

ities left the environment contaminated. Monitoring continues to this day.

In 2004, the military base was closed and transferred to civilian authorities of the U.S. government. Multiple studies of the Johnston Atoll ecology and environment have been conducted and the atoll is probably the most studied island in the Pacific.

Johnston Atoll has been a National Wildlife Refuge since 1923. At that time, it was placed under the administration of the U.S. Department of Agriculture. The atoll was added to the National Wildlife Refuge System in 1926. However, the Navy was interested in the atoll for strategic reasons, and it was placed under its control, but subject to use as a refuge and breeding ground for native birds under the Department of the Interior. In January 2009, the Pacific Remote Islands area was established to administer and protect Johnston Atoll. The national monument includes Johnston Island National Wildlife Refuge within its boundaries and contains 696 acres (2.82 km^2) of land and over 800,000 acres (3,200 km^2) of water area.

From the 1940s until the 1990s, there was ample amateur activity from Johnston Atoll. The earliest activity may well have been KE6SRA, in May 1940, by a radioman in the U.S. Navy. After WW II, callsigns using the KJ6 prefix were used (photo D), with both KJ6AA and KJ6AB active in the mid 1940s. The 1980s began the use of the KH3 prefix. Activity started to dwindle after the 1990s. The last station to be active on Johnston was probably K3J in September 2001.

Kure Atoll (Most Wanted # 20)

Kure is the northernmost coral atoll in the world. It is approximately 1380 miles (2,221 km) from Honolulu, but is part of the State of Hawaii and is considered a part of the City and County of Honolulu. It is part of the Northwestern Hawaiian Islands (NWHI), some 48 nautical miles (55 mi., 89 km) beyond Midway Atoll, at the extreme northwest end of the Hawaiian archipelago. Its coordinates are 28° 25'N 178° 20'W, or 87 nautical miles (100 statute mi, 160km) east of the International Date Line.

It consists of a six-mile (10 km) nearly circular barrier reef. Green Island is the only land of significant size and the only permanent island in the atoll. Kure was acquired by the United States as part of the Territory of Hawaii in 1898. In 1899, President Theodore Roosevelt registered Kure as part of the Hawaiian Islands Bird Reservation, reserving it for the Department of Agriculture.

The atoll is within a major current that washes up debris and junk from the Great Pacific Garbage Patch[6], including all manner of plastic, fishing nets, and cigarette lighters. All of this poses a threat of ingestion to local animals. In 2003 alone, 2700 pounds of marine junk was removed from Kure.

From 1962 to 1992, a U.S. Coast Guard LORAN station was located on Green Island. It, and a runway built to service airplanes, is no longer in use. Since 1993, the Hawaii Department of Land and Natural Resources, along with volunteers of the Nature Conservancy, have helped to return Kure to a more natural state. Since 2010, the Division of Forestry and Wildlife has managed Green Island as a wildlife refuge. Most land areas in the NWHI are extremely sensitive and can easily be disturbed. Consequently, *no landings are allowed on the island.*[7]

Amateur radio began on Kure in 1961, with KH6ECD and KH6EDY (photo E). Thirteen stations operated with the KH6 prefix until it was changed in 1979. Since then, there have been eight operations with the KH7 prefix. The last activity from Kure was K7C, in 2005.

Howland and Baker Islands (Most Wanted # 25)

Howland and Baker Islands, in the central Pacific Ocean, constitute a single DXCC entity and are separated by a mere 38 nautical miles (43 statute miles, 69 km). Both are located just north of the equator and lie almost halfway between Hawaii and Australia. Geographically, they are part of the Phoenix Islands. They are both uninhabited and have been U.S. territories since 1857. Both are grouped with the United States Minor Outlying Islands.

Howland Island is located at 0° 48' 24"N, 176° 36'59"W. The island is kidney-shaped and has a coastline of four miles (6.4 km). It has no lagoon. It covers 450 acres (1.8 sq. km^2).The island is managed by the U.S. Fish and Wildlife Service and is part of the Pacific Remote Islands Marine National Monument. The climate is equatorial, with little rainfall and bright sunshine. A constant wind blows from the east, which helps moderate the temperatures. The terrain is low and sandy. Howland is primarily a nesting and foraging area for seabirds, shorebirds, and marine mammals. The U.S. claims an exclusive economic zone of 200 nautical miles (370 km) and a territorial sea of 12 nautical miles (22 km) around the island.

Howland is perhaps best known as the island that aviatrix Amelia Earhart was trying to reach during her planned around-the-world flight in 1937. Airstrips for her intended landing were built but never used. There are no harbors or docks, and the surrounding reefs may be a maritime hazard. The USFWS visits the atoll once every year.

The Howland Island National Wildlife Refuge was created in 1974, and

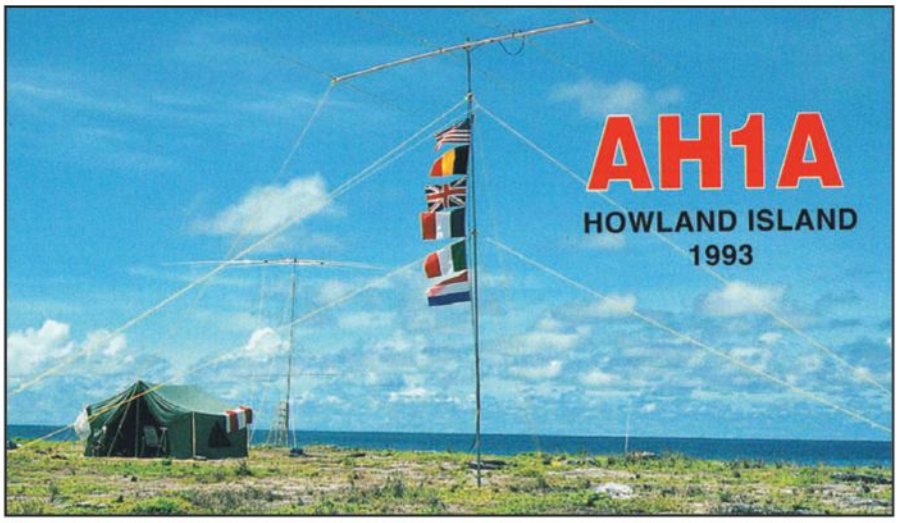


Photo F. Howland and Baker Islands are considered a single DXCC entity by the ARRL. Both today primarily are used as nesting sites by birds and other marine life. Howland is best known as the refueling stop that Amelia Earhart never reached on her ill-fated around-the-world flight attempt in 1937.

expanded in 2009 to include submerged lands within 12 nautical miles (22 km) of the island. The refuge now includes 648 acres (2.62 km^2) of land and 410,351 acres (1,660.63 km^2) of surrounding water.

Baker Island is located at 0°11'41"N, 176°28'46"W. The climate and terrain are similar to Howland Island. The unincorporated and unorganized territory forms the Baker Island National Wildlife Refuge and is grouped with the United States Minor Outlying Islands. The U.S. Fish and Wildlife Service, which has control, visits the island annually. There are no ports or harbors, with only offshore anchorage possibilities. The U.S. claims an exclusive economic zone of 200 nautical miles (230.2 mi; 375 km and territorial sea of 12 nautical miles (13.8 mi; 22.2km) around the island. Baker is treeless, with low-lying shrubs and grasses.

Like Howland, it is primarily a nesting and foraging habitat for birds and marine wildlife. The Baker Island National Wildlife Refuge was created in 1974 and was expanded in 2009 to add submerged lands within 12 miles (22 km) of the island. There are several environmental challenges, including abandoned WW II military debris and illegal offshore fishing.

Public entry onto these islands is only by special use permit from the USFWS, and is generally restricted to scientists and educators. However, several trips have been conducted through coordination with amateur radio operators who have been permitted to operate from the refuge.

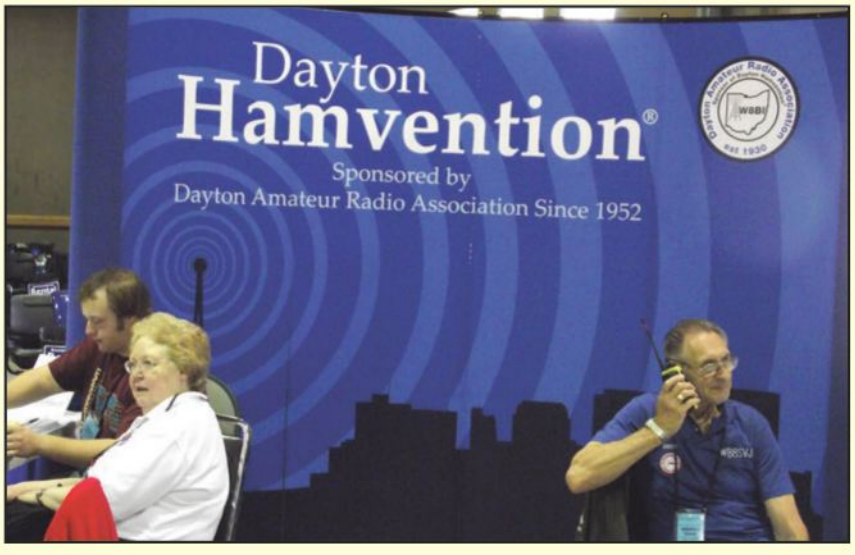
Amateur radio activity seems to be divided into two periods, prior to WW II, and after the 1979 U.S. possessions callsign revamping. There was some activity between 1938 and 1940 by stations such as K6BAZ, KF6DSS, KF6PUL, and KF6SJJ. The callsign change to KH1 saw several operations, the last two being K4AU/WH1 in 1998 and K1B in 2002.

Summary

The purpose of this article was to investigate why these six American entities are so high on the *The DX Magazine*'s "Most Wanted" list to determine any commonalities among them that might cause their lofty position, and to try to offer some possible scenarios by which they could be lowered from their place on that list.

All of these Pacific Ocean DXCC entities have several features in common: They all generally are located in the same geographical area; they all had a military presence during World War II, which continued after the conclusion of the war; they all saw an increase in amateur radio activity as a result of the military presence; as the military relinquished its use of and presence on the islands, it created unintended consequences of human activity, by leaving derelict equipment and scattered debris, causing a degradation of the environmental habitat and ecology of each island. Further, these islands are all presently uninhabited; they are now under the administration of some U.S. government authority or NGO; they all

What Was New at Dayton?



As always, the Dayton Hamvention® provided hobby radio manufacturers with a great platform for introducing new products. Once again this year, our listing of new products, provided by the manufacturers, is posted on the *CQ* website. There are over three dozen new products to look at, from transceivers and antennas to telegraph keys and smartphone apps.

To check them out, visit <http://www.cq-amateur-radio.com and look for the Dayton 2014 New Products link. This page provides a listing and brief description of each item, along with a link to a photo and more detailed information page.

Entity	Callsign	QSO Date	My Call at That Time
Navassa	KC4AF	Mar 1958	K4HNA
Johnston	KJ6BZ	Dec 1962	K4HNA
Kure	KH6EDY	Mar 1967	K4HNA
Palmyra	KP6AL	Aug 1970	K4HNA/8
Kingman	KP6KR	July 1974	W8KGR/4
Howland	AH1A	Jan 1993	W4MGN

The author's contacts with each of the islands discussed in this article (listed by date). Note that the most recent was in 1993.

have become nature reserves, and finally, the authorities all limit or block any visitation. For European amateurs, they all are on a beam heading over the North Pole, with its resultant difficulties in propagation.

Navassa Island is different because it did not experience any wartime build-up, nor is it in the Pacific. However, the ecology and habitat of the island is unusual, and therefore, the island has been placed under governmental control and given the status of a nature reserve.

Although there are layers of governmental bureaucracy, it appears that the organizations that ultimately are responsible for the welfare of these islands are the U.S. Fish and Wildlife Service and the Nature Conservancy. Kure Atoll is managed by the State of Hawaii Department of Land and National Resources (DLNR), Division of Forestry and Wildlife. Permission to travel to and land on Navassa must be granted by the Fish and Wildlife Office in Boqueron, Puerto Rico. No permits have been issued since 1993.

However, there seems to be a mollifying effect in some of these policies. If the USFWS accepts monetary assistance from amateur foundations for trips to Howland and Baker, to help defray expenses, and allows ham operation at the same time, perhaps it will accept such assistance to some, or all, of the other islands as well.

The State of Hawaii's Division of Forestry and Wildlife also accepts volunteers to go to Kure Atoll during the summer months. Applications should be made before the end of March and applicants are selected based on their training, previous experience, and usefulness in ongoing research.[7]

It is hoped that this article has shed some light on the reasons behind the high demand for these American island DXCC entities. At the present time, it seems doubtful that the governmental organizations discussed herein will change their policies on allowing amateur radio activity to resume on these DX-starved islands. Because of the lack of concerns for habitat and conservation of the former residents, the feds and NGOs took control of the islands in order to correct those past activities. Their intent was to return the ecological conditions on those islands to their original pristine or near-pristine state. Perhaps in the future, though, under the most stringent rules of conservation and under real-time supervision of an on-site tropical conservation specialist, these islands will be once again QRV with some regularity on the bands.

Notes

5. "America's Off-Limits Islands: No More DXCC Credits? Part I: Navassa Island, Palmyra Island, and Kingman Reef," *CQ*, June 2014, pg. 30

6. A collection of marine debris in the northern Pacific Ocean caused by a circular ocean current formed by the Earth's wind patterns and forces created by the rotation of the planet. These *gyres*, as they are called, can be found in every ocean.

7. See <http://kureatollconservancy.org>

Announcing:

2014 Inductees, CQ Amateur Radio, Contest, and DX Halls of Fame

The CQ Amateur Radio, Contest, and DX Halls of Fame honor the "heroes" of our hobby … people whose contributions to the art, science, and sport of amateur radio put them on a pedestal as examples to the rest of us. We are pleased to announce the 2014 inductions.

This year, we induct two new members each to the CQ DX Hall of Fame and the CQ Contest Hall of Fame, as well as eight new inductees to the CQ Amateur Radio Hall of Fame.

CQ DX Hall of Fame

Our two inductees to the CQ DX Hall of Fame this year are:

Joe Reisert, W1JR, a DXer and DXpeditioner since the 1950s, Joe has DXCC Mixed, Phone, CW, Digital, and QRP with over 300 entities confirmed for each, along with 13-band Worked All States, 13-band Worked All Continents, and CQ's USA-CA All Counties award. Joe is also a pioneer in 432-MHz EME (Earth-Moon-Earth) communications, ran his own antenna manufacturing company (Antennaco), and is a prolific writer and public speaker.

David Collingham, K3LP, is a leading DXer and DXpeditioner who is also focused on using amateur radio as an educational tool, at home and around the world. David has played a key role in many major DXpeditions over the past two decades, including XZ1J, 7O6T, TI5W, ET3AA, 3D2R, STØR, YI9PSE, 5A7A, VU4AN/VU3RWO, and T33C. He has equipped a complete station at his hometown elementary school and has taught amateur radio to young people in Iraq (where he gave a presentation at a school about technology and amateur radio), Ethiopia (where he brought a team of volunteer examiners to conduct U.S. license testing for 58 students at Addis Ababa Technology University), and Rotuma, Fiji (where he helped establish a club station at a local high school and donated equipment to put it on the air).

CQ Contest Hall of Fame

The two newest members of the CQ Contest Hall of Fame are:

J. Scott Redd, KØDQ, is already a member of the CQ Amateur Radio Hall of Fame for his service to our nation as an Admiral, Deputy Administrator of the Coalition Provisional Authority in Iraq, and the first Director of the National Counterterrorism Center. He was also director of the commission that investigated intelligence-gathering leading up to the Iraq war. Scott has always found time within his professional duties for amateur radio and his first love, contesting. His first major wins were in the 1970s (ARRL DX SSB & CW, CQ WW SSB, and CQ WW WPX SSB); his most recent in 2008 (WPX CW) and 2012 (U.S. single-op, ARRL DX CW). Scott is one of only two people to have won the single-operator category of all of the world's major contests. He will be among the competitors representing the United States this month in the 2014 World Radiosport Team Championship contest (WRTC).

Ed Muns, WØYK, is a noted RTTY contester with nine single-op all-band and one multi-two championships and six world records. Ed is also Director of the CQ World-Wide RTTY DX and RTTY WPX Contests, and manager of the North American Sprint RTTY Contest. Licensed in 1962, Ed did not discover RTTY contesting until 2004. Along the way, though, he participated in several DXpeditions and became a "big gun" in CW contesting. Over the past decade, Ed has become the world's top RTTY contester. He is also very active in the Northern California Contest Club and is a past club officer and director.

A note on nominations: *Nominations for the CQ Contest and DX Halls of Fame may now be submitted by any indi-*

CQ DX Hall of Fame inductee Joe Reisert, W1JR, shown displaying the inaugural DX Marathon plaque for Top CW score in 2011.

CQ DX Hall of Fame inductee David Collingham, K3LP, on one of his many foreign trips. (Photo courtesy K3LP)

CQ World Wide DX Contest Director Randy Thompson, K5ZD (left), presents the CQ Contest Hall of Fame plaque to 2014 inductee J. Scott Redd, K0DQ, at the Dayton contest dinner. (Photo by and courtesy of Bob Wilson, N6TV)

K5ZD presents 2014 CQ Contest Hall of Fame plaque to inductee and CQ RTTY Contest Director Ed Muns, W0YK, at the Dayton contest dinner. (Photo by and courtesy of Bob Wilson, N6TV)

vidual amateur, club, or organization. The previous restriction of nominations only by contest/DX clubs or national organizations has been lifted. Nominations for 2015 will be accepted between January 1 and March 1, 2015. Watch for announcement in the January 2015 issue of CQ.

CQ Amateur Radio Hall of Fame

The CQ Amateur Radio Hall of Fame honors those amateurs who have made significant contributions to amateur radio or to society at large, as well as those non-amateurs who have had a significant impact on amateur radio. All eight of the members of the 13th "class" of inductees are or were hams, but their contributions were not restricted to the world of amateur radio. In fact, two of this year's inductees truly did change the world.

The 2014 inductees to the CQ Amateur Radio Hall of Fame are (listed alphabetically):

Clifford Berry, W9TIJ, who helped usher in the computer age as co-inventor of the Atanasoff-Berry computer (or ABC), the precursor of virtually all electronic computers.

Warren Bruene, W5OLY, prolific radio designer and innovator who designed many Collins radios and helped the company introduce single-sideband voice communications.

John Huntoon, W1RW, former ARRL General Manager, *QST* Editor, helped bring about international allocation of the 30-, 17-, and 12-meter bands.

Mike Koss, W9SU, DXer and DXpeditoner; founder and owner of filter manufacturer ICE (Industrial Communications Engineers); key player in establishment of Indianapolis Motor Speedway Amateur Radio Club, W9IMS; organizer of special event station W87PAX at 1987 Pan American Games in Indianapolis.

Nancy Kott, WZ8C, former Editor of *WorldRadio* and *WorldRadio Online* and tireless promoter of Morse Code as U.S. coordinator of the FISTS CW Club. (See remembrance of Nancy in the May 2014 issue of *CQ Plus*, p. 127)

Paul Laughton, N6BVH, software designer whose accomplishments include developing Apple's disk operating system and Atari's operating system.

Ralph Showers, ex-W3GEU, expert on electronic interference and leader of efforts to set national and international standards for electromagnetic compatibility (EMC). He holds several awards from the American National Standards Institute (ANSI) and the Institute of Electrical and Electronics Engineers (IEEE).

Steve Wozniak, ex-WV6VLY and ex-WA6BND, co-founder of Apple Computers.

Congratulations to all of our inductees! Formal presentations to Contest and DX Hall of Fame inductees were made at the respective Contest and DX dinners at Dayton in May.

Results of the 2014 CQ WW WPX RTTY Contest

BY ED MUNS, WØYK

Really good propagation conditions over the whole weekend! . . . ***DL1EAL***

One of the best WPX RTTY Contests I have ever entered. Band conditions were incredible . . . ***WØRAA***

My tenth WPX WW Contest and the best . . . ***F5RD***

Amazing fun! Some good conditions, and plenty of stations to work, what could be better? Really enjoyed myself . . . ***GUØSUP***

One more CQ WPX RTTY contest, such a pleasure . . . ***TF1AM***

. Great propagation and super WPX RTTY operators . . . ***FP/W6HGF***

Great conditions made for a fun contest . . . ***VE3SS***

10/15m were HOT! . . . ***K7ON***

Great 10 meter opening . . . ***N7UVH***

Great Fun! Good Propagation on 10 . . . ***N8WXQ***

The so-called second peak of solar Cycle 24 elevated the MUF (maximum usable frequency) to the highest point in the last five years of this contest. Ten meters produced as many QSOs as either 20 or 40, with 15 meters being the top band for the weekend. In contrast, 80-meter activity decreased as a percentage of total QSOs:

Band	2010	2011	2012	2013	2014
80	13%	15%	11%	11%	8%
40	27%	28%	23%	26%	21%
20	36%	35%	27%	28%	22%
15	23%	21%	30%	29%	28%
10	0.5%	1%	9%	6%	21%

A number of participants took advantage of the excellent 10-meter propagation to set two new Single-Op world records (of the three possible power levels) on that band. In addition, 14 of the 18 continental records on 10 meters were broken. (See the last three quotes above.)

Fifteen-meter records were also broken: two world and five continental. In total, across all entry classes, five new world records were set, as well as 29 new continental records:

	World		Continent	
	New	**Avail**	**New**	**Avail**
SO10	2	3	14	18
SO15	2	3	5	18
SO20	–	3	2	18
SO40	–	3	7	18
SO80	–	3	1	18
SOAB	1	3	3	18
MS	–	1	–	6
M2	–	1	–	6
MM	–	1	3	6
Total	5	21	29	126

In this 20th annual CQ WPX RTTY Contest, participation decreased from last year to 2,826 submitted logs with total QSOs dropping almost 15% to 1.1 million. There were 186 different countries and 2151 different prefixes logged, about the same as 2013. Once again, 9A1A captured the most prefixes at 1161.

The transmitted RTTY signal bandwidth of many stations continues to be far greater than needed, causing unnecessary interference and crowding on contest weekends such as this one. AFSK users need only ensure their encoder filter is set appropriately narrow, while FSK users must rely on their radio manufacturer to provide the proper bandwidth. Unfortunately, very few radios adequately filter their FSK signals, which is relatively easy to do in today's DSP radios. Just like in the past days of rampant CW key clicks, amateurs need to pressure transceiver companies to responsibly filter FSK. For more discussion on this important topic see Dr. Andy Flowers' (KØSM/2) papers:

- http://www.frontiernet.net/~aflowers/k3rtty/k3rtty.html
- http://www.frontiernet.net/~aflowers/k3beta/.

Single-Operator (2632 entries)

There are many Single-Operator entry categories to satisfy a wide range of interests. Low Power remains the most popular

Fabio 5B/IK2LTR, fifth place 15 Meter LP.

Alessandro 5B/IZ4AMS, third place 10 Meter LP.

*e-mail: <w0yk@cqwpxrtty.com>

power level and 10 meters was the most popular Single Band category this time:

	80	40	20	15	10	SB	AB	SO
QRP	3	14	11	10	16	54	67	121
LP	20	79	71	107	132	409	1219	1628
HP	28	41	44	59	70	242	641	883
Total	51	134	126	176	218	705	1927	2632

QRP (121)

"Band conditions were excellent for QRP." . . . ***K3TW***
Thanks for adding the QRP category to this contest! It's the most fun I've ever had with 5 watts! . . . ***W6QU***

Obaid A61DJ set the new 10 meter QRP world record and the next four places all set new continental records: Jose ED9K (EA9CD); Jorge LW5DW; Jose CO6EC; and Vittorio IZ2JPN. Thirteenth-place Bob KH6KG set the last continental record in Oceania for a clean sweep of all the world and continental records for 10 Meter QRP.

Similarly, in 15 Meter QRP, Gabor HG3IPA set the new world record, with Jose CT1BXE close behind, while Geraldo ZZ80SP; Jim K5ND; Bambang YB2ERL; and Serge RAØAY each set a new continental record.

Alex UX5UU set a new Europe record on 20 meters on the way to winning that category. Mario TG9ADQ won North America and second place overall.

Low-band QRP certainly is a challenge, especially at the peak of a solar cycle. The standings are dominated by European stations. Janiz S51DX captured first place on 40 meters and sixthth place Paul N6MA/7 won North America. Yuichiro JM2RUV won Asia.

Gabor HA5NB took first on 80.

In the All Band QRP category, Rudolf TM3T took first place with nearly the same score as he made in 2013, narrowly missing the world record. The next four places were also from Europe: Gendron F5BEG; Dmitry RX1CQ; Dmitrij UT3N; and Rudolf OM6RK. Sixth-place Dave K2YG won in North America, just short of his last two years' scores in this category. Kazumi JK1TCV set a new Asia record.

Low Power (1628)

The first three places in 10 Meter Low Power each set continental records: Daniel LW6DG; Francisco EE7Y (EA7ISH); and Alessandro 5B/IZ4AMS. Gonzalo XE3N set a new North America record and Danu YD1GCL won Asia.

On 15 meters, Mohamed 5C5W, with nearly 2.5M points, set a new world record, and second-place Vito IW9FDD won Europe. Randy K7TQ won North America and Fabio 5B/IK2LTR won Asia. Gary KH6GMP won Oceania and Adonay PX8X (PT8DX) won South America.

First place world in 20 Meter Low Power was Juan YW5T (YV5JBI), who set a new South America record. Michele, IZ8EFD, was second in the world and first in Europe. Carlos CO2CW won North America and Yuri UA9AFS won Asia. Isidro EA8NQ won Africa and Hugo ZP8T (K2DER) won South America.

Nagy HG5D (HA8QZ) took first place world on 40 meters with the next seven places also from Europe. Ninth place Colin KU5B was first in North America. Hideaki JI3CWI won Asia and Kasmuri YD1MRI won Oceania.

Iacopo IK5AMB won the world in 80 Meter Low Power, barely inching past Zeljko YT5CT. The next four places were also in Europe. Seventh place Dunia EE8T (EA8MT) set a new Africa record.

In All Band Low Power, Fabi VA2UP,set a new North America record on his way to win. Second place was John KK9A who has begun applying his CW and SSB Low Power prowess to RTTY. John operated P40A for many years to capture a number of Low Power wins in the "other" modes. The next three places each won their respective continent: Sergey, EA7/UT5UDX; Wanderley ZZ2T (PY2MNL); and Yuri RT9S. Heijo. EF8O (DJ1QJ) won Africa.

Jeff KS7AA (op. WK6I) driving three radios (SO3R/SO6V) at the W7RN super station in Virginia City, NV.

Nikolay UXØFF SO AB LP with many awards from Top Band to EME.

High Power (883)

On 10 meters, Kari EF8S (OH4KA) set a new world record, second-place Stephane TM6M (F4DXW) set a new Europe record, while Max KH6ZM and Don AA5AU set new Oceania and North America records, respectively. Second-place NA was Fred WW4LL, who "helped" Don win by providing friendly competitive motivation.

Remi LY8O won 15 meters and Tine S50A took second. Dave WK7S (K6LL) took third place for the North America win. Victor UCØA took 9th place and won Asia. Ken VK4QH won Oceania and Edgar CE3EEA won South America.

Pavel OK6W (OK1MU) won 20 Meter High Power, with Rudy N2WQ/VE3 taking second and the North America win. Jose CT3DZ won Africa; Yoshiharu JA9CWJ won Asia; and Wes ZM3T (W3SE) won Oceania.

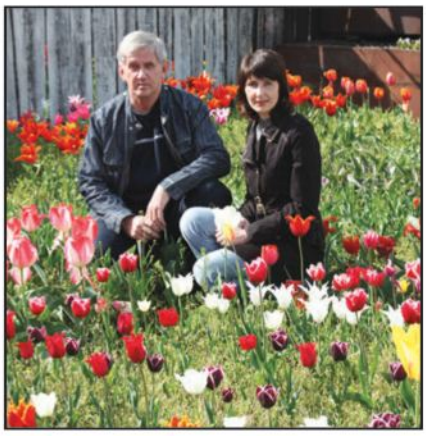
2014 CQ WW WPX RTTY CLUB SCORES

UNITED STATES

Club	# Entrants	Score
POTOMAC VALLEY RADIO CLUB	49	51,550,334
FRANKFORD RADIO CLUB	15	22,571,938
NORTHERN CALIFORNIA CONTEST CLUB	21	19,097,841
SOCIETY OF MIDWEST CONTESTERS	28	17,448,497
CTRI CONTEST GROUP	7	12,394,367
YANKEE CLIPPER CONTEST CLUB	23	9,926,429
CENTRAL TEXAS DX AND CONTEST CLUB	4	8,410,017
ARIZONA OUTLAWS CONTEST CLUB	24	8,221,954
MOTHER LODE DX/CONTEST CLUB	8	6,623,172
FLORIDA CONTEST GROUP	8	6,574,474
TENNESSEE CONTEST GROUP	12	6,455,885
GRAND MESA CONTESTERS OF COLORADO	8	4,974,678
WILLAMETTE VALLEY DX CLUB	14	4,903,087
DFW CONTEST GROUP	10	4,693,593
WESTERN WASHINGTON DX CLUB	11	4,036,675
KANSAS CITY CONTEST CLUB	4	3,927,561
NORTH COAST CONTESTERS	11	3,731,255
ALABAMA CONTEST GROUP	6	2,849,120
MINNESOTA WIRELESS ASSN	17	2,621,105
NIAGARA FRONTIER RADIOSPORT	3	2,528,374
CAROLINA DX ASSOCIATION	6	2,466,145
LOUISIANA CONTEST CLUB	6	2,169,757
ORDER OF BOILED OWLS OF NEW YORK	5	2,151,874
SPOKANE DX ASSOCIATION	8	1,994,867
SOUTHERN CALIFORNIA CONTEST CLUB	11	1,763,158
HUDSON VALLEY CONTESTERS AND DXERS	4	1,753,303
BERGEN ARA	6	1,454,306
BRISTOL (TN/VA) ARC	5	1,257,021
METRO DX CLUB	6	1,255,779
CONTEST CLUB CALIFORNIA PENINSULA	4	1,041,612
MAD RIVER RADIO CLUB	4	890,039
SOUTH EAST CONTEST CLUB	4	849,478
MIDLAND AMATEUR RADIO CLUB	3	697,604
KENTUCKY CONTEST GROUP	5	553,143
MILFORD OHIO AMATEUR RADIO CLUB	4	416,037
SHENANDOAH VALLEY WIRELESS	4	396,083
RADIO CLUB OF REDMOND	3	290,015
WEST PARK RADIOPS	3	170,252

DX

BAVARIAN CONTEST CLUB	93	70,351,815
RHEIN RUHR DX ASSOCIATION	49	36,121,399
SLOVENIA CONTEST CLUB	12	26,042,287
UKRAINIAN CONTEST CLUB	21	25,475,984
HA-DX-CLUB	7	24,665,368
CROATIAN CONTEST CLUB	18	23,962,214
ORCA DX AND CONTEST CLUB	13	16,212,757
CONTEST GROUP DU QUEBEC	11	13,405,573
ARAUCARIA DX GROUP	13	13,100,004
LATVIAN CONTEST CLUB	9	12,945,601
CONTEST CLUB ONTARIO	17	11,383,061
BLACK SEA CONTEST CLUB	22	10,919,354
RADIO CLUB HENARES	6	9,740,269
CONTEST CLUB FINLAND	12	8,875,251
SOUTH URAL CONTEST CLUB	3	7,585,522
CONTEST CLUB SERBIA	14	6,428,834
BELARUS CONTEST CLUB	9	6,224,783
Z37M CONTEST TEAM	4	6,102,732
LU CONTEST GROUP	10	5,785,120
DONBASS CONTEST CLUB	11	5,101,493
RIO DX GROUP	3	3,687,905
KAUNAS UNIVERSITY OF TECHNOLOGY RADIO CLUB	6	3,543,791
TEMIRTAU CONTEST CLUB	3	3,501,816
DL-DX RTTY CONTEST GROUP	9	3,418,074
MEDITERRANEO DX CLUB	4	3,256,285
RTTY CONTESTERS OF JAPAN	9	2,922,935
BOSNIA AND HERZEGOVINA CONTEST CLUB	5	2,894,536
RUSSIAN CONTEST CLUB	4	2,695,908
VYTAUTAS MAGNUS UNIVERSITY RADIO CLUB	3	2,691,115
599 CONTEST CLUB	4	2,499,050
WORLD WIDE YOUNG CONTESTERS	6	2,013,554
EUROPEAN PSK CLUB	8	1,753,398
SP DX CLUB	9	1,742,201
ARCK	3	1,344,845
ARI CASTELLI ROMANI	3	1,041,028
CHILEAN PACIFIC DX GROUP	4	835,181
MARITIME CONTEST CLUB	4	688,692
RUSSIAN CW CLUB	3	496,690
CHILTERN DX CLUB	3	492,812
URAL CONTEST GROUP	3	467,198
SK2AT FORENINGEN UMEA RADIOAMATORER	3	462,600
YB LAND DX CLUB	7	449,035
VRHNIKA CONTESTERS	3	330,156
SOUTHERN OSAKA CONTEST CLUB	3	250,145
DANISH DX GROUP	3	211,440
SK6AW HISINGENS RADIOKLUBB	3	109,324
VK CONTEST CLUB	3	31,214



Nikolay UXØFF and XYL Elena US5FFF enjoying their flower garden. Elena is a radio-officer for the Danube Shipping Company, running high-speed CW.

Jham HK1T won 40 meters world for a new South America record. Alexandre DR1D (DL1NS) was second, winning Europe. Art VE3UTT was sixth, winning North America. Vlad UN1L won Asia and Karsono YBØNDT won Oceania.

Jan OL9A (OK2ZAW) won 80 meters world and Peter VA3XH won in North America. Mike RY9C won Asia.

Ed P49X (WØYK) set a new High Power All Band world record and Rick KI1G won North America for second place. Bud AA3B took third and Boyan LZ8E (LZ2BE) was fourth, winning Europe. Yuri RG9A won Asia for fifth place overall. Nestor EF8G (EA8CNB) won Africa and John 9M6XRO won Oceania.

Multi-Operator (89)

Multi-Single is the most popular multi-operator category as shown below:

MS	M2	MM
65	13	11

Multi-Single. The ED1R team (EA1AR, EA1ASC, EC1KR, EA4AOC, EC4DX) took first place in Multi-Single with UA5A in second place. ZV2K (PY2EL, PY2PT, PY2VM, PY2LED, PY2SHF) was third overall and the South America continental winner. K3MJW (K3RWN, NK3P, WC3O, K3STL, KB3EYY, WA3KFS, K3FH, K3RMB) won North America; UAØAYA (RXØAK, RAØAY) won Asia; and 5IØDX (IV3FSG, ISØAGY, HB9DHG, IK7JWX) won Africa.

Multi-Two. LX7I (LX2A, DL6ZBN, DF8XC, DK5ON, DF7ZS) came out on top in Multi-Two with the next three places also from Europe: S51A (S50LD, S50P, S51F, S51ZJ, S55O); DQ4W (DJ4MZ, DK7MCX, DL2MLU, DL6RAI, DL7LIN); and YL4U (YL2CI, YL2UI, YL3AJA, YL3BF, YL1ZF, @YL2CI). Fifth place NØNI (NØNI, NØAC, NUØQ, NØXR, WIØH, NØMGK) won North America.

Multi-Multi. 9A1A (9A9A, 9A5W, 9A2DQ, 9A5DDT, 9A6A, 9A6TKS, 9A7C, 9A7R, Kristijan) was first in Multi-Multi again and second place NR4M (NR4M, K7SV, K4GM, KK4RTF, KA4RRU, NN4RB, K4SO, K4EC, K3UI, KD4AKC, G2YL, KC4QP, W4IM, K4MIL, N3ZV, KK4TYF, KE3X) set a new North America record. RWØA (RAØAM, RØACG, RAØANR, RAØASG, RUØAI, RUØAM, RWØAR, RZØAF, RZØAT, RVAUI, UAØAFL, RXØA) took third with their new Asia record. HG1S (HA1TJ, HA6NF, HA8DM, HA1DAC HA1DAI) was fourth and W1AW/KH6 (KH6FP, AH6OZ, WH6R, KH6MB, W7NX, KH7U, AH6NF @KH6YY) set a new Oceania record for fifth place this time.

Club Competition

World. The Bavarian Contest Club once again prevailed in the world club competition with 70.4M points from their whopping 93 entries. Rhein Ruhr DX Association took third place, being solidly beat by the Potomac Valley Radio Club, each with the same number of entries, 49. The Slovenia Contest Club edged out the Ukrainian Contest Club for fourth place. Not far behind were the HA-DX-Club and the Croatian Contest Club.

North America. The Potomac Valley

2014 CQ WW WPX RTTY Top Scores

WORLD

SINGLE OPERATOR HIGH POWER ALL BAND

P49X (WØYK) 14,705,300
KI1G 7,701,728
AA3B 6,885,442
LZ8E (LZ2BE) 6,752,395
RG9A 6,727,784
K4GMH 6,679,590
OM5ZW 5,841,099
AB5K 5,757,507
UW1M 5,336,302
SN7Q 5,199,898

28 MHz

EF8S (OH4KA) 3,934,791
TM6M (F4DXW) 2,105,880
IT9RGY 1,651,888
KH6ZM 1,502,976
AA5AU 1,396,395
9A5Y (9A3NM) 1,361,483
YT9A 1,184,720
EA7ZY 1,105,091
EA1KY 1,058,253
WW4LL 1,049,937

21 MHz

LY8O 1,873,080
S5ØA 1,785,595
WK7S (K6LL) 1,581,935
3Z5N (SP5GRM) 1,511,169
N7AT (K8IA) 1,437,988
IW3RUA/IT9 (IW3RUA) 1,291,797
WA5ZUP 1,260,567
AI6YL/7 (AI6YL/7) 1,226,500
UCØA 1,141,278
UT7E (UV5EOZ) 1,016,472

14 MHz

OK6W (OK1MU) 1,841,246
N2WQ/VE3 (N2WQ/VE3) 1,753,890
SO4M 1,623,327
CT3DZ 1,619,695
IW1QN 1,393,953
OH7WW (OH3LQK) 908,890
YO9HP 793,016
IW1PNJ 722,060
IQØAP 704,608
YP5A (YO5CBX) 670,980

7 MHz

HK1T 5,102,542
DR1D (DL1NX) 3,609,472
S52X 3,215,926
IW1AYD 2,827,576
HA8JV 2,720,272
VE3UTT 2,126,802
NO4S (K9OM) 2,077,756
S51CK 1,773,460
9A5D (9A3ID) 1,771,000
OH6R (OH3FM) 1,386,996

3.5 MHz

OL9A (OK2ZAW) 1,246,968
DM7C (DL8CX) 1,024,056
YU3AAA 1,014,528
UX5IO 793,328
E7ØA 761,852
SQ9ORQ 618,096
SP8K 505,076
LY2NY 477,680
DL7URH 399,434
VA3XH 373,632

LOW POWER ALL BAND

*VA2UP 5,751,894
*KK9A/4 4,963,708
*EA7/UT5UDX (UT5UDX) 3,349,320
*ZZ2T (PY2MNL) 2,856,296
*RT9S 2,787,300
*UP6P (UN6P) 2,444,554
*WB5TUF 2,254,500
*HA8BE 2,121,813
*S56A 1,991,748
*AD7JP (K2PO) 1,958,360

28 MHz

*LW6DG 1,912,960
*EE7Y (EA7ISH) 1,582,380
*5B/IZ4AMS 785,916
*HZ1PS 771,256
*A61ZX 666,839
*IØUZF 570,843
*XE3N 564,200
*JH6WHN 481,950
*VO2DX/9 (VE9AA) 454,240
*N2WK 449,548

21 MHz

*5C5W (CN8KD) 2,475,542
*IW9FDD 791,040
*EC7ZK 693,462
*K7TQ 557,568
*5B/IK2LTR (IK2LTR) 547,360
*BA2IA 539,358
*W1ZD/7 483,688
*CT2IOV 447,848
*RA9AU 357,098
*GA5M (GM4ZNC) 344,124

14 MHz

*YW5T (YV5JBI) 1,109,208
*IZ8EFD 776,938
*URØHQ 653,232
*RZ1ZZ 635,725
*YU8NU 559,986
*CO2CW 510,845
*TG9ANF 469,572
*YT2AAA 424,710
*LB2TG 365,748
*VE3IAE 346,164

7 MHz

*HG5D 1,122,082
*OK2RU 910,188
*HA8BT 772,548
*IKØRCY 703,136
*USØHZ 655,802
*DL5KUD 641,592
*G8HBA 631,780
*YU2A 536,300
*KU5B 518,624
*EW8OF 513,922

3.5 MHz

*IK5AMB 626,516
*YT5CT 620,308
*HA1WD 604,788
*SQ2NNN 341,700
*OK2SAR 336,960
*YT2T (OU5A) 276,738
*EE8T (EA8MT) 273,000
*CT3KY 260,434
*OM3RWB (OM3ZCK) 208,638
*MØNKR 194,166

QRP ALL BAND

TM3T (F5VBT) 1,483,900
F5BEG 1,088,666
RX1CQ 858,032
UT3N (UT3NK) 756,071
OM6RK 551,784
K2YG 545,941
N2QT/4 479,960
HG6C (HA6IAM) 460,224
EA1SI 325,185
MØVAA 316,660

28 MHz

A61DJ 664,692
ED9K (EA9CD) 612,774
LW5DW 84,185
CO6EC 73,947
IZ2JPN 73,647
IK4UXA 68,391
JH3DMQ 59,732
IZ3NVR 47,109
W9PDS 16,128
KB2HSH 6,552

21 MHz

HG3IPA (HA3JB) 174,048
CT1BXE 166,254
ZZ8ØSP (PU2TRX) 147,920
K5ND 130,746
SP4LVK 56,032
YB2ERL 32,865
RA3XEV 12,351
RAØAY 3,960
9A4WT 510
DN7DX 270

14 MHz

UX5UU 144,055
TG9ADQ 141,000
WB4MSG 132,775
G8YTF (MØVAA) 91,680
9A4AA 71,340
NJ3I 56,021
EA1GFY 30,600
HG3M 26,070
DL8LR 8,442
W9CF/7 1,976

7 MHz

S51DX 287,448
UR3AHF 231,880
SP4BPH 122,748
UU4JCR 117,440
DJ3GE 111,600
N6MA/7 89,100
WA4VMC 79,508
UX9Q (UR9QQ) 46,512
RQ22RP (RT5R) 42,940
UT3XA 30,340

3.5 MHz

HA5NB 173,712
ON9CC 35,126
LY5D (LY3BY) 34,532

MULTI-OPERATOR SINGLE TRANSMITTER HIGH POWER

ED1R 7,912,293
UA5A 7,532,070
ZV2K 6,311,266
HG7T 6,283,025
IW9GTD 6,244,102
S55W 5,874,678
IZ6TSA 5,079,008
DJ8OG 4,805,172
Z37M 4,788,115
UW5Y 4,632,198

MULTI-OPERATOR SINGLE TRANSMITTER LOW POWER

V31RU 1,889,020
ON4WLR 1,299,879
ES1O 1,044,884
WE5DX 520,257
KT4RR 479,171
WØFRC 290,832
VE7SAR 232,410
AA9L 218,370
IQØTE 169,388
5IØDX 124,020

MULTI-OPERATOR TWO TRANSMITTER

LX7I 12,295,782
S51A 10,864,828
DQ4W 9,232,425
YL4U 7,300,847
NØNI 6,760,203
K9XD 6,040,412
RK4W 5,838,408
WQ2N 4,389,024
LN5O 4,147,535
W4ML 2,295,746

MULTI-OPERATOR MULTI-TRANSMITTER

9A1A 20,731,977
NR4M 15,394,176
RWØA 13,775,882
HG1S 13,377,538
W1AW/KH6 8,793,036
VC7J 8,131,424
DKØKC 7,925,120
K4VV 5,334,410
OH5CY 3,777,808
JH4UTP 3,069,555

ROOKIE HIGH POWER ALL BAND

KK4EIR 898,800
VE2NMB 618,422
WH7DX 177,093

28 MHz

9A3DZH 2,550

14 MHz

F4GTD 129,766

LOW POWER ALL BAND

*IZ8VMV 664,332
*CX4AT 514,960
*IZ3XNJ 470,586
*UR6LEY 468,696
*EA7JW 356,895
*KK4HEG 354,295
*IZ3XEF 276,888
*K5MXG 235,966
*ISØDCR 226,226
*AE7DW 198,000

28 MHz

*A61DJ 664,692
*CA5GRF 101,970
*SP9NWN 16,717
*MMØKFX 2,871

21 MHz

*YD2SM 65,262
*IW9FI 51,060
*DO9MJ 29,376

14 MHz

*IT9CLN 289,221
*PD8SL 33,390

7 MHz

*9A3BWW 244,776
*I4JEE 6,478
*YB2CPO 304

TRIBANDER/SINGLE ELEMENT HIGH POWER ALL BAND

G2F (MØCKE) 2,904,960
GWØA 2,524,041
EU1AZ 2,434,740
OK2SFP 2,278,353
YL9T (YL2TW) 2,170,350
SV2BFN 2,106,156
WP4WW (KP4JRS) 2,080,598
YT2U 1,845,173
DL2SAX 1,836,495
EW4AA 1,806,840

28 MHz

WW4LL 1,049,937
DL2SAX 496,944
XE1EE 310,758
OH2BBT 229,537
JI3BFC 229,250
R11ALS (UA3RF) 203,728
IZ4GWE 65,659
HA5AWT 62,424
M3I 55,040
YO5CUQ 28,665

21 MHz

WK7S (K6LL) 1,581,935
WA5ZUP 1,260,567
UN4PG 914,480
KZ5A 622,422
UA6LJB 607,332
JO4CTB 230,285
NK6A 82,841
BA4MY 46,355
JA2HYD 42,340

14 MHz

N2WQ/VE3 (N2WQ/VE3) 1,753,890
RU5TT (RN3TE) 553,776
USØMS 414,028
JA9CWJ 160,200
IKØBZE 87,890
MØUNI 83,814
JH8SIT 55,896
ZM3T (W3SE) 32,857
PY2KJ 6,650

7 MHz

NO4S (K9OM) 2,077,756
S51CK 1,773,460
IV3SKB 1,162,448
IKØYVV 936,000
S57YX 498,686
KØPK 257,140
LX7X (LX3PR) 245,632
K8YE 72,558
K7EIQ 43,672
W9AKS 32,256

3.5 MHz

DD5FZ 328,724
IV3JCC 178,480
WA3FRP 80,868
ED5J (EA5DM) 15,750
JA9FAI 972

LOW POWER ALL BAND

*ZZ2T (PY2MNL) 2,856,296
*WB5TUF 2,254,500
*HA8BE 2,121,813
*OQ4B (ON4BHQ) 1,908,360
*UT5EPP 1,608,659
*UT7I (UT2IO) 1,541,808
*OM7KW 1,426,659
*GM1C (GM1BSG) 1,288,740
*F4GDI 1,163,684
*N2NF 1,146,080

28 MHz

*IZ8BRI 305,620
*IW4EGX 287,326
*PY4ZE 223,875
*AB1J 183,241
*VE7BC 122,496
*JM1NKT 100,926
*IKØPEA 81,000
*IZ7FLP 79,460
*I4UUL 73,457
*Z39A 70,517

21 MHz

*IW9FDD 791,040
*W1ZD/7 483,688
*YO4RDW 153,680
*K3NK 106,590
*DK1IP 104,904
*JF1PYJ 48,608
*JE2BOM 39,738
*KB9S 38,907
*PY4XX 20,008
*SM3DXC 16,482

14 MHz

*YT2AAA 424,710
*SMØLPO 205,275
*ED4T 97,272
*G8YTF (MØVAA) 91,680
*JI6BEN 22,320
*JK8PBO 20,928
*IY7M (IZ7XNB) 11,952
*W9CF/7 1,976

7 MHz

*OK2RU 910,188
*DL5KUD 641,592
*YU2A 536,300
*I3PXN 470,230
*DF1LX 450,512
*LY2BUU 412,896
*9A5B (9A6NRD) 387,898
*S54X 363,312
*UTØEL 269,808
*IV3IXN 241,332

3.5 MHz

*IK5AMB 626,516
*SQ2NNN 341,700
*YT2T (OU5A) 276,738
*HA5NB 173,712
*IT9JDH 44,908

UNITED STATES

SINGLE OPERATOR HIGH POWER ALL BAND

KI1G 7,701,728
AA3B 6,885,442
K4GMH 6,679,590
AB5K 5,757,507
W4PK 3,986,433
KS7AA (WK6I) 3,463,224
W3LL 3,446,100
ACØC 3,315,615
AI9T 3,152,016
ABØRX 3,134,799

28 MHz

AA5AU 1,396,395
WW4LL 1,049,937
W7ZR 869,400
N5MOA 344,500
K6HGF 310,686
K5QR 133,114
W6BVB 116,630
W6WRT 96,996
K9YC/6 93,456
KØJJ/7 60,417

21 MHz

WK7S (K6LL) 1,581,935
N7AT (K8IA) 1,437,988
WA5ZUP 1,260,567
AI6YL/7 (AI6YL/7) 1,226,500
W9ILY 1,011,129
N2MM 968,192
NC7J (W7CT) 833,310
KZ5A 622,422
N7BV 504,260
N7BT 409,374

14 MHz

KJ5T 598,525
KTØDX 480,048
W3RTY 222,324
W7PU 201,933
NN6NN (W6XK) 155,480
AI3Q 20,291

7 MHz

NO4S (K9OM) 2,077,756
KØPK 257,140
AB9H 216,834
AG2T 116,376
K8YE 72,558
K7EIQ 43,672
W9AKS 32,256

3.5 MHz

K4FJ 229,950
WA3FRP 80,868
N5RZ 74,166
NJ4F 60,762
N1SZ/3 24,252
W7PP 20,382
K4WW 2,112
W6GJB 1,610

LOW POWER ALL BAND

*KK9A/4 4,963,708
*WB5TUF 2,254,500
*AD7JP (K2PO) 1,958,360
*WW3S 1,768,332
*K9NR 1,728,825
*NTØF 1,419,668
*W3FIZ 1,369,669
*AD5XD 1,234,374
*AA8R 1,218,954
*N2NF 1,146,080

28 MHz

*N2WK 449,548
*WA1FCN/4 407,008
*NA5NN (W5UE) 183,274
*AB1J 183,241
*K2PS/4 145,800
*NY7N 104,918
*WNØL 77,909
*K2DSL 72,209

*K7GS....63,666
*WB9TFH....48,645

21 MHz

*K7TQ....557,568
*W1ZD/7....483,688
*W5NZ/4....108,402
*K3NK....106,590
*KC1UX....95,207
*WB3JFS/7....81,732
*KB9S....38,907
*N6BHX....10,695
*KA2RVO/1....10,425
*KFØIQ....9,499

14 MHz

*N8HP....22,781
*AI5AA....782
*AF6T (K6TD)....475

7 MHz

*KU5B....518,624
*KB4KBS....52,800
*KC8IMB....49,248
*W3NR/4....48,616
*K1GU/4....31,992
*NF8I/3....6,708
*WM9Q....3,168

3.5 MHz

*NX5M....34,650

QRP
ALL BAND

K2YG....545,941
N2QT/4....479,960
W6QU (W8QZA)....276,874
N5IJE....186,590
WD9FTZ/8....168,909
N7RN....49,912
KC7CM....37,290
KC8SQC....29,748
WB4OMM....28,386
AI9K....24,500

28 MHz

W9PDS....16,128
KB2HSH....6,552
K3TW/4....5,967
N4QX....341

21 MHz

K5ND....130,746

14 MHz

WB4MSG....132,775
NJ3I....56,021
W9CF/7....1,976

7 MHz

N6MA/7....89,100
WA4VMC....79,508
WFØT....3,724

MULTI-OPERATOR
SINGLE TRANSMITTER HIGH POWER

K3MJW....3,097,724
NAØCW....3,096,733
WX4G....2,336,488
AA4YL....2,319,525
W2YC....1,645,650
N2BJ/9....1,509,650
AK9D/Ø....538,615
KE1B/6....443,729
K3OQ....243,880
W4SAI/4....214,887

MULTI-OPERATOR
SINGLE TRANSMITTER LOW POWER

WE5DX....520,257
KT4RR....479,171
WØFRC....290,832
AA9L....218,370
K4FT....53,382

MULTI-OPERATOR
TWO TRANSMITTER

NØNI....6,760,203
K9XD....6,040,412
WQ2N....4,389,024
W4ML....2,295,746
WB8SKP/4....600,480
KN5S....227,970

MULTI-OPERATOR
MULTI-TRANSMITTER

NR4M....15,394,176
K4VV....5,334,410

ROOKIE
HIGH POWER ALL BAND

KK4EIR....898,800

LOW POWER ALL BAND

*KK4HEG....354,295
*K5MXG....235,966
*AE7DW....198,000
*W4TTM....134,816
*W4SDJ....129,626
*AB3TM....58,344
*AK4QR....35,821
*KD8SNZ....34,126
*KD2DOE....19,270
*KG7DYX....10,676

TRIBANDER/SINGLE ELEMENT
HIGH POWER
ALL BAND

NU4Y....1,506,925
AC4CA/5....1,493,300
NX5O....1,469,736
KA2D....1,355,550
N3QE....1,284,960
K3MD....1,249,879
W4CU....1,182,896
KV7DX (AA7V)....1,155,827
KØALT....1,073,111
NR2C....1,072,683

28 MHz

WW4LL....1,049,937

21 MHz

WK7S (K6LL)....1,581,935
WA5ZUP....1,260,567
KZ5A....622,422
NK6A....82,841

7 MHz

NO4S (K9OM)....2,077,756
KØPK....257,140
K8YE....72,558
K7EIQ....43,672
W9AKS....32,256

3.5 MHz

WA3FRP....80,868

LOW POWER
ALL BAND

*WB5TUF....2,254,500
*N2NF....1,146,080
*WW1MM (N1EN)....1,077,392
*AB4SF....985,938
*WV1K (N1IXF)....779,064
*NY6DX/2....689,510
*KB3LIX....685,875
*K6GHA....606,651
*KM6Z....602,509
*W1CCE....586,606

28 MHz

*AB1J....183,241
*K7GS....63,666
*WB9TFH....48,645
*WE6EZ/5....13,845
*W6TK....3,680

21 MHz

*W1ZD/7....483,688
*K3NK....106,590
*KB9S....38,907
*N6BHX....10,695
*N7UR....2,856

14 MHz

*W9CF/7....1,976

7 MHz

*W3NR/4....48,616
*NF8I/3....6,708
*WM9Q....3,168

EUROPE

SINGLE OPERATOR
HIGH POWER
ALL BAND

LZ8E (LZ2BE)....6,752,395
OM5ZW....5,841,099
UW1M....5,336,302
SN7Q....5,199,898
OH4A (OH1NOA)....5,129,920
OGØZ (OH9MM)....4,636,825
EMØI (UT2IZ)....4,087,215
EM2G....4,008,000
OM7JG....3,562,570
SZ1A (SV1CIB)....3,093,558

28 MHz

TM6M (F4DXW)....2,105,880
IT9RGY....1,651,888
9A5Y (9A3NM)....1,361,483
YT9A....1,184,720
EA7ZY....1,105,091
EA1KY....1,058,253
R22ALS (R7LV)....906,378
DM1A (DL1IAO)....798,126
DL3BQA....679,800
S51MA....587,388

21 MHz

LY8O....1,873,080
S5ØA....1,785,595
3Z5N (SP5GRM)....1,511,169
IW3RUA/IT9 (IW3RUA)....1,291,797
UT7E (UV5EOZ)....1,016,472
OI7AX (OH7UE)....798,369
EC1DBO....712,874
UA6LJB....607,332
UC7A....550,395
SP3PJY (SQ3BME)....448,644

14 MHz

OK6W (OK1MU)....1,841,246
SO4M....1,623,327
IW1QN....1,393,953
OH7WW (OH3LQK)....908,890
YO9HP....793,016
IW1PNJ....722,060
IQØAP....704,608
YP5A (YO5CBX)....670,980
IZ7ECL....623,337
EE5C (EA5EJ)....581,392

7 MHz

DR1D (DL1NX)....3,609,472
S52X....3,215,926
IW1AYD....2,827,576
HA8JV....2,720,272
S51CK....1,773,460
9A5D (9A3ID)....1,771,000
OH6R (OH3FM)....1,386,996
LY2FN....1,313,536
IV3SKB....1,162,448
UR6EA....1,038,552

3.5 MHz

OL9A (OK2ZAW)....1,246,968
DM7C (DL8CX)....1,024,056
YU3AAA....1,014,528
UX5IO....793,328
E7ØA....761,852
SO9ORQ....618,096
SP8K....505,076
LY2NY....477,680
DL7URH....399,434
DD5FZ....328,724

LOW POWER
ALL BAND

*EA7/UT5UDX (UT5UDX)....3,349,320
*HA8BE....2,121,813
*S56A....1,991,748
*OO4B (ON4BHQ)....1,908,360
*UT8EL....1,827,124
*MØA (G8APB)....1,823,394
*UC6A....1,760,598
*LZ5XQ....1,733,256
*ES5RY....1,689,160
*UT5EPP....1,608,659

28 MHz

*EE7Y (EA7ISH)....1,582,380
*IØUZF....570,843
*HGØR (HAØNAR)....332,618
*UZ7HO....311,040
*IZ8BRI....305,620
*EC7AKV....303,408
*IW4EGX....287,326
*UU9JQ....199,984
*LZ2JA....141,887
*EA5HJO....112,761

21 MHz

*IW9FDD....791,040
*EC7ZK....693,462
*CT2IOV....447,848
*GA5M (GM4ZNC)....344,124
*SV1BJW....261,960
*OH7MN....256,587
*IZ0UME....248,530
*IW2HUS....245,364
*RT4S....218,592
*MØOSH....208,800

14 MHz

*IZ8EFD....776,938
*URØHQ....653,232
*RZ1ZZ....635,725
*YU8NU....559,986
*YT2AAA....424,710
*LB2TG....365,748
*SX2V (SV2GJV)....307,830
*EA5FDM....291,560
*IZ0FWD....290,745
*IT9CLN....289,221

7 MHz

*HG5D....1,122,082
*OK2RU....910,188
*HA8BT....772,548
*IKØRCY....703,136
*USØHZ....655,802
*DL5KUD....641,592
*G8HBA....631,780
*YU2A....536,300
*EW8OF....513,922
*LZ9R....508,690

3.5 MHz

*IK5AMB....626,516
*YT5CT....620,308
*HA1WD....604,788
*SQ2NNN....341,700
*OK2SAR....336,960
*YT2T (OU5A)....276,738
*OM3RWB (OM3ZCK)....208,638
*MØNKR....194,166
*UT5KO....193,428
*G4FJK....158,688

QRP
ALL BAND

TM3T (F5VBT)....1,483,900
F5BEG....1,088,666
RX1CQ....858,032
UT3N (UT3NK)....756,071
OM6RK....551,784
HG6C (HA6IAM)....460,224
EA1SI....325,185
MØVAA....316,660
YO4BEW....316,416
EA1GT....288,500

28 MHz

IZ2JPN....73,647
IK4UXA....68,391
IZ3NVR....47,109
9A6K (9A3QB)....560

21 MHz

HG3IPA (HA3JB)....174,048
CT1BXE....166,254
SP4LVK....56,032
RA3XEV....12,351
9A4WT....510
DN7DX....270

14 MHz

UX5UU....144,055
G8YTF (MØVAA)....91,680
9A4AA....71,340
EA1GFY....30,600
HG3M....26,070
DL8LR....8,442
SV1DJG....128

7 MHz

S51DX....287,448
UR3AHF....231,880
SP4BPH....122,748
UU4JCR....117,440
DJ3GE....111,600
UX9Q (UR9QQ)....46,512
RQ22RP (RT5R)....42,940
UT3XA....30,340
UX7UW....10,904
IZ2QKG....9,898

3.5 MHz

HA5NB....173,712
ON9CC....35,126
LY5D (LY3BY)....34,532

MULTI-OPERATOR
SINGLE TRANSMITTER HIGH POWER

ED1R....7,912,293
UA5A....7,532,070
HG7T....6,283,025
IW9GTD....6,244,102
S55W....5,874,678
IZ6TSA....5,079,008
DJ8OG....4,805,172
Z37M....4,788,115
UW5Y....4,632,198
OF4ØR....4,161,760

MULTI-OPERATOR
SINGLE TRANSMITTER LOW POWER

ON4WLR....1,299,879
ES1O....1,044,884
IQØTE....169,388
YO4KAK....30,070

MULTI-OPERATOR
TWO TRANSMITTER

LX7I....12,295,782
S51A....10,864,828
DQ4W....9,232,425
YL4U....7,300,847
RK4W....5,838,408
LN5O....4,147,535
EA1AP....823,125

MULTI-OPERATOR
MULTI-TRANSMITTER

9A1A....20,731,977
HG1S....13,377,538
DKØKC....7,925,120
OH5CY....3,777,808

ROOKIE HIGH POWER
28 MHz

9A3DZH....2,550

14 MHz

F4GTD....129,766

LOW POWER
ALL BAND

*IZ8VMV....664,332
*IZ3XNJ....470,586
*UR6LEY....468,696
*EA7JW....356,895
*IZ3XEF....276,888
*ISØDCR....226,226
*UTØFC....158,200
*DK6SP....113,643
*OO7R (ON6OM)....95,700
*OH7EBA....78,000

28 MHz

*SP9NWN....16,717
*MMØKFX....2,871

21 MHz

*IW9FI....51,060
*DO9MJ....29,376

14 MHz

*IT9CLN....289,221
*PD8SL....33,390

7 MHz

*9A3BWW....244,776
*I4JEE....6,478

TRIBANDER/SINGLE ELEMENT
HIGH POWER
ALL BAND

G2F (MØCKE)....2,904,960
GWØA....2,524,041
EU1AZ....2,434,740
OK2SFP....2,278,353
YL9T (YL2TW)....2,170,350
SV2BFN....2,106,156
YT2U....1,845,173
IZ3SQW....1,836,495
EW4AA....1,806,840
EV1R....1,691,916

28 MHz

DL2SAX....496,944
OH2BBT....229,537
R11ALS (UA3RF)....203,728
IZ4GWE....65,659
HA5AWT....62,424
M3I....55,040
YO5CUQ....28,665

21 MHz

UA6LJB....607,332

14 MHz

RU5TT (RN3TE)....553,776
USØMS....414,028
IKØBZE....87,890
MØUNI....83,814

7 MHz

S51CK....1,773,460
IV3SKB....1,162,448
IKØYVV....936,000
S57YX....498,686
LX7X (LX3PR)....245,632

3.5 MHz

DD5FZ....328,724
IV3JCC....178,480
ED5J (EA5DM)....15,750

LOW POWER
ALL BAND

*HA8BE....2,121,813
*OO4B (ON4BHQ)....1,908,360
*UT5EPP....1,608,659
*UT7I (UT2IO)....1,541,808
*OM7KW....1,426,659
*GM1C (GM1BSG)....1,288,740
*F4GDI....1,163,684
*GM8SBH....1,095,003
*EA1FA....1,089,878
*GUØSUP....985,560

28 MHz

*IZ8BRI....305,620
*IW4EGX....287,326
*IKØPEA....81,000
*IZ7FLP....79,460
*I4UUL....73,457
*Z39A....70,517
*OK8DD....54,558
*IZ3NVR....47,109
*DF4WC....36,668
*F6IRG....19,656

21 MHz

*IW9FDD....791,040
*YO4RDW....153,680
*DK1IP....104,904
*SM3DXC....16,482
*SV7CUD....10,602
*PAØMIR....8,456
*G3RLE....6,552
*IW2NRI....615

14 MHz

*YT2AAA....424,710
*SMØLPO....205,275
*ED4T....97,272
*G8YTF (MØVAA)....91,680
*IY7M (IZ7XNB)....11,952

7 MHz

*OK2RU....910,188
*DL5KUD....641,592
*YU2A....536,300
*I3PXN....470,230
*DF1LX....450,512
*LY2BUU....412,896
*9A5B (9A6NRD)....387,898
*S54X....363,312
*UTØEL....269,808
*IV3IXN....241,332

3.5 MHz

*IK5AMB....626,516
*SQ2NNN....341,700
*YT2T (OU5A)....276,738
*HA5NB....173,712
*IT9JDH....44,908

**Low Power*

Radio Club took second in the world to win the North America plaque, with more than twice the score of NA second-place Frankford Radio Club. With only 15 logs to PVRC's 49, the FRC had a 50% higher average score per log. It is often the case that participation—i.e., number of submitted logs—will win a club competition.

Closing

My first RTTY contest ever, nice new experience . . . ***.E77C***

Nice to take part in WPX RTTY for the 1st time . . . ***F4DSK***

I got my License on November 2013 and CQ WPX RTTY 2014 is my first contest . . . ***YD2SM***

Most contacts I've ever had in a contest! . . . ***W3ZKU***

I love this contest!! Wonderful propagation on high band. See you next year . . . ***IZ1MHY***

Great contest. Had a lot of fun with it. Can't wait until next year! . . . ***ND3R***

It was super fun and I am waiting for the next one . . . ***EA3FF***

The complete results score listing of all received logs is on the web at <http://www.cq-amateur-radio.com/cq_contest/>.

In addition, a searchable database of the results from every CQ WPX RTTY Contest is available at <http://www.cqwpxrtty.com/score_db.htm>.

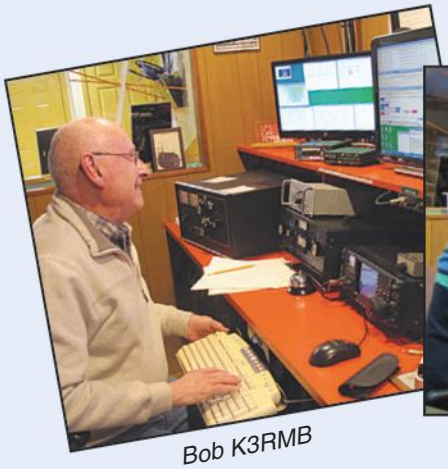
It is surprising that more participants do not request their Log Check Reports (LCRs) and use them for ideas to improve their operating accuracy. Typically, less than a dozen of the roughly 3,000 people who submit logs request their LCR after log checking is complete. This valuable information is readily obtainable by email from <w0yk@cqwpxrtty.com>. You can compare your log check statistics with the averages across all logs in this contest:

- 1.3% incorrect received call sign
- 1.9% incorrect serial number received
- 1.3% NIL (Not In Log)
- 4.5% total error rate (with penalties, score reduction is higher)

Achieving a zero error rate may mean that too much time is being spent on accuracy. Speed and accuracy are a trade-off for optimal communication.

A number volunteers work tirelessly in the background to bring contests to us and to compile the results. For this contest, Mark K6UFO helped to fix log-formatting problems prior to final log checking, including entering paper logs into the computer system. Ken K1EA and Randy K5ZD continue to improve and support the log-checking and website software. K5TR and N5KO quietly manage the IT infrastructure behind the log submittal robots, log storage, and log checking software. The WWROF (World Wide Radio Operators Foundation) provides financial support for the IT services required, among other support for contesting in general. All of us can help with our donations to WWROF, so please consider this way to give back to the radiosport. Gail, K2RED, Managing Editor of *CQ* magazine, does a wonderful job of assembling these contest articles. Barry W5GN performs the huge task of getting certificates out. Ray ND8L manages the plaque program, which is another opportunity for us to give back by becoming a plaque donor. He replaces Mike K4GMH, who expertly handled plaques for both CQ RTTY and WPX RTTY contests for nearly a decade. You can choose an unsponsored plaque in any category. Please contact ND8L for details. The plaques winners for the 2014 contest will be on the both the CQ website and the CQ WPX RTTY website (http://www.cqwpxrtty.com).

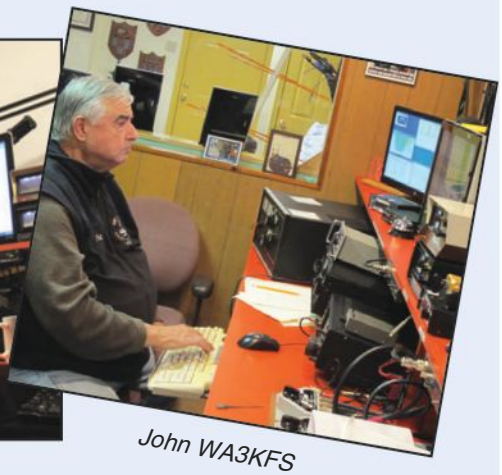
The 21st CQ WPX RTTY Contest will be held on 7–8 February 2015. We hope to see everyone again, including new participants! See you then! 73, Ed, WØYK



Bob K3RMB

Jim K3FH

John NK3P



John WA3KFS

John K3STL prepares another great feast for the K3MJW MS crew.

The Multi-SingleTeam K3MJW (K3RWN, NK3P, WC3O, K3STL, KB3EYY, WA3KFS, K3FH, K3RMB) won North America.

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The ARD300:

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- Decodes analog NFM (Narrow FM) signals
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Announcing:

The 2014 CQ WW RTTY DX Contest September 27–28

Starts 0000 UTC Saturday Ends 2359 UTC Sunday

I. OBJECTIVE: For amateurs around the world to contact as many other amateurs in as many CQ zones, countries, and W/VE QTHs as possible.

II. BANDS: Five bands only: 3.5, 7, 14, 21, and 28 MHz. Observance of established band plans is strongly encouraged.

III. CONTEST EXCHANGE: RST report plus zone (e.g., 599 14). Stations in the continental USA and Canada also send QTH. (e.g., 599 05 MA)

IV. SCORING:

A. Score: The final score is the result of the total QSO points multiplied by the sum of zone, country and US/VE QTH multipliers. Example: 1000 QSO points (30 Zones + 35 Countries + 35 W/VE QTHs) = 100,000 (final score).

B. QSO Points: Stations may be contacted once on each band. QSO points are based on the location of the station worked.

1. Contacts between stations on different continents count three (3) points.

2. Contacts between stations on the same continent but in different countries count two (2) points.

3. Contacts between stations in the same country count one (1) point.

C. Multipliers: There are three types of multipliers.

1. Zone: A multiplier of one (1) for each different CQ zone contacted on each band. The CQ Worked All Zones rules are the standard.

2. Country: A multiplier of one (1) for each different country contacted on each band. The DXCC entity list, Worked All Europe (WAE) multiplier list plus IG9/IH9, and WAC boundaries are standards. Maritime mobile stations count only for a zone multiplier.

3. W/VE QTH: A multiplier of one (1) for each continental US state (48) and each Canadian area (14) on each band. Please use only official U.S. Postal Service abbreviations to identify states (e.g., Michigan = MI, Massachusetts = MA, Ohio = OH). Note: The District of Columbia counts as Maryland (MD). Alaska (KL7) and Hawaii (KH6) are counted as country multipliers only and not as state multipliers. Canadian areas (14 total) are as follows: NB (VE1, 9), NS (VE1), QC (VE2), ON (VE3), MB (VE4), SK (VE5), AB (VE6), BC (VE7), NWT (VE8), NF (VO1), LB (VO2), NU (VY0), YT (VY1), PEI (VY2).

V. ENTRY CATEGORIES:

A. Single Operator Categories: One person (the operator) performs all operating and logging functions. There is no limit on operating time or band changes. Only one transmitted signal is permitted at any time.

1. Single Operator: QSO alerting assistance of any kind is prohibited (see VIII.B.)

a. High Power (All Band or Single Band): Total output power must not exceed **1500 watts**.

b. Low Power (All Band or Single Band): Total output power must not exceed **100 watts**.

c. QRP (All Band or Single Band): Total output power must not exceed **5 watts**.

2. Single Operator Assisted: Entrants in this category may use QSO alerting assistance (see VIII.B.).

a. High Power Assisted (All Band or Single Band): Total output power must not exceed **1500 watts**.

b. Low Power Assisted (All Band or Single Band): Total output power must not exceed **100 watts**.

c. QRP Assisted (All Band or Single Band): Total output power must not exceed **5 watts**.

B. Single Operator Overlay Categories: Any Single Operator All Band entrant above may ALSO submit his/her log for one of the categories shown below by adding the appropriate CATEGORY-OVERLAY line in the Cabrillo log file header. Overlay category entries will be listed separately in the results; grouped by high power and low power.

1. Classic Operator (CLASSIC): The entrant will use only one radio, no QSO alerting assistance, and may operate up to 24 of the 48 hours – off times are a minimum of 60 minutes during which no QSO is logged. If the log shows more than 24 hours of operation, only the first 24 hours will be counted for the overlay score. The one radio must not be able to receive while transmitting.

2. Rookie (ROOKIE): The operator was first licensed as a radio amateur less than three (3) years before the date of the contest. Indicate the date first licensed in the SOAPBOX field.

C. Multi-Operator Categories (all-band operation only): Any number of operators is allowed. QSO alerting assistance is allowed. Only one transmitted signal per band is permitted at any time. Total output power must not exceed 1500 watts on any band at any time.

1. Single Transmitter (MULTI-ONE): Only one transmitted signal on one band permitted at any time (run transmitter). Exception: One—and only one—other transmitted signal (multiplier transmitter) may be used, if—and only if—, it is on a different band than the run transmitter and the station worked is a new multiplier. Each transmitter may make a maximum of 8 band changes in any clock hour (00 through 59 minutes). The log must indicate which transmitter (run or multiplier) made each QSO. The multiplier transmitter may not call CQ (solicit contacts).

a. Single Transmitter High Power (MULTI-ONE HP)

b. Single Transmitter Low Power (MULTI-ONE LP): Total output power must not exceed **100 watts** on any band at any time.

2. Two Transmitters (MULTI-TWO): A maximum of two transmitted signals on two different bands may be used at any time. Each transmitter may make a maximum of 8 band changes in any clock hour (00 through 59 minutes). The log must indicate which transmitter made each QSO.

3. Multi-Transmitter (MULTI-UNLIMITED): The five contest bands may be activated simultaneously. Only one transmitted signal per band is permitted at any time.

D. 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.

VI. AWARDS: A single-band log will be eligible for a single-band award only. If a log contains more than one band it will be judged as an all-band entry, unless specified otherwise. A Single Operator station must operate a minimum of 4 hours be eligible for an award. Multi-operator stations must operate a minimum of 8 hours to be eligible for an award.

A. Certificates: First-place certificates will be awarded in each category for every participating country and in each call area of the United States, Canada, Russia, and Japan.

B. Plaques: Plaques and trophies are awarded for top performance in a number of categories. View the current list of plaques and sponsors at <www.cqwwrtty.com/plaques.htm>. Only one plaque will be awarded per entry. A station winning a plaque will not be considered for a sub-area award; the plaque will be awarded to the runner-up in that area.

VII. CLUB COMPETITION: The club score is the total aggregate score from logs submitted by members. To be listed in the results, a minimum of four logs must be received from a club.

A. USA Clubs: Participation is limited to club members living and operating within a 175 mile radius circle from the center of club area (except for DXpeditions to other countries conducted by members who live within the club circle).

B. DX Clubs: Participation is limited to club members living and operating within the DXCC country where the club is located OR within a 275 km radius circle from the center of club area (except for DXpeditions to other countries conducted by members who live within the club area).

C. General club rules:

1. National organizations (e.g., JARL, REF or DARC) are not eligible for the club competition.

2. Single-operator entries may only contribute to one club. Multi-operator scores may be allocated to multiple clubs as a percentage of the number of club members participating in the operation. The log entry must spell out the full club name (and club allocations if multi-op).

3. A minimum of four logs must be received for a club to be listed in the results. Checklog entries are not counted for the club score.

VIII. DEFINITIONS OF TERMS:

A. Station location: The area in which all the transmitters, receivers and antennas are located. All transmitters and receivers must be within a single 500-meter diameter circle. Antennas must be physically connected by RF transmission lines to the transmitters and receivers.

B. QSO alerting assistance: The use of any technology or other source that provides call sign or multiplier identification along with frequency information to the operator. It includes, but is not limited to, use of DX cluster, packet, local or remote call sign and frequency decoding technology (e.g., CW Skimmer or Reverse Beacon Network), or operating arrangements involving other individuals.

IX. GENERAL RULES FOR ALL ENTRANTS:

A. Entrants must operate within the limits of their chosen category when performing any activity that could impact their submitted score.

B. A different call sign must be used for each entry. Only the entrant's call sign may be used to aid the entrant's score.

C. Do not exceed the total output power limitation of the chosen entry category on any band. Total output power on any band at any time is measured at the output of the active amplifier(s).

D. Self-spotting or asking to be spotted is not permitted.

E. Remote operation is permitted if the physical location of all transmitters, receivers, and antennas are at the operating location. A remotely operated station must obey all station, license, and category limitations.

F. Remote receivers outside the operating location are not permitted.

G. Only one signal on a band is allowed at any time. When two or more transmitters are present on the same band, a hardware device MUST be used to prevent more than one signal at any one time. Alternating CQs on two or more frequencies on a band is not permitted.

H. All requests for contacts, responses to calls, and copying of call signs and contest exchanges must be accomplished using the mode and frequencies of the contest.

I. Correction of logged call signs and exchanges after the contest by using any database, recordings, email or other methods of confirming is not allowed.

J. Call signs logged must be the same as those exchanged over the air by the entrants during the QSO.

K. Only Baudot mode is permitted.

L. A station operating from a DXCC country different from that indicated by its call sign is required to sign portable with an authorized prefix of the country of operation.

X. LOG INSTRUCTIONS: Electronic submission of logs is required for all entrants who use a computer to log the contest or prepare contest logs.

A. The log MUST show the following for each contact: correct date and time in UTC, frequency (or band), call sign of the station worked, exchange sent and exchange received. A log without all required information may be reclassified to Checklog. Stations competing for World and Continent awards should provide accurate frequencies for all contacts in the log.

B. Single band entrants are required to include all contacts made during the contest period, even if on other bands. Only contacts made on the band specified in the Cabrillo header or summary sheet will be considered for scoring purposes. Logs with contacts only on one band will be classified as single band entries.

C. The CABRILLO file format is the standard for logs. See <www.cqwwrtty.com/logs.htm> for detailed instructions on filling out the CABRILLO file header. Failure to fill out the header correctly may result in the entry being placed in the wrong category or reclassified as a Checklog. Note: U.S. stations must indicate the operating location in the CABRILLO header (e.g., LOCATION: OH).

D. E-mail or Web upload is the expected method of log submission. Logs in CABRILLO format should be sent to <rtty@cqww.com>. Include only the entry call sign in the "Subject:" line of the e-mail. Web upload of logs is available at <www.cqww.com/logcheck/>. All logs received will be confirmed via e-mail. A listing of logs received can be found at <www.cqwwrtty.com>.

E. Instructions for NON-CABRILLO electronic logs: If you are not able to submit a CABRILLO format log, please contact the Contest Director for assistance with submitting another format.

F. Instructions for paper logs: Paper logs may be mailed to CQ WW RTTY DX Contest, P.O. Box 1877, Los Gatos, CA 95031 USA. Each paper log entry must be accompanied by a Summary Sheet listing all scoring information, the category of competition, and the entrant's name and mailing address in BLOCK LETTERS.

XI. LOG DEADLINE:

A. All entries must be sent WITHIN FIVE (5) DAYS after the end of the contest: no later than 2359 UTC October 3, 2014.

B. An extension may be requested by e-mail <questions@cqwwrtty.com>. The request must state a legitimate reason and must be received before the log deadline. Extensions are granted only upon confirmation by the Contest Director.

C. Logs submitted or post marked after the deadline may be listed in the results, but will not be eligible for awards.

XII. JUDGING: The CQ WW RTTY DX Contest Committee is responsible for checking and adjudicating the contest entries. Entrants are expected to follow the rules and good amateur radio practices. Violation of the rules of the contest or unsportsmanlike conduct may lead to disciplinary action by the Committee.

A. Unsportsmanlike Conduct: Examples of unsportsmanlike conduct include, but are not limited to:

1. ARRANGING or CONFIRMING any contacts during the contest by use of ANY non-amateur radio means such as telephones, Internet, instant messaging, chat rooms, VoIP, social media or web sites

2. Transmissions by the entrant on frequencies outside of license limitations.

3. Changing times in the log to meet band change or off time rules.

4. Taking credit for excessive unverifiable QSOs or unverifiable multipliers.

5. Signals with excessive bandwidth (e.g., splatter, clicks) or harmonics on other bands.

B. Observer Program: The Committee may request of any entrant to accept a visit by an observer during the contest. Failure to allow a Committee appointed observer full access to the station during the contest period may result in the entry being disqualified.

C. Disciplinary Actions: In the event of a violation, the entrant is subject to a warning letter or disqualification at the discretion of the Committee.

1. DISQUALIFICATION: Entry will be listed at the end of the published results and is not eligible for an award.

2. Notification of Committee actions will be sent by email to the address provided with the log submission. The entrant has five days to appeal the decision to the Contest Director. After that time the decision is final.

3. An entrant may withdraw the submitted log for any reason within 30 days of the log deadline. Contact the Contest Director for instructions.

4. The Committee reserves the right to change the category of any entry based on its examination of the log or other information.

D. Log Checking: All logs are checked using custom software and human judgment.

1. Duplicate contacts are removed with no additional penalty.

2. Contacts with an incorrect received exchange are removed with no additional penalty.

3. Call sign errors or call signs not found in the other log are removed and receive a penalty of two times the QSO point value for that contact.

4. Contacts that do not meet the band change rules for multi-operator entries are removed with no additional penalty.

XIII. DECLARATION: By submitting a CQ WW RTTY DX Contest log, and in consideration of the efforts of the CQ WW RTTY DX Contest Committee to review and evaluate that log, an entrant unconditionally and irrevocably agrees that he/she has: 1) read and understood the rules of the contest and agree to be bound by them, 2) operated according to all rules and regulations that pertain to amateur radio for the operating location, 3) agreed their log entry may be made open to the public, and 4) accepted that the issuing of warnings, disqualifications and other decisions of the Committee are official and final. If an entrant is unwilling or unable to agree to all of the foregoing, the entrant should not submit the entry or submit the entry as a Checklog only.

Questions pertaining to the CQ WW RTTY DX Contest rules may be submitted by e-mail to <questions@cqwwrtty.com>. Answers for many frequently asked questions can be found at <www.cqwwrtty.com>.

Need a break from the summer heat? Think cool thoughts and join W1FK as he recounts his early spring visit to Sweden's northernmost ham radio club.

Hamming in the Swedish Arctic

BY STEW GILLMOR,* W1FK

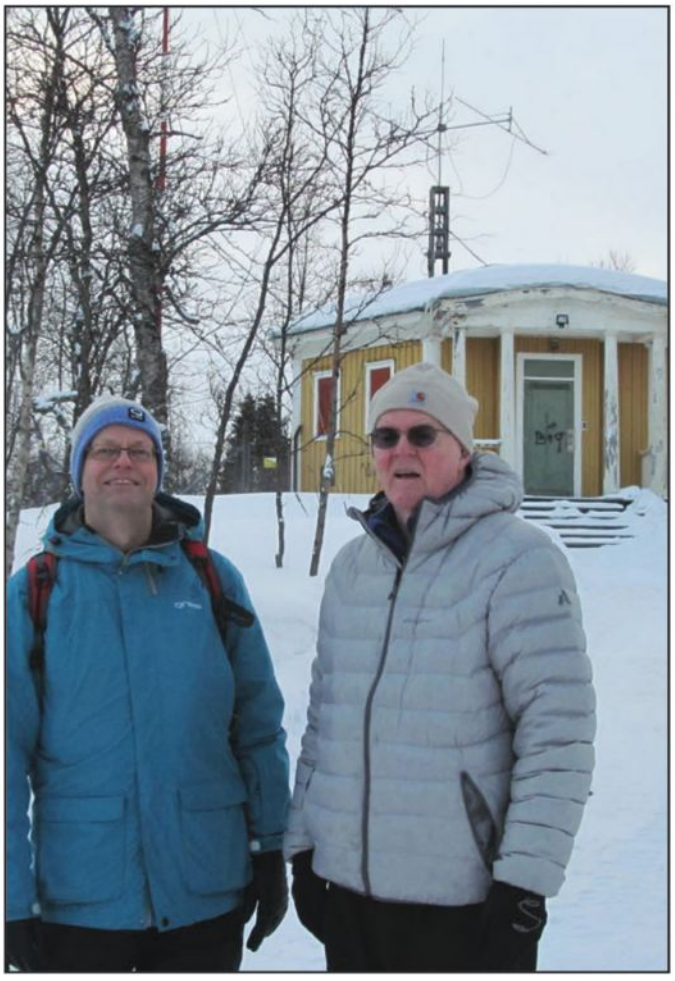
Some twenty-five years ago when I was a guest researcher at the Center for Terrestrial and Planetary Physics in Paris, France, we sent a team up to the arctic, to Tromso, Norway and to Kiruna, Sweden for ionospheric physics studies using the facilities of EISCAT (the European Incoherent Scatter Scientific Association). At that time, these radar research stations were two parts of a three-leg observation network, with the third station in Sodankylä, Finland. EISCAT, coordinating with satellite measurements, provided valuable information concerning the structure and dynamics of the Earth's outer atmosphere and near-space. Each site in those days had as its jewel a fully steerable 32-meter (105-foot) parabolic dish. I had a great time there in early May, with snow still all around. The Tromso,

Photo A. The 32-meter parabolic dish antenna at Kiruna, Sweden. This is part of the EISCAT research facility and not used for ham radio (Photo courtesy Dr. Craig Heinselman)

*e-mail: <sgillmor@wesleyan.edu>

Photo B: Temporary field of 32 Yagi antennas at Kiruna, Sweden. They look ready for some serious 225-MHz EME (moonbounce) work, but really are intended for ionospheric scatter experiments. (Photo courtesy Dr. Craig Heinselman)

Photo C. SM2HMF and W1FK outside the building of Kiruna, Sweden's ham club, SK2GJ. The building once housed arctic Sweden's first AM broadcast station. (Rogene Gillmor photo)



Norway, site was equipped with giant microwave transmitters, and all three sites were used for receiving.

Nowadays, with me retired and somewhat older, my XYL suggested that she (1) had never seen the Northern Lights and (2) had never visited Scandinavia. Thus, I responded with "How about *arctic* Scandinavia? You can see both!" Optimum months for viewing the Aurora Borealis are, naturally, the northern winter months, the season tapering off in mid-March. I have had plenty of time with snow and ice, having been the U.S. Guest Scientist with the 6th Soviet Antarctic Expedition for 14 months in 1960–62. (See "Vodka Amongst the Penguins," *73* magazine, June 1979, pp.126–133.)

We booked our trip several months in advance and planned to visit Denmark as well. After several days in Denmark, we took an overnight boat to Oslo, Norway, then a train ride west to Bergen, where we boarded the Hurtigruten lines ship

Pedal to the Metal

LKAB Mining Industries is Kiruna's major employer and operates the world's largest underground iron mine, from which more than one *billion* tons of ore have been removed over the past 120 years. There has been so much mining over the decades that the city of about 20,000 people is in the process of moving several entire neighborhoods a couple of miles away to lessen the chance of collapse or of landslides.

Tours of the mines are given daily, but for safety reasons, it is required that one speak the language of the tour guide. On the day we were there, the tour was in Swedish only, so we were not able to go.

Photo D. Lennart, SM2HMF, at operating table of station SK2GJ. Despite the QSL cards from around the world, Lennart says most of today's activity is on a linked system of VHF repeaters that covers most of arctic Sweden. (Rogene Gillmor photo)

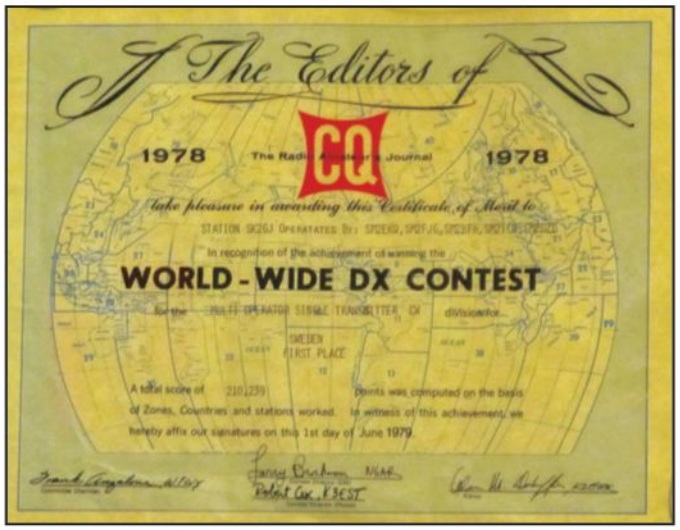


Photo E. Back in the '70s, SK2GJ was a contender in HF contesting, as shown by this CQ WW DX Contest certificate on the wall. (Rogene Gillmor photo)

Nordlys. Most of the time, these ships travel from Bergen, along the central Norwegian coast, stopping at many small ports, all the way north and around east to Kirkenes and the border with Russia, near Murmansk. We went north for three nights, leaving the ship at Bodø and then flying farther north to Narvik. For a long time, Narvik has been a valuable, usually ice-free, port and the western terminus of a rail line eastward to Kiruna, Sweden. Kiruna had the world's largest iron mine in the 18th century and truly large-scale mining began in the late 19th century. The railroad was built about 1900 to transport the iron ore to the port at Narvik for farther transport by ship to iron and steel foundries around Europe and other areas. For this reason, Narvik was the site of terrible air, naval, and land battles during World War II between German forces and British, Norwegian, French, and Polish forces, and some 40 ships were sunk in and around the harbor. From Narvik, we traveled to Kiruna, where we had been promised a tour of the EISCAT site in its current state, as well as a visit to the most northern ham club in arctic Sweden.

When I was a research visitor at EISCAT in the mid-80s, Dr. Murray Barron of the Stanford Research Institute (SRI International today) was the Director. People at SRI kindly put me in touch with Dr. Craig Heinselman, the current Director of EISCAT. Dr. Heinselman is ex-OX3EO and ex-N6MCD. Similarly, other hams were also quite helpful to me. These include Dave Sumner, K1ZZ, Chief Executive Officer of the ARRL; Rod Stafford, W6ROD, International IARU Secretary; and Anders Larsson, SM6CNN, Swedish IARU chairman. Larsson arranged for Lennart Jonasson, SM2HMF, a radio software engineer in Kiruna, to take my wife and me through SK2GJ, the Kiruna ham club station. We were really looking forward to our Kiruna visit.

EISCAT

Dr. Heinselman picked us up at our hotel in Kiruna for the short drive to the EISCAT offices. There he brought us up to date on EISCAT researches. The original working frequency at UHF has been down-shifted to VHF because of tremendous QRM from cellphone (!) usage, particularly at the Sodankylä, Finland site. Today, the big dish uses a dipole

ring feed with cross dipoles at 225 MHz (See photo A). Just next to the EISCAT offices is a temporary field of 32 cross-polarized Yagis for around 225 MHz (photo B), intended for new scatter experiments.

EISCAT is a non-profit international organization with six major partners: China, Japan, Norway, the U.K., Finland, and Sweden. There are five other associate countries. Today's operations include sites on Svalbard (Spitsbergen) with a huge array of riometers (Relative Ionospheric Opacity Meters) and a 32-meter dish with a 1-megawatt peak-power transmitter on 500 MHz.

At Tromso, Norway, there are transmitters on UHF and VHF: a 2-megawatt pulse power transmitter on 931 MHz and a 3-megawatt transmitter on 500 MHz. All this is for research studying the lower atmosphere from 50 km (approximately 31 miles) up to more than 2000 km (1243 miles) and the edge of the magnetosphere. These studies reveal details of ionospheric instabilities, auroral dynamics, and ionospheric heating. In planning is EISCAT 3_D, a fantastic incoherent scatter imaging radar system with thousands of antenna elements which can provide resolution of 100-meter size motions, velocities and particle densities and composition, and can scan multiple areas such as the raster scan on a TV set.

Dr. Heinselman and I talked hamming as well as incoherent scatter radar. He spent eight years working in Greenland and reminisced about the pile-ups he experienced when calling CQ. After this fascinating visit, Dr. Heinselman drove us back to our hotel in Kiruna.

A Visit to SK2GJ

Later that day we met Lennart, SM2HMF, who took us on a pleasant walking tour of the nearby neighborhoods in Kiruna and showed us the building for the earliest radio station in the Swedish arctic. In this little yellow building (photo C) was housed the Kiruna AM radio broadcasting station, which operated from 1926 to 1960, broadcasting on 240 meters wavelength (1250 kHz) with a power of 300 watts. This little station became a relay station for the Swedish Broadcasting System.

Just outside the building is the antenna mast for the AM station, originally about 36 meters (118 feet) high. When the ham club was founded in 1964 with call SK2GJ, it was given use of the then-vacant building and the height of the antenna mast was eventually shortened to about 20 meters (66 feet). The club met for its first several years in the basement of the LKAB Iron Mining Industries plant (see sidebar, "Pedal to the Metal") before moving to the little yellow building.

While there are plenty of QSL cards on the wall from all over the world (photo D) and even a CQ WW contest certificate (photo E), most are from a few decades back. Lennart explained to us that the club is not as active on HF as in former years and that most activity today is with VHF repeaters, which are part of a linked network across much of arctic Sweden.

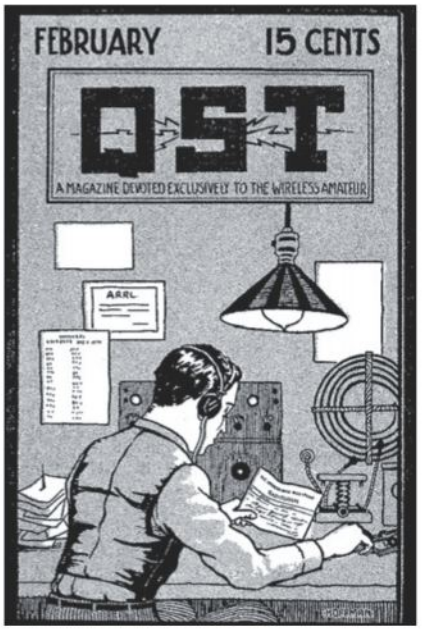
We thoroughly enjoyed the kindness of our Swedish hosts and found that in mid-March the amount of snow and the temperature at our Connecticut home was equal to the weather we found in the Swedish arctic!

How long a history does ham radio have in your town? AD1B did some research and came up with a fascinating portrait of amateur radio in his home town in 1920.

Radio Amateurs of Dedham, Massachusetts in 1920

BY TM HART,* AD1B

The 1920 QTH of John F. Austin, 1HAX (2013 photo). According to census records, the then-18-year-old was born in Japan and was one of five children.



QST *magazine in the 1920s chronicled the interests and issues of importance to radio amateurs of the time. (Copyright ARRL; used by permission)*

After reading a *CQ* article about the Radio Act of 1912[1], I checked "Google Books" for more information on amateur radio in the early 20th century. A 1920 U.S. Commerce Department list of amateur radio stations[2] caught my attention. I collected the names from Dedham, Massachusetts (my QTH) and tried to learn more about these amateur radio pioneers.

Dedham was established in 1635 by an order of the Massachusetts General Court to protect coastal settlements. By 1639, the town covered 200 square miles and was governed by a board of selectmen. Per the 1920 U.S. Census, a geographically smaller Dedham had grown to a population of 10,782 [3]; nine residents held amateur radio licenses (see Table I).

In 1920 Dedham, amateur radio was primarily a young man's hobby. Seven of the amateurs were male teenagers; the others were 27 and 77 years of age. The oldest amateur may have been the grandfather of the 17-year-old operator with the same name. There are no women on the list.

*e-mail: <tom.hart@verizon.net>

The seven teenagers may have been high school students. Their parents worked in agriculture, retail, construction, business, and a law office. Eight of the families listed 31 dependent children; the seven licensed teenagers had 21 brothers and sisters. Two of the nine licensees were married. Five of them were Massachusetts natives; the remaining four were born in Maine, New York, New Jersey, and Japan.

Four of Dedham's hams had 500-watt stations (including the possible grandfather-grandson pair). Two others had 300 watts; the other three were 100-watts. My suspicion is that the power categories were based on spark transmitters. Vacuum tubes were expensive and spark technology was widely used in 1920.

Another Commerce Department book[5] provided the regulations for radio operations. Page 65 defined the two grades of amateur licenses and their requirements:

122. Amateur first grade. — The applicant must have a sufficient knowledge of the adjustment and operation of the apparatus which he wishes to operate and of the regulations of the International Convention and acts of Congress in so far

Name	Address	License	Callsign	Age	Born	Family	Occupation
George A. Chute	Harvard St.	500 watts	1AY	17	Mass.	1 of 3 children	Unknown
Benjamin Brewster	942 High St.	500 watts	1DAV	15	Mass.	1 of 5 children	Father: stock raiser
Lloyd B. Salt	11 Van Brunt St.	300 watts	1GH	27	NY City	Wife and 3 children	Unknown
Elmer Schriwer	16 Elm St.	100 watts	1HAS	17	NJ	1 of 4 children	Father: florist
John F. Austin	19 Court St.	300 watts	1HAX	16	Japan	1 of 5 children	Father: lawyer
George A. Chute	630 High St.	500 watts	1MK	77	Maine	Wife: Clara.	Died in 1920
Ormond Gay	277 Colburn St.	100 watts	1RAO	15	Mass.	1 of 3 children	Father: carpenter
Irving W. Daniels	25 Marion St.	500 watts	1SAO	17	Mass.	1 of 3 children	Father: book keeper
Lawrence E. Anderson	Fairbanks Rd.	100 watts	1VA	16	Mass.	1 of 6 children	Father: iron worker

Table I. Licensed radio amateurs in Dedham, Massachusetts in 1920. Sources: US Dept. of Commerce[2], US Census[3], Dedham business directory[4].

as they relate to interference with other radio communication and impose certain duties on all grades of operators. The applicant must be able to transmit and receive in Continental Morse at a speed sufficient to enable him to recognize distress calls or the official "keep-out" signals. A speed of at least 10 words per minute (five letters to the word) must be attained.

123. Amateur second grade. — The requirements for the second grade will be the same as for the first grade. The second-grade license will be issued only where an applicant can not be personally examined or until he can be examined. An examining officer or radio inspector is authorized in his discretion to waive an actual examination of an applicant for an amateur license, if the amateur for adequate reasons can not present himself for examination but in writing can satisfy the examining officer or radio inspector that he is qualified to hold a license and will conform to its obligations.

Page 54 of the same book specified the station regulations:

65. Class 6. — General amateur stations are restricted to a transmitting wave length not exceeding 200 meters and a transformer input not exceeding 1 kilowatt. (Sec. 4, fifteenth regulation, act of Aug. 13, 1912.)

66. Class 7. — Restricted amateur stations, within 5 nautical miles of a naval or military station, are restricted to a wave length not exceeding 200 meters and to a transformer input not exceeding one-half kilowatt. (Sec. 4, sixteenth regulation, act of Aug. 13, 1912.)

QST magazine issues[6] from 1920 help to shed light on issues of interest to the amateur radio community at the time. Examples include:

- Wave meter construction
- Spark coil transmitter design
- Honeycomb coils and regenerative receivers
- Vacuum tube detectors and amplifiers
- CW transmitters with one or two vacuum tubes
- Underground antennas
- Building "B" batteries
- Radio "misinformation"
- Shortage of vacuum tubes
- Vacuum tubes in rectifiers and oscillators
- Quenched rotary spark gap transmitters for $55. [Over $600 today when adjusted for inflation[7]].

What's Your Town's Ham History?

AD1B has provided a blueprint for discovering the ham history of your hometown using readily-available online sources. Why not dig into your local ham history? And don't forget to talk with old-old-timers as well. Could be a fun and fascinating club project! *—W2VU*

- Editorial against a Congressional bill eliminating amateur radio

The nine radio pioneers from 1920 Dedham lived in an interesting time and faced many challenges. Hopefully, they enjoyed their hobby and were enriched by it.

Notes

1. "The Radio Act of 1912: A Century of Radio Regulation and Licensing," by Rich Moseson, W2VU, *CQ* December 2012, pp.13–15
2. Amateur Radio Stations of the U.S., Department of Commerce, June 3, 1920
3. US Census 1910, 1920
4. *Dedham and Westwood Massachusetts Directory 1920*, A.F. Foss Co., Boston
5. Radio Communication Law of the United States. U.S. Department of Commerce. Edition Aug. 15, 1919
6. *QST* magazine, ARRL, Newington, CT
7. <http://www.bls.gov/data/inflation_calculator.htm>

Back in K3MD's early ham radio days, there was a transmitter circuit John wanted to build … but it was beyond his skills and his budget at the time. Fast-forward a few decades and John not only built the rig, but modified the circuit for modern needs and shares it with us here.

"An Inexpensive 75-Watt Transmitter" Revisited

BY JOHN W. THOMPSON,* K3MD

This is a redesign of the *ARRL Handbook design*[1] that I wanted to build as a new ham, but had neither the expertise nor funding to do at the time. My version of "An Inexpensive 75-Watt Transmitter" (photo A and fig. 1) is a close copy of the original, with the following modifications:

1. Use a tube that will take a higher plate voltage, rather than the war surplus 12-volt 1625 version of the 807. I chose a 6MJ6/6JE6/6LQ6, with a dissipation of 30 watts CCS or 200 watts ICAS. Used, good 6MJ6s are around $20 on eBay. New they are about $70. 6JE6s are cheaper on eBay. (6JB6s will not work well in this circuit.)
2. Dual design of power supply so that an eBay surplus 700 VCT or 1200 VCT 200-ma transformer could be used. (See fig. 2 for alternate power supply circuit)
3. Auxiliary power output socket.
4. Use readily available parts from major suppliers or eBay.
5. Lots of room.
6. 80 and 40 meters only … my old Heathkit HG-10 VFO really drifts too much. I don't have one of the nice DDS VFOs readily available in kit form. I do have an ARC-5 40M VFO with self-contained regulated power supply, which drifts less than the HG-10. Tune up with crystal first.
7. Preserve antique metering of grid and plate current. Add high-voltage (HV) metering. Use RF power meter for tune-up.
8. Tune-up available with crystal control … nominal operation with VFO.
9. Retain cathode keying. Use a keying relay, bug, or Picokeyer UKA-3+ as an interface.
10. Don't bother with fixed bias, just go the LA-1000/AL-84 (sweep tube linear) route.[2]
11. Keep it Simple, Stupid! Make it able to be built by someone who has trouble with modern miniaturized kits (me).

Start with the Parts…

This is a two to three month project, including parts procurement, which is where you should start; it is *not* for a first-time builder. With modern-day prices, your outlay should be in the $150–$200 range. The transformer (photo B) can easily be obtained on eBay or from your local electronics store. If you have a junk tube-type color TV set, you are set. Black is primary, red secondary, red-yellow CT (center-tap) of secondary, green, 6.3V, yellow, 5V. Determine what the HV winding is, if necessary, by feeding 12 volts into the 117-volt primary of the transformer, measuring the output and calculating the value for a 117-volt input. Most of the resistors can easily be obtained from Moyer's[3] or Antique Electronic Supply[4]. What's more, on 80 and 40 most of the values called for in this project can be kluged together with paral-

Photo A. Front view of K3MD's "Inexpensive 75-Watt Transmitter," modified from an ARRL Handbook *design of the 1960s and '70s. Note empty veggie can to left of center, shielding the grid coil.*

**e-mail: <k3md009@gmail.com>*

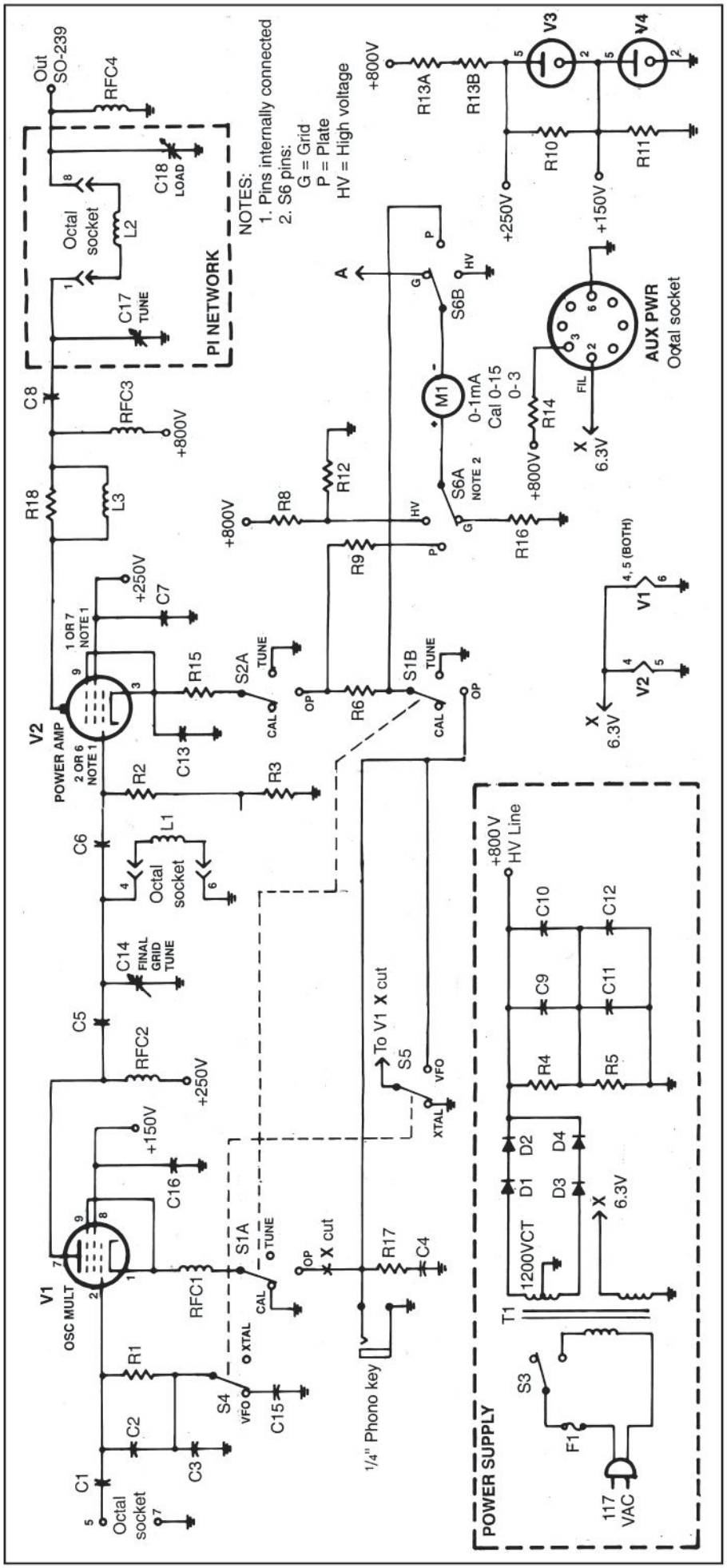


Fig. 1. Schematic for modified "Inexpensive 75-Watt Transmitter" (Note: See alternate power supply in fig. 2)

lel/series combinations from your 1/2-watt resistor junk box. The variable capacitors can be obtained from tubesandmore.com, or from me, compliments of Rebar's Radio Attic[5]. C18 can be made with a dual 0-365 pF unit in parallel with a single-gang unit. C14 and C17 are the oscillator section of a dual-gang BC variable capacitor. 1N4007s are very cheap from All Electronics[6]. Switches S1, S2, and S3 are from Marlin P. Jones and Associates[7]. I could not find a 2-gang 3-position non-shorting switch, hence S1 and S2, which are switched together separately. V1, V3, and V4 are readily available from Antique Electronic Supply or Moyer Electronics. V2 is discussed in the introduction … either a 6JB6, 6MJ6, or 6LQ6 is OK, and they all have identical pin configurations. I used a 17" × 8" × 3" chassis from tubesandmore.com (P-H14444-1782, with a P-H1424-178 cover). Filter caps C9–12 are very cheap from All Electronics. The 1/2W, 1W, 2W, 5W, and 10W resistors are cheapest from Moyer's, or can be series/parallel combined from your 1/2W carbon resistor junk box if you have one.

The Hole Thing

Once you obtain the parts, lay them out so you can begin making the holes with your power drill and rat-tail file. A power nibbler/round file is a nice way to go. A chassis punch would be nice, but they are expensive (up to $55 each). I would mount S1 and S2 on top of each other, and leave room on the front panel for grid tuning capacitor C5. M1 is a pre-calibrated unit from All Electronics (PM-376). Drilling the chassis is the most tedious part of construction. I recommend you obtain several chassis terminal strips from tubesandmore.com.

Layout at 3.5 and 7 MHz is not critical. At these current levels, number 20 solid hook-up wire is sufficient. However, the 800V line should be 1KV or better wire (see parts list).

First construct the HV power supply and HV metering. Place the unit in a location where you can't get to the wiring, and power it up. Remember, whether or not you use the full-wave bridge circuit depends on your transformer. The 12BY7 is powered from the regulator tubes, 250V on the plate. The VR tubes should light, drawing around 30 mA.

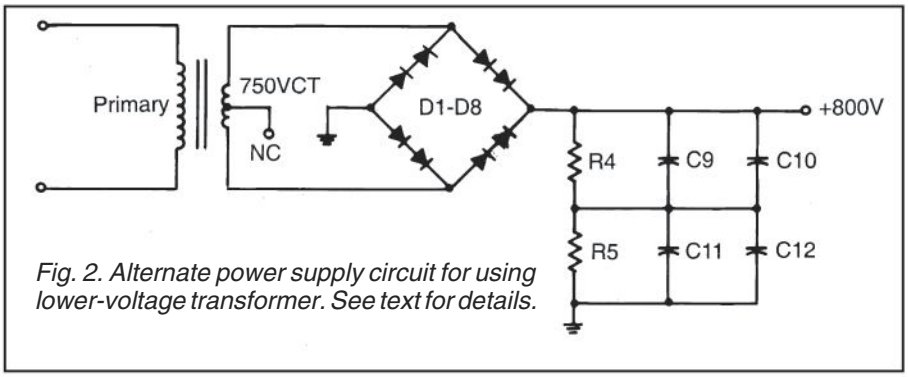


Fig. 2. Alternate power supply circuit for using lower-voltage transformer. See text for details.

Photo B. The power transformer can come from an old tube-type TV or may be ordered online. K3MD's circuit provides two power supply options, depending on the voltage of the transformer used.

Once the power supply is constructed and tested, you can position the switches, meter, variable caps, and associated terminal strips; then position V2 under the chassis with a separate sheet-aluminum support bracket (photo C). C14 should probably be on the front panel with S1 and S2 mounted over and under. The oscillator/multiplier tube and the final circuits can be built at the same time. The aux power jack is wired for a Knight-Kit T-60 VFO. If you are using an HG-10, wire the aux jack for that. With 500-600V on the plate of V2, you can eliminate R14.

It is preferable to try to get the oscillator working first, and to do this with a crystal rather than a VFO. Trying to make a contact with a crystal is an entirely different matter, as in today's world, it is difficult *(although QRP ops with little rigs do manage—ed.)*. I used a loop of wire around the plate cap of V2 (photo D), or you may make your own plate cap from brass shim stock.

Once you have gotten the 12BY7 to oscillate, as heard in a receiver, you can put the 6MJ6 in its socket and do the following tune-up procedure. This is *critical*!

Place S1 and S2 in tune. Turn power on. Check HV, then place meter in grid current monitoring mode. Peak the oscillator, and you should get 1 to 3 mA of grid current. At this point, place a sensitive SWR bridge and dummy load on the output and peak the output. After this is

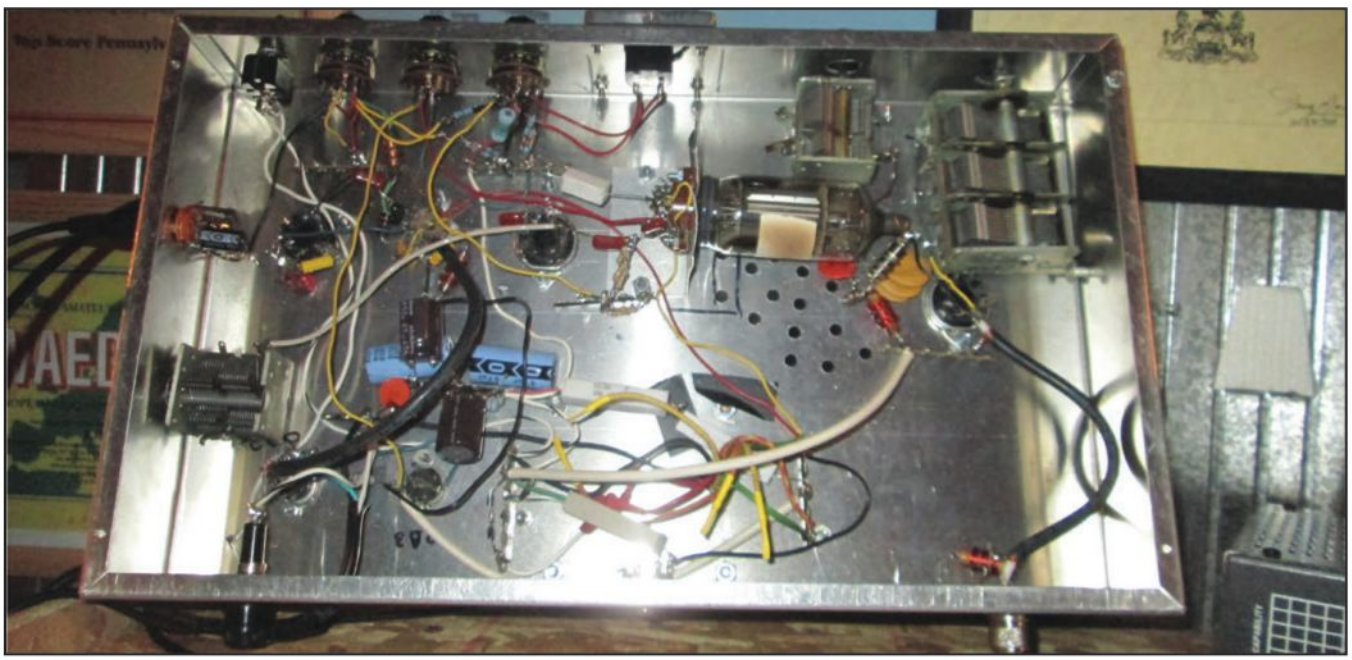


Photo C. Underside of chassis. Note that V2, the power amplifier tube, is mounted underneath the chassis. (However, see photo E for vent holes above tube.)

done, you may place S1 and S2 in the operate position and with *short* strings of dits, peak for maximum output. The 6MJ6 will take 200W, but not for long. It is rated to burn out in 35 seconds. You should see around 220 mA on the plate metering circuit with key down. In this self-biased circuit, going key-down with no excitation is very inadvisable. Do *not* go key down in the operate position without peaking the excitation!

My unit was built without S5. I use a crystal for tuning only, as I prefer the flexibility of a VFO for making QSOs. S5, which can be ganged with S4, lets you turn on the crystal oscillator but key only the final, to avoid chirp. This is not necessary with VFO operation.

Safety First!

I would advise not poking around this unit with the 800V on; just do continuity checks and trust the built-in metering. At all times, remember that the voltages in this unit are capable of instantly electrocuting you. You *must* use the one-hand-in pocket method of checking live voltages!! If your DVM is not capable of measuring 800 volts, don't try. You will blow out the meter. Speaking of meters, the unit will work well with an SWR of up to 2:1.

Initial Tests

Initial testing with this unit has been very good. A 6JB6 produces only around 20 watts, with a cathode current of 100 mA. A 6MJ6 gives you 100 watts out. The grid and plate ammeters are reasonably calibrated with the given values, but not 100% accurate. You will get some really good reports on this transmitter with regard to signal strength as compared to kit-built QRP rigs. I like the ARC-5 VFO somewhat better than the HG-10, as it gives 12V peak-to-peak, while the HG-10 gives only 5V peak-to-peak output. Leave the VFO ON at all times to avoid chirp and drift unless you are using a modern DDS VFO with buffer.

Final Notes

The HG-10 VFO is a Heathkit 80-2 meter VFO, which is powered through the filament and HV voltage in the rig (around 600 volts for the Heathkit DX-40 and 60, around 800 volts for this rig). Therefore, we need an additional dropping resistor,

Parts List

C1, 5, 6, 7, 16: .001 µF 600-volt or1 KV, mica or ceramic (tubesandmore or Moyer Electronics); DO NOT use 100-volt or Mylar caps!!
C2: 22 pF 600-volt mica (tubesandmore.com)
C3: 100 pF 600-volt mica (Moyer)
C4: 4 µF 350-volt (Moyer or All Electronics, if in stock) or *two* 4.7 µF 250-volt caps in series
C8: .01 or .015 µF 1KV (junk box or RF Parts; DO NOT use 600V cap, although two .02 µF 600 volts in series are OK)
C9-12: 22 µF 400-volt (All Electronics 22R400)
C13: .01 µF 600-volt, ceramic or Mylar
C14, 17: 0–140 pF variable (tubesandmore, Moyer, Ebay, radioattic.com, or I have some that need to have the dial drive plate taken off)
C15: .01 µF ceramic, 600V or better
C18: 0–1100 pF (three 0–365 pF in parallel)

D1-8: 1N4007 (All Electronics)

F1: 5-amp fast blow

L1, 2: see coil chart (Table I)
L3: 4 turns number 12 wire space-wound on 3/8-inch form around R18 (photo E)

M1: 0–1 ma calibrated 0–15 and 0–3 (All Electronics PM-376)

R1: 47K 1W
R2: 12K 1W (may be four 47K 1/2W in parallel)
R3: 270-ohm 1/2W
R4, 5, 10, 11: 200K 2W
R6: 9-ohm 1/2W (10-ohm and 47-ohm in parallel)
[There is no R7]
R8: 1.5M 2W
R9: 2700 1/2W
R12: 100K 1/2W
R13A/B: two 10K 10W wirewound in series (or one 10K 20W wirewound, if available)
R14: 5K 5W wirewound
R15: 100-ohm 10W wirewound (five 20-ohm 2W carbon in series are better)
R16: 3600-ohm 1/2W
R17: 100-ohm 1/2W
R18: 100-ohm 2W carbon (Moyer, tubesandmore); mine was stolen from an SB-200 I converted to 6 meters

RFC1, 2: 1.2 mH (tubesandmore P-C206)
RFC3, 4: 2.5 mH (tubesandmore P-C1535B)

S1, 2: see text
S3: 3 amp or better 120-volt toggle switch
S4, 5: ST mini-toggle (may be ganged DPDT)

T1: may be 600-0-600 200 ma from eBay or the more commonly available 375-0-375 175 ma (tubesandmore P-T374BX). 5V and second 6.3V winding (if there) are not used. Use power supply circuit B (full wave bridge; fig. 2) for lower-voltage transformer.

V1: 12BY7 (tubesandmore, Moyer)
V2: 6MJ6, 6JE6, or 6LQ6. 6MJ6 will give 70 watts out. See text.
V3: 0B2 (tubesandmore.com, Moyer Electronics)
V4: 0A2 (tubesandmore.com, Moyer Electronics)

Misc:
No. 6 3/4-inch self-tapping screw to hold cover in place
4/40, 6-32, 8-32 hardware. I used 3/4-inch hardware … count of 4, 12, 4
Two 7-pin miniature sockets
One 9-pin shielded socket
Terminal strips (get 7) (tubesandmore P-0501H01)
Key jack (1/4-inch headphone)
SO-239 chassis mount
Ground lugs (tubesandmore S-H112)
Hookup wire
HV wire for 800V line (RF Parts HV-15)
3AG chassis mount fuse holder
9-pin Novar base (Moyer)
4 octal sockets
4 octal tube bases for coils (tubesandmore P-SP-476) (I used a 2.5 by 4 inch veggie can to shield the grid coil (see photo A). This is held in place by pressure from 4/40 hardware which is directed upwards from the bottom side of the top of the chassis)
9-pin tube shield (may be tubesandmore P-SS9-400)
3-wire power cord
Chassis and cover (see text)

Coil Chart

Band	Grid (L1)	Plate (L2)
80	25 T #30 wire-wrap	40 T #20 solid hookup close-wound on 8-pin tube base
40	7 T #20	13 T #20 solid hookup

Table I. Coils (photo G) wound on tubesandmore.com P-SP8-476 tube base. Resonate grid coils with MFJ antenna meter with grid-dip coil.

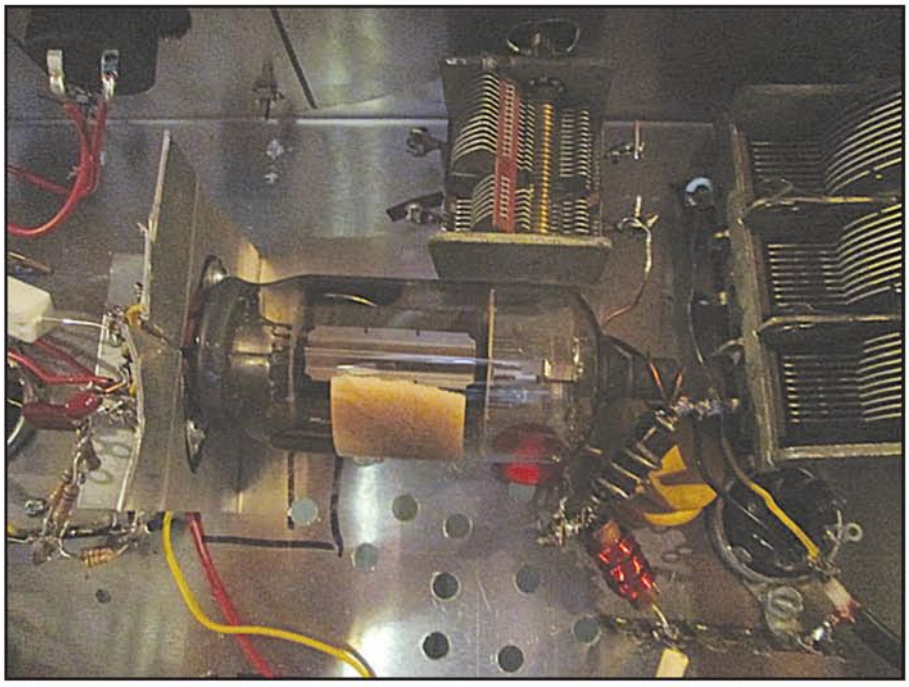


Photo D. Detail of coil L3 wound around R18, whose lead in turn is wound around the plate cap on V2.

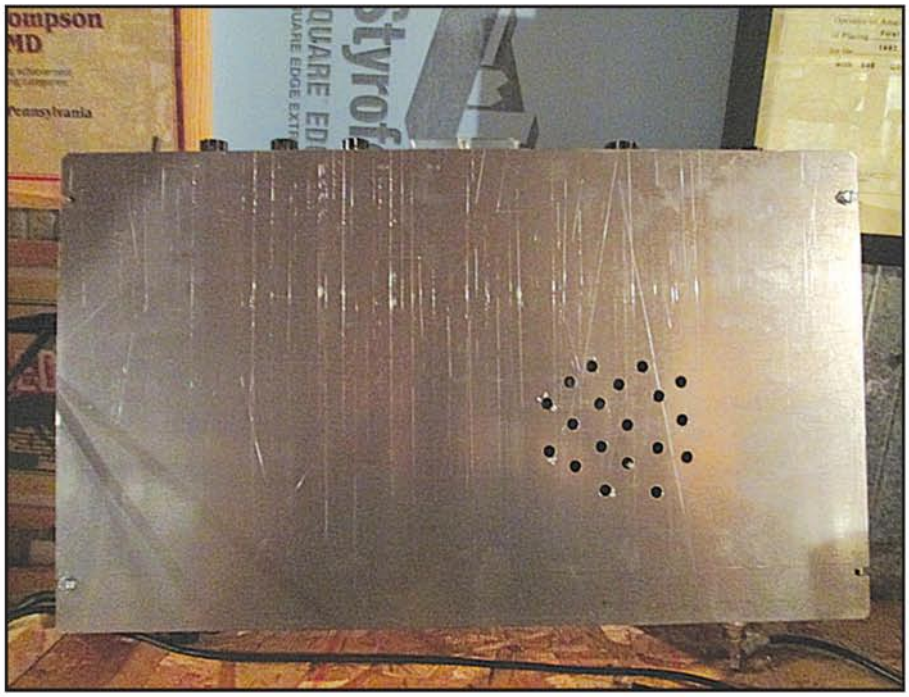


Photo E. Be sure to drill plenty of vent holes in the chassis to provide air to amplifier tube V2, mounted underneath.

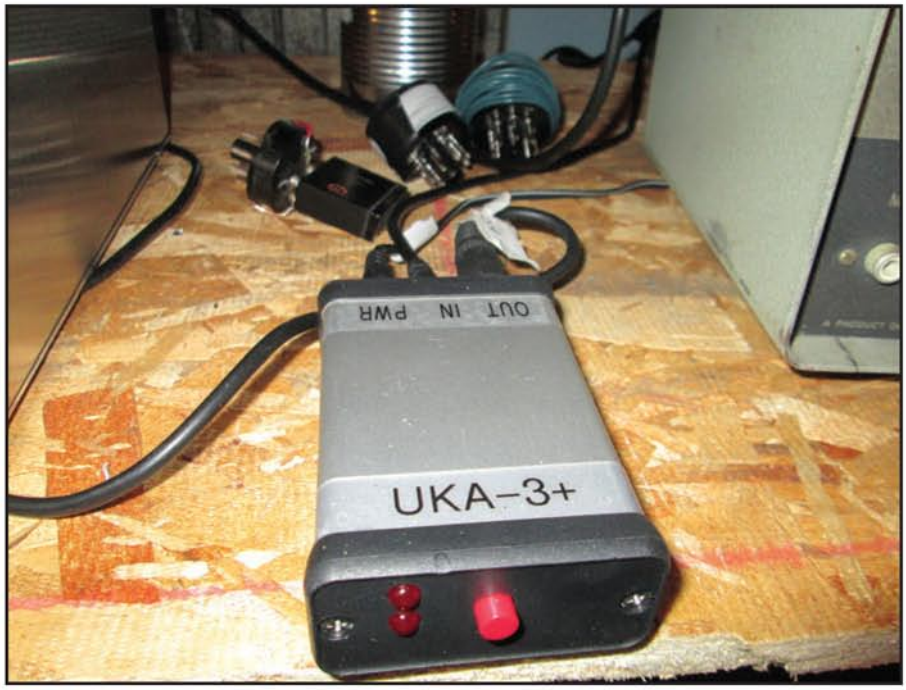


Photo F. The UKA-3+ keyer interface used by the author for cathode-keying the transmitter.

Photo G. Coils are wound on octal tube plugs to make them interchangeable for changing bands.

R 14. Its value is calculated at R = E/I or R = 200/.03 = 5000 ohms. The power is E × I = 200 × .03 = 6W. An HG-10 can be found on eBay for $30 if you are lucky.

Drill plenty of holes for the final tube (photo E). Using a 15–20-watt fan on top of the chassis will try to avoid thermal runaway for the tube, which does happen without the fan (ask me how I found this out).

Please do not attempt to key this unit with MFJ or Logikey transistor direct keying unless you are also using a keying relay or isolation device! I use a Picokeyer UKA-3+ (photo F), which gives better performance than a small 12V relay.

This rig is quite a conversation piece. There are almost no homebrew rigs out there anymore. Have fun!

Notes

1. "An Inexpensive 75-Watter," *ARRL Handbook* circa 1965–75, copyright ARRL; available online at <http://w7ekb.com/glowbugs/projects/inexpensive75wattxmitter.pdf>
2. For more on using TV sweep tubes in ham transmitter circuits, see:

DeMaw, Doug, W1FB, "Some Thoughts About TV Sweep Tubes," *QST*, February 1980, p. 11.

Ingram, Dave, K4TWJ, "Better Results From Those Sweep Tubes," *73*, August 1975.

3. Moyer Electronics, Sunbury, PA; telephone: 570-286-6706; web: <www.moyerelectronics.com>
4. Antique Electronic Supply: <www.tubesandmore.com>
5. Joseph Rebar's Attic: <http://radioattic.com>
6. All Electronics: on the web at <www.allelectronics.com>
7. Marlin P. Jones and Associates: <www.mpja.com>

What You've Told Us...

Our March/April survey asked about the bands and modes on which you operate and the factors that influence your choices. It was no surprise that nearly everyone who responded (92%) is active on the "traditional" HF bands of 40, 20, 15 and 10 meters; followed by the high VHF bands (2 meters, 222 MHz; 75%), the "WARC" bands (30, 17 and 12 meters; 73%), our MF bands (160 and 80 meters; 60%), the low UHF portion of the ham spectrum (420–450 MHz; 58%), and the low VHF bands (6 meters or, in Europe, 4 meters; 42%). A surprisingly low 11% of you are active on 60 meters (5 MHz), while it's no surprise that very few of you (7% total) are on the high UHF (902, 1296 MHz), low microwave (2.4–5.6 GHz) or LF (not yet available in the US) bands.

Switching to modes, 84% of you operate SSB voice, followed by FM voice (66%), CW (65%) and HF digital (text) modes (58%). Then there's a steep drop-off to VHF/UHF digital (text) modes (22%), VHF/UHF digital voice (14%), AM voice (11%), digital image modes (9%), analog slow-scan TV (5%), HF digital voice (5%) and analog amateur TV (2%).

The factors that most influence your choice of an operating band are "interest in activities typical on the band" (35%) and "potential for DX" (32%), followed by space for antennas (11%), availability of equipment (7%), local activity level (5%) and the potential for learning about propagation on the band (5%).

Factors behind your choice of modes included "interest in activities typical of the mode" (45%) and "interest in communicating with the devices typically used" in a given mode (22%), followed by local activity level (9%), availability of equipment (8%) and potential for learning more about the mode's benefits (7%).

This month's winner of a free digital subscription to *CQ* (including our monthly *CQ Plus* digital supplement) is Ray Lowe, WD5DHK, of Ennis, Texas.

Reader Survey July 2014

This month, just for fun, we're going to replace our usual reader survey with a little quiz. The winner of the free one-year subscription to *CQ* will be *first response received with the greatest number of correct answers.*

There are two ways to respond to this quiz:

*** Respond online** at <www.surveymonkey.com/s/CQJun14> [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:** July Reader Survey, CQ magazine, 25 Newbridge Rd., Hicksville, NY 11801.

Since we're making a little contest out of this quiz, it seems appropriate to ask some contest-related questions. Most of the answers can be found somewhere in this issue. Please select only one response to each question.

1. This month features the 2014 World Radiosport Team Championship, or WRTC-14. Where is the contest being held?

Thailand....1
Crimea....2
New England....3
Brazil....4
All over the world....5

2. How many teams are scheduled to participate in this year's WRTC?

40....6
59....7
73....8
156....9

3. When was the first WRTC competition held?

1955....10
1970....11
1990....12
2010....13

4. Where was the first WRTC competition held?

Seattle, Washington....14
Brussels, Belgium....15
Helsinki, Finland....16
Perth, Australia....17

5. How frequently is the WRTC held?

Every year....18
Every two years....19
Every four years....20
Every ten years....21

6. The WRTC is held in conjunction with what larger competition?

The CQ World Wide DX Contest....22
The CQ WPX Contest....23
The ARRL International DX Contest....24
The IARU International HF Championship....25

7. This year's competitors will be operating from...

Select contest superstations....26
The home stations of one member of each team....27
School club stations....28
Tents....29

8. The winning team will receive...

Bragging rights until the next WRTC....30
$10,000 US....31
New radios....32
The right to sponsor the next WRTC....33

Thank you for your responses. We'll be back with more questions in upcoming issues.

Survey Response for Issue:

Name _____ **Call Sign** _____

Address _____

City _____ **St/Prov** _____ **Zip/PC** _____

Country _____

E-mail _____

what's new

New bhi Dual In-Line Module

The new bhi Dual In-Line DSP noise eliminating module provides stereo noise cancellation and is suitable for use on all radios and receivers including SDR, but especially those with stereo or two channel output options.

It can also be used with a standard mono speaker input signal. The module caters to both high- and medium-level audio input signals, and has stereo line out, stereo headphone, and mono speaker output sockets, making it very flexible for the user.

You can listen with headphones and a mono speaker at the same time, and you can also connect a pair of stereo computer speakers to the line output socket.

The Dual In-Line incorporates bhi's new dual DSP noise canceling module, which has an improved noise cancellation algorithm that brings better quality audio to the listener when operating in very noisy conditions, making the processed speech clearer and more intelligible.

Specifications:

- Operating voltage: 10- to 16-volts DC . (800 mA nom, 2.5 amp max)
- Power Connection: 2.1-milimeter power jack
- Audio Input: Input – Stereo (Audio 1 – Plug Tip/Audio 2 – Plug Ring)
  8 ohms at 2 watts RMS
  10K ohm at 600-mV p-p
- Audio Outputs: Headphones/small speakers – 0.5 + 0.5 watts into 8 ohms
  Speaker – Greater than 6 watts into 8 ohms
  Line Stereo – 600 ohms at up to 0 dBV
- Connections: Audio Inputs – 3.5-millimeter stereo jack socket
  Line and Headphone Outputs – 3.5-millimeter stereo jack socket
  Mono Speaker output – 3.5-millimeter mono jack socket
  Power 2.1-milimeter Coaxial Power Jack center Pin = +Ve
- Controls: Audio Input Level
  Combine/Separate signal switch
  DSP Filter Level 1 – 8 (9 to 35 dB)
  Off/On/DSP Noise Canceling On
  Audio Out Level (For a speaker and for headphones)
  Line Out Level
- Indicators: Power ON
  Noise Cancellation ON
  Channel 1 Overload
  Channel 2 Overload

bhi estimates the retail price at $329 to $339. For more information, contact GAP Antenna Products at <http://www.gapantenna.com>, W4RT Electronics <http://www.w4rt.com> or bhi Ltd. at <http://www.bhi-ltd.com>. Email: <sales@bhi-ltd.com>.

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Come along as W7GGM shows us how a bit of ingenuity can produce some really neat antennas — in the spirit of the classic TV series 'MacGyver!'

If MacGyver Could Do It, You Can Too!

BY VERNON R. HARRIS, W7GGM

From 1985 to 1992, Angus MacGyver, troubleshooter for the mysterious *DXS*—the U.S. Department of External Services—astounded TV viewers with his resourcefulness in getting out of sticky situations of international intrigue.

With a Swiss Army knife and some duct tape, MacGyver's jerry-rigs were an exponential improvement to the Professor's "coconut radio" technology found on Gilligan's Island.

You'll be more like MacGyver than Gilligan if you keep these ideas in mind for the next time you're in a jam for emergency communications. *(**HINT:** If you've got old TV rabbit ears laying around gathering dust, **Photo A,** don't toss 'em. You may find these "ears" come in handy when you'd least expect it. Read on!—W7GGM.)*

Please refer to the accompanying photographs as you go step-by-step through coax and antenna preparations.

The Tools to Have Handy

For our purposes, everyone will have a leg up on MacGyver. Sure: grab a sharp Swiss Army or razor-blade knife and some duct tape. But you might want to add:

- Coax cable-cutting tool, for clean cuts on the ends
- Standard wire stripper
- A 12-inch ruler
- Some heat shrink tubing and heat source
- Soldering iron or gun and solder
- Scissors
- General hand tools

Tips for Working with Coaxial Cable

Since a lot of amateur radio antennas involve coax, we'll start with some tricks for working with this type cable. It's commonly used for antenna feed line and, in some cases, for the antenna itself—*as you'll see later!*

*(**ABOUT THE WRITER:** Vernon R. Harris, W7GGM, studied electrical engineering at the University of Oklahoma. He has worked for the Department of Defense, U.S. Air Force, and the Federal Aviation Administration in varied technical capacities. He is an established author, having written everything from technical manuals to books of humor, sci-fi, general fiction and non-fiction. Mostly retired, Harris is owner of Bear Mountain Scientific <http://www.BearMountainScientific.com>.—KI6SN.)*

Video A. Watch and listen to the pilot episode of the classic TV series "MacGyver," <http://bit.ly/1hGwJCy> featuring Richard Dean Anderson as Angus MacGyver, undoubtedly a radio amateur at heart. Time and again, he proved just how far you can get with a Swiss Army knife and a roll of duct tape. <http://bit.ly/1hGwJCy>. (Internet screen grab)

Removing the outer jacket: Here is a fast and efficient method I developed for removing the outer jacket from coax cables whether you want to install a coax connector or hook up a new experimental antenna.

Practice this outer jacket removal procedure on a few scrap pieces of coax cable before performing it on the *real thing*. This procedure can be used in building any of the antennas discussed in this article or other coax projects.

First, find a flat work area. Lay the coax out to one side so you can work on the point of the line where the coax jacket is to be removed.

From the end of the coax measure back about 1-1/2 inches and mark the point with a marker. Draw a ring around the coax's outer cable. This ring will be where the jacket will be cut and removed from the coax.

Using a very sharp knife, set it on top of the point where the marker ring was made on the coax jacket. Start by using the outer tip of the knife blade against the coax. As shown in the photographs, press straight down on the knife blade but not extremely hard. Only a moderate force is required.

Using your fingers on the other hand, roll the coax forward about two inches while holding the knife steady and allow-

ing the blade to move forward with the coax as it is rolled, **Photo B**.

*(**IMPORTANT TIP:** Do not push the knife blade forward and backward across the coax insulation as if you were sawing a piece of wood. You don't want to cut the inner braid. Gently roll the coax beneath the knife and the outer jacket will be cleanly cut, with the braid neither nicked nor cut.—W7GNN.)*

After the coax is rolled forward, inspect the cut to see if the braid is visible through the narrow cut just made in the outer jacket. If it is not, simply lay the knife blade on the narrow cut again and roll the coax forward and backward a bit, while gently pressing the sharp blade against the coax. Repeat this procedure until the braid can be seen all the way around the coax's circumference, **Photo C**.

Now, holding the coax steady, take the sharp point of the knife blade and with gentle pressure, make a cut along the coax starting at the cut ring on the coax and along the cable toward the end of the coax, **Photo D**.

You're doing fine. At the point where the two jacket cuts intersect, use your fingernails to separate the coax outer jacket from the braid, **Photo E**. Once this is done the remainder of the outer jacket can be slid off the end of the coax.

Inspect the braid to ensure it has not been cut or damaged by the cutting, **Photo F**. One or two strands of braid cut at this point is of no large consequence. If several strands are

Photo A. Long-forgotten TV rabbit ears are perfect candidates for making a simple, an effective VHF or UHF antenna—of both. It's just the kind of antenna you might need in an emergency. (Courtesy of KI6SN)

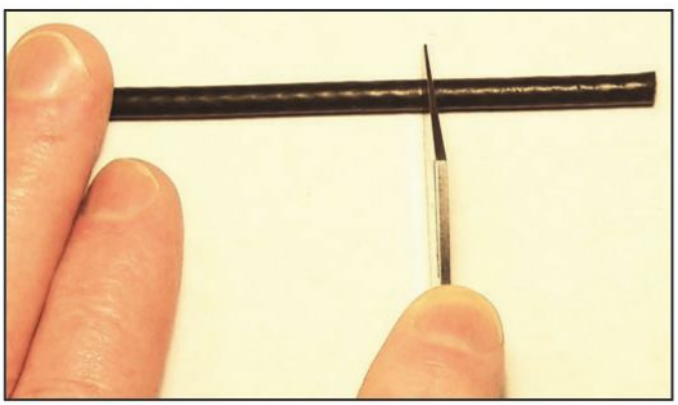

Photo B. For photographs B through P, please refer to the text for details. (Unless otherwise noted, photography by W7GGM)

Photo C

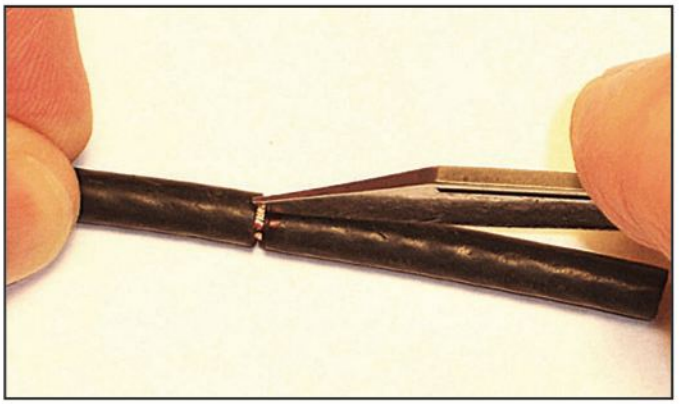

Photo D

Photo E

Photo F

cut, snip off the end of the coax and start over. This is where first practicing on a scrap piece of coax pays off.

Photo G shows the braid after being separated with a sharp pointed tool and a loop of the inner conductor visible. The loop of inner conductor is pulled upward while sliding the braid off the end of the center conductor.

In **Photo H**, the braid and the stripped inner conductor are ready for tinning.

Photo G

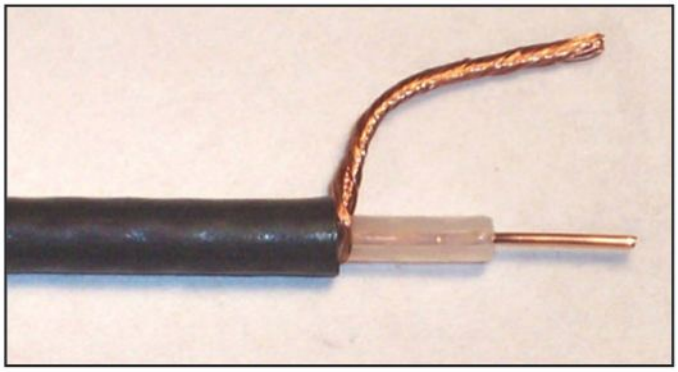

Photo H

Half-wave Dipole Calculations

We're going to be working with antenna designs for half-wavelength dipoles. That means each side of our dipoles will be one-quarter wavelength long.

To calculate a quarter wavelength for each side:

- Divide your desired frequency in megahertz (MHz) by 234.
- **Example 1:** Using the formula, on 28.800 MHz (10 meters) each leg of the half-wave dipole will be 8.125 feet, or 8 feet, 1-1/4 inches. That's 234 divided by 28.800.
- **Example 2:** For a 2-meter half-wave dipole designed for accessing a distant repeater on 146.985 MHz, the calculation is 234 divided by 146.985, or 1.591 feet. That's 19.092 inches, or 19-3/32 inches per side of a half-wave dipole.

Rabbit Ears 2-Meter Antenna

Many radio amateurs of today grew up when the television set was connected to some sort of antenna—indoor or outdoor. If the TV station transmitters were relatively close, a simple set of rabbit ears—stretched out and placed on top of the TV—usually worked fine.

As the TV watchers became more sophisticated often opted for an outside antenna, in many cases with a rotator for directional reception. The rabbit ears were relegated to the garage, helping the other junk there to gather the dust.

Building the Rabbit Ears Antenna. Recently I found three sets of old rabbit ears while cleaning the garage. My first instinct was to trash them. But a flash of an idea saved them. Why not a dipole for amateur radio?

Telescoped to 19-3/8 inches on each side, they might be perfect for 2 meters.

Photos show the basic Rabbit Ears Antenna project and the follow-on stages of its construction.

- **Photo I:** Prior to removing 300-ohm twin lead
- **Photo J:** With RG-58 coax attached
- **Photo K:** Note that the TV antenna's plastic housing had to be broken to get to the dipole's center connection to replace the twin lead with coax cable

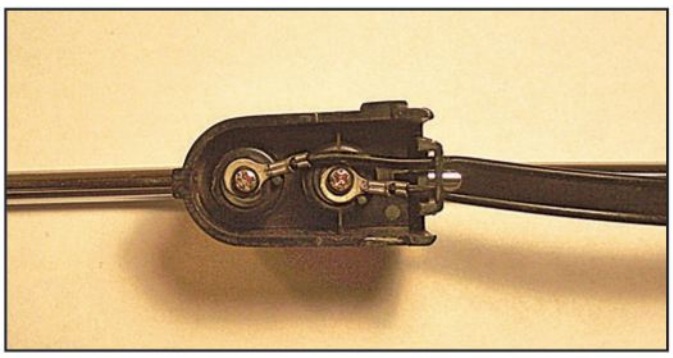

Photo I

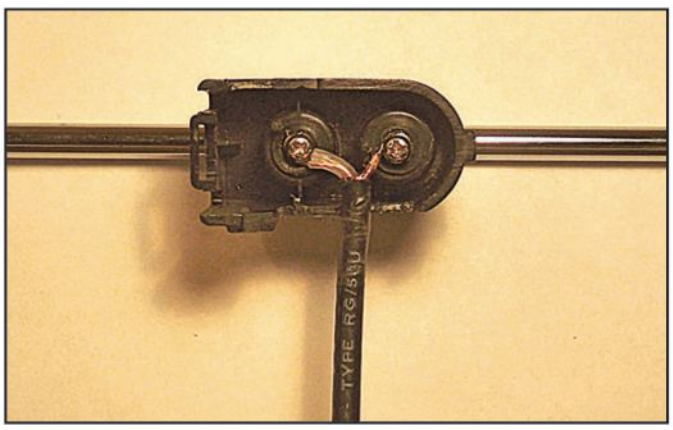

Photo J

At 19$^{3}/_{8}$ inches per side, it will be resonant in the 2-meter band.

Notice on the bottom of the housing for the dipole is a standard 300-ohm twin lead attached with screws. As readers will see, the twin lead was removed and a run of RG-58 was attached to the terminals.

Testing the Dipole. Next, I performed standard SWR checks to verify that the connections were secure and electrically functioning. *Everything looked good.*

The dipole showed a 2.2 to 1 SWR. The resonant frequency was off from where I like to operate in the 2-meter band. The nice thing about this Rabbit Ears Dipole Antenna design is that the length of the dipole arms can be quickly adjusted using the telescoping arms.

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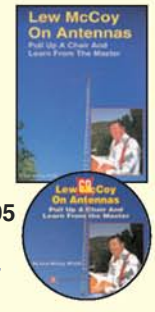

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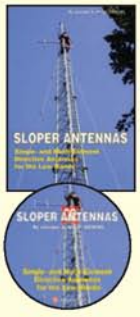

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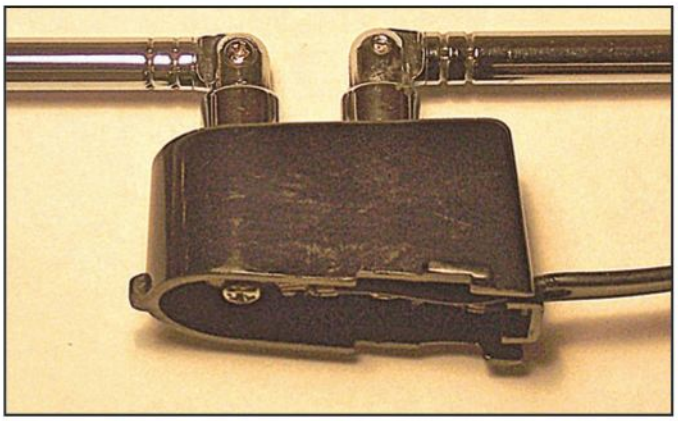

Photo K

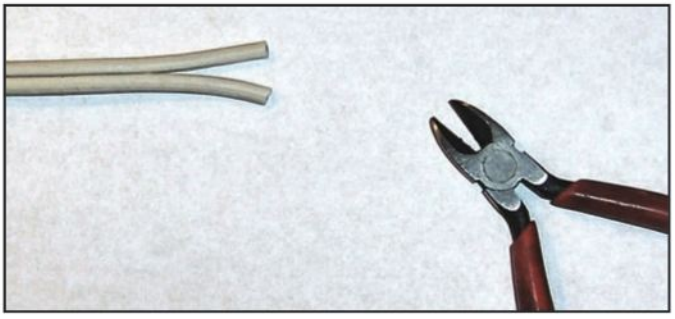

Photo L

Three sets of adjustments on the arms later gave an SWR of 1.2 to 1 and the antenna was resonant very close to my desired frequency. Tuning this antenna is a snap.

By shortening the dipole arms, this antenna will work in the 1.25-meter or the 70-cm band, as well.

Rabbit Ears performance. On 2 meters, the Rabbit Ears Antenna provided very good signal reports in both directions. I usually compare the performance of new antennas on 2 meters to my J-pole, which always provides very good performance.

Signal reports from stations roughly 20 miles away seemed to be the same as my J-pole. Most of the on the air testing was done with the antenna sitting on top of a 6-foot-high plastic fence post.

Final steps. A coating of RTV coating, <http://bit.ly/1kQwd9Z> around the connections provides weather protection if used outside.

Extension Cord Antenna

The Extension Cord Antenna is aptly named. It's made of an extension cord I had in my garage. It's simple and works well.

The extension cord I selected was a standard, medium duty, 10-foot long cord with two conductors.

Building the Extension Cord Antenna. Using a pair of wire cutters, I snipped off the female connector end of the extension cord. I then separated the two wires of the cord — leaving the insulation intact.

These two wires—separated and stretched out in opposite directions — will form the dipole, **Photo L**. You'll need a coax feed line, so the method for preparing coax for antenna connections already covered will come in handy, again.

Using your best electronics practices, solder the coax conductors to the male terminals of the AC extension cord plug, **Photo M**.

*(**TIP:** I used a wire brush on the electrical terminals to clean them and then applied a bit of flux to get good solder joints.—W7GGM.)*

After putting a coax connector on the transceiver end of the coax, the antenna was complete and ready for testing.

Notice in Photo K that at the center of the dipole is a small plastic loop made from two tie wraps. This same type loop was also added to the two far ends of the antenna arms after the arm lengths were trimmed for the frequency where I wanted the antenna to operate.

The end loops were secured close to the ends of the antenna arms but not out to the very end. This allowed the arm ends to be trimmed without the loops getting in the way.

Testing the Extension Cord Antenna: This little gem was tested indoors on 10 meters. It was hung on a wall in my ham shack, close to the ceiling. The center point and outer arm ends were supported simply by hanging the plastic loops over pushpins placed in the sheetrock wall. I later added more support to the center.

Testing 1, 2, 3, 4. On 10 meters, the antenna was tested for SWR. This type of configuration seems to result in the antenna arms needing to be a bit shorter than what the formula indicates it should be. This is good because this allows for a small bit of trimming of the antenna arms. After about four small cuts from each antenna arm the SWR was reduced from 1.8 to 1 down to a bit less than 1.2 to 1.

10-meter performance. In short order, I made contact with a station in Hawaii from my Providence, Utah QTH. *What a pleasant surprise.* There is nothing special about this antenna. It just happened to be at the right place at the right time. As quickly as the signal from Hawaii had faded in, it faded away. What a fun 10-minute experience, though, especially when using a junk box antenna.

In the spirit of Angus MacGyver, the Extension Cord Antenna was another case of building *something* out of *almost nothing.* After moving it outside, the antenna worked well for me — so much so that I decided to leave it up just to show it off. Its gives an especially good demonstration to new hams. It really pays to *"think outside the box."*

The Coax Dipole

For years, antennas have been constructed using a feed line, usually coax, running to some sort of antenna. There are lots of designs, but the dipole is wildly popular—even today.

They are especially popular in portable or emergency operations. Dipoles are simple, can be used in an inverted V configuration so only one support is needed, and can be designed to be lightweight for portability.

In some cases, an emergency antenna needs to be constructed *on the spot* and put into operation rather quickly.

Getting started. All that is required is a run of coax cable in the 50- to 75-ohm range that is long enough to be stretched to a frequency resonant to your desired operating frequency—allowing for a feed line, as well.

Put simply, our coax dipole antenna is the result of cutting open the outer insulation and separating the two conductors to form a dipole antenna when stretched out. It's a very simple antenna to construct and can be folded away and stuffed into a backpack for traveling.

Measure from the coax end back the distance calculated in the length formula and mark the coax at this point. I would suggest adding a bit more length to this mark to allow the antenna arms to be trimmed if necessary.

Using the coax cable techniques described earlier and shown in **Photos B** through **H**, remove the outer jacket — starting at this measured point all the way to the end of the coax, **Photo N**.

Separate the coax shield and inner conductors, **Photo O**. Form the coax braid and center conductor pieces outward to form a dipole configuration, **Photo P**.

Physically secure the dipole pieces and feed line and put it up as high as you can. My installation resulted in the final antenna being about 10 feet above the ground. The dipole ends were secured by placing loops made of plastic tie wraps at the ends of the dipole's legs and using these loops to attach support lines.

Final preparation. Of course, the dipole legs are stretched out in opposite directions to form a standard configuration. I recommend that the braid half of the dipole antenna be formed by hand, twisting and mashing the braid so it is a compact conductor. After this is done, compare the braid arm length of

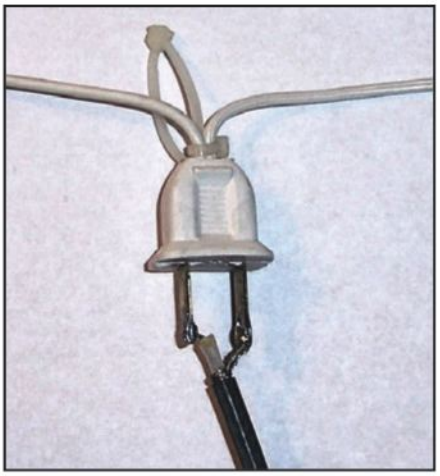

Photo M

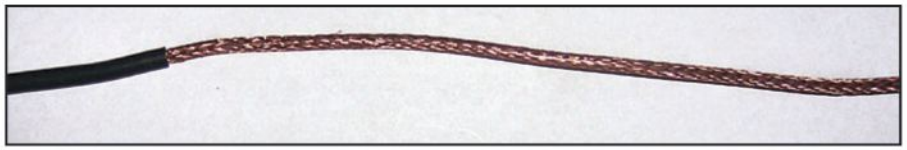

Photo N

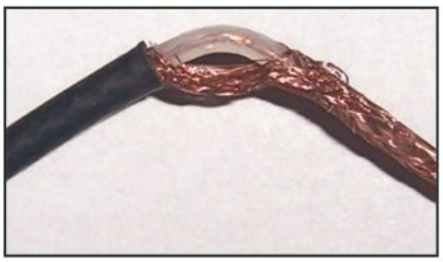

Photo O

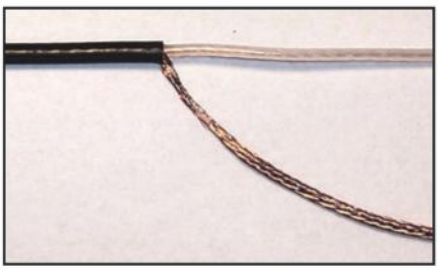

Photo P

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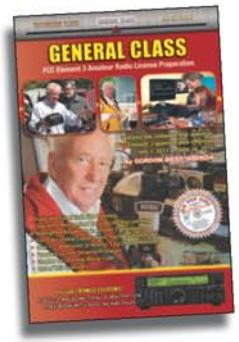

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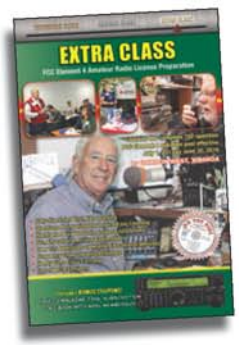

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Pass rate of 99%

Gordon,

To preface the following comments, I am a certified professional law enforcement instructor who has taught countless classes in my areas of expertise. So, while I'm not new to instructing, I am new to teaching ham radio.

I recently registered as an instructor through The W5YI Group's Ham Instructor program. I'd never seen your material in person before now, but have heard about it over the years. Upon researching it, I like it! Sure makes more sense than the junk I used for self-study on my General, and the lack of anything at all used by my Tech instructor. (He put on a class without any books, handouts, or homework!)

A fellow instructor in a neighboring county pointed me in your direction when he said his class retention jumped to about 90% and his pass rate is about 99% since he started using your material. That's outstanding! Most of the ham classes in my area suffer more than a 50% attrition rate and less than an 80% pass rate – mostly because of that "no material needed" method of teaching.

John, KF5FGF

Teaching amateur radio classes is challenging. Joining our Ham Instructor program can make your teaching easier and more successful! Here's how:

Using Gordon West, WB6NOA, study manuals in your classes gives your students the very best in easy-to-understand amateur radio study materials. The Q&A are rearranged into logical topic groups making teaching easier and more focused. Our Power Point shows help you present the material and keep students focused during class. Our pre-study homework prompts students to prepare for every classroom session. Your students will go to their exam session confident and prepared to pass their test for their Tech license, or their upgrade to General and Extra.

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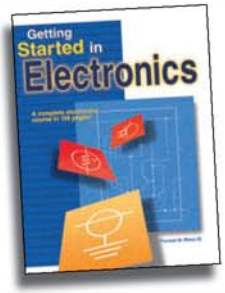

By Forrest M. Mims, III

Getting Started in Electronics

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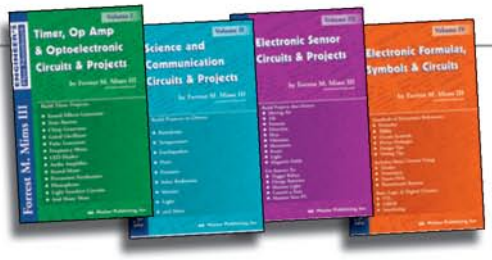
GSTD $19.95



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These 4 Mini Notebooks include wonderful project ideas for students and hobbyists. Forrest's little books have stimulated many science fair projects and are popular with hobbyists of all ages. Even professional scientists recommend them as a fun way to learn about electronics!

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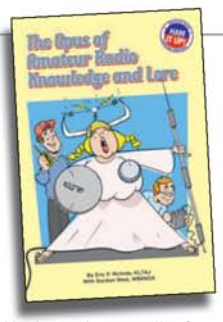

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the antenna to the other arm length. If the braid arm length is longer than the other arm length, trim off the braid arm length so it matches the other arm. Forming and compacting the braid arm will probably lengthen it a bit.

Testing the Coax Dipole. The antenna was initially attached to the ceiling of my ham shack using pushpins in the sheetrock. The other end of the coax—the feed line—was connected to my radio equipment and I then measured the SWR.

Can this antenna be used at VHF? You bet!

I used the same length calculated for a quarter-wave on 2 meters. That's 19-3/8 inches for each side of the dipole.

The SWR values obtained started at 1.8 to 1 and with one calculated trim I was able to reduce this value to 1.2 to 1. The coax antenna worked better than expected and performed as well as any 2-meter dipole antenna I have ever built. I used it to check into a couple of local nets. The coax antenna actually provided better signal reports and stronger received signals than my J-pole for 2 meters.

Impressions of this antenna. The Coax Dipole Antenna is a design that can quickly be duplicated for a range of different bands and frequencies and is a simple and cheap path to take. This is especially helpful in emergencies or for, say, an ARRL Field Day project.

Again, this antenna falls into the MacGyver-esque realm of building *something* from *almost nothing.*

Think about it:

Except for the connection to your radio, there are no coax connectors involved

The feed line goes through a smooth transition from coax to the radiating antenna elements—no solder joints; no muss, no fuss.

In operation: The coax antenna was moved outside the house and elevated to about 10 feet. Surprisingly, the SWR varied a bit, but not as much as I had expected. After a bit more trimming, it was back to 1.2 to 1.

A Final Thought

Building these antennas can be a good Saturday project or might make great projects for your amateur radio club or license class. After all, there's probably a bit of MacGyver in every radio amateur.

Hams helping hams ... a tradition as old as our hobby itself. We're passing along here a somewhat unusual request from Germany for help in building up one ham's maritime-theme QSL card collection.

Wanted: Your Maritime-Theme QSLs

BY HORST BALLENBERGER,* DL8NBM

From time immemorial, man has been a hunter-gatherer. This is still true, and even more so for hams. Some need points for a certain award, while others are island chasers. Now what am I after?

Well, since the summer of 2011, I've been infected by a virus that makes me hunt for QSL cards with nautical motifs. Having been on the seas myself, this simply was bound to happen. About 4000 cards are already safely anchored in my collection (see Maritime QSL Cards at <www.qrz.com/db/dl8nbm>).

However, I'm sure there are more, so here's my request: Please skim through your shoeboxes of QSLs and send me your findings, either as scanned image files to <dl8nbm@darc.de> or as originals to my address at the lower left. Return is guaranteed, unless you explicitly don't want them back. You need not include return postage, but please don't forget your address.

I am looking forward to a "flood" of cards!

73/55 Horst, DL8NBM

Note

Rarely used today, "55" is an old telegrapher's code meaning "lots of success."—ed. Source: <http://www.ac6v.com/73.htm#73>.

*Lindenäckerweg 14, D - 90455 Nürnberg, Germany
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MFJ-1777 is a 102 foot *all band* doublet antenna that covers 160 through 6 Meters with a balanced line tuner. Super strong custom fiberglass center insulator provides stress relief for ladder line (100 ft. included). Authentic *glazed ceramic* end insulators. Handles full 1500 Watts.

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80/40 Meters

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MFJ-17754, $59.95. Short *dual band* 40/20 Meter dipole antenna is only 42 feet. *Full-size* on 20 Meters, ultra-efficient end-loading on 40 Meters. 1500 Watts. Center insulator with SO-239 connector and hang hole.

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MFJ-915 *RF Isolator* prevents unwanted RF from traveling on the outside of your coax shield into your transceiver. This unwanted stray RF can cause painful RF "bites" when you touch your microphone or volume control, cause your display or settings to go crazy, lock up your transceiver or turn off your power supply. In mobile installations, stray RF could cause your car to do funny things even blow your car computer. Clear up these problems, plug an MFJ-915 between your antenna and transceiver. 5x2 in. Handles full 1500 Watts. Covers 1.8-30 MHz.

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MFJ-913, $29.95. 4:1 balun, 300 Watts.

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MFJ-1704 heavy duty *antenna switch* lets you select 4 antennas or ground them for static and lightning protection. Unused antennas automatically grounded. Replaceable lightning surge protection. Good to 500 MHz. 60 dB isolation at 30 MHz. 2.5 kW PEP. Less than .2 dB insertion loss, SWR below 1.2:1. SO-239 connectors. Handy mounting holes. 6¼Wx4¼Hx1¼D in.

MFJ-1702C
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2-Positions

MFJ-1702C Like MFJ-1704, but for 2 antennas. 3Wx2Hx2D"

MFJ-1700C
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MFJ-1700C *Antenna/ Transceiver Switch* lets you select one of six antennas and one of six transceivers in any combination. Plug in an antenna tuner or SWR wattmeter and it's always in-line for any antenna/transceiver combination. Has lightning surge protection. Handles 2 kW PEP SSB, 1 kW CW, 50-75 Ohm loads. Unused terminals are automatically grounded. 1.8 to 30 MHz. SO-239 connectors. 4¾W6½Hx3D inches.

MFJ-1701
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MFJ-1701 *Antenna Switch* like MFJ-1700C but lets you select one of six antennas only. 10Wx3Hx1½D inches.

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BY IRWIN MATH,* WA2NDM

The Invention of Radio

Often the question comes up as to who really invented radio. The answer is not so clear, however. In our various researches we came up with the following information which we thought would be of interest to our readers:

Initially, in 1865, a Scottish physicist/mathematician, James Clerk Maxwell, proposed a theory that suggested that electromagnetic waves might exist. However, this was just a theory.

According to some people, a Virginia dentist, Dr. Mahlon Loomis, succeeded in transmitting information without wires between two points 14 miles apart. This was in 1868.

According to others, David E. Hughes discovered that sparks would generate a signal that could be detected by a telephone receiver in 1879. He then configured a communication system and succeeded to transmit Morse Code messages over a distance of 500 yards, or 460 meters.

In 1887, Heinrich Hertz experimented with radio waves in his laboratory to try to validate the predictions of James Clerk Maxwell.

Finally, in the late 1890s, Guglielmo Marconi started an endeavor that ultimately gained him the title "The Father of Radio."

Let us now look at the actual equipment used by these "radio amateurs."

James Clerk Maxwell

While not exactly an experimenter, James Maxwell was a physicist who, in 1865, began to develop a theory that electricity and magnetism were interrelated and that it was possible to produce so-called electromagnetic waves. In addition, Maxwell suggested the probability that if such waves did exist, their velocity in space would be the same as light. Maxwell never did any specific experiments, but calculated mathematically that such waves could exist. No mention was made by him that these waves had any practical application.

Mahlon Loomis

Dr. Loomis was a dentist by profession who became interested in electricity, and like a true experimenter, felt that perhaps the natural electrical charges present in the upper atmosphere could be used to replace batteries in telegraph systems. It is interesting to note that at the time he lived the telegraph was in wide use and improvements were being sought after constantly by many experimenters. During his experiments Loomis found that a kite flown in the upper atmosphere and secured by a copper-wire string could actually produce an electrical current flow that could be detected by a sensitive galvanometer connected in series with the wire. Using this information, Loomis proceeded to try to develop a communications system that would not need interconnecting wires. Fig. 1 is a drawing (copied from his notes) that shows the basics of his experiments.

When the first kite circuit was set up, a small, detectable current actually began to flow through the galvanometer. Next, Loomis sent up another kite, approximately 14 miles away, and found that when the circuit of the second kite was interrupted, the current in the galvanometer attached to the first kite dropped. Although the system did work to some extent, it proved to be unreliable from day to

*c/o CQ magazine

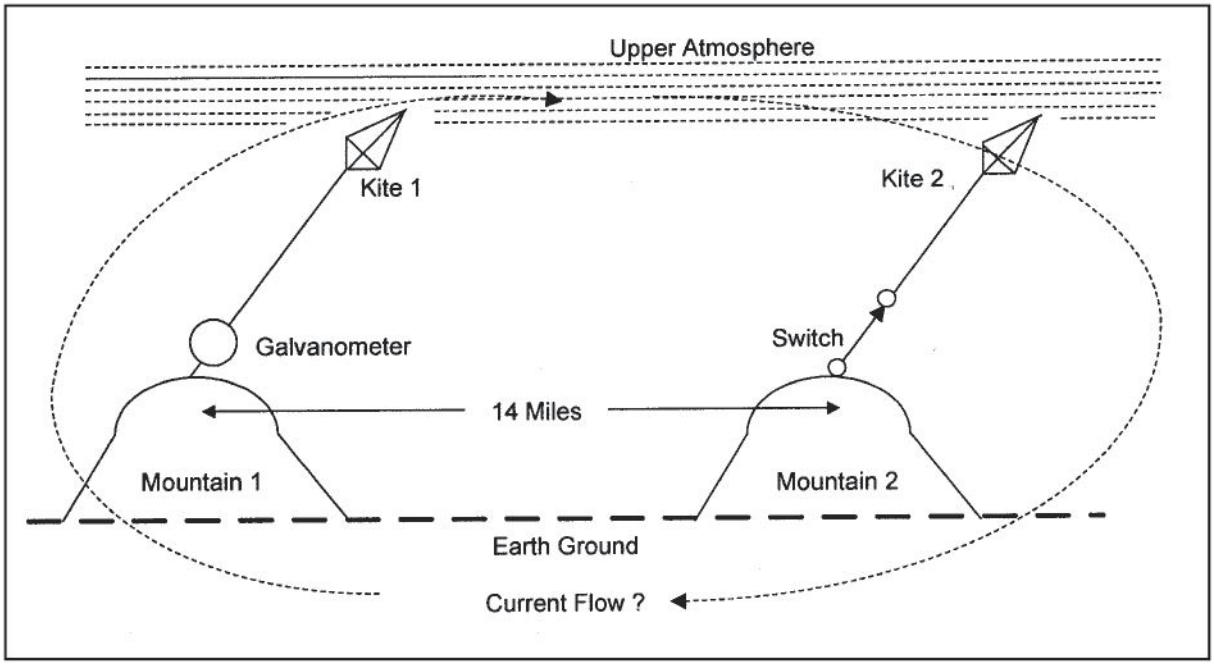

Fig. 1. Dr. Mahlon Loomis's experiment.

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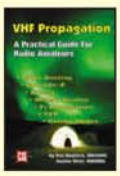

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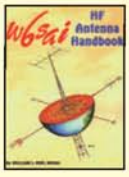
W6SAI HF Antenna Handbook

by Bill Orr, W6SAI



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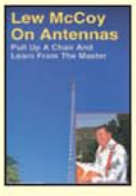

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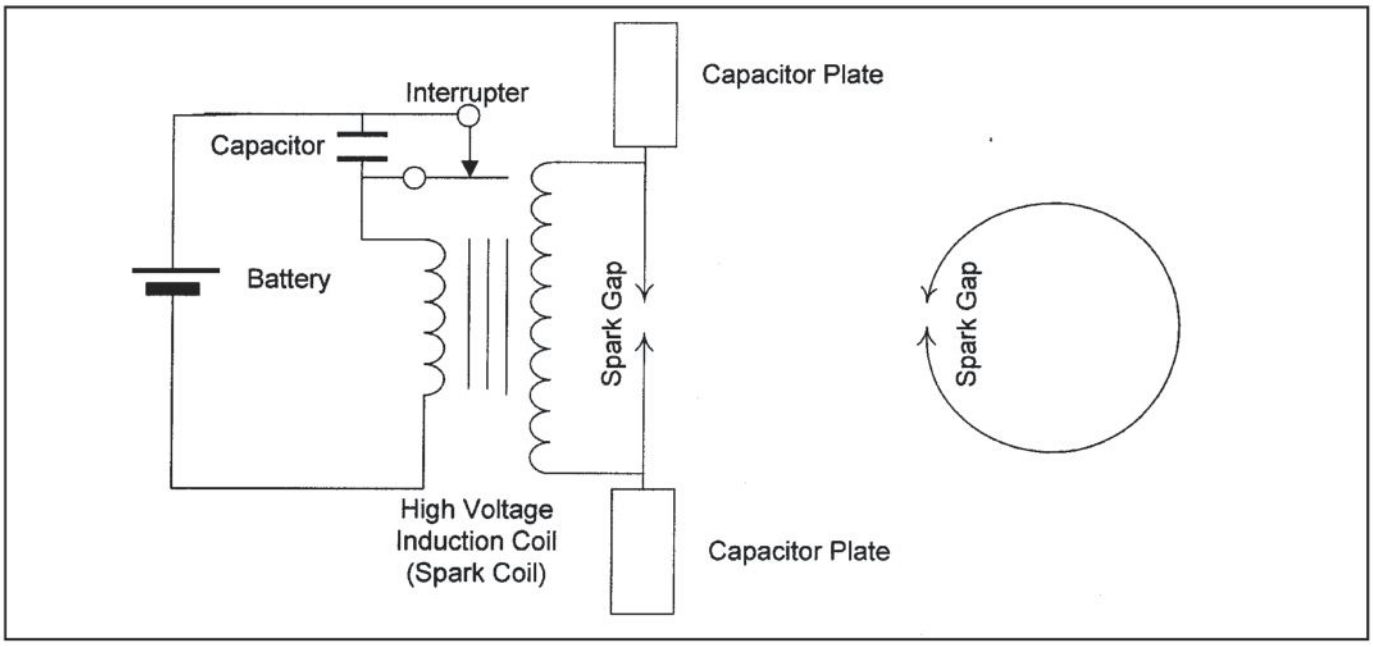


Fig. 2. Heinrich Hertz's experimental apparatus.

day. Loomis did attempt to convince the government to fund further research, but it was not forthcoming and not much more came of it.

Was this true radio or was it a simple series circuit consisting of the charge in the atmosphere, the two copper kite wires, and the conduction of the earth? If so, then it was not really radio, but it was a method of wireless communications.

David E. Hughes

David Hughes was a physicist who was interested in electricity and signaling. In performing his experiments, in 1879 he found that a spark generated by a high-voltage coil would generate a signal that could be heard a short distance away in a telephone receiver of the type used in those days. Although the sound he heard probably resembled static, by refining his equipment, Hughes extended its transmission range to 500 yards and could actually send discernable messages by Morse Code over that distance. As he was trying to develop a true longer range wireless transmission system, the work of Heinrich Hertz became widely known, and, since his work was done, Hughes thought he had lost the race and there was no point in announcing his findings publicly. Since the spark he generated actually produced an electromagnetic wave, one could consider this a true but ultra-simple radio system.

Heinrich Hertz

Heinrich Hertz is probably the first true amateur, since he not only duplicated Hughes' work but actually measured and characterized the electromagnetic waves he was producing as he worked to validate Maxwell's theories. He proved that the electromagnetic wave could travel a significant distance

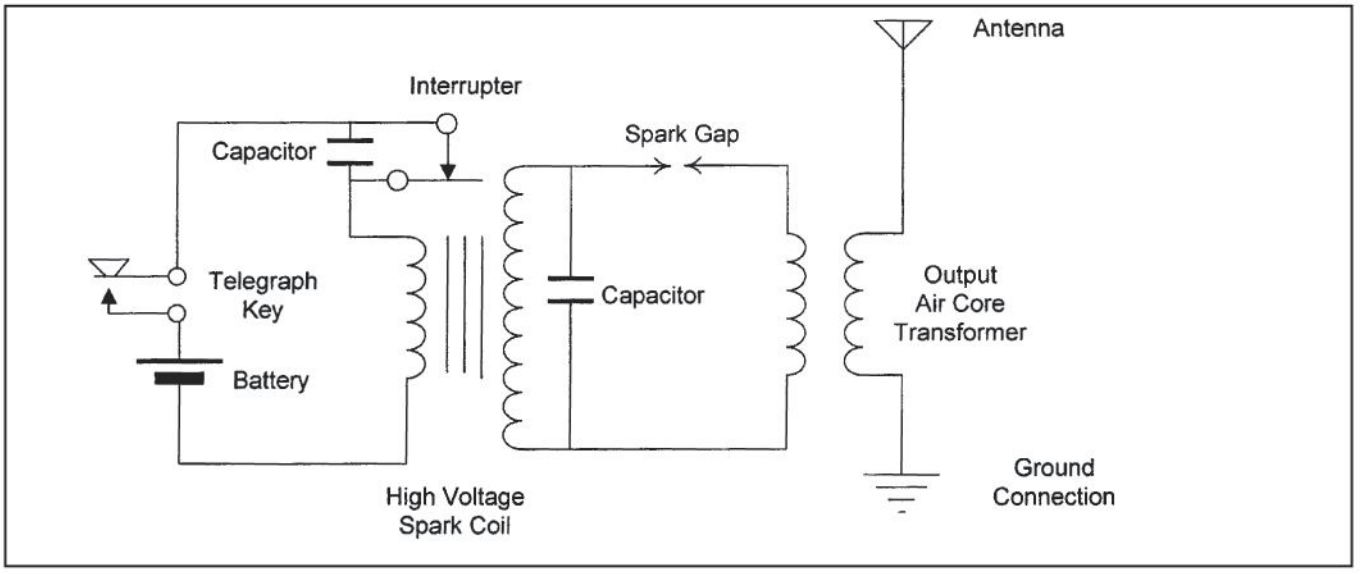


Fig. 3. Typical spark transmitter of the early 1900s.

and could be reflected and produce standing waves that reinforced or diminished their strength. Fig. 2 is a diagram of Hertz's transmitter and receiver.

Hertz had a problem with his simple system, since the received spark was very weak and required a gap that was almost microscopic. To see the spark Hertz tried to enclose the gap in a light-tight box but found that the spark was stronger in visible light and weaker in the dark. Although he did not understand that phenomenon, others later found that he had demonstrated the photoelectric effect without knowing it. The range of Hertz's transmissions was on the order of 12 meters (about 35 to 40 feet).

Unfortunately, Hertz did not propose any form of communications by electromagnetic waves, but did set the stage for others.

Guglielmo Marconi

Guglielmo Marconi was born in 1874, and by the late 1890s he began experimenting with "Hertzian Waves," as they were called at the time. He reviewed the work of many of experiments in the field that came before him and by numerous experiments combined the best parts of each into a true system designed specifically for wireless communications.

By 1896 Marconi had achieved a reliable communications distance of 2 miles and filed a patent application with the British Post Office. Through further experimentation Marconi gradually increased his transmission range until, in 1901, he conducted his most famous experiment. By means of a 20,000-volt alternator in Cornwall, England (instead of a spark coil) that was connected to a large antenna consisting of 60 copper wires between two wooden poles 150 feet high and a 400-foot antenna connected to kite in Newfoundland, he succeeded in spanning the Atlantic Ocean with a simple signal consisting of the letter S in Morse code.

Thus, in retrospect, many experiments were conducted by others before Marconi, and in some cases succeeded in transmitting signals wirelessly. However, it was Marconi who popularized wireless communications for the masses. For reference, fig. 3 is a schematic of a typical transmitter of the early 1900s. Note the similarity to some of the previous experimenters' thoughts and designs.

I hope this information will allow you to decide who actually invented radio, but as I am sure you will agree, the answer is not that clear.

73, Irwin, WA2NDM

BY RICHARD FISHER,* KI6SN

It's All Emergency Communications When You Think About It

Before reading this month's "Emergency Communications" column—known heretofore as "Public Service"—please turn to *CQ* Editor Rich Moseson, W2VU's "Zero Bias" commentary on page 8. In it, he speaks about a curious initiative by the ARRL to play down the term "emergency communications" in favor of "public service communications" when referring to radio amateurs' role in times of need serving the communities and country in which we live. It was detailed in June *QST.*

We thought about that and came to the polar opposite conclusion ARRL Emergency Coordinator Mike Corey, KI1U, did. Public service is a plain vanilla description of what thousands of radio amateurs do and have done admirably for more than a century.

Yes, radio amateurs were in the forefront of Hurricane Sandy and the deadly tornadoes that ripped apart Joplin, Missouri. They were among the first responders when an earthquake levelled Haiti and a terrorist attack sent shockwaves around the world from the Boston Marathon.

However, are the many thousands of hours hams devote each year to honing their EmComm skills during public service events in preparation for "the real thing" any less important than EmComm in "the real thing?" *Of course not.* There is a good case to be made that, in some ways, those training hours are even *more* important. We don't want to be ironing out the wrinkles when human life is at stake, now do we? That's why we train . . . *and train, and train.*

In our view, it *all* is emergency communications.

Radio amateur members of the Lake County (Florida) Amateur Radio Emergency Service, ARES®, are textbook examples of why almost everything we do to serve the public can be termed EmComm. They avidly train in non-emergency settings to be ready when the call goes out in life-threatening situations.

We are fully into the second month of the 2014 Atlantic Hurricane season. From Tallahassee to Key West, Florida is perennially in the likely bull's eye of these killer storms. The members of Lake County ARES® take their responsibility as public servants with dead seriousness. Is it any wonder?

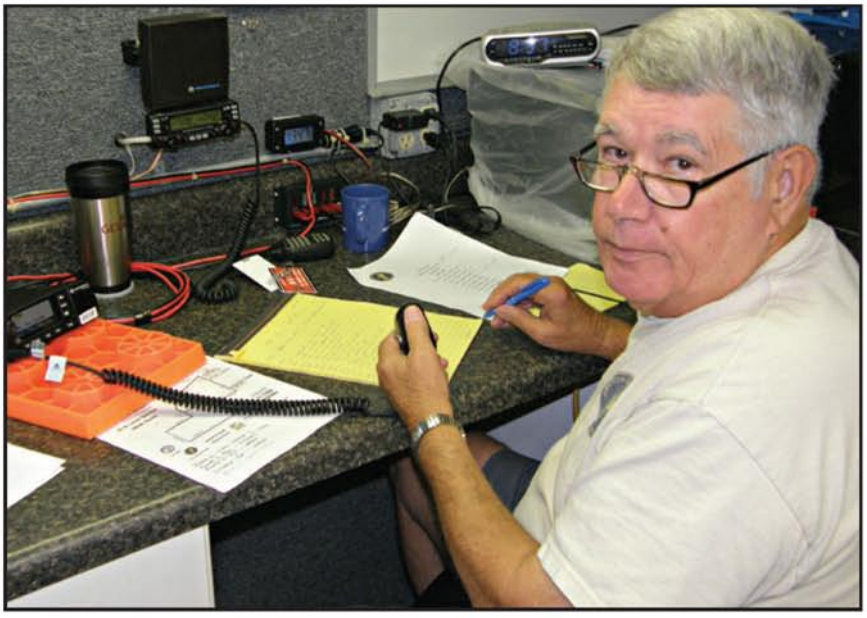
It, and hundreds of other EmComm groups, treat every exercise as vital preparation. It's all emergency communications in one way or another.

Take, for example, LCARES's communications support of the March of Dimes "March for Babies" in Tavares, Florida in May. What could be more benign? And certainly it was. However, dry-running radios, antennas, EmComm protocols, and so on, all comprise very serious work.

"Fifteen volunteer ham radio operators donated their time, vehicles, and equipment for the event," writes Ted Luebbers, K1AYZ. "The Lake County ARES communications trailer was set up in Wooton Park in Tavares on the shore of Lake Dora on a beautiful sunny morning adjacent to the event's start-finish line. The walkathon course was approximately five miles long and had 250 participants."

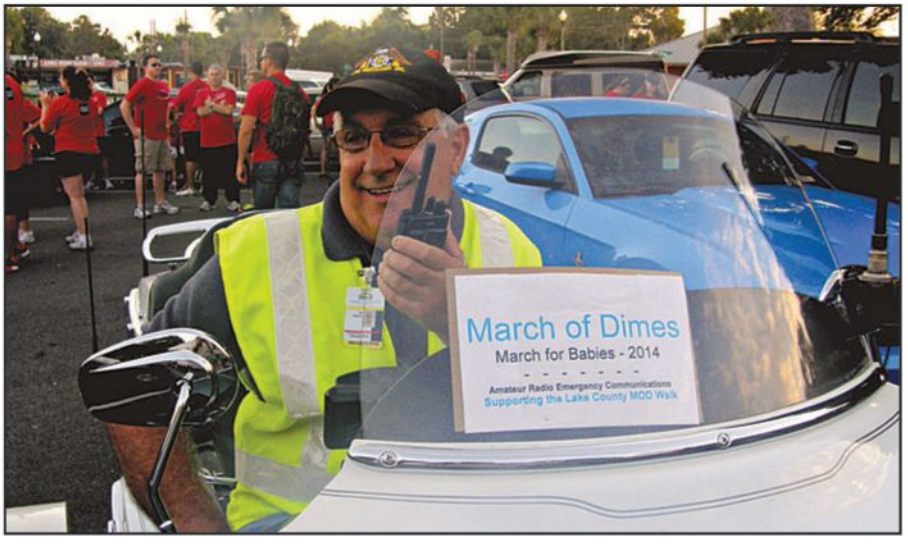
Six rest stops were provided along the route, sponsored by businesses from the Tavares area—banks, medical services, and service clubs. An amateur radio operator was stationed at each rest area with a handheld radio which enabled each

*1940 Wetherly Way, Riverside, CA 92506
e-mail: <ki6sn@cq-amateur-radio.com>



Jay Boehme, N4KXO, ran the net control station, N4FLA, from the Lake County ARES® communications trailer during the March of Dimes "March for the Babies" fundraiser in May in Tavares, Florida. (Photography courtesy of K1AYZ)

Strait Hollis, KT4YA, provided one of the mobile support vehicles for the March of Dimes event, which provided valuable training for members of the Lake County ARES®.



Eli Blanco, N4ELI, rode his radio-equipped Harley Davidson trike as one of the roving safety vehicles with LCARES.

spot to be in contact with the net control station N4FLA in the communications trailer.

"The ARES® personnel also provided three vehicles with mobile radios to make sure the walkers were safe along the route and to transport anybody who could not finish on their own back to the event headquarters tent. These vehicles were also dispatched by net control to deliver ice and water to rest stops that requested them."

Luebbers said LCARES was able to test out a new Digital Mobile Radio system (DMR) for the first time. Lake County Emergency Management loaned the ARES® operators Motorola XPR 7550 handheld radios to stay in contact with the net control station which was using a Motorola XPR 5550 base station.

"These radios were programmed to operate in the amateur 70-centimeter band through two linked repeaters … in Groveland and Paisley, Florida," he said. "This successful test added to the many communications systems the ARES® group can call upon in the event of an emergency situation.

Now, such planning and communications implementation is certainly a public service, but more importantly, it is emergency communications – just without the actual emergency.

"This is an annual event in Tavares which helps raise money for medical research and programs that help babies begin healthy lives," K1AYZ continued.

The Lake County Amateur Radio Emergency Service "always steps up to provide radio communications for the March of Dimes Walkathon," he said, "and it provides an excellent opportunity for its members to train for the possibility of having to use this equipment during a disaster situation. ARES® traditionally provides emergency radio support to first responders such as police and fire departments during times of natural or manmade emergencies."

Public service, for sure, but more importantly, emergency communications.

*(**IN DEPTH:** For more information about LCARES and amateur radio in Lake County, Florida, visit <http://www.k4fc.org> and <http://www. n4fla.org>.—K1AYZ.)*

Public Service Communications vs. EmComm: What Do You Think?

Is the ARRL initiative to downplay the term amateur radio "emergency communications" in favor of generally calling such work "public service" a legitimate and proper course of action? *CQ* Emergency Communications would like to hear your views and to share them with *CQ* readers in upcoming editions of this column. Please write to me at <ki6sn@cq-amateur-radio.com>.

Until next month . . .

73, Richard,KI6SN

A view from the driver's seat of N4ELI's trike shows his ICOM 706 transceiver which operates on HF, VHF, and UHF.

Fred Fitte, NF2F, Emergency Coordinator for Lake County ARES®, provided leadership for the ham volunteers. The Lake County ARES® communications trailer was set up for the "March for Babies" at Wooton Park in Tavares, Florida.

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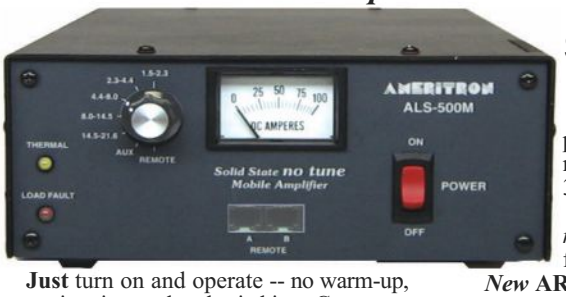

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Ameritron's ALS-500M solid state *mobile* amp gives you 500 Watts PEP SSB or 400 Watts CW output! Covers 1.5-22 MHz, (10/12 Meters with MOD-10M, $29.95 kit, requires FCC license).

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***New* ARI-500, $119.95**, *Amplifier Radio Interface* reads band data from your transceiver so you can *automatically bandswitch* your ALS-500M amplifier. *See right inset.*

***New* ALS-500RC, $49.95**, *Remote Head* lets you mount ALS-500M amplifier *anywhere* and gives you full *manual remote control*. Select desired band, turn On/Off and monitor current draw on its DC Current Meter. Power, transmit and overload LEDs. RJ-45 cables plug into Amplifier/ Remote Head. Works with serial numbers above 13049 (below 13049 requires the ARF-500K, *see below*).

ALS-500M, $949, 500 Watt mobile amp.

ALS-500MR, $979, ALS-500M mobile amp ***plus*** ALS-500RC *Remote Head.*

ARF-500K, $179.95, Remote kit for older ALS- 500M mobile amps with serial # below 13049. Includes filter/relay board for ALS-500M, AL-500RC Remote Head, cables, hardware, instructions.

ARF-500K2, $289.95. Includes ARF-500K Remote kit for older ALS-500Ms ***plus*** ARI-500 *Amplifier Radio Interface* below.

Let your rig *auto bandswitch* your ALS-500M Amplifier

ARI-500
$119.95
Ship Code A

The Ameritron ARI-500 *Amplifier Radio Interface* reads band data from your Icom, Yaesu, Kenwood or Alinco transceiver so they can remotely and automatically bandswitch your ALS-500M amp. Lets you mount your ALS-500M out-of-the-way in your trunk. Works with serial numbers above 13049 (below 13049 requires the ARF-500K, *see above*). You can add the ALS-500RC for manual bandswitching and data monitoring, etc, *see left description.*

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Tuning your mobile screwdriver antenna couldn't be easier or more reliable!

The SDC-102 lets you save *10* of your favorite screwdriver antenna positions in memory -- that's more than enough for all HF bands. Then, with a push of a button, you can quickly return to any saved position.

Up/Down buttons let you manually move the antenna to any desired position. A 4-digit turns counter gives you precise antenna position -- you can see its *super bright LEDs* even in direct sunlight!

Returning to a position from memory is extremely accurate for three reasons . . .

A. The antenna always moves to its desired position from the bottom, insuring that the motor is always loaded the same.

B. Ameritron's exclusive *AutoPark*™ feature automatically bottoms your antenna for parking in your garage and *resets and calibrates* your counter each time to eliminate antenna slippage and turns count errors.

SDC-102
$129.95
Suggested Retail

C. The momentum of the moving antenna causes it to overshoot its stop point. Ameritron's exclusive *Dead-OnSTOP*™ feature automatically reverses the motor briefly just before it stops to eliminate overshoot and come to a precise stop.

Ameritron's exclusive *StallProtector*™ feature prevents your expensive motor from burning out. Automatically detects motor stall and completely shuts off power to motor.

Monitor motor current on LEDs for signs of trouble and to determine stall current.

If you wire the motor backwards, you can reverse its direction from the SDC-102 front panel so the UP button is always up and the DOWN button is always down.

Compatible with single and dual magnetic turns sensors. Requires 12 VDC.

3½Wx3¼Hx1¼D inches.

SRS-100, $29.95. Magnetic sensor kit for High Sierra antennas to use SDC-102.

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1.2 kW Screwdriver Antenna

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SDA-100 lets you operate 3.5 to 30 MHz continuous with six foot whip at full 1200 Watts PEP.

World's most rugged screwdriver antenna features . . . super heavy-duty commercial Pittman 12 Volt gear motor . . . stainless steel/ aircraft aluminum CNC machined components . . . 2-inch machine groove fiberglass coil form with 14-gauge wire wound at 8 turns per inch . . . built-in magnetic sensors . . . super durable Lexan cover . . .

SWP-100, $24.95. 6-ft stainless whip. **SDM-100, $99.** Stainless steel mount. ***Saves $16.85!*** **SDA-110, $509.95.** Includes SDA-100, SDC-100, SWP-100.

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Ultra-thin 1⅝ inch flat mobile SWR/ Wattmeter *flat mounts* on your dashboard wall or shelf for easy viewing. Lighted Cross-Needle meter and *active* electronics let you read *true* peak or average power in 3000/300 Watt ranges 1.8-30 MHz. "High SWR" LED. 5Wx3¼Hx1⅝D inches. *Remote sensor* with 25 feet thin, flexible cable is 3½Wx2¾Hx2¾D inches. Use 9V battery or 12 VDC.

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learning curve

BY RON OCHU,* KOØZ

"I am Skywarn"

All of us come into this hobby with different expectations. Some of us love to build kits, while others pursue DX (contacting distant countries), and still others love contesting. However, many of us are involved to some degree with EmComm (Emergency Communications). As ham radio operators, a major trait that a lot of us have in common, besides our passion to communicate, is the willingness to make ourselves and our equipment available during emergencies.

Occasionally, you'll or see a print or a television advertisement depicting someone proudly saying, "I am the (place name of organization here)! The ads are clever because when you think about it, any organization is made up of people just like you and me. If that organization is made up of caring, enthusiastic, thoughtful individuals, then it is truly something to behold! That advertising slogan applies to amateur radio, especially when it comes to the National Weather Service's (NWS) Skywarn program. Skywarn is made up of caring, enthusiastic, thoughtful individuals such as you and me, and our participation is greatly appreciated by the NWS.

What is Skywarn?

The NWS, which is a part of the National Oceanic and Atmospheric Administration in the U.S. Department of Commerce, maintains 122 Weather Forecast Offices (WFOs) throughout the United States. It's the mission of the NWS to provide forecasts, public warnings, and other products for the purposes of protection, safety, and general information. Toward that goal, the NWS started the Skywarn program in the 1970s to assist with more timely and accurate regional warnings.

Skywarn is a nationwide network of volunteer weather spotters, just like you and me, who are trained by and report to National Weather Service (NWS) meteorologists. Skywarn spotters report many forms of significant weather such as severe thunderstorms, tornadoes, hail, heavy snow, and flooding. The Skywarn program gives trained spotters a platform to communicate real-time weather information and damage reports from out in the field back to NWS meteorologists.

County Warning Area

Each NWS Weather Forecast Office is assigned a geographic area of responsibility, also known as a County Warning Area (CWA), for issuing local public, marine, aviation, fire, and hydrology forecasts. The NWS uses radar, satellite imaging ,and computer modeling to aid with forecasts, but as good as that technology is, forecasters still need "ground truth" reports from out in the field. This is where amateur radio operators are needed and the NWS wants us (photo A)!

Macoupin County, Illinois is where I live, and it forms part of the northern boundary of the St. Louis, Missouri NWS Weather Forecast Office's CWA (photo B). I live about 55 radio miles away from the St. Louis office, and I send my weather spotter reports back to the St. Louis, Missouri office via the WS9V linked repeater system.

I have a pretty good idea of what net control operators are looking for, because years ago, I was one of the St. Louis NWS Skywarn net control operators, and during severe weather events we would stay in the office and keep the net open until all of the storms had left our CWA and we could hand off the watch to the adjoining forecast office. A CWA covers a lot of territory; therefore, a team of dedicated hams is needed throughout the duration of a weather event to keep on giving ground truth reports back to the weather forecast office.

As a former STL NWS Skywarn net control operator, I am here to tell you that your local NWS forecast office needs reports from out in the field! Your observations and input are needed! According to St. Louis NWS meteorologist Gary Schmocker (photo C), "Hams are invaluable; especially in areas where there isn't good radar coverage. In sparsely populated areas, we need ground truth reports. Hail, ponding, flooding, wind and damage reports. During winter, we need snow accumulations. After 10 PM,

*e-mail: <ko0z@cq-amateur-radio.com>

Photo A. "Uncle Sam needs you for Skywarn!" (Photo via Wikimedia Commons)

we especially need help. We don't want to bother people late at night, but we still need ground truth reports and we are desperate for spotter information!"

I Want to be Part of This!

At this point in this column, you may be asking yourself how you can contribute to the Skywarn effort. First , go online and find out when and where a NWS meteorologist will be conducting a storm spotter class (photo D) at <http://www.stormready.noaa.gov/contact.htm>. A map of the United States will appear and from there click on your state and then your county. You will be given a NWS contact name along with a phone number and e-mail address.

Don't be shy about contacting your local NWS office. The folks there are very friendly. Another option is to go online and check out your local NWS office and examine its Skywarn page. For example, the St. Louis office has a very useful Skywarn webpage at <http://www.crh.noaa.gov/lsx/?n=skywarn>. The NWS contact person will assist you with becoming more involved with Skywarn. May I suggest that you also download the NWS "Weather Spotter's Field Guide" at <http://www.nws.noaa.gov/om/brochures/SGJune6-11.pdf>. This is an excellent manual and a "must have" for all storm spotters.

What Next?

Next, you'll need to know which repeaters are used in your area for reporting Skywarn related traffic. Many of these repeaters "loaf" along each day carrying typical ham radio chatter, but when severe weather is imminent, normal activity ceases and everyone, including local media outlets, listens for severe weather related traffic. A net control operator may place the repeater controller in "weather mode," which can increase or even temporarily defeat the repeater's timeout control feature. Some type of a warning tone often will replace the normal courtesy beep at the end of each transmission to alert users that the weather net is up and running. In many NWS offices, NWS meteorologists are also licensed amateur radio operators and they may start the Skywarn net (photo E) and run it until ham radio volunteers arrive to assist. Once the net is up and running, net control will be issuing weather statements over the repeater and will be looking for severe weather reports from spotters out in the affected area.

Skywarn in Action!

For a detailed look at a Skywarn net in action during a tornado outbreak in Arkansas in late May of this year, see the "Disaster DXing" column in this issue of *CQ Plus*, the monthly supplement to our digital edition. If you are reading the digital edition of *CQ*, the article is on page XX.

Photo B. CWA for St. Louis WFO includes eastern Missouri and western Illinois. (Courtesy National Weather Service)

What to Report

In my part of the country, our primary severe weather focus is on damaging thunderstorms and tornadoes. During severe weather, the NWS is looking for reports of strong winds, flood-

Photo C. St. Louis NWS meteorologist Gary Schmocker.

Photo D. St. Louis NWS meteorologist Jim Kramper, NØSLX, conducting a Skywarn class. (KOØZ photos)

ing, hail, wall clouds, funnel clouds, tornadoes, and damage. Different information may be sought in other parts of the country with different types of severe weather, such as blizzards or coastal storms. While the specific information reported may vary, the procedures and the basics remain the same.

It is important to be accurate; Skywarn is not a contest to see who can give out the highest number of reports. Accuracy is the key to providing NWS meteorologists with "ground truth" reports from the field to help them with their forecasts. Let's take a closer look at what to report (based on the types of severe weather we see here in the Midwest):

Photo E. St. Louis NWS meteorologist Ron Przybylinski, KCØWWE, conducting a Skywarn net.

Photo F. St. Louis, MO WSR-88D Doppler radar.

Before issuing any reports, make sure that you can get a good signal back to net control. After net control acknowledges your callsign, give your location, a brief description of the incident, and the time. Speak clearly and calmly.

For example, *"WXØSTL, this is KOØZ, I am located in Macoupin County, in the town of Girard near the intersection of Illinois Route 4 and Center Street and there are tree limbs ranging from about 2 to 4 inches in diameter down from strong winds at 3:45 pm, over."*

Net control will acknowledge your report and if any more information is required, net control will ask you. By giving this report you are helping to confirm what the Doppler WSR-88D Radar (photo F) is seeing and giving communities downrange from your location a better idea of what to expect in the area.

At no time should you ever place yourself in harm's way. The idea behind Skywarn is to have many trained spotters throughout a region who start giving timely, accurate reports as the weather approaches their location. The weather will come to you; don't you go chasing after the weather.

Let's look at some of the specifics we report here in the Midwest:

Strong winds—Any winds that are removing roof shingles, breaking tree branches, tree limbs, or uprooting trees need to be reported.

Flooding—NWS meteorologists don't need to receive reports about heavy rain unless the rain is causing localized flooding such as water over street curbs, flooded intersections, rain-swollen creeks and rivers, levies about to be breached, etc. Then, by all means, radio your observations back to net control.

Hail—An indication of strong updrafts associated with a thunderstorm. Hail can cause damage and the NWS needs to know of any damaging hail. There is some debate as to what size qualifies to be reported such as pea-size vs. marble-size. My recommendation is to report any hail presence back to the NWS office and let the meteorologists sort out the significance. Just make sure to be accurate. Unless you have a ruler with you, determining hail size can present a challenge. A good rule of thumb is to use money as a hail-size gauge, such as dime-size or quarter-size hail, unless you observe larger sizes (hope-

fully not), such as golf ball-size or baseball-size hail.

Wall clouds, funnel clouds, and tornadoes—Again, it's important to stress that at no time should you place yourself in harm's way. From a safe location, report back to net control that you've spotted a wall cloud. A wall cloud is a lowering of the thunderstorm base, usually just behind the rain toward the southwestern region of a thunderstorm. Be especially observant of any rotation within the wall cloud.

For example, *"Net control this is KØØZ located in Macoupin County, in the town of Girard near Illinois Route 4 and Center Street and I am observing what appears to be a wall cloud immediately east of my location, heading northeast, and at this time there is no rotation, over."*

When it comes to funnel clouds, make sure that you have a good visual on the suspected funnel cloud. Take a few moments to confirm that you are indeed seeing a funnel cloud. Identifying a funnel cloud sounds relatively easy, but sometimes it can be a bit tricky; especially if there is rain wrapping around the funnel. When in doubt, report as accurately as you can your observations back to net control. If the meteorologists need more information they will not hesitate to ask. Most likely they will ask you to continue observing it. You will also be providing a "heads-up" to any spotters downrange from your location. Remember that a funnel cloud is not touching the ground. Look for any debris being kicked up by the funnel. If you can see any debris, then the funnel is in contact with the ground and it is now a tornado and that needs to be reported!

I remember a while back, when I was

*****SEVERE WEATHER REPORT*****

DATE: _____ TIME OCCURRED: _____

LOCATION: _____ COUNTY: _____

CALL SIGN: _____ NAME: _____

SEVERE WEATHER REPORTED: _____ Wall Cloud _____ Hail & Size

_____ Funnel Cloud _____ Wind & Speed

_____ Tornado _____ Flooding

FURTHER DAMAGE DESCRIPTION: Crop damage, downed tree limbs or trees, downed power lines, street flooding, water ponding at intersections, flooding creeks/rivers, roof shingles blown away, hail damage, etc.

RECEIVED FROM: _____ Personal observation _____Police/Fire Department

_____ Scanner traffic _____Repeater traffic

_____ Family/Friends (include their location and incident time)

KØØZ-2014

Fig. 1. Severe weather report form template. It should be customized to include specific information requested by National Weather Service meteorologists in your part of the country.

Photo G: Good Friday, April 23, 2011 EF4 tornado storm damage in St. Louis.

acting as net control for the St. Louis office and we were tracking a non-rotating wall cloud. A few minutes later, one of our spotters, living on a hilltop, had a good sight line on the wall cloud. He reported over the repeater that he could see the wall cloud and that it was now slowly rotating on its axis. The lead meteorologist asked me, "How accurate is this spotter?" I replied, "He is very accurate." The lead forecaster said, "Good enough for me," and with that he issued a tornado warning. As it turned out, that wall cloud did produce a weak (EF-0) tornado about ten minutes later.

One may think that spotting a tornado would be relatively easy, but such is not always the case. The EF4 tornado that hit St. Louis a few years ago was wrapped in rain and it was almost impossible for trained spotters to identify. The only clue was the path of sheer destruction that it left in its wake (photo G). Knowing where in a thunderstorm to look for a tornado is crucial for a spotter, and that's why I highly recommend taking a NWS Storm Spotter Training class in addition to studying the NWS "Weather Spotter's Field Guide." The class has a lot of high-quality slides of hard-to-spot tornadoes that give the spotter a better idea of just how difficult it can be to see a tornado, and that goes double when a tornado strikes a community at night. Often, the only way to identify it is from the illumination provided by accompanying lightning flashes or from the sparking of severed high-tension power lines.

Damage Reports—It's always vital to report any weather-related damage, such as: a patch of ruined crops from hail; or broken limbs, uprooted trees, downed power lines, ponding in the streets, lightning damage, etc. Don't forget to include the time and location of each occurrence. Last May, high winds from a severe thunderstorm toppled some big trees in a lakeside community about 8 miles west of my QTH in Girard. The NWS St. Louis office asked us to go out to the area and report any damage. I approached the area from the east and fellow spotter Mark Kerhlikar, WD9HBF, approached from the west because there was a power line blocking the main road. Fortunately, there was no one injured and outside of some uprooted, very large trees and some roof damage, we dodged the bullet that time.

A Handy Report Form

I've created a handy report form in fig. 1 that can be used by spotters out in the field. You may want to make a number of copies of this form and put it into your EmComm "Go Bag" along with extra batteries for your HT and flashlight, some snacks, water, maps, and a compass. You should modify the specifics based on the different types of information requested by meteorologists in your area.

Skywarn Needs You!

Skywarn has a proud history of amateur radio participation and even with radar, computer, and satellite advancements, the NWS still needs you! NWS meteorologist Gary Schmocker explains: "Even though we have dual polarization with the WSR-88D Doppler radar and better satellite imaging, we still need ground truth observations along with damage reports to compare radar and satellite data with real time events."

So keep an eye to the sky and listen to your NWS weather radio for reports similar to this one issued for an expected severe thunderstorm event in eastern Missouri and west central Illinois:

"SPOTTER ACTIVATION IS LIKELY THROUGH TONIGHT ... ESPECIALLY DURING THE AFTERNOON AND EVENING HOURS. SPOTTERS ARE ENCOURAGED TO REPORT ANY SEVERE WEATHER ... IF OBSERVED ... TO THE NATIONAL WEATHER SERVICE. NWS STL April 27, 2014"

Remember, YOU are Skywarn!

73 and GL, Ron, KØZ

BY GORDON WEST,* WB6NOA

Mini-Meters, Mobile Antennas, and More

This month, we're going to take a look at some new meters, HF mobile whips, and waterproof logbooks, along with some tips on proper care and feeding of Anderson PowerPole™ DC connectors.

Mini Digital Meters

Radio City, Inc., of Minnesota, has a new line of miniature LED meters that will fit your budget ($5) as well as tight (1/2 inch × 1 inch) spots in and around your radio equipment.

My favorite is the three-digit, 3-volt DC to 30-volt DC color LED meter—red, green, or blue readout (photo A). These meters are bright . . . and fast. They refresh every half-second, don't flicker, and accurately display the DC voltage they are measuring.

I tested them for EMI, and about the only micro-amount of noise that I could detect was smack-dab on 10 MHz. The noise source was so low, though, that your operation on the 30-meter band won't be affected.

If you are looking for both voltage AND current, Radio City also has a dual-display DC volt and amp meter, 20 amps maximum (photo B). Voltage is blue and current is green, and at under $10, it is a bargain. Check out the 10-amp and 50-amp versions, too.

This dual display is about 2 inches wide, and just over an inch in height. The two-color LED dual displays are multiplexed, so it took me a micro-second or two to adjust to a quick glance at the display readout. In other words, unlike the straight voltmeter LED readout, this display has a unique characteristic when taking a quick glance at it.

Radio City, Inc. also offers an LED AC voltmeter.

There are many ways to mount these meters, but to get started I covered the exposed back of

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e-mail: <wb6noa@cq-amateur-radio.com>

Photo B. Radio City also offers a combination voltage and current meter.

Photo A. Mini DC voltmeter from Radio City.

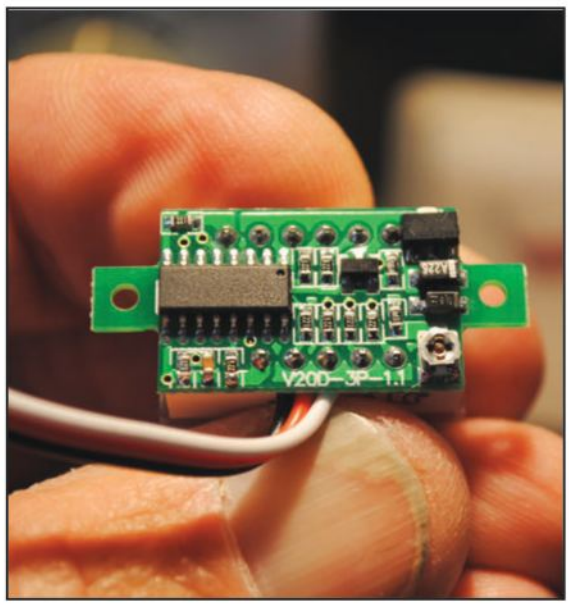

Photo C. An easy way to mount these LED meters is with double-stick tape foam on the back of the circuit board.

the circuits with just a little bit of Scotch™ double-sided foam tape. For more info, visit <http://www.radioinc.com>.

Diamond Antenna Mobile Whips

Most low-cost, single-band HF whip antennas use a 3/8-inch × 24 thread to screw into Diamond's popular K400 mobile mount, among others. This common thread is the lightweight HF mobile antenna standard.

The team at Diamond Antenna realized there were many hams who wanted to try out Technician voice privileges on the 10-meter band, as well as Technician CW privileges on 10, 15, 40, and 75 meters. Thus, instead of needing to change an existing UHF-style mount, Diamond has introduced single-band mobile HF whips that screw on to the UHF SO-239 type connection with their PL-259 type connector.

These HF antennas (photo D) are center-helically loaded with a stainless-steel lower section and a stainless-steel whip. They will handle 200 watts, but the helical wire size is relatively lightweight to keep this antenna ultra-mobile-portable. Don't run any more than 100 watts into the 75-meter whip.

Each single-band antenna weighs about 550 grams (1.2 pounds) and is about 6 feet tall. Each antenna is so slim, there should be minimal wind resistance on your existing mobile mount.

This is a new addition to the extensive Diamond Antenna product line, so we won't have pricing on each antenna until we see them in the ham radio marketplace. Check them out at <http://www.diamondantenna.net>. Diamond Antennas are distributed in the U.S. by RF Parts, Inc.: <http://www.rfparts.com/antenna/antennadiamond.html>.

Photo D. Diamond Antennas' new HF vertical whips are designed with PL-259 connectors at the base to attach to an SO-239-equipped mobile mount. (Photo courtesy RF Parts)

Care With Andersons

Most emergency communicators—or should I say *public service* communicators[1]—use the popular Anderson PowerPole™ connectors for 12-volt DC applications. Many of us also use Anderson power strips, some with built-in voltage monitoring. It is good that we have a uniform DC connector that improves interoperability, but Andersons are not without problems. Here are some important considerations when using the connectors:

- Use the correct swage tool to crimp your individual Anderson blades. (I also solder my crimped blade as well.)
- Remember, when viewed from the rear, red is on the right, blade down. (*Note:* right-red-rear-down; see photo E.) There was a period when one popular manufacturer sold a distribution panel wired just the opposite.
- The plastic on some Anderson connectors can become brittle after about a year of use, and no longer holds the blade tight against the other wiper blade. The plastic may actually break off (photo F). If this happens, you will no longer have a solid connection.

Be cautious using the retainer pin to keep the red and black connectors aligned. Sometimes the pin may vibrate out and short out the inside of the power strip. Many hams use miniature tie wraps to keep the pins aligned or a drop of superglue in the hole.

Andersons need to be regularly plugged and unplugged to maintain a good solid connection. When passing average

Photo E. An easy way to remember proper orientation of an Anderson PowerPole™—right, red, rear, down.

Photo F. After a year or so of constant use, PowerPoles may begin to break down. Time to replace them if they start looking like the ones in this photo.

currents, any slight resistance won't be seen. However, when passing current below 600 mA (less than an amp on a solar panel trickle charger), the slight resistance within an Anderson that has not been regularly exercised will result in less current getting to the battery under charge.

Photo G. Waterproof logbooks and similar notebooks are becoming popular among hams providing emergency communications and/or operating from outdoors.

This will result in a higher voltage value seen at the connector than the typical 19 volts open circuit of a solar panel. On some power strips with an over-voltage alarm, the alarm sounds, but the battery down the line is barely getting a charge. Contact cleaner will help. Therefore, regularly work your Anderson connectors, especially if they are passing only a few hundred milliamps.

Waterproof Field Radio Logbooks

Hams around the country have discovered fellow operators writing messages in the middle of a rainstorm on waterproof logbooks (photo G). The paper is synthetic, totally waterproof, and will not degrade when wet. They can take pen or pencil input and this magical synthetic paper will not warp in the rain.

The rustproof spiral binding keeps the pages from accidentally tearing out and blowing away during a storm, too.

If you have a pen that works under water, you can even take notes when scuba diving.

As an emer . . . public service communicator, these logbooks are small enough to fit in a pocket, pliable enough that you won't even know they are there, and durable enough to retain your notes until you return to the EOC.

For more information on the multiple styles of logbooks from radio to geocaching, go to <http//www.waterproof logbooks.com>.

73 for this time, Gordo, WB6NOA

Note

1. If you don't know what I'm talking about in terms of emergency vs. public service communications, see "Zero Bias" and "Emergency Communications" elsewhere in this issue.

BY TOM SMERK,* AA6TS

Young Hams in Finland, PR in VK, and More Ham News from Around the World

Let's begin this month with a look at some interesting festivals, hamfests and other celebrations that have occurred recently or are coming soon:

Youngsters on the Air 2014 in Finland This Summer

The Youngsters on the Air 2014 ham radio camp will take place July 15th to the 22nd in Virrat, Finland. The event is being organized by the Finnish Amateur Radio League. During the week, teams from 15 different European countries will be participating in radio-related activities including radio-based competitions, visiting stations, taking part in workshops, and more.

Previous events held in Romania, Belgium, the Netherlands, and Estonia (photo A) have shown that for young radio amateurs, Youth in Amateur Radio will be a great experience they will never forget. For more information, visit <http://ham-yota.eu>.

[IARU-R1]

Public Relations Event Held in Australia

The theme of recent PR4Amateur Radio Expo held throughout Australia was to publicize amateur radio on World Amateur Radio Day with an Expo by Wireless Institute of Australia (WIA) affiliates across the nation showcasing modern amateur radio to the public at demonstration stations and calling on residents to get involved in the fun.

Now that the event has concluded, it looks like all of the hard work the planners invested was successful. Some of the aims included community interaction and media coverage for amateur radio.

A few visitors to the expo reported they had seen an antenna in their neighborhood but did not know what it was. Some thought hams had gone out of existence, while others had not even heard of amateur radio.

The PR4Amateur Radio Expo led to a radio interview by the Australian Broadcasting Corporation (ABC) of a Bundaberg radio amateur. He talked about his do-it-yourself techniques and how he enjoys chatting with on-the-air friends, both near and far.

Some other comments to the public included Dave Nebe, VK4HAX, who prefers using amateur radio while others may choose the Internet or other ways to stay in touch, and Glen Woodrow, VK4FARR, who said, "It has never been easier to enter the hobby through the basic Foundation License, and the club can show you how to join in the fun."

Initial reports indicate some potential recruitment and a greater understanding of amateur radio among the public who visited.

[Southgate Amateur Radio News]

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e-mail: <aa6ts@cq-amateur-radio.com>

Photo A. Group picture, Youngsters On The Air 2013 in Estonia. (Photo by Kristjan Kodermac, S50XX)

Summer Finds at the CQ Store

FREE shipping on orders of $100 or more!

DX World Guide

by Franz Langner, DJ9ZB

This 384-page DXer's guide-book is the first edition using color throughout and the first to be entirely in English.

Includes info on well over 300 DX entities. Geographical info, WAZ and ITU zones, ITU callsign allocations, amateur prefixes and more!.

6 X 9 Paperback $42.95
***New!* CD Version $22.95**
Buy both for only $60.95

VHF Propagation

by Neubeck, WB2AMU & West WB6NOA

A comprehensive source-book on VHF propagation by two great authors. Includes: Tropo ducting, Aurora, Meteor Scatter, TEP, Sporadic-E, Combo Modes and more!

6 x 9 Paperback $15.95

Lew McCoy on Antennas

by Lew McCoy, W1ICP

Unlike many technical publications, Lew presents his invaluable antenna info in a casual, non-intimidating way for anyone!

8.5 X 11 Paperback $19.95
***New!* CD Version $14.95**
Buy both for only $29.95

Up The Tower

The complete Guide To Tower Construction

by Steve Morris, K7LXC

A highly experienced professional tower installer Steve has over 25 years of tower experience on over 225 amateur radio installations as well as dozens of commercial sites and has a rich background of tower and antenna construction

6 X 9 Paperback $35.00

Understanding, Building & Using Baluns & Ununs

by Jerry Sevick, W2FMI

The successor to the popular and authoritative Baluns and Ununs. Great deal of new tutorial material, and designs not in previous book, with crystal clear explanations of how and why they work.

8.5 X 11 Paperback $19.95
***New!* CD Version $14.95**
Buy both for only $29.95

The Short Vertical Antenna and Ground Radial

by Sevick, W2FMI

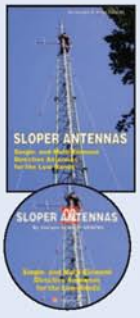
This small but solid guide walks you through the design and installation of inexpensive, yet effective short HF vertical antennas. With antenna restrictions becoming a problem, it could keep you on the air!

6 x 9 Paperback $10.00

Sloper Antennas

By Juergen A. Weigl, OE5CWL

Single- and Multi-Element Directive Antennas for the Low Bands



With calculations and practical experience, this book shows which basi concepts have to be considered for sloper antennas for the low bands.

6 X 9 Paperback $24.95
***New!* CD Version $18.95**
Buy both for only $36.95

Reflections III

by Walter Maxwell, W2DU

Includes all the information in Reflections I & II and much, much more! This fully revised and updated, this 424-page, third edition is truly a must have!

8.5 X 11 Paperback $39.95
***New!* CD Version $29.95**
Buy both for only $59.95

2014-15 calendar

15 months of value
January 2014
through March 2015

Fifteen spectacular color images of some of the biggest, most photogenic shacks and antennas from across the country and. . . new this year. . . we've included three Classic Radio and three CQ Contest pictures for good measure! These six shots, along with nine interesting and diverse Amateur Radio Operator's shacks from various locations across the country, comprise what we're sure you'll agree is our best calendar to date!

SALE! **$6.95 plus shipping**

Shipping charges: USA $3; Canada/Mexico $5; All other countries $10.

The NEW Shortwave Propagation Handbook

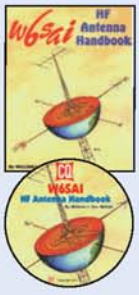
by W3ASK, N4XX & K6GKU

This authoritative book on shortwave propagation is your source for easy-to-understand information on sunspot activity, propagation predictions, unusual propagation effects and do-it-yourself forecasting tips.

8.5 X 11 Paperback $19.95
***New!* CD Version $14.95**
Buy both for only $29.95

W6SAI HF Antenna Handbook

by Bill Orr, W6SAI



W6SAI was known for his easy-to-understand writing style. In keeping with this tradition, this book is a thoroughly readable text for any antenna enthusiast, jam-packed with dozens of inexpensive, practical antenna projects that work!

8.5 X 11 Paperback $19.95
***New!* CD Version $14.95**
Buy both for only $29.95

Shipping & Handling: U.S. add $7 for the first item, $3.50 for the second and $2 for each add'l item. FREE shipping on orders over $100 to one U.S. address. CN/MX-$15 for 1st item, $7 for 2nd and $3 for each add'l. All Other Countries-$25 for 1st item, $10 for 2nd and $5 for each additional. Buy Both=single item!

CQ Communications, Inc., 25 Newbridge Road, Hicksville, NY 11801
Call:* 1-800-853-9797 • *Fax:* 516-681-2926 • *http://store.cq-amateur-radio.com

I know that hamfests are common in many countries, but this next story caught my eye and made me think that "timing is everything!" Read about how the extreme weather conditions attracted people who like to come out with their radios when things get extreme ...

38th Durham Region Amateur Radio Hamfest Attracts Emergency Responders

The Durham Region Amateur Radio Hamfest (photo B) was held on Saturday, April 19, 2014 in Pickering, Ontario. The event was organized by the South Pickering Amateur Radio Club and the Oshawa-based North Shore Amateur Radio Club.

Extreme weather and prolonged power outages brought a strong attendance of representatives of ARES®, who were there looking for new volunteers, and CANWARN, a group of ham radio operators who report severe weather to Environment Canada *(the Canadian equivalent of Skywarn in the U.S.—ed.)*. More than 350 attendees and 60 vendors and exhibitors participated in this year's hamfest.

Two main themes of the event were portable operation using batteries and building your own equipment, such as antennas, to save money as well as experience the enjoyment of "doing-it-yourself."

"It's getting back to our roots, which was working with surplus junk," said Tom Muzzin, VE3THR. Eric Bates, VA3EEB, added, "You get the satisfaction of building something at the end of the day."

Photo B. Joe Stratton and Al Duncan talked shop during the 38th Durham Region Amateur Radio Hamfest put on by the North Shore Amateur Radio Club and the South Pickering Amateur Radio Club. (Photo by Jason Liebregts, Durham Region.com)

Originally launched 38 years ago as a chance to buy and sell equipment, the festival has evolved to include learning and networking with other operators, since much of the buying and selling is now happening online. "It's important because many of these people talk to each other over the air for a number of years. The only time they can meet face-to-face is at events like this," said Walter Cang, event chairman for Durham Hamfest.

[durhamregion.com]

DARC Hosts Thai Amateur Radio Delegation

On March 30, 2014 the Deutscher Amateur Radio Club (DARC) amateur radio center in Baunatal received a visit from a delegation of members from the Thai National Broadcasting and Telecommunications Commission (NBTC) and the Amateur Radio and Citizen Band Development Sub-Committee (ARCB). The visit was organized by Thida Denpruektham, HS1ASC, editor of the Thai *100 Watts* magazine, who is also a member of the ARCB. Benji Klingler, DJ5BK/HS6SSE, acted as interpreter.

DARC representatives provided information on amateur radio topics in Germany and Europe, especially with regard to emergency radio activities and youth work. In May 2012, Thailand had 246,959 radio amateurs holding the basic entry-level VHF license but only 717 Intermediate and Reciprocal HF license holders. One of the problems in obtaining a license upgrade in Thailand is the frequency with which the Intermediate license exam is offered. The last upgrade exam was held two years ago, while the previous exam was back in 2004! Thailand's Intermediate license still includes a Morse code exam.

Oops...

We misspelled a name in June's "4-Wheel it to the Field" article. The photographer for Photo A (Operating at "Pancake Rock") is Marilu Howard, KJ6ONN, not Marilou. We apologize for the error.

Thai radio amateurs are hoping to get a number of license improvements this year, including access to the Amateur Satellite Service band at 435–438 MHz as well as 146.0–146.5 MHz, and the granting of 28.0 – 29.7 MHz (10 meters) to basic entry license holders, which should significantly increase HF activity. An Advanced license class equivalent to the USA Extra and UK Advanced is also being discussed.

[Radio Amateur Society of Thailand/ Southgate]

Radio Club D'Haiti Celebrates 66th Anniversary

Le Radio Club D'Haiti (HH2RCH), still working very hard to get back on its feet after the devastating earthquake of January 12, 2010, has announced that it celebrated its 66th anniversary in March of this year. The members in photo C may look happy, but they also had some difficult moments remembering all those who passed away.

[Thanks to HH2JR]

There have been a few more changes to rules and spectrum ...

UK's Ofcom Announces Changes to 2300- and 3400-MHz Bands, Increases 2-Meter Allocation, and Cautions about Use of 60 Meters

Following a Consultation last year (which is about the equivalent to a "Notice of Proposed Rule Making" in the United States) after receiving a request by the Ministry of Defence (UK spelling) to implement measures to ensure that the MoD's systems are adequately protected from interference from amateur users, the Office of Communications (Ofcom), the UK's telecommunications regulatory agency, has announced that it plans to remove from amateur radio use the frequencies that the MoD plans to release for new civil uses. This includes 40 MHz of radio spectrum from 2350 to 2390 and 3410 to 3475 MHz. The timing of the notice gives amateurs at least 12 months' notice from the date of publication that their licenses will be varied to remove these bands. The Ministry of Defense's plans are part of a government commitment to release 500 MHz of spectrum by 2020.

Ofcom has also decided to retain amateur access to the bands 2310 to 2350, 2390 to 2400, and 3400 to 3410 MHz, but to put in place a procedure to enable it to remove these frequencies

Photo C: Members of Le Radio Club D'Haiti, HH2RCH, mark the organization's 66th anniversary. (Photo by Jean-Robert Gaillard)

quickly should harmful interference arise in the future. Ofcom said it was making 2300 to 2302 MHz available for amateur use, but licensees first must obtain a Notice of Variation to their licenses. For sake of comparison, hams in the US have secondary access to 2300 to 2310 MHz, 2390 to 2450 MHz, and 3300 to 3500 MHz.

Details of the statement are online at: <http://stakeholders.ofcom.org.uk/consultations/public-sector-spectrum-release/statement>.

Additionally, Ofcom has indicated that there may be temporary increased usage of the 5-MHz band by a primary user. Hams in the UK have been advised to take care to ensure that frequencies are not in use before calling CQ. In the UK as elsewhere, use of the 5-MHz band by ham radio is on a secondary, non-interfering basis to all other users.

In a related announcement, Ofcom has proposed the release of around 6 MHz of VHF spectrum in the 143- to 169-MHz band for amateur radio use on a non-protected and non-interference basis with any other service.

Regarding the 2-meter band, *Land Mobile* magazine reports that Ofcom has issued a summary of responses to an earlier Call for Input (CFI) published in July 2012 regarding the possible release of around 6 MHz of spectrum in the 143 to 169 MHz band, returned to civil use by the Emergency Services. The responses to the CFI identified a number of potential uses that the spectrum could be put to. Read the full article at: <http://www.landmobile.co.uk/news/ofcom-updates-on-vhf-spectrum-release> (Keep in mind that no actual release of frequencies has yet been announced!)

[Ofcom/RSGB/Southgate]

New Rules Proposed for Amateur Radio in Belgium

The Belgium Amateur Radio Society (UBA) met on February 19 with the Belgian national Telecom Regulator (BIPT) to discuss forthcoming changes for radio amateurs expected later this year. You can read the full list of proposed changes at <tinyurl.com/BelgiumUBA>. We'll be sure to let you know the outcome.

[Southgate Amateur Radio News]

Canada Updates Exam Question Pool

Based on recommendations made by Radio Amateurs of Canada (RAC), Industry Canada, the telecommunications regulatory agency in that country, a new set of amateur radio exam questions has been released and launched via a new exam generator on its web site to help hams practice for their Basic and Advanced level amateur examinations. Radio Amateur du Québec (RAQI) was engaged to collaborate on the French language component of the contract.

The curriculum has not been changed and the topics addressed in the exams remain the same. The changed questions are clearer, more accurate, more understandable, and more relevant to modern amateur radio.

On March 13, 2013, RAC completed its work and delivered the recommendations to Industry Canada. The team is now in the process of preparing information identifying where changes have been made to assist instructors in modifying their course materials and alerting examiners to prepare for the change.

The new exam generator can be accessed at: <http://www.ic.gc.ca/eic/site/025.nsf/eng/h_00040.html>

[Radio Amateurs of Canada]

Hams are always busy in emergency communications and public service. Here is one of the more significant EmComm stories this month:

Ham Radio Responds To Chile Earthquake

The Radio Club de Chile was activated after a major 8.2-magnitude earthquake struck off the coast of northern Chile on April 1st, causing at least five deaths and triggering a tsunami that pounded Chile's shore with 2-meter-tall waves.

The Radio Club de Chile is working in collaboration with ONEMI, Chile's National Emergency Office of the Ministry of Interior and Public Security. The latest information available at press time showed several HF nets operating to offer emergency assistance as well as provide for health and welfare needs.

The Chilean government evacuated that nation's northern coast and President Michelle Bachelet declared the area a disaster zone.

[IARU Region 3 and other sources]

From the sporting and contesting side of amateur radio, we have the following:

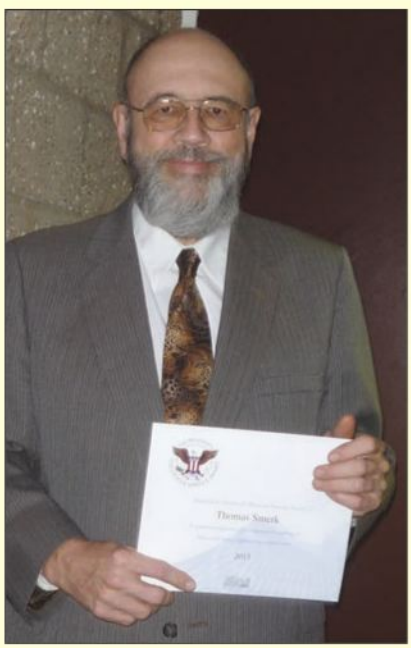
Canadian Hams Attempt 2-Meter Trans-Atlantic Contact

A group of Canadian hams will be attempting to claim the "Brendan Trophy" from July 4th to the 12th by completing a 2-meter transatlantic QSO. Operating from Pouch Cove, Newfoundland, grid square GN37, and transmitting on 144.270 MHz with about 750 watts into a 30-meter long rope Yagi with a gain of more than 23 dB over a dipole, the group will be using the digital mode JT65B, which offers greatly enhanced performance over more conventional analog operation. They will also have the capability to operate CW and SSB if conditions warrant.

A special callsign has been requested. In the event one is not issued, the group

AA6TS Honored with Presidential Service Award

CQ International Editor Tom Smerk, AA6TS, was honored this spring with the President's Volunteer Service Award in recognition of his many hours of voluntary service to his community and the nation. The award is issued annually by the President's Council on Service and Civic Participation, which was created in 2003 by then-President George W. Bush. To qualify, one must volunteer a certain number of hours in a calendar year or throughout one's lifetime.



According to Tom, "I began volunteering on a regular basis in the early to mid 1980s, working mainly with REACT and the American Red Cross. At the time, I was working part-time. I thought that I would not have much time for volunteering when I started working full-time, but instead, I find myself more active than ever. This year and last, I have worked for six different agencies: ARES, RACES, Skywarn, California Disaster Corps, CERT, and the Mountain Empire Amateur Radio Club."

Tom was presented with his award on May 9 during an awards program held in conjunction with the centennial of continuing education programs in the San Diego, California, Community College District, where he teaches.

For more information on the President's Volunteer Service Award, visit <http://www.presidentialserviceawards.gov>. Congratulations, Tom!

(Photo courtesy AA6TS)

On the Cover

It's like Field Day in July … except that the tents and tribanders scattered around the New England countryside on the weekend of July 14–15 will be occupied and operated by some of the world's top contesters, competing in the 2014 World Radiosport Team Championship (WRTC2014). But they need *you* to take part as well.

Fifty-nine teams from 38 countries will be competing from identical operating sites—just like the one in Massachusetts seen on our cover—in this "Olympiad" of radiosport. The two-person teams were selected on the basis of 55 qualifying events over a 3-year period. Differences in stations and geography have been minimized in an effort to make WRTC a true test of operator skill.

The World Radiosport Team Championship is held every four years. Previous competitions have been held in Seattle (1990), San Francisco (1996), Slovenia (2000), Finland (2002), Brazil (2006), and Russia (2010).

The WRTC2014 competition is held in conjunction with the IARU HF Championship July 14–15. Teams will be using distinctive 1x1 callsigns and everyone is encouraged to work the teams on 80–10 meters, SSB and CW. Prizes are available for working all teams and the most band modes. More information is available at <www.wrtc2014.org>.

For more on the competition and some of the competitors, see OH2BH's article "Those Flying Finns Gearing Up for WRTC 2014" and N2GA's "Contesting" column in this issue (pages 12 and 103, respectively). *(Cover photo by Randy Thompson, K5ZD, courtesy WRTC2014)*

will use VO1NO. Real-time information on operating modes and schedules will be posted during the expedition on the team's website, the ON4KST website site, and the G4CQM Shoutbox. Facebook users are also welcome to join the group's page at Brendan Quest 2 meter Trans-Atlantic Attempt 2014.

The Brendan Trophy is offered by the Irish Radio Transmitters Society to the first amateur radio operators to complete a 2-meter transatlantic QSO. For more information, please visit <www.brendanquest.org>.

[Radio Society of Great Britain (RSGB) Blog]

EUCW Introduces New Morse Code On-The-Air Game

Are you looking for a fun way to get into Morse code (or to get back to it)? The European CW Association, EUCW, has introduced an opportunity to earn a certificate by participating in a new on-the-air Morse-based game called Snakes and Ladders. The game is designed to promote increased activity on all amateur bands by encouraging friendly contacts.

Similar to the board game with the same name, also known as Chutes & Ladders, the board squares are replaced by the 100 grid locator squares of the continent of Europe. The rules are based on the board game and can be read in a variety of language translations at <www.eucw.org>.

The concept is not so much as a contest, but rather a way of making the hobby more fun.

[EUCW]

Here's another "first" for ham radio:

Lithuania's President Relays Greetings via Amateur Radio CubeSat

Last year, Lithuanian President Dalia Grybauskaite visited the Science Communication and Information Center at Vilnius University and got to see her country's first amateur radio satellite, LituanicaSAT-1 CubeSat, being readied for its January 9 trip into space. LituanicaSAT-1 was deployed into orbit with other amateur radio satellites from the International Space Station on February 28.

Then in March, President Grybauskaite, using the callsign LY5N, transmitted using a handheld radio "Greetings to all Lithuanians around the world!" Her greeting was recorded on a memory chip in the satellite and the message was successfully transmitted from space.

Grybauskaite may be the first head of state to send a message via an amateur radio satellite, and the first president of a nation to send a greeting from space since U.S. President Eisenhower in 1958.

The $10 \times 10 \times 10$ cm CubeSat, weighing slightly more than 1 kilogram, carries a payload of an FM Morse Code Beacon on 437.275 MHz (LY5N), an FM Voice Repeater with a 145.950-MHz uplink (PL 67 Hz CTCSS) and 435.180-MHz downlink, and an AX.25 Packet Radio on the 145.850-MHz uplink and 437.550-MHz downlink 9600-baud FSK, FM.

[ARRL Letter]

And finally, South Africa mourns the passing of one of its most dedicated hams:

South African Radio Pioneer Dave Larsen ZS6DN, S.K.

Amateur Radio Newsline reports that South Africa has lost one of its best known and most dedicated radio amateurs, Dave Larsen, ZS6DN. Dave's many accomplishments include working with his team to evolve an HF frequency-hopping system along with the installation of a five-band HF beacon as part of an international amateur radio propagation research program.

Dave Larsen was heavily involved in the development of single-sideband communications. For more information about Dave and his work on the Salbu Experimental Station and HF frequency hopping, please visit <http:// www.tinyurl.com/zs6dn>.

[Amateur Radio Newsline]

In Conclusion

Before I wrap up for this month, I again make a plea for more photos. I want this column to include new photos that have not been previously used in print or online magazine stories. *Your* photos! I'm counting on you, our readers, to send me news stories *before* they are picked up by other ham radio news sources so that this column will become a trusted source for international news. E-mail them to <aa6ts@cq-amateur-radio.com>.

I would also be happy to hear your comments, questions, suggestions, and stories about your enjoyment of ham radio. My goal is to make new friends in every country that enjoys amateur radio activity so that we can share your news with the rest of the world through *CQ Amateur Radio* magazine and *CQ Plus*. 73 de AA6TS

Some Post–Field-Day QRP Projects

BY CAM HARTFORD,* N6GA

As this issue of *CQ* lands in your mailbox or on your computer, Field Day 2014 will have just passed into the history books. Many of us will have just spent an enjoyable but tiring weekend operating our favorite QRP rigs in the company of our QRP buddies. I find that it takes a few days, sometimes a few weeks, to want to get back to pounding the brass or yelling into the mic. It's a good time, then, to fire up the soldering iron and engage in an entirely different but equally enjoyable aspect of the QRP hobby—building!

For your consideration this month, we have a new take on an old idea in tuner design and a new idea in portable antennas to try out. Also, our intrepid trooper from Illinois takes on SOTA (Summits On The Air) activities and hamfesting all in one week. Bravery in the mountains of Missouri!

The Kon-Tiki Tuner

Back in February 2013, we published an account of a small transceiver designed by Gary Davis, KD9SB, which was inspired by the voyage of the *Kon-Tiki.* Gary enjoyed operating this small rig from aboard his sailboat. Recently I heard again from Gary. This time he sent along the design of a compact antenna tuner he built for use with his HB transceiver. Here's Gary's account:

Since your story of my Kon-Tiki inspired QRP transmitter, I have been experimenting with a simplified QRP 20-meter antenna tuner. I decided to use a miniature lamp as an antenna current indicator, as was used on the original 1947 Kon-Tiki transmitter. I also was able to use the same miniature .56 microhenry inductors that I used in the transmitter article by putting two inductors in series. The tuner circuit is the standard T-type antenna tuner with a #44 lamp in series with the antenna. The tuner is adjusted for maximum brilliance, indicating maximum antenna current. Then to operate, the switch is closed, shorting the lamp and providing full power to the antenna.

I used the 20-meter version on my sailboat last summer while running 1.3W output. Tests indicated that it will work well with a 20-meter Zepp, inverted-Vee, or a Hustler mobile whip antenna.

Photo A is a picture of the tuner. The use of an incandescent lamp takes me back quite a few years to when a couple of lamps were somehow configured in a device that was clamped to twin-lead and served as an SWR indicator—low tech, but very effective. Fig. 1 is the schematic of Gary's tuner; fig. 2 is the parts list.

Gary continues, "Yes I have tested the bulb method to make sure that it tracks with the SWR meter. It tracks very closely, but slightly different. I also observed that throwing the switch from tune to operate does not affect the SWR reading enough to make a difference. By using a #44 1.575W bulb with the 1.3W transmitter, the bulb does not light to full brilliance. Therefore, it is a little easier to judge the exact point of maximum current by the brilliance of the lamp."

Gary also mentioned the importance of using a balun. "I use either a commercial 1:1 current balun or a coax-coil, common-mode choke balun (11 ft. of coiled 50-ohm coax, 6 turns, 7 inches in diameter, close to the antenna feed point or at the bottom end of the ladder line when using a Zepp). I use a commercial 1:1 current balun on my inverted-Vee at home, and a coax balun on the boat's Zepp and the car's Hustler whip with a mag-mount."

Doubling Your Radio Fun

Some of us enjoy attending hamfests and others of us enjoy operating our radios from mountaintops. Yet others find a way to double their radio fun by combining both activities in a single long weekend. One such person is my Illinois correspondent, Woody Hester, WD9F, who managed to add some SOTA activations to a visit to Ozarkcon this past April. Woody filed this report:

"As I was making my plans for the (Ozarkcon) trip, good friend John Watkins, NØEVH, encouraged me to come early and do some SOTA summits with him..." For those of you yet unfamiliar with the SOTA program I suggest visiting the Summits On The Air website at <www.sota.org.uk>. The program originated in the UK and now there are actively participating associations across the entire world, including in almost every state in the USA. Woody continues…

I took John up on his offer and he was kind enough to identify and plan navigation routes to three summits near

Photo A. KD9SB's 20-meter tuner. For ease of construction, Gary used the molded .56 microhenry inductors shown with the tuner.

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

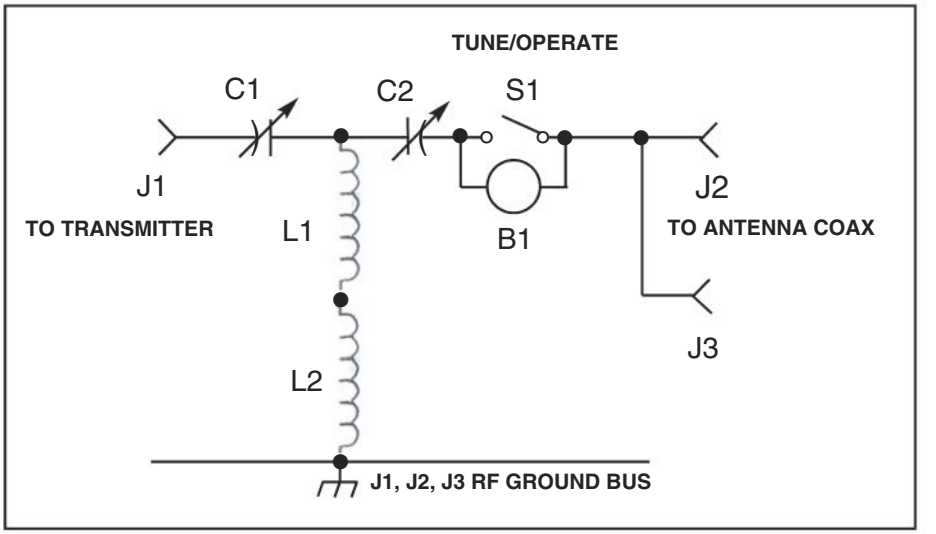

Fig. 1. Gary KD9SB's tuner schematic.

Parts List KD9SB 20-Meter QRP Antenna Tuner

C1, C2	10.0 to 324 pF variable capacitor
L1, L2	.56-µH miniature inductor (DC current rating 0.70A) Mouser #434-22-R56
B1	#44 miniature incandescent lamp 6.3V .250A, 1.575W (antenna current indicator)
S1	Tune/Operate toggle switch
J1, J3	UHF BNC antenna connector
J2	SO-239 antenna connector

Misc. Parts
Plastic box
Rubber grommet to fit #44 lamp
2 plastic capacitor tuning knobs
Hookup wire
Coax coil common mode choke (11 ft. of 50-ohm coax coil, 6 turns, 7 inches in diameter) located close to the antenna feedpoint, or at the bottom end of the ladder line when using a Zepp. A 1:1 current balun may also be used on the inverted-Vee as an apex support element. (The apex angle of the Vee should not be less than 90 degrees).
Note: The above values were tested at 1.3W output using a Zepp, an inverted-Vee, and a Hustler vehicle whip antenna with magmount. The tests were conducted in the CW portion of the 20m band. The Zepp and inverted-Vee were also tested as temporary antennas aboard several sailboats with metal mast and shrouds.

Fig. 2. Gary, KD9SB's 20-meter tuner parts list.

Branson, Missouri. We planned to do two on the first day, then one the following morning, still arriving at Ozarkcon in time for the opening program and dinner.

I arrived at John's camper on Table Rock Lake bright and early the morning of April 3rd and we headed out to the first of two summits we planned to activate that day. The weather was iffy with storms in the area but forecast not to worsen until late afternoon... Just as we reached the summit, the full fury of a spring thunderstorm in the Ozarks broke right over our heads. We sought what little shelter we could and, for about 20 minutes, endured sideways rain, pea-size hail, and high winds. Finally, the storm moved off and we broke out our gear. John had brought along his KX3 and used an end-fed wire thrown up in a tree with a counterpoise and the rig's internal tuner. He operated on several bands. My rig of choice for the trip was my AT Sprint II. I stuck to 20 meters and used an EndFedz 20M oriented as a half-wave vertical supported with a push-up mast that I bungee-corded to a sturdy sapling.

Because we had posted alerts about our activation on the SOTA website, stations began calling us as soon as we tuned up on the bands. I was not mentally prepared for the pileup that ensued and it took me a few minutes to find my feet in the roar of stations calling. By using my RIT to listen to the edge of the pack, I was able to pick out individual calls and began logging contacts. During an hour or so of operation, I managed to log 24 contacts. We also had our 2-meter handhelds along and received a call on simplex from Martha Auchard (WØERI), who was on another summit about three miles away known as WØM/ES-003 (Pilot Knob). Martha

and her husband Gary, WØMNA, were activating that summit with their HF rig, and by making contact with them on 2 meters we each received credit for a summit-to-summit contact (S2S). Martha and Gary were in the area to attend Ozarkcon, too.

Finally, I hauled my wet and stiff body back into a standing position and we packed up and began our trek back to the car. When we finally reached the car, we were wet, tired, and behind schedule to make the second summit of the day. At that point, we made the decision to call it a day and join Martha and Gary for lunch at a country eatery they had found.

Sitting in a dry country café with a cheeseburger, fries, and great company was a delight. Martha, Gary, and John all are veteran summit activators and they had lots of wonderful stories to tell. During our lunch, we discussed plans for the following day and it was agreed that Martha and Gary would activate our planned second-day summit in Northern Arkansas with us. They would operate SSB while we operated CW.

After a restful night back at my hotel, I picked up John at his campsite early the next morning and we headed out to the next summit, Kennedy Mountain (photo B). Once again, John's expert land navigation skills got us to the trailhead easily and we were able to park the car fairly close to the summit, leaving just enough "people power" hiking to meet the requirements of the SOTA rulebook. Compared to the day before, the weather was glorious. It only took us a few minutes of hiking to reach the summit and setup was quick.

We were the first ones there, with Martha, Gary, and other activators from Ozarkcon a few minutes behind us. Once again we had posted alerts on the SOTA website and even as I was tuning up, stations began calling me on 20 meters. I was prepared for the pile-up this time and was able to do a better job of managing it. I logged 34 contacts and would have logged more if we had not spent so much time visiting with Gary, Martha, and others in the crowd of Ozarkcon/SOTA activators, supervisors, and hecklers that showed up on the mountain. We had a wonderful time and made a lot of CW and SSB SOTA contacts. A highlight of the day was watching Peter Horne, G3JRH, from Winchester, England, run a pile-up from the summit. Peter's accent quickly captured the attention of all the chasers. The effort was truly international! (See photo C.)

Once again, we wrapped up our SOTA activities for the day with a group lunch at a great Mexican restaurant that we found on the way back to Branson. It was Peter's first taste of Mexican food in the U.S., so Martha was kind enough to help him with the menu. We arrived at Ozarkcon in plenty of time to clean up, register, take part in the afternoon camaraderie, and attend the opening banquet.

For me, Ozarkcon 2014 was the best ever. The conference itself was just wonderful. I learned new things, made new friends, visited with old friends, and the SOTA activities were the icing on the cake.

I was really pleased with the performance of my SOTA gear. The AT Sprint II cranks out a steady 4+ watts at 12V and 8 AA batteries carried me through both activations just fine. My half-wave End Fedz, oriented as a vertical with my push-up mast, at 2,000 feet above sea level, resulted in great signal reports from both coasts, and for a new SOTA guy I was pleased with the number of contacts I made.

With a little food, plenty of water, and some extra stuff for safety, my total pack weight was only 14 pounds. I learned a lot and I'm looking forward to activating some of the nine summits located in my home state of Illinois later this summer.

My thanks to John Watkins, NØEVH, for inviting me to join him on his SOTA expeditions. You can bet I'll be doing Ozarkcon again next year as well as some summits along the way.—*WD9F*

The LDL (Low Delta Loop)

Here's a new portable antenna idea from John, NØEVH (photo D). In an e-mail, John said, "I am wondering if you have ever heard of anyone running a delta on the ground and feeding in this fashion? Base down and fed along one side about one-quarter the way up from one lower corner."

I'd seen this alternate way of feeding a delta loop, but never one as close to the ground as this. The typical feed method is in the center of the bottom, which results in horizontal polarization.

As such, the higher the better for a decent low angle of radiation. However, if you feed the loop one quarter or one third of the way up one side, the antenna becomes vertically polarized. Apparently, it will work just fine close to the ground with this side feed method.

John continues, "I sent you the EZNEC file (fig. 3) so you could take a look. It is designed for 20, but I have made 300-mile contacts on 40 with it. Used it in the field now several times, both at altitude on summits and down in deep valleys. The antenna is easy to put up, one support, and it is omnidirectional just like a vertical. Depending on the location, I either lay the bottom on the ground or attach it to small bushes or plastic stakes near the ground. I feed it with a short

Photo B. WD9F operating on Kennedy Mountain. Old Stars and Stripes is good for a couple extra dB! (NØEVH photo)

Photo C. Peter, G3JRH, works the pileup while Martha, WØERI, logs. (WD9F photo)

Photo D. NØEVH enjoying some liquid SOTA sunshine. (WD9F photo)

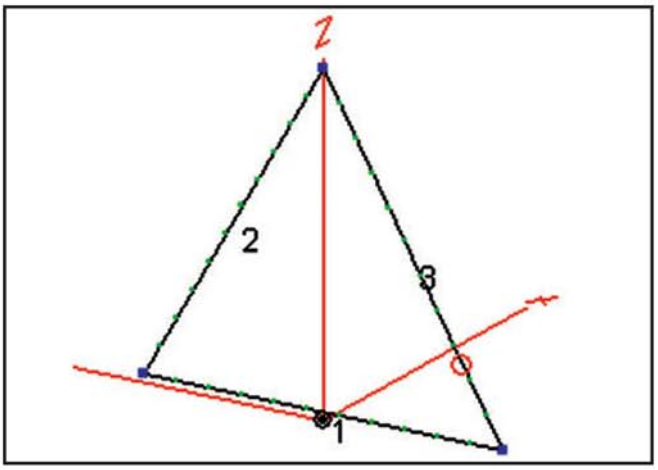

Fig. 3. An EZNEC rendering of NØEVH's Low Delta Loop.

Photo E. A quickie feedpoint attachment point for twin lead.

length of 300-ohm ladder line to a 4:1 balun to my KX3."

The first thing I noticed about the EZNEC file John sent along was that the loop was mounted with the bottom wire about 6 inches off the ground. I asked John how he came up with that measurement and he said, "Well, funny question, 1/2 foot . . . that is how long the plastic stakes are! ... When I was on a timbered peak, I used bushes for that time rather than stakes. I have used it in the field now about five times in very different situations from rocky peaks to down in valleys near trout streams."

I fired up my copy of EZNEC and ran the model to see what it would do. Surprisingly, it's almost omni-directional with just a couple of dB gain broadside to the loop. It has a good low angle of radiation and at resonance, the feedpoint impedance is close to 200 ohms. A short run of 300-ohm twinlead and a 4:1 balun should be a very low-loss feed method. For comparison purposes, I ran a model of an end-fed halfwave and the results were very similar. One possible advantage I can see for this antenna is that the apex of the loop only needs to be up about 22 feet, so hanging it from a low-hanging tree branch or a 24-foot crappie pole shouldn't present much of a problem.

Modeling certainly has its uses, but there comes a time when it's necessary to determine what actually happens when the rubber meets the road, so to speak. I built a copy of this loop to give it a try. It went together easily, just 23.2 feet on a side and some compression clips for the corners. For a quick and easy feedpoint, I bolted a bulkhead-mount set of binding posts to a small piece of plexiglass, as in photo E. I wanted something that would allow me to change feedlines quickly for testing purposes, which this setup will do. It probably isn't suitable for long-term use, because there's no strain relief for the twin-lead, but for quick-up portable ops, it will do just fine. I tossed a line over a tree branch to raise the peak of the loop and used a couple of buckets filled with antenna-raising gear to hold out the corners. For the first setup, I used an electrical half-wave of 300-ohm line so I could measure the actual impedance at the feedpoint. In the case of 20 meters, that length worked out to about 28 feet. As predicted, the feedpoint impedance was almost exactly 200 ohms. Attaching a 4:1 balun at that point resulted in an SWR of 1.12:1, low enough for any rig to tolerate without use of an ATU.

For some portable installations, a 28-foot feedline might be a bit long, especially since it's twin lead and probably shouldn't be coiled up lying on the ground. So next I tried a 10-foot section of 300-ohm line, a more practical length for a quick portable setup (photo E). Since the shorter piece of line would transform the feed-point impedance into some unknown quantity, I was interested in seeing what that transformation would be, and how difficult a match it would be for the ATU of choice. Well, no worries. The resulting impedance was 250 –j56 ohms, which the 4:1 balun transformed to about 90 ohms, an amount easily handled by any ATU.

Interestingly, I tried tuning up this antenna on other bands and found that it would play on all bands from 20 through 10 meters.

The next test was to set up both the LDL and a 20-meter vertical EFHW. The two antennas performed almost identically in a series of A/B tests, with neither having a clear advantage.

John finished his note with these thoughts: "So far I have made over a 100 QRP to QRP contacts with this setup. Since it is a loop of wire, I leave it assembled and it just unrolls and you hang it or use a crappie pole to support for the tip." I have to agree. It is easy to erect and can be used on several bands with a tuner. Thanks for the good idea, John!

Sign Off

As always, I extend my thanks to KD9SB, NØEVH, and WD9F for their contributions to this month's column. If you have something you think might be of interest to the QRP community, please don't hesitate to send it in.

72/73, Cam N6GA

kit-building

BY JOE EISENBERG,* KØNEB

"Parts is Parts" . . . and Lots of Hints

When building kits, I have found that having standard parts assortments handy can make the difference between success and failure. During a kit-building session, I sometimes have been frustrated by a missing part that is quite common, such as a 100K resistor. You can write or call the kit supplier and have it send the missing resistor, but having them on hand makes it a lot faster and easier, as it could take many days to get one sent in the mail, or have to run to a local electronics parts store if one is handy.

Another reason I keep extra parts on hand is because often there are modifications or updates made to kits by their designers or the builders to improve their performance. Often it takes the form of a part or two added or removed or changed. Having a number of standard parts on hand makes it easy to make these changes yourself or to try some of your own changes if you feel comfortable changing the circuit design. Resistors are by far the most common part changed in kits, followed by capacitors. Diodes, transistors, and other parts are less often changed in modifications.

Be aware that some modifications can require parts to be soldered under a circuit board to make space for them. When soldering parts to the bottom of a board, be sure that you have left plenty of room in the case below the board by using standoffs of sufficient size and be extra careful not to short any connections that are not meant to be changed. Soldering a part under a board usually means trimming the leads first and heating up the connection, adding only a little solder if needed to add the part. Excess lead length on parts added under a board can be a source of unintentional shorts, so be sure to have insulating material, such as heat-shrink tubing, just in case the part is in a tight spot.

When searching for parts at a flea market or hamfest, you often can find sellers of large quantities of one or more values of parts. Sometimes you can find yourself buying a bag of a few of that part for the price of one or two of them in a store. Simply find a parts bin for the remainder, be sure to label it, and you are on your way to making a collection of standard parts. I try to sort them in order of value, so as you move from left to right, the values of the parts increase. I also often combine relatively close values of resistors into one bin, as they are easy to pick out by color code without having to find a separate container for each value.

I have found quite a few suppliers of standard parts assortments that can really come in handy for kit building. Try Digikey at <http://www.digikey.com>, Newark at <http://www.newark.com>, and Jameco at <http://www.jameco.com>. These suppliers have assortments of resistors, capacitors, diodes, transistors, and other components. For LEDs, try <http://www.andromace.com>. The company sells a wide variety of sizes and colors ranging from red, blue, green, and white to ultraviolet.

The "grab bag" type of assortment also often contains switches and other components that are just as needed when building projects. Be sure to have bin spaces set aside for switches and plugs and jacks. Sometimes these bargain parts are there for a reason, such having unusually long leads. A quick snip with your cutters makes them a lot more usable without having to buy more expensive parts with the lead lengths you desired.

Finally, hardware is a constant need as well. Keep your eye out when going to major hamfests for assortments of hardware such as 4-40 screws and associated nuts, washers, lockwashers, and standoffs. Have threaded standoffs as well as insulated standoffs handy when mounting your kits into your own cases. As with the other parts, the more you can sort them, the faster you will be able to access them when building your kits into cases. Of course, the best kits come with the cases and the hardware needed, saving you time and effort, but at a higher cost.

Parts bins come in a wide variety, ranging from open bins to cabinets with small slide-out drawers. The main thing is to be sure you have adequate space for your parts collection as well as enough bins to accommodate all of the different values needed. A local hardware store or Harbor Freight

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

Resistor bins with labels for the values in each bin.

is a great source for these. A great one for keeping your parts handy is Harbor Freight's 40-bin Organizer #94375. It sells for under $20 and includes an extra-large bottom drawer, a perfect place for your hardware. Find it at <http://www.harborfreight.com>, as well as many other small-parts containers. As with all kinds of organizers, be sure it is not able to be tipped over and spilled easily. Finding a way to secure the bins to your bench will prevent disasters. Transparent bins make for easier parts identification, as well.

Unlabeled bins with easily identifiable parts inside.

A label maker, such as the Brother p-Touch series, is useful for making your parts-bin labels as well as marking your kit cases. You can also use a word processor to make paper labels to tape to the inside or outside of a bin to identify the parts clearly.

Cases have been a big reason why many people shy away from kits, with all of the drilling, etc., needed to make it useful. There are a lot of kits now available that have their own cases, making that part of the building experience much easier. Some kits are designed to fit in a standard-size Altoids® tin, so be sure to keep a few of those handy.

I have found old computer switch boxes to be perfect cases for kits, as well. These boxes were more popular years ago, with functions such as serial- or parallel-port switching for computer printers. With most printers now being connected to a network, the majority of these simple switches have been discarded or put aside and can easily be used for a kit case. Most already have connectors on the back that can be removed with ease, along with the big rotary switch that is often the centerpiece of these switches. Save

what's new

Wouxun Bolsters Line of Dual-Band Handhelds

Wouxun's latest entry into the dual-band handheld market is the KG-UV8D, a 2-meter/70-cm handheld with a bright LCD screen and a compact, lightweight design that replaces the KG-UV6D.

Operating within the 136- to 174-MHz and 400- to 480-MHz bands, this little guy can transmit up to 5 watts on VHF and 4 watts on UHF, and can receive on one band while simultaneously transmitting on another (or it can listen on two bands at once). In addition, it can work dual repeaters from VHF to UHF or vice versa.

While working repeaters, the 'UV8D can offset the frequency and has programmable direction while sending out a single-tone pulse frequency of 2100/1750/1000/1450 Hz for signaling and activating repeaters (*This is a feature used mostly in Europe - ed.*).

On the receiving end, the 'UV8D will work the 2-meter/70-cm bands as well as pick up FM from 76 to 108 MHz. And a Priority Scan function enables users to quickly scan the bands for signals that hams want to hear. If you would like to search for signals manually, the wide/narrow bandwidth selection is 25 kHz/12.5 kHz. With almost 1,000 memory channels, your favorite frequency will always be available at the touch of a button.

The large colorful screen has enough real estate to display the dual-frequency operation and all other operations of the radio. If you need additional assistance, voice prompts in English and Chinese can guide you to that menu option that is just outside your grasp.

Additional features of the 'UV8D include multi-function side keys, incoming message display, DTMF encoding/decoding, SOS function, remote alarm, flashlight illumination, and a stopwatch.

Wouxun prices the KG-UV8D at $159.99. For more information visit: <http://www.wouxun.com> or see your local ham radio dealer.

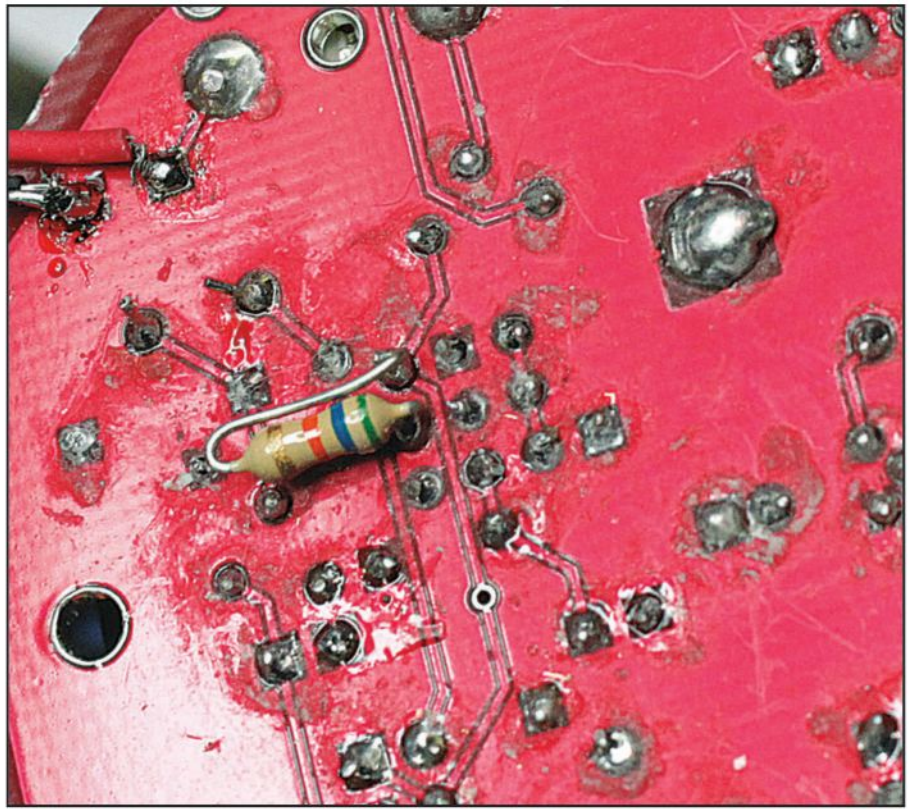
Note: *"What's New" is not a product review and does not constitute a product endorsement by CQ. Information is primarily provided by manufacturers/vendors and has not necessarily been independently verified.*

4-40 threaded and non-threaded standoffs are a must to keep on hand when mounting kits in cases. Most kits are designed with holes that match 4-40 hardware. →

the main knob, as it often will fit common potentiometers or tuning capacitors that can be mounted in that same middle hole! The back panel holes left over from the computer connectors are often more rectangular in shape and can have their extra space covered with a small piece of thin sheet metal to accommodate jacks on the back panel. In addition, the wiring you remove from inside the box is a bonus for making your interconnections when mounting your kit. Most have bundles of individual wires, ready to be trimmed from the connectors and the switch.

I appreciate all of my readers and look forward to writing many more columns. Next month, I will bring you the latest kits and tools previewed at the Dayton Hamvention® in May. Also, look for me in July at the ARRL Centennial National Convention in Hartford, Connecticut and in August at the Huntsville Hamfest in Alabama!

Until next time . . . 73 de KØNEB



Resistor mounted under a circuit board as a modification to the kit. In this case, the added resistor makes improvements to the oscillation stability.

BY TONY EMANUELE, WA8RJF

The Magic Band(s)

If history is any guide, by the time this issue reaches your doorstep or inbox, the sporadic-*E* season should be well under way. For most of us in the mid-latitudes—the area between magnetic latitudes of 20 and 60 degrees—almost daily single-hop and, to a lesser extent, double-hop events will be the norm on 50 MHz by late June and early July. In most of the literature, the *E*-layer is defined as a region approximately 90 to 130 kilometers (55 to 80 miles) above the Earth's surface capable of supporting communications between 800 and 2,200 kilometers (500 to 1300 miles.) The actual ionization mechanism at play in the *E*-layer is complex, and though much has been learned recently, it is not fully understood. However, the end result is a 50-MHz band loaded with signals many days during the early summer.

Most VHF and above enthusiasts are interested in achieving the best possible DX on a given band. Though not as common and far from routine, most sporadic-*E* seasons include a few openings involving three or four hops, making possible QSOs over distances approaching 8,000 kilometers (5,000 miles). As an example, during those types of openings, 50-MHz stations located on the U.S. east coast or in the Midwest can work stations in western Europe.

VHF Plus Calendar

CQ WW VHF Contest: July 19-20
CSVHF Conference Austin, TX: July 24–27
ARRL UHF Contest: August 2–3
Persieds Meteor Shower: August 10–13
ARRL 10 GHz and Above Cumulative: August 16–17
16th EME Conference, Pleumeur-Bodou, France: August 25–26
Microwave Update , Rochester, NY: October 24–25

Extreme Multi-Hop *Es*

For over a decade there have been reports of non-*F2* 50-MHz QSOs at distances of 6,600 km to greater than 13,000 km (4,000 to 8,000 miles). Called *extreme multi-hop 50 MHz Es* by Jim Kennedy, KH6/K6MIO[1], and *Short Path Summer Solstice Propagation,* or *SSSP,* by Han Higasha, JE1BMJ[2], there is an ongoing effort to fully understand and characterize this tantalizing phenomenon. As noted by Kennedy, the propagation seems to occur exclusively during summer in the local hemisphere, suggesting that some form of sporadic-*E* is at work.

The evidence to date seems to suggest that the savvy North American 50-MHz operator would be wise to start looking toward Europe at about 0800 Local Solar Time (LST), the morning sporadic-*E* peak period, and toward Japan at approximately 1600 LST (approximately 0800 LST Japan) during the afternoon sporadic-*E* peak period. It remains to be seen what this summer's sporadic-*E* season will bring in the way of DX, but as always, be prepared. I look forward to receiving 50-MHz extreme multi-hop propagation reports as the season progresses.

144-MHz Sporadic-*E*

Though sporadic-*E* on 50 MHz has been observed almost anytime during the summer season, my experience has been that sporadic-*E* on 144 MHz is most likely to occur from late June into early July.[3] During those few weeks, sporadic-*E* openings on 50 MHz seem to be the most intense. Signal strengths can be very strong, evidence of high ionization, and the duration of openings can be prolonged. As the ionization of the *E*-layer increases, the MUF (maximum usable frequency) increases as well, and the skip distance on 50 MHz will *decrease,* approaching 800 km or less during periods of high ionization. Not to be confused with *backscatter*, which is generally weak, the signal strength of those close-in stations can be quite strong. When both of these conditions exist, I turn my attention to 144 MHz and more often than not have been rewarded with sporadic-*E* QSOs on 2 meters.

For many years, dedicated 144-MHz operators monitored the top of the FM broadcast band—106 to 107.5 MHz—for signs of increasing MUF, and many still do. Today, though, there are many other tools available, such as *DX Maps* at <http://www.dxmaps.com>, permitting one to evaluate the extent of a band opening, determine path midpoint, and thus the general location of the sporadic-*E* "cloud." Additionally, the estimated MUF is noted (all important aids in knowing when to move to 144 MHz). In any event, be prepared to move up in frequency. The duration of a 144-MHz sporadic-*E* opening may be only minutes, so it is important to pass the necessary minimum information required for a valid QSO immediately. Don't forget to move off the calling frequency, as 144.200 can be busy, making completion of a QSO problematic.

222-MHz Sporadic-*E*

It has been estimated that 144-MHz sporadic-*E* events occur one-tenth or less as often as openings on 50 MHz, implying that sporadic-*E* openings on 222 MHz are extremely rare. In recent years, the number of occurrences on 222 MHz seems to have increased and the reported increase is likely the result of a general awareness of the local conditions in almost real time, using the monitoring tools such as DX Maps and others available via the Internet. My personal experience, albeit anecdotal, is that the typical 144-MHz sporadic-*E* opening is fleeting, lasting a few minutes to tens of minutes, but on those occasions when an opening has persisted for a longer period of time and when

c/o CQ magazine
e-mail: <wa8rjf@cq-amateur-radio.com>

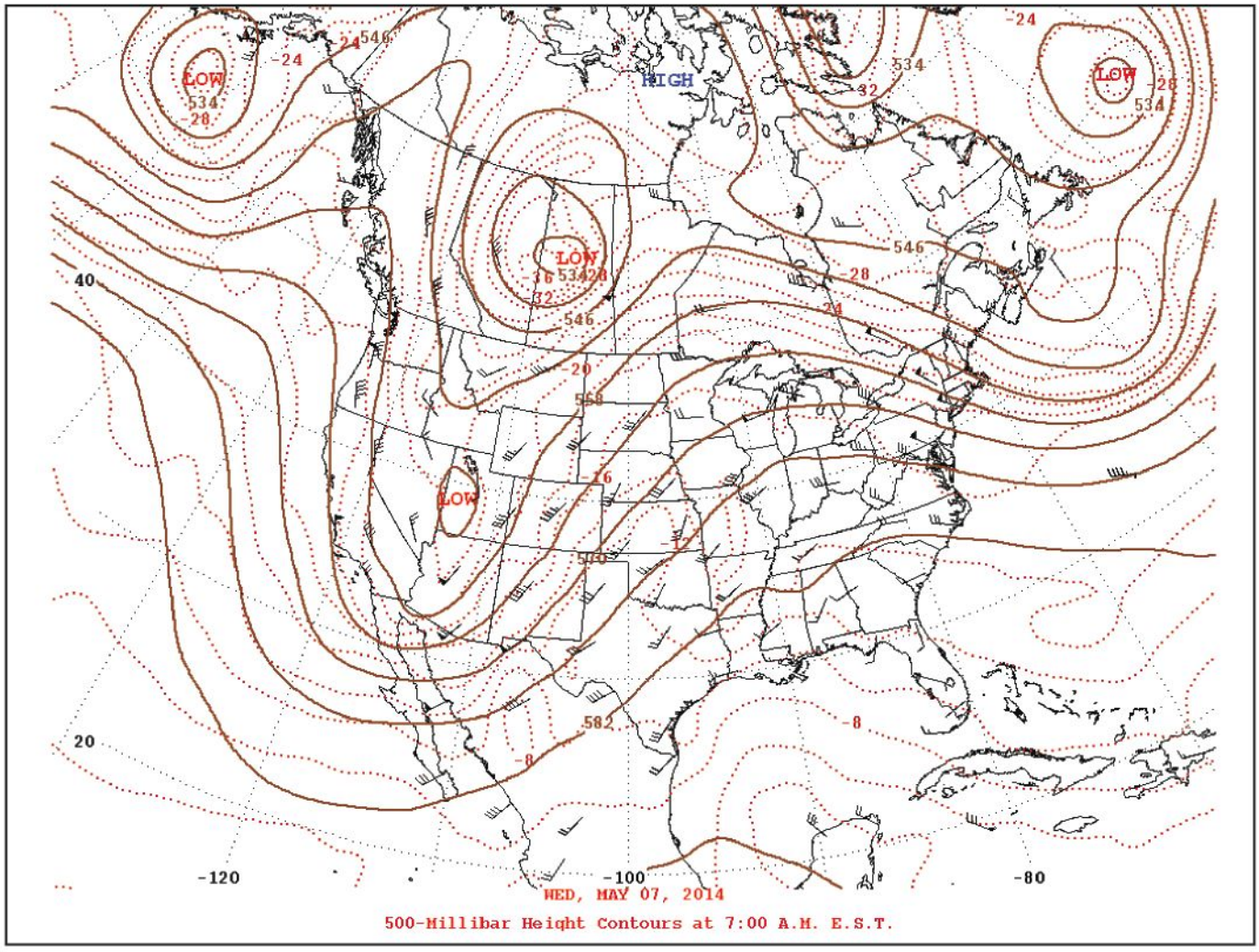


Fig. 1. The National Weather Service 500-millibar chart for 7 AM eastern time on May 7, 2014. The pattern of the isobars, or equal lines of atmospheric pressure, at an altitude of approximately 5000 meters or 18,000 feet, indicates weather activity, troughs, and ridges in the upper atmosphere – the counterpart to surface high- and low-pressure systems. (Source: U.S. Department of Commerce <http://www.hpc.ncep.noaa.gov/dailywxmap/index_20140507.html>)

signal levels are quite strong, it is time to make some noise on 222 MHz.

SEVHF Conference

The annual Southeastern VHF Society Conference was held in Norcross, Georgia on April 25th and 26th. It began Friday morning with the antenna range, noise-figure measurements and RF measurement clinic, in conjunction with the vendor display area. This was a great way to start the conference and provided plenty of entertainment for all those in attendance. The morning session was followed by an in-house luncheon with guest speaker Ray Rector, WA4NJP.

The conference presentations began on Friday afternoon with a K4N DXpedition summary, which was followed by variety of presentation on topics including beacons and antenna alignment and concluded with Charles Osborne, K4CSO's "Antenna Ranges from Backyard to Professional." After dinner, the indoor flea market was conducted with the usual movement of radio treasures from one owner to the next. The evening ended (late) in the hospitality suite with the requisite and at times lively discussions of most topics of interest to the serious weak-signal VHF/UHF/microwave operator.

Saturday began with presentations ranging from Reference Oscillator Phase Noise to Water Barrel Counterbalanced Tilt-over Towers. Other presentations included 144-MHz VUCC with Attic Antennas, Trends in VHF/ UHF, Logging programs, Switching Power Supply for Linear Amps, Noise Source Calibration, DC Grounded Power Dividers, and Getting on the Microwave Bands.

A collaborative presentation was made by the members of the SVHFS and CSVHFS on the new spring and fall Sprints reporting process on 3830. See: <http://3830scores.com/>. Conference presentations ended with an open VHF/ UHF/Microwave forum conducted by Steve Kostro, N2CEI.

The "Best Presentation Award" was won by Ray Rector, WA4NJP, for his "Power Line Noise and Tribulations" program. It's always a treat to watch Ray in action! The "Best Technical Paper Award" was presented to Moe Wheatly, AF4JY, for his effort entitled "VersRef Signal Generator." All of the above and more can be found in a copy of the 2014 SVHFS conference proceedings, readily available at the ARRL Store.

The conference finished with the banquet and guest speaker, ARRL Southeast Division Director Doug Rehman, K4AC. It was very entertaining and you should never miss an oppor-

tunity to listen to Doug if you get the chance. The conference was officially concluded with everyone's favorite program activity—the drawing for door prizes. Next year's conference will be held at Morehead State University in Morehead, KY at the end of April. See the SVHFS website for further details at <http://svhfs.org>.

KH8 DXpedition 50 and 144 MHz

Noted 50-MHz DXer and EMEer Lance Collister, W7GJ, recently announced a planned DXpedition to Tula, American Samoa (grid AH45rs) from July 12th to 28th. As Lance put it, "You may very well ask, why in the world would anybody go to the opposite side of the world on a 50-MHz DXpedition at a time of year and during a solar cycle with little to no chance of *F2* propagation? The answer, of course, is to take advantage of the superb EME conditions." If you are going to go someplace, it might as well be to a very rare place, as it will be a new country for just about anyone who makes the grade.

Lance's station, consisting of an Elecraft K3 with PR6 preamp and M2 6M-1000 amplifier with a solid KW output when running JT65a, is a proven performer, having shown its capabilities during previous DXpeditions to E51SIX, 3D2LR, 5WØGJ, E6M, and TX5K. Lance will do his best to be QRV during all European and North American moonsets and European moonrises, affording those stations without elevation the opportunity to take advantage of ground gain. Of course, any DXpedition is at the mercy of local conditions, including weather, so persistence is key. If you have not completed a QSO using WSJT prior to the DXpedition, please gain some experience prior to any attempt with Lance for the benefit all. For additional details see <http://www.bigskyspaces.com/w7gj/AmericanSamoa2014.htm>.

Bob Sutton, ZL1RS, will also be QRV from KH8 during this same period, but on 144 MHz. The site located northeast of Tula, grid AH45rs, is elevated so Bob cautions that moonrise will be earlier and moonset later than the software predictions. During moonrise and moonset, the second week preference will be given to Europeans because of the short window between KH8 and Europe. Bob will listen for callers on CW and may answer using WSJT's CW mode on 144.140 + 600 Hz USB audio. The software-driven CW will be sequenced and synchronized to UTC with KH8/ZL1RS transmitting on even minutes only. For additional details see: <http://www.qsl.net/zl1rs/kh8.html>.

Beacon Spot US

In an effort to create a central, reliable, and dynamic repository for up-to-date VHF/UHF and microwave beacon data, Joe Korkin, W2DSN, has created *Beacon Spot US*. See <www.beaconspot.us>. Joe reports that the website is now

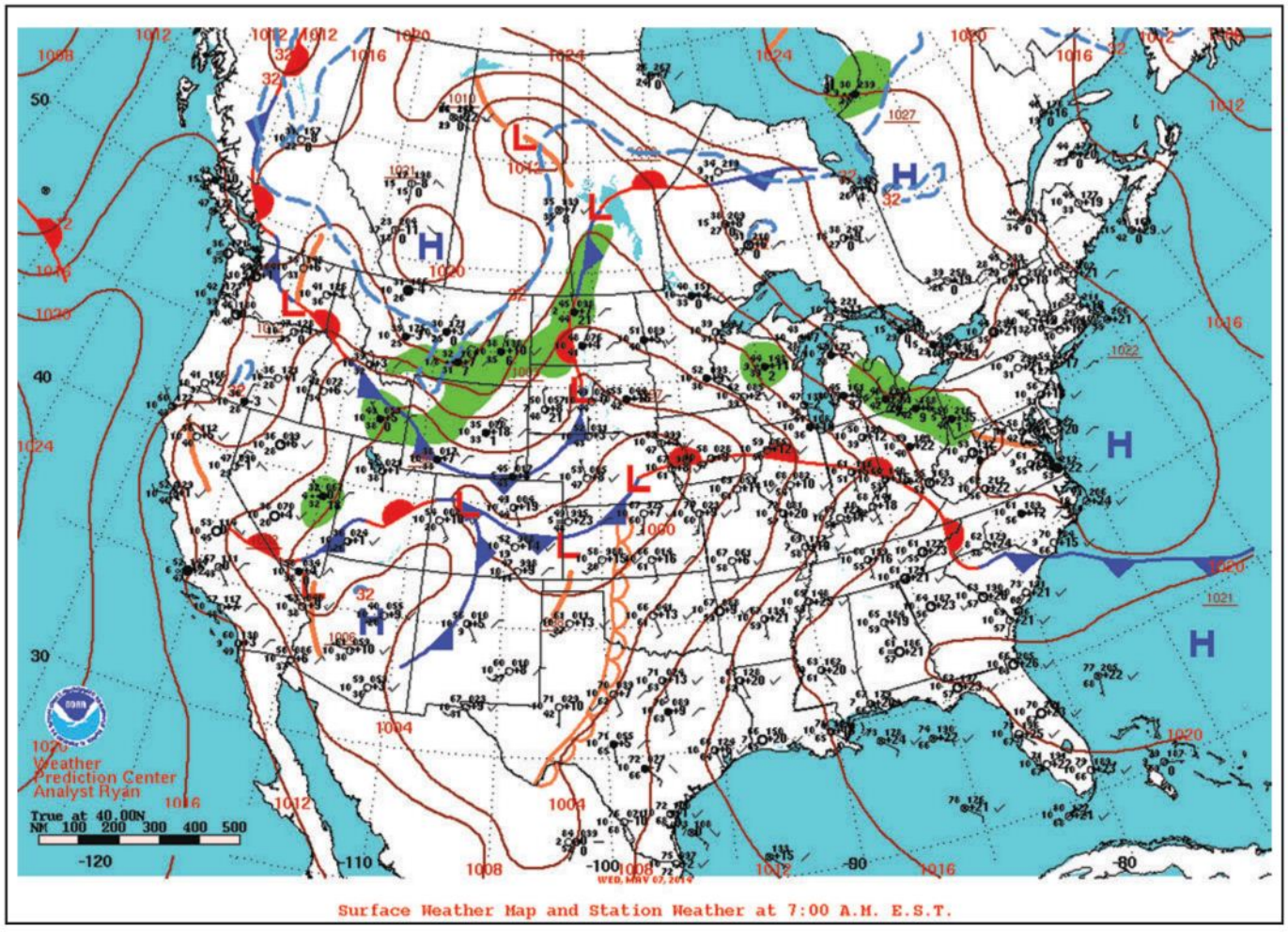


Fig. 2. Surface weather map for the same date and time as the map in fig. 1. Note the absence of any significant weather system for most of the path between Texas and southern Ohio. (Source: NOAA National Weather Service Weather Prediction Center <http://www.wpc.ncep.noaa.gov/archives/web_pages/sfc/sfc_archive.php>)

up and running the Beta release software. He is looking for suggestions and comments.

VHF/UHF/Microwave DX of Note

Bob Matthews, K8TQK, EM89je, worked Dick Hanson, K5AND, EM00xh, on 902 MHz during the tropo opening the morning of May 7th. The distance is 1,672 km (1,039 miles), just short of the record on that band. Bob began his day with his usual routine of checking the beacons on 432 and 1296 MHz. The beacons in FM07 and EM86 were up a bit, but not enough to suggest enhanced conditions. However, the K4UHF beacon in EM85 was much enhanced. Bob gave a listen on 144.200 and, to his amazement, heard Dick S9 +10. They quickly worked on 144 MHz and progressively went up in frequency, working next on 222 MHz and then 432 MHz easily on CW with S9+ signals.

The 902-MHz QSO was not as easy, with signals not as strong, but Bob, running 200 watts, received a respectable 539 report. Unfortunately, they did not complete on 1296 MHz despite K8TQK hearing K5AND, who was peaking S3 at times on SSB. It is interesting to note that the usual predictive indicators such as the Hepburn forecast or the APRS map did not predict enhanced conditions far north into Ohio from the south.

However, the weather maps (figs. 1 and 2) for May 7th do suggest that there was the potential for enhanced conditions from Texas to southern Ohio. Springtime wave cyclones generally last at most a few days and are the result of a cold air mass overtaking a large, warm area. The weather along the front can be violent with thunderstorms, hail, high winds, and tornadoes. The longest paths generally occur along a line out ahead of the cold front. The moral of the story is that although the various online propagation forecasts or APRS maps are helpful indicators, there is no substitute for checking the beacons and making a few calls to test the waters.

73 & CU you on the bands . . .

Tony, WA8RJF

Notes

1. Kennedy, James KH6/K6MIO, "Extreme Multi-Hop 50 MHz Es," *Proceedings of the 44th Conference of the Central States VHF Society*, pp. 74–88
2. Higasha, Han JE1BMJ, "SSSP: Short-path Summer Solstice Propagation," *CQ VHF*, Fall 2008, p.12
3. Having said that, my first and only sporadic-*E* contact in 2013 on 144 MHz occurred in May.

BY TED MELINOSKY,* K1BV

July Independence Week Special Event, Awards from Austria

I hope that you receive the July issue of *CQ* magazine in early July just as the USA gets ready to celebrate the Independence Day holiday on July 4th. For the past several years, Ken Villone, KU2US, has organized a growing group of volunteers who will activate stations in the 13 states that represent the 13 original colonies that comprised the United States at the beginning of the Revolutionary War. The volunteer stations will be on the air with single digit calls (K2M = Pennsylvania, etc.) The award can be earned with just one official contact, or you can try to work all of the 13 states. The cost is modest and it's a lot of fun to try to complete all of them. We start off this month's column with this special event and then follow with DX awards from Austria, etc.

USA 13 Colonies Special Event Independence Week

Fifteen special event stations will be active July 1–6 celebrating independence week. These are stations operating from the 13 original colonies, as mentioned above, plus friends at WM3PEN will again participate from Philadelphia, PA, where independence was declared. Also on the air will be W3FT from Baltimore, MD, commemorating the writing of our national anthem, "The Star Spangled Banner," in 1812.

The 13 colonies certificate has a Liberty Bell added for a contact with WM3PEN. A W3FT contact has a special 15-star 1812 US flag of the period added to the 13 Colonies certificate. There will also be a special QSL card printed just for this event. The theme for 2014 is "Revolutionary War Era Colonial Currency." The certificates are printed on heavy card stock. Stations working one state or as many as all 13, will be eligible for a certificate. A "Clean Sweep" indicator will be affixed for those lucky enough to make a QSO with all 13 colonies. A special endorsement will be attached for stations contacting WM3PEN, in Philadelphia, PA.

Applying for the award:

1. Download and print out the Colony Log sheet, found on the website listed at the end of this section. Fill-in all applicable information. *Note:* This also applies to SWLs requesting a certificate.

2. A $5.00 (US) donation is requested to cover costs of printing the award and all the QSL cards needed for the event. Also include your return self-addressed label for your certificate envelope.

3. Cash, check, or money order is OK. The check should be made out to Ken Villone-Award Manager.

4. Send your return label, donation, and log sheet to: Ken Villone-KU2US, PO. Box 185, Conesus, NY 14435-0185 USA.

5. Sponsor will provide the return envelope and postage. No extra postage is required for DX requests.

Internet: <http://www.13colonies.info/>

USA-CA Honor Roll

500

UA3DPX.....3641
SV1DPI 3642
EA9PY.....3643
KB3GSY.....3644
KC9TTR 3645
JA7QVI.....3646
WB5TOI 3647

2500

K7ZYV.....1359

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 in the USA-CA Record Book, which may be obtained from CQ Magazine, 25 Newbridge Road, Hicksville, NY 11801 USA for $2.50, or 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.

DX Awards

Some award programs are stable year after year and some grow. It's always a pleasant surprise to check on a program and find that the sponsors have added new certificates to their programs.

The certificate for the USA 13 Colonies Special Event Independence Week in July.

*12 Wells Woods Rd., Columbia, CT 06237
e-mail: <k1bv@cq-amateur-radio.com>

Such was the case with the national amateur organization of Austria, the OVSV. Its total awards program is comprised of some 17 awards. The new ones, which do not include VHF/UHF and SWL-only awards, are described below.

Austria OVSV Award Series

General requirements for OVSV: GCR list accepted and endorsed by two amateurs or the award manager of your national society. (*Note:* Do not use Registered Mail, as the sponsor is unable to accept registered mail.) SWL OK. Send to: Richard Kritzer, Aich 4, A-9800 Spittal/Drau, Austria.

Cost of each award is 10 Euros; cost for endorsements is 1 Euro, or 2 IRCs. Europeans may pay by electronic funds transfer using: BAWAG Konto.Nr. 98416006261 IBAN: AT971400098416006261 BIC: BAWAATWW.

E-mail: <diplom@oevsv.at>

Internet: <http://www.oevsv.at/opencms/oevsv/referate/diplome/#oben>

Worked All Austrian States. Contact at least three different stations in each of the nine Austrian states (the call areas OE1 through OE9). SWL OK.

Austrian states: OE1 Vienna, OE2 Salzburg, OE3 Lower Austria, OE4 Burgenland, OE5 Upper Austria, OE6 Styria, OE7 Tyrol, OE8 Carinthia, OE9 Vorarlberg.

Worked All Austrian Capitals Award. Contact all stations that are located in the capital cities of Austrian states on or after 1 January 2000. SWL OK. Special endorsement is offered for one mode. Austrians need six contacts from Austrian capital cities. All others need three contacts from Austrian capital cities. The list below shows call area, province, and capital city:

OE1, Vienna, Vienna; OE2, Satzburg, Sakzburg; OE3, Lower Austria, Sankt Polten; OE4, Burgenland, Eisenstadt; OE5, Upper Austria, Linz; OE6, Styria, Graz; OE7, Tyrol, Innsbruck; OE8, Carinthia, Klagebfurt; OE9, Vorarlberg, Bregenz.

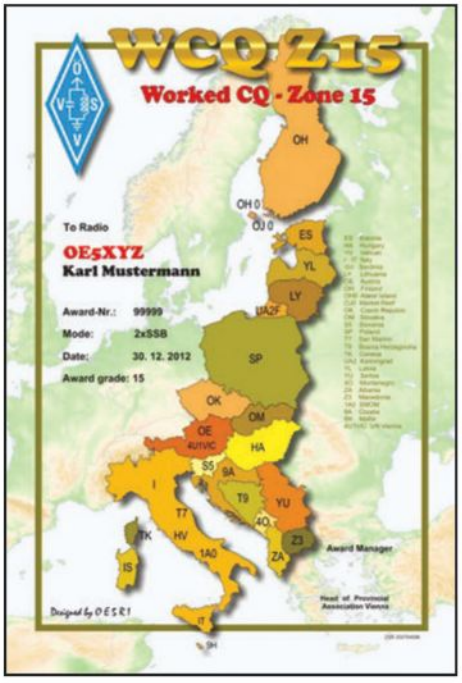
Worked All Countries in CQ Zone 15. Contact at least 20 of the 27 DXCC countries that are included within the borders of CQ Zone 15. SWL OK. Three contacts with each of the countries is required.

The following prefixes can be counted for the award: ES, HA, HV, I, IT, ISØ, LY, OE, OH, OHØ, OJØ, OK, OM, S5, SP, T7, T9, TK, UA2, YL, YU, 4O, ZA, Z3, 1AØ SMOM, 9A, 9H,

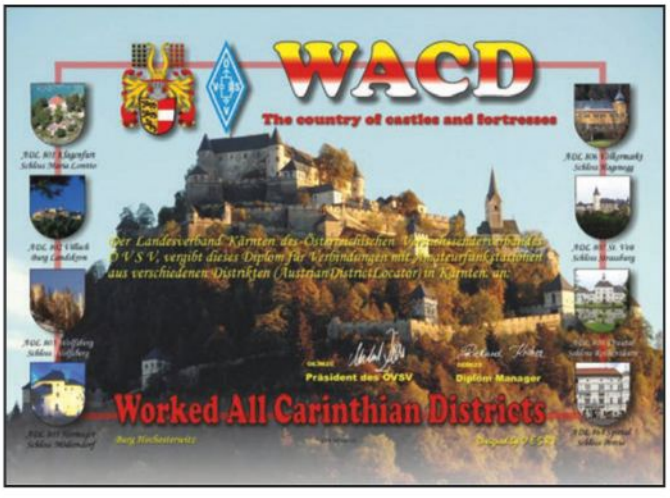
To earn the Worked All Austrian States Award contact at least three different stations in each of the nine Austrian states (the call areas OE1 through OE9).

The Worked All Austrian Capitals Award is available for contacting all stations that are located in the capital cities of Austrian states on or after 1 January 2000.

Contact at least 20 of the 27 DXCC countries that are included within the borders of CQ Zone 15 for the Worked All Countries in CQ Zone 15 Award.



This award is made available to all radio amateurs and SWLs for making contacts with Carinthian stations (prefix OE8), earning at least 100 points on or after 1 January 2000.



The Alpine Countries Award certificate shows the Alpine arc, starting in the west in Monaco and France going to the east to Slovenia and Austria. See text for details.

4U1VIC. Each club station contacted may be used as "wild card" (joker) and will count for three QSOs in the applicant's country.

A PDF image award is available for a reduced fee of 5 Euros. (Electronic diploma applications go to: <diplom@oevsv.at>.) Otherwise the standard price of 10 Euros applies for the printed version.

Worked Carinthian Districts. The award pictures an 11th century castle sitting prominently on top of a 400-foot high limestone cliff and visible from many surrounding mountains and hills. The OVSV of the National Association Carinthia gives this award to all radio amateurs and SWLs for making contacts with Carinthian stations (prefix OE8), earning at least 100 points on or after 1 January 2000. Each QSO with a station from Carinthia is worth 10 points. Each contact with a club station from OE8 counts 50 points. All bands and modes OK.

Alpine Countries Award. This certificate shows the Alpine arc, starting in the west in Monaco and France going to the east to Slovenia and Austria. Contact the Alpine countries of Europe. There are eight countries that have significant Alpine mountainous country. These are F, 3A, HB, HBØ, I, DL, OE, and S5. The award may be earned by working at least five different stations from each of seven of these eight countries, a total of 35 contacts.

SWL OK. Contacts on or after 1 January 2010 count for the award. All modes and bands OK. The award may be endorsed if all contacts are made on one mode.

The award is available in an electronic version for the reduced fee of 5 Euros. (Apply to <diplom@oevsv.at> for e-award.). The fee for the printed version is 10 Euros.

We are always interested in learning of new awards for this column. Please contact me with any details and a URL on the internet would be fine.

73, Ted, K1BV

BY WAYNE MILLS,* N7NG

Logbook of The World™ Start-Up Difficulties

Logbook of The World is an electronic QSLing system originally created to support ARRL awards. If you are not familiar with its beginnings, here is a quick summary:

In the late-1990s, as postal rates were beginning to go through the roof, Lew Jenkins, N6VV, presented a paper at the 1998 Visalia International DX Convention describing a method, based on the paper QSL model, of using secure electronic documents to exchange QSO confirmations. Shortly thereafter the ARRL picked up the idea and ran with it. By the time the ARRL actually started work on the project, however, the system had evolved into a central-clearing-house type of system where logs were sent directly to ARRL. It was aptly named Logbook of The World™ or LoTW.

Originally, the idea was for hams to exchange three-part e-messages that could be signed electronically using PKI—Public Key Infrastructure—so that their exact original content would be secure until verified in use. (Secure *storage* is the most important facet of signed records.) The three parts would include a QSO record, a QSL graphic, and (perhaps) a funds transfer for contributions, etc. A major flaw in the system, to the best of my knowledge, went unnoticed, however. More on that later.

In order to sign a document, a unique digital certificate must be obtained from a certificate authority (or CA), in this case, the ARRL. Admittedly, administering PKI technology for consumer use is dodgy. Many security-conscious businesses don't use PKI because of the relative complexity of successfully obtaining and using a certificate. Quite simply, the consumer public can't handle it. When LoTW went public, there was concern about handling the certificate requests. Some form of validation for applicants is necessary. To resolve this, the ARRL adopted a postcard system in which a postcard received at an FCC address would be considered adequate verification.

Unfortunately, in 2003 when LoTW was introduced, addresses for hams in the rest of the world weren't generally available because of privacy concerns. Alternately, it was necessary for non-US hams to send a letter to the ARRL with some form of identification. There was considerable resentment over this "discrimination," and to some extent, there still is. There may be a friendlier way, but implementation—making changes—is always a problem.

Without a doubt, initial growth of LoTW was slow. Yet with all of the start-up difficulties, LoTW is succeeding and gaining popularity. After 11 years, the use of LoTW is becoming commonplace. It is growing rapidly, and more and more DXers are looking for LoTW users as they work toward awards. The system is becoming a standard for DXpeditions, contests, and even general QSLing, although certain bumps are being worked out. The shift to band-mode credits , and the resulting sheer volume of confirmations needed, has made LoTW very popular.

What's the Flaw?

On the surface, the central-clearing-house concept seems to make great sense. QSOs are matched and processed in one operation as they are submitted. The matches are assigned to the records of each user and progress toward the various awards is noted. The system can keep track of progress and easily facilitate award processing

*P.O. Box 1945, Jackson, WY 83001-1945
e-mail: <n7ng@cq-amateur-radio.com>

Photo A. Could your LoTW QSL look like this, or will paper QSLs continue to have a special meaning and purpose?

as desired. There is no need for participants to manage their own LoTW QSL records.

All is well until one wishes to participate in an award program not supported by LoTW. What about CQ, RSGB, and JARL awards? The flaw in the concept is that since all QSL records are stored in a central location at ARRL HQ in Connecticut, any use of these records is subject to the processes and procedures of the ARRL. While there was much talk early on of including other awards-sponsoring organizations in the LoTW system, no additional awards were supported until just recently with CQ's WPX award, more than ten years after LoTW began operating. Quite simply, as built, the LoTW system requires additional custom software to be added for each award that the system supports. It has also become clear that supporting additional awards will require additional manpower. It might be possible to share or sell QSO records and validation routines, but little movement in that direction been seen.

The ARRL spent a lot of money be-

The WPX Program

CW

3532 ..... 9A3PM	3540 ..... IK1WGZ
3535 ..... DF1XC	3541 ..... W6JWK
3536 ..... W2GS	3542 ..... JH9AUB
3537 ..... KF4MH	3543 ..... N8DUY
3538 ..... DM2TO	3544 ..... TF4M

SSB

3470 ..... AD6LV	3504 ..... NC6DX
3489 ..... KK6CKB	3505 ..... W7KKC
3493 ..... KD2BXD	3507 ..... AG4C
3494 ..... K4HX	3508 ..... VE9PLS
3498 ..... K7LOL	3511 ..... KØUD
3499 ..... KQ4KK	3512 ..... AC6ZM
3500 ..... VA3EJN	3513 ..... WØQKL
3501 ..... K6SCA	3514 ..... K6JJ
3502 ..... W8LMG	3515 ..... N1SUZ
3503 ..... OM7ACA	

Mixed

2684 ..... JA6CMQ	2787 ..... IKØOPS
2754 ..... WCØW	2788 ..... KAØGOA
2756 ..... F5LCU	2790 ..... UR7FM
2763 ..... NK4K	2791 ..... DM2TO
2768 ..... 9A3PM	2792 ..... W6AER
2775 ..... WM9I	2795 ..... WØQKL
2776 ..... AA6RR	2796 ..... K6JJ
2777 ..... KO4GS	2797 ..... AC8AZ
2778 ..... OH2LHE	2798 ..... N1IVY
2779 ..... NP3B	2799 ..... W5GFI
2780 ..... KØUD	2800 ..... W6JWK
2783 ..... IC8SQS	2801 ..... JH9AUB
2784 ..... NC6DX	2802 ..... IWØECV
2785 ..... N7PR	2803 ..... KO9A
2786 ..... NN7NN	2804 ..... N8DUY

Digital

320 ..... WL7CG	323 ..... N2SO
322 ..... KC9YAZ	

CW: 50 W6JWK. 400 N8DUY. 500 K4MLD, NA2AA. 650 DF1XC. 700 K6HRT. 800 DM2TO, N2SO. 850 W2GS. 1000 N2SO. 1350 RMØF. 2650 W9IL. 3200 K9UQN. 4000 W8IQ. 4750 N6JV.
SSB: 350 KQ4KK, VA3EJN, KD2BXD, AG4C. 400 NA2AA, NC6DX, AK4PE, KAØGOA, WØQKL. 450 AG1T, WV2M, K6SCA, W8LMG, WB4VMH. 500 K6JJ, KØUD. 550 K4HX, IKØOPS. 600 AE4WG, WH7DX. 750 IT9CLU. 800 K6HRT. 1050 RMØF. 2550 W9IL.
Mixed: 450 AA6RR, 9A3PM, NC6DX, IZ1XBB, KB7HDX, W6JWK. 500 WM9I, N7PR, JH9AUB. 550 K4MLD, KØUD, IKØQPS, N8DUY. 600 AE4WG. 650 WV2M, K6JJ. 700 NA2AA, WCØW, KO9A. 750 AG1T, WB4VMH. 800 IT9CLU. 850 W5GFI. 900 WH7DX. 950 IC8SQS. 1000 AGØA, N2SO. 1150 K6HRT, N2SO. 1250 UR7FM. 1300 DM2TO. 1450 NKØS. 1700 K6UXO. 2000 RMØF. 3500 W9IL. 3600 K9UQN.
Digital: 350 N2SO. 400 AF6GA. 450 NKØS. 500 WH7DX. 550 DL4FAP.

160 Meters: NA2AA, W2GS, TF4M
80 Meters: W2GS, DM2TO
40 Meters: DM2TO, N2SO
30 Meters: NKØS
20 Meters: W2GS, DM2TO, W5GFI, N2SO
15 Meters: JA6CMQ, W2GS, WB4VMH, DM2TO, K6JJ, W5GFI, N2SO
12 Meters: NKØS
10 Meters: W2GS, DM2TO, IT9CLU, K6JJ, W5GFI
6 Meters:

Africa: DM2TO, RMØF
Asia: AG1T, DF1XC, IT9CLU, RMØF
Europe: AG1T, WV2M, K4HX , F5LCU, VA3EJN, NP3B, KD2BXD, W8LMG, DF1XC, W2GS, OM7ACA, VE9PLS, N1IVY, RMØF, TF4M, WØQKL
Oceania: JA6CMQ, RMØF
North America: NA2AA, K6SCA, KO4GS, W8LMG, NC6DX, N7PR, NN7NN, W2GS, W6AER, K6JJ, N1IVY, KB7HDX, KAØGOA, AC8AZ, KO9A, N2SO, RMØF

Award of Excellence with 160 Bar: K4MIJ, RW5C
30M Bar: RW5C
17M Bar: K4MIJ, RW5C
12M Bar: RW5C

Award of Excellence Holders: N4MM, W4CRW, K5UR, K2VV, VE3XN, DL1MDD, DJ7CX, DL3RK, WB4SIJ, DL7AA, ON4QX, 9A2AA, OK3EA, OK1MP, N4NO, ZL3GO, W4BQY, IØJX, WA1JMP, KØJN, W4VQ, KF2O, WB8CNL, W1JR, F9RM, W5UR, CT1FL, WA4QMQ, W8ILC, VE7DP, K9BG, W1CU, G4BUE, N3ED, LU3YL/W4, NN4Q, KA3A, VE7WJ, VE7IG, N2AC, W9NUF, N4NX, SMØDJZ, DK5AD, WD9IIC, W3ARK, LA7JO, VK4SS, I8YRK, SMØAJU, N5TV, W6OUL, WB8ZRL, WA8YTM, SM6DHU, N4KE, I2UIY, I4EAT, VK9NS, DEØDXM, DK4SY, UR2QD, AB9O, FM5WD, I2DMK, SM6CST, VE1NG, I1JQJ, PY2DBU, HI8LC, KA5W, K3UA, HA8UB, HA8XX, K7LJ, SM3EVR, K2SHZ, UP1BZZ, EA7OH, K2POA, N6JV, W2HG, ONL-4ØØ3, W5AWT, N3XX, HB9CSA, F6BVB, YU7SF, DF1SD, K7CU, I1POR, K9LJN, YBØTK, K9QFR, 9A2NA, W4UW, NXØI, WB4RUA, I6DQE, I1EEW, I8RFD, I3CRW, VE3MS, NE4F, KC8PG, F1HWB, ZP5JCY, KA5RNH, IV3PVD, CT1YH, ZS6EZ, KC7EM, YU1AB, IK2ILH, DEØDAQ, I1WXY, LU1DOW, N1IR, IK4GME, VE9RJ, NN1N, HB9AUT, KC6X, N6IBF, W5ODD, IØRIZ, I2MQP, F6HMJ, HB9DDZ, WØULU, K9XR, JAØSU, I5ZJK, I2EOW, IK2MRZ, KS4S, KA1CLV, WZ1R, CT4UW, KØIFL, WT3W, IN3NJB, SSØA, IK1GPG, AA6WJ, W3AP, OE1EMN, W9IL, I7PXV, S53EO, DF7GK, S57J, EA5BM, DL1EY, DJ1YH, KUØA, VE2UW, 9A9R, UAØFZ, DJ3JSW, OE6CLE, HB9BIN, N1KC, SM5DAC, RW9SG, WA3GNW, S51U, W4MS, I2EAY, RAØFU, CT4NH, EA7TV, W9IAL, LY3BA, K1NU, W1TE, UA3AP, EA5AT, OK1DWC, KX1A, IZ5BAM, K4LQ, KØKG, DL6ATM, VE9FX, DL2CHN, W2OO, AI6Z, RU3DX, WB9IHH, CT1EEN, G4PWA, OK1FED, EU1TT, S53MJ, DL2KQ, RA1AOB, KT2C, UA9CGL, AE5B, KØDEQ, DKØPM, SV1EOS, UAØFAI, N4GG, UA4RZ, 7K3QPL, EW1CQ., UA4LY, RZ3DX, UA3AIO, UA4RC, N8BJQ, UA3BS, UA9FGR, UT3UY, WA5VGI, UT9FJ, UT4EK, K9UQN, UR5FEO, LY2MM, N3RC, OH3MKH, RA3CQ, UT3IZ, S55SL, RU3ZX, YO9HP, RA3DNC, K8ZT, KE5K, JH8BOE, TF8GX, S58MU, UX1AA, AB1J, DM3FZN, AG4W, UA3QNS, RX3AGD, WB5JID, LY3W, LY5W, RW4WZ, VO1CV, VE1YX, DK8MCT, HB9DDO, DL4CW, W9RPM, IZ3ENH, DM2DXA, EY8MM, K4HB, K6ND, TF3Y, K4CN, W1RM, W3LL, 4Z1UF, W3UA, N8VV, HA8QC, LU5OM, US3IZ, RV9CX, K6UM, RWØLT, 4L1MA, UR1MI, IV3ARJ, K6SIK, R3IS, R9MJ, DG7RO, AB1OC, 9H1SP, K7LV, EA2AAZ, KØMD, RL2A, RT3M, WF2S.

160 Meter Endorsements: N4MM, W4CRW, K5UR, VE3XN, DL3RK, OK1MP, N4NO, W4BQY, W4VQ, KF2O, W8CNL, W1JR, W5UR, W8ILC, K9BG, W1CU, G4BUE, LU3YL/W4, NN4Q, VE7WJ, VE7IG, W9NUF, N4NX, SMØDJZ, DK5AD, W3ARK, LA7JO, SMØAJU, N5TV, W6OUL, N4KE, I2UIY, I4EAT, VK9NS, DEØDXM, UR2QD, AB9O, FM5WD, SM6CST, I1JQJ, PY2DBU, HI8LC, KA5W, K3UA, K7LJ, SM3EVR, UP1BZZ, K2POF, IT9TQH, N6JV, ONL-4ØØ3, W5AWT, N3XX, F6BVB, YU7SF, DF1SD, K7CU, I1POR, K9LJN, YBØTK, K9QFR, W4UW, NXØI, WB4RUA, I1EEW, ZP5JCY, KA5RNH, IV3PVD, CT1YH, ZS6EZ, YU1AB, IK4GME, NN1N, W5ODD, IØRIZ, I2MQP, F6HMJ, HB9DDZ, K9XR, JAØSU, I5ZJK, I2EOW, KS4S, KA1CLV, KØIFL, WT3W, IN3NJB, SSØA, IK1GPG, AA6WJ, W3AP, S53EO, S57J, DL1EY, DJ1YH, KUØA, VR2UW, UAØFZ, DJ3JSW, OE6CLD, HB9BIN, N1KC, SM5DAC, S51U, RAØFU, CT4NH, EA7TV, LY3BA, K1NU, W1TE, UA3AP, OK1DWC, KX1A, IZ5BAM, DL6ATM, W2OO, RU3DX, WB9IHH, G4PWA, OK1FED, EU1TT, S53MJ, DL2KQ, RA1AOB, UA9CGL, SM6DHU, KØDEQ, DKØPM, SV1EOS, N4GG, UA4RZ, 7K3QPL, EW1CQ, UA4LY, RZ3DX, UA3AIO, UA4RC, N8BJQ, UA3BS, UA9FGR, UT3UY, WA5VGI, UT9FJ, UR5FEO, N3RC, UT3IZ RU3ZX, YO9HP, RA3DNC, K8ZT, KE5K, JH8BOE, S58MU, UX1AA, DM3FZN, AG4W, UA3QNS, RX3AGD, LY3W, LY5W, VO1CV, HB9DDO, DL4CW, W9RPM, IZ3ENH, DM2DXA, EY8MM, K4HB, K6ND, W1RM, W3LL, 4Z1UF, W3UA, RV9CX, K6UM, UR1MI, IV3ARJ, R3IS, R9MJ, DG7RO, K6SIK, AB1OC, 9H1SP, EA2AAZ, KØMD, RL2A, WF2S.

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.

5 Band WAZ

As of May 1, 2014 1871 stations have attained at least the 150-zone level, and 929 stations have attained the 200-zone level.

New recipeints of 5 Band WAZ with all 200 zones confirmed:
None

The top contenders for 5 Band WAZ (zones needed on 80 or other if indicated):

K1LI, 199 (24)
K3JGJ, 199 (24)
N4NX, 199 (26)
KØQC, 199 (26)
W4DC, 199 (24)
N4WW, 199 (26)
W4LI, 199 (26)
K7UR, 199 (34)
IK8BQE, 199 (31)
JA2IVK, 199 (34 on 40)
IK1AOD, 199 (1)
VO1FB, 199 (19)
KZ4V, 199 (26)
W6DN, 199 (17)
W3NO, 199 (26)
RU3FM, 199 (1)
N3UN, 199 (18)
W1FZ, 199 (26)
SM7BI, 199 (31)
EA7GF, 199 (1)
JA5IU, 199 (2)
RU3DX, 199 (6)
N4XR, 199 (27)
HA5AGS, 199 (1)
JH7CFX, 199 (2)
RA6AX, 199 (6 on 10)
RX4HZ, 199 (13)
S58Q, 199 (31)
K8PT, 199 (26)
N8AA, 199 (23)
IZ1ANU, 199 (1)
IN3ZNR, 199 (1)
JK1BSM, 199 (2)
RWØLT, 199 (2 on 40)
JA1CMD, 199 (2)
I5REA, 199 (31)
RZ3EC, 199 (1 on 40)
W1FJ, 199 (24)
K2EP, 198 (23,24)
WC5N, 198 (22,2
ZL2AL, 198 (36,37)
W6OUL, 198 (37,40)
EA5RM, 198 (1,19)
N8LJ, 198 (17,24)
EA5BCX, 198 (27,39)
G3KDB, 198 (1,12)
JA1DM, 198 (2,40)
9A5I, 198 (1,16)
G3KMQ, 198 (1, 27)
N2QT, 198 (23,24)
OK1DWC, 198 (6, 31)
W4UM, 198 (18,23)
US7MM, 198 (2,6)
K2TK, 198 (23, 24)
K3JGJ, 198 (24,26)
F5NBU, 198 (19,31)
W9XY, 198 (22,26)
KZ2I, 198 (24,26)
W9RN, 198 (26,19 on 40)
W5CWQ, 198 (17,18)
UA4LY, 198 (6 and 2 on 10)
JA7XBG, 198 (2 on 80 & 10)
JA3GN, 198 (2 on 80 & 40)
N4GG, 198 (18,24)
K4JLD, 198 (18,24)
NS6C, 198 (17,22)
WA2BCK, 198 (23,24)

The following have qualified for the basic 5 Band WAZ Award:

SQ1EIX (164 zones)
UA1CKC (168 zones)
KØYQ (152 zones)
JA7QVI (196 zoes)
EW8DJ (184 zones)
PT7ZT (165 zones)

5 Band WAZ updates:

WA2BCK (198 zones)

***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, Floyd Gerald, N5FG, P.O. Box 449, Wiggins, MS 39577-0449. 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 Floyd Gerald. Applicants sending QSL cards to a *CQ* checkpoint or the Award Manager must include return postage. N5FG may also be reached via e-mail: <n5fg@cq-amateur-radio.com>.

The WAZ Program

6 Meters

118 .UT5JAJ (30 zones)

12 Meters SSB

48 .....W6BCQ

40 Meters SSB

116 .....KJ6P

12 Meters CW

83 .....K5MC

17 Meters CW

105 .....K5MC

40 Meters CW

300.....K7CU

80 Meters CW

99 .....SM3NXS

10 Meters Digital

001.....F4GTB

15 Meters Digital

001.....F4GTB

20 Meters Digital

002.....F4GTB

160 Meters

447 ....UT5JAJ (35 zones)

160 Meter Updates

K5UO .....(39 zones) K2FF .....(31 zones)

All Band WAZ

Mixed

9114 .....EI8IU
9115 .....DL4ZAB
9116 .....WC2C
9117 .....DF3EH
9118 .....PB2A
9119 .....JF0EBM
9120 .....K6KLY
9121 .....JA7QVI
9122 .....EW8DJ
9123 .....R6FS
9124 .....HB8FBG
9125 .....JE6ADE
9126 .....IZ5JMZ

SSB

5295 .....KC8RP
5296 .....W4WV
5297 .....KDØAA
5298 .....N7GCO
5299 .....DL6FD
5300 .....W5UXE
5301 .....WDØBMS

CW

752.....SV1PS
753 .....K7LV
754.....K5FO
755.....NØCKC
756 .....KDØAA
757.....F4GTB

RTTY

245 .....KØYQ
246.....HA5VZ
247 .....WD9DZV

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, Floyd Gerald, N5FG, P.O. Box 449, Wiggins, MS 39577-0449. 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 Floyd Gerald. Applicants sending QSL cards to a *CQ* checkpoint or the Award Manager must include return postage. N5FG may also be reached via e-mail: <n5fg@cq-amateur-radio.com>.

tween 2000 and 2003 building and writing software for LoTW. Even before it was finally turned on for the ham public, it was obvious (internally) that once it was up and running, very little additional development—other than necessary repairs—would be done for some time. In fact, it was quite some time before another award, the ARRL's own Triple Play, was conceived and implemented. The prospects for non-ARRL award support were dim. Interestingly, there has been virtually no movement toward creating unique awards that could actually generate revenue, such as an annual DXCC award based entirely on LoTW. In a sense, the job isn't complete.

Still a Place for Paper?

There is no doubt that individuals managing a system involving individual QSL records would be complex and time-consuming, yet there would be software created to do the job, and most important, other organizations would be able to participate on an equal basis. It appears that the ARRL has created a mechanism through which the continued use of paper QSL cards is almost guaranteed.

QSL cards convey much more information: information about the operator, a DXpedition, or a special event (photo A). In many cases, the feeling associated with a major event is much better described with a QSL card or packet, yet we can't deny the burden of postage, printing, and even the time required to process and distribute the large number of cards in this new era. Even the bureau cards, so beloved by European DXers, are suffering from the expense of postage and shipping. In many countries cards are sent free of charge, but covered by society dues, which are often double those of the ARRL. In many cases, it is no longer free to carry a sizable box of QSLs to the USA to save postage.

Where will Logbook be in five to ten years? Electronic transportation of confirmations will undoubtedly grow. Will additional records and graphics tell us more about the sender? Will electronic QSLing support more awards? While LoTW has been a good start, I suspect there are greater things just beyond the horizon.

CW Competence

When the no-code controversy was raging in past years, many of us were worried about things such as a future lack of interest in Morse Code operating. Some hams felt so strongly that they said they would rather ham radio go away than lose the code requirement. Who would still be interested in the code?

Others weren't so worried about the demise of CW operating, but rather the quality of the resulting Morse Code. My

The CQ DX Field Award Program

Mixed

137 .....WA5VGI 138 .....N8YQX

Endorsements CW

W4UM 198

Endorsements SSB

JN3SAC 182 & 3.5/7 MHz W4UM 186

Endorsements Mixed

K9YC.....192
K8OOK.....205
W4UM 204
VE3ZZ.....217
OK1ADM 228
W6OAT 230

The basic award fee for subscribers to *CQ* is $6. For nonsubscribers, 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.

CQ DX Awards Program

CW

1151 .....W3GH

SSB

2619 .....W3GH 2626.....KN2GSP

Endorsements

K6UXO .....CW 269 IK5ZUK.....SSB 260

The basic award fee for subscribers to *CQ* is $6. For nonsubscribers, 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.

observation so far is that without actually requiring code proficiency, more hams are becoming interested in CW— and using it—often after they are first licensed. With the proliferation of code-generating electronics, sending code is usually no problem at all. There are still a few old bugs and hand keys that are often hard to copy, but in general, code as practiced on the bands is quite easy to decipher.

There is positive evidence that more DXers are using CW. DXpeditions are making more QSOs on CW than ever before, sometimes more than on phone, more than on the digital modes. Although RTTY is becoming increasingly popular, CW seems, arguably, to have regained its position as the top DXpedition mode, as it was in the beginning.

Increasingly, though, there seems to be a problem with DXers *copying* the code. Overall, initial CW ability among the newly licensed is probably lower than in the past, but there is interest. That copying ability is more difficult probably is no surprise. Copying CW has always been more difficult than sending, especially with helper devices such as electronic keyers, memories, and keyboards being available for transmitting.

Therefore, we have many code-sending aids, but the availability of adequate receiving devices is lagging well behind. Code readers are available, but through on-the-air listening we know that they are not yet up to the task of copying code well enough to use in difficult DXing situations. It is becoming painfully clear that many DXers are using code readers and that a good percentage of these devices are not working well enough to keep their operators out of trouble. QRM, weak signals, and QRN can all cause errors. Changes in speed, such as a signal report sent at a speed 5 words-per-minute greater than the base speed, can cause errors as well. DXpedition operators who send sloppy code at 38 words-per-minute don't help the situation either.

That's all understandable and quite frustrating for well-practiced CW ops. However, here's the rub: Who is going to tell these DXers, new to CW, not to even try? (Well, I know one UK DXer who was frustrated and vocal about wishing "… if we could rid ourselves of the code readers we would have a chance; why can't those guys stick with SSB, RTTY, or other reading modes?") Do we really want to discourage these guys who want to learn the code and maybe become good CW DXers? As much as I am frustrated by others' inability to understand exactly what is happening in a CW pileup, I am not going to be the one to tell these fledgling CW DXers to go back to phone. I might try to help them a bit though.

What's the solution? More mentoring? More on-the-air help? This is a good function for clubs. I do know that more

CQ DX Honor Roll

The CQ DX Honor Roll recognizes those DXers who have submitted proof of confirmation with 275 or more ACTIVE countries. With few exceptions, the ARRL DXCC Countries List is used as the country standard. The CQ DX Award currently recognizes 341 countries. Honor Roll listing is automatic when an application is received and approved for 275 or more active countries. Deleted countries do not count and all totals are adjusted as deletions occur. To remain on the CQ DX Honor Roll, annual updates are required. All updates must be accompanied by an SASE if confirmation of total is required. The fee for endorsement stickers is $1.00 each plus SASE. (Stickers for the 340 level are available.) 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.

CW

OH2BN 341
DL3DXX 340
EA2IA 340
F3TH 340
K2FL..... 340
K2TQC.....340
K3UA.....340
K4CN.....340
K4IQJ 340
K4MQG 340
K5RT 340
K9BWQ 340
K9IW 340
K9MM 340
N4AH.....340
N4JF.....340
N4MM 340
N5FG 340
N7FU 340
N7RO 340
NØFW 340
OK1MP.....340
W3GH 340
W4OEL 340
W5BOS 340
W7CNL.....340
W8XD.....340
WB4UBD 340
WK3N.....340
WSSJLC 340
K3JGJ 339
K4JLD 339
K7LAY 339
K9IW 339
N4CH.....339
N4NX.....339
N5ZM 339
W7OM.....339
YU1AB.....339
K8LJG 338
KA7T 338
G3KMQ 337
K8SIX.....337
W7IIT 337
W6OUL 336
K1FK 334
K9OW 334
PY2YP.....334
HB9DDZ 333
K2OWE.....333
K5UO.....333
K7VV 333
N6AW.....333
W4MPY.....333
F6HMJ.....332
K6LEB 331
N7WO 331
W1DF 331
WG5G/
QRPp.....330
JA7XBG.....329
K6YK 329
IKØADY 328
W9IL 327
K6CU.....326
KE3A 326
EA5BY 325
KA3S 325
OZ5UR 325
N7W0 324
KØKG 324
K8ME 323
WD9DZV 323
ON4CAS 322
KSSKG 320
W6YQ 319
CT1YH.....317
N2LM 317
EA3ALV 316
RA1AOB 314
WA4DOU.....313
YO9HP 313
HB9DAX/
QRP/p 311
AB4IQ 310
KT2C 306
K7ZM 304
HA5LQ.....301
K8IHQ 301
K4IE 295
N3RC.....295
HA1ZH.....292
WA2VQV 285
K7CU.....282
PP7LL 282
N2VW.....280
K4EQ.....280
4Z5SG.....276
YO6HSU 275

SSB

AB4IQ.....341
DJ9ZB 341
DL3DXX 341
DU9RG.....341
EA2IA 341
EA4DO.....341
I8KCI.....341
IK1GPG 341
IN3DEI.....341
K2TQC.....341
K3JGJ 341
K4CN.....341
K4IQJ 341
K4JLD 341
K4MQG 341
K4MZU.....341
K5OVC.....341
K5RT 341
K5TVC 341
K6YRA.....341
K8SIX.....341
K9BWQ 341
K9MM 341
KE5K 341
KZ2P 341
N4CH.....341
N4JF.....341
N4MM 341
N5FG 341
N5ZM 341
N7BK.....341
N7RO 341
NØFW.....341
OK1MP.....341
OZ3SK.....341
OZ5EV 341
VE1YX.....341
VE2GHZ.....341
VE2PJ 341
W3GH 341
W4ABW.....341
W5BOS 341
W6BCQ 341
W7BJN.....341
W8ILC.....341
W9SS.....341
WB4UBD 341
WK3N.....341
XE1AE 341
YU3AA.....341
K2FL.....340
K3UA.....340
K7LAY 340
K7VV 340
K9HQM 340
K9IW 340
KØKG 340
N4NX.....340
VE3MR.....340
VE3MRS.....340
VE3XN.....340
W4UNP 340
W6DPD 340
W7OM.....340
YU1AB.....340
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patience—not less—on the part of more experienced DXers is in order. Think about it: If there are no ops, there are no problems.

Write To the DXAC and ARRL Directors about Updating the DXCC Country Criteria

As many of us are aware of by now, since their introduction in 1998, the current DXCC country criteria have been broken (verb). By removing the IARU Society criterion and by recognizing that the International Telecommunications Union (ITU) is indeed a United Nations organization (which won't be unilaterally issuing radio prefixes and telephone calling codes for a long time), the DXCC program is left with only one avenue to country criteria. Neglecting the one-use Department of State rule, that remaining criterion is the acceptance of a political entity as a United Nations member state. On its face, that is not objectionable, but the threat of objection in the UN Security Council is enough to thwart adding a legitimate entity to the DXCC country list.

Most DXers know that this problem is hampering the addition of Kosovo to the DXCC list. This problem isn't unique to Kosovo, however. A careful reading in the list of UN member states, which do not recognize Kosovo <http:// en.wikipedia.org/wiki/International_recognition_of_Kosovo> reveals that a large number of the non-recognizing states have similar, dissident populations that very much want to have their own independent states. If their administrations recognize Kosovo, why shouldn't these populations be recognized as well? Where will we be in another six to ten years? Will there be two, three, four more countries that exist in all ways except UN recognition and in limbo with DXCC status? Does it matter? Maybe not.

This is the way of the world, and we are not going to change it. However, to say that ARRL/DXCC should not take the position of recognizing Kosovo because it is political—as some officials have said—is simply taking a different *political position*, that of *not* recognizing Kosovo. Both decisions are patently political. Perhaps the only way to resolve the problem of politics is to act in the best interest of ham radio and the ham operators involved. What do you think?

Local DX University Sessions: Mentoring

The DX University by now has presented eight sessions in five cities. It is scheduled for a session at the ARRL Centennial Celebration in Hartford, Connecticut in July, and again at the International DX Convention in Visalia, California in 2015. Another session or two may also be conducted between these events.

It is difficult, if not impossible, to conduct sessions with the same staff in areas with fewer DXers. DX University at its best can be a framework for DX mentoring sessions conducted at local and regional clubs. If you or your club would like to consider such mentoring sessions, contact the DX University at <http://www.dxuniversity.com/contact_form.php>.

73, Wayne, N7NG

ham radio news *(from page 2)*

"Baofeng" Becoming "Pofung"

Having trouble correctly pronouncing the names of various Chinese radio manufacturers? Well, at least one of them feels your pain and is taking great pains to help. Baofeng announced recently that it is "rebranding" its products as "Pofung" in international markets in order to help customers pronounce the name correctly. In a news release on its website, the company says "Baofeng" is "a literal Pinyin translation of our Chinese character name," but that it "may be difficult for a hobbyist across the ocean to pronounce." The new name, it says, is easier to pronounce "while maintaining the phonetic symbolism of our brand." The company's website, <http://www.baofengradio.com>, will not be changed. The company also encouraged consumers only to purchase its equipment from authorized distributors, including amazon.com, radioddity.com, and baofengtech.com. *[Tnx WA6ITF]*

Russia Blocks U.S. Access to Space Station

American astronauts scheduled to head to the International Space Station have become "collateral damage" in the escalating tension between the United States and Russia over the political situation in the Ukraine. The *ARRL Letter* reported that after the U.S. imposed sanctions on Russia as a result of its annexation of Crimea, Russia responded by saying it would no longer provide transportation to the space station for U.S. astronauts. The U.S. has relied on Russia to carry crew members back and forth since the space shuttle program ended in 2011. NASA astronaut Steve Swanson is currently the only American on board the space station.

ARRL Offers Free Exam Review Website

The ARRL has been publishing amateur radio license manuals for decades, and it is now expanding its license preparation efforts to the Internet. The *ARRL Letter* reports that the League is now offering free practice exams on its website, made up of questions from the actual license exam question pools. ARRL membership is not required.

Additional and updated news is available on the Ham Radio News page of the CQ *website at <http://www.cq-amateur-radio.com>. For breaking news stories, plus info on additional items of interest, sign up for* CQ*'s free online newsletter service. Just click on "CQ Newsletter" on the home page of our website.*

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 lisiting 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.

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WRTC 2014 Competitor Profiles

The World Radiosport Team Championship (WRTC) takes place July 9 through 14, 2014. The event will be held on the east coast of the United States near Boston, Massachusetts. WRTC will occur during the International Amateur Radio Union (IARU) HF Championship contest held during the second full weekend in July. (See the contesting column in the March/April 2014 issue of *CQ*).

The WRTC website (wrtc2014.org) says: "The World Radiosport Team Championship (WRTC) is held every four years and consists of approximately 50 two-person teams of amateur radio operators competing in a test of operating skill. Unlike most on-the-air competitions, all stations are required to use identical antennas from the same geographic region, eliminating all variables except operating ability. WRTC 2014 will include 59 competing teams from 29 qualifying regions around the world. This will be the largest and most competitive WRTC ever!"

The competitors are some of the best contesters in the world. We wanted to find out their opinions, expectations, and strategies about contesting. We recently queried the WRTC competitors and asked them about these and other issues. Here are some of their responses.

John Crovelli, W2GD, from Flemington, New Jersey, USA, has been a ham for 53 years. His teammate is George DeMontrond, NR5M. Crovelli is an accomplished CW contester and feels DeMontrond is a "good runner on phone." He is looking forward to "spending time with the 'best of the best' in our contest family from around the world." W2GD says, "We're unlikely to win, but would like to finish in the top half, but the competition is secondary to the social aspects of this gathering. It is an honor to participate." Crovelli says their strategy will be to use "a different mix between CW and PH operations that will have an impact on our ultimate results." His opinion about what a newer contester should do to improve is to: "Observe the operating techniques of the best operators, how they CQ, how they handle a pile-up, exactly what they say or don't say during a contact. Then PRACTICE PRACTICE PRACTICE!" His best contesting experience to date has been

John Crovelli, W2GD, with teammate George Demontrond, NR5M, represents sponsored team "Team 59."

*P.O. Box 657, Copiague, NY 11726
e-mail: <n2ga@cq-amateur-radio.com>

Calendar of Events

All year	**CQ DX Marathon**	**http://bit.ly/vEKMWD**
June 28–29	ARRL Field Day	http://www.arrl.org/field-day
June 28–29	King of Spain SSB Contest	http://bit.ly/1cKAR5V
June 28-29	Ukrainian DX DIGI Contest	http://www.izmail-dx.com/
June 30–July 6	10-10 Int. Spirit of 76 QSO Party	http://bit.ly/yTsaDk
July 1	RAC Canada Day Contest	http://bit.ly/1kznzue
July 5–6	Marconi Memorial HF Contest	http://bit.ly/1h4yYg6
July 5–6	DL-DX RTTY Contest	http://bit.ly/1iOZ7GT
July 5–6	Original QRP Contest	http://www.qrpcc.de/contestrules/index.html
July 5–6	Venezuelan Ind. Day Contest As of mid-May, 2014 rules had not yet been posted; date is based on 2013 weekend; please check website for update.)	http://yv5rcv.org/reglasindep.aspx (Note:
July 6	DARC 10 Meter Digital Contest	http://bit.ly/18gGDIM
July 11	FIST Summer Sprint	http://bit.ly/YRJv5V
July 12–13	IARU HF Championship	http://www.arrl.org/iaru-hf-championship
July 19–20	**CQ WW VHF Contest**	**http://www.cqww-vhf.com/**
July 19–20	DMC RTTY Contest	http://bit.ly/10psCkt
July 19–20	North American RTTY QSO Party	http://ncjweb.com/NAQP-Rules.pdf
July 26–27	MARAC QSO Party	http://marac.org/contests.htm
July 26–27	RSGB IOTA Contest	http://bit.ly/1eSkTSR
Aug. 2	European HF Championship	http://bit.ly/H2eMg5
Aug. 2–3	North American CW QSO Party	http://ncjweb.com/NAQP-Rules.pdf
Aug. 2–3	ARRL UHF Contest	http://www.arrl.org/august-uhf
Aug. 2–3	10-10 Int'l Summer Contest SSB	http://bit.ly/yTsaDk
Aug. 3	SARL HF Phone Contest	http://bit.ly/H0IqQf
Sept. 27–28	**CQ WW RTTY DX Contest**	http://www.cqwwrtty.com

"Winning CQ WW DX CW and PH WORLD several times from P40W." The specific challenges he sees for contesting in the future are "finding ways to keep everyone 'honest' in terms of operating category, power class, etc."

Stephane Van langhenhoven, F4DXW, from Ploudalmezeau, Brittany, France, is a team leader from Western Europe. He has been a ham for 14 years. His teammate is Sébastien Bajulaz, F8CMF, "a good op on CW and phone, enduring and a nice man." He is looking forward to "being a competitor, and having a good experience." His expectations are to have "a good trip with my friend F8CMF and a good result of course." His specific strategies and advantages are "motivation and a great experience in M/S and M/2 contest." His recommendation for someone trying to contact him during the contest is to "call me and thank you for the QSO." His opinion about what a newer contester should do to improve is to "listen to some contests and train with good contest software (Wintest, of course)." His best contesting experience to date has been "a big JA and USA pileup at the same time in the Djibouti Republic (J28VS) with a rate to 400 QSOs/hour." F4DXW concludes, "May the best team win and thank you to the WRTC organization. See you in July."

Sébastien Le Gall, F8DBF, from Brest, France, is a team leader from Western Europe. He has been a ham for 14 years. His teammate is Olivier "Oli" Seizelet, F1AKK, "a very good operator, tenacious and persevering." He is looking forward to "meeting other participants (most for the first time) and hope some good experiences." His expectations regarding his upcoming WRTC experience is "a good organization of this event with real equality of all participants." F8DBF comments about specific strategies that he has "no real strategy but we have participated in many contests together and know each other very well." His recommendation for someone trying to contact him during the contest is "just to be quick and clear." He says for newer contesters to improve, they should "participate in lots of contests and listen to other participants." Of his best contesting experience to date, he says there is "not really a single one but maybe the first good results in major contests." Of specific challenges in contesting's future, he says "continued participation in HF or VHF contests." Le Gall concludes, "Good luck to all participants!"

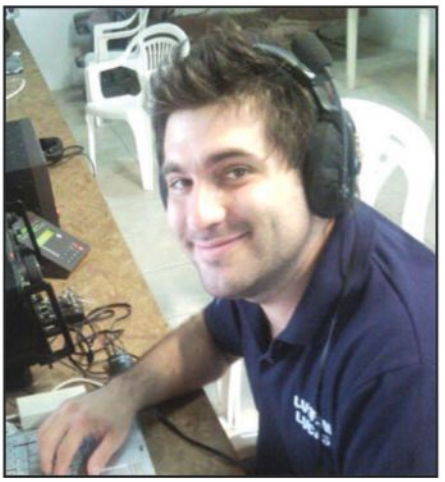
Katsuhiro "Don" Kondou, JH5GHM, from Daiba, Minato-ku Tokyo, Japan, is a team leader from Asia. He has been an amateur radio operator for 36 years. His teammate is Hajime Hazuki, JA1OJE, who Don says has "flexibility to any kind of environment." He is looking forward to "meeting the top contesters in the world." His expectation for his WRTC experience is to have the "best score of the competition." The specific strategies his team is using to help provide an advantage are "an analysis of QSOs by test stations." For a newer contester to improve, he says, "Keep it simple, avoid any redundancy, and improve efficiency for both the operation and its environment." His best contesting experience to date was when he "made an M/M JA record of CQ WW DX CW in 1988 as JA1YAD." The specific challenges he sees for contesting in the future are "to have SO2R capability for operation and its environment." JH5GHM concludes, "We need to introduce more young operators to enjoy themselves and make contests much more exciting."

Lucas Maiorov, LU1FAM, from Rosario, Santa fe, Argentina, represents South America. He has been a ham since 1997 (17 years) and got his call when he was 17 years old. His teammate is Jorge Diez, CX6VM, who he says is "a great CW and SSB operator. A much better lowband multiplier hunter than I am." He looks forward to "first of all meet again with a lot of friends and meeting new ones and sharing tons of chats and experiences!" His expectation for WRTC is "It will be a great

Stephane Van Langhenhoven, F4DXW, with teammate Sebastien Bajulaz, F8CMF, represents Europe region 1.

Sebastien Le Gall, F8DBF, with teammate Olivier "Oli" Seizelet, F1AKK, represents Europe region 1.

Katsuhiro "Don" Kondou, JH5GHM, with teammate Hajime Hazuki, JA1OJE, represents Asia region 5.



Lucas "Luc" Maiorov, LU1FAM, with teammate Jorge Diez, CX6VM, represents South America region 2.

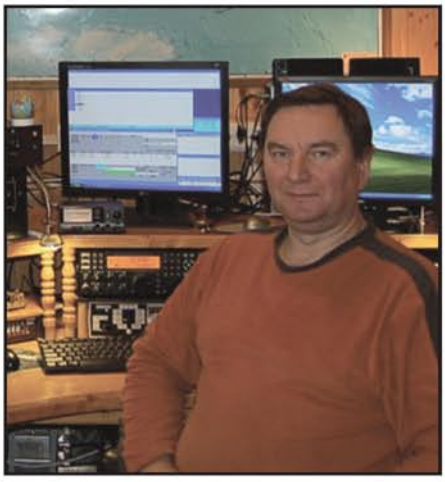
event! I know most of the people behind WRTC and I am completely sure they will do a great WRTC!"

A specific strategy to provide his team with an advantage is "Being on the DX side is a great advantage when it comes to run but we will need to find good mults to win the contest!" His recommendation for someone trying to contact him during the contest is "Timing is a very important thing when you are trying to work someone; sometimes I pick up a low signal just because the op is smart enough to call me in a good moment." For a newer contester to improve, he says, "Listen, listen, and more listen! Look for a good op in a contest and listen how he/she manages the pileup. That helped me a lot!" His best contesting experience to date was "I have a few, but operating from PJ4 was one of the best. Also operating from CE3CT with a triband and a few wires was incredible! It is amazing what can you do with simple antennas!" Specific challenges he sees for contesting in the future are "Technical improvements, operator behavior during pileups, alerting assistance, and power limitations." LU1FAM concludes, "I always enjoy contesting! When contesting gives you something other than happiness just QUIT!"

Andrey "Andy" Melanin, UA3DPX, from near Dmitrov (Moscow region), Russia, is a team leader from Eastern Europe. He's been an amateur radio operator for 38 years. His teammate is Igor Korolkov, UA4FER, who is "one of RT4F, P33W, CN2AA operators, like a fish in the water in multi op team, and extremely great experience on site in contests since old times in the USSR and we are the Champions of Russia WRTC style for the last three years." He is looking forward to "good propagation and big rate during the contest and meeting old friends outside of the contest." His expectations for this WRTC experience are "to be at the TOP." The things that will provide his team with an advantage are "good physical condition, and the great experience of both operators." To contact him during the contest, "just call and be quicker to make the QSO."

For new contesters to improve, they should "Forget the clusters, listen, and rotate the tune knob faster and be very attentive to make QSO but not to make extra QRM." Of his best contesting experience to date, he says, "I had many—VP2E, P3A, IG9/AC6WE, EX9A, first in Russia as RM3F in Russian DX contests for some years, was six-time winner of WRTC-style Russian Championships. I cannot mark one of many; all are best." Of specific challenges for contesting in the future, he says, "As for me, I like to have big setup at my home in Russia and have a lot of plans to make it *bigger*. So I will improve my setup and in the future may make true multi-multi from Russia." He concludes, "Hope to have great time during the future WRTC in New England this July!"

Dan Thompson, W4UH, from Jupiter, Florida, represents USA call area 4 west. He has been a ham for 54 years. His teammate is Julio Henriquez, AD4Z, and Dan says about him, "He never leaves the chair and is a CW operator." He is looking forward to "meeting the world's best operators" at WRTC. His expectations regarding the upcoming WRTC experience are that it will be a "once in a lifetime experience." His recommendations to contact him during the contest are to "tune the band and/or use cluster/Skimmer to look for our special 1×1 calls." For a newer contester to



Andrey Melanin, UA3DPX, with teammate Igor Korolkov, UA4FER, represents Europe region 6.

Dan Thompson, W4UH, with teammate Julio Henriquez, AD4Z, represents USA call district 4 west.

improve W4UH suggests, "Operate as many contests as possible and keep your butt in the chair (BIC)." He says his best contesting experience to date "will be WRTC 2014."

Kazunori "Kazu" Watanabe, MØCFW (aka JK3GAD, M5Z), from Central London, England, is a team leader from Western Europe. He has been an amateur radio operator for 31 years. His teammate is Gerry Lynch, GIØRTN, whose best qualities as a contester are "accuracy and efficiency." Kazu is looking forward to "see all friends" at WRTC. His expectations for his WRTC experience are "learning new skills, ideas from competitors." Of his specific strategies for WRTC, he says, "We are still testing our strategies and cannot tell you!" Of recommendations for someone trying to contact him during WRTC, he says, "It is just another contest. No different strategies are necessary." For a newer contester to improve, he suggests "They should go to the other end of pileup and learn how to call stations efficiently. It is win-win situation. (It is related to packet/RBN spot clicking everyone's calls on same frequency problem)." Of his best contesting experience to date, he says it was "All Asian DX CW @OH8X in 2010. Not only using monster 160/80m antenna but also climbing 100m tower and walking to the edge of boom!" For contesting in the future, he says, "We need more participants. It is very obvious the ham radio population is shrinking." He concludes he is anxious to "hear where WRTC 2018 will be."

Scott Redd, KØDQ, from McLean, Virginia, USA, represents USA call area 3. He has been an Amateur Radio operator for 60 years. He is a CQ Contest Hall of Fame inductee for 2014. His teammate is Ken Low, KE3X, of whom he says Ken is a "great competitor; good guy; won the W3 area; high-speed CW op." He is looking forward to "meeting other contesters I've worked over last six decades and operated with." His expectations regarding his upcoming WRTC experience are "fun and a good dose of humility." His specific strategy that he feels will provide his team with an advantage is "have operated from New England for last three years so should have a decent idea of propagation."

Kazunori "Kazu" Watanabe, MØCFW, with teammate Gerry Lynch, GIØRTN, represents Europe region 1.

His recommendations to contact WRTC stations during the contest are to "work as many of the special WRTC callsigns as you can; you won't know who's behind the curtain." For a newer contester to improve, KØDQ suggests, "Learn the strengths and weakness of your station. Study logs of top scorers to understand their strategy. Adapt to your strengths and weaknesses. Learn to run."

Of his best contesting experience to date he says, "Several stand out. 1973 as 6J9AA in ARRL DX SSB. First single op contester to work 10,000 QSOs in major contest (All-Time two-weekend world record). 2009 as P40Q in CQ WW DX CW. One of first two contesters to win world SOAB in all six major contests (both modes CQ WW, CQ WPX, ARRL DX) (Recognized as first by *CQ* magazine; believe W2SC/8P5A beat me by a year or two. W2GD since joined the 'Grand Slam Group'). Working to add US Championships in the big three on CW (hearing too far gone for phone). So far have won ARRL DX CW and WPX CW but not CQ WW CW (two #2 finishes, but it's not horseshoes). 2013 as KØDQ @ WW1WW in ARRL DX CW. First single op to work 5000 QSOs from U.S. in a major contest (5170) and set all-time world record. (Increased QSO record to 5609 in CQ WW CW 2013)."

Scott Redd, KØDQ, with teammate Ken Low, KE3X, represents USA call district 3.

The specific challenges he sees for contesting in the future are "activity levels as my generation phases out." He concludes, "Was basically out of contesting for two decades due to professional responsibilities. Great coming back. One of the few hobbies you can remain competitive into your seventh decade. Still great fun. Looking forward to the ham radio 'Olympics'."

Summary

Be on the lookout for special WRTC callsigns in the IARU HF Championships held starting at 1200 UTC (8 AM Eastern Daylight Time) on Saturday, July 12, and running for 24 consecutive hours, ending at 1200 UTC on Sunday, July 13. As of this writing, the exact WRTC callsigns are unknown, but expect special-event 1×1 calls, probably in the range of K1A–K1Z, N1A–N1Z and W1A–W1Z. See <http://www. wrtc2014.org/> for more information and a live scoreboard. There will be awards for working the competing teams.

Here's wishing all the competitors great success and much fun! You, too, can join with them and celebrate contesting in 2014! 73, George, N2GA

Looking Ahead In CQ

Here are some of the articles we're working on for upcoming issues of *CQ*:

- **Results, 2014 CQ World Wide 160-Meter Contest**
- *CQ 160* from a WWII German Command Bunker
- Two Stations, One Moon
- A Two-Band "QRP Kilowatt"

Upcoming Special Issues

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 our writers' guidelines on the *CQ* website at <http://www.cqamateurradio.com/cq_writers_guide/cq_writers_guide.html>

BY TOMAS HOOD,* NW7US

It's All About The Noise

A Quick Look at Current Cycle 24 Conditions

(Data rounded to nearest whole number)

Sunspots
Observed Monthly, April 2014: 85
Twelve-month smoothed, October 2013: 75

10.7 cm Flux
Observed Monthly, April 2014: 144
Twelve-month smoothed, October 2013: 135

***Ap* Index**
Observed Monthly, April 2014: 9
Twelve-month smoothed, October 2013: 8

One Year Ago: A Quick Look at Solar Cycle Conditions

(Data rounded to nearest whole number)

Sunspots
Observed Monthly, April 2013: 72
Twelve-month smoothed, October 2012: 59

10.7 cm Flux
Observed Monthly, April 2013: 125
Twelve-month smoothed, October 2012: 119

***Ap* Index**
Observed Monthly, April 2013: 5
Twelve-month smoothed, October 2012: 7

LAST-MINUTE FORECAST

Day-to-Day Conditions Expected for July 2014

	Expected Signal Quality			
Propagation Index.....	(4)	(3)	(2)	(1)
Above Normal: 1, 7-15, 18-24, 27-28	A	A	B	C
High Normal: 3-6, 16, 26, 30-31	A	B	C	C-D
Low Normal: 2, 17, 25, 29	B	C-B	C-D	D-E
Below Normal: N/A	C	C-D	D-E	E
Disturbed: N/A	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 3 will be great on July 1st, fair to good on the 2nd, and good from the 3rd through the 6th, etc.

3. As an alternative, 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 ionospherically supported.

One of the most common obstacles that can block your ability to catch that rare DX station is local RF noise, covering up those weak signals with sometimes such strong levels you might not even catch the local HF net! There are books written, and many magazine articles, too, on how to address local noise sources, isolating them and then curing your environment of them. Using your favorite, powerful Internet search engine might also reveal useful examples of cures for the common local noise problem. A Google search using the search phrase "radio reception and noise" yields a wealth of links that include resources focusing on AM broadcast reception and the problems of local noise, as well as VLF radio reception. When searching on your own proves unsuccessful, you might resort to working with your local amateur radio club or with the ARRL (see for, example, <http://g.nw7us.us/13oDKA8>, <http://g.nw7us.us/U6Htnn>, and <http://g.nw7us.us/U6Hvvt>.

After dealing with local noise problems, how does noise affect radio signals? There are two naturally occurring sources of noise: atmospheric and cosmic noise. Cosmic noise, which originates at points outside of the Earth's atmosphere, doesn't contribute much to the problem of radio signal reception. However, atmospheric noise has a significant impact on the reception of a radio signal. Atmospheric noise is the bane of summertime radio reception!

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Atmospheric Noise

As we begin our look at atmospheric noise (see fig. 1, a map showing the global distribution of electrical storms), it is most useful to look at the problem as an issue of effectiveness. Often, when people talk about radio reception, signal strength is touted as the most useful factor in the effort of getting a signal from the transmitter to the receiver. However, since the problem of reception is more complex than a simple power issue (just pump more watts into the antenna), the better way to get a handle on the problem is to use the signal-to-noise ratio (SNR) measurement of a circuit (the radio circuit is the path between, and including, the transmitter and receiver). The SNR is a real measure of effectiveness. With it, we can better understand how effectively a signal can get from point A to point B.

Take a look at the four sample radio circuit analysis graphs (figs. 2, 3, 4, and 5). These are all modeled with isotropic antennas on both ends of the radio circuit, and the transmitter is running 1000 watts. Each graph shows the SNR in dB on each of the standard amateur radio HF bands at 1400

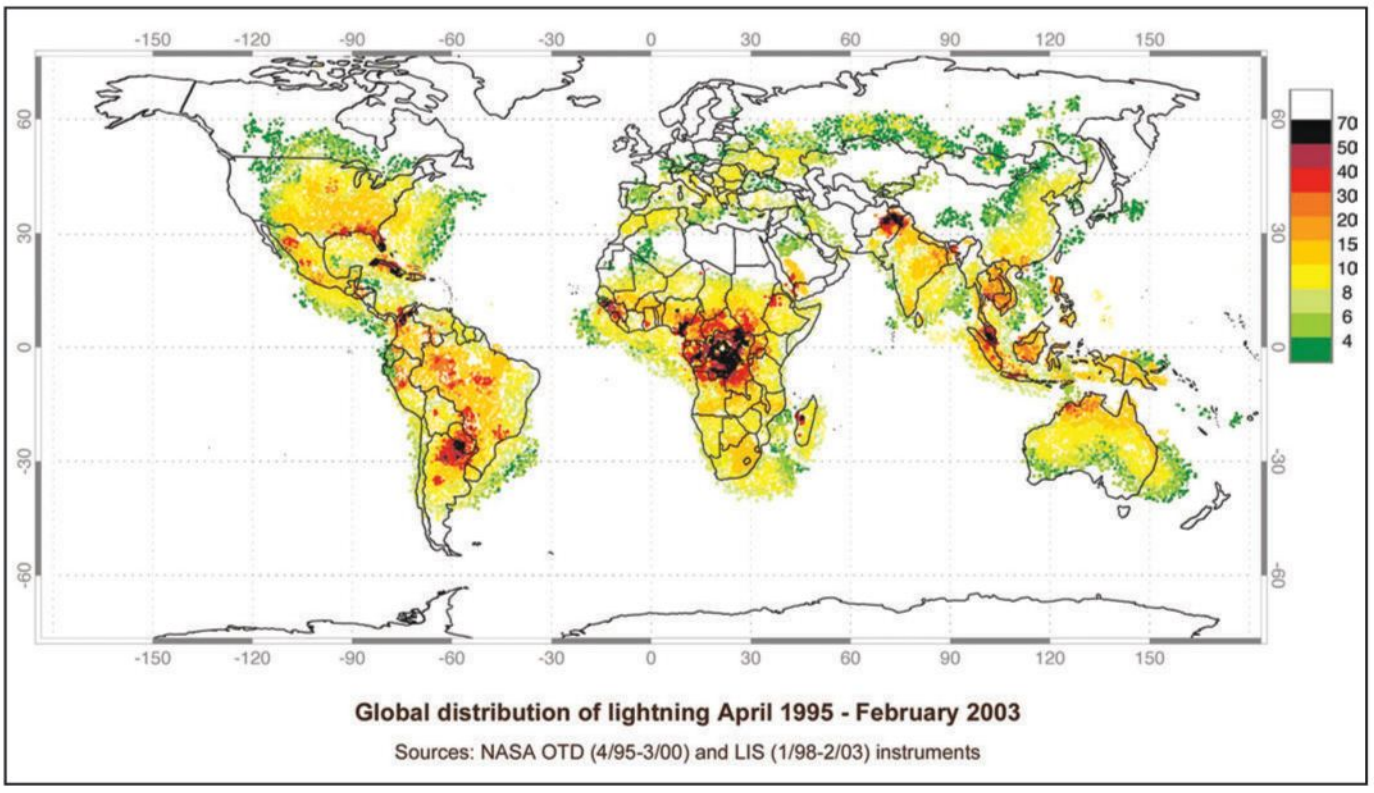

Fig. 1. The global distribution of lightning, the source of atmospheric noise that plagues reception on the high frequencies; see text. (Credit: NOAA)

UTC, for July 2014, between Nebraska and New York. Fig. 2 models the circuit with a man-made (MM) noise level of "remote" at the receiver (164-dBW-Hz, for 1-Hertz bandwidth at 3 MHz). Note that "propagation" is possible on 20 meters, and marginally on the 40-meter band. The green color for a frequency band indicates that the circuit reliability is at least eighty percent. This means that for eighty percent of the month, statistically, the signal will be reliably received on this circuit.

Increase the MM noise by 10 dB, and we see a slight degradation on the bands, enough that propagation is lost on 40 meters, but still remains "good" on the 20-meter band (fig. 3). Increase noise by another 10 dB, however, and you can note a significant degradation in circuit quality on even 20 meters (fig. 4). Finally, increasing the noise level a full 24 dB over the remote level as shown in fig. two, you can see severely limited circuit usefulness on any band (fig. 5).

This means that with all parameters except noise staying the same (power, antenna, solar activity, azimuth, time of day), MM noise makes a very large difference in the quality of a circuit. Be careful not to generalize from that finding, as different circuits and different seasons would yield different data, I'm sure. The noise factor in these examples was based on MM sources. The other source of noise, atmospheric, also plays this same way in a circuit's usefulness.

All atmospheric noise is created by weather. More specifically, this noise comes from lightning flashes, with most of the noise caused by cloud-to-ground flashes because the currents in those strokes are much stronger than those of cloud-to-cloud flashes. However, some energy from horizontal flashes gets converted into vertically polarized energy and adds to the total at the ground receiver. (Horizontally polarized energy doesn't propagate well to the surface, but

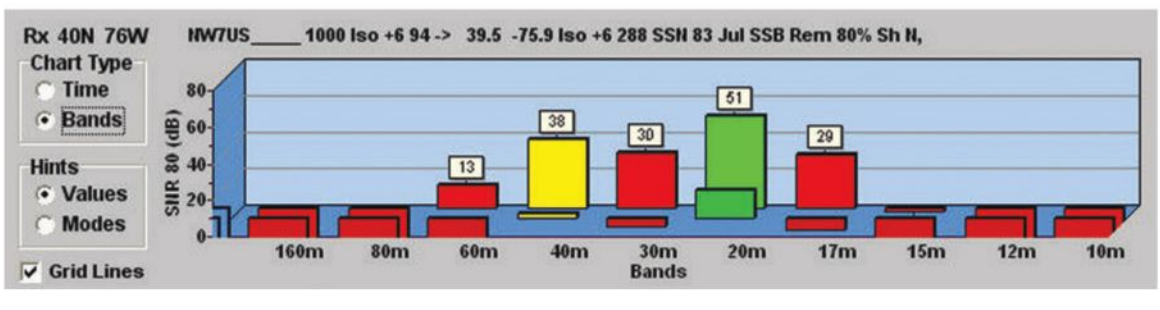

Fig. 2. The signal-to-noise (SNR) analysis graph of a sample radio circuit modeled with isotropic antennas on both ends of the radio circuit. The transmitter is running 1000 watts. The graph shows the SNR in dB on each of the standard amateur radio HF bands, at 1400 UTC, for July 2014, between Nebraska and New York when the station in New York is in a "remote" noise environment. (See text for explanation). (Credit: ACE-HF Pro [http://hfradio.org/ace-hf/], used by NW7US

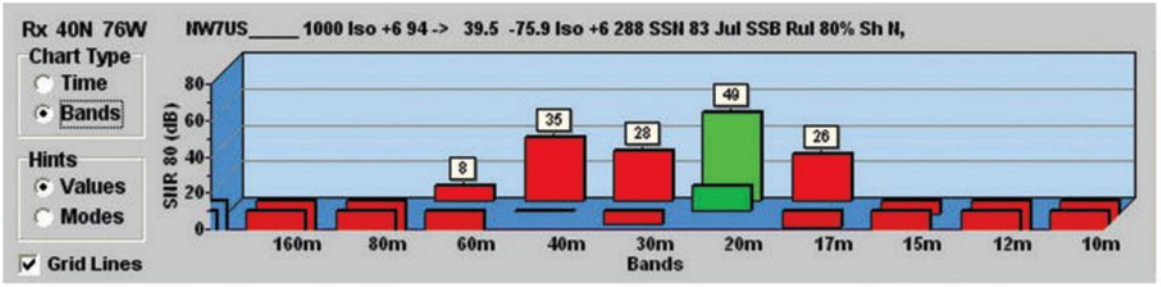

Fig. 3. The signal-to-noise (SNR) analysis graph of the sample radio circuit between Nebraska and New York when the station in New York is in a "rural" noise environment. (See text for explanation). (Credit: ACE-HF Pro [http://hfradio.org/ace-hf/], used by NW7US)

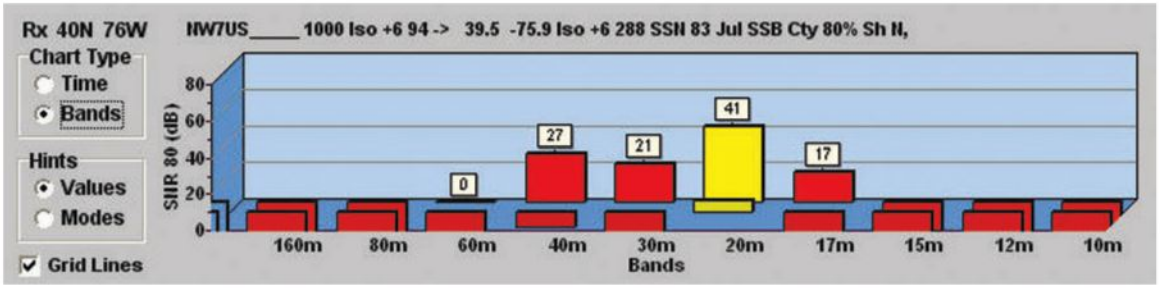

Fig. 4. The signal-to-noise (SNR) analysis graph of the sample radio circuit between Nebraska and New York when the station in New York is in a "city" noise environment. (See text for explanation). (Credit: ACE-HF Pro [http://hfradio.org/ace-hf/], used by NW7US)

is an important factor with airborne radio reception, such as used in transoceanic flights.)

Worldwide, more than eight-million lightning flashes occur daily. That's roughly 100 lightning flashes (with their resulting pulse of radio noise) per second. If your receiver is very far away from most of the storm centers, you'll only experience what is sometimes called "white noise." Atmospheric noise is impulsive, though, and is not evenly distributed as is true with white noise. White noise, when viewed on a 'scope is pretty well evenly distributed, as would arise from cosmic "background" noise. A Gaussian distribution of most parameters usually follows a "normal" (or Gaussian) probability curve, often called a bell-shaped curve. However, impulsive noise is just that—impulsive. If you view it on an oscilloscope, it looks like short-lived pulses rising out of an even bed of background noise.

Atmospheric noise, then, is the combination of many, many lightning flashes. Radio scientists model each thunderstorm center as a radio transmitter, usually called an "Equivalent Noise Transmitter," or ENT. Such energies then propagate around the world just as do international broadcast radio transmissions. At a receiver we can then add up all of those energies propagated from worldwide storm centers. We find that the amount of that power-sum varies with seasons and with the nearness of the major storm centers.

Starting in the 1960s and continuing through the 1980s, a worldwide effort was made to measure all of this. The result was the CCIR 322 publication, which has been updated several times. The latest version is the CCIR 322-3 (see <http://g.nw7us.us/1iKUQyC>), which summarizes the vast amounts of raw data on noise (see an example graph of atmospheric noise during the spring season, in the United Kingdom, fig. 6). A reader of the publication will quickly note that frequency plays a great part in HF communication from a noise standpoint. Lightning creates a broad-spectrum emission, but in the high-frequency range, it is frequency-dependent, with noise power decreasing as frequency increases. In VLF work, atmospheric noise dominates nearly completely (assuming an electromagnetic interference-clean local environment and EMI-clean radio components). At HF, however, man-made noise is a large part of the total energy in the high bands.

When the question is asked, "When will good propagation occur?" the reader should look at more factors than just concentrating on the space-weather disturbed environment. The other factors that affect propagation are radio circuit path length and orientation, frequency, diurnal effects, as well as the transmitter power and antenna gain, and the parameters of the receiving station. Space weather and geophysical (weather, geomagnetic field, location) factors are not changeable by the average radio hobbyist (but, if you were God, perhaps you could tweak conditions). The rest of these factors are the parts you can control.

The principal effect is always propagation itself, which is the result of ionospheric profiles that vary over the world as the day-night terminator sweeps through, and that cannot be controlled by the radio operator. One might start by running propagation analysis tools (such as ACE-HF Pro <http://hfradio.org/ace-hf/>) to see how different the ionos-

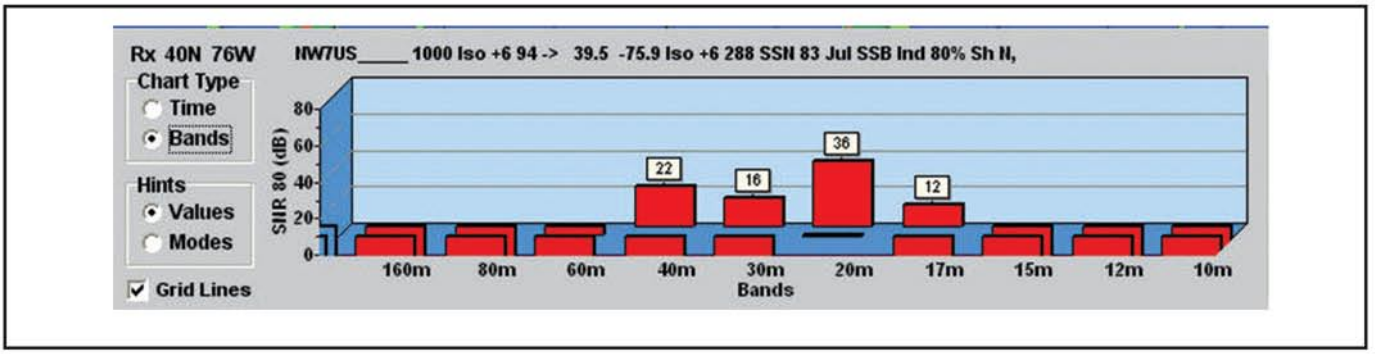

Fig. 5. The signal-to-noise (SNR) analysis graph of the sample radio circuit between Nebraska and New York when the station in New York is in an "industrial" noise environment. (See text for explanation). (Credit: ACE-HF Pro [http://hfradio.org/ace-hf/], used by NW7US)

phere is between steady-state daytime and nighttime, and how that affects reception on simple circuits. (ACE-HF defines the most reliable mode at every time of the prediction.) You might not need the power of a computer propagation tool such as ACE-HF to see what happens in cases where the radio circuit exists completely in either a day or night ambient environment. However, when the circuit crosses the terminator and part is in day and part in night, the problem gets harder, and using computer modeling to sort out all the variables is about the only practical solution.

Thus again, "When will good propagation occur?" Tools such as ACE-HF will show you and will sort out the best frequencies to use, regardless of environmental conditions. Using ACE-HF, a selected radio circuit can be defined, and then an analysis of the affect of noise can be made. Change out different antenna models and see what that does to your reception. After you begin to understand the way these factors influence radio propagation, then you can begin playing with the differences caused by the range of smoothed sunspot numbers (SSNs), the month, and so on. Using the powerful modeling tools of ACE-HF (such as the animated maps that show the hour-by-hour coverage of a transmitted signal), one quickly can see that generalized "rules of thumb" about sunspots are often overly simplified. While low SSNs are usually worse, some frequencies favor lower SSNs while others favor higher SSNs. It all depends on time of day, season, circuit position, and so on.

Now we have begun to understand "when good propagation will occur." And we haven't touched on the disturbed environment. What then about *A*- and *K*-indices, solar flux, solar

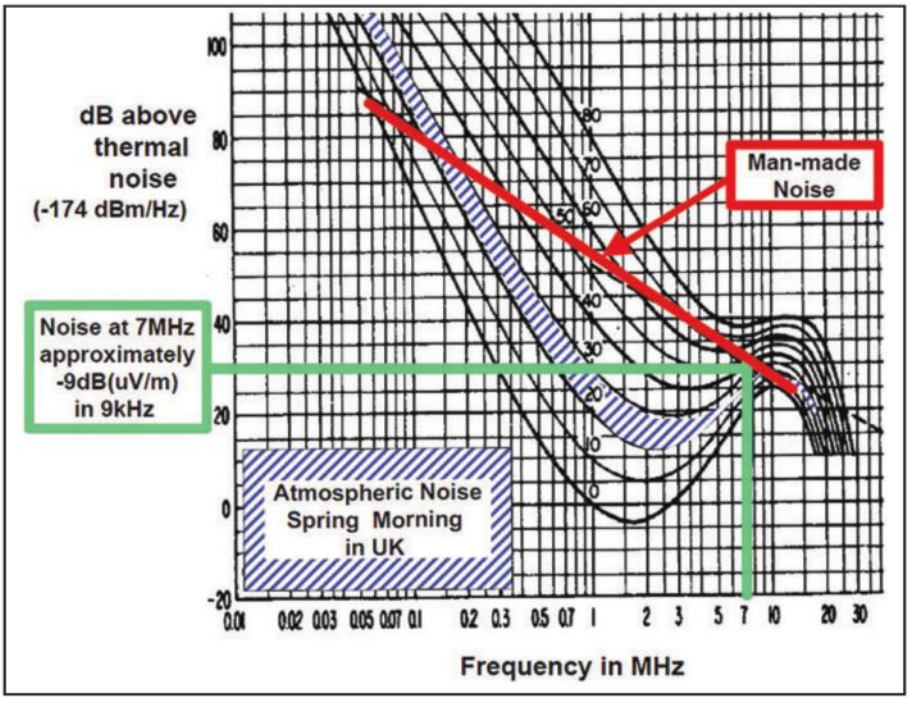

Fig. 6. Amount of atmospheric noise for LF, MF, and HF spectrum according to CCIR322, with overlaid lines added by G3JWI for published presentation on behalf of RSGB. (Source: Wiki Commons [see http://en.wikipedia.org/wiki/Atmospheric_noise])

flares, geomagnetic fields, and so on? I suggest that to emphasize those factors alone is a mistake, because ACE-HF and other tools that use the Voice of America VOACAP engine <http://g.nw7us.us/1iKVmNg> (which is keyed to the CCIR data) have built in compensations for such factors. This is where statistics comes in.

The reason for this is that VOACAP was calibrated through measurements made during a wide range of environmental conditions so that the resulting SNR distributions implicitly include the effects of a range of disturbed conditions. The range of environmental effects is built into the model and shows up in the statistical factors. Since VOACAP was validated through so many years of testing, and is generally acknowledged to be the "gold standard" of propagation models, it's a relief to know how easy it is to use with confidence. From a radio hobbyist standpoint, it is much easier to use tools based on VOACAP, such as ACE-HF, than other models where such factors must be laboriously worked out and input.

In up-coming issues, we'll dig more into "when will propagation be good" using propagation tools such as ACE-HF. We'll explore how to use these tools to begin unlocking the science of radio propagation at HF. More than ever before, with powerful computers available for reasonable prices, and with affordable tools, any radio hobbyist can begin to make sense of all these factors that play a role in radio communications on HF.

Summertime Blues

The current solar Cycle 24 has had two peaks of sunspot activity (easily seen in the monthly smoothed numbers). It is clear that we might now be in the decline phase of this current cycle. The geomagnetic activity has shown a slight increase. In previous cycles, we saw a more dramatic increase in this activity, but we expect a steady dose of elevated solar-wind speeds and solar plasma as this cycle moves away from sunspot maxima, causing a regular degradation of HF conditions in the next few years. Of course, this might be good news for VHF DX hunters, as there might well be an increase in aurora-mode propagation. This provides an opportunity for some exotic DXing on the VHF bands.

HF Propagation for July

Many DX hunters view July as the least exciting month of the year. With generally lower daytime maximum usable frequencies (MUFs), the highest of the amateur HF bands are mostly unusable for long-distance *F*-layer propagation during the summer. Added to this seasonal change is the low solar activity of this ever-meandering cycle. We might already in the ending phase of Cycle 24.

While ionospheric *F*-region propagation of the highest HF frequencies will be poor, radio signals near the best usable frequency (BUF) will be stable over paths that could remain open for longer periods than during the winter and early spring season. In addition, July's sporadic-*E* (*Es*) ionization is near the year's seasonal peak. This should result in a considerable increase in short-skip openings on almost all of the high-frequency amateur bands and on 6 and 2 meters as well.

Twenty meters should continue to be the best band for DX propagation during the month. When conditions are at least Low Normal, the band is expected to remain open to one area of the world or another from sunrise through the early evening. Peak conditions on 20 meters are expected for a few hours after local sunrise and again during the late afternoon and early evening, when the band should open in almost all directions. When conditions are at least Low Normal, expect 20-meter openings toward South America, the South Pacific, and Oceania until as late as midnight. When conditions are High Normal or better, the band should also remain open to most other areas of the world until as late as midnight.

Considerably fewer *F*-layer path DX openings are expected on 15 meters and very few, if any, on 10 meters during July, than during previous years. This is due to a combination of changing seasonal conditions and the current level of solar activity in the decline of this solar cycle. When conditions are at least Low Normal, 15 meters should occasionally open toward the south. Look for some short-skip openings into the Caribbean area and Central America as early as 10 a.m., with a peak expected to all areas of Latin America between 3 and 5 p.m. local daylight time. When conditions are High Normal or better, the band may also open to Africa during the late afternoon from the eastern half of the country, and to Australasia and the South Pacific area during the late afternoon and early evening from the western half of the country. Seventeen meters will act somewhat the same as 15, but openings will be tend to be longer, and signals perhaps stronger and more stable.

Expect short-skip openings on 10 and 12 meters during July toward the Caribbean and possibly Central America as a result of sporadic-*E* ionization. When conditions are High

Normal or better, an occasional opening deeper into South America may be possible, especially during the afternoon hours.

Overall, look for frequent short-skip openings on 10, 12, 15, and 17 meters between distances of 500 and 1300 miles. During the afternoon hours skip may extend to beyond 2300 miles as a result of *F*-layer reflection. Short-skip openings should range between 250 and 2300 miles on 20 meters. Peak conditions are most likely to occur during the late morning and again during the late afternoon and early evening hours. Daytime openings on 40 and 30 meters should range between 100 and 600 miles, increasing to between 250 and 2300 miles after sunset. Look for openings up to about 300 miles on 80 meters during the day, extending out to the maximum short-skip (one-hop *F*-layer reflection) of 2300 miles during the hours of darkness.

Nighttime openings into many areas of the world are possible on 20, 30, and 40 meters. However, seasonally high static levels may often make DX reception difficult on both 30 and 40 meters. High static levels are also expected to result in somewhat poorer DX conditions on 80 meters, although some long-distance openings are forecast during the hours of darkness. 160 meters is virtually shut down due to the high static levels of summer. The best bet for 40-, 80-, and 160-meter DX openings is an hour or two before midnight for openings toward the north and east, and just before local sunrise for openings toward the south and west. Expect some 160-meter openings between sunset and sunrise for distances up to approximately 1300 miles, if the seasonally high static levels permit.

Good daytime openings on 40 and 30 meters should range between 100 and 750 miles, increasing to between 250 and 2300 miles after sunset. Look for openings up to about 300 miles on 80 meters during the day, extending out to the one-hop limit of 2300 miles during the hours of darkness. However, these bands could be quite noisy.

While no short-skip openings are likely on 160 meters during the daylight hours of July, expect some openings between sunset and sunrise for distances up to approximately 1300 miles, if the static levels are low.

Tropospheric Ducting

Scattered reports of tropospheric openings on VHF have been made since spring, corresponding to severe spring weather. Now that we're in the first part of summer, tropospheric ducting should be on the increase. In tropospheric ducting, radio waves are trapped in a type of natural waveguide between an inversion layer and the ground or between two inversion layers. Ducting causes very little signal loss and often signals are only heard at each end of the waveguide. Ducting via the troposphere can propagate signals great distances, such as from Hawaii to California. This ducting depends on large weather systems, however, that are more common during the late summer. With the early reports, though, it is worth watching for this mode of propagation. The summer weather season may well be violent and eventful.

Advanced visual and infrared weather maps can be a real aid in detecting the undisturbed low clouds between the West Coast and Hawaii or farther during periods of intense subsidence-inversion band openings. This condition occurs also over the Atlantic. There is a great resource on the Internet that provides a look into current conditions. Bill Hepburn has created forecast maps <http://g.nw7us.us/MfedDD>, which includes maps for the Pacific, Atlantic, and other regions.

If you know that conditions are favorable for tropospheric ducting in your area, try tuning around the 162-MHz weather channels to see if you can hear stations way beyond your normal line-of-sight reception. It is possible to hear stations over 800 miles away. Amateur radio repeaters are another source of DX that you might hear from the other end of the duct.

These openings can last for several days, and signals will remain stable and strong for long periods during the opening. The duct, however, may move slowly, causing you to hear one signal well for a few hours, to then have it fade out and another station take its place from another area altogether.

Sporadic-E Conditions

Statistical studies show that a sharp increase in sporadic-*E* propagation takes place at mid-latitudes during the late spring and summer months. During July and August short-skip propagation over distances ranging between approximately 600 and 1300 miles should be possible on 6 meters. Openings may also be possible on 2 meters during periods of intense sporadic-*E* ionization with stations up to 1300 miles away. While sporadic-*E* short-skip openings can take place at just about any time of the day or night, statistics indicate that conditions should peak for a few hours before noon and again during the late afternoon and early evening. During July you can expect 6-meter sporadic-*E* on at least three out of every four days. Openings may last from a few minutes up to hours.

Field Day: How Was Your Experience?

Speaking of sporadic-*E* propagation, the annual ARRL Field Day was this past June 28 and 29. How did you and your team fare? Did you experience any surprises in propagation conditions? Did sporadic-*E* provide any excitement? Please let me know.

Current Solar Cycle Progress

The Royal Observatory of Belgium reports that the monthly mean observed sunspot number for April 2014 is 84.7, a sharp decline from the March number of 92.2 and February's 102.8. The 12-month running smoothed sunspot number centered on October 2013 is 76.0. The forecast for July 2014 calls for a smoothed sunspot count of about 83, give or take seven points.

The Dominion Radio Astrophysical Observatory at Penticton, BC, Canada, reports a 10.7-cm observed monthly mean solar flux of 144.3 for April 2014, also down from 149.9 for March. The 12-month smoothed 10.7-cm flux centered on October 2013 is 134.7. The newly released predicted smoothed 10.7-cm solar flux for July 2014 is 138, give or take seven points.

The observed monthly mean planetary *A*-index (*Ap*) for April 2014 is 9, showing a rise in geomagnetic activity. The 12-month smoothed *Ap*-index centered on October 2013 is 7.8. Expect the overall geomagnetic activity to vary greatly between quiet to minor storm levels during July.

I thank those of you who have taken time to write to me. I welcome your thoughts, questions, and experiences regarding this fascinating science of propagation. I also welcome corrections and clarifications. You may e-mail me, write me a letter, or catch me on the HF amateur bands. I also invite you to participate in my online propagation discussion forum at <http://hfradio.org/forums/>. Don't forget to check out the NW7US Propagation Center at <http://SunSpotWatch.com>. If you are on Facebook, check out <http://www.facebook.com/spacewx.hfradio> and <http://www.facebook.com/NW7US>. I look forward to hearing from you. Happy DXing!

73, Tomas, NW7US

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HAM RADIO GIFTS: <www.mainestore.com>

FT243 AND HC6U CRYSTALS: www.af4k.com

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CHECK SPOTS; log contacts; manage QSLs, LoTW with DXtreme Station Log: <http://www.dxtreme.com/>.

FUTURE TIMES: Dreams and visions of Disasters. Great guide book for Hams. www.xlibris.com/futuretimes.html

OLD QSLs Available. 50's and 60's, DX and USA. Specify call, send SASE. W5SQA@arrl.net

HAM RADIO PARADISE in the Pacific (NA-072) for sale. See www.qsl.net/hp1vxh and e-mail to contadora@gmx.de

QRP KITS: <www.breadboardradio.com>

SOTA BEAMS: <http://www.sotabeams.co.uk>. G3CW**HAM RADIO CLUB WEBSITES & NEWSLETTERS:** Domain names, websites, email, newsletters, logos and club marketing aids. Newsletters customized for your club. So affordable any size club can now have a professional newsletter. http://www.HamRadioWebsites.Net (503-717-3484)

FMTV ARTICLES: Comprehensive transmitter and receiver deviation calibration, standards, intermodulation, power amplifier calculations. WB9OQM, http://mathison.freeshell.org

ROSS DISTRIBUTING: Go to <www.rossdist.com>. WB7BYZ

Wanna ham in the **CAYMAN ISLANDS**?" Go to <www.martykaiser.com/24a.htm>.

HF Mobile or Fixed Virtual X Antenna Patent: For Sale or License. Request Free Power Point Presentation file. Shows design details, pictures, prototype tests. Design applies to a broad frequency range for mant antenna arrays/beams/verticals. <lgslay@sbcglobal.net>. Larry Slay, K5WUL

WANTED: Good 8236 Pentode Electron Tubes for my transmitter. What price each do you need and how many can I order? Dave at 281-781-5955 or <fullerphone7150@yahoo.com>.

NEED ROPE? All kinds,types, including: antenna rope, hauling, gin. **FREE**, free consultation, Go to <http://www.davisropeandcable.com/>. Veteran owned, K1PEK, 978-369-1738.

TV TECHNOLOGY pen-pal wanted to help me (a prisoner) learn about Cableheads, Satellite TV, FTA Satellite channels, IPTV, microwave relays, etc. Please write to Samuel Grauman #114227, SCF 1B-304, PO Box 6000, Sterling, CO 80751. My inmate #, and a return address, are required on all letters..

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washington beat

COMPILED BY RICHARD FISHER, KCQ6PC

Shiver Me Timbers: Three FM Pirates Under FCC Scrutiny

The Federal Communications Commission has fined two FM radio pirates a total of $45,000 for operating stations without a license, according to a report posted on RadioWorld.com <http://bit.ly/1ovO2ZK>.

A Notice of Apparent Liability for Forfeiture of $25,000 has been issued to **Damian Anthony Ojouku Allen,** of Fort Lauderdale, Florida "for operating a station without a license ... The Enforcement Bureau warned him several times that pirate operations are illegal and previously imposed a fine against Allen for operating a pirate station in Pompano Beach, Florida."

"The fact that Mr. Allen would commit the same violation on the same frequency demonstrates a complete disregard for the commission's authority and its rules," writes Dennis Carlton, regional director of the south central region of the Enforcement Bureau in his decision.

The Enforcement Bureau has proposed a $20,000 fine against **Marc-Nus Charles** for operating an unlicensed station on 92.5 MHz in Pompano Beach, Florida. "Charles has a history of such action, according to the decision from Resident Agent Stephanie Dabkowski of the Miami office," the web report noted.

In a separate report by All Access Music Group, <http://bit.ly/1mb6Lqx>, **Walter Olenick** and **M. Rae Nadler-Olenick** face an FCC fine of $15,000 for operation of an unlicensed station at 90.1 FM in Austin, Texas. The Olenicks unsuccessfully argued that they are "not subject to the jurisdiction of the Commission."

HBO's John Oliver Directs Viewers to FCC Website — Havoc Ensues

New HBO talk-show host John Oliver devoted more than 10 minutes of "Last Week Tonight" recently to the issue of net neutrality — urging viewers to comment on the FCC website. With an HBO viewing audience of more than a half-million, the website slowed to a crawl and reported for a few hours it had "experienced technical difficulties with (the) comment system." *(**IN DEPTH:** The full Laugh Button report is at <http://bit.ly/1hbkq4G>.)*

FCC Takes Kentucky, Idaho and Colorado Stations to Task

According to a series of items on All Access Music Group, <http://bit.ly/1mb6Lqx> Federal Communications actions have lightened the pockets of a couple of communications interests, and put one on notice:

- The FCC issued a $10,000 fine against **Meade County Communications**, **Inc**. for public file violations at Country WMMG-A/Brandenburg, Kentucky, which was missing 24 quarterly issues/programs lists, covering its entire license term.
- **Salmon River Communications**, **Inc**. and the FCC have reached a consent decree over late license renewal applications and subsequent unauthorized operation of AC KSRA-A and Country KSRA-F/Salmon, Idaho. Salmon River will make a "voluntary contribution" of $4,000 to the U.S. Treasury to settle the matter.
- The FCC has decided not to fine **KAGM-FM Joint Venture** for failure to properly monitor and light its antenna structure located near Strasburg, Colorado due to its financial situation and past compliance. The move dismisses a proposed $15,000 fine but warns the tower owner that future violations will draw fines.

Commission Chairman Wants More Engineers, Economists

In comments attributed to him during testimony in May before the House Subcommittee on Communications and Technology, FCC Chairman Tom Wheeler said he believes the FCC could use more engineers and economists.

In previous testimony, Wheeler told lawmakers the agency has more than 200 relic computer systems that are costing the agency more to maintain than they would to replace over the long term.

BY GERRY L. DEXTER*, WPC9GLD

Wither VoR? From Russia, With Confusion!

It's becoming a challenge. That is, keeping pace with the incredible shrinking Voice of Russia.

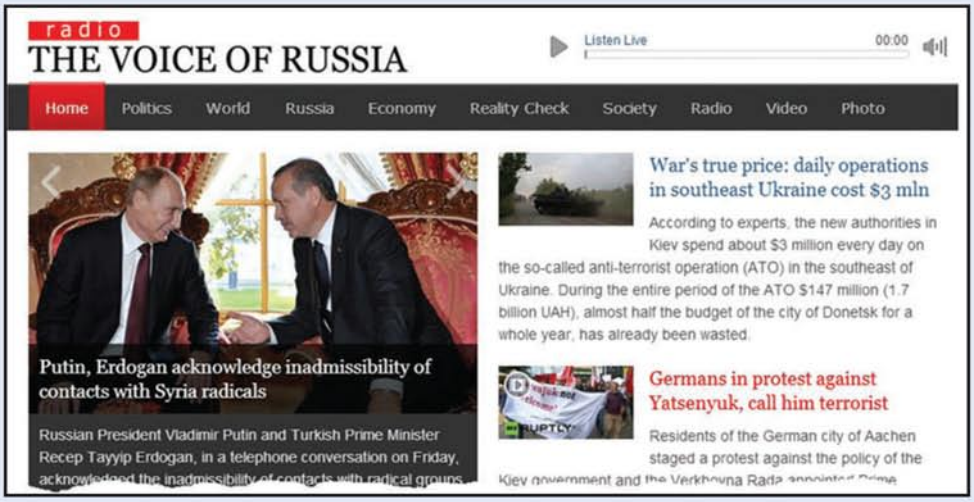
According to Elena Osipova of the VoR World Service Letters Department, as of April 1 the Voice of Russia discontinued all transmissions to the world on both short and medium waves. But never fear, you can still get them via streaming audio — *just don't get seasick.* — at <http://voiceofrussia.com>.

Ralph Perry (IL), who forwarded that bit of news, points out that Radio Rossi <http://www.radiorus.ru> remains active and uses many different sites, so — from a DX standpoint — all is far from lost.

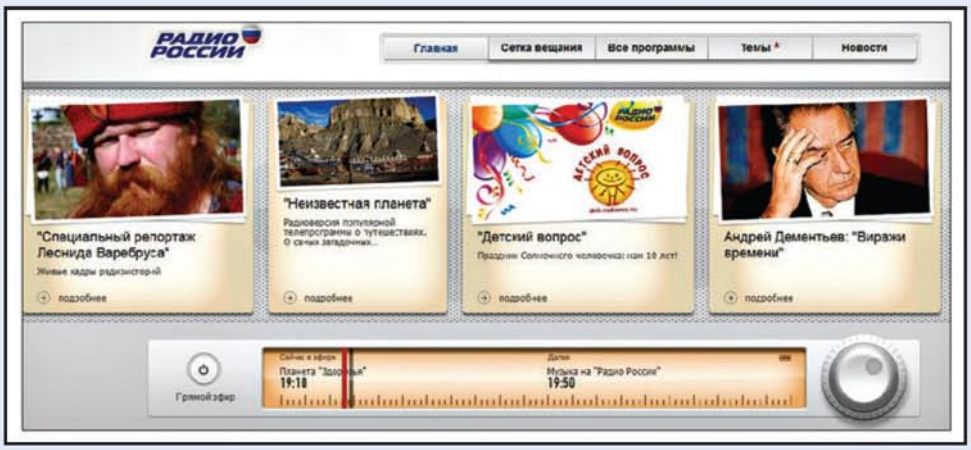
<gdex@wi.rr.com>

A Few of this Month's Shortwave-lets:

- There's a new country on the air: **Horizon FM** from **Tanerife** in **the Canary Islands** went on the air with a throbbing 75 watts (said to be increased to a full kilowatt) on 6255. Ralph Perry, SWBC DXing's Captain Marvel, has heard this new one around 0230, but he notes that its schedule is now 24 hours and the power has been upped to a full 300 watts.



Listeners can "tune in" to Voice of Russia streaming audio via the Internet at <http://voiceofrussia.com>. (Internet screen grab)



Ralph Perry, whose listening post is in Illinois, points out that Radio Rossi <http://www.radiorus.ru> remains active and uses many different sites, "so — from a DX standpoint — all is far from lost," writes WPC9GLD. (Internet screen grab)

Top: *Describing the transmission process as "old-time shortwave," the Miami Herald carried a story about Cuban spy number stations. See the full piece at <http://hrld.us/1mz82ZW>. (Internet screen grab)*

Middle: *Radio Free Chosun, finally came through for Bob Brossell in Wisconsin.*

Bottom: *Radio Australia's HF site at Shepparton has been active for over 60 years. (Thanks: Mike Yonicki, ON.)*

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Posted on Monday, 02.17.14 A A Share email print comment reprints

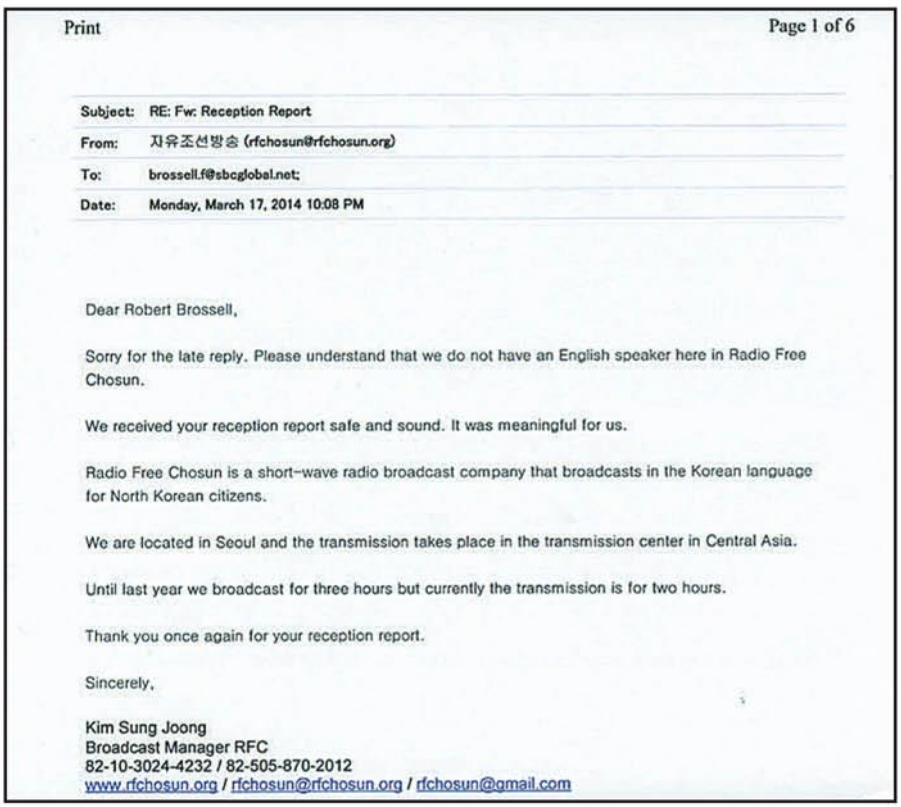
CUBA

Cuban spies received secret messages by old-time short-wave Like 149

BY JUAN O. TAMAYO
JTAMAYO@ELNUEVOHERALD.COM

Even if you're not a Cuban spy, you too can receive secret messages sent by Havana to its spooks in Miami, Washington and around the world.

Every week, one short wave radio station in Cuba broadcasts 97 messages coded in fax-like tones. A computer program easily available to the public changes the tones into numbers, and the Cuban spies



Print Page 1 of 6

Subject: RE: Fw: Reception Report
From: 자유조선방송 (rfchosun@rfchosun.org)
To: brossell.f@sbcglobal.net;
Date: Monday, March 17, 2014 10:08 PM

Dear Robert Brossell,

Sorry for the late reply. Please understand that we do not have an English speaker here in Radio Free Chosun.

We received your reception report safe and sound. It was meaningful for us.

Radio Free Chosun is a short-wave radio broadcast company that broadcasts in the Korean language for North Korean citizens.

We are located in Seoul and the transmission takes place in the transmission center in Central Asia.

Until last year we broadcast for three hours but currently the transmission is for two hours.

Thank you once again for your reception report.

Sincerely,

Kim Sung Joong
Broadcast Manager RFC
82-10-3024-4232 / 82-505-870-2012
www.rfchosun.org / rfchosun@rfchosun.org / rfchosun@gmail.com

- **La Voz de la Resistencia** is a new opposition broadcaster directed to **Colombia**. This station uses 6215 for 45 minutes daily in SS at 1400 and 1900. I'd guess this one might be the Revolutionary Army of Columbia, a.k.a. FARC, which used to operate periodically on the higher end of 6 MHz.
- It looks like the Pacific Ocean breezes are refreshing **Radio Vanuatu**. The station may be refurbishing its 3945 frequency, as well as 7260, both of which open programming at 0700 from Port Vila and use 10 kilowatts, 5055, which WRTH also lists, still seems silent.
- **Radio Nacional Uruguay** (ex: SODRE) is said to be active on 6125 at all hours — all Spanish — using a mere 250 watts. Good luck in hearing this so-called "world service."
- **Cuban spy number stations** are featured in a March, 2014 *Miami Herald.* Visit: <http://hrld.us/1mz82ZW>. The piece was reprinted in the March issue of *The NSWA Journal*, the official publication off the North American Shortwave Association. Information about joining NASWA and all the advantages it offers the SWBC DX listener can be found at <http://www.naswa.net>.
- **WWV** began tests on 25 MHz beginning in early April. The schedule is variable, but it seems to be from about 1500-2100 and the power is presumed to be about 2,500 watts.

Now, Let's Hear from You

Remember, your shortwave broadcast station logs are always welcome. But please be sure to double or triple space between the items, list each logging according to its home country and include your last name and state abbreviation after each. Also needed are spare QSLs or good copies you don't need returned, as well as station schedules, brochures, pennants, station pho-

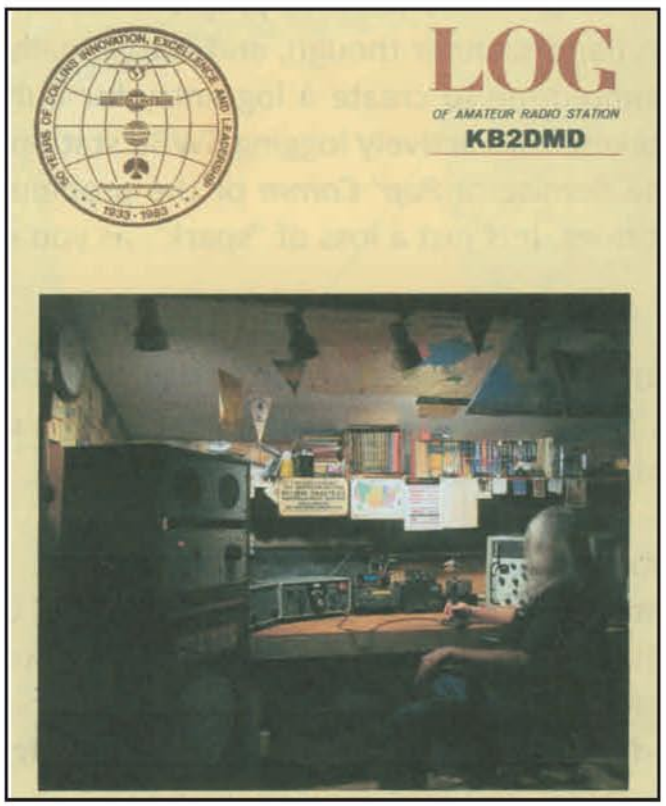
tos, and anything else you think would be of interest. And how about sending a photo of yourself at your listening post? It's high time your photo graced these pages!

July's Shortwave Listings

For this month's shortwave listings, link to: <http://www.CQPluslisteningpost.blogspot.com>. – ***WPC9GLD***.

SWL Listings:
For the latest SWL loggings, visit: <http://www.CQPlusListeningPost.blogspot.com>.

Magyar Radio, a.k.a. Radio Budapest, in Hungary, when they were still active early in the century. (Courtesy of Mike Yonicki, ON.)



Pennsylvania's Rich Parker, KB2DMD, put together his own station log, complete with shack photo. Note that neat Collins 51S-1 on his desk.

it took a mere 54 weeks for Radio Inconfidencia to send this QSL to Bob Brossell (WI).

London Bridge still stands; but the BBC continues to slip. (Courtesy of John Miller, GA.)

NDR (North German Radio via Nauen and Issoudun) verified for D'Angelo with this QSL.

AR6000 Professional Grade 40 kHz ~ 6 GHz Wide Range Receiver

Now tunes to 6 GHz

Continuous Coverage That Goes Far Beyond!

The AR6000 *delivers continuous tuning from 40 kilohertz to 6 gigahertz in a wide variety of modes for professional monitoring performance that's nothing short of amazing in terms of accuracy, sensitivity and speed. Standard modes include AM, FM, WFM, FM Stereo, USB, LSB and CW. An optional module can add the capability to receive APCO25 digital communications plus an optional I/Q output can be added to capture up to one megahertz of bandwidth onto a storage device for later listening or signal analysis.*

Designed for the monitoring or technical service professional, there are no interruptions in the AR6000's tuning range. With exceptional tuning accuracy and sensitivity throughout its tuning range, the AR6000 begins at the floor of the radio spectrum and continues up through microwave frequencies so it can be used for land-based or satellite communications. It works as a measuring receiver for those seeking a reliable frequency and signal strength standard. To support its broad spectrum, the AR6000 has two antenna ports, with the added capability of an optional remote antenna selector from the front panel of the receiver.

With its popular analog signal strength meter and large easy-to-read digital spectrum display, the AR6000 is destined to become the new choice of federal, state and local law enforcement agencies, the military, emergency managers, diplomatic service, lab technicians, news-gathering operations and security professionals.

Continuously amazing, the AR6000 professional grade receiver features:

- 40 kHz ~ 6 GHz coverage with no interruptions
- Multimode AM, FM, WFM, FM Stereo, USB, LSB and CW
- Tuning steps of 1 Hz up to 3.15 GHz; 2 Hz from 3.15 ~ 6 GHz
- Receiver is programmable and manageable through a USB computer interface
- Up to 2,000 alphanumeric memory channels
- Analog S-meter, large tuning dial, front panel power, volume & squelch controls
- Direct frequency input
- Fast Fourier Transform algorithms
- An SD memory card port can be used to store recorded audio
- Two selectable antenna input ports plus optional remote antenna selector

Add to the capabilities of the AR6000 with:

- Optional APCO-25 decoder
- Optional interface unit enables remote control via the internet
- Optional I/Q output port allows capture of up to 1 MHz onto a computer hard drive or external storage device

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Hobby Broadcasting Automation in the 21st Century

BY DAN SREBNICK, K2DLS*

Welcome to the inaugural *Radio and Computers* in *CQ Plus.* Readers of the late *Popular Communications* magazine may remember my column *RF Bits,* which appeared in its printed pages for many years. Well, we've transitioned to *CQ Plus* under our new signature.

It's only natural, right? Much of our analog culture has been migrating to the digital world. Therefore, the transition of a column about the fusion of radio and digital mediums to a digital format makes perfect sense to me.

So let's start off this first digital column with a probing question:

How has digital technology affected your enjoyment of the radio hobby?

- A – positively affected
- B – negatively affected
- C – positively and negatively affected

My answer is C. Does that surprise you? *(**GIVE US YOUR DIGITAL PROFILE:** Link here to let us know how you'd answer the question: <https://www.surveymonkey.com/s/JM3N6H2>. I'll share the results in an upcoming column. – K2DLS.)*

There is a lot to like about the digital revolution. Software Defined Receivers (SDR), advanced scanners, logging programs that run on a smartphone, online call book lookups, and so many other facets of the hobby that we take for granted did not exist 20 years ago. I don't want to go back to that time.

However, switching power supplies, radiating plasma televisions, LED light bulbs, and RF generating computing and network devices have sent the noise level in our shacks up

*Email: k2dls.rfbits@gmail.com

Photo A. *Here's what OtsAV Radio Broadcaster looks like. The list on the left is the current playlist. In the middle is the music library and on the right is the history of what was played so far. The decks are on the bottom and the turntable icons can be used for club-like effects, such as scratches. (Internet screen grab)*

a few S units, and in some cases have made entire frequency ranges unusable at certain locations.

Hobby Broadcasting and the Digital Revolution

Go back 20 years in time. If you wanted to broadcast to your neighborhood, or to the world, there were few options. You could purchase time from a broker — WWCR for example — go Part 15 <http://bit.ly/SUFYrB> with a limited range and limited audience, or go pirate (and possibly face negative consequences). In the digital age, you can host your own podcast or a streaming service on the Internet. No matter which path you take, if your plan is to play music, you will need a wide ranging music library. Potential listeners — even if they're only in your own living room — are going to tire of hearing the same tracks repeatedly.

We have a lot of digital music in our household, not to mention all the analog music in the old vinyl format. My challenge is to get the iTunes collection, the Amazon MP3 collection, and others into a format where they can be used by my broadcast automation software.

Do I Need Broadcast/Webcast Automation Software?

If you only want to listen to your own playlists via a Part 15 transmitter or your home network, there is no need to read further. There are plenty of ways to set up playlists using iTunes, Windows Media Player, Winamp, and so on. I'm talking about the possibility of putting a polished sound on the airwaves or the Internet, complete with live announcements or DJ banter.

Pros Do It, and So Do Pirates

I use OtsAV Radio Broadcaster, from OTS Labs <http://www.otsav.com>, **Photo A**. This is a professional, capable, and very responsive package used by Internet and over-the-air (OTA) stations around the world. I've used it to produce live and pre-recorded broadcasts that have been heard around the world via shortwave and the Internet. There are different versions at escalating price levels, but you can try it out for free for 30 days.

OtsAV isn't the only choice. Another popular package is SAM Broadcaster <http://spacial.com>. SAM has an evaluation package available and I've even run into at least one pirate broadcaster who relies on SAM. Both programs feature virtual turntables, music libraries, and scripting capabilities.

Scripting, you may ask? I can set up an OtsAV script that at the top of the hour, picks a song from the 2000s Alternative Music genre that hasn't been played in a while, and follow that by a classic rock hit from the 1970s. Then play an announcement followed by a golden oldie. Think you can come up with a more pleasing format than your local FM station? Experiment all you want because the power of a professional broadcasting engine is under your control.

Another nice thing about broadcast/webcast automation software is that it does a pretty good job of mixing from one track to another — in most cases. The software analyzes the amplitude, timing and beats per minute of the two selections and mostly gets it right. I have also heard some really jarring segues. So this may be easier than mixing tracks like the DJ of yore but in neither case will always be perfect.

Back to the Challenge

Unless you want to do a talk show, and perhaps even if you do, you're going to need that diverse music library I mentioned earlier. OtsAV can directly read individual MP3 files, but my goal was to import all my iTunes and Amazon MP3 content into Ots Albums. Ots Albums are optimized for speed and use by the OtsAV software.

I had two primary requirements:

- Metadata, the descriptive data about the song, artist, genre, and release date, must be accurate for streaming to the listener.
- The solution needs to be automated and repeatable.

I needed to overcome these issues to meet my requirements:

iTunes protected content. At one time, most iTunes content was protected by digital rights management (DRM) and encryption. These files usually have an m4p extension. Apple moved away from DRM in 2009. Is there a (legal) way to remove the copy protection on these .m4p tracks?

iTunes non-protected content. iTunes uses a high quality CODEC (AAC), resulting in better quality audio files than standard MP3 tracks for the same file size. These files have an .m4a extension. How could I import these tracks into my radio library?

Metadata. Ots assigns album and track metadata from the filename construct and some from ID3V1 tags, **Table 1**. The AAC encoding used by iTunes supports extensive tagging, but not ID3V1 tags. OtsAV expects that the music file is named:

- ##-Artist – Song

What is ID3 (v1)?

The audio format MPEG layer I, layer II and layer III (MP3) has no native way of saving information about the contents, except for some simple yes/no parameters like "private", "copyrighted" and "original home" (meaning this is the original file and not a copy). A solution to this problem was introduced with the program "Studio3" by Eric Kemp alias NamkraD in 1996. By adding a small chunk of extra data in the end of the file one could get the MP3 file to carry information about the audio and not just the audio itself.

The placement of the tag, as the data was called, was probably chosen as there were little chance that it should disturb decoders. In order to make it easy to detect a fixed size of 128 bytes was chosen. The tag has the following layout (as hinted by the scheme to the right):

Internal layout of an ID3v1 tagged file.

Table 1. *Here are the ID3V1 tag layouts as they appear at <http://id3.org/ID3v1>. (Internet screen grab)* ⟶

- Where ## is a track number from 01-99. Note that there is no space between the track number, dash and artist and that there is one space on each side of the dash between artist and song. Files would have to be renamed to this convention. A meta-tag conversion method had to be found.

Ots follows the Redbook CD specification for track numbering, which specifies a maximum of 99 tracks per compact audio disk. However, iTunes and Amazon often now use a disc number before the track number and name, such as:

- 01-01 First Track on Anthology Disc 1

The Ots software doesn't parse this correctly and the files end up displaying skewed metadata. This would need to be worked around.

Compilations. On import into Ots Studio (a music library maintenance tool that is offered free of charge), Artist Name is often replaced in the library data with the Album Name. I didn't want my listeners to see "Various Artists" instead of "The Beatles."

Some Solutions

iTunes Match. In principle, it is irksome to have to spend money on something that you already "own". That said, for a (really) nominal fee of $25 for a year, iTunes offers a cloud service called Match <http://www.apple.com/itunes/itunes-match>. Match makes a backup of your iTunes library in the Apple cloud. But Match also has a bonus. If you upload a previously purchased track with DRM protection, Match offers you the ability to download the track without protection — if an unprotected version is now available. This solved 99 percent of my copy protection issues and did so legally. I was happy about this and highly recommend this approach, even if you only sign up for one year and then cancel the service.

Add a CODEC. I had a few false starts with the AAC formatted music. I installed a CODEC package on my broadcast computer that could decode AAC. I found the free and cleverly named CCCP Project <http://www.cccp-project.net>, which stands for the Combined Community Codec Pack. I started up Ots Studio and imported a batch of music.

A couple of problems were noticed right away. The metadata came in completely wrong. There were no genres or release dates. Sometimes the artist names were wrong and track numbers displayed in the metadata stream. I determined that adding the CODEC made the music format readable and playable but it did nothing to address the metadata needs of the Ots Software. As I mentioned, *ID3V1 required.*

I decided that what needed to be done was to convert the iTunes tracks from AAC to MP3 and to make sure the metadata tags are correct. I looked at a few Windows-based downloadable programs to do this and didn't find the exact capabilities I was looking for. I then discovered ffmpeg.

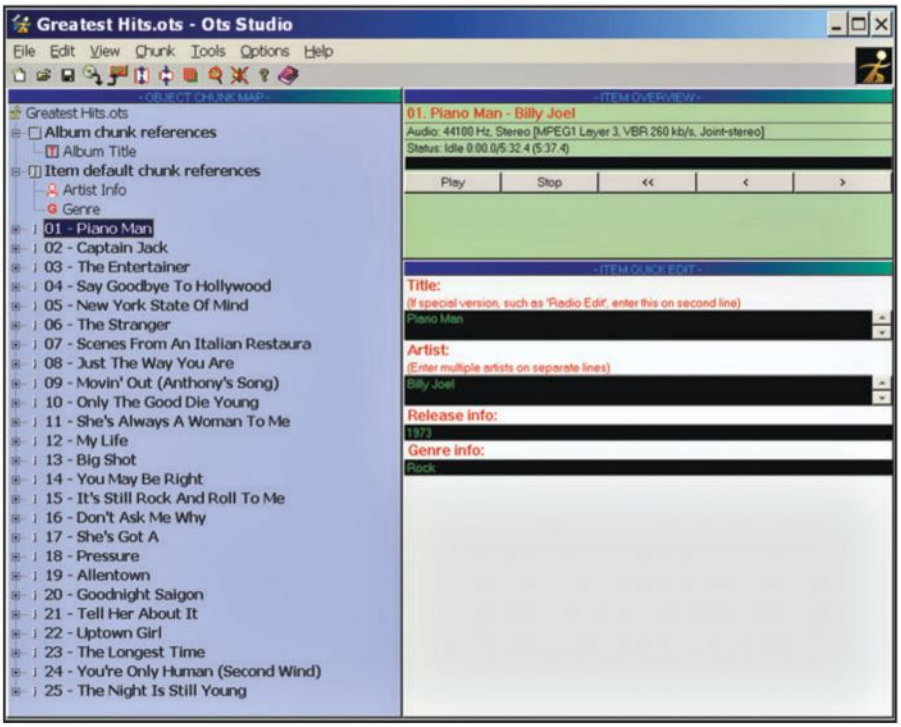


Photo B. *Ots Studio allows the webcaster/broadcaster to maintain albums and update metadata used by OtsAV. (Internet screen grab)*

Linux, Ffmpeg, and Scripts to the Rescue

Ffmpeg is a command line tool. It is available on the Linux platform and is a general-purpose mpeg audio/video tool. *(**NOTE:** More and more hobbyists are turning to Linux, which embraces the spirit of openness and sharing integral to the radio hobbies. – K2DLS.)*

According to <http://www.ffmpeg.org>, "FFmpeg is a complete, cross-platform solution to record, convert, and stream audio and video." It can read the AAC format, write an MP3, and update metatags. After playing with this for a while, I decided it could do exactly what was needed and proceeded to create a bash shell script to automate the process.

Assume the directory structure found in **Table 2**. The script will change directory to Kraftwerk, and then in turn traverse Computer World and The Man Machine. For each album, it will deter-

K2DLS Bash Shell Script Automating FFmpeg

```
Music
    Kraftwerk
        Computer World
            01 Computer World.m4a
            02 Pocket Calculator.m4a
            03 Numbers.m4a
        The Man Machine
            01 The Robots.m4a
            02 Spacelab.m4a
            03 Metropolis.m4a
```

At left are the tree relationships for automating FFmpeg, 'a complete, cross-platform solution to record, convert and stream audio and video.' It can read the AAC format, write an MP3, and update metatags.

Table 2.

mine whether any track numbers are preceded by a disc number, which is not allowed in the Redbook format used by the Ots software. If disc numbers are present, the script will work around this issue by adding an offset to the relative track number, which is just used for sorting purposes. The offsets used are:

- Disc 2 – 25
- Disc 3 – 50
- Disc 4 – 75

Assumptions are that no single disc will have more than 25 songs and that no collection will contain more than 4 discs.

The script will then:

- Extract the tags needed
- Create the filename convention needed by Ots (Track-Artist Title.mp3)
- Convert the file to mp3 and write the tags
- Rinse and repeat as many times as necessary

The script also had to address the need to make sure that the filename created includes the actual artist name, rather than the compilation name.

Copy My Script

The complete script that I developed for my needs is included with this column in the Program Listing found on the *Radio and Computer* landing page: <http://www.CQPlusRadioandComputers.blogspot.com>. It can be copied and pasted for your use from that web address.

Take a look at the ffmpeg command line, **Table 3**. This is where all the work gets done to rewrite the media file as an MP3 and properly set up the meta-tags. The –vsync 2 switch eliminates some errors around album art, which is included in the resultant mp3 file. –aq 0 means use the highest quality variable bitrate encoding.

Alternatives

If you find this too complicated, you may want to look at a combination of other tools. I find Musicbrainz Picard <http://musicbrainz.org/doc/MusicBrainz_Picard> to be a useful tool for mass file renaming to a template, but it did not address converting the m4a files to mp3 while inserting the proper tags. Picard is available for Mac, Windows, and Linux platforms. Mac users will also find a lot of Mac-specific iTunes scripts that are available for music library maintenance.

Danger: *Whatever you do, be certain to make any changes to a backup copy of your music, not to the original files!*

Metadata Menzamenz

Despite all my metadata massaging, the results still seemed to be only menzamenz — Italian dialect for *half and half* or *so-so.* I would often not agree with the genre tagged in the music file. This is further complicated by the sometimes narrow divide between rock and pop, for example.

Worse, however, is the way that the release date is used. If I play a Beatles song from 1965, I expect that the metadata should reflect the original release date. Instead, it might even show 2013, if the track came off the 2013 Beatles American Albums collection.

Ots scripting will make use of genre and release date, but if I want to do a 2000s and today format, the 1965 Beatles song is going to be selected based upon the re-release date. The ID3V2.4 spec seems to fix this by allowing for additional date fields that would

```
if [ $TRACK -lt 10 ]; then
  TRACK="0$TRACK"
fi

  TITLE="`echo $i | cut -d " " -f2- | rev | cut -c 5- | rev`"
MP3SONG="$TRACK-$ARTIST - $TITLE.mp3"
  echo -e "$MP3SONG\n"
ffmpeg -i "$i" -vsync 2 -acodec libmp3lame -ac 2 -aq 0 -ar 44100 -write_id3v1 1
"$MP3SONG"
  done
  cd
```

Table 3. *For emphasis, key data is underlined in RED in the ffmpeg command line. The full code can be obtained by linking to the Radio and Computers landing page at <http://www.CQPlusRadioandComputers.blogspot.com>.*

allow the original date of release to be captured. For the present, however, OtsAV only supports ID3V1.

I would recommend that any serious effort at producing a music station using digitally stored music should have a designated participant who is anointed music librarian and whose job is to reconcile all these issues as the library is built and new songs added.

Hard work

It takes lots of hard work and dedication to put a high-quality, well-produced streaming service on the ether(net). This exploration of "what is takes" has barely scratched the surface. It has increased my understanding of and respect for the many thousands of independent stream and podcast producers who are having fun but will likely never make any money at it.

A side benefit of my efforts is that I have all my music files aggregated on a NAS (network attached storage) server and have complete access to music and playlists from all my devices such as Reciva-based Internet radios. This is made possible via the NAS' included media server software and UPNP protocol. OtsAV or SAM are not required.

Wish List

I would like to see Ots enhance its software to handle the issues that I had to work around through scripting and file manipulation. The multidisc naming issue needs better support. I'd also like to see an update to support for ID3V2 tags as well as the AAC tag format.

Radio and Computers Glossary:

CODEC – A software program that encodes or decodes digital data in a specific format. CODECs are used to code and decode digital music, voice, and video.

Metadata – Data that describes other data. In this case, the labels for artist, song title, etc. that describe a song that is stored in digital format.

ID3 Tags – An industry format for storing music metadata in the same file as the music itself.

Script – A list of instructions to be carried out in a specific order. A type of simple software program.

MP3 – A music encoding format for digital audio that uses lossy compression.

AAC – A music encoding format for digital audio that uses lossy compression, but is better quality for the same file size than MP3.

UPNP – A network communication protocol designed for easy setup and exchange of data, used primarily in residential networks for device communication (printers, cameras) and entertainment (media servers).

– **K2DLS**

For Hams with Disabilities, It's an Ever-Evolving World of Technological Wonder

BY PATRICK TICE, WAØTDA

Welcome to the new world of *CQ Plus!* For those of you making the trip from *Worldradio Online,* our bi-monthly column, *With the Handihams* was a forum where we talked about making amateur radio accessible for people who have disabilities.

I'd written the column for a couple of decades, more or less, which is an eternity in technological time. We've literally made the journey from analog to digital in that time, and nothing — *NOTHING* — is untouched by these changes, including the way we read magazines — which is why we are here in this new medium under a new banner. It's the way people want to use media, everywhere and any time they want to read *CQ Plus.*

Amateur radio, a technical pursuit in the first place, seems more complex than ever in this new world. When I started working with the Courage Center's Handiham program in 1991, our highest and best technology was an IBM Selectric typewriter. Our filing system was index cards and paper in cabinets, and adaptations to radio equipment included gluing pieces of wood (think: part of an old wooden clothespin) onto radio dials to give the user more leverage to click through a bandswitch. *(**VISIT:** The Handiham section of the Courage Kenny Rehabilitation Institute website at <http://www.Handiham.org>. – WAØTDA.)*

Ten-Tec Century 21 CW transceivers were considered super high-tech since they were completely solid-state, and we adapted those for blind users by cutting a hole in the plastic covering the frequency dial display and affixing raised bumps at intervals on the dial. A blind op could feel and count the raised dots while cranking through the frequencies, starting from a known point.

Volunteer readers recorded instruction manuals for us onto cassette tape, and we had tape duplicators to reproduce them for our blind members. Our tape library took up most of a room. A book on tape filled a shoebox.

In 2014 we do things a bit differently. In fact, if you do have a disability today, one might even say that you are living in the best of times. Technology has evolved exponentially, driven by the computerization of everything, a trend that has made analog passé and digital the new normal. Then connect all of it together in networks, make it so small that it's easy to tote, and now you are talking some pretty cool stuff.

The tape library is gone. Who needs it when an entire audio library can fit on a USB stick? And why bother with physical media at all when you can download a book from a website?

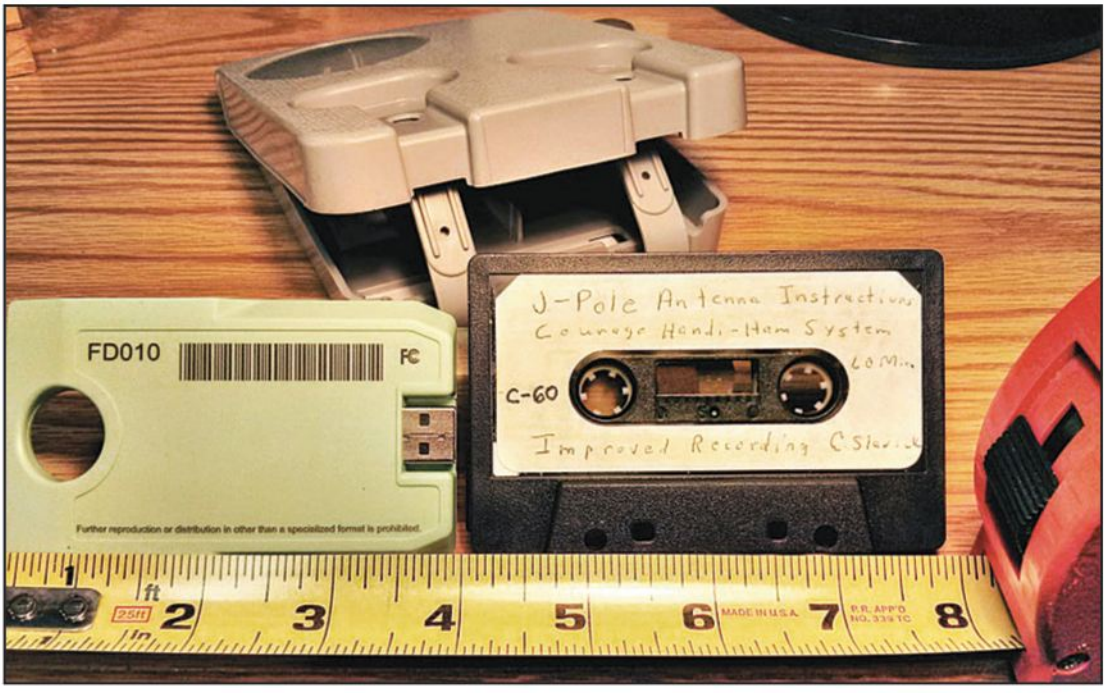
Our blind Handiham members would rather download what they need whenever they want to do so, using screen-reading computers. A book that would have taken 20 cassette tapes and been shipped in a container the size of a shoebox in 1991 can be sent in the mail on a single digital cartridge for new DAISY players distributed by the Library of Congress to blind users. Computer-savvy blind users can usually download the same book even faster, and then transfer it to their digital players.

Technology has evolved exponentially, driven by the computerization of everything, a trend that has made analog passé and digital the new normal.

Even better, we've ditched the idea of reading radio instruction manuals and embraced the idea of teaching the radio through an audio course. It's better to hear an experienced blind user tell you how to run the radio than to slog through a manual. Besides, all major manufacturers now make their

The press of a button on the ICOM IC-7200 and the radio speaks the signal strength and the frequency displayed on the readout.

Ten-Tec Century 21 CW transceivers "were considered super high-tech since they were completely solid state, and we adapted those for blind users by cutting a hole in the plastic covering the frequency dial display and affixing raised bumps at intervals on the dial," writes Patrick Tice, WAØTDA. "A blind op could feel and count the raised dots while cranking through the frequencies, starting from a known point."



Compare the new Library of Congress National Library Service digital cartridge on the left with an old C-60 cassette tape. The cartridge can hold 4 GB of data, which means that entire audio books for the blind, which used to take a whole shoebox full of tapes, can fit on a single NLS cartridge — along with several other books! Players are free from NLS for people with reading disabilities.

Matt Arthur, KAØPQW, has no problem operating the Kenwood TS-590S equipped with the VGS1 Voice Guide option. This inexpensive module makes the 590 blind-accessible, even speaking all the menu settings. The Kenwood rig control software is also blind-accessible, working with screen-reading programs on Windows computers.

manuals available online in Adobe PDF format with embedded text that can be read by blind users with screen-reading computers running Windows, Mac OS, or Linux.

Radios have made the leap to digital, too. Sure, they may still have knobs and buttons on the front panel, but inside they are very different from your dad's radio. What was once considered an expensive custom adaptation – speech frequency readout — is now so common as to be built-in to modestly-priced radios like the ICOM IC-7200 and the Yaesu FT-450D. At the press of a button, the radio announces frequency and mode.

Kenwood radios that take an optional VGS1 Voice Guide module go even further and speak menu item settings along with frequency and mode. Elecraft has begun building accessibility into both its radios and supporting documentation. That is a far cry from having to stick your finger through a hole in the Plexiglas dial cover and counting raised bumps to tell what frequency you were tuned to.

Most modern radios now have data ports — USB ports in the newest ones — and that allows for rig control by computer, a phenomenal advancement for people with mobility disorders who can run adapted computers to control their radios. Compare that to gluing a stick on a knob for leverage.

Of course we are only scratching the surface of technologies that make the lives of people with disabilities better. As we consider some of these in future columns, we'll find out better ways to "meet the challenges" that life deals us.

Some of them will keep us on the air. Some will be useful both in the ham shack and around the house or when we are out and about. Whatever happens, I feel safe in predicting that the trajectory of technology points to a better future in which we will meet our ham radio challenges!

Want to Learn More?

For more information about amateur radio for people with disabilities, please check out the Courage Kenny Handiham Program. Membership is $12 per year.

Courage Kenny Rehabilitation Institute
Handiham Program
3915 Golden Valley Road
Golden Valley, MN 55422
<http://www.Handiham.org>
Toll free: (866) 426-3442

The Yaesu FT-450 and Old National Road Net Check-In

WATCH and LISTEN: *To the Yaesu FT-450D transceiver in action at: <http://bit.ly/SLAuzp>. (Internet screen grab)*

Did You 'Make' the Scene At the 2014 Dayton Hamvention?®

By Richard Fisher, KI6SN

With the themed wedding of the Maker community and amateur radio, a crowd of many thousands jammed the halls and parking lots of Hara Arena for the 2014 Dayton Hamvention® the weekend of May 16-18. *'Make' the scene? You bet they did!*

As you'll see in the accompanying photographs and cartoons, good times were breaking out all over the place. The world renowned "Cat in the Hat," **Joe Eisenberg**, **KØNEB**, was busy making the rounds with his camera, producing a YouTube gallery of images capturing the fun of this year's event to the sounds of ZZ Top's "Sharp Dressed Man." ***(WATCH and LISTEN:*** *To CQ Kit-Building columnist KØNEB's Dayton chronicle at <http://bit.ly/1p0RjkL>. – KI6SN.)*

You'll see, as well, *CQ* cartoonist **Jason Togyer**, **KB3CNM**, was literally making the scene, capturing the action in special 2014 Dayton Hamvention® editions of *"Spurious Signals."*

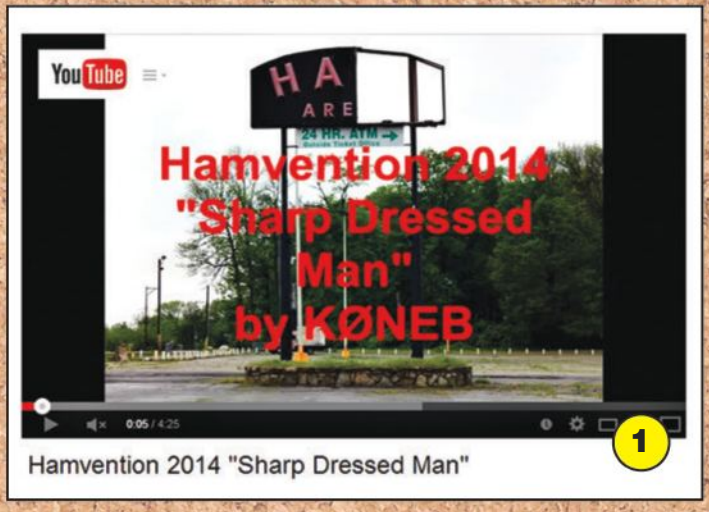
There is no doubt, this year's Dayton pilgrimage was a winner. We're already anxiously anticipating Dayton 2015!

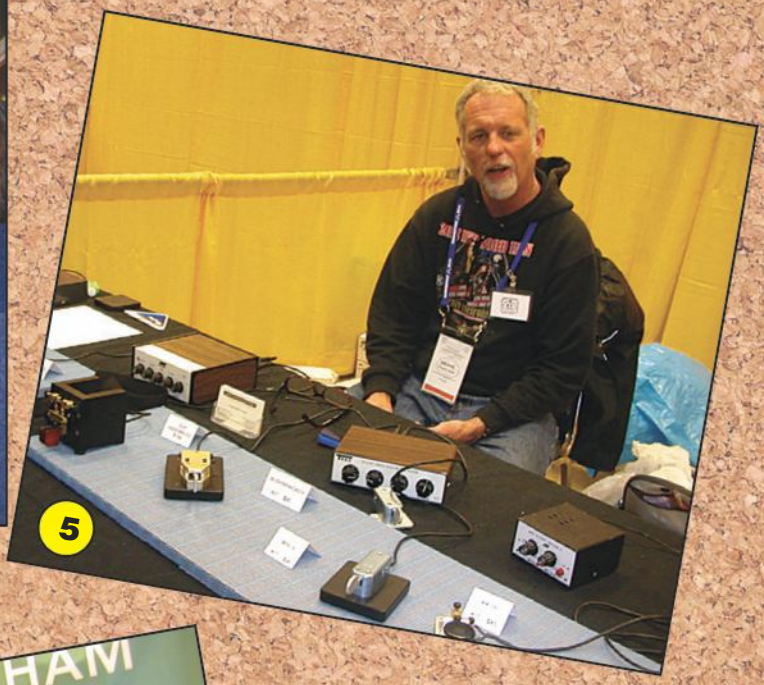
—***KI6SN***

1. *CQ Kit-Building columnist Joe Eisenberg, KØNEB, put his digital camera to work at the 2014 Dayton Hamvention®, resulting in a YouTube production titled "Sharp Dressed Man," with a little help from ZZ Top. (**WATCH and LISTEN:** At <http://bit.ly/1p0RjkL>. –KI6SN.)*

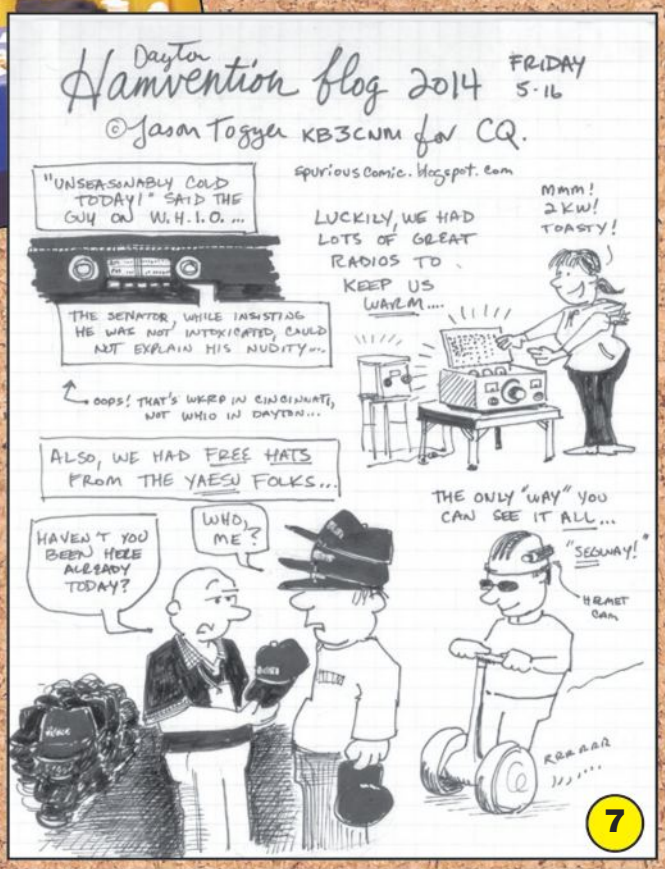
2. *Spurious Signals @ Dayton – Thursday: It's Off to 'Nerdland'*

3. *Dmitry Zhikharev, RA9USU, was thrilled to see his 7O2A callsign listed in May's edition of CQ as the World Single Operator winner in the Contest Expeditions category of the 2013 CQ World-Wide SSB Contest.*





...More Pictures



4. *Kristen Andrews, KB3OQV, ''Antenna Hair Girl," rocked the Hamvention® with her ever-more-innovative folically-supported aerial system. From Washington, Pennsylvania, she has become a Dayton regular, much to the delight of her many fans.*

5. *There were CW instruments galore in Dayton. Here, Doug Hauff, W6AME, mans-the-fort for American Morse Equipment, based in San Luis Obispo, California.*

6. *CQ Plus "Ham Radio Challenges" columnist and CQ Hall of Fame member Patrick Tice, WAØTDA (facing camera) spread the word about the Courage Kenny Rehabilitation Institute in Minnesota over the three-day Dayton Hamvention®.*

7. *Spurious Signals @ Dayton – Friday: We're Just Getting Started*

And Some More...

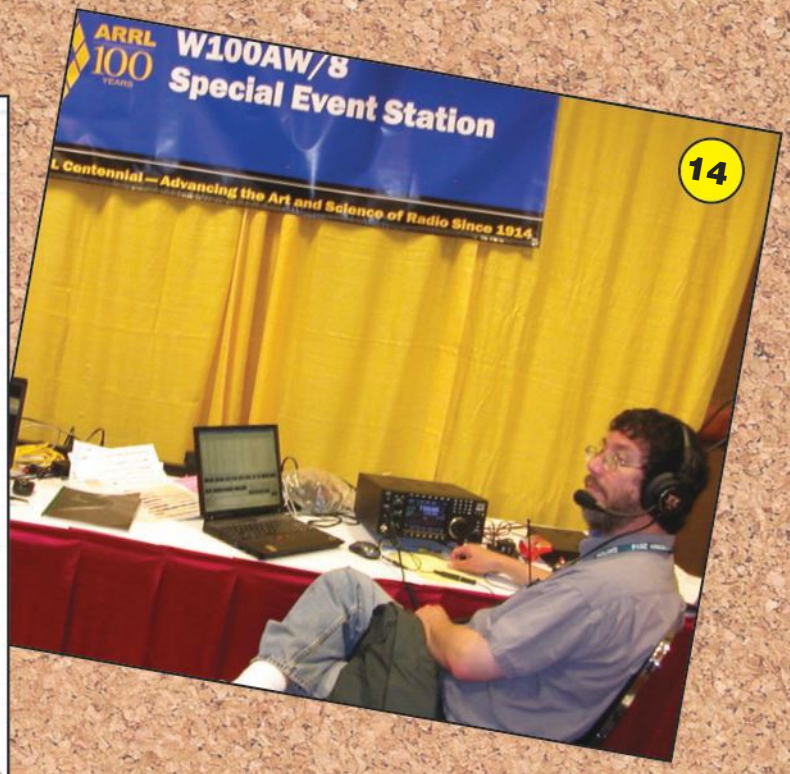
8. Keith Miller, KA9RSL, of Syracuse, Indiana, took a few moments to chat with CQ Editor Rich Moseson, W2VU, before heading off to deliver a Dayton presentation on going bicycle mobile.

9. Spurious Signals @ Dayton – Saturday Morning: Forums and the Flea Market

10. Traveling to Dayton all the way from Qatar, Saleh Alqahtani, A71EZ, left, and Abdulrahim Al-Mushiri, A71BA, pose with "The Cat in the Hat," Joe Eisenberg, KØNEB, who writes the monthly Kit-Building column in CQ magazine.

11. Janice Crawford, KD8CFN, of Beavercreek, Ohio, displays one of the commemorative 2014 Dayton t-shirts, complete with the "Makers" theme.

12. Capt. Manolis Joannou, HP1X, and his wife Nancy, HP1NYC, are all smiles having made the journey from Panama to Hara Arena for the 2014 Dayton Hamvention®.



13. Spurious Signals @ Dayton – Saturday Afternoon: On the Red Carpet

14. There was a steady stream of operators eager to operate the ARRL Centennial station W100AW/8 over the Dayton weekend.

15. "Putting the Power to Create in the Palm of Your Hand," a team representing Andromace Enterprises helped put the "makers" stamp on this year's Hamvention®.

16. Spurious Signals @ Dayton – Sunday: What a Great Show!

BY JOE MOELL,* KØOV

New Apps for Hidden Transmitter Hunting

Most of the time, I'm not an early adopter of consumer electronics. When I'm spending my own money, I tend to sit back while new technologies work out their early bugs, features improve, and prices become reasonable. Sometimes that's smart. I never got stuck with a Betamax or a 300-bps modem.

Desktops and laptops met all my computing needs for many years, but I followed the proliferation of mobile devices and apps with interest. When Bob Iannucci, W6EI, first told me about his Foxhunt app,[1] I had to agree that it was useful and "cool." At the time, I was experimenting with automatic mobile bearing-taking and triangulation on my laptop. I wasn't interested in using a cell phone for triangulation because the screen is far too small to display maps well. Then the Map-n-Compass radio-orienteering course layout app for Apple devices came along and I knew that it was time to spring for an iPad Mini that would run it and all the other radio direction finding (RDF) apps on a display of useful size.

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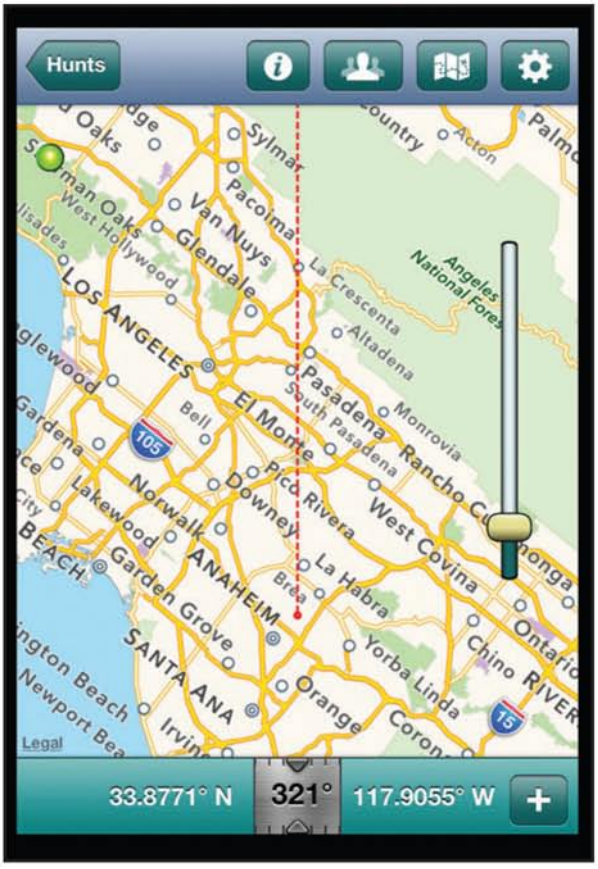
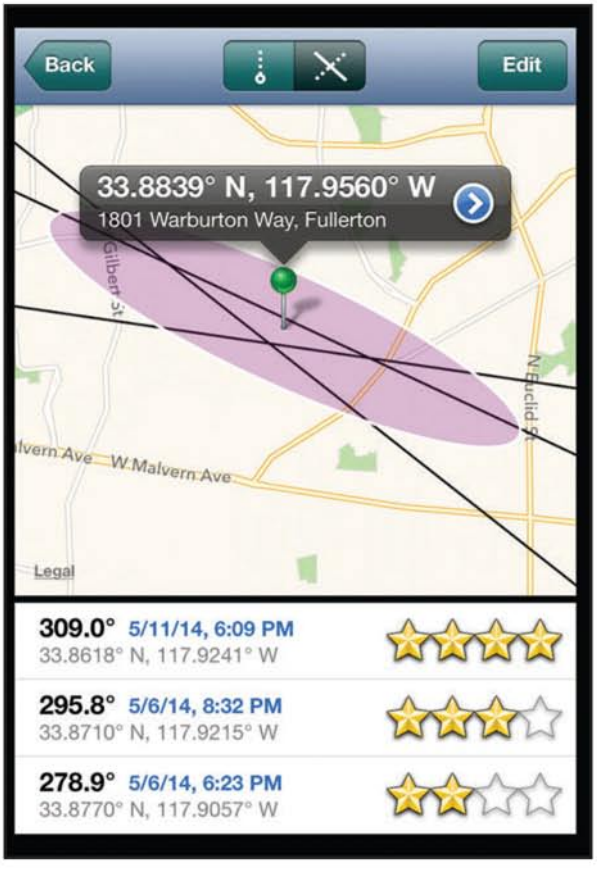
e-mail: <k0ov@homingin.com>
web: <www.homingin.com>

Foxhunt App Gets Better

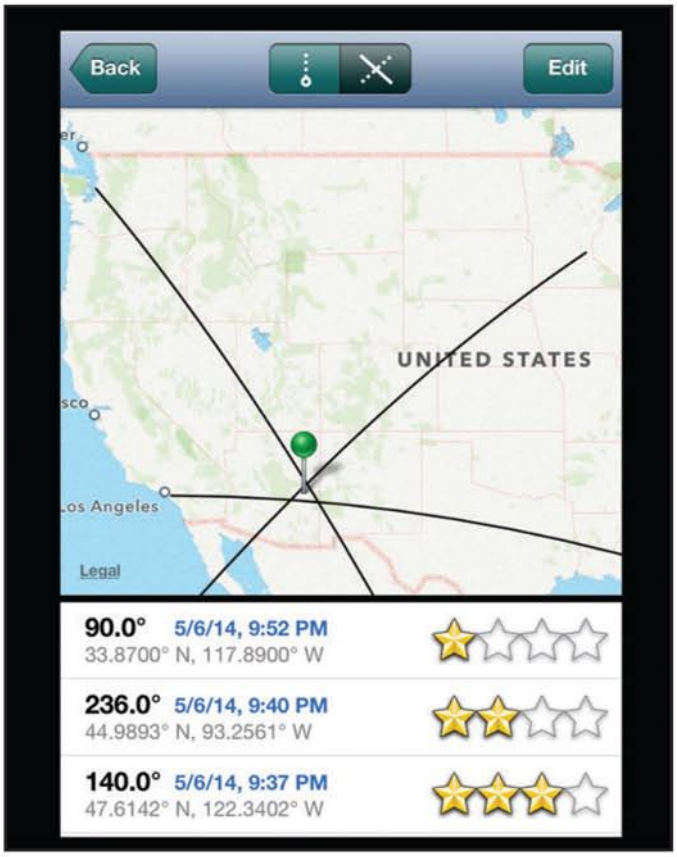
I reviewed the first version of W6EI's Foxhunt in "Homing In" for the Spring 2010 issue of *CQ VHF* magazine. Bob is an MIT-trained engineer and computer scientist who got the idea for the app when he and his wife Susan, W6SJI, went with friends on their first mobile transmitter hunt with the San Francisco Bay T-hunt group. He concluded that his iPhone 3GS could do a better job of keeping track of all the bearings than he could with paper maps.



Map view in Foxhunt Pro. A green dot on the upper left of the screen indicates that FHP is in contact with the cloud-bearing server. The map turns as it orients to the internal compass reading. The slider at right zooms the map in and out, replacing the traditional "pinch" method.



Result of the triangulation of three bearings in Foxhunt Pro. The purple ellipse is the uncertainty of the triangulation, based on the confidence level given to each bearing by the assigned number of stars.



A long-distance triangulation on Foxhunt Pro, showing how the bearings take into account the curvature of the Earth.

At present, Bob's program doesn't interface directly with radios or RDF antennas. It's just a very simple way for anyone to record bearings from multiple locations and display them and their intersections on Google Maps. After getting a bearing with an RDF system, the user looks in that direction while holding the iPhone directly in front. The phone's GPS engine and internal compass determine location and azimuth and then the program puts a bearing ray on the display map. When multiple bearings have been entered, the best triangulation can be computed and displayed.

The accuracy of your transmitter location predictions with this app will depend on the directivity pattern of your RDF antenna, signal reflections, and how well you can sight your bearings from the antenna boom while looking at the screen of the phone. However, you won't have to worry about bearings extending beyond the edge of a paper map or making an error by not correcting for magnetic declination.

The original Foxhunt app works on iPhone 3GS and later models, as well as iPad. It is still available for free, supported by advertising. Dr. Iannucci soon had several ideas for a more advanced version, but for a while that had to take a back seat to new demands on his time as he became Associate Dean of the College of Engineering at Carnegie Mellon University and Director of the Silicon Valley campus. With help from Bob's son Peter, K6PAI, Foxhunt Pro (FHP) finally became a reality in February of this year.

FHP doesn't display ads and is available in the App Store for $6.99. Like the original Foxhunt app, you must search for it under iPhone apps, even if you plan to use it on an iPad. FHP's primary new feature is bearing sharing via the cloud. Although it's "every team for itself" in most competitive transmitter hunts, there are some situations, such as a search-and-rescue mission, where it's important for everyone to be aware of all the hunters' locations and bearings.

Collaborating foxhunters must have a data connection (usually cellular) and must log on with their unique user ID and password before the hunt starts. One hunter on the team creates a hunt ID on the server and invites team members to join in sharing bearings during that hunt. Whenever someone logged into that hunt, ID takes a bearing, it goes to the server, and all others logged into that hunt ID see it on their screens.

The Analysis Mode shows a list of all the hunt's bearings. Edit it by deleting ones you don't want and adding stars to the ones that you think are best. With that done, a tap of the Intersections button puts a green pin on the map at the estimated location of the transmitter and an "ellipse of uncertainty" around it. FHP determines the pin location and ellipse size by triangulating all the bearings, giving greatest weight to the ones that were given the most stars. With a couple more taps, FHP displays directions from your location to the green pin.

When I installed and tested version 3.0.1.10073 of FHP, I liked some additional subtle improvements over the first version that I found, including the constant display of current GPS coordinates and compass reading at the bottom of the screen. This is a true heading, corrected for magnetic declination. The map view shows your position as a red dot and a red dashed line extending in the direction that the device is pointed. The dashed line is convenient if you want to use terrain features on the satellite view to sight your bearings.

In addition to receiving bearings from your friends via the cloud, you can manually add bearings they send you by changing the data source to Manual and then pinching and sliding the map to place the red dot over the location from which the bearing is to be entered. A slider at the bottom of the display rotates the map and the bar at bottom shows the true bearing to be entered. When location and heading are right, press the plus-sign button. You can also tap the GPS coordinates bar to bring up a data entry form to type in GPS latitude/longitude or UTM coordinates plus numeric true or magnetic headings.

FHP has upgraded the triangulation algorithm to use great-circle calculations. That's important because flat maps have large inaccuracies at a distance due to curvature of the Earth. A flat map would lead you to believe that Atlanta is directly east of Los Angeles, but the actual bearing from LAX to ATL is just over 80 degrees true.

Great-circle triangulation is a boon when skywave interference on HF bands must be found. I can imagine a network of HF-RDF stations around the USA exchanging bearings from their homes via the cloud or e-mail, with each participant being able to triangulate them with FHP. Accuracy of the bearings wouldn't be good enough to pinpoint the interference sources from afar, but it could be good enough to determine where mobile foxhunters could go to receive the interference via ground-wave.

SigTrax for Apple and Android

In January, I received e-mail from Jim McCullers, WA4CWI, who is a computer software engineer and entrepreneur. In telling me about his new app, he wrote, "I was co-winner in 1982 of the first foxhunt conducted by Birmingham Amateur Radio Club and have participated in many hunts since then, both as fox and hound. I have also been involved with several near-space balloon launches and I succeeded in recovering one where all telemetry was lost and we depended on a 30-milliwatt, 2-meter beacon to locate the payload.

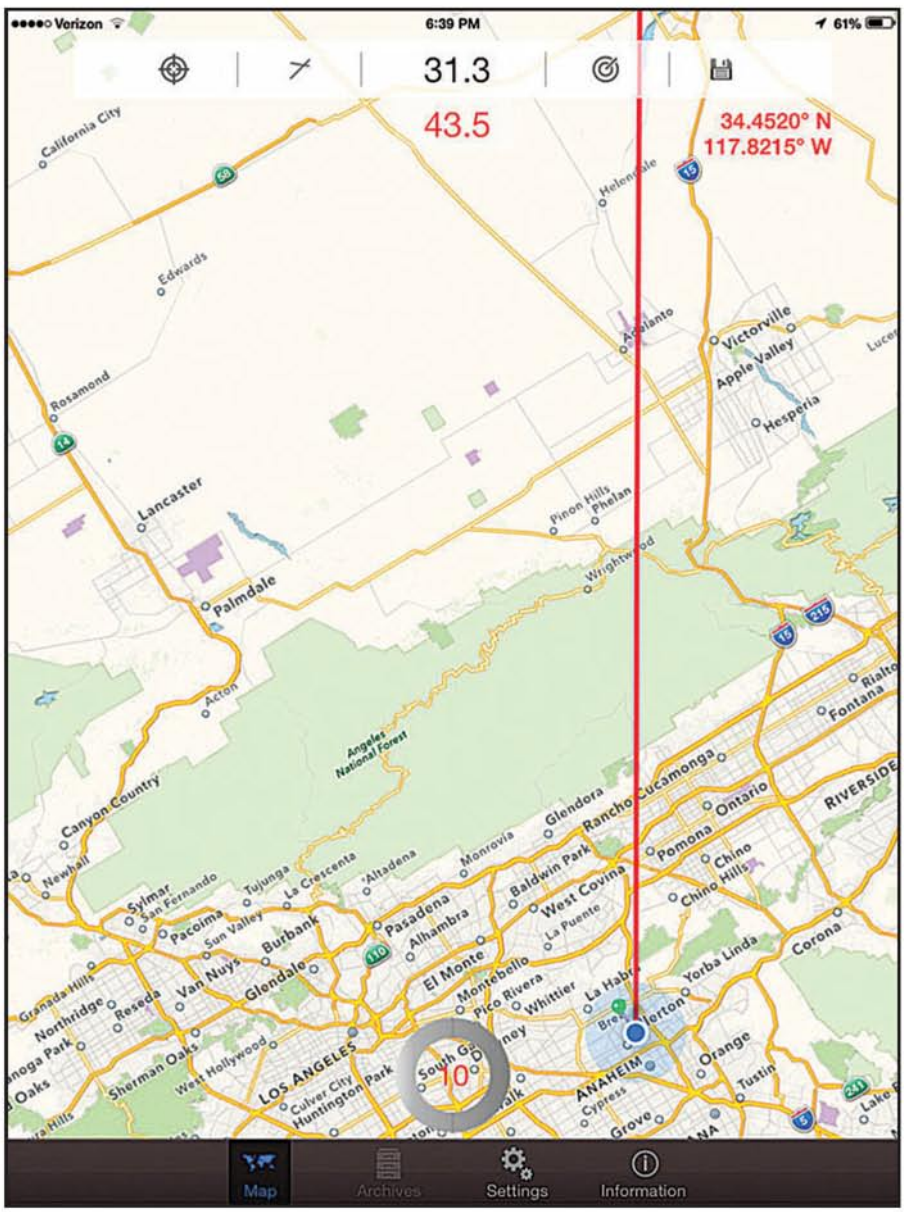
"I also help in finding interference and have tracked down a pirate broadcaster," Jim continued. "With SigTrax, I combined my enjoyment of RDF and programming to create a solution that eliminates a lot of the burden of carrying maps and drawing bearing lines while attempting to locate a signal."

An important goal for Jim was for his app to work on either Apple or Android devices. He wrote, "I believe an app that is general purpose in nature should not limit itself to a single platform. I have given it an attractive price that, combined with the website,[2] should encourage people to purchase."

SigTrax iOS version is $3.79 in the Apple Store and the Android version is $3.99 at Google Play. If you cannot find the program, verify that your device has built-in GPS. Upon loading, the program displays map or satellite view, whichever you have selected, with a blue dot indicating your position. GPS coordinates are shown in the upper right.

Like FHP, SigTrax has an internal Compass Rotation mode that allows you to put a bearing on the map simply by rotating your device until the incoming signal indication is dead ahead. Then tap the blue dot that indicates your GPS position. You will get a dialogue box that asks if you want to "Insert Fix Bearing?" Tap Yes and the bearing will be added to the list.

SigTrax Map View always shows all



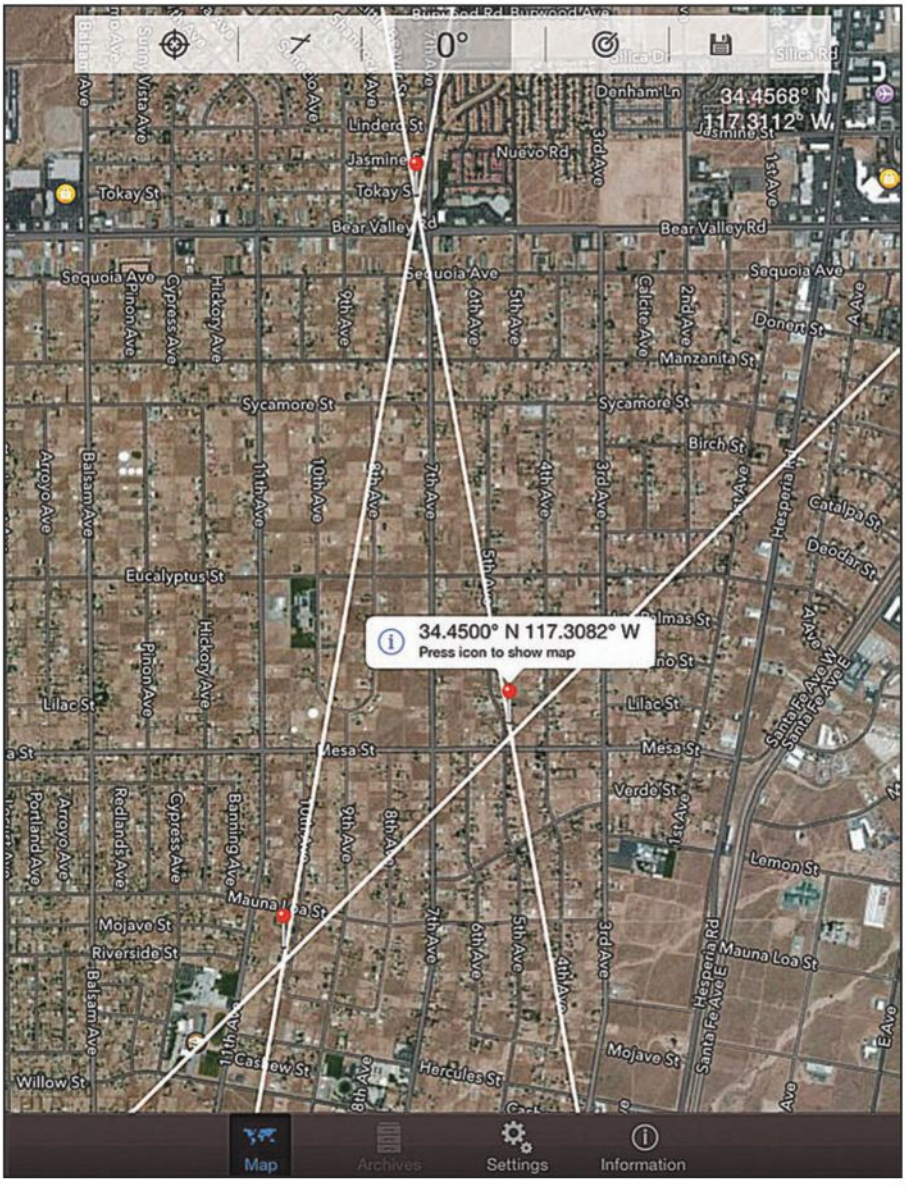
To take SigTrax bearings without using the internal compass, rotate the map in 10-, 1-, or 0.1-degree steps with the rotation ring at the bottom. Red bearings show up best on Google map view.

bearings at once, drawn in the color selected by Settings. Wherever any two bearings intersect, the program places a red pin. (SigTrax calls the intersections "crosspoints.") Tapping on a red pin pops up a dialogue box with the GPS coordinates of the crosspoint. The box also has an icon which, if tapped, takes you out of the program to Google Maps, where a blue-lined map and directions from your location to the crosspoint are shown.

When I first tried SigTrax, our county RACES organization had begun a monthly cooperative 2-meter transmitter hunt to help newcomers gain RDF skills that they could use for search and rescue. During the hunt, participants communicate on a UHF repeater with announcements such as "I'm at Third and Elm and the signal is due east." I told Jim that it would be nice to be able to enter such a bearing quickly by sliding the map to Third and Elm, tapping it, and typing 90 degrees into a pop-up dialogue box.

When Apple Version 1.3.0 of SigTrax was released in March, that feature was included. Jim told me that it may not be possible in Android because only the Apple OS can distinguish between pressure on the screen and a tap. Also there are differences among Android devices in their responses to varying touch forces.

An extensive Settings Menu allows selection of bearing color, bearing length, measurement units, etc. The maximum bearing length is 10,000 kilometers (6214 miles). SigTrax uses great-circle algorithms for bearing traces, so it can be used for long-distance triangulation such as FHP. The red pin is slightly offset from the crosspoint when the triangulation is distant, but it isn't important because of the inherent uncertainty of skywave bearings.



SigTrax puts a red pin at every bearing crosspoint. White bearings show up best on Google satellite view. The traditional "pinch" method zooms the map in and out to show exact locations of the crosspoints.

SigTrax includes a method of entering bearings from your location without relying on the internal compass. "The compass technology in mobile devices is not well developed and impossible to keep in calibration," WA4CWI opines. "I tell people that if lost in a forest, I would place the device against a tree and let moss grow on the north side rather than trust its internal compass heading. So I added the Rotation Ring."

If you set Map Rotation to Manual in the Settings menu, the Map View includes a ring near the bottom of the screen and a true heading at the top that corresponds to the map orientation. Tap the right side of the ring to rotate the map counterclockwise and increase the straight-ahead true heading, or tap the left side to do the opposite. The map moves in 10-degree steps, but you can toggle that to 1-degree or 0.1-degree steps by pressing the center of the ring for about a second. When the map is oriented such that the signal is toward the top, press your blue location dot as before to insert a bearing from your location.

I have a higher opinion of the internal compass than Jim does. When I first tried out my iPad with a dedicated compass app (Digital Compass), I agreed with him because the compass heading was inaccurate and would often "stick" as I turned the device, even after performing Apple's "wave in a figure-eight" compass calibration routine. Then I removed the iPad from its Belkin folio case/stand and the compass began working fine. The folio has a magnet closure, but even cutting off the magnet wouldn't get the iPad compass to work while inside it. So now the iPad goes "naked" or in a zip-lock bag when I'm transmitter hunting. Compass performance is excellent most of the time, but it works best when I hold the device parallel to the ground, not "standing up."

Apple makes two iPad Mini models, one with cellular data plus WiFi, and one with only WiFi. Only the cellular-equipped iPads include GPS, because the iPad GPS depends on cellular system data for rapid startup. When I was away from cellular service on the high seas recently, I couldn't get the iPad GPS to acquire my location.

Cellular data plans for iPad are available on a month-to-month basis with no

contract from the four major carriers. Even before I signed up, my Verizon version acquired GPS in seconds because it picked up LTE location data from the towers. However, for streaming Google Maps in the boonies for the triangulation programs, a cellular plan is a necessity.

Map-n-Compass

Charles Scharlau, NZØI, discovered hidden transmitter hunting in the Puget Sound area of Washington State in the 1980s. He went on to compete in the first USA Amateur Radio Direction Finding (ARDF) Championships in 2001, which led to a trip to the Czech Republic in 2004 as a member of USA's team for the World Championships. Charles and his wife Nadia have continued their involvement in ARDF as much as family obligations have allowed. Last year, they were the course planners and setters for the USA ARDF Championships near their home in North Carolina.[3]

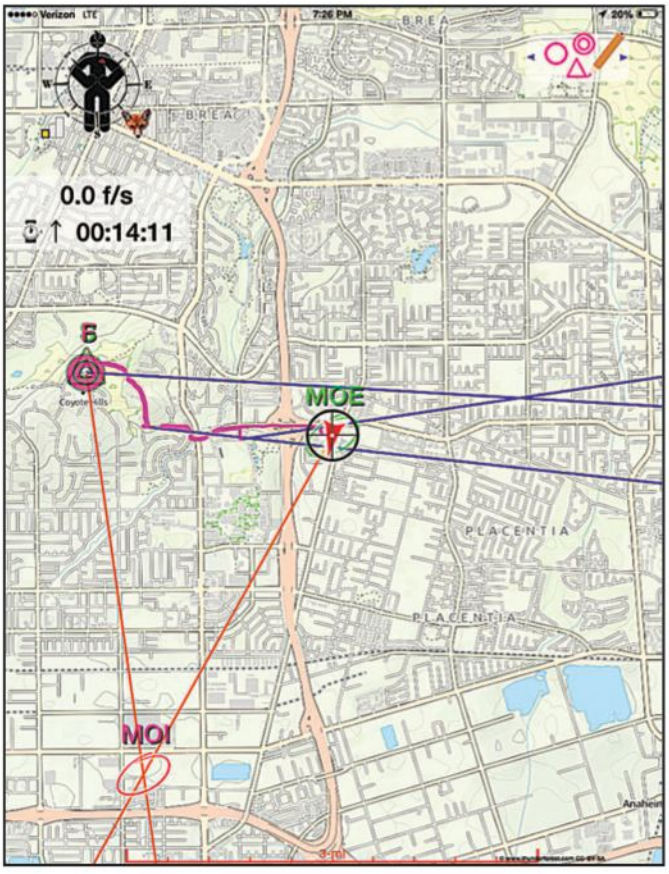
Charles is a software engineer and embedded systems specialist who has formed his own company, Digital Confections. He is the proud author of the new Map-n-Compass app (MnC).[4] It sells for $9.99 and is only available for Apple devices. MnC is so feature-rich that you will spend a lot of time learning how to use it. Charles must have realized this, because upon loading, the first dialogue box asks if you want to go to the map or to the 44-page help file.

Like the other two apps, MnC will go along on a hunt with you, keeping track of your position, plotting your bearings and providing estimated transmitter locations based on triangulations. Charles intended the app to be used for all-on-foot hunts under international rules, but there's no reason why it can't also be used on area-wide mobile hunts, provided that you go into the settings and increase the maximum bearing length as appropriate.

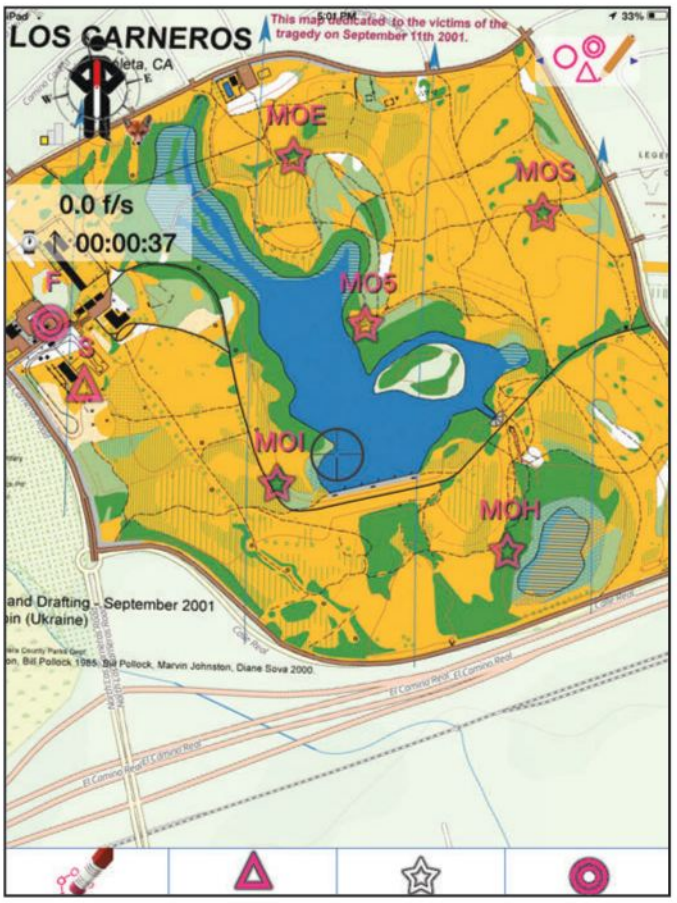
An advantage of MnC is that it is designed for multiple-transmitter hunts and will keep track of bearings for up to five different foxes at a time. In the screen shot of a sample mobile hunt, the timing is stopped and all bearings are displayed with different colors for each fox. When the hunt clock is running, bearings for only one transmitter at a time are shown. The program draws a purple trace as "bread crumbs" showing your route.

MnC is intended to be used with orienteering maps that have been created in accordance with International Orienteering Federation (IOF) standards. However, it also works with open-source street, aerial, and topographical maps, either online or stored on-device. For this illustration, the base map is open-source 4U Outdoor Map.[5] 4U also has a street map version which would be a better choice in urban areas.

MnC not only helps you win transmitter hunts, it creates them. In as little as five minutes, the program can lay out a complete five-transmitter course for ARDF with GPS coordinates for each fox. According to Charles, "I wouldn't want to try designing and field-checking courses without it. We carry all of Nadia's courses and Backwoods Orienteering Klub maps in the app, and we use it to help us navigate quickly and eas-



Map-n-Compass in use during a mobile transmitter hunt, starting from Coyote Hills. After 14 minutes, the first fox (MOE) has just been found with three bearings and two additional bearings have triangulated the possible location of the second fox (MOI).



ARDF course-setters can quickly design courses like this within the Map-n-Compass app and then use the device to locate and set the transmitters in the field. The map is oriented to magnetic north, which is standard for ARDF. The five transmitter icons can be hidden for assisted or virtual tracking.

ily to all the transmitter locations when we put them out."

I think the coolest MnC feature is its ability to provide a virtual on-foot foxhunt experience with all of the fitness benefits and none of the transmitting hardware. Have a friend create an ARDF course map in the device for you and tell MnC to hide the foxes, so you won't know where they are. Then take the app, plug in your earbuds, go to the start point, and switch to navigate mode. Slide the navigation arrow to display "#1-MOE."

You will hear the first virtual transmitter. Hold the device level to the ground and turn in azimuth for the strongest audio signal, just as you would with a 2-meter beam. Tap the navigation icon to put a bearing on the screen and move in that direction. Move on while taking bearings until you get within 20 meters of the hidden fox icon, whereupon the program will automatically declare that you found it.

You can then switch to "#2-MOI" and continue on to find that one with virtual RDF, and so on. After finding #5-MO5, you can navigate to the finish by selecting "F" and homing in on the MO signal, or just use map navigation to the double circle. Tap "STOP" and the app will create a record of your course with your GPS track and time to find each fox.

What a great way this is to practice your bearing-taking and navigation skills in between your local ARDF events. As in regular ARDF, your results will be better if you check bearings on all foxes at the start, then choose the order of finding the five foxes to minimize your travel time. MnC's virtual ARDF is easier than actual ARDF in the Beginner mode, because all five foxes are continuously transmitting on separate virtual "frequencies" so you can easily tune among them. When you have mastered Beginner mode, switch to Intermediate and Expert, where the foxes are on for 60 seconds each in sequence, just like championship courses.

According to Charles, "Menus should be left in restaurants," so there are no pull-down menus. All functions are accomplished by single-tap, double-tap, or tap-and-slide. This is faster and easier when you are out in the field, but it requires practice and experience to memorize the function commands before you go.

I have become a big fan of this app, but for me it had a long learning curve because of the number of features and the lack of menus. I spent a lot of time switching back and forth between the app and the help files to figure out what to tap, hold, or swipe to make it do what I wanted.

There are still many features that I haven't tried yet, such as the ability to create an ARDF course on PC or Mac and send it to MnC by e-mail or iTunes file sharing. Similarly, courses created within MnC can be shared and viewed on PC or Mac. Hunt results files can be displayed and animated to "relive" the hunt experience. You can choose the display orientation, portrait, or landscape. Settings can be customized for the number of transmitters, on-air time for each, antenna beamwidth, signal tone pitch, peak versus null signal tracking, arrival range, and much more. This app is going to keep me busy for a very long time.

Final Thoughts

International rules forbid the use of GPS positioning and electronic mapping by participants in formal ARDF championship contests. National and world-class radio-orienteers are expected to do it the old-fashioned way, with paper maps supplied by the course-setters and their own hand-held compasses. Don't be surprised if the organizers of championship ARDF events forbid the carrying of any mobile devices on courses from now on.

At this time, all RDF mobile device apps require a human to determine the direction of incoming signal and to either aim the device or type in the bearing in degrees. There are no apps that interface directly with electronic RDF equipment to automatically receive and plot bearings. That takes a PC, a GPS engine, and the GoogleHunt program by Bob Simmons, WB6EYV. GoogleHunt automatically plots bearings from Doppler RDF sets that have serial output in Agrelo format. I reviewed GoogleHunt, the Agrelo format, and compatible Doppler sets in "Homing In" for the Winter 2012 issue of *CQ VHF* magazine.

I look forward to hearing from you about your transmitter hunts, including your experiences with new tools such as these apps. When you experiment with computer mapping and tracking, keep safety in mind at all times. On mobile hunts, get a helper to handle the computer and RDF gear when you drive, or get someone else to drive so you can concentrate on the RDF task. Have solid mountings for your computer, GPS, and RDF gear so they can't fly about during sudden stops. Minimize distractions and pay full attention to the road while driving. Take your time and have fun! 73, Joe, KØOV

Notes

1. http://foxhunt.rail.com
2. http://www.sigtrax.com
3. http://www.homingin.com/nc2013
4. http://apps.digitalconfections.com/ ?page_id=104
5. http://www.4umaps.eu/mountain-bike-hiking-bicycle-outdoor-topographic-map.htm

disaster dxing

BY MEHMET BURK*

SKYWARN®: Fusing Amateur Radio with Disasters

In this edition of *Disaster DXing*, I'm focusing on the National Weather Service's (NWS) SKYWARN® program, which highly leverages the amateur radio community. Radio amateurs have long been a pillar of SKYWARN since the program's inception in the 1970s. As shown by recent events, hams play a pivotal role in providing critical intelligence to the National Weather Service and local emergency officials.

This month, we're focusing especially on Internet streaming of NOAA weather radio and VHF/UHF ham transmissions during disaster events. As always, I'm most interested to hear from you anytime. You can contact me at <nburk@reliefanalysis.mygbiz.com>, or visit my websites ReliefAnalysis.com <http://bit.ly/QTG5TB> and Relief Analysis Radio <http://bit.ly/PMiZgt>. My newsletter audience for *SWL and Emerging Disasters* is growing each week, and I'd be delighted to connect with you through that forum.

SKYWARN® and Amateur Radio

For those unfamiliar with SKYWARN, it is an established severe weather monitoring program relying on trained citizens to provide key observations back to NWS offices. SKYWARN spotters are trained through free local classes facilitated by warning coordination meteorologists in each of the United States' 122 NWS offices.

I've been a trained spotter since 2001, and have taken classes in three states. The classes are all unique and the content varies by location. I've been in some classes where NWS "behind the scenes" web-based operational tools were shared helping spotters predict the severity of potential tornado outbreaks. Other classes focused on the unique structural characteristics of severe storms — including advice on the safest trajectory to follow a storm if weather spotting via vehicle. All SKYWARN programs are underpinned by this detailed reference guide, a product that has a great deal of sophisticated information for spotters of any level. (***IN DEPTH:*** <http://www.1.usa.gov/1kUXfbO>. – *MB.)*

Trained spotters can literally provide life-saving information to the National Weather Service as severe weather situations unfold. A spotter who identifies a rotating funnel cloud that has potential to become a full-fledged tornado could help the NWS to trigger a Tornado Warning to impacted communities. Many National Weather Service tornado warnings have references to trained spotters identifying funnel clouds or tornadoes as the basis for the emergency notification, **Photo A**.

While one does not need to be a radio amateur to participate in SKYWARN, amateur radio has long held a special status within the SKYWARN program. Many NWS field offices have internal, manned amateur radio capability that functions during an emergency. Ham radio nets are also used to consolidate and relay information via a central focal point. A high percentage of SKYWARN spotters (almost half) are amateur radio operators, **Photo B**.

Indications of whether SKYWARN spotters will be "activated" on a given day can frequently be heard

* Email <nburk@reliefanalysis.mygbiz.com>

***Photo A**. SKYWARN spotters, including amateur radio operators, can provide extremely valuable information to National Weather Service field offices during severe weather events. (Courtesy of NOAA)*

Photo B. *Many National Weather Service field offices have amateur radio capabilities that are activated during severe weather outbreaks. (Courtesy of NOAA)*

on NOAA Weather Radio during the Hazardous Weather Outlook products. In this example from NOAA Weather Radio Station KIH27 on 162.55 MHz, SKYWARN spotters are asked to stand by for potential activation as severe weather is forecast for the Tulsa, Oklahoma area. (***LISTEN:*** *<http://bit.ly/1g6TYJv>. – MB.)*

Case Study: Arkansas Tornadoes, May 27-28, 2014

The true power of amateur radio in the SKYWARN program was on full display May 27-28 when a violent tornado outbreak erupted over Arkansas. On May 27, the National Weather Services' Storm Prediction Center designated much of Arkansas with a "High" probability for strong tornadoes (EF2 or greater on the Fujita tornado intensity scale) and golf-ball sized hail expected, **Photo C**. That same day, tornadoes erupted, causing extensive damage in swaths exceeding 40 miles. According to the National Weather Services' Little Rock office, "An estimated 400 to 500 homes were destroyed. There were 16 fatalities reported (12 in Faulkner County, 3 in Pulaski County, and 1 in White County), which makes this the deadliest single tornado in Arkansas since the Jonesboro (Craighead County) twister (rated EF4) of May 15, 1968 (35 fatalities)." (***IN DEPTH:*** *<http://www.1.usa.gov/QV7pA4>. – MB.)*

In this powerful audio clip from the Central Arkansas Radio Emergency Net on 146.940 MHz, a network of trained spotters in the field provided outstanding intelligence about the unfolding devastation. Ham spotters reported encountering damage and injuries, populations in immediate need, and work to maneuver around the tornado path. At the same time, the net controller at the NWS field office does a tremendous job in validating callsigns and field reports and relaying tornado warnings immediately as they are issued. This clip shows the true symbiotic nature of the amateur radio net pushing tornado warnings to spotters in the field to provide support the geographic location of their placement. At the same time, the spotters are observing and relaying critical information that support the NWS and emergency personnel. (***LISTEN:*** *<http://bit.ly/1jrQ5hC>. – MB.)*, **Photo D**.

The Central Arkansas Emergency Net has been functioning since the 1950s and supports the Arkansas SKYWARN Net with a total of two digital repeaters and seven voice repeaters. For detailed history and technical specifications of this equipment, including the one sampled during the tornado outbreak, visit <http://bit.ly/1uMMBus>. *– MB.)*

In summary, the SKYWARN program is truly a powerful endeavor that I've been proud to be affiliated with for 13 years. If any readers are radio amateurs with SKYWARN experience and have stories or photos from the field they would like to share, I'd be delighted to communicate with you and feature these in an upcoming column. You can get in touch with me via my e-mail <nburk@reliefanalysis.gmail.com> or via the opt-in box at my site at <http://www.ReliefAnalysis.com>.

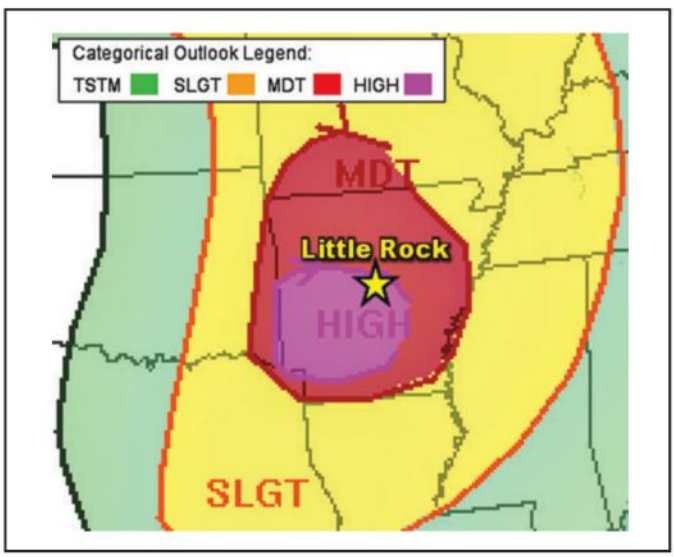


Photo C*. Central Arkansas was declared to be at high risk of severe weather potential on May 27 — shown in purple. It was a rare designation that activated local SKYWARN and amateur radio operations. (Courtesy of the National Weather Service/Little Rock field office)*

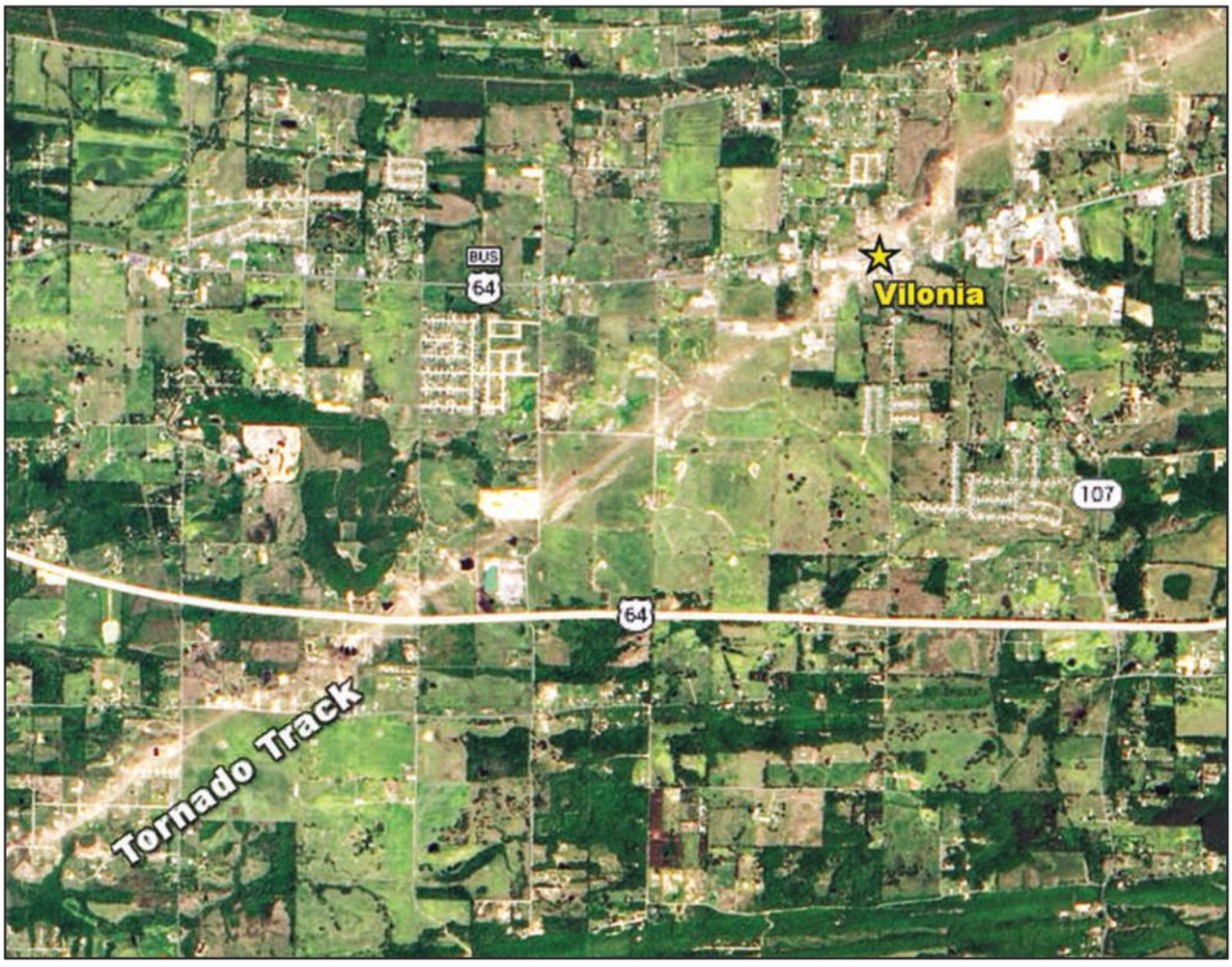


***Photo D**. Here's a look at devastation from the May 27-28 tornados as viewed from space. (Courtesy of the National Weather Service/Little Rock field office)*

One final note: storm spotting can be dangerous, and it is extremely prudent to heed all of the cautions taught in the SKYWARN literature and in the spotting class. In the audio clip, it was clear that radio amateurs were driving through some dangerous and devastated locations. Having a NOAA Weather Radio is of vital importance. There are many digital models that provide location-specific warnings triggered by NWS radio transmissions. Even an analog weather radio can be of vital importance. For a tornado warning situation (of which in the last 2 years I've been in 3), the all-analog Kaito KA550 performs marvelously.

*(**REVIEW:** Read about Mehmet Burk's listening experience using the Kaito KA550 receiver in the June edition of CQ Plus beginning on page 136. – KI6SN.)*


NATIONAL BUREAU OF STANDARDS WASHINGTON, D. C.
RADIO TRANSMITTING STATION, BELTSVILLE, MD.
STANDARD FREQUENCY EMISSIONS
Accurate to Better Than 1 Part in 5,000,000
W W V
Thank you for your report concerning our broadcast on
5000 kc, 440 cycles on July 23, 1940.
LYMAN J. BRIGGS,
Director, National Bureau of Standards.

***Photo E**. QSL from WWV from the 1940s. Even today, the marine weather, space warning, and GPS forecasts can still provide an important, redundant source of information in the shortwave bands. (Courtesy of Wikipedia)*

Shortwave Weather Bulletins via WWV and WWVH

In addition to NOAA Weather radio, another unique but subtle source of U.S.-based public weather information exists in the shortwave spectrum. WWV and WWVH broadcast storm warnings for the North Atlantic and Northeast Pacific Basins, as well as geophysical alerts (i.e. "space weather" forecasts), in addition to updates about GPS satellites and related operations. I often use WWV and WWVH to provide me with a baseline for propagation conditions when using my Tecsun PL-660 or when jumping on another receiver via Global Tuners — but in addition to the time signaling, there can be some interesting tidbits of information to be found throughout the hour on 2.5, 5, 10, 15, and 20 MHz.

For a schedule of hourly information and a description of what is in each forecast period, visit: <http://www.1.usa.gov/1kUYoA4>.

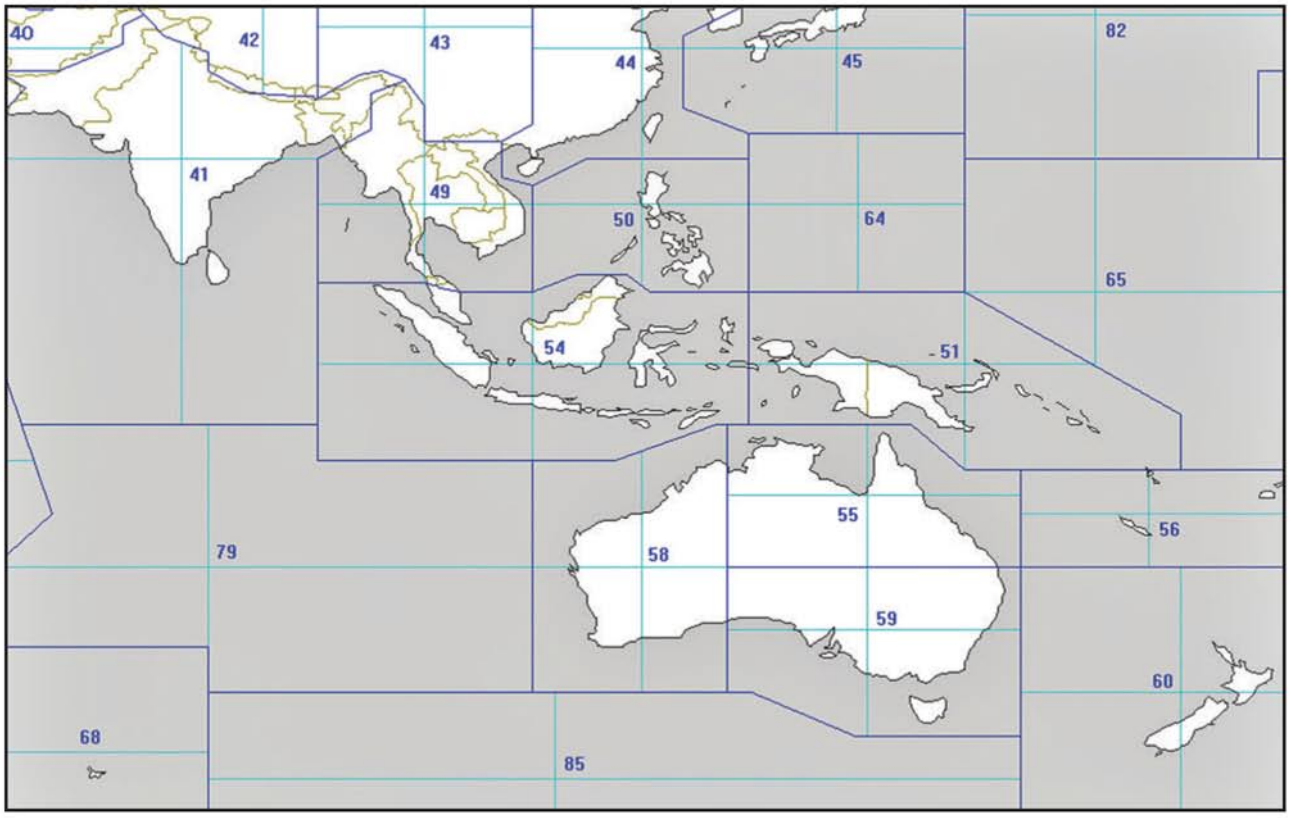


***Photo F**. CIRAF Zone 54 — the target location of the High-Frequency Coordination Councils' test of the International Radio for Disaster Reduction in June 2014. (Courtesy of the International Telecommunication Union)*

For a sample audio clip of North Atlantic Marine warning at 01:10 UTC on 20.00-MHz link to <http://www.bit.ly/1oAPHgW>, **Photo E**.

International Radio for Disaster Reduction

The High-Frequency Coordination Commission is proceeding with its work on the International Radio for Disaster Reduction (IRDR) project. The IRDR fosters cooperation among international shortwave broadcasters in the event of a large disaster. Shortwave broadcasters would transmit emergency information on set frequencies to the impact zone. A test of the IRDR in June focused on Zone 54, which encompasses Indonesia.

See the HFCC website and ReliefAnalsysis.com for coverage of the IRDR's test in this region. Readers who subscribe to my *SWL and Emerging Disasters* newsletter will get updates about the development of the IRDR as it continues to evolve, **Photo F**.

Equipment Review Two Products for Journalists and NGOs

I had the pleasure of testing two products recently from Kaito Electronics. Degen's DE660 is a Bluetooth speaker and FM radio that provides exceptional sound quality when streaming NOAA Weather Radio, or any other Internet radio application.

Degen's DE1128 is a pocket-sized FM, medium wave, and shortwave radio that also has voice recording and broadcast recording capabilities. Please look for my reviews in the August edition of *CQ Plus.*

Both products are worthy additions to the shack, or journalist's toolkit, or for NGO field operations.

System Fusion

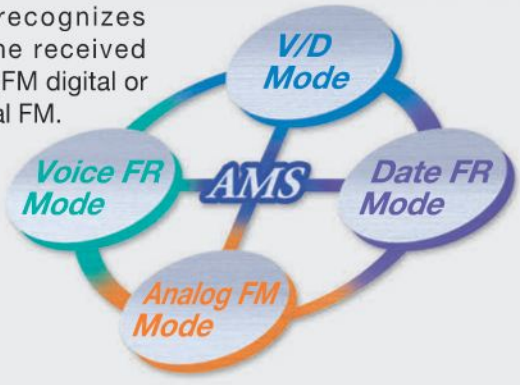
Get the Integrated Solution

System Fusion provides total integration of Digital and Conventional FM

System Fusion delivers integrated operational functionality that enables you to communicate with other Amateur Radio operators using conventional FM mode while you enjoy advanced digital communication features, such as image, text data and GPS position data using C4FM digital. System Fusion is designed to enable seamless communication between conventional FM and C4FM Digital Communication using a single unified platform.

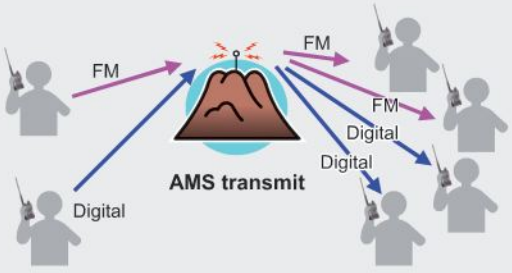
AMS (Automatic Mode Select)

- Instantly recognizes whether the received signal is C4FM digital or conventional FM.



FM Friendly Digital

- System Fusion can be used in multiple ways, for digital communication, for conventional FM communication and even internet communication.



New Functions Enabled by C4FM Digital Communication

Digital Group Monitor (GM) Function

- Automatically checks whether members registered to a group are within the communication range.

Snapshot Function (Image Data Transmission)

- Image data can be sent easily to other C4FM FDMA digital transceivers.
- Image data can be displayed on the screen. (FTM-400DR ONLY)

Smart Navigation Function

- Real-time navigation function enables Location checking at any time.
- Backtrack function for returning to your departure Point.

For latest Yaesu news, visit us on the Internet: http://www.yaesu.com

System Fusion Lineup

C4FM Clear and Crisp Voice Technology

144/430 MHz DUAL BAND
C4FM/FM DIGITAL REPEATER

DR-1X

- Three digital modes and a Conventional FM mode
- Emergency Operation: Supports operation on an emergency battery

Exciting New Amateur Digital Transceiver

C4FM Clear and Crisp Voice Technology

C4FM FDMA 144/430 MHz DUAL BAND
5W DIGITAL/FM TRANSCEIVER

FT1DR Heavy Duty Package

(1800 mAh Li-Ion Battery FNB-102LI included)

- Three digital modes and a Conventional FM mode
- Automatic Mode Select (AMS) Function
- Snapshot Picture Taking Capability
- Digital Group Monitor Function
- Smart Navigation Function

Equipped with advanced touch panel operation and full-color TFT large-scale display

C4FM Clear and Crisp Voice Technology

C4FM FDMA 144/430 MHz DUAL BAND
50W DIGITAL/FM TRANSCEIVER

FTM-400DR

- Three digital modes and a Conventional FM mode
- Automatic Mode Select (AMS) Function
- 3.5-inch Full Color Touch Panel Operation
- Snapshot Picture Taking Capability
- Digital Group Monitor Function
- Smart Navigation Function

Advanced VoIP wireless WIRES-X

C4FM Clear and Crisp Voice Technology

Amateur Radio Internet Linking Kit

HRI-200

- Advanced Internet VoIP radio communication is available with C4FM.
- Easy access to Node/Room stations by a simple operation.
- The NEWS Function enables exchanging messages, Images and Voice in the new communications method.

YAESU The radio

YAESU USA
6125 Phyllis Drive, Cypress, CA 90630 (714) 827-7600

BY KENT BRITAIN, WA5VJB

CubeSat Antennas and Circular Polarization

In the first issue of *CQ Plus*, we covered an S-band patch antenna for the Korean KuSAT CubeSat. This time, we will cover two new patch antennas for Cubesats and a bit of patch antenna theory.

Photo A is certainly not one of the better photos of your columnist, but traveling as G8EMY, I attended the UK FunCube technical party in Martlesham, England this past April. In the photo, David Bowman holds one of the prototype L-band patch antennas that could be used on a future FunCube satellite.

The Patch antennas got passed around the AMSAT booth at Dayton in May. **Photo B** shows how the L-band antenna mounts on a CubeSat. **Photo C** shows the L-Band, the S-Band, and the KSAT antennas with the AMSAT FOX prototype.

Photo A. *Your columnist at the FunCube Technical meeting in the UK last April.*

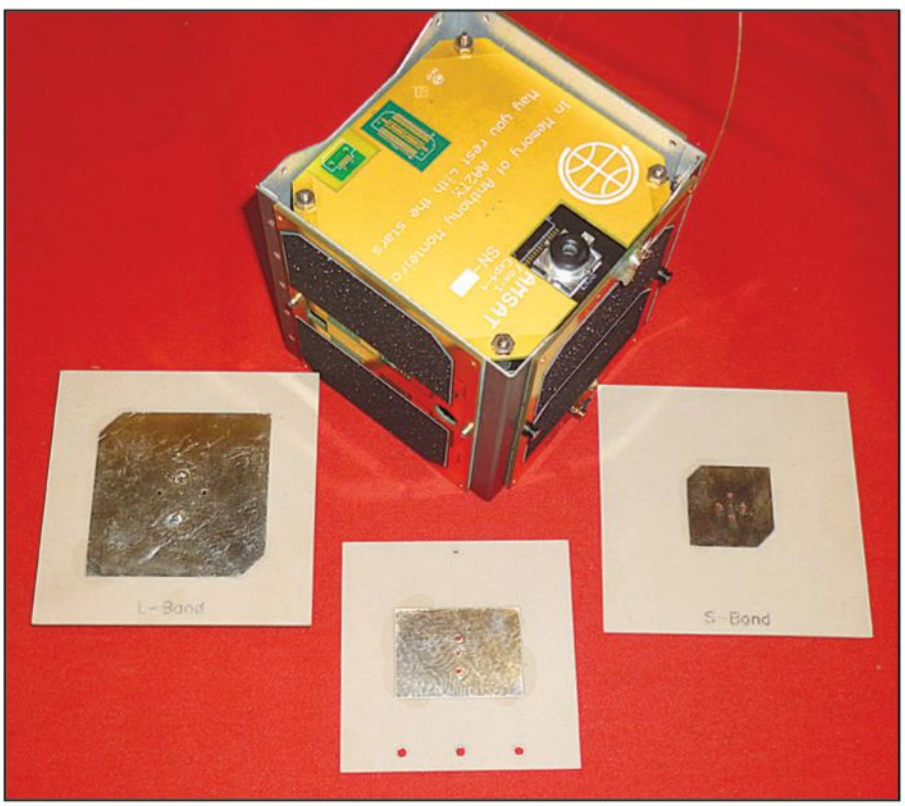


Photo B. *Cubesat with the L-Band Patch.*

Circular Polarization on a Patch Antenna

There are many ways to make a patch antenna circularly polarized. Perhaps the simplest is to unbalance the vertical and horizontal components by trimming the corners of a square patch as shown in **Figure 1**. The amount that is trimmed off is somewhat critical for good circular polarization, and the only way to do it right is on an antenna range. But once you have the dimensions, then the antenna design is easily duplicated.

Note that there is a ground *via* in the very center of the patches. The center of a patch is a voltage null point, much like the center of a Yagi element. You can ground the center of a Yagi element without affecting performance, and the same is true for a patch antenna. There are many advantages to having an antenna with grounded elements. Around the ham shack, grounded elements improve lightning protection on your HF antennas and protect RF parts from that *ZAP* you get when walking across the carpet on a dry winter's day for your indoor antennas. In space, there are a lot of free electrons and charged particles floating around and it is best if the antenna and the electronics are at the same voltage

potential. Grounding is good! (*even 100+ miles above the ground! – ed.*)

Looking back at **Figure 1**, we can change the patch antenna from left-hand to right-hand circular polarization by trimming the opposite corners. Or, we can have a new feed point 90 degrees from the first and accomplish the same thing. On some Cubesats, the antenna will be recessed a bit, on others the antenna will protrude a bit. On these designs, the patches have an edge impedance of about 200 ohms. So the antenna could be fed at the edge with a 200-ohm feedline, or a 1/4-wave transformer could be used to impedance match a 50-ohm line to the 200-ohm edge impedance. On this design, we know that the very center of the patch is a 0-ohm null point. About 1/4 of the way from the center to the edge is the 50-ohm point. So the designs are fed near the center. There is a hole in the ground plane to allow the pin of an SMA connector to come up from the back of the antenna. It would also be possible to directly solder coax to the antenna and eliminate the connectors entirely.

Note that I have two feed points for each polarization. One is a bit higher than 50 ohms and one is a bit lower than 50 ohms. At this point we don't know just how much metal will be around the antenna. These 2nd set of connections produce the other sense of circular polarization. Just choose the

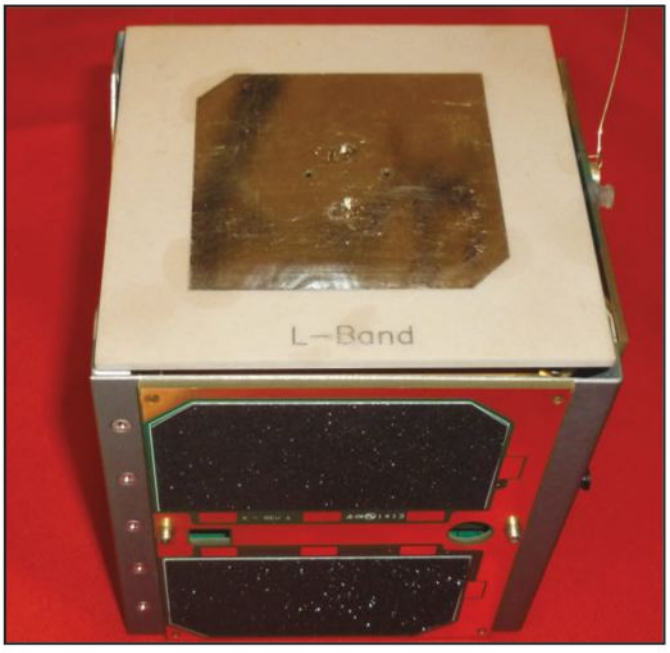


Photo C. *AMSAT FOX Cubesat with L and S-Band Patch antennas.*

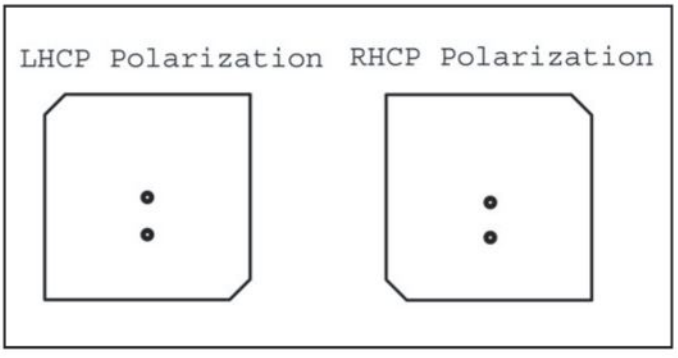
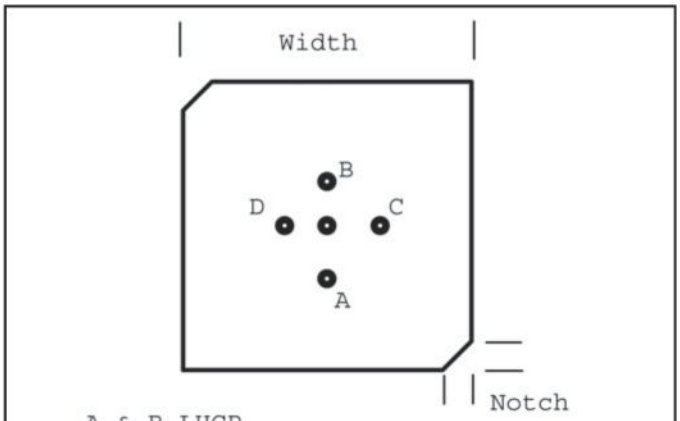


Figure 1. *Patch antenna for circular polarization.*

one that gives the best return loss or SWR when mounted in your housing.

Figure 2 shows the dimensions for the patch antennas, as designed for either L-Band (1.2 GHz) or S-Band (2.4 GHz). Of course, the outside edge will be configured to fit the 10- x 10-centimeter standard frame of a Cubesat. Mounting holes should be more than 10 millimeters from the edges of the patch, farther if possible. The patch is square, so width and height are the same. It may be possible to mount solar cells around the S-Band patch, or cut out and use just the active area of the patch.



Patch Antenna Dimensions

	L-Band	S-Band
Patch Width/Height	63 mm	32 mm
Notch Width/Height	8 mm	5 mm
Feedpoint distance from center ground via		
LHCP Hi impedance A	10 mm	4.5 mm
LHCR Lo impedance B	9 mm	4.0 mm
RHCP Hi impedance D	10 mm	4.5 mm
LHCP Lo impedance C	9 mm	4.0 mm

Figure 2. *Dimensions for L and S-Band patch antennas.*

The patches use 100-mil Arlon 25N material. This is a low-loss PCB material that uses FR4-G10 PCB processing and has a history of use in space. If you substitute a different material, you are on your own.

These have a bit more work to do, especially on the antenna range. Before trying to duplicate one yourself, you are welcome to contact me for any updates with their design at <wa5vjb@amsat.org>.

Notes on Circular Polarization

I was reading an article on the use of circular polarization on the video links from Quad Copters. The writer was emphasizing that if the transmitter had left-hand polarization, then the receiver also had to be left-hand polarization.

Wrong.

While with linear polarization, you want a vertical antenna talking to a vertical antenna, the exact opposite is true with circular polarization. If the transmitter is left-hand polarized, then the receiver needs to be right-hand polarized. With CP, you want opposites.

Don't believe me? Get a friend and have him or her stand about 10 feet away. Now move your hand in a circle and have your friend match your circle movement. One of you will be going clockwise, and the other counterclockwise. Circular polarization is *opposite* when the transmitter and the receiver are looking at each other.

Get Your Cheap Yagis Here!

Now for something that is a bit more self-serving. I ended up with a large number of the 1250-1300 MHz 3 element Yagis shown in **Photo D**. They're great for D-STAR, FM repeaters, video links, etc., and they make a simple feed for a small dish if you are into L-Band AMSAT. My daughter is selling them on eBay <www.ebay.com/itm/251521404089> or you can contact her directly at <kb5rye@wa5vjb.com>. Hard to beat at $5.49 each plus mailing.

I enjoy helping you with your antenna issues, and your letters and e-mails have been the source of many topics for the column. Send your antenna questions or suggested topics to <WA5VJB@cq-vhf.com> *or snail mail to my QRZ address.*

Photo D. *1250-1300 MHz PCB Yagi antennas. Get 'em while they last!*

Skewed 10-Meter Paths to FT5ZM on Amsterdam Island

BY CARL LUETZELSCHWAB, *K9LA

The January/February 2014 FT5ZM DXpedition to Amsterdam Island in the southern Indian Ocean gave many DXers a new DXCC country. The FT5ZM team did an excellent job handing out QSOs. Visit <http://www.amsterdamdx.org> for more details on this DXpedition — the team, the island, QSL procedures and so on, **Photo A**.

Did you work them on 10 meters? If so, did you find that your directional antenna was pointed in an unexpected direction? For example, after the DXpedition I received an email from Ed Callaway, N4II, commenting that he and several others in south Florida worked FT5ZM on 10 meters, not via the true great circle path to the southeast, but rather along a skewed path on headings between 60 and 75 degrees — essentially to the northeast.

What we'll do in this month's *Practical Propagation* is answer two fundamental questions with respect to skewed paths:

- Why wasn't the true great circle path available?
- What enabled the skewed path?

Along the way we'll learn about great circle paths, worldwide F_2 region ionization and how propagation predictions work.

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Those Great Circle Paths

The shortest distance between any two points on a globe is a short great circle path. Commercial airliners generally fly great circle paths to minimize fuel consumption unless their path is modified by winds, terrestrial weather storms, geomagnetic field storms, or political issues.

Going the opposite way around from the short path is the long great circle path. **Figure 1** shows great circle paths — dotted black lines — out of FT5ZM in 10-degree increments. *(**THANKS:** To the late Bob Brown, NM7M SK, for the software that generates these maps. – K9LA.)*

FT5ZM is the red dot in the southern Indian Ocean. The red dot in North America is the FT5ZM antipode. The antipode of a location is the point on Earth that is exactly on the opposite side of the Earth. For the record:

- The FT5ZM antipode is in southeast Colorado. All great circle paths out of FT5ZM arrive at the antipode.
- Locations in North America that are east of the FT5ZM antipode have their short great circle paths to FT5ZM in an easter ly direction.
- Locations in North America west of the FT5ZM antipode have their short great circle paths to FT5ZM in a westerly direction.

Photo A. *The FT5ZM DXpedition to Amsterdam Island in January and February produced lots of contacts and great data for K9LA's examination of propagation paths on 10 meters. Visit the FT5ZM website at <http://www.amsterdamdx.org>. (Internet screen grab)*

- Locations exactly on the antipode longitude can either go north or south — both are the same distance.
- The dotted line meandering above and below 0 degrees geographic latitude is the magnetic equator.

Highlighted with solid blue lines in **Figure 1** are short great circle paths from N4II to FT5ZM on a southeasterly heading out of N4II; from K9LA to FT5ZM, on an easterly heading out of K9LA; and from AA7XT to FT5ZM, on a westerly heading out of AA7XT.

AA7XT is included to help with answering our second question: *What enabled the skewed path? (**IN DEPTH:** See Footnote 1. – K9LA.)* These North America locations are shown as the blue stars.

First Things First

To answer the first question — *Why wasn't the true great circle path available?* — we'll look at a worldwide map of F_2 region ionization. **Figure 2** — thanks to Proplab Pro V3 — is a map with the blue stars the same locations as in **Figure 1**. The overhead Sun is the yellow Sun-like dot off the eastern coast of South America. The cross-hatched area, which is perhaps a little tough to see, is the dark ionosphere.

Figure 2 shows contours of the MUF (maximum useable frequency) in MHz at 1445 UTC for the one-month period centered on February 1, 2014. These are monthly median values, implying 50 percent probability.

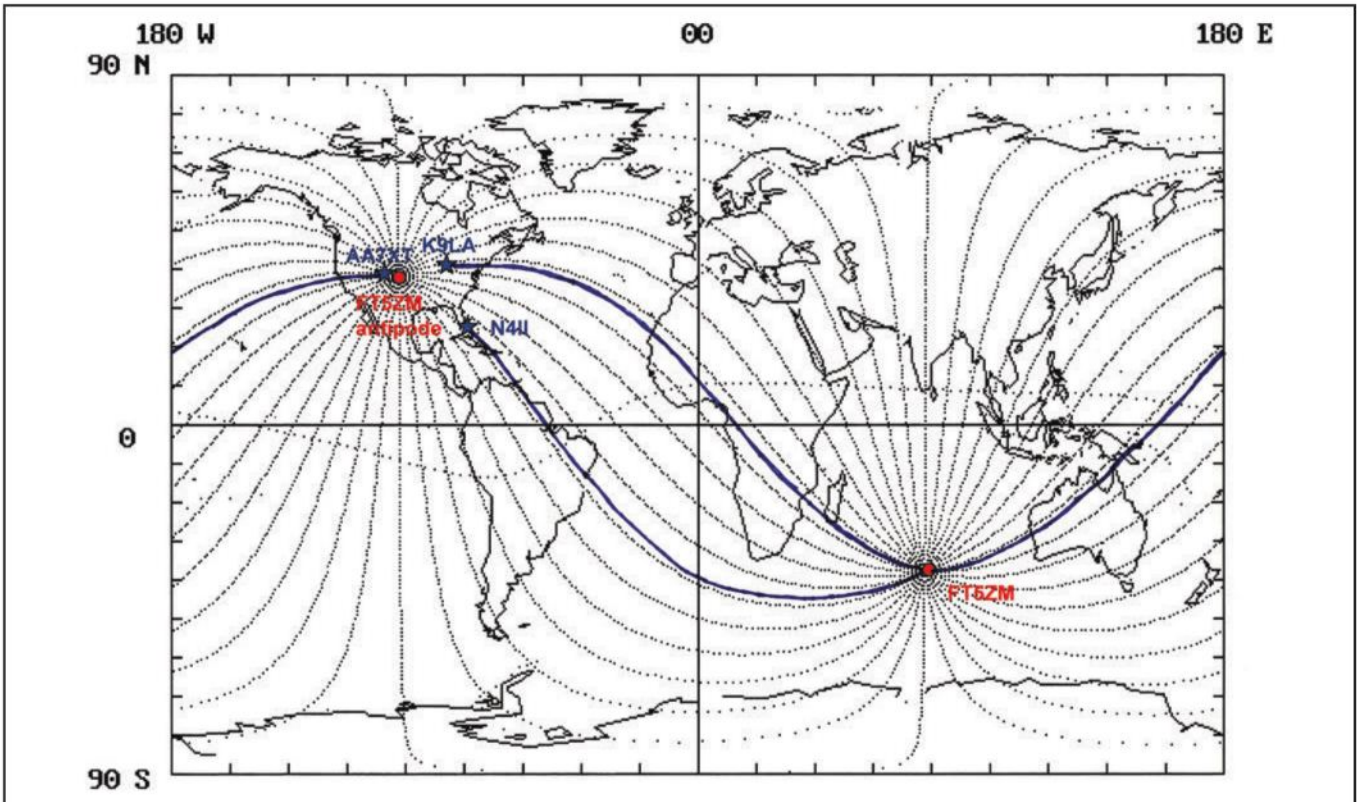
On any given day in this one-month period, the MUF could be several MHz higher or lower than the designated value. To generate this map for highest accuracy in the vicinity of FT5ZM, I downloaded ionosonde data at Perth, Australia and varied the sunspot number to force the F_2 region model in Proplab Pro V3 to agree with the monthly median Perth data.

Any point on **Figure 2** can be considered the midpoint of a 3,000-kilometer hop via the F_2 region. The value at that point (interpolation is needed between the contour lines) is the MUF over this 3,000-kilometer hop length. For a shorter hop, the MUF will be a little lower since the wave encounters the ionosphere at a slightly higher angle.

For a longer hop, the MUF will be a little higher since the wave encounters the ionosphere at a slightly lower angle. For example, the MUF for a 4,000-kilometer hop (the accepted limit of a hop at the higher end of the HF bands) is about 10 percent higher than the 3,000-kilometer MUF. I mention this as our propagation predictions essentially use 4,000-kilometer hops for predicting F_2 region openings.

Hopping Methodology

This concept of using 4,000-kilometer hops comes from the fact that it has been found from many observations that F_2 region propagation beyond 4,000 kilometers does not appear to fail until the ionosphere fails to support propagation at one



Footnote 1: Figure 1 shows that AA7XT is very close to the FT5ZM antipode. You've probably read about the magical qualities of being very near a station's antipode. Signals could arrive from many directions. And there can be a signal enhancement with all the signals from different directions adding in-phase. These two qualities need to be tempered with real-world physics. First, on the higher bands, is the ionization high enough along the many paths to support the given frequency? And on the lower bands, is ionospheric absorption low enough along the many paths to give useable signals? Second, if many signals manage to arrive, are they equal enough in amplitude and close enough in phase to give a noticeable enhancement with a reasonable probability? This is an interesting topic that can generate some interesting claims. I believe it is best to work with both observations and science to arrive at a reasonable conclusion. – *K9LA.*

Figure 1. *Great circle paths out of FT5ZM.*

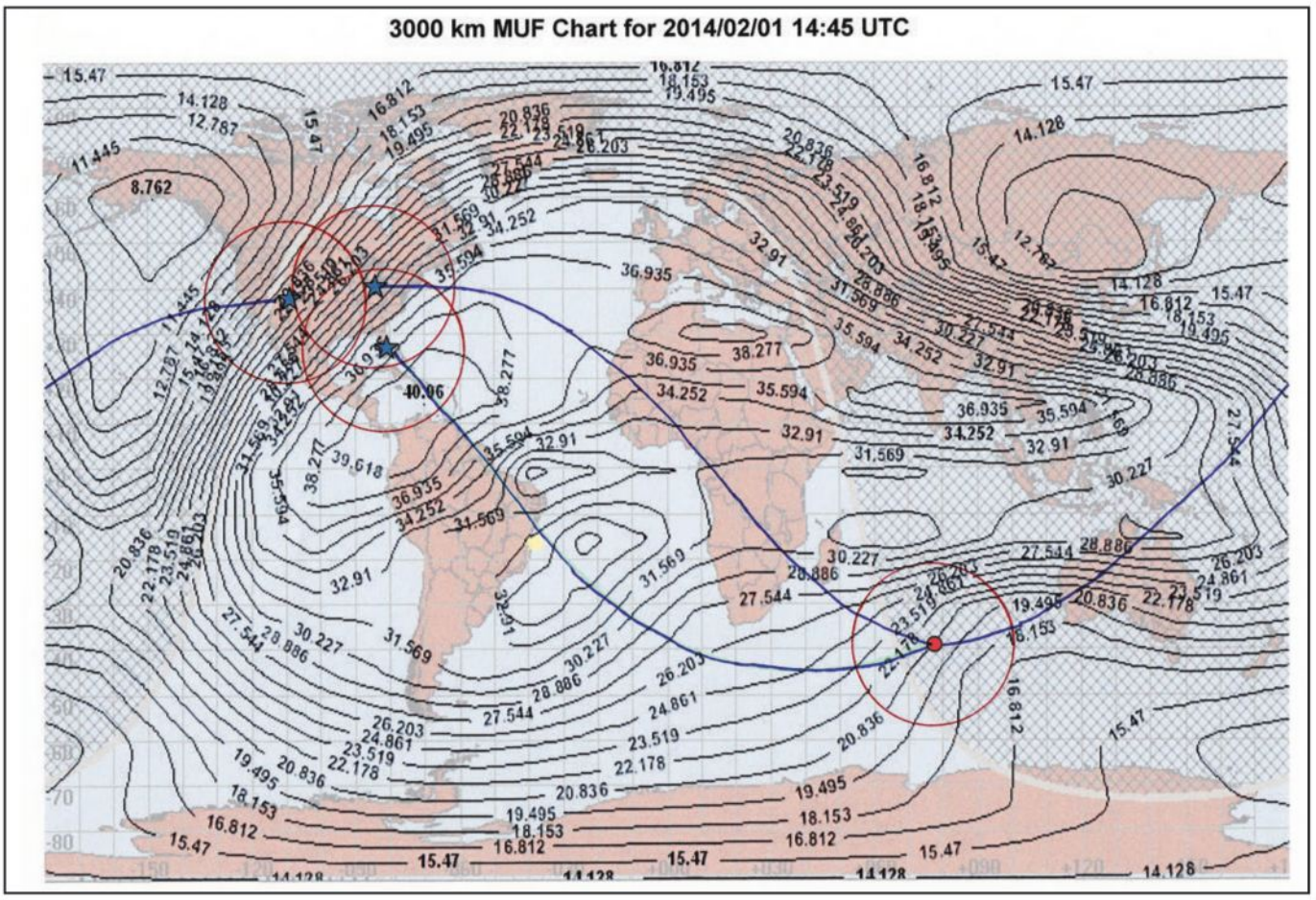


Figure 2. *Worldwide F_2 MUF map with great circle paths.*

of two "control points" on the great circle path at 2,000 kilometers from each end.

This is the reason why there are red circles on **Figure 2** centered on FT5ZM, N4II, K9LA, and AA7XT. The circles have a radius of 2,000 kilometers, and thus are the control points around the compass for paths out of these four locations.

If the MUF is very close to 28 MHz at the two control points — remembering to take into account the 10 percent increase from the previous paragraph and allowing for the daily variation — then F_2 region propagation is likely for the entire path.

From the red circle around FT5ZM we see that headings from about northwest through northeast are the only ones that could support 10 meters at the given time of day because of the lower MUFs at higher southern latitudes. In actuality this is pretty much true for the entire day. Thus the great circle path to N4II, again highlighted in blue, is not available, even though the N4II end can support 10 meters. Also, the solid blue great circle path to AA7XT is not available at either end.

Finally, the solid blue great circle path to me, K9LA, is right on the verge of being available. I *did* work them on an easterly heading along the true great circle path.

Making Sense of It All

Now we know why N4II and AA7XT did not work FT5ZM along their short great circle paths. The N4II end could support 28 MHz but the FT5ZM end could not. AA7XT was hit with a double whammy — neither end could support 28 MHz. This brings us to the second question — *What enabled the skewed path?*

To understand what enabled the skewed paths out of N4II and AA7XT, we'll use the same worldwide MUF map as in **Figure 2** but now we'll include the actual reported headings out of N4II (we'll use the midpoint of 67.5 degrees) and out of AA7XT (to the northeast over Europe). See **Figure 3**.

For N4II, his red circle still shows his end of the solid blue 67.5-degree great circle path can support 28 MHz. For AA7XT, his red circle now shows his end of the solid blue 45-degree great circle path can support 28 MHz.

Propagation Path Askew

Note that I extended these reported headings out of N4II and AA7XT until they intersected over northern Africa. This suggests that this is the area in which the skew of each path took place to put it onto a great circle path into FT5ZM. I also took the liberty of adding the great circle path out of FT5ZM to this intersection, highlighted in green. The heading out of FT5ZM to this skew point can now support 28 MHz.

This area being the skew point makes a lot of sense, as it's in the equatorial ionosphere where the highest electron densities exist. A quick look at the horizontal electron density gradients in this area suggests refraction is not the skewing mechanism. It is more likely that reflection with some loss — or even scatter — was the skewing mechanism.

The 'Ah-ha' Moment and a Retrospective

Now we have a good idea of what enabled the skewed path. The RF from N4II and AA7XT headed out on headings that could support 28 MHz and skewed (thanks to the robust equatorial ionosphere) onto a heading into FT5ZM that could support 28 MHz.

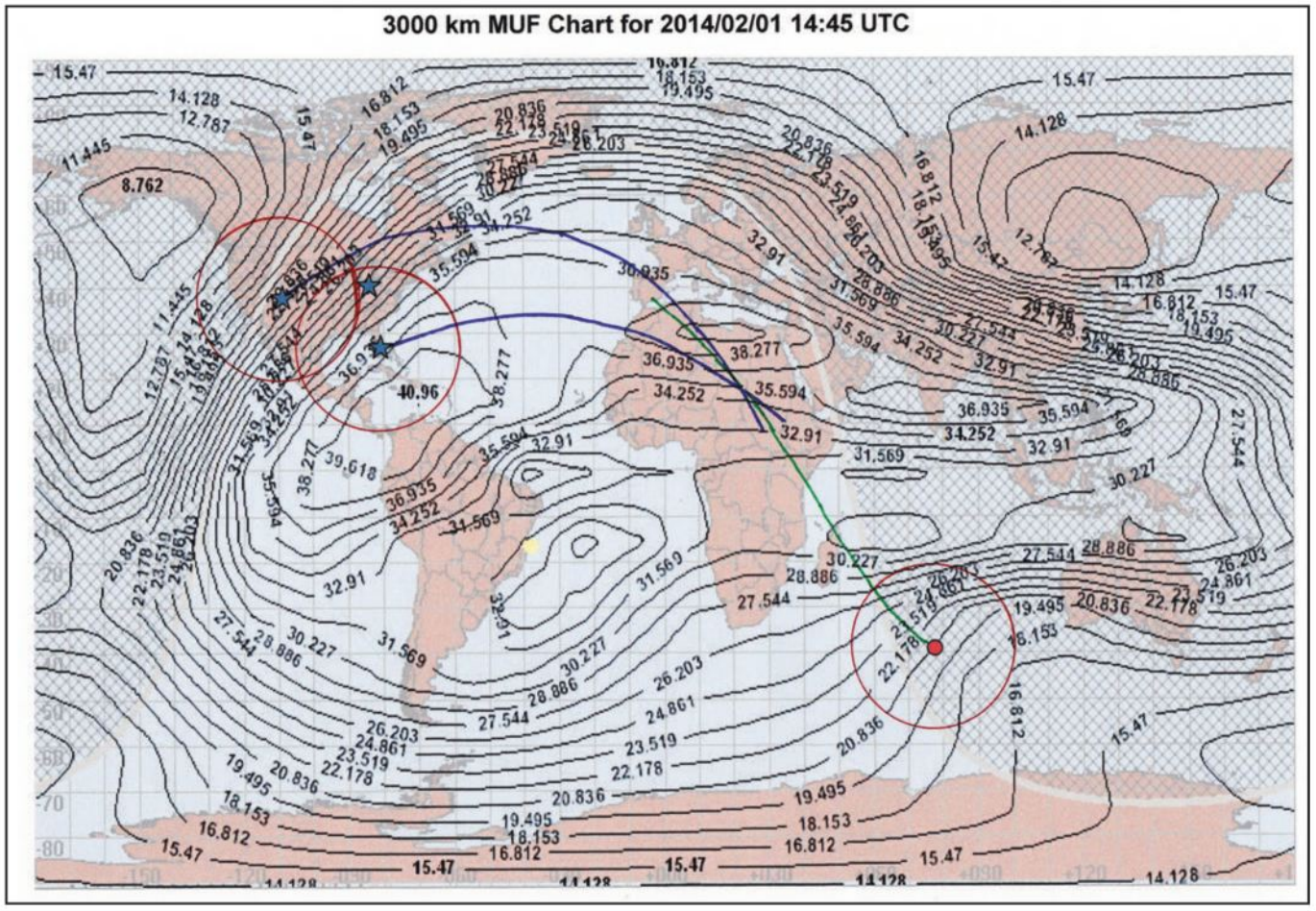


Figure 3. *Worldwide F_2 MUF with skewed paths.*

Arrival Direction of FT5ZM in North America on 160m
Carl Luetzelschwab K9LA **Rev C March 30, 2014**

The FT5ZM DXpedition to Amsterdam Island early in 2014 provided many topband DXers with a new country (more properly called an entity in DXCC parlance). The FT5ZM team did an excellent job of handing out QSOs on all the bands. Check out the FT5ZM web site at http://www.amsterdamdx.org for the team members, information about the island, QSL procedures, etc.

Preliminaries

Understanding propagation on 160-Meters is a tough nut to crack. The region of the ionosphere that is responsible for good or bad propagation is the lower ionosphere, where we don't have a lot of data. Ionosondes (essentially swept-frequency vertical-sounding

Photo B. *Practical Propagation's Carl Luetzelschwab, K9LA, finds fascinating propagation at work in his web-based piece titled "Arrival Direction of FT5ZM in North America on 160m." Download the PDF document at <http://bit.ly/1hiPY99>. (Internet screen grab)*

Some final comments are in order.

First, N4II reported that 20 meters through 10 meters exhibited the observed skew. **Figure 2** suggests that 12 meters had the same problem as 10 meters — the lack of enough ionization around FT5ZM. But based on the MUF data in **Figure 2**, 15, 17, and 20 meters could have been supported along the short great circle path. Why they weren't could be due to the FT5ZM Yagi pointed in a more northerly heading and/or increased ionospheric absorption as the true great circle path goes right under the overhead Sun — highest absorption. More work is needed here.

Second, many 160-meter operators reported hearing FT5ZM from other than their great circle path. For details on this, link to my piece titled *"Arrival Direction of FT5ZM in North America on 160m"* at <http://bit.ly/1hiPY99>, **Photo B**.

Wrapping It All Up

In summary, we've answered with good confidence the two fundamental questions with respect to FT5ZM skewed paths on 10 meters:

- Why wasn't the true great circle path available?
- What enabled the skewed path?

In doing this, we learned about great circle paths, we learned that F_2 region MUFs are highest around the equator and lowest at the higher latitudes, and we learned how our propagation prediction programs assess whether a path can support a given frequency.

Additional Propagation Charts
For Tomas Hood's, NW7US's propagation predictions, visit <http://www.CQPlusPropagation.blogspot.com>.

Optimum Working Frequencies (MHz) - For July 2014 - Flux = 138, Created by NW7US

UTC TO/FROM US WEST COAST	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CARIBBEAN	27	27	27	26	24	22	20	18	17	16	15	14	15	17	19	21	22	23	24	25	26	26	27	27
NORTHERN SOUTH AMERICA	35	35	35	32	29	27	25	23	21	20	19	18	17	20	24	26	28	30	32	33	34	35	35	35
CENTRAL SOUTH AMERICA	34	31	28	26	24	22	20	19	18	17	17	20	20	22	25	28	30	32	33	34	35	36	37	36
SOUTHERN SOUTH AMERICA	29	21	19	18	17	17	16	16	15	15	15	15	14	19	22	25	27	29	31	32	34	35	34	32
WESTERN EUROPE	15	14	13	13	12	12	17	15	14	14	13	15	19	21	22	23	24	25	25	24	23	22	21	19
EASTERN EUROPE	12	11	11	11	15	19	17	15	14	13	12	12	17	20	21	23	24	23	22	21	20	17	13	12
EASTERN NORTH AMERICA	32	31	31	30	29	28	26	24	22	20	18	18	19	22	24	26	27	29	29	30	31	31	32	32
CENTRAL NORTH AMERICA	18	17	17	17	17	16	16	14	13	12	11	10	10	11	13	14	15	15	16	17	17	17	17	18
WESTERN NORTH AMERICA	9	9	9	9	9	9	8	8	7	7	6	6	5	5	6	7	7	8	8	9	9	9	9	9
SOUTHERN NORTH AMERICA	28	28	28	28	27	27	25	22	20	19	17	16	16	16	19	21	23	24	25	26	27	27	28	28
HAWAII	23	24	24	24	24	24	23	23	21	19	17	16	15	14	13	13	14	16	18	19	20	21	22	23
NORTHERN AFRICA	21	19	17	16	15	15	17	16	15	14	13	17	19	21	23	24	24	25	25	26	25	25	24	23
CENTRAL AFRICA	22	20	19	17	17	18	17	16	15	14	13	16	19	21	22	23	24	25	25	26	26	26	26	24
SOUTH AFRICA	19	18	17	16	16	15	16	23	21	19	19	20	22	24	26	27	28	29	30	27	25	23	21	20
MIDDLE EAST	17	16	16	17	19	20	16	15	14	13	12	12	17	20	22	23	24	25	25	24	23	22	21	19
JAPAN	24	25	25	25	25	24	24	23	22	21	20	18	17	17	17	18	16	16	16	17	19	21	22	23
CENTRAL ASIA	25	26	26	25	25	24	24	23	22	21	19	17	16	16	17	19	21	20	19	18	17	18	21	23
INDIA	22	22	23	23	22	21	19	16	14	14	13	12	12	12	12	11	11	10	10	13	17	19	20	21
THAILAND	21	23	25	25	25	24	23	22	21	19	17	16	15	14	16	19	21	22	20	19	17	16	16	18
AUSTRALIA	36	37	37	37	37	37	36	35	33	29	26	24	22	21	20	18	18	17	16	16	19	27	31	34
CHINA	23	24	24	25	25	24	23	22	20	18	16	15	14	13	16	19	19	18	17	17	17	19	21	22
SOUTH PACIFIC	36	36	36	36	34	32	29	22	19	18	17	16	16	15	15	15	15	14	14	25	30	33	34	35

UTC TO/FROM US MIDWEST	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CARIBBEAN	31	30	30	29	27	25	22	21	19	18	17	16	17	20	22	24	26	27	28	29	30	30	30	31
NORTHERN SOUTH AMERICA	32	32	31	29	26	24	22	21	19	18	17	16	16	20	22	25	26	28	29	30	31	32	32	32
CENTRAL SOUTH AMERICA	34	31	28	26	24	22	20	19	18	17	17	19	21	24	26	29	30	32	33	34	35	36	36	36
SOUTHERN SOUTH AMERICA	28	21	20	18	18	17	16	16	15	15	15	15	15	21	24	27	29	31	32	33	34	35	34	32
WESTERN EUROPE	19	16	15	14	13	13	16	16	15	15	18	20	21	22	23	24	25	25	25	25	24	23	22	21
EASTERN EUROPE	12	12	11	11	11	17	16	15	14	13	16	19	21	22	23	24	24	24	23	23	21	20	17	13
EASTERN NORTH AMERICA	23	22	22	22	21	19	17	16	15	14	13	13	14	16	18	19	20	21	21	22	22	22	23	23
CENTRAL NORTH AMERICA	10	10	10	10	10	9	9	8	7	7	6	6	6	7	8	8	9	9	10	10	10	10	10	10
WESTERN NORTH AMERICA	18	18	17	17	17	16	16	14	13	12	11	10	10	11	13	14	15	15	16	17	17	17	18	18
SOUTHERN NORTH AMERICA	20	20	20	19	19	18	16	15	14	13	12	11	11	12	14	15	16	17	18	18	19	19	20	20
HAWAII	27	28	28	28	28	28	27	25	23	21	19	18	16	16	15	15	17	19	21	23	24	25	26	27
NORTHERN AFRICA	25	23	21	20	18	18	18	17	17	17	18	20	21	22	23	24	25	25	25	26	26	26	25	25
CENTRAL AFRICA	22	20	19	17	16	16	19	17	17	17	19	20	22	22	23	24	24	25	25	25	25	25	25	24
SOUTH AFRICA	18	17	17	16	16	15	15	24	22	21	21	22	25	28	30	32	33	34	31	27	24	22	21	19
MIDDLE EAST	18	16	15	15	17	18	17	16	15	15	18	20	22	23	24	24	25	25	25	25	24	23	21	19
JAPAN	24	25	25	25	24	23	22	21	19	18	16	16	16	19	20	18	17	16	16	18	20	21	23	23
CENTRAL ASIA	25	25	25	24	24	23	22	20	18	17	15	15	16	19	21	22	23	21	19	18	17	18	21	23
INDIA	15	18	19	20	21	19	16	15	14	13	12	16	19	21	20	19	18	15	12	11	11	11	10	10
THAILAND	20	23	24	24	23	22	20	18	16	15	14	13	16	19	21	22	24	22	21	19	18	17	16	18
AUSTRALIA	36	37	37	37	37	36	35	32	29	27	24	23	21	20	19	18	17	16	16	15	20	28	32	34
CHINA	23	24	24	24	23	22	20	17	16	15	14	13	17	19	21	21	20	18	17	17	18	19	21	22
SOUTH PACIFIC	36	36	36	35	33	31	27	19	18	17	17	16	16	15	15	15	15	14	14	26	31	33	35	36

UTC TO/FROM US EAST COAST	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CARIBBEAN	24	24	24	22	20	18	17	16	15	14	13	13	15	17	19	20	21	22	23	23	24	24	24	25
NORTHERN SOUTH AMERICA	28	28	27	25	23	21	19	18	16	15	15	14	16	19	21	23	24	25	26	27	28	28	28	29
CENTRAL SOUTH AMERICA	33	30	28	25	23	22	20	19	18	17	16	19	23	25	28	29	31	32	33	34	35	35	35	35
SOUTHERN SOUTH AMERICA	26	21	20	18	18	17	16	16	15	15	15	15	21	24	27	29	30	32	33	34	35	35	34	31
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EASTERN NORTH AMERICA	11	11	10	10	9	8	8	7	7	6	6	6	7	8	9	9	10	10	10	10	11	11	11	11
CENTRAL NORTH AMERICA	24	24	23	23	22	20	18	17	15	14	13	13	15	17	19	20	21	22	22	23	23	24	24	24
WESTERN NORTH AMERICA	32	32	31	30	30	29	26	24	22	20	18	18	19	22	24	26	27	29	30	30	31	31	32	32
SOUTHERN NORTH AMERICA	25	24	24	24	22	20	18	17	16	15	14	13	14	16	18	20	21	22	23	23	24	24	24	25
HAWAII	30	30	31	31	30	28	26	23	22	20	18	17	17	17	16	16	18	21	23	25	26	27	28	29
NORTHERN AFRICA	26	23	21	20	18	17	17	18	18	19	21	24	26	27	28	29	30	31	31	31	31	31	30	28
CENTRAL AFRICA	22	20	19	17	16	16	18	18	18	19	21	24	26	27	28	29	30	31	31	30	30	29	26	24
SOUTH AFRICA	18	17	17	16	16	15	15	21	20	19	20	23	26	28	30	32	33	34	31	27	24	22	20	19
MIDDLE EAST	22	20	19	18	18	18	17	16	16	17	19	21	22	23	24	25	25	26	26	26	26	26	26	24
JAPAN	24	24	24	23	22	21	20	18	17	17	17	19	21	22	20	18	17	17	17	19	20	22	23	23
CENTRAL ASIA	25	24	24	23	22	20	18	17	16	15	17	19	21	22	23	24	23	21	20	18	18	18	21	23
INDIA	11	11	11	10	17	18	16	15	15	17	19	21	22	23	23	23	23	22	21	20	18	14	12	12
THAILAND	19	22	23	22	20	18	17	15	15	16	19	21	22	23	24	25	25	24	22	20	19	17	16	17
AUSTRALIA	36	37	37	36	35	33	30	27	25	23	21	20	20	19	18	17	17	16	16	15	22	29	32	35
CHINA	23	24	23	22	21	19	17	16	15	15	18	20	22	23	22	21	19	18	16	15	15	18	20	22
SOUTH PACIFIC	35	35	35	34	32	29	24	19	18	17	16	16	15	15	15	15	14	14	15	27	31	33	34	35

BY CORY GB SICKLES, *WA3UVV

A Case of 'Hindsight Smart' vs. 'Teenage Stupid'

Kids! Don't try this at home! Don't even try it in someone else's home!

When most outsiders hear the term "amateur radio" or "ham radio" they think of some passive, sitting in a chair activity that takes place in an attic, basement, or spare room — outside the "normal" day-to-day of someone's home. Seldom is the thought of any *real* "activity" considered. Those of us who are fortunate enough to be hams know there's much more to our interests.

At times, all sorts of physical activity can be associated with getting on a radio and talking to others, whether across the state or across the world. This month, I'll share one such adventure — albeit from a few years back — that illustrates an example of "extreme" bicycle mobile operation.

The Back Story

I grew up in a small town in southwestern Pennsylvania — Uniontown — not too far from Pittsburgh and relatively close to the borders of three neighboring states. During prohibition, it was common for those engaged in some illegal activity to outrun the police — *they had no radios to call ahead for backup or assistance* — by crossing the border into Maryland, Ohio, or West Virginia. As there were also no "hot pursuit" laws in effect, numbers runners, moonshiners, and the like were safe, once they got across.

That has nothing directly to do with ham radio, but does give you some idea of the geography of my hometown area. Another, perhaps more germane fact is that the region is quite hilly. We called them mountains, but as anyone from Montana or Wyoming would tell you, they weren't high enough to quality for mountains — no, they're just hills.

Enter: Two-Wheeled Mobile Radio

I got my Novice license a few years before I could get a driver's license in the Commonwealth. That meant that either I had to ride with someone in a car to get somewhere, or walk if I was just going downtown, or ride my bike.

* Email: <WA3UVV@gmail.com>

Advertisements appearing CQ magazine in the 1970s made note of the Wilson 1402 SM's value as a most-capable 2-meter, 2.5-watt handheld FM transceiver.

power supply ($32).

Where's the Wilson?

The Wilson is so popular that hams have adopted the word *Wilson* to replace the designation walkie-talkie. "Where's the Wilson?" is a common question around my house since the *XYL* (ham lingo for wife) also is a licensed amateur radio operator.

Even though hundreds of thousands of amateurs have traditional ham shacks for talking around the world from their homes, it's not necessary to have even a tiny corner of an apartment or house to get into the fun of ham radio. Keep a Wilson handy or Heath mobile rig under your car's dash and you can be on the air at any time.

Many times I have enjoyed a *rag-chew* (ham talk for what CBers call ratchet jawing) with ham friends 100 miles from my home as I relax in the den, chatting through the hand-held Wilson.

Wilsons come in several models for use in different ham bands. The 1402-SM ($179) and 1405-SM ($249) two-meter-band models are most popular.

Popular Mechanics, June 1977. *In his article "Two Hot Ham Radios You'll Want When You Step Up from CB," Anthony R. Curtis, K3RXK, wrote that "Wilson" radios, so popular at the time, had become shorthand for walkie-talkie by radio amateurs. (Internet screen grab <http://bit.ly/1iMVN8G>)*

I loved riding a bike and still do. While today I have an 18-speed racing bike and another for mixed — paved and off-road — fun, back then it was either a 5 or 10-speed that got me around. No helmet, no kneepads, no safety gear of any sort — just a speedometer and a serious amount of adrenaline, combined with arrogance and a misplaced sense of immortality.

I rode early in the morning. I rode late at night. I rode in the summer and even in the winter, speeding headlong down a hill while getting the worst "freezer headache" you could imagine.

Once I discovered CB radio, I — of course — mounted one on my bike, along with some serious batteries on a tray over the rear wheel. A 9-foot whip antenna completed the setup. I started out with a 5-channel radio, eventually getting up to a basic 23, with no meter. *Who could read a meter, while furiously peddling?*

Soon, the addition of a 4-channel pocket-sized VHF scanner let me listen to the local police and ambulance activity. When I upgraded to Technician, the CB gave way to a 2-meter rig. My first portable was a Wilson 1402. For the low-low price of $199, you got a 2.5-watt, 6-channel handheld piece of communications hardware (rechargeable batteries included) that stood only 9-inches high, less antenna. That was rather impressive in those days.

By whacking up a means for external power, microphone, and antenna cable, the portable became a bicycle mobile, using the same batteries, but a different antenna — a Hustler collinear with 5.2 dB of gain. It seemed almost as long as the CB whip, but it proved to be a great antenna.

Most 2-meter FM activity at the time was on simplex, as there weren't that many repeaters in the area. In fact the two closest — 07/67 and 16/76 — were 20-some air miles away, in opposite directions. I thought, "If I could just get up a little bit higher, I bet I could work guys all the way to Pittsburgh."

Radio Success from The Summit Inn

As it ultimately turned out, "a little bit higher" was about 2,000 feet, at a place commonly known as "The Summit" — home of The Summit Inn and quite a few communications towers. One Saturday, I set out early in the morning with a couple of peanut butter and jelly sandwiches, three cans of RC Cola, some homemade cookies and some ice to keep it all cool.

After about two hours, I had finally managed to ride, climb and, for a time, walk the bike up to The Summit. While I was about two-thirds of the way up, I had noticed that I could hear a number of conversations on 146.52 and 146.94 MHz simplex — the latter still used for simplex in my area at that time. I drank one of the RCs while I contemplated if I had gone far enough for the day. I worked three stations, then decided to press on to the top.

Once I got up there, I moved off the road and onto a small field, where I could almost see "the 'Burgh" through the haze. I rewarded myself with the sandwiches and the second RC. For several hours, I worked stations through a couple repeaters, plus 146.52 and 146.94 simplex. As predicted, I made several contacts in that direction. The surprise, however, came from QSOs in West Virginia, Maryland, and even Ohio. All with just 2 watts and a decent mobile antenna.

By mid-afternoon, I had consumed the cookies and the third RC — the latter reminding me that indoor plumbing awaited me in the village of Hopwood at the bottom of the mountain. I'd accomplished what I wanted to do, which was working dozens of stations, many from places I had yet to go. It had been a tiring, but wonderful day.

So I packed up, turned off the radio — *just one more contact* — and got ready to head downhill.


HUSTLER

the buck passing stops here!

No more buck passing—trading or shopping once you acquire a Hustler two-meter colinear. It is the ultimate in mobile antenna performance—electrical and mechanical—the answer to your search for effective power gain—transmitting and receiving!

SPECIFICATIONS

5.2 gain compared to 1/4 wave ground plane
Frequency coverage - 143 to 149 MHz
SWR at resonance - 1.2:1 or better
Bandwidth for 6 MHz - 1.5:1 or better
Power Rating - 200 watts FM
Radiator - 85" consisting of 1/4 wave lower section, phasing transformer and 5/8 wave upper section

MODEL CGT-144—Easy—no holes to drill installation with trunk lip mount on side or edge of trunk lid. 180 degree swivel ball for optimized vertical positioning of antenna. Stainless steel radiator. Includes 17' MIL SPEC RG-58/U coax with all connectors attached. Antenna is removable from mount.

MODEL CG-144—Antenna supplied with 3/8"-24 base to fit all standard mobile ball mounts (mount or cable not included).

AVAILABLE FROM ALL DISTRIBUTORS WHO RECOGNIZE THE BEST!

THE QUICK — QUICK DISCONNECT

MODEL QD-1—For easy press and twist removal of your two meter colinear or Hustler HF mobile, add this assembly between antenna base and mount. It's 100% stainless steel, rugged and precision.

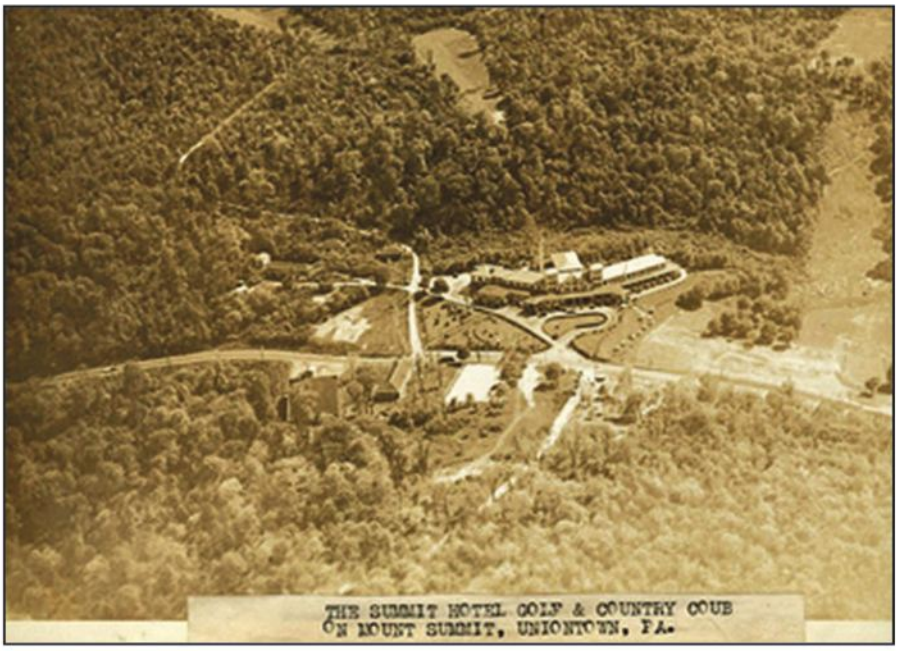
CG-144
CGT-144
QD-1

The Hustler CGT-144 2-meter collinear antenna was featured in an advertisement in the July 1976 edition of CQ. "5.2 (dB) gain compared to a quarter-wave ground plane," the ad announces. (Internet screen grab)

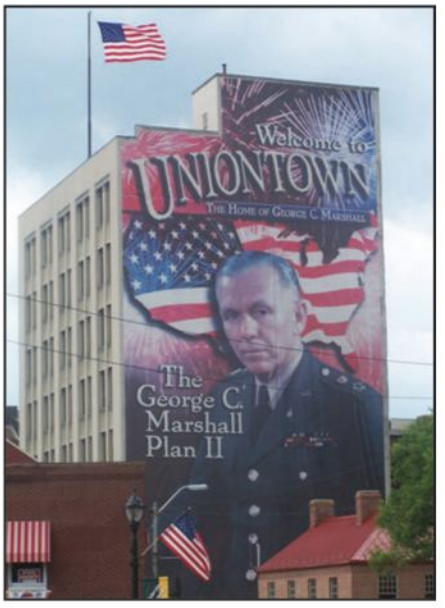
What Danger? 45+ mph Down U.S. 40!

At this point I should mention one other thing that's at The Summit. There's a sign. *A big sign.* It was a big *red sign* warning truck drivers that they

Here's how The Summit Inn looks today — even breathtaking for visitors who haven't pedaled a bicycle loaded with ham gear to the resort. (Internet screen grab <http://summitinnresort.com>)



Even in the early years of the 20th Century, The Summit Hotel, Golf and Country Club struck a mighty pose in the steep hills surrounding Uniontown, Pennsylvania. (Internet screen grab <http://bit.ly/1pFmCBq>)



A mural on the side of a building in Uniontown, Pennsylvania celebrates local hero General George Marshall and the city's revitalization efforts. (Courtesy of Wikimedia Commons)

have to stay at 10 mph or their brakes will fail. And that there's a runaway truck road down below, in case that happens. Automobiles were encouraged to shift to a lower gear and conserve braking. At the time, there was also a count as to how many had been killed by accidents. *Serious stuff, indeed.*

There was a scenic "back way" to go home that was safer than rolling downhill on a four-lane highway, but never mind that. *I was a teenager.* What did I care about danger?

While I wasn't overtly thinking that, it was somewhere in my mind. I had a moment of "Teenage Stupid." Thus, I crossed the road and started peddling downhill on a highly-traveled, dangerous section of U.S. Route 40.

While I tried to stay in the right lane, the slow-moving trucks "forced" me to move into the left and intermix with the down-shifted cars and smell of burning brake material from those who didn't. My bike's speedometer scale stopped at 45 mph, so I don't know exactly how fast I was going, but that needle was pinned and ready to bend.

As I noticed my brakes had become somewhat ineffective, I decided to stay in the left lane as much as possible, leaning in when I wanted to accelerate more. Remember, I'm trying to keep up with cars that were no doubt quite "surprised" to see me.

To Slow Down, Straighten Up

If I needed to decelerate, I simply created drag by bringing my upper body as vertical as I could. It was like trying to stand up in a 60+ mph wind. There was so much wind noise that I could hardly hear the occasional horn behind me and if I hadn't worn sunglasses, I'd never have been able to see where I was going. Had just one thing gone "sideways," I'd have never made it out of the '70s.

The whole affair was a thrilling adrenaline high. My "need for speed" reached a new plateau that day, yet I did want the ride to be over so I could get out of the traffic in which I'd essentially trapped myself.

Eventually, everyone concerned got their wish, as I came into the village at the bottom, turned into a parking lot — and finally stopped.

One of Many Great Days to Come

I could hardly stand, as the adrenaline had my legs pulsing. I was well aware at the frequency and intensity of my racing heart. As my body chemistry began to return to normal, I took stock of the day. I had a great experience on the air with dozens of Qs in the log and survived the descent — *literally the ride of my life.*

This was not to be my last time operating from The Summit or nearby peaks. It was the last time I teased death in that particular way. Future trips involved taking the back way. Eventually, once I had my driver's license in hand, the bike gave way to a car — opening up many more possibilities for moments of *Teenage Stupid.*

Today, I still enjoy riding my bike with an HF or VHF radio, but can't remember the last time I went faster than 30 mph, through the flatlands of South Jersey. I still have that 2-meter antenna, as it stood the test of time and being mounted on the trunks of cars I drove well in excess of 100 mph.

Still Alive and Pedaling

I still like hiking to high spots and I still like having fun with ham radio in less-populated areas, like Shenandoah National Park in Virginia. Despite my best efforts at times past, I'm glad I'm still around to do both, now with more sense and preparation in mind. Tempering your enthusiasm with some common sense helps ensure a long life.

Most of my bicycle mobile riding is on trails or less-traveled roadways. Soda has been replaced with bottled water, but I still pack peanut butter and jelly sandwiches for longer rides. No matter what age you may be, enjoying ham radio wherever you are can be fun. Just do it in such a way that later on you're alive to talk about it.

Having an SWL-of-a-Time With the KA500 Voyager at the Beach

BY RICHARD FISHER, *KI6SN

On a lazy Saturday afternoon in May, my "trail" led to a listening post looking out across the Pacific. The excursion wasn't planned as a radio expedition. A friend had given me a Kaito KA500 Voyager five-band portable receiver and, as an afterthought, I threw it into the pouch of my beach chair.

It just had never occurred to me to do AM/FM broadcast DXing, SWLing, or NOAA Weather Radio DXing while "watching the tide roll away," as Otis Redding once sang.

The Kaito KA500 Voyager, **Photo A**, is the older sibling of the Kaito 550, reviewed by *Disaster DXing's* Mehmet Burk in June's *CQ Plus.*

The Voyager has several power options, via:

- 6-volt Wall-wart
- Three replaceable internal AAA batteries
- Internal rechargeable battery pack — kept energized through the radio's solar panel or by hand crank

Of course, with the Sun blazing down on Newport Beach in Southern California, the solar panel turned out to be a great choice for powering the Voyager non-stop for several hours.

Holy Quietude!

It would turn out to be an afternoon of revelations — the first being just how "radio quiet" the beach can be. After plopping ourselves in the sand near the 48th Street lifeguard stand — putting some distance between my radio and interference from appliances, fluorescent lights, plasma TVs, and other RF troublemakers is incredibly refreshing.

The Voyager has fixed settings for National Oceanic and Atmospheric Administration NOAA Weather Radio broadcasts on seven channels: 162.400, 162.425, 162.450, 162.475, 162.500, 162.525, and 162.550.

From my home base, about 50 miles inland, the Voyager could pick up NOAA on channels 3, 5, and 7. In Newport Beach, with the Pacific only about 50 feet away, it was copying weather broadcasts on every channel, with greatly varying signal strength. *But still ... wow.*

FM reception was amazing. Of course, all of the Los Angeles, Orange County, and some inland stations were easily copied. But San Diego and some stations south of the border in Mexico were "making the trip," as well. Had I carried a notepad, a much better log would have been kept.

AM signals from the same regions were coming in, as well. Walk a half-mile inland from the beach and they would have been obliterated by man-made noise. The sand and water seem to make the beach a broadcast band DXer's paradise.

On the Shortwaves

The Voyager's shortwave bands are covered in two increments:

- 3.2 to 8 MHz — a slice of spectrum for gray line and nighttime reception

*email <ki6sn@cq-amateur-radio.com>

Photo A. *You never know who else might be listening during an AM/FM, SWL, and NOAA Weather Radio listening expedition to the beach. The Kaito KA500 Voyager five-band portable radio turned out to be a quack, er crack performer from our Newport Beach, California listening post.*

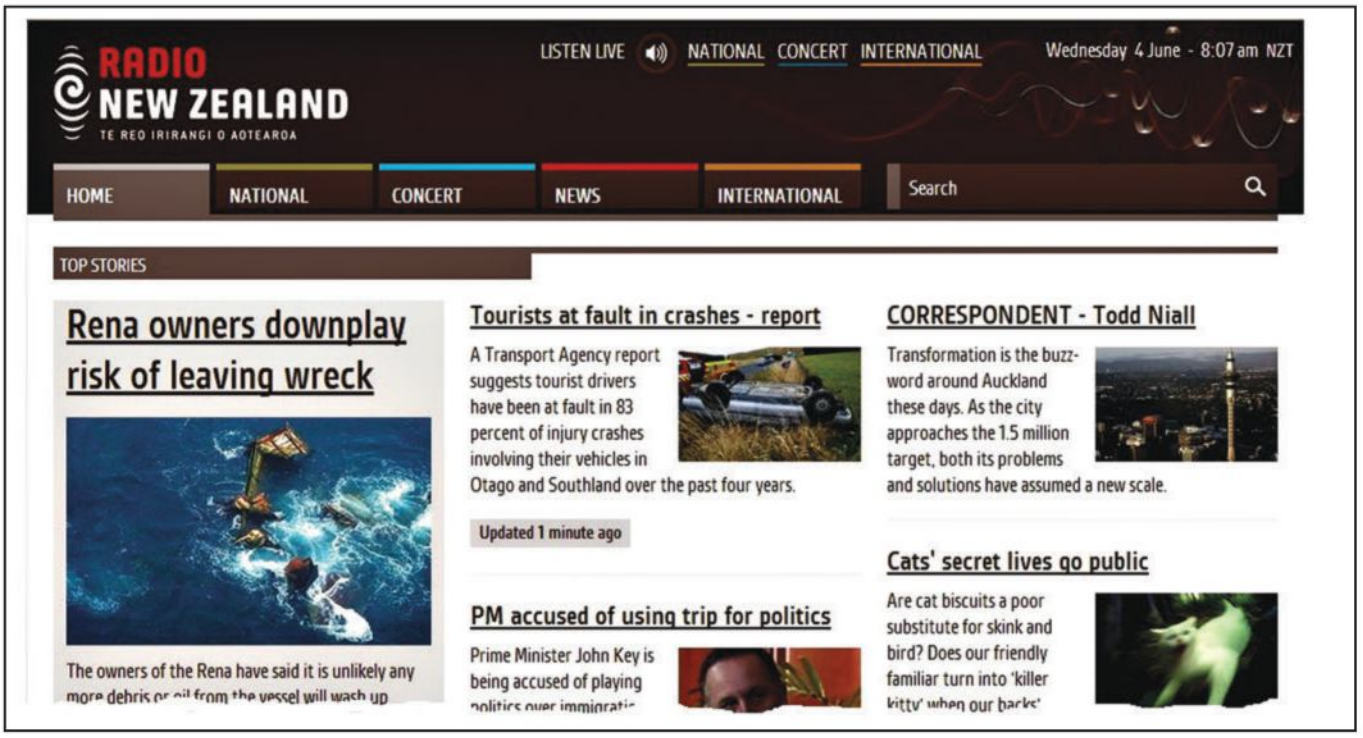


Photo B. *To our great surprise, Radio New Zealand was one of the loudest stations coming through on the shortwaves at our beach location in late May.*

- 9 to 22 MHz — especially good for daytime reception

As a bonus, there are several amateur radio bands that fall into the Voyager's span of coverage: 80/75, 60, 40, 30, 20, 17, and 15 meters. *More on that later.*

On shortwave, Radio Australia and China Radio International were neck-and-neck in terms of prominence. During my SWLing adventure — which lasted from about 1 to 5 p.m. local time — it seemed one or the other was popping up on the dial. Especially on the Voyager's SW2 (9 to 22 MHz).

Radio New Zealand, **Photo B**, and WWCR, from Nashville, Tennessee, were also making the scene. In addition, there were lots and lots of foreign language broadcasts I wasn't able to identify. Believe me, though, the Voyager was not for want of incoming RF. There were stations wall to wall — some sounding like locals; others fading in and out just above the natural noise level.

I did my best to log them on my cell phone's notepad. *(**NOTE TO SELF:** Next time bring a proper log sheet or logging program, **Photo C**. – KI6SN.)*

Tuning Across the Amateur Radio Bands

When exploring the amateur radio bands, things got *really* interesting. Now, the Voyager is capable of AM and FM reception, but was not designed with a beat-frequency oscillator (BFO). So Morse (CW) and SSB (single sideband) reception is difficult — but not impossible.

*(**UPCOMING:** Without modifying the Kaito 500, I believe it is possible to use an outboard BFO to allow "real" CW and SSB reception. Perhaps that's a project we can take on soon. – KI6SN.)*

The beauty of the Voyager's analog (opposed to digital) tuning is that the listener can maneuver between standard frequencies to make signals readable that might not otherwise be.

With the '500, Morse code comes in without a tone. It sounds like a dead RF carrier you might have heard on 75-meter AM 50 years ago — except that it is intermittent. Atonal CW is actually quite easy to copy on the Voyager. An outboard BFO would be a nice addition,

Photo C. *During our SWLing expedition, I sent a text message to CQ Editor Rich Moseson, W2VU, with this picture attached. "Radio Australia may be bouncing off the Goodyear blimp," I surmised. I don't think he bought into my propagation theory!*

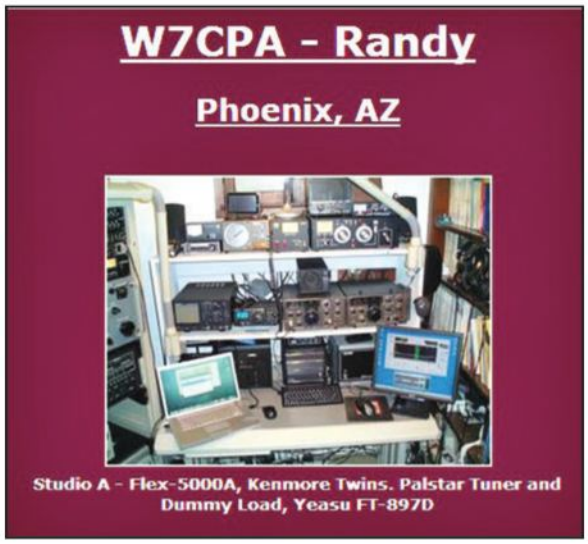


Photo D. *Using a Flex 5000A, Randy Best, W7CPA, was putting a bodacious signal into the Voyager KA500 on 40-meter AM from Phoenix, Arizona. Find links to his many radio-related websites at <http://www.QRZ.com/db/W7CPA>. (Internet screen grab)*

Photo E. *The KA500's pop-up solar panel assures unlimited listening time on a sunny day — especially from a listening post just a few feet from Pacific waters.*

but even without one, I was able to capture a bunch of CW QSOs on several amateur radio bands.

For example, I listened to Alain Claverie, FO5RH, running one DX contact after another on 15-meter CW. His signal was pounding into Newport Beach all the way from French Polynesia. Coming in like a ton of bricks, as well, was AC2K on 17 meters — Alan Lomenski, up the coast in Redmond, Washington.

On 30-meter CW, I enjoyed listening to a casual rag chew between Bob Gates, W7AYN, of Mesa, Arizona and Al Gordon, N6ZI, of San Diego. They were S9 and a joy to copy.

Ohhhh, That Sideband

Sideband reception is a lot more challenging on the Voyager. It's kind of like listening to Donald Duck with laryngitis — no tone, just a lot of air.

Photo F. *There are times that the only man-made noise to be heard at the beach is from a random jogger, in this case being trailed by his little dog. It's a radio monitor's paradise. (Courtesy of Catatonique via Wikimedia Commons)*

what's new

Vectron International Announces Small Form Factor Low G-Sensitivity TCXO

Vectron International, a manufacturer of precision oscillators and timing solutions, has announced the release of a low g-sensitivity TCXO (Temperature Compensated Crystal Oscillator) suitable for harsh environment applications. This TCXO was designed to meet the challenge of delivering low g-sensitivity performance in the smallest footprint.

Features:

- Low g-sensitivity 0.2 ppb/g standard, with a 0.1 ppb/g option.
- Package: 7.0 millimeters x 5.0 millimeters x 2.8 millimeters
- Temperature stability to +/-1 ppm -40° to 85° C
- Standard frequencies: 10, 12.5, 20, 25, 40, and 50 MHz
- Fully hermetic device for washable applications

For more information contact: Vectron International, 267 Lowell Road, Suite 102, Hudson, New Hampshire 03051. Phone: (888) 328-7661. Fax: (603) 598-0075. Website: <http://www.vectron.com>.

Note: *"What's New" is not a product review and does not constitute a product endorsement by CQ. Information is primarily provided by manufacturers/vendors and has not necessarily been independently verified.*

There was a YY1 running DX contacts from Venezuela. It sounded like a YL (young lady) at the microphone. Too bad I couldn't quite catch the callsign.

Meantime, Frederick Kleber, K9VV/KP2, had a beautiful SSB signal from St. Croix in the Virgin Islands. He was the big shot caller in a wild DX pile-up.

On 40-meter SSB, I heard Randy Langley, NF6Y, from Hesperia in the Southern California high desert.

Perhaps the most pleasant amateur radio phone reception came in the form of Randy Best, W7CPA, from Phoenix, Arizona. He was on 40-meter AM (amplitude modulation) and totally in the clear on the high end of 7.2 MHz. His broadcast-quality signal sounded fantastic on the Voyager's SW1 shortwave band. 'CPA was running a Flex 5000A through an RF amplifier at high power, <http://bit.ly/1l3vu3p>, **Photo D**. And what gorgeous audio he was delivering to this Sun-soaked listener 350+ miles to his west.

Other Pleasant Surprises

The Voyager's solar panel kept the radio's internal rechargeable batteries topped-off the whole afternoon, **Photo E**. What a pleasure it was to traverse the bands without having to worry about running out of power. And to my surprise, the small telescopic whip antenna did just fine on all five Voyager bands. The "radio quiet," **Photo F**, wasn't hard to take, *at all.*

With the wind picking up and the Sun getting lower in the sky, it was time to pack our things and head home. But what a great several hours of AM/FM, shortwave, and NOAA Weather Radio monitoring we had.

I can only imagine what on-the-beach reception must be like after sundown. Now, there's something to plan for. *And real soon.*

The *Subaudible* Sound of Silence

BY CORY GB SICKLES, *WCQ2CS

And in the naked light I saw
Ten thousand people, maybe more.
People talking without speaking,
People hearing without listening,
People writing songs that voices never share
And no one dared
Disturb the sound of silence.
– From "The Sound of Silence," Simon & Garfunkel
<http://bit.ly/U73sux>

Listening to your favorite Citizens Band channel when conditions are quiet is generally a pleasant experience. Bring up your carrier squelch control to the point just beyond where the noise is silenced and only incoming signals will be heard.

Bring it up somewhat higher and only strong signals will be heard. When the bands are open, or the noise level is higher, the squelch control doesn't always seem to be all that effective — as a constant stream of undesired signals come through your speaker.

What if there was a better way to silence your receiver until just the transmissions of friends, family, or radio club members could be heard — blocking out all others? With GMRS, FRS, and MURS we have such capabilities, in the form of Continuous Tone Coded Squelch System (CTCSS) and its high-tech cousin, Digital Coded Squelch (DCS). Perhaps there's a way to easily incorporate this for AM use on 27 MHz.

Essentially, CTCSS adds a tone in the frequency range that's lower than the normal frequency bandwidth that voice communications uses — 300 Hz to 3,000 Hz. Using an industry-standard set of tones ranging from 67 Hz to 250.3 Hz, encoder and decoder circuitry is designed to enable quieter and specifically targeted communications.

If memory serves, Motorola was the first company to introduce the idea and trademarked it as Private Line (PL). Most hams and communications professionals will often refer to CTCSS as PL.

PL enabled more users on a specific frequency, as long as they were willing to talk at different times. Thus, a municipality's Water Department, Highway Department, and School District could all share the same frequency and, or repeater. Maybe the same repeater could be shared by several municipalities or commercial businesses. Using PL they don't have to hear each other's conversation. A "busy" light or "busy lockout" function helped ensure non-interference.

Other two-way radio companies soon joined in, with General Electric offering "Channel Guard," RCA calling theirs "Quiet Channel" and more. Some even added "non-standard" tones and codes. If your receiver didn't make use of a CTCSS decoder, then you'd still hear everything on a given channel.

Originally, tones were generated and detected through the use of "reeds" and "elements," which might be marked with Motorola's 2-character designators (see accompanying chart). As specialized integrated circuits became available, the elements gave way to chips that were programmable through DIP switch or jumper settings. Companies like Communications Specialists <http://www.comspec.com> offer modern add-ons for transceivers that don't already have CTCSS built-in.

Using something like the TS-64WDS, **Photo A**, you attach the encoding signal to your transmitted audio and pull the decoder input from your receiver's pre-processed audio. The specific points vary from radio to radio, but the theory is basically the same with all of them. An experienced technician — with appropriate certification — is required to modify any CB transmitter, so employing the services of one is highly encouraged.

As mentioned, CTCSS has an updated version. As so much else is going analog to digital, DCS would be an improvement in one particular area. When AM signals mix, from more than one transmission simultaneously being heard on a channel, the difference in frequencies is often detected as an audio tone — known as a heterodyne or "squealing." If the frequency difference was somewhere

Photo A. *"Using something like the TS-64WDS" from Communications Specialists, writes WA3UVV, "you attach the encoding signal to your transmitted audio and pull the decoder input from your receiver's pre-processed audio." (Internet screen grab <http://bit.ly/1l0Ed6s>.)*

*<wa3uvv@gmail.com>

between 67 and 250 Hz, then a CTCSS-equipped receiver might just see that as a legitimate tone and open up the squelch.

DCS, by virtue of its digital signal, doesn't allow for that possibility. Going back to our friends at Communications Specialists, their DCS-23 would give you the ability to have a DCS encoder/decoder added. DCS is seeing more popularity with some GMRS and amateur radio repeater communities. Modern two-way transceivers have both analog and digital signaling features built in.

While FM users have long made use of this technology, it can also be used for AM. Again, a skilled and qualified technician should be used and it does add some expense to your

Photo B. *Here is the Ramsey TT7 DTMF Decoder Kit. (Internet screen grab <http://bit.ly/T74Psl>)*

Photo C. *Ramsey offers a Tone Encoder/Decoder kit designated the TD1. (Internet screen grab <http://bit.ly/1mJrAuU>)*

transceiver, but the resulting reduction in noise and overall "pleasantness" of having less unwanted background chatter might be worth the investment.

If you're a member of a CB club and want some simple way to alert everyone on a specific channel, there's also the idea of using a single tone to open up the receivers. In the early days of 2-meter AM repeaters, hams used standardized tones in the 2,200-Hz range for such purposes. These are definitely audible tones and can be emitted by whistles from talented individuals with perfect pitch. A simple pair of tone encoder and decoder circuits, available as kits from Ramsey Electronics <http://www.ramseyelectronics.com>, **Photos B** and **C**, could be made using the popular LM567 chip, if you have a "solder junkie" in your midst.

The advantage of such an approach is that the tones can be inserted and detected outside of your transceiver, without the need for surgery by a suitable "radio doctor." If you want to use DTMF (Touch Tone) tones, then Ramsey also offers a DTMF decoder. By making use of a DTMF microphone as the encoder — popular on VHF/UHF ham rigs — that also opens up the possibility of a selective calling arrangement. Here again, no internal modifications are required.

I have seen CTCSS implemented in European CB rigs, but not on anything offered for the North American market. Perhaps if some popular manufacturers get enough emails about this subject — *from all of you* — they'll add CTCSS or some other means of tone-enabled operation. Such enhancements would make 27-MHz communications and monitoring all that much more useful and enjoyable — especially the *sound of silence.*

Valid Motorola PL Codes

XZ 67.Ø	WZ 69.3	XA 71.9	WA 74.4	XB 77.Ø	WB 79.7
YZ 82.5	YA 85.4	YB 88.5	ZZ 91.5	ZA 94.8	ZB 97.4
1Z1ØØ.Ø	1A 1Ø3.5	1B 1Ø7.2	2Z 11Ø.9	2A 114.8	2B 118.8
3Z 123.Ø	3A 127.3	3B 131.8	4Z 136.5	4A 141.3	4B 146.2
5Z 151.4	5A 156.7	5B 162.2	6Z 167.9	6A 173.8	6B 179.9
7Z 186.2	7A 192.8	M1 2Ø3.5	8Z 2Ø6.5	M2 21Ø.7	M3 218.1
M4 225.7	9Z 229.1	M5 233.6	M6 241.8	M7 25Ø.3	ØZ 254.1

Codes in RED are non-standard and are NOT recommended.
Codes above 200 Hz may be audible and are not recommended.

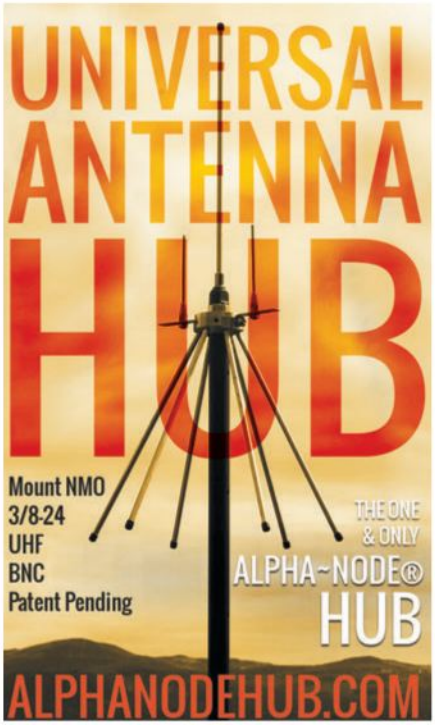
Table 1.

Valid Motorola DPL (DSC) Codes

Ø	Ø	Ø	Ø	Ø	Ø	Ø	Ø	Ø	Ø	Ø	Ø	Ø
2	2	2	3	3	4	4	5	5	5	6	7	7
3	5	6	1	2	3	7	1	3	4	5	1	2
Ø	Ø	1	1	1	1	1	1	1	1	1	1	1
7	7	1	1	1	2	2	3	3	3	4	5	5
3	4	4	5	6	2	5	1	2	4	3	2	5
1	1	1	1	1	2	2	2	2	2	2	2	2
5	6	6	7	7	Ø	1	2	2	2	4	4	4
6	2	5	2	4	5	2	3	5	6	3	4	5
2	2	2	2	2	2	2	2	3	3	3	3	3
4	5	5	6	6	6	6	7	Ø	1	1	2	3
6	1	2	1	3	5	6	1	6	1	5	5	1
3	3	3	3	3	3	4	4	4	4	4	4	4
4	4	5	6	6	7	1	1	1	2	2	3	3
3	6	1	4	5	1	1	2	3	3	5	1	2
4	4	4	4	4	4	4	5	5	5	5	5	5
4	4	5	5	6	6	6	Ø	Ø	1	2	2	3
5	6	2	5	4	5	6	3	6	6	1	5	2
5	5	5	5	6	6	6	6	6	6	6	6	6
4	5	6	6	Ø	1	2	2	3	3	4	5	5
6	2	4	5	6	2	4	7	1	2	5	2	4
6	6	7	7	7	7	7	7	7	7	7	7	
6	6	Ø	1	2	2	2	3	3	3	4	5	
2	4	3	2	3	5	6	1	2	4	3	4	

Codes shown in RED are non-standard and are not recommended.

Table 2.



BY RYAN ARCHER, KCQ6KPH

With a 6146's Warm Glow, Memories Of a Beloved, Departed Brother

My friend Jimmy Brown seemed awfully sad when he came back to school after Spring Break. Not the kind of sad *everyone* was feeling after two weeks of fun and mom's cooking — away from classes and study halls and mandatory this-and-that.

Jimmy had lost his big brother to a car accident just one day after vacation began. Nobody at school found out about it until we returned for the academy's final term of the 2014 academic year. Jimmy was crestfallen.

Me being kind of an electronics and radio geek, Jimmy sometimes would talk long after "lights out" about his brother, Michael's, passion for building and restoring audio equipment. Talk is what roommates do to preserve their sanity by "escaping" from prep school, using their imagination to free themselves from the mind-numbing routine.

Jimmy idolized his big brother, and long before Michael's death Jimmy was giving me a blow-by-blow, week-by-week description of Michael's construction of a Maestro Audio Power Amplifier — a circuit Michael had found in the pages of a dusty, dog-eared edition of *Audio Engineering* magazine from November 1952.

Having been brought up on radio stories from my great-grandfather, Herbert "Roary" Wallace, Jimmy's descriptions of his brother's meticulous "homebrewing" made me miss my Pop more now than ever.

"Ryan," Jimmy would say as he leaned into the dorm room's darkness, "you shudda seen that Maestro Michael was working on. Turn out the lights and the glow from those tubes was like a soft comforter laying right on top of you."

Oh, Jimmy knew the tube line-up, all right: Two 6SN7 dual triodes driving a pair of mighty 6146 tetrode beam power tubes — the kind I'd heard about so often from Pop in amateur radio transmitter RF amplifiers, **Photo A**.

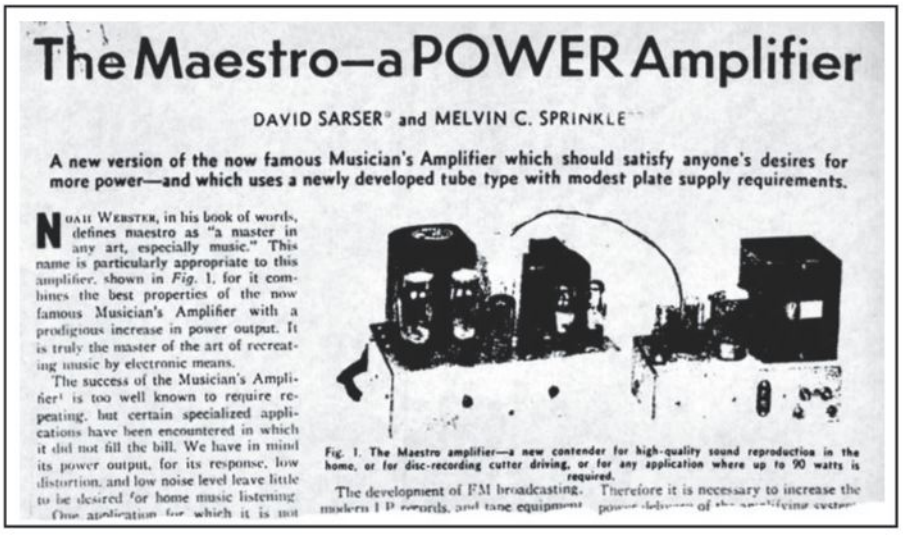
In their 1952 *Audio Engineering* article, David Sarser and Melvin C. Sprinkle wrote that the Maestro design "combines the best properties of the now-famous Musician's Amplifier <http://bit.ly/1kjZM31> with a prodigious increase in power output." *(Read that: "a pair of 6146s," **Photo B**.)*

I'd wondered why Michael had chosen a circuit more than 60 years old to duplicate in his 21st Century homebrewing style. "Because that's when the 6146 had just appeared on the scene, you knucklehead," Jimmy said. "Michael wanted to hear for himself what all the fuss was about — even though it was *way back when.*"

Having heard similar thinking from Pop, I understood completely. The caption under the photo-

Photo A. *In remembrance of Michael Brown, Ryan Archer, KCQ6KPH, guided Michael's little brother, Jimmy, through a construction project that brought a glow and warmth of memories of his older brother to their dorm room at the academy.*

Photo B. *A pair of 6146s were the big-time power brokers in the Maestro Audio Power Amplifier circuit featured in the November 1952 edition of Audio Engineering. (Courtesy of Wikimedia Commons)*



The Maestro—a POWER Amplifier

DAVID SARSER* and MELVIN C. SPRINKLE**

A new version of the now famous Musician's Amplifier which should satisfy anyone's desires for more power—and which uses a newly developed tube type with modest plate supply requirements.

NOAH WEBSTER, in his book of words, defines maestro as "a master in any art, especially music." This name is particularly appropriate to this amplifier, shown in *Fig.* 1, for it combines the best properties of the now famous Musician's Amplifier with a prodigious increase in power output. It is truly the master of the art of recreating music by electronic means.

The success of the Musician's Amplifier[1] is too well known to require repeating, but certain specialized applications have been encountered in which it did not fill the bill. We have in mind its power output, for its response, low distortion, and low noise level leave little to be desired for home music listening. One application for which it is not

Fig. 1. The Maestro amplifier—a new contender for high-quality sound reproduction in the home, or for disc-recording cutter driving, or for any application where up to 90 watts is required.

The development of FM broadcasting, modern LP records, and tape equipment Therefore it is necessary to increase the power delivery of the amplifying system

Photo C. *A new, improved version of their earlier Musician's audio amplifier, David Sarser and Melvin C. Sprinkle designed the Maestro to "satisfy anyone's desire for more power — and which uses a newly-developed tube type with modest plate supply requirements." That, of course, was the 6146, the perfect tube to commemorate the memory of Michael Brown. (Internet screen grab <http://bit.ly/1h1vXU5 >)*

graph accompanying the *Audio Engineering* article, **Photo C**, described the Maestro as "a new contender for high-quality sound reproduction in the home, or for disc-recording cutter driving, or for any application where up to 90 watts is required."

Is it any wonder Michael couldn't resist the urge to build, listen to, and savor the Maestro?

Sadly, Jimmy's updates ended with Michael's death, and I guess we'll never know if the Maestro was actually finished. In a way, though, that's kind of nice, because in our memories, Michael will *always* be working on the amplifier — tweaking its audio response circuitry, experimenting with voltages, capacitances, resistances, and inductances. In our imaginations, it would be Michael's infinite project in a quest of audio perfection.

"Every time I see an electronic tube in the night I think of Michael," Jimmy said. "Its glow makes me feel close to him. Wouldn't it be nice to have something with a tube in it right here in our dorm room?" Jimmy wondered. "It would even take the edge out of the darkness when we're talking after 'lights out,'" he said.

That got me to thinking: Pop had boxes and boxes of vacuum tubes in his radio workshop. There *must* be at least one 6146 in there.

After Pop and I almost burned down the house with that dusty power supply we'd pulled out to power our regenerative receiver, Granny dictated there would be no more high-voltage projects allowed. But for a 6146 to glow in the dark, it doesn't need high voltage — only the 6.3-volts AC to light its filaments.

Why not wire a 6146's filaments to a 6.3-volt AC transformer and create a glow of our own?

On my next visit to Granny's, I rifled through Pop's old tube collection. Sure enough, there was a 6146 near the top of the pile — dusty, but looking none-the-worse for wear. A small 6.3-volt transformer was within reach on the shelf above Pop's workbench. All we needed now were an AC power cord, single-pole/single-throw (SPST) toggle switch, an octal tube socket (8 pins), and some kind of enclosure.

Within a half hour, Jimmy and I had found everything we needed to make our glow-in-the-dark tube "rig."

Michael had been saving a low, rectangular plastic box for an upcoming project, Jimmy recalled. "I think it would make a perfect place to mount the 6146, power transformer, and the power switch in his memory," he smiled.

A week later, Jimmy returned to school with the plastic box. He was right: the box was just right. The next weekend we "escaped" to Granny's and went to work in Pop's radio workshop.

We carefully drilled the eight holes needed to mount the tube socket, power transformer, SPST switch, and the AC power chord. In practically no time, the parts were in place. We even plugged rubber grommets into the holes where wires passed.

The black leads from the transformer primary went to the AC line, which was turned off and on using the toggle switch. They were connected to the AC source using blue connector caps — the kind you see in the electrical department at local home improvement stores.

The yellow wires from the transformer's secondary carried the 6.3-volts AC needed to light the 6146's filaments. They connected to pins No. 2 and 7 on the bottom of the octal tube socket. The black center-tap on the secondary wasn't used, so we clipped it short and carefully insulated it in a bundle of wires from the transformer's other secondary leads.

The old-school toggle switch was a little too tall to mount up-and-down in the plastic box, so we turned it sideways. We shined it up with steel wool. It fit like a glove, **Photo D**.

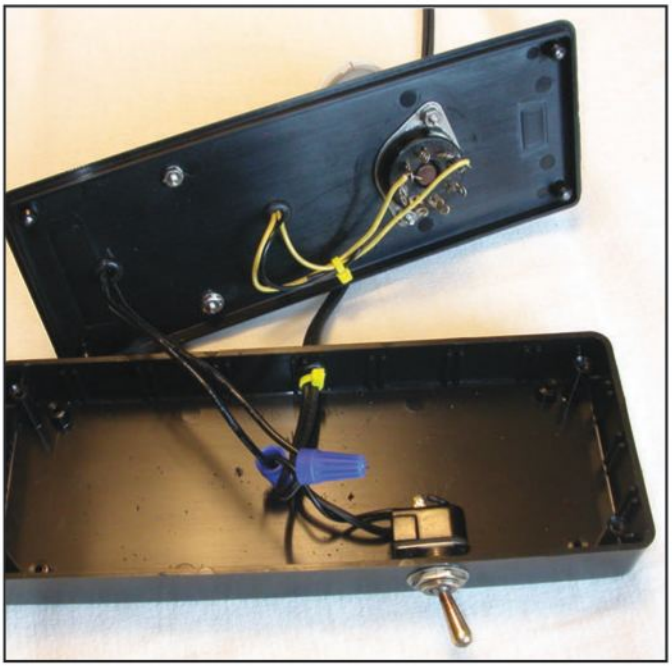


Photo D. *The plastic enclosure Jimmy Brown found in his brother's audio workshop turned out to be the perfect housing for what he and Ryan Archer would name "Michael's Glow Tube."*

Photo E. *A white, porcelain tube cap carries high voltage to the plate of the 6146 in this beautiful RF amplifier built by Dr. Greg Lassa, AA8V, and posted on an Internet site at Frostburg State University in Maryland <http://bit.ly/1opR01N>. (Internet screen grab)*

In an amplifier circuit such as the Maestro, the 6146 would have high voltage connected to the metal connection on top of the tube, **Photo E**. But since we weren't dealing with high voltage — *remember: Granny's orders* — we just left it bare. No shock value there!

"That looks really *rad,"* Jimmy said. I agreed.

We tightened wires in place using yellow plastic wire ties. All that was left to do was tighten the lid of the glow tube unit to its base and plug in the 6146. "OMG," Jimmy said. "Do you think it's going to work?"

"It'll be *perrrrrrrrrrr-fect,"* I said, with the faux confidence my Pop always exhibited. It put me in mind of him going on and on about the design of the E.F. Johnson Viking transmitters, with 6146 finals, **Photo F**. It was almost as though Pop was right there for our project.

IT'S NEW

Viking RANGER

Experienced Amateurs... Novices...

The 75 Watt Transmitter/Exciter Kit YOU Designed!

Everything you've ever wanted in a compact, *completely self-contained* transmitter/exciter. Furnished as a complete, effectively TVI suppressed kit, the Viking "*Ranger*" is designed for easy assembly by novice or experienced amateur. Operates with built-in VFO or by crystal control. Crystals accessible from front panel . . . crystal socket accommodates two crystals — front panel switching.

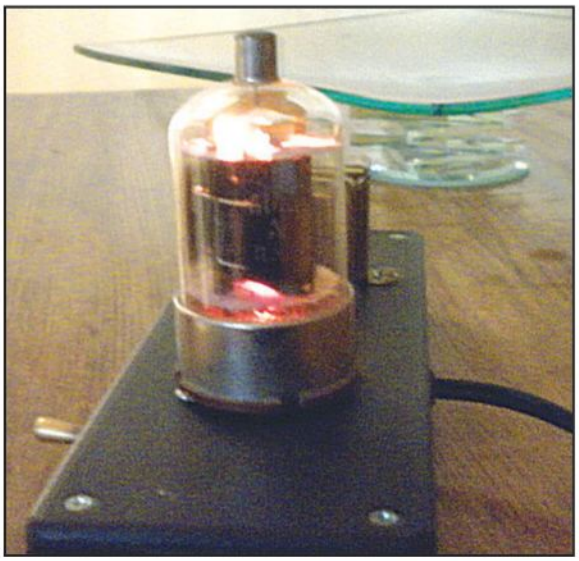
As a transmitter the "RANGER" is a rugged 75 watt CW input or 65 watt phone unit, with 100% AM modulation and pi-network antenna load matching from 50 to 500 ohms. Completely band-switching 160, 80, 40, 20, 15, 11 and 10 meters. . . tures high gain audio

FEATURES

• Built-in VFO—improved version of the famous Johnson Model 122 • Can be crystal controlled—provision for two plug-in crystals. Crystal switching may be accomplished from front panel • Seven bandswitch positions, 160 through 10 meters • 100% AM modulation • 75 watts input CW; 65 watts phone • Smooth (break-in) oscillator keying.

• Simplified tuning . . . basic tuning controls for QSY are right on VFO dial escutcheon. (Simply set VFO, touch-up buffer tuning, touch-up antenna loading and dip final. Other controls needed only when changing bands or changing mode of transmission) • Broad tuning—reasonable frequency excursions made by readjusting only VFO setting • Pi-network output matches antennas from 50 to 500 ohms . . . types can handle large amounts of

Photo F. *The original E.F. Johnson Viking Valiant ransmitter-exciter was designed with multiple 6146 beam power tubes — very popular in electronic amateur radio when this advertisement ran in the June 1954 edition of CQ magazine.*



With the lights down low, we assured the toggle switch was in the OFF position before plugging the power cord into the wall socket.

Jimmy would do the honors. His right-hand index finger was on the toggle. His left-hand pinky finger was hooked to my right pinky in a show of solidarity. "Well, here we go," Jimmy said with his eyes closed.

"Click."

Slowly opening our eyes, we waited for sparks and smoke, but there were none. And slowly ... slowly the orange glow grew inside the 6146's tube envelope. Its beauty pierced the darkness. We looked on in awe. *Speechless.*

Granny's voice broke the silence, calling us up for dinner — fried chicken and mashed potatoes, and ice cream for dessert. Could our homebrewing adventure have ended on a brighter, more delicious note?

After dinner, we carefully put "Michael's Glow Tube" in a shoebox lined with crumpled newspaper for its trip back to campus.

Back in the dorm, "lights out" on Sunday night was 10 o'clock. We could hardly wait. The unit was placed ceremoniously on a small table between our desks and beds — a perfect vantage point for each of us.

In the darkness, Jimmy asked: "You ready, Ryan?"

"Sure am, Jimmy."

Click ...

As the warm glow of the 6146 softened the darkness, we smiled and signed off:

"Goodnight, Jimmy."

"G'night, Ryan," Jimmy said. "Ya' know, Michael would have loved this."

With Appreciation to Ms. Huniwell

As many of you know, I wouldn't be writing for *CQ Plus* without the mentoring, encouragement, and support of Ms. Shannon Huniwell, longtime author of *Shannon's Broadcast Classics.*

I fill in for Ms. Huniwell from time to time — especially since she has been on special assignment in South and Central America. I wish I could tell you more about her current reporting, but it must be Top Secret, or something.

Thanks to everyone who has been kind enough to write me. If you'd like to drop me an email, do so at <CQPlus Digital@gmail.com>. The editors pass your notes along to me, which is very nice of them. I hope to hear from you soon.

*– **Your Friend,***
Ryan Archer, KCQ6KPH

Looking Ahead In CQ

Here are some of the articles we're working on for upcoming issues of *CQ*:

- **Results, 2014 CQ World Wide 160-Meter Contest**
- *CQ 160* from a WWII German Command Bunker
- Two Stations, One Moon
- A Two-Band "QRP Kilowatt"

Upcoming Special Issues

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 our writers' guidelines on the *CQ* website at <http://www.cqamateurradio.com/cq_writers_guide/cq_writers_guide.html>

CQ's 6 Meter and Satellite WAZ Awards

(As of June 1, 2014)

By Floyd Gerald,* N5FG, CQ WAZ Award Manager

6 Meter Worked All Zones

No.	Callsign	Zones needed to have all 40 confirmed
1	N4CH	16,17,18,19,20,21,22,23,24,25,26,28,29,34,39
2	N4MM	17,18,19,21,22,23,24,26.28.29,34
3	JI1CQA	2,18,34,40
4	K5UR	2,16,17,18,19,21,22,23,24,26,27,28,29,34,39
5	EH7KW	1,2,6,18,19,23
6	K6EID	17,18,19,21,22,23,24,26,28,29,34,39
7	KØFF	16,17,18,19,20,21,22,23,24,26,27,28,29,34
8	JF1IRW	2,40
9	K2ZD	2,16,17,18,19,21,22,23,24,26, 28,29,34
10	W4VHF	16,17,18,19,21,22,23,24,25,26,28,29,34,39
11	GØLCS	1,6,7,12,18,19,22,23,28,31
12	JR2AUE	2,18,34,40
13	K2MUB	16,17,18,19,21,22,23,24,26,28,29,34
14	AE4RO	16,17,18,19,21,22,23,24,26,28,29,34,37
15	DL3DXX	18,19,23,31,32
16	W5OZI	2,16,17,18,19,20,21,22,23,24,26,28,34,39,40
17	WA6PEV	3,4,16,17,18,19,20,21,22,23,24,26,29,34,39
18	9A8A	1,2,3,6,7,10,12,18,19,23,31
19	9A3JI	1,2,3,4,6,7,10,12,18,19,23,26,29,31,32
20	SP5EWY	1,2,3,4,6,9,10,12,18,19,23,26,31,32
21	W8PAT	16,17,18,19,20,21,22,23,24,26,28,29,30,34,39
22	K4CKS	16,17,18,19,21,22,23,24,26,28,29,34,36,39
23	HB9RUZ	1,2,3,6,7,9,10,18,19,23,31,32
24	JA3IW	2,5,18,34,40
25	IK1GPG	1,2,3,6,10,12,18,19,23,32
26	W1AIM	16,17,18,19,20,21,22,23,24,26,28,29,30,34
27	K1LPS	16,17,18,19,21,22,23,24,26,27,28,29,30,34,37
28	W3NZL	17,18,19,21,22,23,24,26,27,28,29,34
29	K1AE	2,16,17,18,19,21,22,23,24,25,26,28,29,34,36
30	IW9CER	1,2,6,18,19,23,26,29,32
31	IT9IPQ	1,2,3,6,18,19,23,26,29,32
32	G4BWP	1,2,3,6,12,18,19,22,23,24,30,31,32
33	LZ2CC	1
34	K6MIO/KH6	16,17,18,19,23,26,34,35,37,40
35	K3KYR	17,18,19,21,22,23,24,25,26,28,29,30,34
36	YV1DIG	1,2,17,18,19,21,23,24,26,27,29,34,40
37	KØAZ	16,17,18,19,21,22,23,24,26,28,29,34,39
38	WB8XX	17,18,19,21,22,23,24,26,28,29,34,37,39
39	K1MS	2,17,18,19,21,22,23,24,25,26,28,29,30,34
40	ES2RJ	1,2,3,10,12,13,19,23,32,39
41	NW5E	17,18,19,21,22,23,24,26,27,28,29,30,34,37,39
42	ON4AOI	1,18,19,23,32
43	N3DB	17,18,19,21,22,23,24,25,26,27,28,29,30,34,36
44	K4ZOO	2,16,17,18,19,21,22,23,24,25,26,27,28,29,34
45	G3VOF	1,3,12,18,19,23,28,29,31,32
46	ES2WX	1,2,3,10,12,13,19,31,32,39
47	IW2CAM	1,2,3,6,9,10,12,18,19,22,23,27,28,29,32
48	OE4WHG	1,2,3,6,7,10,12,13,18,19,23,28,32,40
49	TI5KD	2,17,18,19,21,22,23,26,27,34,35,37,38,39
50	W9RPM	2,17,18,19,21,22,23,24,26,29,34,37
51	N8KOL	17,18,19,21,22,23,24,26,28,29,30,34,35,39
52	K2YOF	17,18,19,21,22,23,24,25,26,28,29,30,32,34
53	WA1ECF	17,18,19,21,23,24,25,26,27,28,29,30,34,36
54	W4TJ	17,18,19,21,22,23,24,25,26,27,28,29,34,39
55	JM1SZY	2,18,34,40
56	SM6FHZ	1,2,3,6,12,18,19,23,31,32
57	N6KK	15,16,17,18,19,20,21,22,23,24,34,35,37,38,40
58	NH7RO	1,2,17,18,19,21,22,23,28,34,35,37,38,39,40
59	OK1MP	1,2,3,10,13,18,19,23,28,32
60	W9JUV	2,17,18,19,21,22,23,24,26,28,29,30,34
61	K9AB	2,16,17,18,19,21,22,23,24,26,28,29,30,34
62	W2MPK	2,12,17,18,19,21,22,23,24,26,28,29,30,34,36
63	K3XA	17,18,19,21,22,23,24,25,26,27,28,29,30,34,36
64	KB4CRT	2,17,18,19,21,22,23,24,26,28,29,34,36,37,39
65	JH7IFR	2,5,9,10,18,23,34,36,38,40
66	KØSQ	16,17,18,19,21,22,23,24,26,28,29,34
67	W3TC	17,18,19,21,22,23,24,26,28,29,30,34
68	IKØPEA	1,2,3,6,7,10,18,19,22,23,26,28,29,31,32
69	W4UDH	16,17,18,19,21,22,23,24,26,27,28,29,30,34,39
70	VR2XMT	2,5,6,9,18,23,40
71	EH9IB	1,2,3,6,10,17,18,19,23,27,28
72	K4MQG	17,18,19,21,22,23,24,25,26,28,29,30,34,39
73	JF6EZY	2,4,5,6,9,19,34,35,36,40
74	VE1YX	17,18,19,23,24,26,28,29,30,34
75	OK1VBN	1,2,3,6,7,10,12,18,19,22,23,24,32,34
76	UT7QF	1,2,3,6,10,12,13,19,24,26,30,31
77	K5NA	16,17,18,19,21,22,23,24,26,28,29,33,37,39
78	I4EAT	1,2,6,10,18,19,23,32
79	W3BTX	17,18,19,22,23,26,34,38
80	JH1HHC	2,5,7,9,18,34,35,37,40.
81	PY2RO	1,2,17,18,19,21,22,23,26,28,29,30,38,39,40
82	W4UM	18,19,21,22,23,24,26,27,28,29,34,37,39
83	I5KG	1,2,3,6,10,18,19,23,27,29,32.
84	DF3CB	1,18,19,32
85	K4PI	17,18,19,21,22,23,24,26,28,29,30,34,37,38,39.
86	WB8TGY	16,17,18,19,21,22,23,24,26,28,29,30,34,36,39
87	MUØFAL	1,2,12,18,19,22,23,24,26,27,28,29,30,31,32
88	PY2BW	1,2,17,18,19,22,23,26,28,29,30,38,39,40.
89	K4OM	17,18,19,21,22,23,24,26,28,29,32,34,36,38,39.
90	JHØBBE	33,34,40
91	K6QXY	17,18,19,21,22,23,34,37,39
92	JA8ISU	7,8,9,19,33,34,36,37,38,40
93	YO9HP	1,2,6,7,11,12,13,18,19,23,28,29,30,31,40
94	SV8CS	1,2,18,19,29
95	SM3NRY	1,6,10,12,13,19,23,25,26,29,30,31,32,39
96	VK3OT	2,10,11,12,16,34,35,37,39,40
97	UY1HY	1,2,3,6,7,9,12,18,19,23,26.28,31,32,36
98	JA7QVI	2,40
99	K1HTV	17,18,19,21,22,23,24,26,28,29,34
100	OK1RD	2,7,8,9,11,13,18,19,21,22,28,39,40
101	S51DI	1,2,6,18,19
102	S59Z	1,2,6,7,10,12,17,18,19,22,23,24,26,31,32
103	UY5ZZ	1,2,3,6,7,10,11,12,13,18,19,29,31,32,39
104	UXØFF	1,2,6,7,10,12,13,18,19,22,28,29,31,32
105	EI3IO	1,3,12,18,19,23,29,30,31,32
106	JJ2BLV	2,4,5,7,8,9,16,18,19,34,35,36,37,38,40
107	EA6SX	1,2,10,12,18,19,22,26,27,28,29,30,31,32
108	PE5T	1,2,3,6,12,18,19,22,27,29,30,31,32,39
109	SP3RNZ	1,2,3,6,7,13,18,19,23,24,26,28,31,32
110	W9VHF	17,18,19,21,22,23,24,26,28,29,30,34,36,39
111	UT5URW	1,2,3,4,6,7,10,11,12,18,19,29,30,31,32
112	KR7O	18,19,21,22,23,26,28,33,34,35,36,37,39,40
113	K8SIX	19,13,17,18,19,21,22,23,24,26,29,30,34,37
114	K7CW	16,18,19,21,22,23,24,26,28,33,34,35,36,37,39
115	SP3E	1,2,6,7,10,12,13,18,19,22,27,29,30,31,32
116	UT9FJ	1,2,3,4,5,6,7,10,11,18,19,23,30,31,32
117	9H1SP	1, 2, 6, 10, 13,18,19,23,28,29,30,31,32
118	UT5JAJ	1,2,3,6,7,10,12,18,19,32

Satellite Worked All Zones

No.	Callsign	Issue date	Zones Needed to have all 40 confirmed
1	KL7GRF	8 Mar. 93	None
2	VE6LQ	31 Mar. 93	None
3	KD6PY	1 June 93	None
4	OH5LK	23 June 93	None
5	AA6PJ	21 July 93	None
6	K7HDK	9 Sept. 93	None
7	W1NU	13 Oct. 93	None
8	DC8TS	29 Oct. 93	None
9	DG2SBW	12 Jan. 94	None
10	N4SU	20 Jan. 94	None
11	PAØAND	17 Feb. 94	None
12	VE3NPC	16 Mar. 94	None
13	WB4MLE	31 Mar. 94	None
14	OE3JIS	28 Feb. 95	None
15	JA1BLC	10 Apr. 97	None
16	F5ETM	30 Oct. 97	None
17	KE4SCY	15 Apr. 01	10,18,19,22,23, 24,26,27,28, 29,34,35,37,39
18	N6KK	15 Dec. 02	None
19	DL2AYK	7 May 03	2,10,19,29,34
20	N1HOQ	31 Jan. 04	10,13,18,19,23, 24,26,27,28,29, 33,34,36,37,39
21	AA6NP	12 Feb. 04	None
22	9V1XE	14 Aug. 04	2,5,7,8,9,10,12,13, 23,34,35,36,37,40
23	VR2XMT	01 May 06	2,5,8,9,10,11,12,13,23,34,40
24	XE1MEX	19 Mar. 09	2,17,18,21,22,23,26,34,37,40
25	KCØTO	17 Mar. 11	None
26	TI5RLI	10 July 12	2,16,19,22,23,24,26,34
27	K7YCH23	Oct 13	10,19,21,26,34,36,37,38,39
28	AHØU	26 Nov 13	2,9,17,18,20,34,36,39

CQ offers the Satellite Work All Zones award for stations who confirm a minimum of 25 zones worked via amateur radio satellite. In 2001 we "lowered the bar" from the original 40 zone requirement to encourage participation in this very difficult award. A Satellite WAZ certificate will indicate the number of zones that are confirmed when the applicant first applies for the award.

Endorsement stickers are not offered for this award. However, an embossed, gold seal will be issued to you when you finally confirm that last zone.

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 the WAZ Award Manager: Floyd Gerald, N5FG, P.O. Box 449, Wiggins, MS 39577-0449. 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 Floyd Gerald. Applicants sending QSL cards to a CQ Checkpoint or the Award Manager must include return postage. N5FG may also be reached via e-mail: <n5fg@cq-amateur-radio.com>.

**P.O. Box 449, Wiggins, MS 39577-0449; e-mail: <n5fg@cq-amateur-radio.com>*

How to Build and Operate a Very Simple Radio Receiving Set

A Retro Project from 'Radio Broadcast' Magazine, 1922

BY RICHARD FISHER, *KI6SN

This article is Letter Circular L C 43 of the Bureau of Standards, Department of Commerce. The edition of the circular is small and the editors of "Radio Broadcast" feel it a public service to bring this most authoritative matter within the reach of all beginners.

This article describes the construction and operation of a very simple and cheap radio-receiving outfit which will enable one to listen both to radio code messages and to music and voice transmitted by radio.

This article shows how to construct the entire receiving station, including antenna as well as a crystal-detector receiving set. This station will enable one to hear the messages sent from medium-power transmitting stations within an area about the size of a large city, and to hear high-power stations within 50 miles, provided the waves used by those stations have wave frequencies between 500 and 1500 kilocycles per second — wave lengths between 600 and 200 meters.

Much greater distances are often covered, especially at night. If a person constructs the coil and other parts as indicated, the total cost of this set can be kept down to about $6. If, however, a specially efficient outfit is desired, the cost may be about $15.

Essential Parts of Receiving Station

There are five essential parts: the antenna, lightning switch, ground connections, receiving set, and phone. The received signals come into the receiving set through the antenna and ground connection. In the receiving set they are converted into an electric current which produces the sound in the "phone" — either one or a pair of telephone receivers worn on the head of the listener.

The purpose of the lightning switch is to protect the receiving set from damage by lightning. It is used to connect the antenna directly to ground when the receiving station is not being used. When the antenna and the connection to the ground are properly made and the lightning switch is closed, an antenna acts as a lightning rod and is a protection rather than a source of danger to the building.

The principal part of the station is the "receiving set." In the set described herein it is subdivided into

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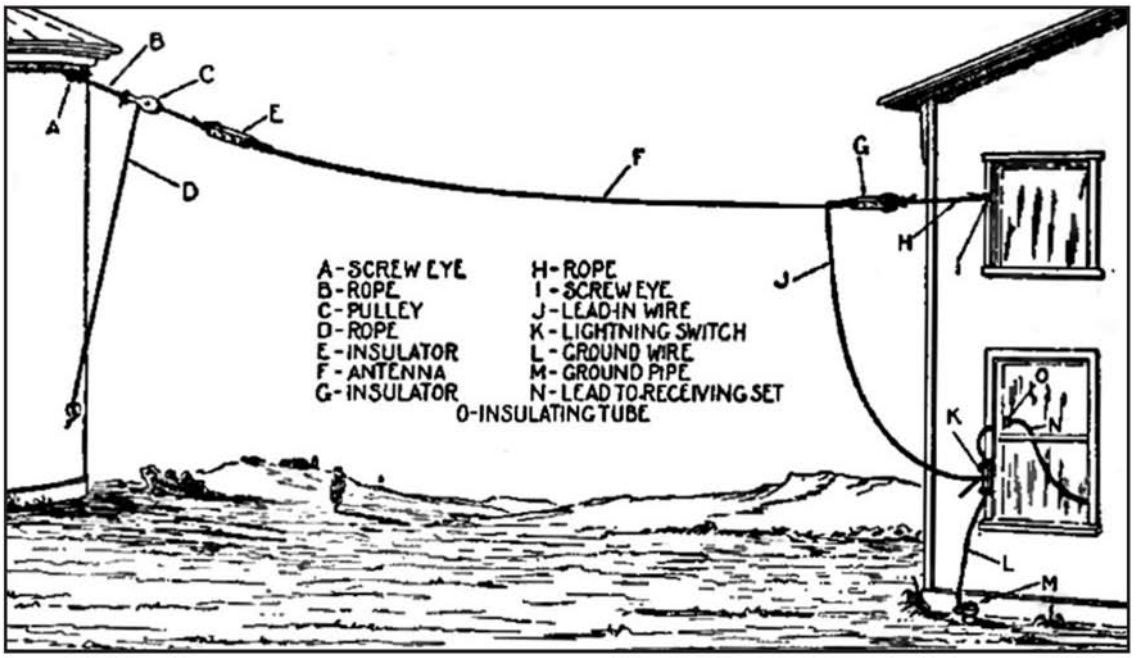

Figure 1. *Showing the exterior equipment for the radio-telephone receiving set. The antenna does not have to be horizontal.*

two parts, the "tuner" and the "detector," and in more complicated sets still other elements are added.

The Antenna, Lightning Switch, and Ground Connections

The antenna is simply a wire suspended between two elevated points. Wherever there are two buildings, or a house and a tree, or two trees with one of them very close to the house, it relieves one of the need of erecting one or both antenna supports. The antenna should not be less than 30 feet above the ground and its length should be about 75 feet, **Figure 1**.

While this figure indicates a horizontal antenna, it is not important that it be strictly horizontal. It is in fact desirable to have the far end as high as possible. The "lead-in" wire or drop-wire from the antenna itself should run as directly as possible to the lightning switch. If the position of the adjoining buildings or trees is such that the distance between them is greater than about 85 feet, the antenna can still be held to a 75-foot distance between the insulators by increasing the length of the piece of rope (D) to which the far end of the antenna is attached. The rope (H) tying the antenna insulator to the house should not be lengthened to overcome this difficulty, because by so doing the antenna "lead-in" or drop-wire (J) would be lengthened.

Details of Parts

The parts will be mentioned here by reference to the letters appearing in **Figures 1** and **2**.

A and **I** are screw eyes sufficiently strong to anchor the antenna at the ends.

B and **H** are pieces of rope three-eighths or one-half-inch in diameter, just long enough to allow the antenna to swing clear of the two supports.

C is a single-block pulley, which may be used if readily available.

D is a piece of three-eighths or half-inch rope sufficiently long to make the distance between **E** and **G** about 75 feet.

E and **G** are two insulators that may be constructed of any dry hardwood of sufficient strength to withstand the strain of the antenna; blocks about 1 x 2 x 10 inches will serve. The holes should be drilled as shown in **Figure 1**, sufficiently far from the ends to give proper strength. If wood is used the insulators should be boiled in paraffin for about an hour. If porcelain wiring cleats are available they may be substituted instead of the wood insulators. If any unglazed porcelain is used as insulators, it should be boiled in paraffin the same as the wood. Regular antenna insulators are advertised on the market, but the two improvised types just mentioned will be satisfactory for an amateur-receiving antenna.

F is the antenna about 75 feet between the insulators **E** and **G**. The wire may be No. 14 or 16 copper wire either bare or insulated. The end of the antenna farthest from the receiving set may be secured to the insulator **(E)** by any satisfactory method, being careful not to kink the wire. Draw the other end of the antenna wire through the other insulator **(G)** to a point where the two insulators are separated by about 75 feet, twist the insulator **(G)** so as to form an anchor as shown in **Figure 1**.

The remainder of the antenna wire **(J)**, which now constitutes the "lead-in" or drop-wire should be just long enough to reach the lightning switch.

K is the lightning switch. For the purpose of a small antenna this switch may be the ordinary porcelain-base, 30-ampere, single-pole/double-throw battery switch. These switches as ordinarily available, have a porcelain base about 1 by 4 inches. The "lead-in" wire **(J)** is attached to this switch at the middle point. The switch blade should always be thrown to the lower clip when the receiving set is not actually being used and to the upper clip when it is desired to receive signals.

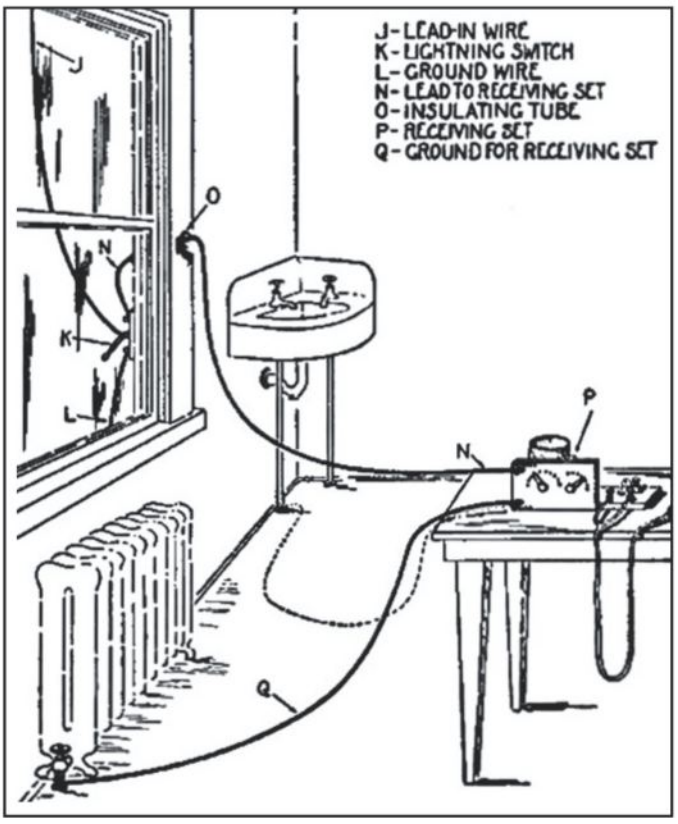

Figure 2. *Showing interior arrangement of equipment.*

L is the ground wire for the lightning switch; it may be a piece of the same size wire as used in the antenna, of sufficient length to reach from the lower clip of the lightning switch **(K)** to the clamp on the ground rod **(M)**.

M is a piece of iron pipe or rod driven 3 to 6 feet into the ground, preferably where the ground is moist, and extending a sufficient distance above the ground in order that the ground clamp may be fastened to it. Scrape the rust or paint from the pipe before driving in the ground.

N is a wire leading from the upper clip of the lightning switch through the porcelain tube **(O)** to the receiving set binding post marked "antenna."

O is a porcelain tube of sufficient length to reach through the window casing or wall. This tube should be mounted in the casing or wall so that it slopes down toward the outside of the building. This is done to keep the rain from following the tube through the wall to the interior.

Figure 2 shows the radio receiving set installed in some part of the house.

P is the receiving set, which is described in detail later.

N is the wire leading from the "antenna" binding post of the receiving set through the porcelain tube to the upper clip of the lightning switch. This wire, as well as the wire shown by **Q**, should be insulated and preferably flexible. A piece of ordinary lamp cord might be unbraided and serve for these two leads.

Q is a piece of flexible wire leading from the receiving set binding post marked "ground" to a water pipe, heating system or some other metallic conductor to ground, except **M**, **Figure 1**.

If there are no water pipes or radiators in the room in which the receiving set is located, the wire should be run out of doors and connected to a special "ground" below the window, which shall not be the same as the "ground" for the lightning switch. It is essential that for the best operation of the receiving set this "ground" be of the very best type.

If the soil near the house is dry it is necessary to drive one or more pipes or rods sufficiently deep to encounter moist earth and connect the ground wire to the pipes or rods. This distance will ordinarily not exceed 6 feet. Where clay soil is encountered this distance may be reduced to 3 feet, while in sandy soil it may be increased to 10 feet. If some other metallic conductor, such as the casing of a drilled well, is not far away from the window, it will be a satisfactory "ground."

The detector and phone will have to be purchased. The tuner and certain accessories can be made at home.

Tuner (R, **Figure 3)**. This is a piece of cardboard or other non-metallic tubing with turns of copper wire wound around it. The cardboard tubing may be an oatmeal box. Its construction is described in detail below.

Crystal Detector (S, **Figure 3)**. The construction of a crystal detector may be of very simple design and quite satisfactory. The crystal, as it is ordinarily purchased, may be unmounted or mounted in a little block of metal. For mechanical reasons the mounted type may be more satisfactory, but that is of no great consequence. It is very important, however, that a very good tested crystal be used. It is probable also that a galena crystal will be more satisfactory to the beginner.

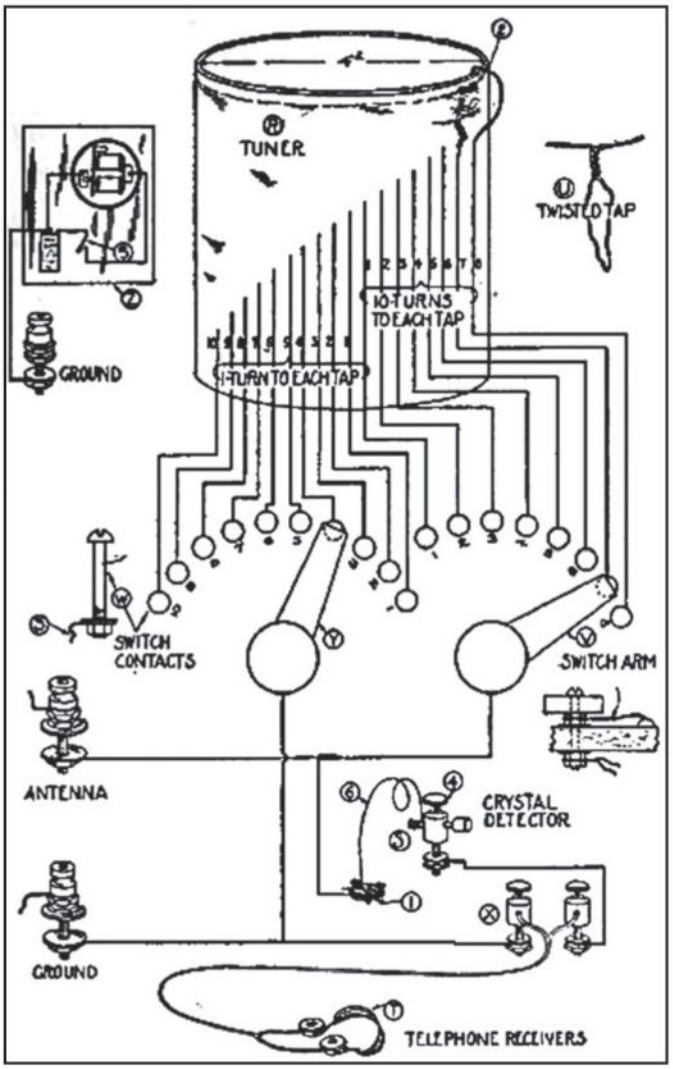

Figure 3. *The tuner and certain accessories can be made at home.*

The crystal detector may be made up of a tested crystal, three wood screws, short piece of copper wire, a nail, setscrew type of binding post, and a wood knob or cork. The tested crystal is held in position on the wood base by three brass woodscrews as shown at **I**, **Figure 3**.

A bare copper wire may be wrapped tightly around the three brass screws for contact. The assembling of the rest of the crystal detector is quite clearly shown in **Figure 3**.

Phone (T, **Figure 3)**. It is desirable to use a pair of telephone receivers connected by a headband, usually called a double telephone headset. The telephone receivers may be any of the standard commercial makes having a resistance of between 2,000 and 3,000 ohms.

The double telephone receivers will cost more than all the other parts of the station combined but it is desirable to get them, especially if one plans to improve his receiving set later.

If one does not care to invest in a set of double telephone receivers a single telephone receiver with a headband may be used; it gives results somewhat less satisfactory.

Accessories. Under the heading of accessory equipment may be listed binding posts, switch arms, switch contacts, test-buzzer, dry battery, and boards on which to mount the complete apparatus. The binding posts, switch arms and switch contacts may all be purchased from dealers who handle such goods or they may be quite readily improvised at home. There is nothing peculiar about the pieces of wood on which the equipment is mounted. They may be obtained from a dry packing-box and covered with paraffin to keep out moisture.

The following is a detailed description of winding the coil, construction of the wood panels, and mounting and wiring the apparatus.

Tuner (R, **Figure 3)**. Having supplied oneself with a piece of cardboard tubing 4 inches in diameter and No. 24 (or No. 26) double cotton covered copper wire, one is ready to start the winding of the tuner. Punch two holes in the tube about 1/2-inch from one end as shown at **2** on **Figure 3**.

Weave the wire through these holes in such way that the end of the wire will be quite firmly anchored, leaving about 12 inches of the wire free for connections. Start with the remainder of the wire to wrap the several turns in a single layer about the tube, tightly and closely together.

After 10 complete turns have been wound on the tube, hold those turns snugly while a tap is being taken off. This tap is made by making a 6-inch loop of the wire and twisting it together at such a place that it will be slightly staggered from the first tap. This method of taking off taps is shown quite clearly at **U**, **Figure 3**.

Proceed in this manner until 7 twisted taps have been taken off at every 10 turns. After these first 70 turns have been wound on the tube then take off a 6-inch twisted tap for every succeeding single turn until 10 additional turns have been wound on the tube. After winding the last turn of wire, anchor the end by weaving it through two holes punched in the tube — much as was done at the start, leaving about 12 inches of wire free for connecting.

It is to be understood that each of the 18 taps is slightly staggered from the one just above, so that the several taps will not be bunched along one line on the cardboard tube. See **Figure 3**. It would be advisable, after winding the tuner as just described, to dip the tuner in hot paraffin. This will help to exclude moisture.

Upright Panel and Base. Having completed the tuner to

this point, set it aside and construct the upright panel shown in **Figure 4**. This panel may be a piece of wood approximately 1/2-inch thick. The position of the several holes for the binding posts, switch arms, and switch contacts may first be laid out and drilled.

The "antenna" and "ground" binding posts may be ordinary 1/8-inch brass bolts of sufficient length and supplied with three nuts and two washers. The first nut binds the bolt to the panel, the second nut holds one of the short pieces of stiff wire, while the third nut holds the antenna or ground wire, as the case may be.

The switch arm with knob, shown at **V**, **Figure 3** may be purchased in the assembled form or it may be constructed from a thin slice cut from a broom handle and a bolt of sufficient length equipped with four nuts and two washers together with a narrow strip of thin brass somewhat as shown. The switch contacts **(W**, **Figure 3)** may be of the regular type furnished for this purpose or they may be brass bolts equipped with one nut and one washer each or they may even be nails driven through the panel with an individual tap fastened under the head or soldered to the projection of the nail through the panel.

The switch contacts should be just close enough so that the switch arm will not drop between the contacts but also far enough apart so that the switch arm can be set so as to touch only one contact at a time. The telephone binding post should preferably be of the set-screw type as shown as **X**, **Figure 3**.

Instructions for Wiring

Having constructed the several parts just mentioned and mounted them on the wood base, one is ready to connect the several taps to the switch contacts and attach the other necessary wires.

Scrape the cotton insulation from the loop ends of the 16 twisted taps as well as from the ends of the two single wire taps coming from the first and last turns. Fasten the bare ends of these wires to the proper switch contacts as shown by the corresponding numbers in **Figure 3**. One should be careful not to cut or break any of the looped taps. It would be preferable to fasten the connecting wires to the switch contacts by binding them between the washer and the nut as shown at **3**, **Figure 3**.

A wire is run from the back of the binding post marked "ground" **(Figure 3)** to the back of the left-hand switch arm bolt **(Y),** thence to underneath the left-hand binding post marked "phones."

A wire is then run from underneath the right-hand binding post marked "phones" to underneath the binding post **(4**, **Figure 3)**, which forms a part of the crystal detector. A piece of No. 24 bare copper wire about 2-1/2-inches long, one end of which is twisted tightly around the nail (the nail passing through **binding post 4)**, the other end of which rests gently by its own weight on the crystal **(I)**. The bare copper wire which was wrapped tightly around the three brass wood-screws holding the crystal in place is led to and fastened at the rear of the right-hand switch-arm bolt **(V)**, thence to the upper left-hand binding post marked "antenna." As much as possible of this wiring is shown in **Figure 3**.

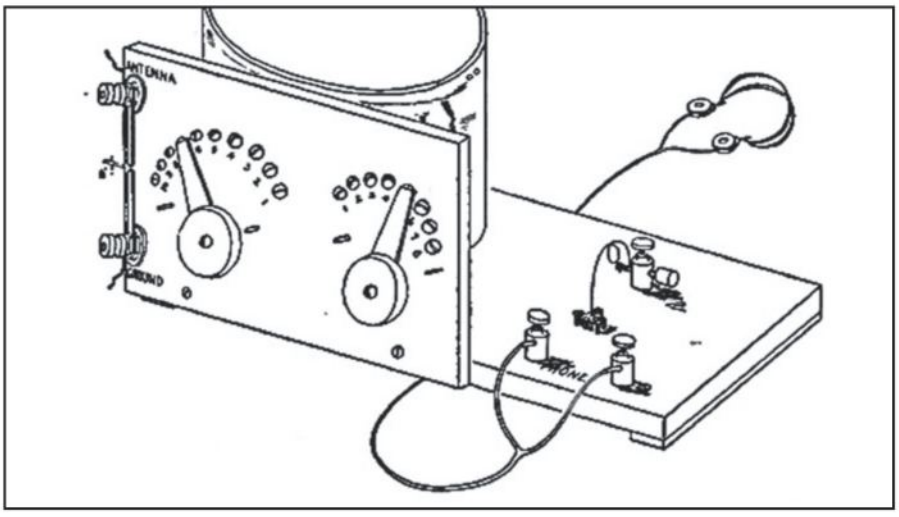

Figure 4. *The completed receiving set.*

After all the parts of this crystal-detector radio receiving set have been constructed and assembled the first essential operation is to adjust the little piece of wire, which rests lightly on the crystal, to a sensitive point.

This may be accomplished in several different ways; the use of a miniature buzzer transmitter is very satisfactory. Assuming that the most sensitive point on the crystal has been found by the method described in paragraph below, "The Test Buzzer," the rest of the operation is to get the radio receiving set in resonance or in tune with the station from which one wishes to hear messages.

The tuning of the receiving set is attained by adjusting the inductance of the tuner. That is, one or both of the switch arms are rotated until the proper number of turns of wire of the tuner are made a part of the metallic circuit between the antenna and ground, so that together with the capacity of the antenna the receiving circuit is in resonance with the particular transmitting station. It will be remembered that there are 10 turns of wire between each of the first 8 switch contacts and only 1 turn of wire between each 2 of the other contacts. The tuning of the receiving set is best accomplished by setting the right-hand switch arm on contact **(I)** and rotating the left-hand switch arm over all its contacts.

If the desired signals are not heard, move the right-hand switch arm to contact **(2)** and again rotate the left-hand switch arm throughout its range. Proceed in this manner until the desired signals are heard. It will be advantageous for the one using this radio receiving equipment to find out the wave frequencies (wave lengths) used by the several radio transmitting stations in his immediate vicinity.

The Test Buzzer (Z, **Figure 3)**. As mentioned previously, it is easy to find the more sensitive spots on the crystal by using a test buzzer. The test buzzer is used as a miniature local transmitting set. When connected to the receiving set as shown at **Z**, **Figure 3**, the current produced by the buzzer will be converted into sound by the telephone receivers and the crystal, the loudness of the sound depending on what part of the crystal is in contact with the fine wire.

To find the most sensitive spot connect the test buzzer to the receiving set as directed, close the switch (**5**, **Figure 3**, and if necessary adjust the buzzer armature so that a clear note is emitted by the buzzer), set the right-hand switch arm on contact point **No**. **8**, fasten the telephone receivers to the binding posts marked "phones," loose the set screw of the binding post slightly and change the position of the fine wire **(6**, **Figure 3)** to several positions of contact with the crystal until the loudest sound is heard in the phones, then tighten the binding post set screw **(4)** slightly.

The Weirder Side of Wireless, and Beyond

Alphabet Soup: APJHAB Reaches for the Sky Above Malawi

APJHAB team members Andrew Ashe, G8SRV; Peter Gibbs (BBC weather guy); and Jerry Sandys, G8DXZ, flew three balloons during a week-long, High-Altitude Balloon (HAB) holiday in Malawi, **Photo A**.

*(**DIGRESSION:** Who cares about where in the world Carmen San Diego is? More importantly, where in the world is Malawi? Link to: <http://bbc.in/1hrKNBa>. – KI6SN.)*

The APJHAB team is not as weird as it is cool. You can see for yourself. *(**WATCH and LISTEN:** To a BBC video report on the team's adventure at <http://bbc.in/1x8cWV1>. – KI6SN.)*

BTW: APJHAB = Andrew, Peter, Jerry, High-Altitude Balloon

To get up-to-date information on balloon flights, subscribe to the UKHAS mailing list by sending a blank email to this address: <ukhas+subscribe@googlegroups.com>.

Morse vs. Texting: The Gift That Keeps on Giving

Will the text kids ever live this down? A Fox News report aired in May about amateur radio made reference — yet again — to the Texting vs. Morse Showdown on "The Tonight Show with Jay Leno," circa 2005. For the arithmetically challenged, that's *nine* years ago.

The young SMSers were soundly trounced by Morse aficionados Ken Miller, K6CTW; and Chip Margelli, K7JA. *(**WATCH and LISTEN:** To the Fox News report on amateur radio at <http://fxn.ws/1jRhCEL>, **Photo B**. The Fox smackdown comes at 1:58 of the report. **RELIVE:** The Digital Fight at the Tonight Show Corral at <http://bit.ly/1kCZpzH>. – KI6SN.)*

Electronic Smog: Coming from a Refrigerator Near You?

"A problem for amateur radio in the urban and domestic environments is household devices that contain electronic control systems which can contribute to the "electronic smog" and the ever-increasing noise floor," Jim Linton, VK3PC, writes from Down Under.

Gilbert Hughes, VK1GH; and Rob Milliken, VK1KRM, in their annual Standards Compliance, Interference and EMR report, have "a vigilant watch on the commercial products that can impact on high frequencies and beyond," VK3PC says.

"This committee can test devices to assess their compliance with the relevant applicable Standard, with sufficient accuracy to determine whether it's compliant, borderline or not.

Of course, all radio amateurs "are encouraged to have devices tested for compliance, naturally, with priority given to mass market consumer devices with a known potential for interference."

Look: Up in the Sky! Wi-Fly! Oh, my!

This just in from Southgate ARC News:

The Australian communications company Telstra has been conducting a trial of mobile devices on planes, including the ability to deliver a broadband signal to aircraft that allows phone users to use 4G to browse the web, send and receive emails, make video calls, watch movies, and download music and photos.

The testing of the network on mock flights between Melbourne and Sydney has so far delivered fast speeds of up to 15 megabits per second. Special antennas have been placed on four phone towers between the two capitals to deliver broadband signals to passengers en route. Trials were conducted on a twin-propeller aircraft and a Cessna mustang jet that flew at the height of a commercial flight at 30,000 feet.

Testing has not yet extended to include sending and receiving text messages and making phone calls.

This Month's Contributors

Items from this month's "Unwired" are compliments of contributors to Southgate ARC News. Thanks! – KI6SN.

***Photo A.** The high-flying APJHAB team — the focus of a very interesting BBC web story — included Andrew Ashe, G8SRV; and Jerry Sandys, G8DXZ, appearing in this part of a video narrated by the Beeb's Peter Gibbs. **(READ, WATCH and LISTEN:** At <http://bbc.in/1x8cWV1>.) (Internet screen grab)*

***Photo B.** Fox News' Jon Scott "air texts" as he and Jonathan Serrie recall the "Morse vs. Text" showdown on "The Tonight Show with Jay Leno" from May 13, 2005. Will those SMS whippersnappers ever live it down? (Internet screen grab <http://fxn.ws/1jRhCEL>)*

BY KURT N. STERBA*

No Need to Say 'Curtains' for the Lazy H Antenna

An email arrived at Krusty Acres in June angrily asserting that Kurt, in fact, *did not* invent the Sterba Curtain antenna.

The Krusty One is not sure where the writer heard that. But, of course Kurt didn't invent the Sterba Curtain. He never claimed he did!

E.J. Sterba invented the Curtain array back in the late 1920s. Kurt never laid claim to its invention. The writer can blame the Krusty One's mother for Kurt's reverse name similarity to the antenna. There is a back story that Kurt will get to at another time.

Not too long ago, the Newington Brain Trust at the ARRL killed the Krusty One off. Even wrote his obit. Of course, that ain't so. Nor is the Krusty One's connection to the invention of the Sterba Curtain. If you're hearing things about Kurt that don't seem believable, just write him. Kurt has *always* been a straight shooter. *But we digress.*

So, what about E.J. Sterba's Curtain? As KNS has explained previously, the Curtain antenna is an array of dipoles stacked atop one another and side-by-side.

For example, factor eight dipoles in this configuration and you'll have a 4 x 4 Sterba Curtain — with about 14dBd of gain. An 8 x 8 has around 20dBd of gain.

Nice gain, if you can get it. So why aren't Curtains being hung in radio amateurs' backyards all around the world? When was the last time you worked someone using one?

The simple answer is: *They're too big.* Sterba Curtains are more suited for shortwave broadcasters with deep pockets and lots of real estate. Historically, Curtains have made the scene at transmitter sites for the likes of Radio Sweden, **Photo A**, and Radio Free Europe, **Photo B**. As you can see, they *can* get a bit wieldy.

Many hams get interested in Sterba Curtains around ARRL Field Day. Here they are in great spaces outdoors. They look into the sky and want to see lots of wire — a whole curtain of it.

Here's a Krusty suggestion: Let's think about a mini-version of the Sterba Curtain called the Lazy H. Imagine it is for 10 meters — a 2 x 2, with two half-wave elements in-line at the top and two more three-quarter wavelengths below them. *(**IN DEPTH:** Paul Carr, N4PC, wrote an excellent treatise on the Lazy H that appeared in the March 1995 edition of CQ. Visit: <http://bit.ly/1jQN6eg>, **Photo C**. – KI6SN.)*

The Krusty One has calculated the gain of the

* c/o <CQPlusDigital@gmail.com>

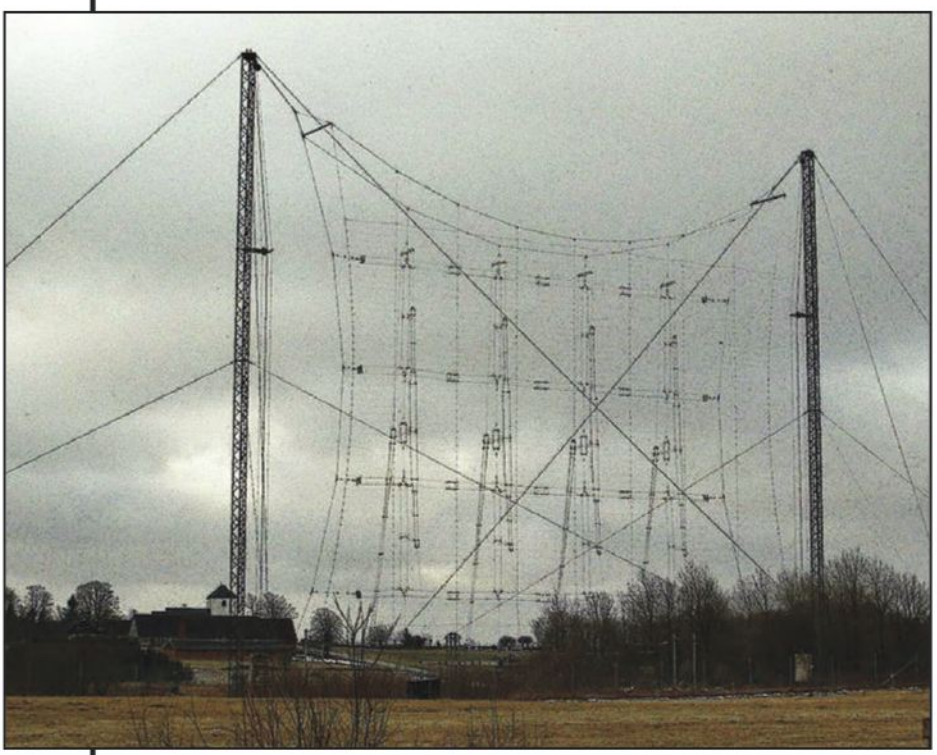

***Photo A.** This Curtain antenna array known as Antenna G1 is at Radio Sweden's Hörby shortwave station. According to the photograph's caption on Wikipedia, "it consists of 16 horizontal wire dipoles in a 4 x 4 array, suspended in front of a wire screen. Each of the four columns of dipoles is fed by a separate open-wire transmission line, which can be seen exiting at an angle from the center of each column. The diagonal wires in the foreground are guy wires." (Courtesy of Wikipedia)*

Lazy H at about 6.6dBd. Not too shabby. And it's bidirectional. It's possible to use the 10-meter version on 15 and 20 meters, as well. But you'll be giving up a significant amount of gain by doing so.

An antenna tuner will be required. And our Field Day group most likely won't be able to rotate its Curtain. *(**ASIDE:** Kurt knows for a fact that some of the big dog shortwave broadcasters have mounted their Sterba Curtain hardware on railroad cars on a circular track. When it's time to change signal direction, they ring up the engineer and move the whole she-bang to a different position on the circle. Think about THAT for Field Day. – KNS.)*

Now, a three-band beam will deliver gain similar to, or exceeding a Curtain used on 10, 15, and 20 meters. It's easy to rotate. It likely has a good front-to-back ratio — great for tamping down Field Day interference. And a tri-bander often doesn't need a tuner. So why not go this route?

In a word: *Expense.* A Lazy H is nothing more than wire and insulators. It's a cheap and fairly easy way to get out a good signal on three bands in two directions. It's up to the Field Day Committee to weigh the pluses and minuses. If their FD location has some well-placed trees and plans for a dedicated 10-meter operation, a Lazy H might be worth trying.

Kurt welcomes questions of general interest from readers and will answer them in his kolumn. Write to him at: <CQPlusDigital@gmail.com>.

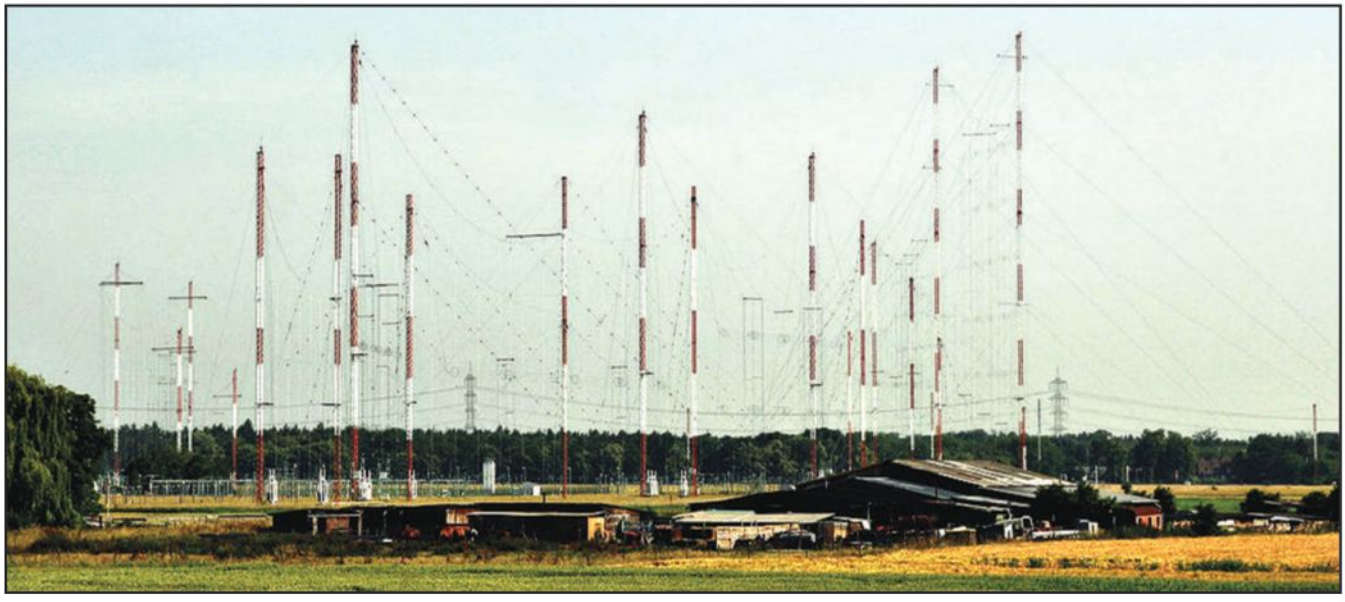

***Photo B.** This massive Curtain array is used at the Radio Free Europe transmitter site in Biblis, Germany. (Courtesy of Wikipedia)*

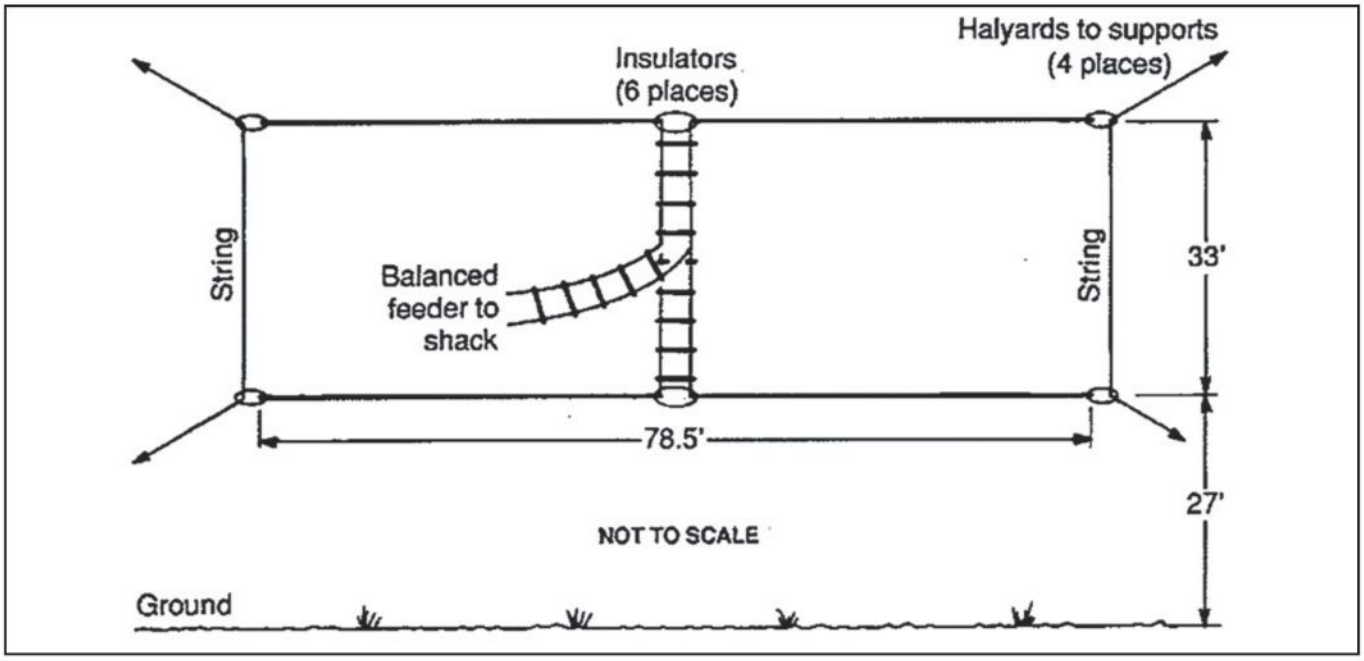

***Photo C.** The headline on Paul Carr, N4PC's piece in the March 1995 edition of* CQ *read: "The Lazy H Antenna Packs a Punch" — even when configured horizontally. Read the article at <http://bit.ly/1jQN6eg>.*

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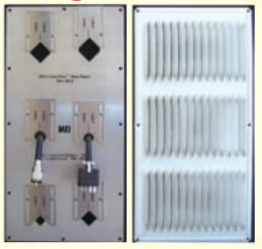

MFJ-4616 shown with standard full-size vent (not included) it replaces. For *6 Cables* **$26.95**

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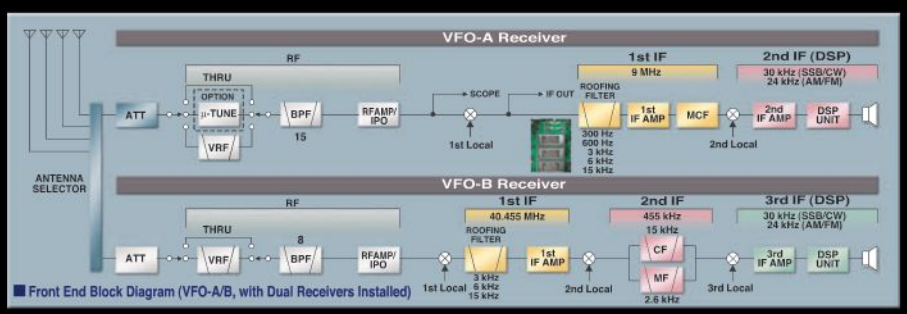

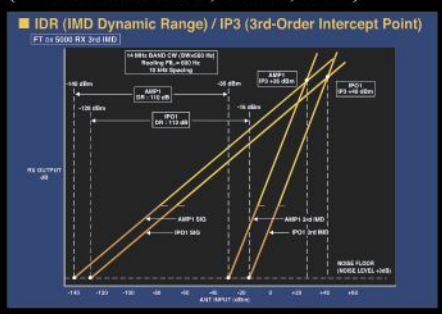

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