America's Off-Limits Islands, p. 30

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Amateur Radio

CQ

COMMUNICATIONS & TECHNOLOGY

JUNE 2014

"Take it to the Field" Special!

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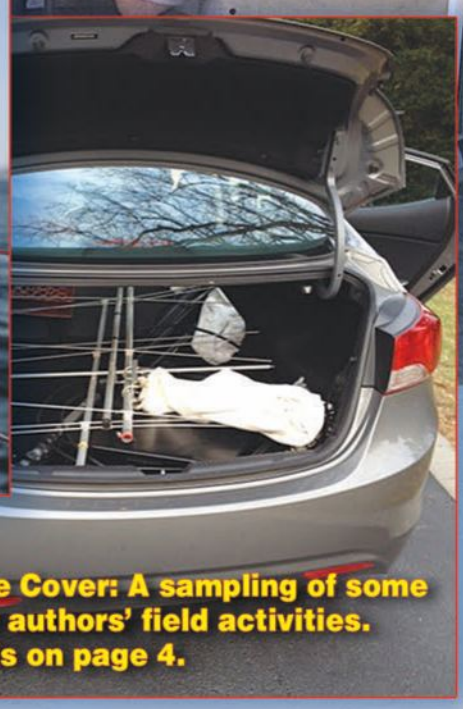

- Results, 2013 DX Marathon, p. 26
- Contesting Jargon, p. 101
- A Radio-Astronomy Renaissance Man, p. 124

On the Cover: A sampling of some of our authors' field activities. Details on page 4.

HF/50MHz ALL MODE TRANSCEIVER TS-590

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The TS-590S

Kenwood has essentially redefined HF performance with the TS-590S compact HF transceiver. The TS-590S RX section sports IMD (intermodulation distortion) characteristics that are on par with those "top of the line" transceivers, not to mention having the best dynamic range in its class when handling unwanted, adjacent off-frequency signals.*

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New! Cushcraft R9 . . . *80-6 Meters*

80 Meters . . . No Radials . . . 1500W

Cushcraft's world famous R8 now has a big brother!

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

It's omni-directional low angle radiation gives you exciting and easy DX on all 9 bands: 75/80, 40, 30, 20, 17, 15, 12, 10 and 6 Meters with low SWR. QSY instantly -- no antenna tuner needed.

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The R9 is super easy to assemble, installs just about anywhere, and its low profile blends inconspicuously into the background in urban and country settings alike.

Compact Footprint: Installs in an area about the size of a child's sandbox -- no ground radials to bury with all RF-energized surfaces safely out of reach.

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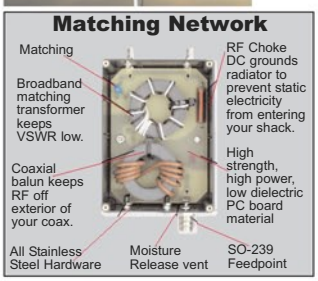
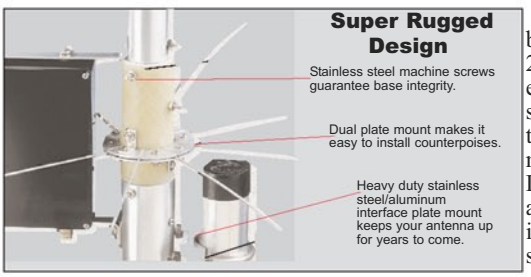
31.5 feet tall, 25 lbs. Mounting mast 1.25 to 2 inches. Wind surface area is 4 square feet.

R8, $539.95. Like R9 antenna but less 75/80 Meters.

R-8TB, $79.95. Tilt-base lets you tilt your antenna up/down easily by yourself to work on.

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





MA-5B *5-Band* Beam

Small Footprint -- Big Signal

The MA-5B is one of Cushcraft's most popular HF antennas, delivering solid *signal-boosting directivity* in a bantam-weight package. Mounts on roof using standard TV hardware. Perfect for exploring exciting DX without the high cost and heavy lifting of installing a large tower and full-sized array. Its 7 foot 3-inch boom has less than 9 feet of turning radius. Contest tough -- handles 1500 Watts.

The unique MA-5B gives you 5-bands, automatic band switching and easy installation in a compact 26-pound package. On 10, 15 and 20 Meters the end elements become a two-element Yagi that delivers solid power-multiplying gain over a dipole on all three bands. On 12 and 17 Meters, the middle element is a highly efficient trap dipole. When working DX, what really matters are the interfering signals and noise you *don't hear*. That's where the MA-5B's impressive side rejection and front-to-back ratio really shines. *See* ***cushcraftamateur.com*** *for gain figures.*

Cushcraft 10, 15 & 20 Meter Tribander Beams

Only the best tri-band antennas become DX classics, which is why the Cushcraft World-Ranger A4S, A3S, and A3WS go to the head of the class. For more than 30 years, these pace-setting performers have taken on the world's most demanding operating conditions and proven themselves every time. The key to success comes from attention to basics. For example, element length and spacing has been carefully refined over time, and high-power traps are still hand-made and individually tuned using laboratory-grade instruments. All this attention to detail means low SWR, wide bandwidth, optimum directivity, and high efficiency -- important performance characteristics you rely on to maintain regular schedules, rack up impressive contest scores, and grow your collection of rare QSLs!

It goes without saying that the World-Ranger lineup is also famous for its rugged construction. In fact, the majority of these antennas sold years ago are still in service today! Conservative mechanical design, rugged over-sized components, stainless-steel hardware, and aircraft-grade 6063 make all the difference.

The 3-element A3S/A3WS and 4-element A4S are world-famous for powerhouse gain and super performance. **A-3WS, $499.95,** 12/17 M. **30/40 Meter** *add-on kits* available.

Cushcraft Dual Band Yagis

One Yagi for Dual-Band FM Radios

Dual-bander VHF rigs are the norm these days, so why not compliment your FM base station with a dual-band Yagi? Not only will you eliminate a costly feed line, you'll realize extra gain for digital modes like high-speed packet and D-Star! Cushcraft's A270-6S provides three elements per band and the A270-10S provides five for solid point-to-point performance. They're both pre-tuned and assembly is a snap using the fully illustrated manual.

Cushcraft Famous *Ringo* Compact FM Verticals

W1BX's famous *Ringo* antenna has been around for a long time and remains unbeaten for solid reliability. The Ringo is broad-banded, lighting protected, extremely rugged, economical, electrically bullet-proof, low-angle, and more -- but mainly, it just plain works! To discover why hams and commercial two-way installers around the world still love this antenna, order yours now!

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Ten-Tec, Alpha Amplifiers, Merge

Two major American ham radio manufacturers are now one. RF Concepts, the company that manufactures Alpha power amplifiers, has purchased Ten-Tec, Inc. Both Alpha (based in Longmont, Colorado) and Ten-Tec (headquartered in Sevierville, Tennessee) will continue to operate independently but under joint management, according a May 9th announcement from RF Concepts Chairman Michael Seedman, AA6DY.

Plans call for Alpha's manufacturing operations to move to Sevierville once a new operations facility is found, while engineering, technical, and customer-support services and many front-office operations will be based in Colorado. Ten-Tec President Jim Wharton, NO4A, and Alpha President Ken Long, NØQO, will remain in charge of their respective divisions.

ARRL Opposes FCC Move to Withdraw Protections from Licensed Services

In a case that is not directly related to amateur radio spectrum, the ARRL has strongly opposed a proposal by the FCC to expand the frequencies on which Globalstar mobile satellite phones may operate, "with the condition that customer handset users in the new allocation accept interference from unlicensed radio services now legally operating there." In a posting on it website, the League said its comments pointed out that this would be the first time that licensed users would not be protected from interference by unlicensed (Part 15 or Part 18) devices with which they shared spectrum. "This is untenable as a precedent," the comments concluded, "and it makes the entirety of the [NPRM] likewise untenable." The comments were filed on IB Docket 13-213 and RM-11-685.

"Ham Video" Up and Running on the ISS

International Space Station Commander Koichi Wakata, KC5ZTA, finished the "commissioning" process for the new digital amateur television transmitter aboard the ISS in mid-April, saying the ability to transmit pictures to school groups during Amateur Radio on the International Space Station (ARISS) contacts "will enhance space conversations between crew members and students." Video of the commissioning transmission maybe viewed on YouTube at <http://youtu.be/EpFzbKvK1pk>.

K9LA: "Grand Solar Minimum" May Be Starting

CQ Plus Propagation Editor Carl Luetzelschwab, K9LA, told a webinar in late April that evidence is suggesting that we may be entering a "grand solar minimum," or extended period of low sunspot activity. However, he says he is not convinced that we're heading for another "Maunder minimum," a 70-year period of few or no sunspots in the late 17th and early 18th centuries.

According to the ARRL Letter, Luetzelschwab told a webinar sponsored by the World Wide Radio Operators Foundation (WWROF), "It sure looks like something inside the sun changed around the peak of Cycle 23" and that several weak cycles may lie ahead. However, he noted that many factors are involved in forecasting future solar activity and its impact on radio propagation, adding that "we need to gather some really good data" over the next decade to get a better picture of what may lie ahead.

Milsap Inducted into Country Music Hall of Fame

Country singer Ronnie Milsap, WB4KCG, has been named one of the newest inductees into the Country Music Association's Country Music Hall of Fame. The *ARRL Letter* reports that Milsap had 40 number-1 hits and sold more than 35-million albums at the peak of his career in the 1970s and '80s. He has also won six Grammy awards and, a little-known fact, once worked as a session musician for Elvis Presley!

CQ Columnist Earns Presidential Service Award

CQ International Editor Tom Smerk, AA6TS, has been honored with a President's Volunteer Service Award for 2013. He received the award at a presentation in early May. The President's Volunteer Service Award recognizes Americans who perform a minimum of 100 certified hours of volunteer work in a 12-month period, or more than 4,000 hours of service over a lifetime. The award was created by the President's Council on Service and Civic Participation (established by President George W. Bush) and today, the program is administered by the Corporation for National and Community Service.

For details, see <http://www.presidentialserviceawards.gov>.—*Congratulations, Tom!*

Good News, Bad News, on KickSat Launch

The AMSAT News Service reports that five CubeSats were successfully launched in mid-April aboard a SpaceX rocket. Among them is KickSat, which carried 104 tiny "Sprite" satellites—each the size of a cracker—and was supposed to deploy them once it achieved orbit. They would be the smallest satellites ever place in orbit.

However, a May 5th posting on the ARRL website reports that, due to a technical glitch, it may not be possible for the sprites to be deployed before KickSat re-enters the Earth's atmosphere. Their deployment was to be based on a certain elapsed time from launch, but controllers reported that KickSat's master clock reset after reaching orbit, delaying the automatic deployment. In addition, low battery voltage is keeping controllers from overriding the pre-programmed settings. Check out the CQ Newsroom for updates.

VLF News from Canada and Down Under

On May 1st, Canada opened 472–479 kHz to general amateur use, allowing any of that country's hams to operate on the 630-meter band. The move followed the grant of an experimental license last December to the Marconi Radio Club of Newfoundland. Radio Amateurs of Canada reports that it is a secondary allocation with a maximum power level of 5 watts EIRP.

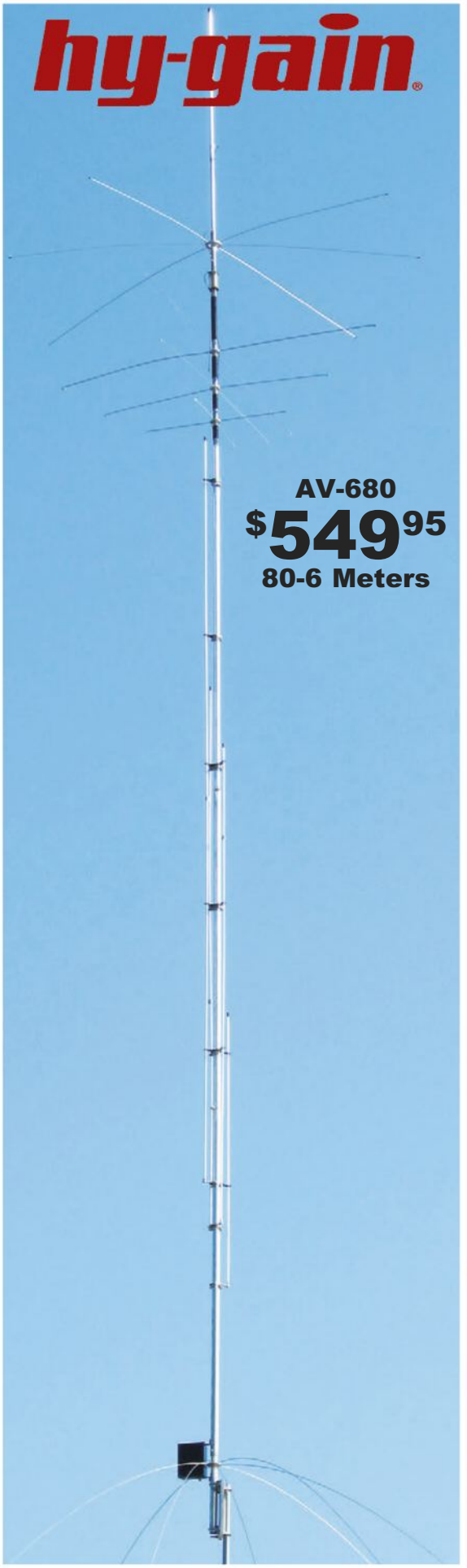
How far can you talk on this band? The South African Radio League reports that on April 13th, ZL1BPU in New Zealand (operating as ZL1EE) was heard in Western Australia by VK5ABN/8 (at a distance of 2100 miles) and then by VK6DZ, 3100 miles away. ZL1EE was using WSPR-2 with a 23-foot-high Marconi antenna.

Here in the US, several hams have been authorized to use the band under an experimental license, but the ARRL says the FCC has yet to act on its 2012 petition to allow all US hams on 630 meters.

WWV Briefly Returns to 25 MHz

Responding to an e-mail from an Illinois amateur, the lead electrical engineer at time and frequency standard station WWV briefly returned the station's 25-MHz transmitter to the air in early April. WWV stopped regular transmissions on 25 MHz in 1977, according to the *ARRL Letter*, and said the surprise reactivation came after Dean Lewis, W9WGV, of Palatine, Illinois, lamented its loss in an e-mail toe WWV's Matt Deutch, NØRGT. Lewis reportedly told Deutch he relied on WWV's signals as propagation beacons and missed having the 25 MHz signal to let him know if 10 meters was open. Deutch responded by firing up the old transmitter for a series of tests, receiving reception reports from as far away as Scotland. No word on whether those tests may be repeated in the future.

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.*



AV-680

80-6 Meters

Hy-Gain's new AV-680 adds 75/80 Meters with no radials!

Includes 40, 30, 20, 17, 15, 12, 10 and 6 Meters operation with low 17 degree radiation angle and omni-directional world-wide coverage. No ground or radials needed. Handles full 1500 Watts key down continuous for two minutes.

Highly Efficient

The AV-680 uses quarter wave stubs on 6, 10, 12 and 17 meters and very efficient end loading coil and capacity hats on 15, 20, 30, 40 and 80 Meters -- no traps. End loading allows efficient operation with a low-profile. Resonators are placed in parallel not in series.

Each band individually tunable

Extra wide low VSWR bandwidth. End fed with broadband matching unit. Single coax cable feed. Automatic bandswitching.

Sleek and low-profile

Low 2.9 sq. ft. wind surface area. Small footprint for mounting easily on decks, roofs and patios. 26 feet, 18.5 lbs.

Built-to-last

High wind survival of 65 mph. Broadband matching unit made from all *Teflon*® insulated wire. Aircraft quality aluminum tubing, stainless steel hardware.

Hy-Gain verticals are the best built, best performing and best priced multiband verticals available today.

hy-gain® warranty

Two year limited warranty. All replacement parts in stock.

ATB-75, $79.95. Tilt base for Hygain AV-680/AV-640 and AV-620 verticals.

AGK-8, $56.95. Guy Kit, three point non-conductive guy system for Hygain AV-680/AV-640 and AV-620 verticals.

AV-640, $449.95. 8 bands: 40, 30, 20, 17, 15, 12, 10, 6 Meters. 25.5 ft., 17.5 lbs.

AV-620, $349.95. 6 bands: 20, 17, 15, 12, 10, 6 Meters. 22.5 ft., 10.5 lbs.

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VOLUME 70 NUMBER 6

CQ June 2014

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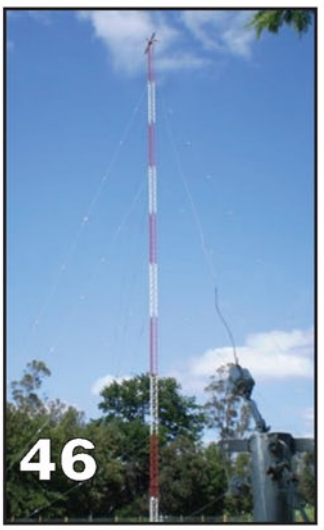


FEATURES

Take it to the Field Special

DEPARTMENTS

ON THE COVER: A montage of ham radio field activities, including: In the background, a license exam session in the desert (p. 11, photo by Tim Augustine, KG6WFV; center, author Charlotte Austin, AF7DY, with her handheld in Puget Sound (p. 14, photo by Bryan Aulick); and at the lower right, KC2LSD's portable EME station ready to roll (p. 18, photo by Cody Codianni, KC2LSD).

CQ plus (digital edition only)

FEATURES

COLUMNS

System Fusion

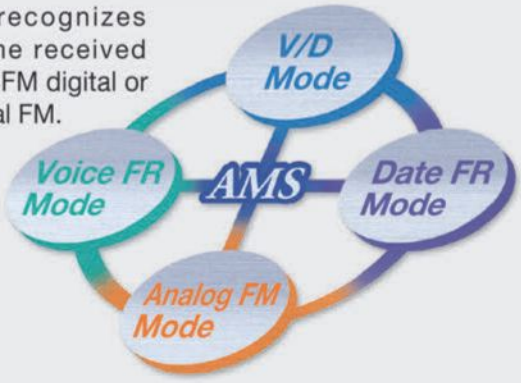
Get the Integrated Solution

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.

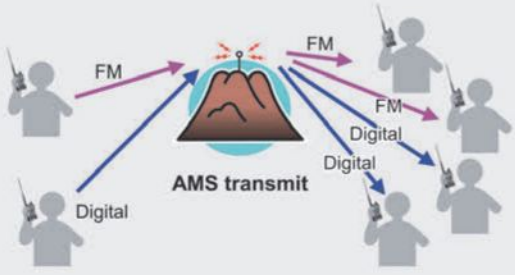
AMS (Automatic Mode Select)

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



FM Friendly Digital

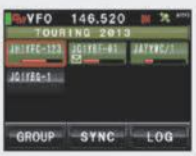
- System Fusion can be used in multiple ways, for digital communication, for conventional FM communication and even internet communication.



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 Digital Communication
Clear and Crisp Voice Technology

144/430 MHz DUAL BAND
C4FM/FM DIGITAL REPEATER

DR-1

- Three digital modes and a Conventional FM mode
- Emergency Operation: Supports operation on an emergency battery

Exciting New Amateur Digital Transceiver

C4FM Digital Communication
Clear and Crisp Voice Technology

C4FM FDMA 144/430 MHz DUAL BAND
5W DIGITAL/FM TRANSCEIVER

FT1DR

- 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 Digital Communication
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

Amateur Radio Internet Linking Kit

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HRI-200

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zero bias – a CQ editorial

BY RICH MOSESON,* W2VU

New and Different (Or Not . . .)

From moonbounce on the beach to contesting in a minor league ballpark, this year's "Take it to the Field" special is just packed with amazing articles about the different ways in which our readers bring their radio hobby with them to unusual and fascinating places. Our emphasis this year is on some of the less-traditional approaches hams have found to portable operating. Also on our menu for this month are six project articles, all tied into our main theme (nine, if you add in the three more in the CQ Plus portion of our digital edition). We hope these articles will inspire you to try something new and different in ham radio, even if you're not aiming a Yagi across the ocean toward a rising moon or paddling a sea kayak across Puget Sound.

My personal goals for this summer include doing more portable HF operating, both on-foot and on my bicycle. Back when my bike and I were much, much younger, I mounted a bracket to the rear reflector and attached an SO-239 antenna socket (see photo A) so I could plug in a 5/8-wave 2-meter antenna (which I still have someplace) and run the cable forward to my TR-22C (which I still have, too) in the handlebar bag.

For you "newbies" with less than 30 years in the hobby, the Drake TR-22C was a 1-watt, 12-channel, crystal-controlled 2-meter FM transceiver. Predating the now-ubiquitous HT, it was one of the earlier ham rigs designed for the user to "take it to the field." It had a built-in telescoping whip, plus a standard SO-239 in the back for connecting an external antenna. As you can see from the photo, that connector behind the bike seat is pretty much shot, and besides, most of my portable gear today uses BNC connectors. So my goal for the bike is to replace the corroded SO-239 with a dual-female BNC "L," which will allow me to choose between using a (new) cable to the handlebar bag or plugging in a longer cable to operate my rig from, say, a picnic table while using the bike as an antenna support. The idea here is to be able to ride someplace with the rig and antenna in the handlebar bag or a backpack, then set up and tear down quickly at my chosen operating location. The use of interchangeable cables will also allow me to use my HT while riding, and have it connected to an external antenna.

The More Things Change…

While digging around to see if I already had a BNC "L" adapter, I came across a circuit board that I'd built sometime in the early 1980s (photo B). I think I kept it because it was the first project I'd built from scratch (rather than a kit), and as best I can figure, its purpose was to be some sort of audio interface for my Timex-Sinclair ZX-81 computer (if you don't remember the ZX-81, look it up!). Beyond that, I can't remember what it was for. Trying to create a schematic from the circuit itself is too tedious, so I guess it will have to remain a museum piece, alongside my TR-22C and my Heathkit Twoer.

But … thinking about the ZX-81 and the TR-22 got me comparing 1980s technology to today's. In some ways, the advances have been mind-boggling, but in others, it seems that the more things change, the more they stay the same. My portable HF gear today is about the same size as the TR-22, with about the same power output, and two of my three portable QRP rigs are also crystal-controlled. My smartphone is about one-third the size of that ZX-81 and immensely more powerful and capable. But ... it basically has a membrane keypad just like the ZX-81. Each is equally frustrating to use!

Photo A. The 30-year-old antenna connector on the back of W2VU's bike is more than ready for an upgrade!

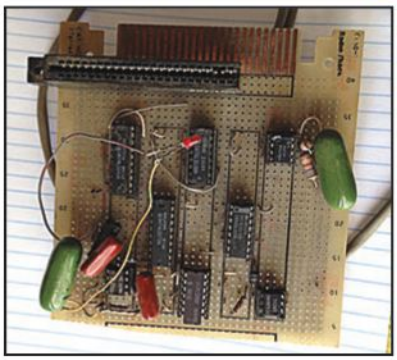

Photo B. This board was built as an add-on for the now-iconic Timex-Sinclair ZX-81 computer. Beyond being some sort of audio interface, its purpose is lost to the sands of time. →

One big difference I noted: The ZX-81 was built with experimentation in mind—expansion ports and add-on boards were the order of the day as users were encouraged to stretch the limits of the computing power then available. They did, with relish, and changed the world. But the result is likely not what those innovators imagined. The result is a world of amazing but hermetically-sealed devices for which the only possible "add-ons" are a pair of headphones and a power cord. Creativity today is channeled into "apps," which is great, but experimenters and developers are still tied to someone else's hardware. Try building an add-on card for your iPad!

There are those who fight back, of course, and they make up the core of the maker, fixer and open-source cultures. For us hams, though, this is nothing new. We have always been makers and fixers, and the "open-source" philosophy has long been a cornerstone of our culture as well. We freely share ideas and projects, encourage others to improve on what we've done and then share it as well.

Some manufacturers specifically encourage this in their web "communities," but our primary means of sharing this type of information is in your hands … *CQ* and all the other ham radio magazines that have occupied our bookshelves (and now, for some of us, our screens) over the decades. We continue that tradition in this issue by sharing the creativity of our readers and with no less than six project articles.

Even if taking ham radio "to the field" isn't on your personal list of things to do in the hobby, I'm confident that you'll find plenty of interesting reading in this issue. And I hope you find time this summer in your ham activities to try something new and different … or, as in my case, to update something old and find new pleasure in it!

73, Rich, W2VU

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

announcements

BETHPAGE, NEW YORK — The Long Island Mobile Amateur Radio Club will hold the **Long Island Hamfair & Electronics Show** Sunday, June 1 at Briarcliffe College. Contact: Dave Akins, AK1NS, (516) 694-4937. Email: <hamfest@limarc.org>. Website: <http://www.limarc.org>. Talk-in 146.85 (PL 136.5).

BUTLER, PENNSYLVANIA — The Breezeshooters will hold its **60th Annual Hamfest and Computer Show** Sunday, June 1 at the Butler Farm Show Grounds. Contact: Bob Benna, N3LWP, P.O. Box 101018, Pittsburgh, PA 15237. Phone: (412) 366-0488. Email: <hamfest2014@breezeshooters.org>. Website: <http://www.breezeshooters.org>. Talk-in 147.300+. VE exams.

PRINCETON, ILLINOIS — The Starved Rock Radio Club will hold **Hamfest 2014** Sunday, June 1 at the Bureau County Fairgrounds. Contact: Matthew Weaver, KB9VZH, 319 Desoto Street, Ottawa, IL 61350. Phone: (815) 313-5924. Email: <starvedrockhamfest@hotmail.com>. Website: <http://www.w9mks.org>. Talk-in 146.955- (PL 103.5). VE exams.

SEASIDE, OREGON — The Sea-Pac Convention will be held Friday, June 6; Saturday, June 7; and Sunday, June 8 at the Seaside Convention Center. Contact: SEA-PAC Ham Convention, P.O Box 25466, Portland, OR 97298-0466. Wayne Schuler, AI9Q, (360) 892-5580. Email: <info@seapac.org>. Website: <http://www.seapac.org>. VE exams.

HERMON, MAINE — The Pine State Amateur Radio Club will hold the **27th Annual Bangor Hamfest** Saturday, June 7 at the Hermon High School. Website: <http://n1me.com>. Talk-in 146.940-. VE exams.

HUDSONVILLE, MICHIGAN — The Independent Repeater Association, Inc. will hold the **2014 IRA Grand Rapids Hamfest** Saturday, June 7 at the Hudsonville Fairground. Contact: IRA Hamfest, P.O. Box 8122, Kentwood, MI 49518. Phone: (616) 541-4090. Email: <hamfest@w8ira.org>. VE exams.

MAPLEWOOD, MINNESOTA — The TwinsLAN and **Mining Amateur Radio Clubs** will hold the **23rd Annual Tailgate Swapfest** Saturday, June 7 at the 3M Center. Email: <tailgate@twinslan.net>. Website: <http://www.twinslan.net>. Talk-in 147.120.

MARIETTA, GEORGIA — The Atlanta Radio Club and the **Kennehoochee Amateur Radio Club** will hold the **Atlanta Hamfest** Saturday, June 7 at the Jim R. Miller Park. Contact: John Talipsky, N3ACK, <n3ack@atlantaradioclub.org>. Website: <http://www.atlantahamfest.org>. Talk-in 146.820- (PL 146.2). VE exams.

MARYSVILLE, CALIFORNIA — The Yuba Sutter Amateur Radio Club will hold its **Hamfest** Saturday, June 7 at the Peach Tree Mall. Talk-in 146.085 (PL 127.3).

MISSISSAUGA, ONTARIO, CANADA — The Mississauga Amateur Radio Club will air special event station, **VE3MIS**, from 1400 to 2000 UTC, daily from Saturday, June 7 and Sunday, June 8. Frequencies include 14.240 and 7.230. For certificates mail a SASE and $2 U.S. to MARC, c/o Michael Brickell, VE3TKI, 2801 Bucklepost Cres., Mississauga, ON, Canada L5L 1M6. Website: <http://www.marc.on.ca>.

PRINCETON, KENTUCKY — The Princeton Ham Radio Club will hold its **Third Annual Hamfest** Saturday, June 7 at the Princeton, KY Fire Training Center. Email: <n4mht@mchsi.com>. Phone: (270) 365-7777. Website: <http://www.w4kbl.org>. Talk-in 145.230 (PL 179.9). VE exams.

TEDROW, OHIO — The Fulton County Amateur Radio Club will hold the **Fulton County Amateur Radio Club Outdoor Flea Market and Hamfest** Saturday, June 7 at The Roth Family Woodlot. Email: <hamfest@k8bxq.org>. Website: <http://k8bxq.org>. Talk-in 147.195+. VE exams.

SHOW LOW, ARIZONA — The Kachina Amateur Radio Club will hold the **White Mountain Hamfest** Saturday, June 7 at the Show Low City Hall. Contact: Jim Mortensen, <w7azy@arrl.net>. Website: <http://www.kachina-arc.org>. Talk-in 145.310 (PL 110.9). VE exams.

WINSTON-SALEM, NORTH CAROLINA — The Forsyth Amateur Radio Club of Winston Salem, NC will hold the **Winston-Salem Classic Hamfest** Saturday, June 7 at the Summit School Dining Hall. Contact: (336) 245-5740. Email: <hamfest@w4nc.com>. Website: <http://www.w4nc.com>. Talk-in 146.64 (PL 100) or 145.47 (PL 107.2). VE exams.

GRANITE CITY, ILLINOIS — The Egyptian Radio Club will hold **EgyptianFest 2014** Sunday, June 8 at the Granite City Moose Lodge. Egyptian Radio Club, P.O. Box 562, Granite City, IL 62040. Email: <hamfest@w9aiu.net>. Website: <http://www.w9aiu.org>. Talk-in 146.790.

MANASSAS, VIRGINIA — The "Ole Virginia Hams" Amateur Radio Club, Inc. will hold the **40th Annual Manassas Hamfest Amateur Radio, Computer & Electronics Show** Sunday, June 8 at the Prince William County Fairgrounds. Vendor contact: Ron, N4RDZ, <vendors@manassashamfest.org>. Website: <http://manassashamfest.org> or <http://w4ovh.net>. Talk-in 146.97-, 442.200+, or D-STAR 442.5125+. VE exams.

MANASSAS, VIRGINIA — The Prince William County 4-H will air special event station, **N4H**, from 1100 to 1900 UTC, Sunday, June 8. Frequencies include 14.225, 18.155, 21.335, and 28.335. QSL with a SASE to N4H, c/o Clarence Meese (K4CNM), P.O. Box 2158, Manassas VA 20108. Phone: (703) 501-8929.

QUEENS, NEW YORK — The Hall of Science Amateur Radio Club will hold its semi-annual **Hamfest** Sunday, June 8 at the New York Hall of Science park-

(Continued on page 106)

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Photo A. Tim Augustine, KG6WFV, and Richard Johnson, KI6EZA, relax with Richard's military HF rig at "Pancake Rock" in eastern San Diego County. (Photo by Marilou Howard, KJ6ONN)

Off-road adventure can pave a pathway to ham radio, something that's encouraged by a growing number of 4WD clubs

4-Wheel it to the Field

BY TOM SMERK,* AA6TS

We all are aware that many people have migrated to amateur radio after using CB radio. I would like to discuss a particular form of this transition as it relates to the use of two-way radio for off-road 4-wheel-drive (4WD) activities.

When two or more Jeeps or other 4WD vehicles venture off-road (it is never advisable to go off-road alone!), it is necessary to maintain contact between the two vehicles in case they become separated. It als would be nice to be able to call for help in an emergency. Cell-phone service often is not available in the remote areas that attract off-roaders. While CB (and sometimes Family Radio Service, or FRS, radios) has worked well for car-to-car contact, it cannot be relied upon to reach "back to civilization."

Often, all it takes is for one ham radio operator to show up at an event with a mobile rig in his/her vehicle, and before long everyone else who is there has discovered the clear, reliable communications that FM VHF/UHF ham radio offers. Because of this, many vehicles that are showing up for off-road activities are now equipped with a mobile FM amateur radio, along with a licensed driver or passenger.

In addition to having the ability to call for help through an accessible repeater, other reasons for having ham radios include using APRS (Automatic Packet Reporting System; see <www.aprs. org>) for location tracking and the ability for the trip leader to communicate interesting information about

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Photo B. Testing session in the desert northeast of the Salton Sea in southern California. (Photo by Tim Augustine, KG6WFV)

the history of an area, or about local plants, trees, geology, or interesting facts about what is being observed during the trip. Mobile HF gear is growing in popularity as well.

Many areas have four-wheel-drive clubs that sponsor weekly or monthly trips and other events. Also, many of these clubs are now making arrangements for amateur radio classes and testing for their members and are encouraging as many members as possible to obtain their ham radio licenses and equip their vehicles with mobile or handheld transceivers. Three of them are profiled here.

4x4 Ham Group

The 4x4 Ham group (http://www. 4x4ham.com) in Arizona is one of the many established and emerging clubs that have combined the two great pastimes of amateur radio and 4-wheeling. Founded in early 2008, it has grown to over 130 members worldwide. 4x4 Ham members have promoted both 4-wheeling and ham radio in various ways, and have joined forces with other groups to support responsible land use and public-service events. There is a net on local Arizona repeaters each Wednesday evening, and when possible, streaming audio is broadcast live on the internet for out-of-area participants to listen and reply via the chat forum. The group also conducts training exercises and participates in Field Day activities.

Tierra Del Sol

Tim Augustine, KG6WFV, is president of the Tierra Del Sol Four-Wheel-Drive Club (TDS) of San Diego. TDS hosts monthly 4WD runs in a variety of remote mountain and desert locations throughout California. The group uses 2-meter ham radio for nearly all trail communications on these runs. Tim shared the following information:

> Approximately 85% of our club's members are licensed ham radio operators. Most traffic is short-range simplex communications, just chatter. We also use them to keep the group together when spread out, sometimes over miles apart on the trail. At a minimum, the "trail-boss" and the tail-end "charlie" will have radios to make sure both ends stay in contact and no one gets lost or misses a turn. Trail etiquette dictates that you keep the vehicle behind you in sight so that they can see you make any turns. This doesn't always work out, so the trail leader calling out turns as they are made also helps to ensure that no one gets lost. We also can communicate breakdowns, needs for the group to stop, points of interest, etc. If the group needs to split up, then the groups can stay in contact with each other easily over longer distances. When I lead a historical run, I am often telling historical stories and describing points of interest of the area as we go along. While I have done my research, there are those attending that know additional stories or info that adds to the group's knowledge, so the run becomes a moving classroom.

Many of the larger events involve the use of a net control station that tracks the progress of the vehicles and can dispatch help during an emergency. In those rare events, the net control might declare an emergency, which would mean that radio traffic is restricted to important communications for getting the situation resolved.

Sometimes the 4-wheelers meet up with hikers or dirt bikers who are also equipped with ham radio, and they communicate useful information to each other. Ham radio-

Photo C. HF ham radio is growing in popularity among off-roaders, along with VHF/UHF FM. (Photo by Dave Kupfer, K6DTK)

equipped vehicles are also useful for reporting emergencies that might be encountered along the road en route to or from an excursion.

Tim got into ham radio as a direct result of his first run with the TDS club. Since he didn't have a ham license at the time, he monitored the communications on his scanner and was impressed, but what really convinced Tim was when after camping on the beach overnight the group split up with some members staying at the camp while the main group continued south along the coast. When one person realized he had lost his glasses, he called the group back at the camps to see if they could search around his campsite. This was a clear simplex contact of over 60 miles! Shortly thereafter, Tim began studying for his license!

Now studying for his Extra Class ticket, Tim has been taking his mobile HF rig with him on longer trips (photo A), such as to the Grand Canyon, and uses it to keep in touch with his friends back home as well as to make DX contacts. Once known mainly as a "4-wheeler," Tim is now a respected ham radio operator who is giving back by promoting ham radio and encouraging other "wheelers" to get their ham licenses (photo B). Tim is also active with RACES, SKYWARN, and other amateur radio organizations.

Outdoor Adventure USA

Outdoor Adventure USA (OAUSA) is another 4WD club that has embraced amateur radio. I spoke with founder Dave Kupfer, K6DTK, and he explained that when OAUSA was formed, it had two goals: first, to showcase the incredible beauty that exists in our country by using 4WD vehicles; and second, to promote the use of ham radio as an indispensable piece of equipment when traveling into remote locations.

It was decided that a great way to promote ham radio was to offer testing opportunities in the remote and unique locations to which the group travels. OAUSA has about 10 Volunteer Examiners among its members and offers testing in these locations several times a year. Imagine testing for your ham license or upgrade in the desert, on the rim of a canyon, or on the beach within 15 yards of the ocean! OAUSA also participates in the ARRL Field Day activities every year.

In photo C you will see that OAUSA also travels with HF equipment. Dave, K6DTK, explains: "I use this setup for both HF voice and Airmail. Airmail is an HF e-mail program that allows me to send and receive regular e-mails (including pictures) from virtually any location. It works in every location I have ever been in, including deep canyons where even the sat phones wouldn't work. I use Airmail whenever we travel beyond cell-phone range (which is most of the time) to keep in touch with family and friends."

Making DX contacts on HF encourages more hams to upgrade to at least General Class to gain access to more bands to enjoy this popular ham radio activity. "All the HF contacts showed increased interest when they learned where we were," said Dave. "The group has also used APRS to guide a late arriving member … to our campsite."

It seems to me that we have discovered yet another excellent source for recruiting many more good hams!

The team paddles across Puget Sound toward Blake Island. (Photos by Bryan Aulick)

Some people drive to portable operating locations, others walk or ride a bike. AF7DY goes by sea kayak…

Calling Home: Two Days on Blake Island

BY CHARLOTTE AUSTIN,* AF7DY

There is salt water in my mouth; the wind whips at my hair. Waves crash against the hull of our two-person kayak. Squinting into the sun, I gauge the distance to Blake Island, a tiny atoll in Puget Sound where we will camp for the night. At my back is the Seattle skyline; to my left and right are jagged snow-capped mountains, sharp against the bright blue sky. In my backpack is my HT.

Earlier that morning, our group of eight paddlers and two guides met at the Elliott Bay Marina. The trip was a joint venture between two Seattle-based companies—Ballard Kayak[1] and Lake Union Charters[2]—which are exploring the possibility of offering multisport adventures. For the inaugural expedition, we would kayak from Elliott Bay to Blake Island, camp on the beach for the night, and sail back to Seattle the next day. As a mountain guide[3], I had been invited to participate so that I could offer feedback on the logistics of the trip; as a newly-minted extra class ham, I was looking forward to bringing my radio.

After introductions and a brief safety orientation ("Don't flip over!"), we worked together to load gear into kayaks at the dock. Because Blake Island is uninhabited, our boats carried everything required for the overnight: tents, sleeping bags, firewood, a Coleman stove, food for lunch, supper, and breakfast. My Yaesu VX-8 was carefully stowed in a waterproof Aquapac drybag, and two extra batteries were tucked into a Pelican Micro Case. (Technically, both the batteries and the radio are submersible, but I wasn't taking chances with saltwater.) My backpack also held my Garmin GPS, a tiny Buck knife, a chart of the local waterways, and an avocado. When we finally slid the kayaks off the dock and into the water, the boats rode low from the weight of the gear.

We paddled tentatively, then gained confidence as the incoming tide pushed us forward with gentle, relentless swells. From the marina, we paddled south across Elliott Bay toward the Duwamish Head, then hugged the rocky coastline until we reached a small white lighthouse at Alki Point. Less than two hours after leaving the marina, we beached the boats to devour hummus wraps, guzzle water, and stretch our shoulders. Directly to the west across Puget Sound — and the shipping lanes—was Blake Island.

As we reloaded the kayaks after lunch, I set my radio to scan the weather channels, the marine frequency used by freighters in the area, and the 146.960 Seattle repeater, then fixed the waterproof case securely to my personal flotation device (PFD). We moved quickly to clear the shipping lanes, and the radio crackled as I paddled hard, flexing the mus-

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cles in my forearms with each long stroke. When we finally pulled into our camp on the northwest side of the tiny island, we had paddled a total distance of more than nine nautical miles (about 10.3 statute miles).

Blake Island

Blake Island, north of Vashon and south of Bainbridge, is a 475-acre park with more than five miles of saltwater beach shoreline. Once used as a summer camping ground by the Suquamish tribe, the island (which is only accessible by boat) is now home to raccoons, lush green salal[4], wind-ravaged pine trees, and the occasional human visitor. To the east is an unobstructed view of the Seattle skyline, but our camp faced the Olympic mountains to the west. We were less than five miles from a major metropolitan area, but the place felt isolated. Wild.

After pitching tents in a soft bed of grass above the tide line, our group disbanded: some explored the island; others played in the surf. I checked my watch, then walked clockwise around the island until I could see Seattle. Switching on my radio, I dialed in the repeater, then stood alone on the beach and waited for the call.

As scheduled, my father's voice came through the radio at exactly 6 p.m. I smiled as I identified myself, and we chatted about the crossing (I lied and said it was easy), my sunburn (I told the truth and said I'd worn SPF 100), and what we were having for dinner (chicken). I'm not sure how much he copied through the spotty connection, but that didn't matter, as he'd heard my voice and I'd heard his, and we were com-

Backcountry essentials

municating love rather than details. My iPhone had full service, but it was turned off and zipped deep in my backpack.

Later that night, I shared the experience with one of our guides, and he understood. "When we're in the city," he said, "we forget to share ideas with each other. Cell phones and technology mean that we're always in touch, but are we really making meaningful connections?" He gestured at the small cluster of sunburned paddlers talking in low voices in the glow of our campfire. "When I bring people into the wilderness, I always hope the experience serves as a reminder to be deliberate about the way we communicate with people, with nature, with ourselves. I ask myself all the time whether I'm letting people inside my world."

The author listens to the weather report on her VX-8 dual-band handheld.

I nodded, thinking about the similarities between my work in the mountains and my experiences with ham radio. Both climbers and hams have been trained to enunciate clearly and to think before they speak. More than that, they're people who seek genuine human connection, and who listen to what isn't said.

The group slept hard that night, our arms aching from the day's work. The smell of breakfast woke me up the next morning, and we packed our gear with fingers burned from hot bacon grease. At mid-morning we were met by *Circe,* a 62-foot wooden schooner that had sailed from Elliott Bay with a group that would paddle our kayaks back to Seattle. After being shuttled by dingy to the sailboat, we relaxed on the teak decks and enjoyed a lunch of halibut ceviche, fresh salmon with pesto, and chocolate ganache.

Happy and full, I found a quiet perch near the bow as we pulled away from the island. The captain had raised the sails and shut off the engine, and I overheard my fellow paddlers marveling at the ancient technology. My radio, volume low, chattered in my jacket pocket. The schooner moved with the waves; the city grew on the horizon. I rummaged in my pack, found my phone, and snapped a photo of the Seattle skyline to send to my father.

Notes:

1. Ballard Kayak: <www.ballardkayak.com>
2. Lake Union Charters: <www.lakeunioncharters.com>
3. Read more Charlotte Austin's work at <www.charlotteaustin.com>
4. Salal is a small evergreen shrub native to the Pacific coast of North America

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QSK-5, $359.95, pin-diode T/R switch gives lightning fast silent QSK operation.

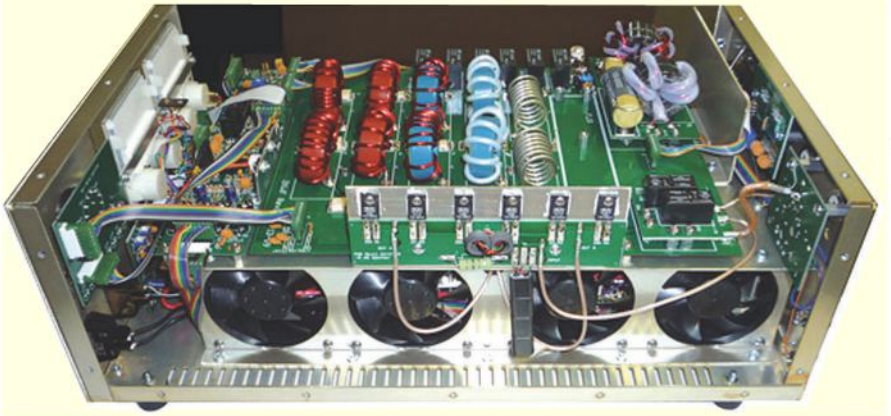
Here's what they say . . .

I have had my amp now for a few days and WOW! I picked the amp up at the factory and Mike was very helpful in showing me the ins & outs of the amp. Mine is S/N 8 and these amps are in high demand. It will truly talk 1200 watts all night long and never get warm. Thanks to Ameritron for the way they treat their customers and taking time that I was satisfied. N5SBZ

I've been using SN3 for about six weeks now. No processors or digital read-outs, but very easy to use and it puts out 1200 watts on most bands with no problem. I have been operating QSK as the internal relays are plenty fast enough. AD5X

I have had this fine amp now for a week and have made a number of QSO's (20). It can make the difference, and has in a number of occasions, getting thru the QRN and making a contact. Some of my QSO's have lasted up to 1 hour and there has not been a single problem...runs cool and gives me excellent results. KB4KKX

Inside the ALS-1300 Solid State Amplifier



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"To the Moon, Alice!" KC2LSD tells of his first Earth-Moon-Earth (EME) contact using just 50 watts, a single 10-element Yagi, and a really big ground plane.

EME on the Beach

BY CODY J. CODIANNI,* KC2LSD

I have always been fascinated by the concept of bouncing a radio signal off the moon. I often read about Earth-Moon-Earth (EME) contacts and how a large antenna array is no longer necessary, especially with today's digital modes, such as JT65. This past December I read yet another article about how a small station can make an EME contact, and it got me thinking … which led to researching the EME mode, assembling a station, planning, and finally making a QSO.

Assembling the station was the easy part. I have a ton of radio gear, and all I was missing was a 2-meter Yagi. A friend quickly solved that problem by giving me a 10-element Cushcraft he wasn't using. Now it was time to start learning about EME and the process of planning and making a contact.

Doing My Homework

While researching EME and reading up on the WSJT (**W**eak **S**ignal Communications Software, K1**JT**, by Joe Taylor) digital modes, it was clear that it was possible to make an EME contact without the need for a "big gun station" with high power and a very large antenna array. Once I downloaded the WSJT program and understood the tutorials, I had a general idea of how to conduct an EME QSO. WSJT has audio files embedded in the tutorial which enabled me to practice decoding EME signals in preparation for the big day.

Next, I learned about *ground gain*, which uses the natural reflectivity of the Earth's surface to amplify signals when the antenna is pointed toward the horizon. It is suggested that small stations can benefit from 6 dB or more of ground

Photo A. A day on the beach. You can't tell from the photo, but it was January 2 and a nor'easter was bearing down on the Jersey shore, but KC2LSD braved the elements and beat the storm to make his first-ever moonbounce contact with just 50 watts and a single Yagi. (Photos courtesy of the author, except as noted)

*413 Martin Ct., Leonardo, NJ 07737
e-mai,: <kc2lsd@yahoo.com

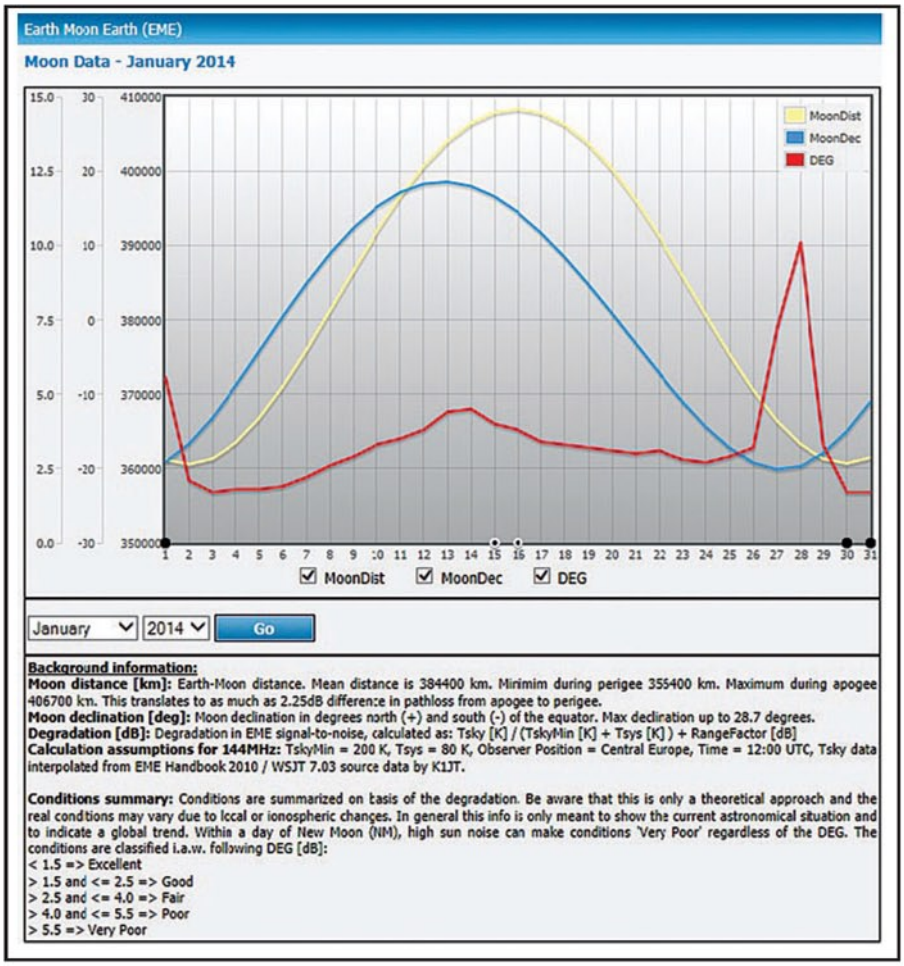


Photo B. Graph of projected EME conditions for January 2014 on the MMMonVHF website. January 1, 2, and 3 were the best days (lowest values on the three measures). I had made my schedule with Franco in late December for these dates. With a nor'easter on target for January 2, I had one chance or would need to wait nearly 30 days for the next opportunity. (MMM on VHF screen shot, courtesy DG2KBC)

gain by conducting the QSO at either moonrise or moonset, with a clear, flat view of the moon … such as over the ocean (photo A). This also eliminates the need to elevate the antenna. You only need to know where and when the moon will rise or set.[1] Remember, the most opportune time may not be during the night. In my case, it was 8:00 a.m.

There are many other factors to consider as well. Here are a few[2]:

Earth-Moon distance: The average distance between the Earth and the Moon is 238,855 miles, or 384,400 kilometers. However, the actual distance varies from a minimum of 221,456 miles (356,400 km) at perigee to a maximum at apogee of 252,711 miles (406,700 km). This translates to as much as a 2.25-dB difference in path loss from apogee to perigee.

Moon declination, or its apparent position in the sky, in degrees north (+) and south (–) of the equator. The Moon's maximum declination is 28.7 degrees.

Degradation or changes in EME signal-to-noise ratio, based on a variety of factors.

Charts combining all of this information to show you when conditions might be best may be found on DG2KBC's "MMMonVHF" website at <www. mmmonvhf. de/eme.php> (photo B).

Online Essentials

Two other essential tools are Ping Jockey and PJ Client. Ping Jockey <http:// www.chris.org/cgi-bin/ jt65emeA> is a website where the EMEers chat and set up schedules. You will see people chatting about meteor scatter as well as 2-meter and

Photo C. The author set up his station at home first, for a practice run, the day before his scheduled contact.

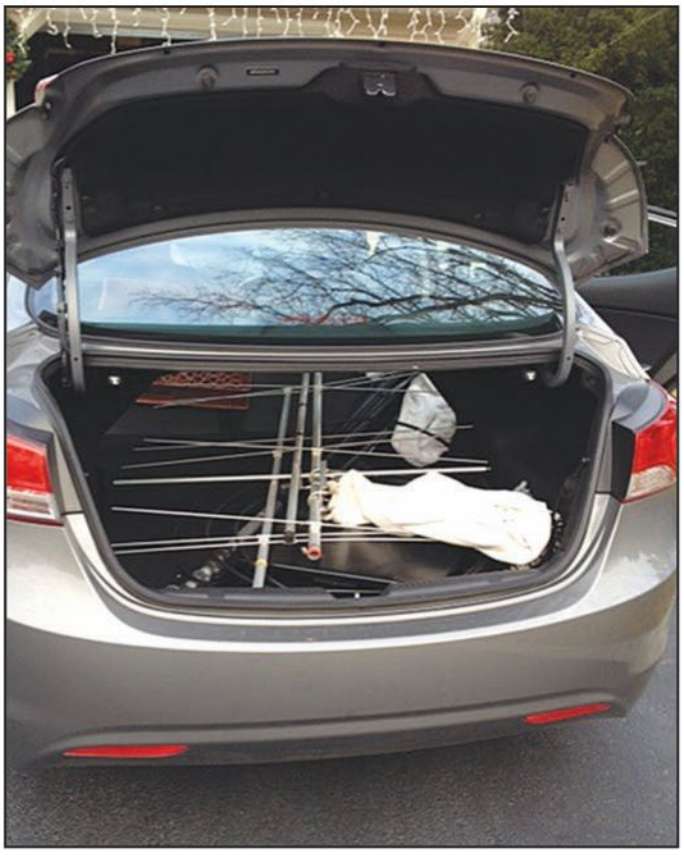


Photo D. After practicing setting up and tearing down the station, everything was packed into the author's trunk in preparation for an early-morning trip the beach the folowing day.

6-meter EME. PJ Client is a downloaded version of Ping Jockey, and in my opinion it's much easier to use.

On these sites you will see people signing their call like this: **xxxx/4x20/1K**. This translates into the station callsign/antenna system consisting of four 20-element Yagis/and power of 1 kilowatt. I can't imagine what people thought when they saw **KC2LSD/1x10/50W**.

One other very important program is called Dimension4. This program[3] makes sure your PC clock is accurate. It is very important that both stations' clocks are in sync because of the sequencing of a WSJT QSO.

A Typical JT65 EME Contact

Now let me briefly describe a 2-meter EME QSO using the JT65b mode of WSJT. First, make sure you are familiar with the sequence of the QSO (which we'll get to in a moment). Then type in the station callsign before the scheduled QSO time. If you're new to EME, the other station will tell you if he will call first or second. This is very, very important.

The WSJT program is set up to transmit for 50 seconds of a minute. Thus, the person calling first transmits on the even minute and then the other station transmits on the odd minute, starting at the top of each minute. This is why the clocks must be in sync.

Here is a typical QSO:

Let's say I have a schedule with Bob, his call is xx1xxx, his grid is AA20, and he is going to call me first:
KC2LSD xxx1xxx AA20

If I can decode him, I send:
xx1xxx KC2LSD FN20 OOO *(My grid is FN20, and OOO acknowledges receipt of the first call)*
Assuming he can decode me, his reply is:
RO *(meaning "received your 'O'")*
Then I go again:
RRR
And he wraps up by sending:
73

It takes about two seconds for the signal to return to Earth. This is explained in the tutorial for the program.

A Real QSO

Now all this brings me to my first 2-meter EME contact. The stage was set. I had a schedule with Franco, I2FAK, on January 2, 2014 from Leonardo Beach on Sandy Hook Bay in northern New Jersey. The ocean provides a great ground plane for the greatest ground gain.

The day before, I set up my station in my yard, twice (photo C). My total set-up time was 22 minutes. Then I loaded up my car (photo D) with my Icom IC-706 MkIIG transceiver, a deep-cycle marine battery, laptop, antenna, tripod, LMR 400 feedline, two small tables, and a milk box to sit on.

Moonrise on January 2 was 13:00 UTC, or 8:00 a.m. Eastern time. I got up at 12:00 UTC and checked the weather conditions. A predicted nor'easter was still on track to hit us that day, but it looked like I would have enough time. I live only two miles from Leonardo Beach; the temperature was 22 degrees and

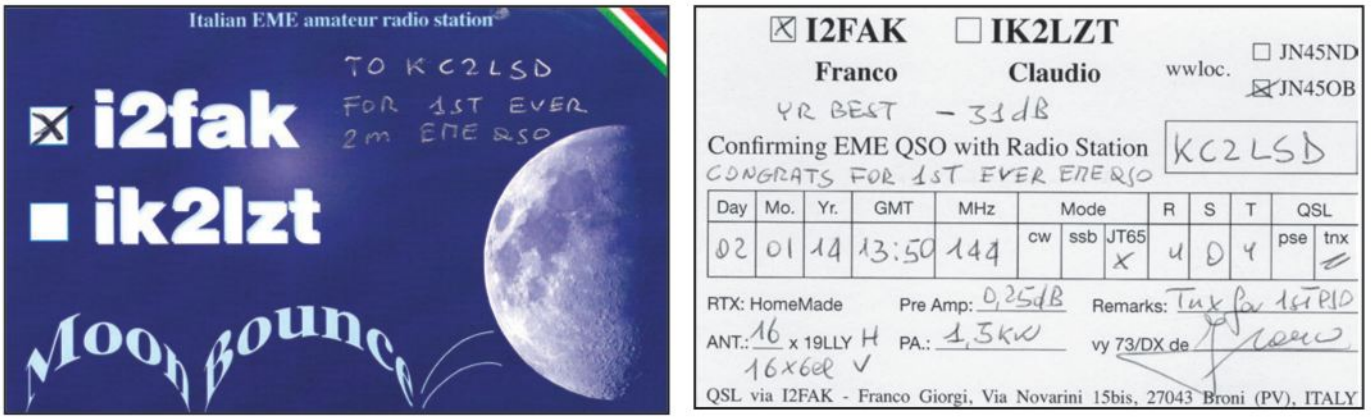


Photo E. The proof is in the pudding … or in this case, the QSL card! See Franco's notation to Cody on the front of the card (left), as well as the specifics of the QSO on the back (right).

sustained winds were 15 miles per hour out of the east—not the most pleasant weather for a morning at the beach, but at least it wasn't snowing yet!

I made it to the beach and set up my station (photo A). My moonrise was unobstructed. All I had in front of me was open water. My laptop has a WiFi connection, so I was able to chat with Franco via PJ Client.

He wrote, "Cody are you here?"

"Yes."

"OK, let me find a frequency."

"Ok, Cody. I call first 144.119. Good luck."

I was freezing, the winds were picking up sand and blowing it around, making it very difficult to operate the radio and the laptop, but I hung in there and waited. Then I saw Franco's trace on my screen, followed by the decoded call: **KC2LSD I2FAK JN45**

Then I sent my reply. It was touch and go, because my station is so small. However, after about one hour we completed our QSO. Franco gave me -30/-31 dB signal report (it doesn't get any lower). But I had done it!

I made a 2-meter EME contact from a New Jersey beach while the moon was at perigee, about 245,568 miles one way, running 50 watts powered by a deep-cycle battery! This exceeded my wildest dream!

The EME Community

I have posted my achievement on a few EME reflectors and I met some really nice people along the way. One person in particular is Lloyd, K8DIO. He helped fill in a lot of blanks, such as how to set up PJ Client, and he sent me sample JT65 QSOs so I didn't screw up. He even joined Franco and me on PJ Client the day of our contact. Of course, too, Franco, I2FAK, thank you for taking time out of your day to make mine (see Franco's QSL card, photo E).

There are others who called or sent me e-mails, and still others who now want to work the little guy from the Jersey Shore. I am making skeds with them all, but I am waiting for warmer weather.

I don't know how others feel after they've made an EME contact, but every time I see the moon now, it looks a lot different. I am no expert on this subject. I did a lot of research and asked for help along the way. If nothing else, I have learned a lot about the moon, Mr. Faraday, and meteor scatter. What joy I had that day, knowing with 50 watts I was able to bounce a little "LSD" off the moon.

Notes

1. Try one of these websites in order to know when and where the moon will rise or set: <http://www.timeanddate.com/worldclock/sunrise.html> or my preferred site, <http://aa.usno.navy.mil/data/docs/AltAz.php>.
2. See <http://www.mmmonvhf.de/eme.php>
3. <http://www.thinkman.com/dimension4/>

Photo A. The author's van parked at the ocean's edge, ready for operating JT9 in the field. (Photos courtesy of the author)

Portable HF operating doesn't have to be limited to CW or SSB. W4GAL enjoys finding scenic spots from which to work the JT9 digital mode from his car.

JT9 in the Field (or on the Beach)

BY GARY LILJEGREN,* W4GAL

I like operating from portable locations in scenic spots. When I operated from my van this time, in early April, my location of choice was at the edge of the Atlantic Ocean. I parked my van just a little south of Crescent Beach, Florida, in the late afternoon (photo A) and prepared for some JT9 QSOs.

Quick Setup

It takes me very little time to set up as most everything is ready … the 8-foot Hamstick® antenna is already on the top of the van and adjusted to around 14.078 MHz, I just connect the equipment and I'm on the air. I'm using an ICOM IC-718 plus a SignaLink USB with my Acer PC (Windows® 7) computer and the WSJT-X software for the JT9 mode[1]. I carry seven Hamsticks for the HF bands in my van, each tuned to CW and JT9 frequencies, but 20 meters is often my first choice. My 80-meter antenna is the eighth one and the exception to the rule because it is 17 feet tall plus the loading coil. That one I set up after I arrived at my destination. Otherwise, I wouldn't make it under bridges. With the other Hamsticks, topping out at 13 feet 10 inches is exciting enough.

The IC-718 doesn't have an antenna tuner, but I don't need one because I can adjust the Hamsticks to be on the right frequencies. Photo B shows my MFJ-259B directly connected to the 20-meter antenna on the roof of the van. 1.0:1 is amazing. No, the antenna is not full size, but it is a nearly perfect load, and most importantly, it works!

On the Air

It's always fun to turn on the rig and see a bunch of signals on the waterfall (photo C) and know everything is working and the sunspot god is in a good mood. On JT9, you never know who is on until the end of the first minute of monitoring, at which point the signals are identified with call letters. Ahhh, great. As twilight turned into evening, the signals were good from Europe, Africa, South America, and all over North America. The WSJT-X program supplies the signal reports, but you can get a good idea just from watching the waterfall.

Now for the results: I spent about four hours on this excursion, but half of it was being a beachgoer instead of a radio

* e-mail: <gary@liljegren.com>

ham. Isn't that part of the package? Twenty meters was good. I called CQ and was answered by a VA3 in Ontario. Then, after spending more time watching the water, I worked a KA7 in the western USA and five stations in Europe … each in a different country. I was running 10 watts, and with JT9, it is astounding to me how well all this functions. The times I have worked JT9 developer Joe Taylor, K1JT, he was running 10 watts and a dipole. Perfect.

Photo B. The antenna on the van roof is tuned for a perfect match on the 20-meter JT9 frequency.

Reasons for Success

There are really four reasons why this portable operation worked so well from the field:

1. JT9 is a super-efficient mode that makes a low-power operation very successful.
2. In this case, I was at the western edge of a highly reflective surface (the Atlantic Ocean).
3. The antenna was maximized for the operating frequency and was on a flat van roof.
4. Conditions were good.

I have great success on JT9, even when portable. For me, it's quite fun to work one DX station after another when I am running low power in a scenic location, and while I am enjoying the sea breezes and sounds of the ocean in the background. Maybe the only thing missing for this perfect evening was an "807" and some island music … and the van even has a CD player. Next trip!

Note

1. For more information about JT9, see my article in the February 2014 issue of *CQ*, page 29. Note: This issue is available in digital format only. See <http://bit.ly/OgiSIP>.

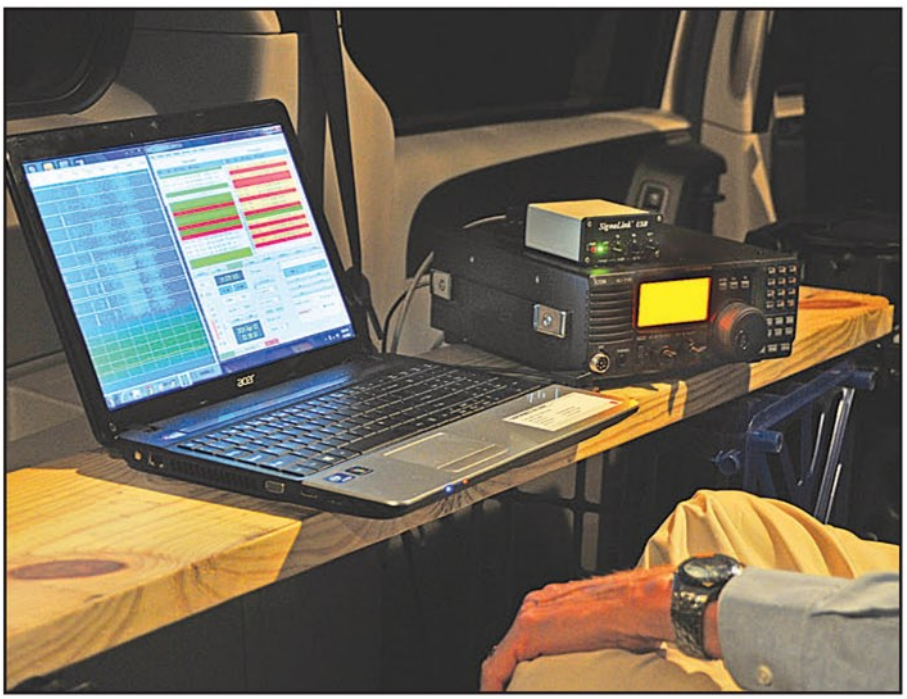


Photo C. A waterfall display full of JT9 signals is a good start for portable operating.

Results of the 2013 CQ DX Marathon

BY JOHN SWEENEY,* K9EL/VA3CDX

With growing competition due to increased participation, the DX Marathon is holding true to its name! Dictionary.com defines marathon: "any contest or event requiring exceptional endurance". With the top five scores only one point apart each, it really was a marathon battle for first place! In fact, 21 participants finished in the top ten—a 50% increase over last year. Although there were four fewer entities available in 2013 for a maximum possible score of 334 (compared to 338 in 2012), the 330 winning score actually matched that of 2012. 2013 was indeed a very competitive year for the Marathon. 10 meters really came to life in 2013 and overall activity on 10 was up 14% over 2012 and accounted for almost 15% of all Marathon QSOs. 15m remained the single most active band with 25% of all QSOs. CW remained the favorite mode accounting for more than 50% of QSO's. Digital participation was down slightly but still represented 15% of all QSOs. Single Band/Single Mode submissions increased over last year with some amazing scores.

Overall submissions were up 7% over 2012 although there were fewer entries from Europe. Activity was high as DX Marathon entrants submitted a total of 113,653 QSOs! Formula Class participation dropped to 20% reflecting comments from many of about the antenna restrictions. Starting in 2014 the Marathon now has a third class which is expected to increase the number of lower power participants. See sidebar elsewhere in this article for details of the new Limited Class.

And the Winners Are …

Although overall participation from European stations was down in 2013, EU stations were very much in the battle for the top spots in all classes. Since the inception of the Marathon in 2006, Eduard, OM3EY, has been a major contender every year and has never finished out of the top five. He finished first in 2008, 2nd three times, 3rd place two times and last year was 5th in the Unlimited Class. But 2013 was his magic year and he was able to capture the top spot with a score of 330. Not far behind Eduard was Bob, W9KNI, with a score of 329. Most amazing was that Bob made all his QSOs on 20 meters! Rounding out the top five with scores of 328, 327 and 326 respectively were EA1DR, KBØEO, and IKØOZD. Congratulations to Eduard for his Unlimited Class win!

Although the number of participants in Formula Class was down from last year, the scores remained high! This year's top 100 Watt Formula Class honors go to Zoli, HA1ZH, with an impressive score of 310. W4TV was once again runner-up with an equally impressive score of 304. N4RI, K8CQ and E73Y filled the next three positions in the top five. In the 10 watt or less Formula Class, Dan, WG5G, repeated his feat of last year by taking first place with an amazing score of 295. Congratulations to all of our Formula Class participants.

The single mode competitions continue to attract additional participants and there was no shortage of high scores in all modes. Soundly winning the Phone competition, Wayne, NØUN, led the group with a score of 323, well ahead of his competition. Last year's Formula Class winner, UT9FJ, entered Unlimited Class this year

Announcing a Third Class of Competition

Starting in 2014, the CQ DX Marathon has introduced a third class of participation to enhance the opportunities for those with modest stations to participate. Formula Class, designed primarily for those 100-watt stations with wire or vertical antennas, remains in place. Many 100-watt stations, however, use small small Yagis or umbrella type antennas at lower heights. Previously, those stations would compete in the Unlimited category against those with large antennas and amplifiers. The introduction of Limited Class is a welcome addition to the DX Marathon. For complete rules on the new Limited Class and the DX Marathon, please see the December 2013 issue of *CQ* magazine or the DX Marathon website at <www.dxmarathon.com>.

The impressive antenna farm of Eduard, OM3EY, 2013 Unlimited Class winner. Eduard won the Marathon in 2008 and has never finished lower than third every year since 2006.

*Program Manager, CQ DX Marathon
e-mail: <k9el@dxmarathon.com>

Formula Class winner in his shack. Zoli, HA1ZH, was licensed in 1943 and is very active on all bands and modes. Zoli uses a vertical on the higher frequencies and dipoles for 160 through 30 meters.

Bill, K2TQC, from New York had the top North America score in 2012 along with finishing number two overall in Unlimited Class.

TOP SCORES

BOLD = Plaque Winners
* = Certificate Winners
Callsign is followed by Score

Unlimited Class
OM3EY 330
W9KNI.....329
EA1DR.....328
KBØEO.....327
IKØOZD.....326

Formula Class - 100w
HA1ZH 310
W4TV.....304
N4RI.....276
K8CQ.....275
E73Y.....274

Formula Class - 10w
*WG5G.....295
IV3AOL.....268
W8QZA.....265
NDØC.....236
K8ZT.....220

CW
UT9FJ.....319
W1RM.....312
LY5W.....311
W4QN.....310
K4UTE.....306

Phone
NØUN.....323
N3CDA.....300
PT7ZT.....290
EA8MT.....289
PY1SX.....286

Digital
WS3N.....260
N5MOA.....252
IK5FKF.....244
IK2RPE.....209
GUØSUP.....187

Africa
EA8MT.....289
ZS6GRL.....245
ZS6A.....231
CT3HF.....220
7P8PB.....111

Antarctica
*DP1POL.....56

Asia
JE1FQV 320
A65CA.....315
JAØDAI.....312
JG3FEA.....291
OD5ZZ.....274

Europe
OM3EY.....330
EA1DR.....328
IK0OZD.....326
EA4KD.....323
OK2SG.....323

North America
W9KNI 329
KB0EO.....327
W1JR.....325
K3KO.....324
W7UT.....324

Oceania
VK3HJ 319
YB1AR.....309
YE1NZ.....293
ZL2IFB.....293
VK3EW.....292

South America
PP5EG.....317
PY4ZO 316
LU5VV.....299
PP1CZ.....292
PY4OY.....291

6 Meters
*PY2HN.....97
CO2QU.....30
W3ZGD.....12

10 Meters
GM7TUD.....279
PY2UD.....249
NØAH.....246
KU5B.....210
PX2B.....148

12 Meters
W8BBQ.....269
PY2CX.....222
YB9WZJ.....85

15 Meters
PP5EG 317
VE3CRG.....307
SM0MPV.....298
IZ8BRI.....283
KØLUZ.....260

17 Meters
WK3N 311
LY5M.....299

20 Meters
W9KNI.....329
N6ML 315
K1QS.....288
SP3BGD.....266
PY2KJ.....178

30 Meters
N5KM.....242
OH5RF.....154
PY2MC.....149
FG4NO.....139

40 Meters
IZØCBB.....284
W1FQ.....264
N8MZ.....253
K9CJ.....211
N3QE.....198

80 Meters
OH6MW 203
K3TW.....148

160 Meters
*N4IS.....178
K4IQJ.....153
K7ZV.....148

Zones
3.....W9KNI.....329
4.....*KBØEO.....327
5.....*W1JR.....325
6.....XE1EE.....208
8.....WP4U.....289
9.....HK3W.....272
11.....PP5EG.....317
12.....XQ7UP.....189
13.....LU5VV.....299
14.....EA1DR.....328
15.....OM3EY.....330
16.....R6YY.....320
17.....*UA9FAR.....280
20.....YO9HP.....299
21.....A65CA.....315
22.....VU2PTT.....222
25.....JE1FQV.....320
26.....XV4Y.....211
27.....DU2BOQ.....156
28.....YB1AR.....309
29.....*VK6HG.....176
30.....VK3HJ.....319
31.....WH7DX.....227
32.....ZL2IFB.....293
33.....EA8MT.....289
38.....ZS6GRL.....245
39.....S79MHY.....63

Note: Top scorers in some zones received Plaques or Country Certificates.

Club Scores
*Araucaria DX Group 8,336
Carolina DX Assoc.....4,155
YB Land DX Club.....3,366
RIO DX Group.....3,141
Northern Illinois
DX Association.....2,889

Dunia,EM8AT, from the Canary Islands. Dunia had the top Africa score in both 2011 and 2012.

What is it like to Participate in the Marathon?

As manager of the DX Marathon I have only one regret: I cannot participate! But in order to understand what a DX Marathon participant goes through each year, I decided to pretend I was actually competing in the 2013 Marathon. I set my logging program to highlight new 2013 countries, paying special attention to the unique CQ Entities. I found myself spending more time on the air, but really enjoyed it. I found some old friends and made some new ones. I got up in the middle of the night a couple times as well, something I had not done for years. To make sure it was a real comparison, I only responded to DX spots. I did not set up any schedules or receive any special tips. It is quite amazing how much DX is called in on the spotting network. Of course, like many of you, I missed a few good ones along the way. Vacations, birthday parties, a part-time job, and family obligations meant hours away from the radio. Even with remote access to my station, it was simply not possible to make the Top 10. In the end, I worked 282 entities and all 40 zones for a score of 322. I now have a real appreciation for the incredible amount of effort and dedication that is required to compete at the highest levels. It truly is a *marathon*!

John, K9EL/VA3CDX

and decided to pursue CW only. Missing only three CW countries that were active in 2013, Sam lead the CW competition with a score of 319. The Digital leader for 2013 was Jack, WS3N with a score of 260 points. Each mode winner will receive a plaque.

Additional plaques are also awarded for the highest scores on the 10-80 meter bands and for the top continental scores. The 15, 17 and 20 meter bands generated a lot of competition and some very impressive single band scores. The Europe, North American and South American competitions were also very close, with only three points separating the top three positions in both Europe and North America. For 2013, we are awarding all plaques, so the runners-up for 20 meters, Europe and South America, will receive plaques. All band and continental plaque winners are highlighted in the Top Scores box elsewhere in this article. As always, we sincerely appreciate the tremendous support of all of our plaque sponsors. If you or someone you know would like to become a DX Marathon plaque sponsor, please contact the author directly.

Certificates will be given to the top scorer in each country and zone, plus the 6 and 160 meter top scorers, for those who did not already qualify as a plaque winner. In the DX Marathon Club competition, once again the Araucaria DX Group in Brazil took top honors with a total score of 5,895. The Carolina DX Association was second with a score of 4,740. If you are a member of a radio club, be sure to include your club affiliation in your submission.

To help everyone improve their score, each year we publish a list of busted calls, pirate calls and other helpful information on the DX Marathon website. We are pleased to report that the 2013 error rate dropped significantly – from 2.35% in 2012 to 1.98% in 2013 and fewer actual subtractions than last year. The top spots are usually only one point apart, so even one error can be significant. We are also happy to report that twice as many entrants submitted error free logs compared to last year, although over 85% of participants still had at least one error. 55% of the errors were due to submissions with Invalid Calls. Although many of those were real QSO's where the entrant made a typing error when entering the callsign in their log, many points were lost to bad spots on the spotting networks. We encourage everyone to listen very carefully to the DX station – never assume the callsign that was spotted is correct!

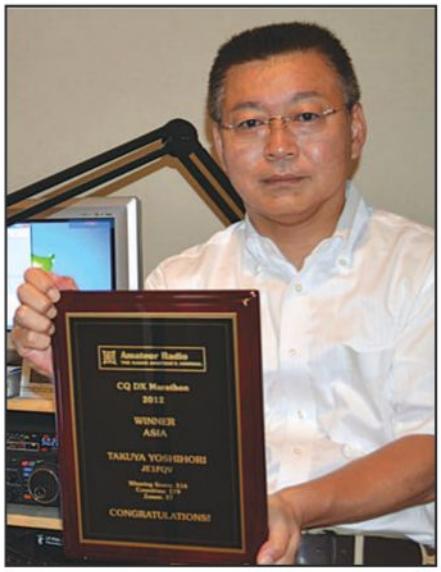
Twenty-eight percent of the errors were due to claiming a country different from what it actually was. We encourage all participants to use electronic logging and update their country databases before preparing their final Marathon submission. The majority of these errors can be caught in software. 15% of the errors were due to incorrect zones. We continue to see a high number of errors in Zones 2, 3 ,4, 5. The DX Marathon web page has a separate section dedicated to help determine whether that VE2 station is in Zone 2 or 5. For the USA zones, a manual check on QRZ.COM or in the FCC database is often

COUNTRY WINNERS

Callsign is followed by score

4S7JL....103	GI4SJQ....214	PJ7MF....151
4Z4DX....218	GM7TUD....279	PP5EG....317
7P8PB....111	GUØSUP....187	S51DX....321
9A2EU....316	GW4EVX....140	S79MHY....63
9V1PW....188	HA1ZH....310	SM0MPV....298
A65CA....315	HB9CBR....141	SP3BGD....266
XQ7UP....189	HK3W....272	SV9COL....277
DP1POL....56	IKØOZD....326	R6YY....320
CO2AJ....180	J34J....169	UA9AGX....237
CT1AHU....48	JE1FQV....320	UT9FJ....319
CT3HF....220	WH7DX....227	VE1DX....321
CR2H....141	WP4U....289	VK3HJ....319
DL5AN....322	LA8AW....263	VU2PTT....222
DU2BOQ....156	LX1ER....234	W9KNI....329
E73Y....274	LU5VV....299	XE1EE....208
EA1DR....328	LY5W....311	XU7AEU....53
EA8MT....289	LZ2TW....299	XV4Y....211
EI7CC....297	OD5ZZ....274	YB1AR....309
EW7SM....201	OE1WEU....254	YO9HP....299
F5CQ....308	OH6RE....317	YY4DNN....240
FG8OJ....288	OK2SG....323	ZL2IFB....293
FS/PJ7MF....25	OM3EY....330	ZS6GRL....245
G3VKW....308	ON4ON....306	
	OZ7YY....321	Note: Top scorers in some countries received plaques.
	PAØMIR....215	

Gary, ZL2IFB, from Hastings had the top Oceania score in 2012 and fourth in 2011.



Tac, JE1FQV, from Yokohama had the top Asia score in both 2011 and 2012.

required. There are a number of stations with KL, KP and KH prefixes that actually live in the lower 48 states. The remaining 2% of the errors were due to pirates.

With a database of almost 114,000 QSOs, there is a lot of information and data available. For example, in 2013, 20% of all QSOs took place in October and November, reflecting the excellent band conditions and the large number of DXpeditions that took place then. That figure is quite a change for previous years and confirms that the Marathon is truly a year long event. The busiest three hour period for the Marathon is 1400–1700Z accounting for almost 20% of all QSOs. Winning the Marathon often means working those countries that only make a few QSOs each year. There were three countries that between them accounted for only 13 QSOs. Working rare countries can be quite a challenge! Zone activity varies significantly as well, with Zone 2 accounting for only 345 QSOs. That means over 30% of participants were not able to work Zone 2! Zone 14 is the most popular zone, accounting for 11% of all Zone QSOs. If there are other statistics our readers would be interested in seeing, please contact the author.

Elsewhere in these pages and on the CQ website for expanded results (www.cq-amateur-radio. com) you will find a Top Scores listing and the detailed listing of all participants' final scores. For more detailed scoring information, please see the CQ and DX Marathon websites. Good luck to all in 2014!

Results 2013 CQ DX Marathon

UNLIMITED CLASS

Callsign	Countries	Zones	Score
OM3EY	290	40	330
W9KNI	289	40	329
EA1DR	288	40	328
KB0EO	287	40	327
IK0OZD	287	39	326
W1JR	285	40	325
K3KO	284	40	324
W7UT	285	39	324
EA4KD	283	40	323
K2TQC	283	40	323
K5EK	283	40	323
NØUN	283	40	323
OK2SG	285	38	323
WN4N	283	40	323
DL5AN	282	40	322
W2QO	282	40	322
K9CT	281	40	321
KC6AWX	281	40	321
OZ7YY	281	40	321
S51DX	281	40	321
VE1DX	282	39	321
AA9A	280	40	320
JE1FQV	280	40	320
K9NB	280	40	320
R6YY	280	40	320
K9NU	280	39	319
UT9FJ	279	40	319
VK3HJ	279	40	319
W2IRT	279	40	319
N5JR	278	40	318
N8DE	278	40	318
UA3AGW	279	39	318
VE2BR	278	40	318
DJ9ZB	279	38	317
OH6RE	277	40	317
PP5EG	277	40	317
W3ZJ	278	39	317
9A2EU	276	40	316
AI2C	276	40	316
IK2QPR	276	40	316
N6AR	276	40	316
PY4ZO	276	40	316
A65CA	275	40	315
K8AJS	275	40	315
N2BJ	276	39	315
N6ML	275	40	315
W4UM	275	40	315
AA4SC	274	40	314
K3WA	274	39	313
JAØDAI	272	40	312
KØXB	272	40	312
N6QQ	272	40	312
NI3P	272	40	312
W1RM	272	40	312
W9OA	272	40	312
LY5W	271	40	311
WK3N	273	38	311
K7VV	272	38	310
W4HG	272	38	310
W4QN	270	40	310
W9OP	271	39	310
IK2YCW	270	39	309
YB1AR	269	40	309
F5CQ	269	39	308
G3VKW	269	39	308
WX6V	268	40	308
K1SM	267	40	307
VE3CRG	267	40	307
W9OA/9	267	40	307
K4UTE	266	40	306
KTØDX	266	40	306
NØKE	267	39	306
N4KW	266	40	306
N8AGU	266	40	306
ON4ON	268	38	306
W6XK	266	40	306
W4VIC	265	40	305
DL8ZAW	264	40	304
G5LP	266	38	304
N4MM	267	37	304
W2LK	264	39	303
K6YK	262	40	302
W4VQ	263	39	302
IK2DJV	261	40	301
K6FW	262	39	301
OH5BM	265	36	301
VE5UA	261	40	301
F5IN	261	39	300
N3CDA	260	40	300
AB1OC	262	37	299
K6XT	261	38	299
LU5VV	259	40	299
LY5M	259	40	299
LZ2TW	264	35	299
YO9HP	260	39	299
SM0MPV	258	40	298
WA4DT	259	39	298
EI7CC	257	40	297
AA8R	257	39	296
K9KK	258	38	296
W6GX	257	39	296
VE3ZZ	255	40	295
W3GQ	258	37	295
W6RS	260	35	295
K1SND	255	39	294
K2UF	256	38	294
YE1NZ	257	36	293
ZL2IFB	253	40	293
PP1CZ	253	39	292
VK3EW	253	39	292
JG3FEA	251	40	291
PY4OY	251	40	291
HAØHW	250	40	290
PT7ZT	251	39	290
EA8MT	249	40	289
OM3DX	250	39	289
WØRIC	253	36	289
WP4U	253	36	289
FG8OJ	252	36	288
K1QS	248	40	288
W8AV	248	40	288
WS7L	247	40	287
K5JTH	247	39	286
ON5SY	249	37	286
PY1SX	246	40	286
W3MC	246	40	286
IZØCBB	245	39	284
K1ESE	245	39	284
PY4HO	245	39	284
IZ8BRI	244	39	283
ON4CAS	243	40	283
WA5VGI	245	38	283
WB4YDL	244	39	283
W4CU	242	40	282
PY1ON	242	39	281
UA9FAR	240	40	280
VK4CC	243	37	280
GM7TUD	240	39	279
W2LE	239	40	279
KE9I	238	40	278
YBØMWM	239	39	278
N9LAH	237	40	277
SV9COL	239	38	277
PY2IU	236	40	276
WA4JQS	235	40	275
OD5ZZ	238	36	274
K7LVJ	234	39	273
HK3W	234	38	272
N1EN	232	40	272
WØEWM	231	40	271
K1ZO	230	40	270
K5DC	232	38	270
K9MK	230	40	270
NØRB	230	39	269
PY2RN	229	40	269
PY4RGS	229	40	269
W8BBQ	231	38	269
N7RD	228	40	268
VE1OP	230	38	268
WD9DZV	229	39	268
WO7R	229	39	268
K9YC	226	40	266
PY3OZ	226	40	266
PY2EL	226	39	265
W1FQ	225	39	264
LA8AW	224	39	263
YBØMZI/4	226	36	262
JN3SAC	223	38	261
K5BG	222	39	261
PY2KP	221	40	261
W8DX	221	40	261
KØLUZ	221	39	260
K5WAF	221	39	260
N8AG	220	40	260
PT2AP	223	37	260
WS3N	220	40	260
AA4FU	219	40	259
K4MM	222	37	259
SP3NYG	219	40	259
W1EBI	219	40	259
PY1NX	218	40	258
K7ACZ	218	39	257
W2NK	221	36	257
K2DSW	215	40	255
N4ANV	218	37	255
OE1WEU	217	37	254
PY2ZEA	216	38	254
VK3FM	215	39	254
WU9B	219	35	254
AA4R	213	40	253
K9OR	214	39	253
N8MZ	214	39	253
W2RDS	214	39	253
N5MOA	212	40	252
NV5E	213	37	250
VE5MX	212	38	250
W9ILY	210	40	250
JA6BZI	211	38	249
PY2UD	211	38	249
IK2SGB	210	38	248
KI0J	212	36	248
K3NK	207	40	247
K4NC	209	38	247
KC9QQ	210	37	247
KY7M	207	40	247
OH2BEN	208	39	247
VE9HF	208	39	247
W9ROG	211	36	247
HA8KW	211	35	246
K2SX	206	40	246
NØAH	211	35	246
W6GJB	207	38	245
ZS6GRL	211	34	245
IK5FKF	206	38	244
N2RJ	207	37	244
AE5X	203	39	242
N5KM	203	39	242
PR8ZX	205	37	242
VA7ZT	202	39	241
N4PQX	200	40	240
NC4MI	205	35	240
W2YE	201	39	240
YY4DNN	204	36	240
VK2MWG	201	37	238
PY1KR	198	39	237
UA9AGX	198	39	237
WØVX	199	38	237
YB4IR	200	36	236
K8YC	196	39	235
NR9J	199	36	235
LX1ER	196	38	234
PY5VC	196	38	234
ZS6A	196	35	231
LA2LI	194	36	230
VE9AA	194	36	230
YV5EN	195	35	230
K4FS	190	39	229
NY9H	191	38	229
PP5JR	191	38	229
VY2SS	190	39	229
YB1UUN	192	37	229
PY1ZV	192	36	228
YB1TJ	192	36	228
W1NK	190	37	227
WH7DX	187	40	227
YC2BYC	194	33	227
ZW5B	187	39	226
PY6TS	185	40	225
YCØQR	186	38	224
KD4POJ	185	38	223
N7US	184	38	222
PY2CX	183	39	222
PY2VA	187	35	222
VU2PTT	183	39	222
W3OA	183	39	222
W9RPM	187	35	222
WP3GW	190	32	222
AB6Z	189	32	221
PT2ON	191	30	221
CT3HF	182	38	220
KSØT	181	38	219
SM7BHM	181	38	219
4Z4DX	179	39	218
DF9DD	183	35	218
VK3MEG	180	37	217
KK9H	179	37	216
NKØS	177	39	216
VE1ZA	177	39	216
PAØMIR	177	38	215
GI4SJQ	179	35	214
WC3W	176	38	214
KØARY	176	37	213
PP5EJ	178	35	213
YB2LSR	176	37	213
K9CJ	172	39	211
WA9MAG	175	36	211
XV4Y	172	39	211
KU5B	170	40	210
PP5BZ	171	39	210
PY3YD	172	38	210
W5ZO	178	32	210
IK2RPE	173	36	209
VE9ML	170	39	209
XE1EE	170	38	208
W5GWH	169	37	206
VE1JS	170	34	204
OH6MW	166	37	203
YB8HZ	171	31	202
A65BD	165	35	200
PQ5B	162	38	200
K9IR	165	34	199
KN3A	165	34	199
N3QE	163	35	198
N5PG	159	39	198
PS2T	158	40	198
PS7AB	162	35	197
VE9OA	163	33	196
PY2XV	161	34	195
WW1MM	159	36	195
LU8ADX	153	38	191
PY5IP	155	36	191
YB3MM	153	37	190
XQ7UP	151	38	189
9V1PW	152	36	188
AB1QB	150	38	188
GUØSUP	148	39	187
N7WO	151	35	186
K1MIJ	150	35	185
PT5T	146	38	184
VK5DG	145	39	184
W2DZ	151	32	183
YB2TJV	155	28	183
VU3DMP	151	31	182
AJ4FM	147	33	180
CO2AJ	147	33	180
N4IS	143	35	178
PY2KJ	140	38	178
VY2LI	139	37	176
W6ZQ	144	32	176
KZ2I	137	37	174
YB1LZ	136	38	174
YV6BXN	141	33	174
PY5KC	137	34	171
NK5A	136	34	170
J34J	136	33	169
CE3OP	130	33	163
K9XE	131	32	163
PR7HR	127	33	160
OH5RF	125	29	154
K4IQJ	122	31	153

KF7PBM	123	30	153
PJ7MF	117	34	151
PW5G	115	36	151
DU1IVT	115	35	150
PY2MC	116	33	149
YB1HK	116	33	149
JG1WCT	116	32	148
K3TW	114	34	148
K7ZV	117	31	148
PX2B	112	36	148
YB1FWO	116	31	147
CR2H	106	35	141
IZ1TRG	112	29	141
GW4EVX	111	29	140
YC1CWK	117	23	140
K9DDO/4	112	27	139
PY2BK	120	17	137
VE1BVD	105	32	137
CE4KCA	106	27	133
W1KSZ	100	33	133
PY2YU	98	34	132
K9AMP	107	24	131
VU2CDP	100	31	131
KG5VK	97	32	129
PY2ADR	97	32	129
WT8E	102	27	129
KI4TZ	97	29	126
YB1JYL	99	25	124
PP5ZP	93	30	123
PY1TR	93	30	123
W9VA	91	32	123
NF8I	97	25	122
VY2MP	93	28	121
PU5FJR	92	28	120
PY5AKW	94	26	120
PY5FB	88	27	115
YB3EDD	90	25	115
W9MU	84	29	113
YE90PK	87	26	113
YB2ECG	83	29	112
7P8PB	82	29	111
AF5Q	83	26	109
PT2AZ	88	20	108
YE1C	79	27	106
PU4HUD	77	26	103
PY2HN	77	20	97
PY1SGT	71	22	93
F6KRD	66	20	86
PY2RX	61	24	85
PY5AP	58	27	85
YE4IJ	63	19	82
NN6NN	51	26	77
KF6ILA	49	24	73
PY2EQ	52	19	71
K6DSW	46	23	69
G4BWP	53	15	68
PY2NDX	47	18	65
YBØNDT	36	25	61
DP1POL	40	16	56
PU2RSD	35	17	52
VE1DT	32	14	46
VE4HAZ	29	12	41
W3ZGD	6	6	12

FORMULA CLASS - 100W OPTION

Callsign	Countries	Zones	Score
HA1ZH	270	40	310
W4TV	265	39	304
N4RI	240	36	276
K8CQ	235	40	275
E73Y	234	40	274
SP3BGD	228	38	266
AD1C	225	39	264
VE1RGB	224	39	263
YO6DDF	231	31	262
PY2KC	223	38	261
OK1WCF	223	37	260
JA1IRH	214	40	254
HA7LJ	213	37	250
PY5WD	215	35	250
IN3FHE	206	39	245
W3ZL	204	38	242
KB3LIX	199	38	237
SQ9JKS	199	38	237
PP2RON	199	37	236
K2DBK	191	37	228
OK1BA	189	39	228
KA9MOM	186	38	224
N1AM	189	34	223
YO4AAC	188	34	222
VU3NXI	181	35	216
FG8NY	181	34	215
W4KVS	178	34	212
AF5CC	168	38	206
JL6USD	171	34	205
KFØIQ	168	34	202
W2OR	165	37	202
EW7SM	162	39	201
PP6ZZ	166	35	201
K6LE	164	34	198
EA3FF	157	36	193
WX0Z	159	34	193
EI3CTB	160	29	189
OK1BLU	152	35	187
YB2ERL	155	30	185
K9HWL	149	34	183
W6HGF	147	33	180
IK2FIL	141	36	177
KJ8O	142	34	176
VK6HG	142	34	176
WA2VQV	143	28	171
JA7OXR/1	132	37	169
PY3KN	139	30	169
NU4I	138	30	168
PU8YPL	139	28	167
OO9O	130	35	165
PY4LH	132	30	162
YO8BGE	129	33	162
K9IA	127	32	159
DU2BOQ	127	29	156
CA3MRD	126	29	155
YF1AR	120	35	155
K7FLI	123	31	154
WF7T	120	32	152
CA3LGJ	120	30	150
OO2T	112	34	146
KJ4VTH	119	24	143
YC1EGP	111	31	142
IZ1MHY	110	30	140
FG4NO	112	27	139
W2GHD	107	32	139
VE3FCT	109	27	136
KD8SAV	107	27	134
PG1R	106	27	133
PJ7AA	99	32	131
JH1GBO	97	31	128
VK4BL	87	32	119
CO2VE	93	25	118
CE7FKG	100	13	113
CO2WL	91	16	107
4S7JL	76	27	103
PU3LYB	71	25	96
K9WIS	71	23	94
YB9WAN	64	22	86
YB9WZJ	60	25	85
VK8HPB	54	11	65
W7JSD	44	20	64
S79MHY	45	18	63
YC1DML	45	18	63
XU7AEU	38	15	53
CT1AHU	36	12	48
I/IQ1KZ	26	16	42
CO2QU	20	10	30
FS/PJ7MF	13	12	25
PY1CPF	5	3	8

FORMULA CLASS - 10W OPTION

Callsign	Countries	Zones	Score
WG5G	256	39	295
IV3AOL	229	39	268
W8QZA	226	39	265
NDØC	198	38	236
K8ZT	182	38	220
KD8NYO	179	35	214
NU4B	172	34	206
KD8NYP	154	34	188
W2WGK	156	30	186
IZ3NVR	133	34	167
ON2AD	124	30	154
VU2LBW	111	34	145
HB9CBR	111	30	141
VA1MM	72	19	91
PY1CMT	57	20	77
CO2HA	52	20	72

They are U.S. possessions, so why are they all so high up on DXers" "most wanted" lists? W4YO did some (figurative) digging and came up with some answers … and some news.

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

Part I: Navassa Island, Palmyra Island, and Kingman Reef

BY EDMUN B. RICHMOND,* W4YO

Recently, I was looking at the latest "Most Wanted Survey" from *The DX Magazine*[1] and was surprised by what I saw. Listed among the 25 most-wanted DX entities in the world are six U.S. islands or island groups. They are, with their rankings: KP1 Navassa Is. (#2); KH5 Palmyra Is. (#11); KH5K Kingman Reef (#12); KH3 Johnston Is. (#18); KH7K Kure Is. (#20), and KH1 Baker and Howland Islands (#25). Most of these islands have been activated at least occasionally since the 1950s and were fairly easily workable from the States, but because of the propagation paths involved, some other areas of the world have had difficulties in working them. Clublog.com shows a more dire situation in Europe. Its European Most Wanted Survey statistics show the following for the same six entities: KP1 Navassa Is. (#1); KH1 Howland & Baker (#2); KH5 Palmyra Is. (#4); KH3 Johnston Atoll (#6); KH5K Kingman Reef (#7), and KH7K Kure (#11)[2]. I decided to investigate this situation and see if I could determine the reasons for the positions of these American islands on these two most-wanted lists.

Points of Departure

The starting point of discovery is within two United States governmental entities which then filter down into other governmental agencies and non-governmental organizations (NGOs). The first is called the *Pacific Remote Islands Marine National Monument,* which includes Baker Island, Howland Island, Johnston Atoll, Kingman Reef, Palmyra Atoll, Jarvis Island, and Wake Island. The second is the *United States Minor Outlying Islands,* which includes these same Pacific Islands, as well as Navassa Island in the Caribbean Sea.

The Pacific Remote Islands Marine National Monument comprises a group of U.S. Pacific territories, all of which are managed by the United States Department of the Interior. The area was proclaimed a national monument in January 2009 by then-President George W. Bush. The monument includes some 77,000 square miles (119.500 km^2) and is part of the National Wildlife Refuge (NWR) System. The land area of Wake Atoll is under the jurisdiction of the U.S. Air Force, but the waters out to 12 nautical miles (22 km) are protected by the NWR. The monument includes both flora and fauna of the equatorial area where these islands are located. Federal law prohibits commercial fishing in the monument area, as well as the dumping of waste, and the destruction or extraction of area plant or animal life. *Public entry into these areas requires a special permit from the U.S. Fish and Wildlife Service (which administers national wildlife refuges) and is restricted to scientists and educators.*

In January 2014, Kingman Reef was found to be too dangerous to approach or to land. Henceforth, no further permits will be given for amateur activity.

The United States Minor Outlying Islands groups the same Pacific islands, but only as a statistical convenience. The main task of this organization is to collect and provide statistical information on these islands, including, but not limited to, island area, lagoon area, geographical coordinates, climatology, NWR establishment dates, and date of U.S. acquisition. The specific areas monitored are: The Northern Pacific Ocean Scattered Isolated Islands (i.e., Wake Island, Johnston Atoll); the Northwestern Hawaiian Islands (i.e., Midway Islands); in the central Pacific Ocean, the Northern Line Islands (i.e., Kingman Reef, Palmyra Atoll); the Central Line Islands (i.e., Jarvis Island), and the Northern Phoenix Islands (i.e., Baker Island, Howland Island); and in the Caribbean Sea, Navassa Island.

These islands are not administered collectively, but only as a group of uninhabited islands under the sovereignty of the United States. None of the islands has any permanent residents, but occasionally, there are scientists or military personnel who take up temporary residence. Kure Atoll is not listed in either of the above government programs. That atoll is actually part of, and governed by, the State of Hawaii. With this general information, let's now turn our attention to the specifics of the individual islands. We'll cover Navassa, Palmyra/Jarvis and Kingman Reef here, followed in Part II by Johnston Atoll, Kure Atoll, and Baker & Howland Islands.

Navassa Island (Most Wanted # 2)

Navassa is an island in the Caribbean Sea, located at 18° 24'10"N 75°0'45"W, or 100 miles (170 km) south of the U.S.

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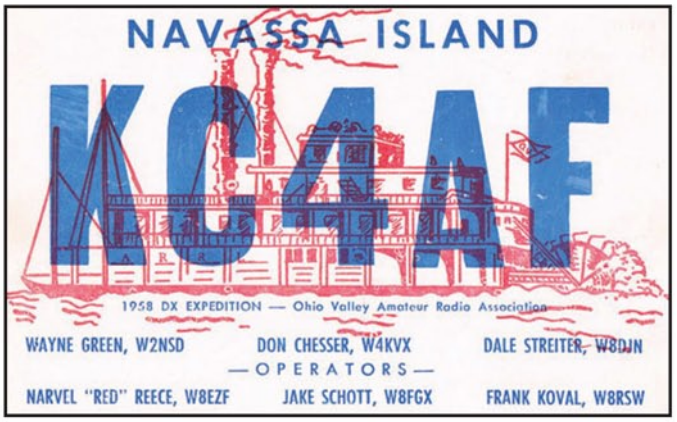

Photo A. The 1958 KC4AF DXpedition to Navassa Island included then-CQ Editor Wayne Green, W2NSD, as one of the six operators. (QSL cards from the author's collection)

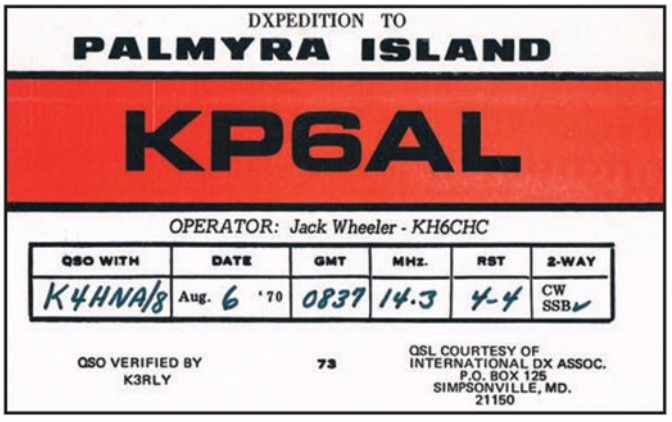

Photo B. KP6AL was used by at least four different amateurs operating from Palmyra before the island's prefix was changed to KH5 in 1978.

Naval base at Guantanamo Bay, Cuba, and 40 miles (64.3 km) west of the *Anse d'Hainlaut* on the lower peninsula of Haiti. It is an uninhabited piece of land with high cliffs, about 2 sq. mi. (5.2 km^2). There are no natural harbors or landing areas An offshore anchorage is the only means to set foot on dry land. Navassa is claimed by the United States as an unorganized unincorporated territory, but is also claimed by Haiti.

From 1903 to 1917, the island was administered by the U.S. Coast Guard. Since January 1996, it has been administered by the U.S. Department of the Interior. In 1998, The U.S. Fish and Wildlife Service took over administrative control of Navassa. In December of 1999, the island, and the sea around it, became known as *Navassa Island National Wildlife Refuge.* The political particulars are retained by the Office of Insular Affairs, and judicial authority is now exercised by the nearest U.S. Circuit Court, which is in Puerto Rico.

Due to hazardous coastal conditions, and for preservation of species and habitat, *the refuge is closed to the public*. Since this change of status, hams have applied for, but have repeatedly been denied, both travel and entry permits.

Although Navassa is relatively close to the U.S., and should be reached with only minor difficulty, it has seen limited amateur activity through the years. The first operation form there was in 1954 using the callsign KC4AB for three days! Eight groups of amateurs followed from March 1958 (photo A) to November 1974.

In 1978, the prefix for Navassa was changed to KP1. The largest multi-operator DXpeditions to the island at the time were NØTG/KP1 and WØRJU/KP1 in November–December 1978. Four other groups followed from 1982 to 1993. There have been no legally authorized operations since.

Palmyra and Jarvis Islands (Most Wanted #11)

Palmyra is a tropical coral atoll located at 5°53'N 162°5"W. It is unoccupied and is administered as an unorganized incorporated territory by the U.S. federal government. It is one of the Northern Line Islands and is located almost due south of the Hawaiian Islands. It is southeast of Kingman Reef and north of the Republic of Kiribati. It is small, with only 4.1 square miles (12 km^2) and has one anchorage at West Lagoon.

Although it has no permanent residents, there can be as many as 20 individuals on the atoll at any given time, depending on research projects being conducted by various departments of the U.S. government, the Nature Conservancy, and the Palmyra Atoll Research Consortium. Weather is wet and humid, with steady temperatures around 85° Fahrenheit (29° C), and abundant rainfall levels of 175 inches (4400 mm) per year.

The atoll is located where the northern and southern Pacific Ocean currents meet. Consequently, its beaches are constantly littered with some form of trash and debris, including lots of plastic bottles and mooring buoys.

Politically, Palmyra is subject to all provisions of the U.S. Constitution and is permanently under American sovereignty. There is no Act of Congress as to how Palmyra should be governed. The only relevant federal law gives the President authority to govern in the way he sees fit. The atoll is counted as one of the U.S. Minor Outlying Islands. Cooper Island, as part of the atoll, is owned by the Nature Conservancy and is managed as a nature reserve. The remainder of the atoll is federal land and waters under the jurisdiction of the U.S. Fish and Wildlife Service. Since there is no local form of government on the atoll, Palmyra is administered directly from Washington, D.C. by the Office of Insular Affairs of the U.S. Department of the Interior.

Although the atoll is now federal U.S. territory, it was not always that way. It was claimed for the United States in 1859. Since then, ownership of the atoll has passed through various hands,

including several individuals. All but two of Palmyra's islands were once owned by three brothers. Upon their death in December 2000, the Nature Conservancy purchased, and now owns, most of Palmyra. In January 2009, the Pacific Remote Islands Marine National Monument, including Palmyra, was established with supervision by the U.S. Fish and Wildlife Service. In 2001, the Secretary of the Interior signed an order establishing Palmyra's tidal lands, submerged lands, and surrounding waters out to 12 nautical miles (22 km) from the water's edge as a National Wildlife Refuge. *Limited visits to the refuge are allowed, but visitors must obtain prior approval from the Nature Conservancy.*

Jarvis, one of the Line Islands, is located 25 miles south of the Equator at 0°22'S 160°01'W, or about halfway between Hawaii and the Cook Islands. It is 460 miles (731 km) south southeast of Palmyra Atoll. A small, low-lying coral island, only 1.75 square miles (4.5 sq. km), it is an unincorporated, unorganized territory of the United States. It is administered by the U.S. Fish and Wildlife Service as part of the National Wildlife Refuge system.

The island has a tropical desert-like climate with high temperatures during the day, but cool temperatures at night. There is no natural water and very little rainfall. Vegetation is mostly coconut palm trees. Its lagoon is completely dry, unlike most coral atolls. Jarvis has no land anchorages. Swift currents are also a hazard.

In 1974, the Jarvis Island National Wildlife Refuge was created. This was expanded in 2009 to include all submerged land within 12 nautical miles (22 km) around the island. Jarvis is also administered by the U.S. Fish and Wildlife Service. *Public access to Jarvis Island is restricted to scientists and educators, and requires a special-use permit.* The Fish and Wildlife Service and the U.S. Coast Guard periodically visit the island.

Palmyra and Jarvis are counted as one entity for DXCC purposes. Most activity has been from Palmyra. Only two accredited DXpeditions have operated from Jarvis, in 1983 and 1990. Before World War II, KG6MV was on the air from Palmyra in 1940[3]. During WW II, the islands came under the jurisdiction of the U.S. Navy. After the war, several KP6 stations were operated, mostly by Navy personnel. The first station to operate post-WW II was KP6AA in 1947. The callsign KP6AL (photo B) was recycled several times and appears to have been used by four different operators until 1977. The prefix for this entity changed to KH5 after the reassignment of U.S. prefixes in 1978. More than 25 stations have operated for various lengths of time with the /KH5 portable indicator.

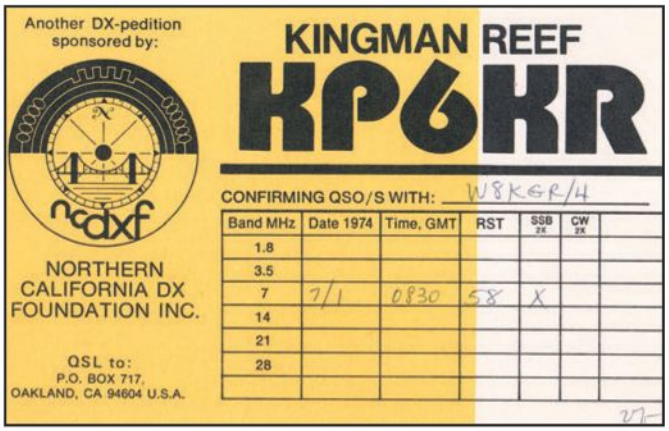

Photo C. Always a rarity, Kingman Reef recently was declared too dangerous for approach or landing, and the U.S. government says it will no longer issue permits for amateur radio activity there.

Kingman Reef (Most Wanted #12)

Kingman Reef is an uninhabited reef located 6°23'N 162°25'W, or 36 nautical miles (41.4 miles, 67 km) northwest of Palmyra Atoll. It is the northernmost of the Northern Line Islands. It's a rather large reef, 11 miles (18 km) long running east-west, and 6 miles (9 km) wide running north-south. It is about 29 square miles (76 km^2). The highest point on the reef is less than 5 feet (1.5 m) above the sea. The reef consists mostly of pieces of dead coral and clam shells, which, over the years, have been washing away due to the action of high tides and winds.

This reef is awash most of the time, making Kingman a maritime hazard. Since the reef is awash or submerged most of the time, there are no trees. Occasionally, a palm tree might take root, but dies out rapidly due to the tides and lack of nutrients needed for sustained growth. Even so, the reef has a variety of marine life not found elsewhere.

The U.S. Navy assumed jurisdiction of the reef in December 1934. Pan American Airways used the Kingman lagoon in 1937 and 1938 as a stopover station for its "Clipper" route between Hawaii and American Samoa. In September 2000 the Navy relinquished control of Kingman, and in January 2001 the Kingman Reef National Wildlife Refuge was created. It is an unincorporated territory of the United States and is administered from Washington, D.C. by the Department of the Interior. It is grouped as part of the United States Minor Outlying Islands, and in January 2009 was designated a marine national monument under the control of the National Wildlife Refuge System and is managed as a no-take marine protected area. *The atoll is closed to the public. Access is managed through the issuance of a Special Use Permit when the activity is considered compatible with the purposes of the refuge establishment.*

Amateur radio activity has been limited. In 1974, KP6KR (photo C) became the first ham station to be active from the reef. Since then, other DXpeditions have taken place in 1977, 1980, 1981, 1988, and 1993. The most recent DXpedition was in October 2000, using the callsign K5K.

In January 2014, on a USFWS inspection trip the reef was found to be drastically inundated, almost to the point of being totally submerged. It is now considered too dangerous to approach or to land. *Henceforth, no further permits will be given for amateur activity*[4].

Coming Up in Part II

When we continue, we'll take closer looks at Johnston Atoll (#18 on the Most Wanted list), Kure Atoll (#20), and Baker & Howland Islands (#25). Each of these has some unique history to go along with its rarity in the ham radio world.

Notes

1. For the complete list, see <www. dxpub.net/MOST-WANTED-SURVEY. html>

2. See <www.clublog.org/mostwanted. php>

3. This, and other QSLs of stations mentioned in this article, may be seen at K8CX's very impressive web pages at <http://hamgallery.com>

4. Personal communication on March 26, 2014 with Amanda Pollock, Deputy Supervisor of the FWS for the Pacific Remote Islands Marine National Monument, and Project Manager for Kingman Reef, who confirmed to me that no further special use permits will be issued for amateur radio activity on Kingman Reef.

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A slice of paradise … with no fresh water and an abundance of seagulls. Welcome to Portsmouth Island!

Portsmouth Island, North Carolina … A "Rockmitey" QRP Expedition

BY ED COBB,* K4YFR

The "Ham Radio News" column in the December 2013 issue of *CQ* announced that Dave Benson, K1SWL, was closing his shop, Small Wonder Labs, to enjoy the freedom of retirement. Dave certainly has earned it by pleasing a large number of us hams with some outstanding QRP products, not the least of which is the incredible Rockmite CW transceiver. As a tribute to Small Wonder Labs and K1SWL, I recall the following experience on April 6, 2013, that the Rockmite inspired (photo A). But first, a little background…

Upon retirement, my wife and I joined the local Tidewater Appalachian Trail Club whose main purpose is to maintain a portion of the 2,180 miles of the well-known trail that connects Mt. Katahdin, Maine, to Springer Mountain Georgia. The club's regular outdoor adventures open up many opportunities for portable QRP operation from the mountains to the seashore, both within easy reach of our QTH in coastal Virginia Beach.

Along the Appalachian Trail, cellular service might, or might not, be reliable, provided you can see a valley town from a mountaintop position. However, don't count on consistent cellular service where the bears live. Sounds like a job for ham radio!

Could we come up with a super-light QRP station complete with antenna system that meets a backpacker's very low weight requirements? Backpackers are not joking when they say that their toothbrush handles have been shortened to save weight. If you watch the ounces, the pounds will take care of themselves. This prompted the purchase of a Rockmite 40 CW transceiver from Small Wonder Labs. The kit went together easily and exceeded expectations at a half-watt output. Talk about bang for the buck!

Photo A. K4YFR outside his tent on Portsmouth Island, North Carolina, operating his Rockmitey transceiver. (Photos courtesy of the author)

There are many choices for backpacker QRP equipment sets that are proven performers, but very few that will compete with the Rockmite in terms of both light weight and good performance. Using a fixed frequency on 40 meters (7120 kHz) that's typically not very busy during mid-day hours leaves only the scheduled QSO time as a variable factor. Twelve o'clock noon works for me. Time to stop for a lunch break, raise the fishing pole (more on this in a minute), connect the inverted-Vee antenna, and call home. The only control required is the on-off switch, since the Rockmite has no receiver gain potentiometer.

Rockmite to Rockmitey

Old friend and electronics guru Ray Kauffman, AJ4YN, packaged my assembled Rockmite printed circuit board in a small 7" × 3.75" × 1.5" plastic enclosure that contains a sealed Micro-Switch hand key, a 1.5-watt RF amplifier, a 1:1 balun, and a half-dozen AA batteries (photos B & C). It fits in a coat pocket, completely self-contained. A sailboat pad eye (metal loop) protects the switch to prevent accidentally turning on the Rockmite. All one needs are ear buds and a simple wire antenna for a complete, working ham radio station. The resulting Rockmite-on-steroids

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e-mail: <ed-cobb@cox.net>

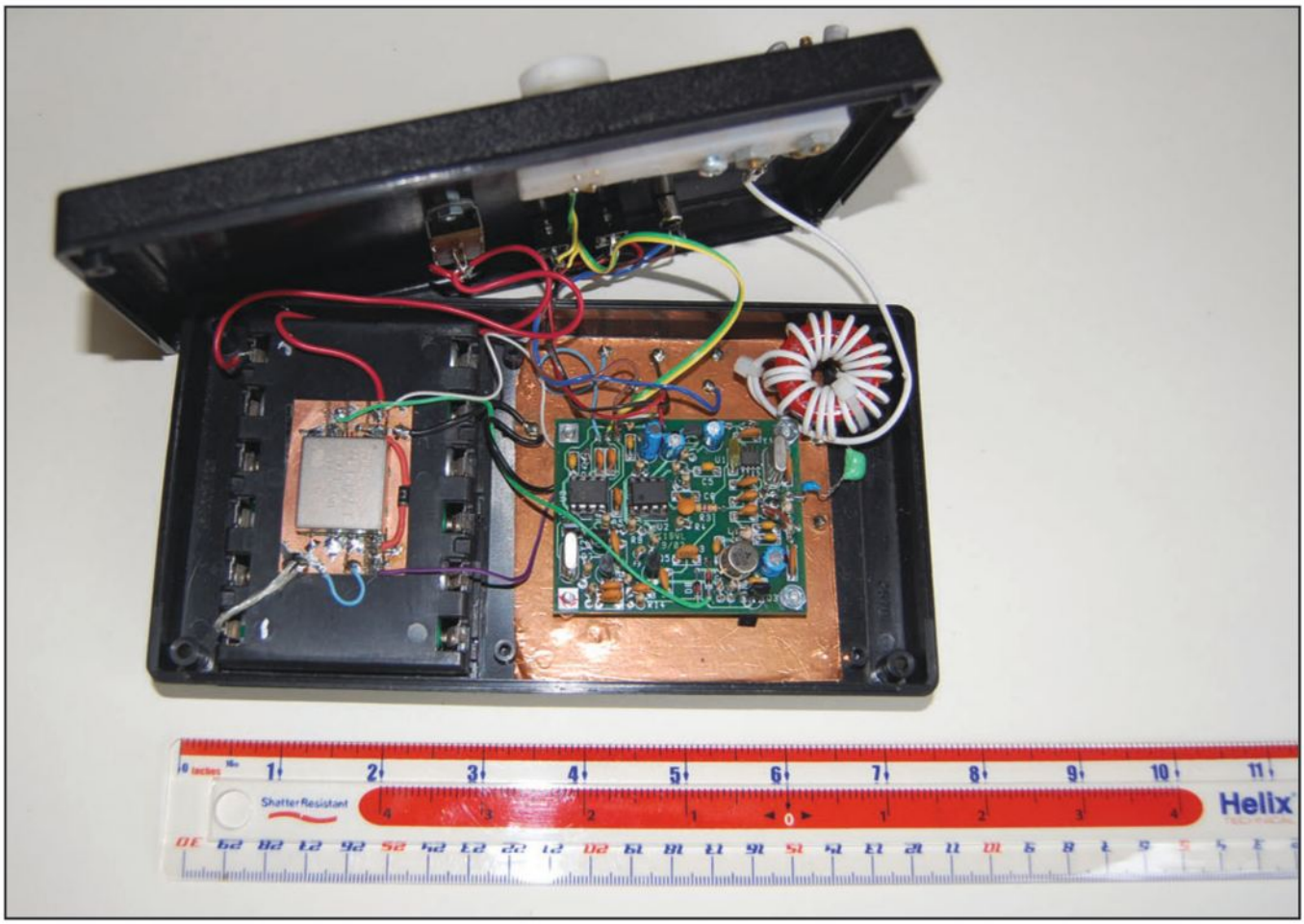

Photo B. Inside view of the Rockmitey. The Rockmite board is on the right. Notice the key (white) built into the top cover and the 1:1 balun at the upper right. The unit also includes a 1.5-watt amplifier.

was dubbed "Rockmitey" after passing all on-air testing. I used a simple inverted-Vee antenna supported by a telescoping 20-foot fishing pole mounted with hose clamps to a surf-rod holder. The inverted-Vee is adjusted for best SWR match simply by changing the apex angle and the height of the element legs above ground, having already done the length trimming part at home.

Many stations within daylight range of about 300 miles airline were worked from the backyard test site, mostly using NVIS, or Near Vertical Incidence Skywave, propagation (see sidebar "What's NVIS All About?"). I was delighted to find that my test setup rarely failed to make a contact when the band was in fairly good condition. I frequently got 559 reports and an occasional 599. Backyard testing was followed by remote field operations from several campsites, including Loft Mountain on Virginia's Skyline Drive at an elevation of approximately 3000 feet. After a day on the trail "Old Hiker's Midnight" is typically about 8 PM. The usual foreign

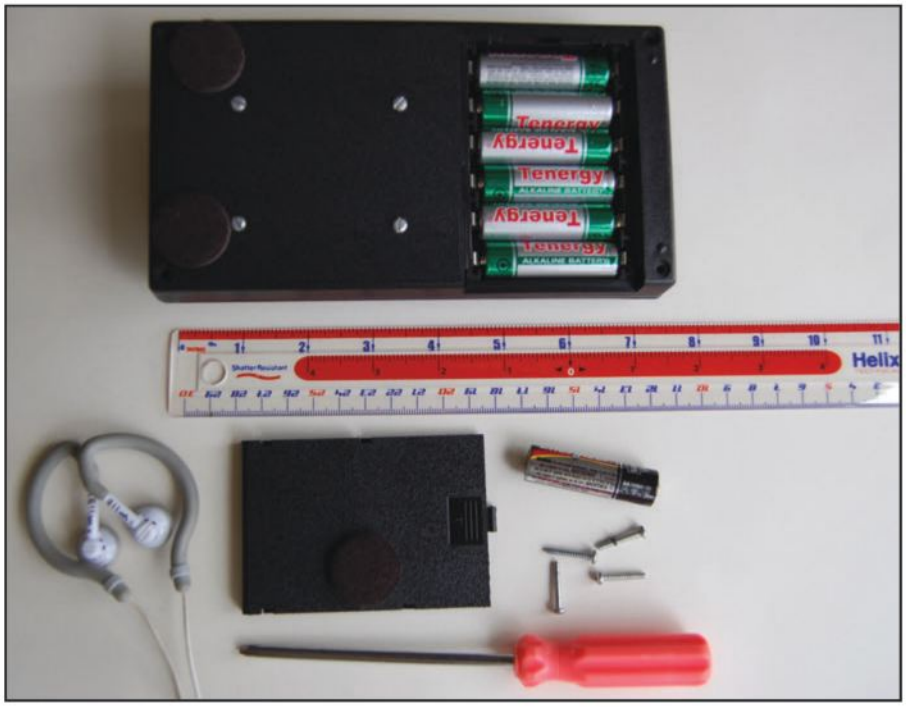

Photo C. Six AA batteries provide all the power this mini-QRP rig needs. Earbuds (lower left) and an antenna are all that are needed for a complete portable station.

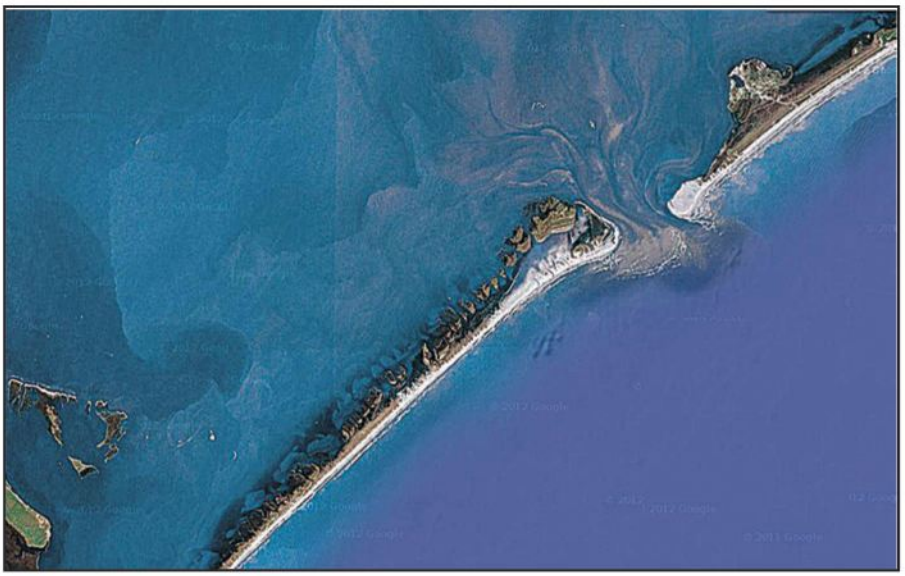

Photo D. Satellite view of Portsmouth Island (left) and Ocracoke Island (right). Note the shoals blocking Portsmouth's harbor discussed in the sidebar, "Where Did Everyone Go?" (NASA photo)

phone activity on 7120 kHz was never a problem. In fact, it provided some evening entertainment.

Heading to Portsmouth

Last April, the Tidewater Appalachian Trail Club sponsored an overnight hike and camping trip to Portsmouth Island, North Carolina (photo D). My wife and I decided to go, and of course, my Rockmitey station came along.

An aerial photo of Portsmouth Island (IOTA #NA-067) could be that of a remote atoll in the South Pacific, but it's actually located just south of Ocracoke Island on the Outer Banks of North Carolina. The last residents of Portsmouth Village (established in 1753) departed in 1971, leaving the island uninhabited. Deserted buildings remain, including the general store/post office, church, school, Life Saving (pre-Coast Guard) station, and several homes. All electrical and fresh water infrastructure is long gone, along with common mode noise. This place is incredibly quiet for radio work!

Pedestrian (only) ferry service is provided by Austin Tours, a couple of retired North Carolina ferry service licensed captains who have 24-foot Carolina Skiffs that can carry up to ten passengers each (photo E). These gentlemen are very knowledgeable about Portsmouth Island history and do a super job, making everyone comfortable and welcomed. The ride over is exhilarating and a lot of fun. Be sure to take your foul weather gear if you go, though. You won't be taking a nap during the voyage!

Rockmitey in Action

OK, here we were, 200 miles from home on Portsmouth Island with QRP camp setup. The Rockmitey was ready for action with the inverted-Vee hooked up (photo F). It was about 2 PM, perfect weather, and very quiet. AJ4YN was heard 599 right on schedule. Ray was running15 watts "QRO" with his new Elecraft K3 on 7120 kHz, with not a hint of QRM or QRN. K4YFR/P/QRP responded. Contact was established on the first attempt. CW made up for weak-signal QSB from the (±539) portable station with 99% copy throughout the QSO, which was a conversation lasting about 15 minutes. AJ4YN at his home station in Chesapeake, Virginia was using his excellent single-wire-fed, 1920-style, Windom antenna with a massive 30' × 40' metal building under it, pretending to be ground radials and doing it very well indeed.

Several fellow campers in our Appalachian Trail Club group stopped by to check out the ham station. This was an initial experience for some who had never actually witnessed radio telegraphy first hand.

Off-the-grid radio operation has to be experienced to be truly appreciated. Unless your receiver happens to be tuned to a frequency in use, it will seem like your antenna is disconnected upon

Where Did Everyone Go?

What happened that caused the entire population of Portsmouth Island (685 residents in 1860) to move away? There was probably more than one reason, but the most likely one was major hurricanes that cut across North Carolina's Outer Banks (a.k.a. "OBX"—*OBX bumper stickers have been sighted in Arizona*.) Raging wind and surf over the years caused Portsmouth's harbor to shoal up, preventing the transit of deep-draft ocean sailing vessels (the shoals are visible from space in photo D). Overseas shipping came to an end. What had been a thriving eastern port during the days of sailing ships became a small fishing village. Ironically, the same storms that isolated Portsmouth Island opened up Hatteras and Oregon Inlets.

To give you a feel for the type of community Portsmouth village was back in the day, an islander could go to the post office after the mail boat arrived and have an impromptu game of croquet with neighbors while the postmaster was distributing the mail to the appropriate pigeon holes. The croquet lawn was conveniently located adjacent to the post office/general store. Also near the building is a tide-marker post showing the dates and levels of exceptional high tides. Clearly the island has been flooded by several big storms over time.

When radio became available, a few locals had broadcast receivers. They were very popular indeed. One of those radios, a classic Atwater Kent, is on display in the island museum.

Should you have an interest in the geography and history of Portsmouth Island, much information is readily available online. The island is maintained by the National Park Service and is a protected area for wildlife. "Leave no trace" rules apply. Camping is permitted on the beach, but not in the village.

What's NVIS All About?

NVIS, Near Vertical Incidence Skywave, is an operating technique in which a low, horizontally polarized antenna is used to send most of the RF signal straight up to the ionosphere, creating an "umbrella" effect that covers a radius of about 300 to 600 miles. A typical NVIS station includes a transceiver of not more than 100 watts output and is very effective at QRP levels. One of the advantages of NVIS is lower incoming noise, which improves the signal-to-noise ratio of the receiver. Being highly effective over a relatively short range using low power in combination with the quieter signal-to-noise ratio makes NVIS a true advantage for the operator who is interested in QRP remote operations in the field.

Photo E. There's only one way to get onto and off of Portsmouth Island … and this pedestrian-only ferry is it!

Photo F. The author outside his tent discussing ham radio with fellow campers. Note the fishing pole at left, which is his antenna support.

initial fire-up in a real no-noise environment. Manmade noise is exponentially stronger with respect to shorter distances to the noise source. You might find a spot of common mode noise tranquility within a reasonable range of your home. It is well worth the trip for a mini-QRP expedition!

The logistics of any expedition, be it DX or QRP, seem to represent the biggest challenge to success. Just read any story about a major DX trip to a remote island. Joining an active hiking/camping group solves nearly all logistical problems for trips closer to home. Plus, you have the added benefit of group security and safety. You simply can put your little QRP rig in your backpack and use a retracted lightweight telescopic fishing pole as your hiking stick.

Understanding that many Rockmite owners will have an interest in AJ4YN's amplifier and built-in accessories, we plan to have a technical how-to article on that subject soon. Kudos to Dave, K1SWL, for his outstanding Rockmite transceiver, and best wishes for a long and happy retirement.

How to make a small, inexpensive paddle from a paper clip … well, two paper clips…

Building the "Bulldog" Paddle

BY GEORGE AVERILL,* K4EOR

Hiking with a CW QRP rig can be fun, but one must be mindful of the size and weight of equipment carried. One question that constantly worried me was "Where can I find a small, inexpensive, lightweight paddle?" Then I discovered the "bulldog" paddle, which can be made from a paper clip!

Some Research

Several hams have posted notes online about building a "bulldog" paddle[1,2,3], but none of the articles seemed to include really clear instructions for building one. There also are several variations of "paper clip" paddles. After some experimentation, I found building the "bull dog" is quite easy and a lot of fun. Commercial vendors[4] can be found if you would rather purchase a completed paddle, but I found that building one to my own design was much more rewarding!

Photos A and B show two completed "bulldog" paddles. One is attached to a small angle bracket on the side of my Elecraft K1. The other is attached to a clipboard. There are many more ways to mount the paddle, such as suction cups, on a wood block or ceramic tile. They can be attached with screws or glue.

Tools and Materials

Like many projects, you can use an entire shop full of equipment or just some basic tools. I chose to use simple tools that can be found on most hams' workbenches. You will need an electric drill with some small bits, a soldering iron and solder, a fine-tooth hacksaw, a knife or wire-stripper, a pair of needle-nose pliers, and a fine-tooth metal file.

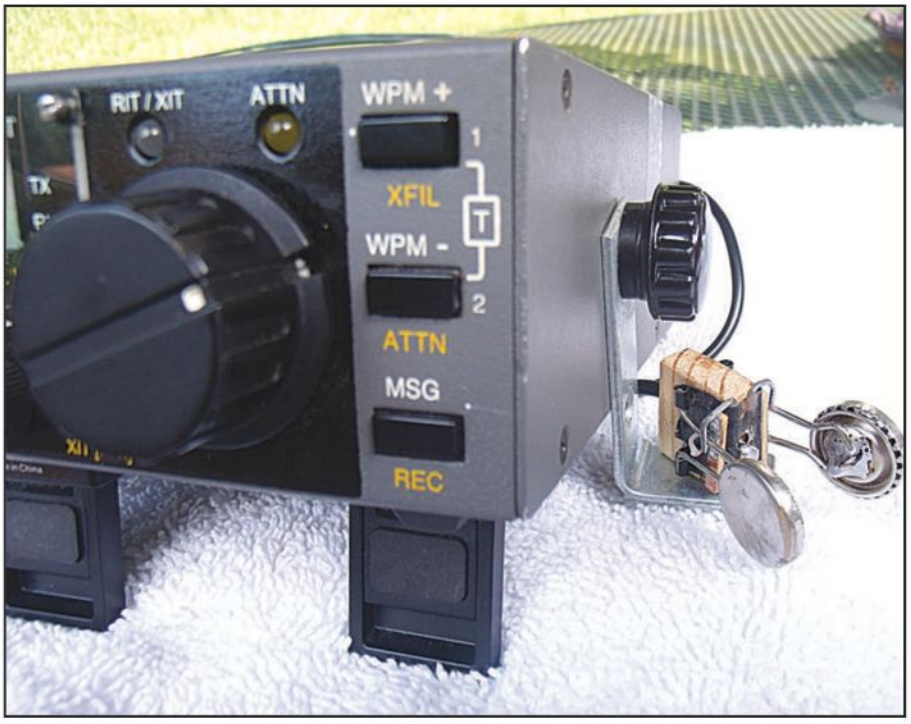

Photo A. The bulldog paddle mounted to the author's Elecraft KX-1. (Photos courtesy of the author)

You will need the following materials: one "spring style" binder-type paper clip (sometimes sold as Bulldog clips; thus the name), one medium-size standard paper clip, one small-diameter cable with a 5-mm stereo plug attached to one end (or whatever other type of key input your rig requires), one strip of wood for mounting the paper clip, two flat metallic buttons (the type found in most fabric stores for covering with fabric), one small wood screw for attaching the paddle to the mount of your selection, gel super glue, and whatever miscellaneous materials you might need for the mount.

Locating the Parts

You may already have a cable lying around in your junk pile, but if not, you can purchase an inexpensive device such as an earphone at a local dollar store. Simply clip off the earplug and use the remaining cord with the stereo 5-mm plug attached. You may find it easier to use a larger diameter two-conductor-plus-shield cable, and solder on a plug. If you don't have the paper clips

*e-mail: <k4eor@arrl.net>

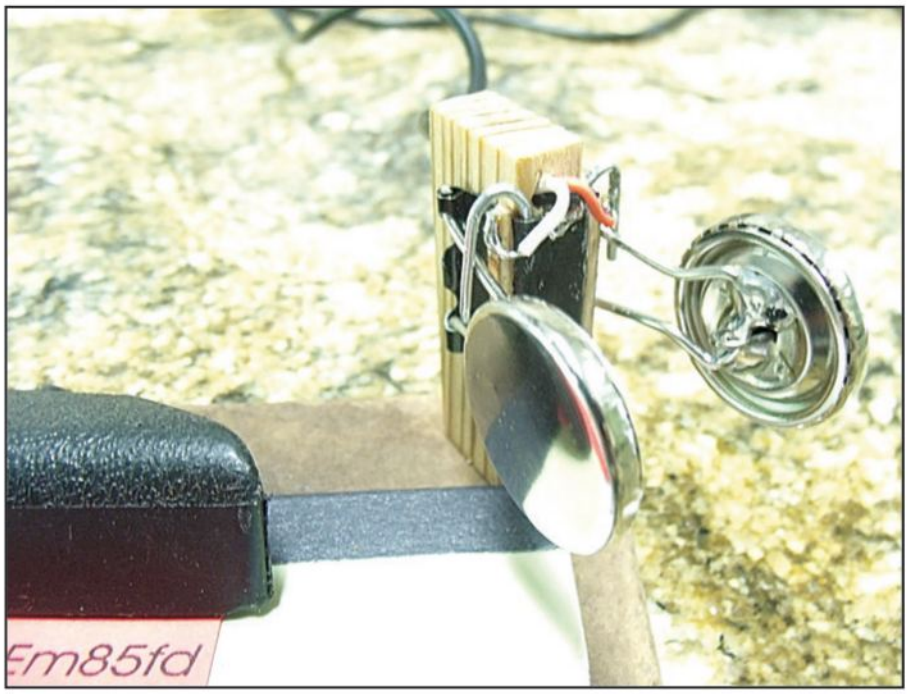

Photo B. The completed paddle mounted to a clipboard … an idea suggested by Carlton Haycock, K2CMH.

on hand, you can find them at almost any office store. The wooden strip is harder to find. I cut mine from a larger piece of pinewood scrap. The rectangular wooden strip should be approximately 8 mm × 18 mm (1/4 in. × 3/4 in.) and 30 cm (1 1/4 in.) long in order to help hold things during construction.

Modifying the Binder Clip

Here the real secret is revealed![3] When an unmodified clip is attached to the wood strip and the wires folded back, they normally will spring together. What you want is for them to spring apart to provide the outward push for the paddles.

The modification of the binder clip is based on the design commonly used for the doors of bathroom stalls to reclose the doors after they have been opened (without using any springs). The hinges of these doors are designed on an incline, which lifts the doors when opened and then lets the weight of the doors pull down on the incline to close them.

First, remove each of the clip wires by pushing the ends of each one together. Lay them aside. Then, using a fine-tooth metal file, reshape the outer edges of

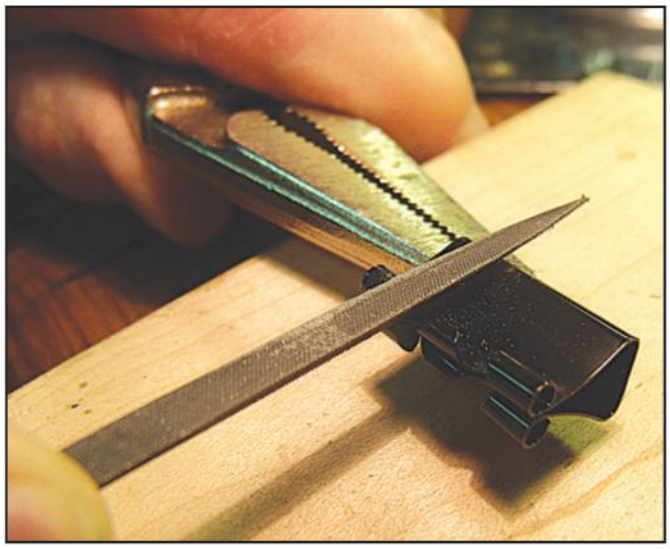

Photo C. Modifying the clip by filing the loops that hold the wires in place.

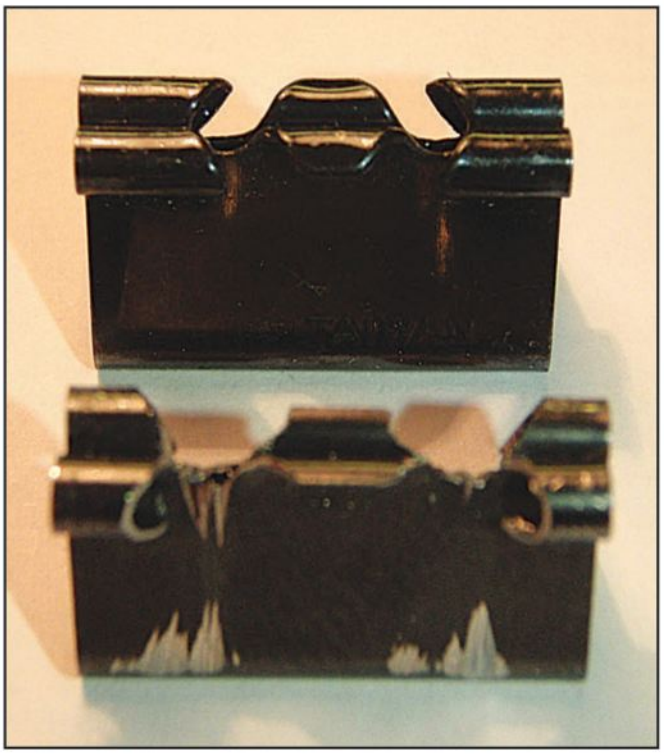

Photo D. The binder clip after filing. Note that the inner edges of the loops now point outward instead of inward, reversing the action of the clip wires.

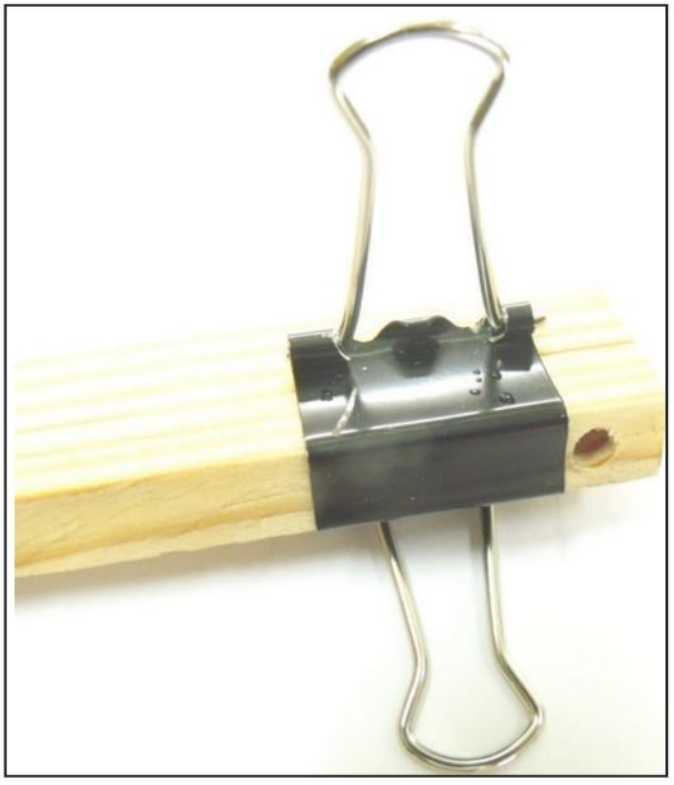

Photo E. Drill a hole through the wood next to the clip to pass through the wire to the transmitter.

the clips where the wires enter (photo C). Notice that filing has changed the direction of the outer parts of the clip from pointing inward to pointing outward (photo D).

The metal is hard, so don't give up! It helps to use a pair of needle-nosed or narrow-tipped locking (Vise-Grip) pliers to hold the binder clip while filing. After the metal has been reshaped, reinsert the wires, add a very small amount of oil, and *voilà*, the wires will spring outward instead of inward! Bending the wires apart increases the spring tension of the paddles.

Drilling the Wood

The wood should be rectangular and large enough to hold the clip fully open when it is attached. A long piece of wood works best, because it will give you a "handle" for holding things when drilling. You might want to use a small drill press for this step, but I actually used my hand drill while supporting the wood against a slab of firewood on my woodpile!

Clamp the modified binder clip approximately 8 mm ($^1/_4$ inch) down from the end of your wood strip, as shown in photo E. Then drill a hole the size of your cable through this exposed section of wood.

Photo F. Cutting the circuit board strips. It's best to cross-cut first, before cutting lengthwise.

Cutting and Attaching the Circuit Board Strips

Single-sided board works best, but thin, double-sided board can also be used. The thing to remember is that the board needs to be thin enough to allow the wires of the clip to move close to the body of the clip when sending. You might want to file down a thicker board to make it thinner. Clean the circuit board with fine steel wool before cutting.

It helps to cross-cut the circuit board the length of the binder clip before making the long, thin cuts (photo F). The resulting circuit board strips should be as narrow as possible. After cutting the strips, use super glue to attach the strips to the upper edges of the paper clip. (It is better to put glue on the binder clip,

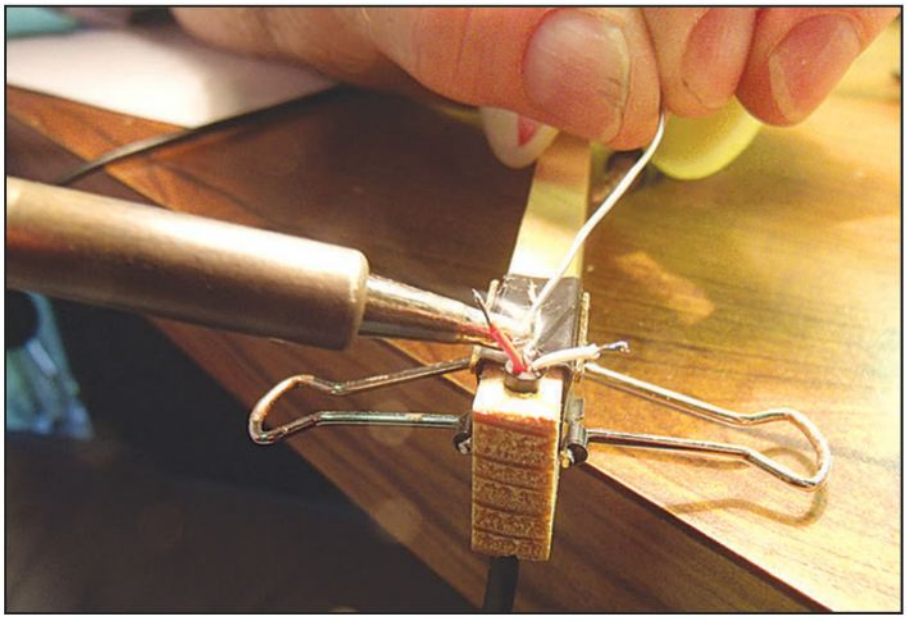

Photo G. Attaching the wires.

then gently drop the thin circuit board strips onto the glue.)

Attaching the Wires

Push the cable through the rear hole in the wooden block. After stripping the wire, pull the cable back down and trim the wires as needed. Then solder the ground wire to the binder clip. Use a file, sandpaper, or a knife to scratch the bluing from the center outside end of the clip. This will allow solder to adhere better when the ground wire is soldered to the clip. You may prefer to tin the clip at this point before soldering the braid (photo G).

Next, solder the remaining wires to the top edges of the appropriate circuit board strips. (Note: Verify which is "dit" and which is "dah" before doing this. Most CW operators prefer to attach the "dit" wire to the left paddle and the "dah" wire to the right paddle.)

After attaching the wires, cut the wood approximately 2 cm ($^{7}/_{8}$ in.) below the clip. This determines the height of your paddle.

Bending the Wire Paper Clip

This paper clip is used to limit the outward swing of the wires (the paddles) of the binder clip. It fits behind the binder clip, next to the wood. The middle of this wire should bend up at the bottom to hold it in place against the bottom of the binder clip (photo H). It should extend between the clip and the wood then finally out and down just outside the wires of the binder clip. Use your needle-nose pliers to make the bends. I used both round- and flat-tip needle-nose pliers. You should clip off the excess wire after bending the wires down. You will need to make final adjustments of this wire after completing the "bulldog." Bending the wire does this.

Adjustments

The distance the paddles move to each side is adjusted by bending the small paper clip wires in or out. Removing the wires and bending them together or apart adjusts the tension. With proper adjustment, your bulldog paddle will operate very smoothly and will be a valuable addition to your QRP rig.

Adding the Buttons

It isn't necessary, but if desired, you can solder or glue buttons to the wires of the clip as paddles. You may find them easier on the fingers than the just the wires of the binder clip.

Summary

Building this project requires that you take your time and work in close quarters. If you mess up, you can always start over; you won't have lost much in the way of parts. You can also modify or improve the design to fit your particular application. When you finish, you will have a piece of ham equipment that you can actually use for a very long time, and you can feel proud because you made it yourself!

Notes

1. N2UHC: <http://www.reocities.com/ n2uhc/paddles.html>
2. KL7R: <http://kl7r.ham-radio.ch/ files/microbulldog.html>
3. N2UHC: <http://www.k7hb.com/ Projects/Paperclip/paperclippaddle.pdf>
4. K9LU: <http://www.amateurradioproducts.com>
5. <http://blog.samolyk.com/?p=60>
6. K2CMH: The idea for attaching the paddle to a clipboard was one of his many helpful suggestions.

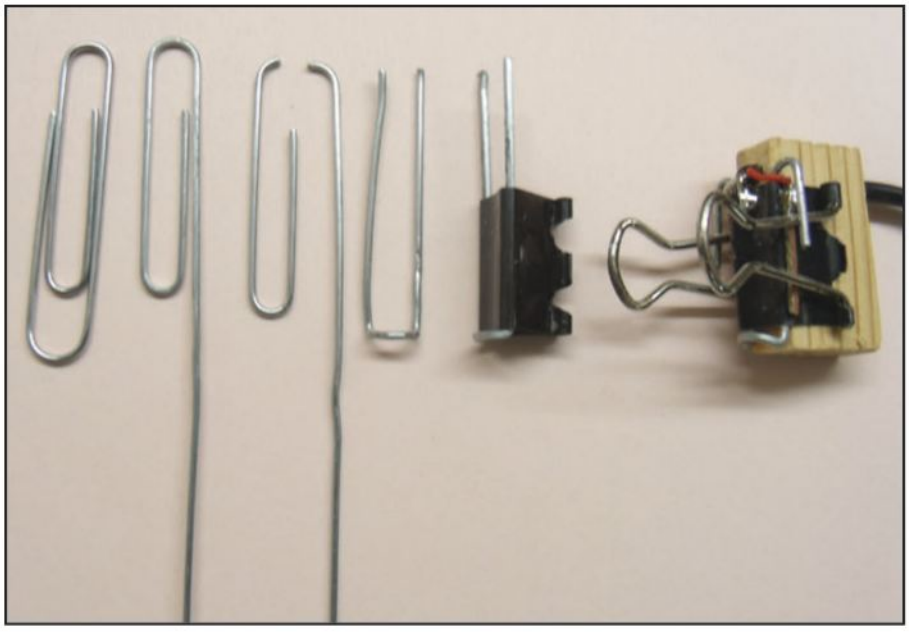

Photo H. Bending the wire paper clip. See text for details.

So you're walking on a tropical beach (or not) and you get the urge to do a little portable hamming … but you don't have a lot of time to set up and tear down an antenna. Enter (drum roll, please) … the Tapper-Walkie!

Tapper-Walkie

BY CORY GB SICKLES,* WA3UVV

'Twas thrilling, and the singing words
Did ebb and flow upon the waves;
All music were they in the 'phones,
And the mobile rig outside.

"Beware the Tapper-Walk, my son
The paddles that send, the 'phones that hear.
Beware the drag-line snags, and seize
The furious band openings!"

[With (extreme) apologies to Lewis Carroll]—*WA3UVV*

My wife works for a wonderful family-owned company that is international in scope. Among its employee incentives is a program known as "Partners in Excellence," through which one can be recognized as a departmental Partner of the Year. Last year, she was one of those who stood out. Part of the reward was a week-long trip to St. Thomas, in the U.S. Virgin Islands.

As soon as she was nominated, I began thinking about the possibility of operating there. Of course, I'd bring along a 2-meter radio to work some of the locals, but I also wanted something for HF. When I got a text message from her that she'd "won" in December, I had to consider what I wanted to bring along. (Funny how amateur radio can influence what you want to do on your vacation.)

The quick and easy answer was to grab my Yaesu FT-817ND "Go Bag" and be done with it. This would give me coverage for HF, VHF, and UHF, if I wanted. However, I also thought about doing something a bit different. With the '817 as a solid "Plan B," I started sketching out an alternative.

Keeping It Small and Simple

The biggest limiting factor for someone wanting to operate in the field or otherwise portable is the need for an antenna. Finding suitable trees, getting a wire up there, getting it back down, etc., can eat up a lot of time and put a damper on an otherwise fun activity. There are vertical antenna possibilities, too, but they have limits. When flying in today's *ala carte* airline environment, anything of substance is going to add weight, complexity, and cost.

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e-mail: <wa3uvv@gmail.com>

Perhaps most importantly, you need to keep your ham radio activities in perspective. This was a vacation, not a DXpedition to "KP2 land." I was going to limit my radio-active time to an hour here and there, whenever we had some unscheduled relaxation opportunities. Spending time with all the setup and tear-down efforts could leave little for actual operating and enjoyment.

After a few moments, a memory came to me of using my '817 on 10-meter FM with an MFJ telescopic antenna and counterpoise wire. What if I could fashion "something" that I could hold in my hand, with no big antenna needed and minimal battery weight? Thus, the "Tapper-Walkie" was born.

The Tapper-Walkie

With low power being a necessity, I figured that since CW is 20 times more effective than SSB, that's how I'd go. A quick experiment with a modified 20-meter RockMite in my hand and paddles on a picnic table snagged me a few contacts—with just 1 watt! About this time, I also saw that Ed Breneiser, WA3WSJ, had modified a switch to perform as a paddle with his Elecraft KX1. The closest thing I have to a KX1 is my customized MFJ-9200, which I wrote about last year.[1] I decided that since I'd be using it during the day, 20 and 17 meters would be my bands of choice.

My ultimate goal was to be able to use the radio one-handed, including keying it. I tried several approaches, but everything that worked wore out my hand in less than 10 minutes of sending. With a decent magnet and a "Dirt Cheap Paddle" from American Morse[2], I could hold the rig in my left hand and send with my right (photo A). I took the arrangement to a local park and gave it a try. After about 15 minutes, my patience paid off and I had a nice series of contacts with hams in Florida, Texas, and Ontario. This was with about a watt, using a set of 9-volt batteries inside the transceiver.

I got better results when I was running about 5 watts out, with more serious (external) batteries, but again, I wanted the whole thing to be as self-contained as possible. After a few refinements (still an ongoing process), I came up with a small, lightweight, package that would fit easily into my carry-on bag.

Grab and Go

As for logging, I grabbed a pad of sticky notes. You can apply a couple to the back of the '9200 and write down the pertinent info as you work folks, to be transcribed into your log at

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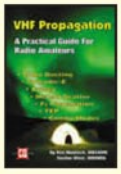

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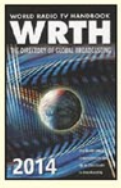

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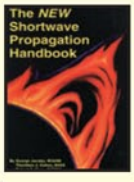

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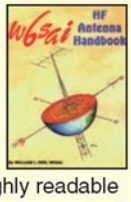

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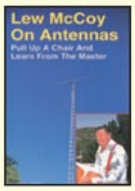

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Photo A. Here's how the Tapper-Walkie fits in my hand, whether on a beautiful day in the tropics (left) or the recurring nightmare of a snow-laden winter in New Jersey (right).

a later time. Hang a pen or pencil on a lanyard around your neck to grab whenever needed.

For an antenna, I used an MFJ-1820T[3] telescopic whip and a quarter-wave counterpoise. Your impedance match will be influenced by variations in ground conductivity and the role of your body as part of the counterpoise system, but get close enough and don't worry too much about SWR. It should work fine, even without a perfect match.

As the BNC antenna connector on the '9200 is horizontally oriented when fitting comfortably in your hand, I added a right-angle adapter and pressed an old computer hard drive rail into service as a support (photo B). To keep the antenna from bouncing around on it, I added a Bongo Tie[4] to keep it in place. (I also use Bongo Ties in my video business, where I have an obscene number of cables to deal with at any given time.) The pictures will give you some idea of what the end result looks like.

As a bonus, when I want to put the rig on a table or other support, I can easi-

Where the Rubber Meets the Road

The Tapper-Walkie concept represents some compromise, so you may be wondering how well it works. While not as "good" a station as setting up a "serious" antenna on top of a hill, or walking around with a 100-watt rig on a backpack frame, it is very light in weight and requires substantially less time to set up.

As the MFJ-9200 has a built-in CQ memory, I preprogrammed my call as WA3UVV/KP2 before leaving home. I also worked out what length the telescopic antenna should be, negating the need for further metering. The most serious compromise, to me, was deciding to use a set of internal 9-volt batteries, which limited me to about a watt of output power.

Still, I managed a surprising number of contacts in the time I had available and it was an enjoyable experience. I'm certain that if I had been willing to use a "beefier" set of batteries with a resulting 5 watts, I'd have worked many more. Importantly, my "fun time" on the radio didn't interfere with my wife's "fun time" while we were away.

Location also enters into your coverage. On the warmer days we had in the first quarter of this year (which I can count on one hand), I took the Tapper-Walkie to some nearby parks. More contacts were achieved when there wasn't such a distance between me and other more-populated land masses. Like anything else, propagation and some luck factor in.

Having the paddles attached with a magnet allows me to take them off the case and use them on a picnic table whenever I find one. I could also bring along one of my miniature straight keys. Like any other "in the field" station, some prior planning helps.

I'm now in the process of taking a crystal-controlled QRP kit and amplifier, and with some "glue" items I have around, installing everything in the leftover case of a dead 2-meter portable. The rotary switch on the radio is being pressed into service as a frequency selector. Once finished, the whole thing will give me roughly 5 watts in my hand and cost me less than $100. With a little imagination, maybe you can come up with something similar that lets you be on the air—on short notice—while enjoying some exercise on a sunny day.

ly detach the paddles. As a member of the Straight Key Century Club[5], I gave some thought to just placing a small straight key on it—somewhere—but haven't quite come up with a layout that's comfortable and attractive.

Variations Galore

The same thing could be done with other similar transceivers, such as the HB1B, available from Ten-Tec[6] or by packaging an inexpensive QRP kit in a suitable enclosure. With a rotary switch to select crystals and small audio amplifier, you could even add some 5-watt punch to your signal with a Texas Topper from QRP Maine[7].

If CW just isn't your thing, there are SSB and even AM possibilities out there. YouKits[8] makes a 5-band, 5-watt hand-held rig that's available as a kit or assembled and tested. If you'd prefer AM, then the HT-7 from DZkit[9] may be just the ticket, or there's always the trusty Yaesu FT-817ND[10].

Bottom line: You don't need to bring along a lot of "infrastructure" when you go on vacation and want to squeeze in some moments of HF fun. Same goes for taking a hike or stopping during a bike ride. Let your radio fun be part of the enjoyment of your primary activities and you'll discover that you're able to enjoy it in more places!

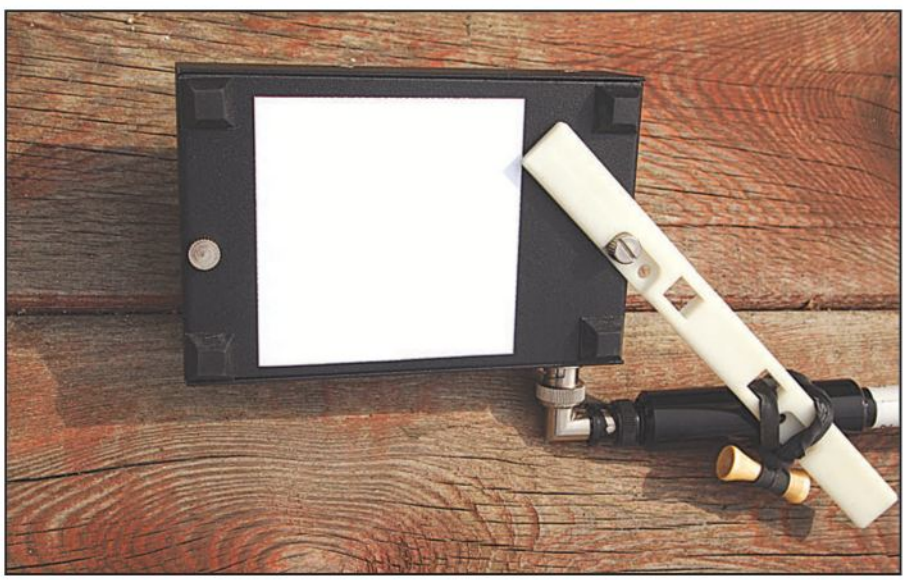

Photo B. A view of the Tapper-Walkie's back side highlights the antenna support and sticky note for quick logging. When in use, the counterpoise wire attaches to the screw at the bottom.

Notes

1. Sickles, "Easy Enhancements for the MFJ-9200," *CQ* magazine, June 2013, p. 36
2. <www.americanmorse.com>
3. <http://bit.ly/1m7MSFO>
4. <http://www.bongoties.com>
5. <http://skccgroup.com>
6. <http://www.tentec.com>
7. <http://www.qrpme.com>
8. <http://youkits.com>
9. <http://dzkit.com/HT-7.htm>
10. <http://bit.ly/1r0geUs>

Photo A. The portable 20-meter ground plane set up in the author's back yard. The feed point is about four feet off the ground.

Wire antennas are popular for field use because they are compact and effective. However, keeping them tangle-free can be a challenge. K2RFP has one D-I-Y solution designed to fit in a backpack.

A Portable 20-Meter Ground Plane Antenna and Spooler

BY RICHARD PAV,* K2RFP

This article describes a portable ground-plane antenna for 20 meters and a simple spooler for storing and transporting it. It has been used several times, and in each case it performed as expected, with an SWR of about 1.5:1 or less.

A Simple Ground Plane

Since it is a wire antenna, you must have some way to support it. A tree with a horizontal branch up about 20 feet works just fine. Simply attach a string to the top end of the vertical element to hang from the tree. Photo A shows the antenna set up in my back yard.

**85 Radio Ave., Miller Place, NY 11764*
e-mail: <k2rfp@arrl.net>

To build the antenna, I started with an SO-239 coax receptacle and ground off one if its corners so it would lie on that flat side in the spool I was going to build. Then I attached five 16-foot wires[1] as shown in photo B. In this setup, the feed point is about four feet above the ground with the four radial wires equally spaced and pinned to the ground with short lengths of clothes-hanger wire.

I used #22 stranded black-and-white twisted pair wire because that is what I had on hand. As it turns out, that makes the wire rather visible, which is a good thing for temporary locations where one would not normally expect to see wires in place. Having used twisted pair wire in the construction, I could untwist them to make eight radials and probably make them shorter as well. I did not try this nor did I try trimming the length of the vertical segment. Since it is meant to be a

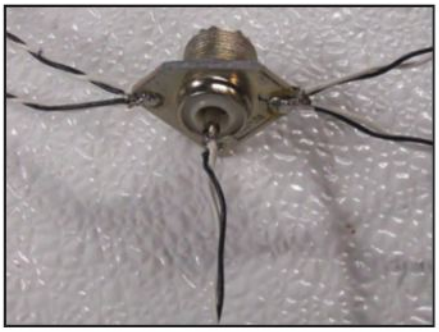

Photo B. Close-up of the SO-239 around which this antenna is built. One side has been ground flat to lie in the spool the author built for tangle-free transport and storage.

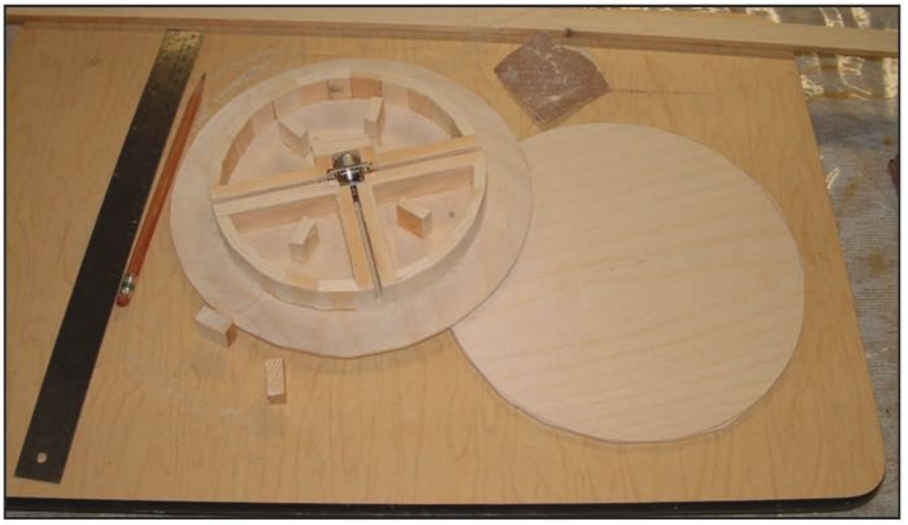

Photo C. Basic components of the spool prior to assembly. See text for details.

portable antenna, I reasoned that any "right on the money" trimming at one location is likely to be different when moved to another location.

A Do-It-Yourself Spool

Portable antennas tend to become a tangled mess during take-down and storage, so I set about building a spool to store and transport it. I started with two 8-inch disks cut from 1/8-inch plywood I bought at a craft store. I glued 3/4-inch pine blocks to one disk as shown in photo C. I checked the spacing with another SO-239 before letting the glue dry.

I then cut this disk into three pieces—one half and two quarters. I rounded the corners and sanded everything smooth. Then I glued the pieces one at a time to the other disk, checking the fit as I went along before the glue set. Photo D shows the spool with the last quarter yet to be glued in place. After final sanding, I gave it a few coats of wipe-on poly varnish.

Photo E shows the finished spool and a few others I've made for additional portable antennas, including a 40-meter version of this ground plane and different length end-fed antennas. The spools are all sized to fit in my backpack as part of my portable QRP station.

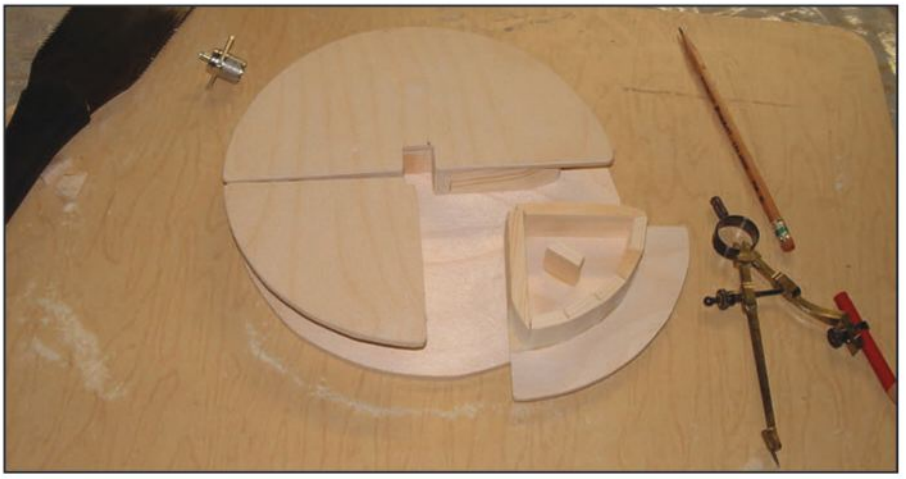

Photo D. Almost done … the final 1/4 segment measured and about to be glued in place on the bottom disc.

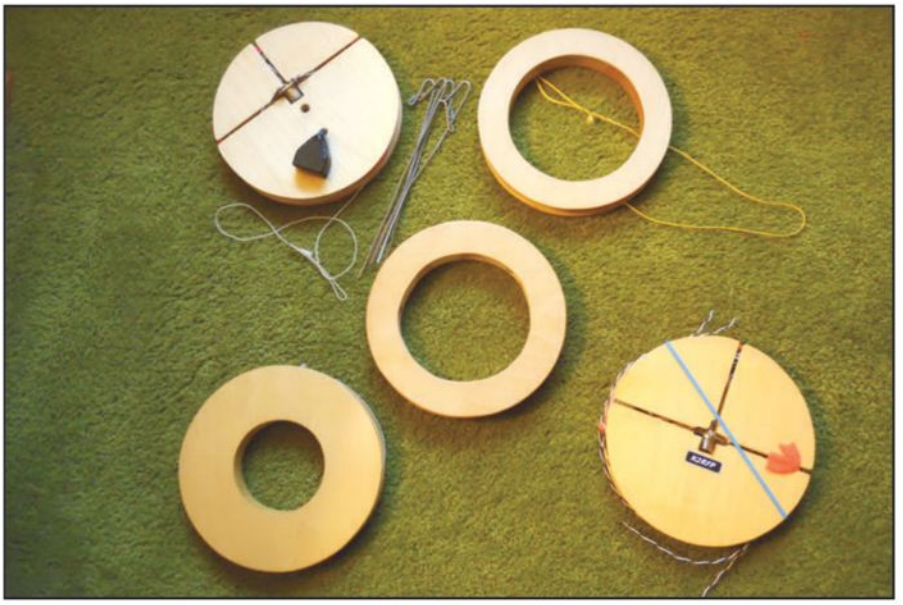

Photo E. Several finished antenna spools. Two (top-left and lower right) are for ground planes while the other three for are different-length end-fed antennas.

Note

1. Using the classic formula of 234/f(MHz) for a 1/4-wave antenna at the popular QRP CW frequency of 14.060 MHz would give you an "ideal" length of about 16 feet, 8 inches, for each of the elements. However, the impedance—and thus the SWR—of a ground plane changes with the angle of the radials. Again, ideally you would have the radials sloping down at 45-degree angles for 50-ohm impedance. However, the reality of field use is that this is not always possible and in practical use, any length between the author's chosen 16 feet and about 16-1/2 feet should be quite effective.—*W2VU*

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1. Passive is defined as any technology that provides call sign and frequency information of potential new contacts to the operator, not initiated by the entrant. It includes, but is not limited to: The DX Cluster, spotting nets, packet and web clusters, Skimmer, Reverse Beacon Network, and the like. Passive assistance is allowed for all categories. No self-spotting is allowed.

2. Active involves the direct initiation of QSO alerting information by, and with the direct participation of, the entrant to benefit the entrant's score. It includes, but is not limited to, self-spotting or by stealth (such as asking other stations to spot you). **Active QSO alerting** assistance is permitted only by stations attempting digital EME or digital meteor-scatter contacts. Stations calling CQ using such modes are limited to spotting call sign, frequency, and sequence only. **Caution**: To ensure strict compliance with these rules, the adjudication process will include review of real-time and archived transcripts from websites used to coordinate passive alerting data during the contest period.

3. Interactive includes any two-way conversation (or variation thereof) between stations to effect a QSO. This includes use of the telephone, and website posts providing information **beyond** that of call sign, frequency, and sequence. **Interactive QSO alerting** is prohibited for all categories during the contest period.

V. Categories of Competition: For all categories: Transmitters and receivers must be located within a 500-meter diameter circle or within the property limits of the station licensee's address, whichever is greater.

1. Single Operator—All Band. Only one signal allowed at any one time; the operator may change bands at any time.

2. Single Operator—Single Band. Only one signal allowed at any one time.

3. Single-Operator All-Band QRP. There are no location restrictions—home or portable—for stations running 10 watts output or less.

4. Hilltopper. This is a single-op QRP **portable** category for an all-band entry limited in time to a **maximum of 6 continuous hours**. Backpackers and portables who do not want to devote resources and time to the full contest period are encouraged to participate, especially to activate rare grids. Any power source is acceptable.

5. Rover. A Rover station is one manned by no more than two operators, travels to more than one grid location, and signs "Rover" or "/R" with no more than one call sign.

6. Multi-Op. A multi-op station is one with two or more operators and may operate 6 and 2 meters simultaneously with only one signal per band.

Stations in any category, except Rover and QRP Hilltopper, may operate from any single location, home or portable.

VI. Exchange: Call sign and Maidenhead grid locator (4 characters, e.g., EM15). Signal reports are optional and should not be included in the log entry.

VII. Multipliers: The multiplier is the number of different grid locators worked per band. A grid locator is counted once per band. Exception: The rover who moves into a new grid locator may count the same grid locator more than once per band as long as the rover is himself or herself in a new grid locator location. Such change in location must be clearly indicated in the rover's log.

1. A rover station becomes a new QSO to the stations working him or her when that rover changes grid locator.

2. The grid locator is the four character Maidenhead grid (e.g. EM15).

VIII. Scoring: One (1) point per QSO on 50 MHz and two (2) points per QSO on 144 MHz. Work stations once per band, regardless of mode. Multiply total QSO points times total number of grid locators (GL) worked.

Rovers: For each new grid locator visited, contacts and grid locators count as new. Final Rover score is the sum of contact points made from each grid locator times the sum of all grid locators worked from all grids visited.

Example 1. K1GX works stations as follows:

50 QSOs (50 × 1 = 50) and 25 GLs (25 multipliers) on 50 MHz

35 QSOs (35 × 2 = 70) and 8 GLs (8 multipliers) on 144 MHz

K1GX has 120 QSO points (50 + 70 = 120) x 33 multipliers (25 + 8 = 33) = 3,960 total points.

Example 2. W9FS/R works stations as follows:

From EN52: 50 QSOs (50 × 1 = 50) and 25 GLs (25 multipliers) on 50 MHz

From EN52: 40 QSOs (40 × 2 = 80) and 10 GLs (10 multipliers) on 144 MHz

From EN51: 60 QSOs (60 × 1 = 60) and 30 GLs (30 multipliers) on 50 MHz

From EN51: 20 QSOs (20 × 2 = 40) and 5 GLs (5 multipliers) on 144 MHz

W9FS/R has 230 QSO points (50 + 80 + 60 + 40) × 70 multipliers (25 + 10 + 30 + 5) = 16,100 total points

IX. Awards: Certificates suitable for framing will be awarded to the top-scoring stations in each category in each country. Certificates may also be awarded to other top-scoring stations that show outstanding contest effort. Certificates will be awarded to top-scoring stations in each category in geographic areas where warranted.

Geographic areas include states (U.S.), provinces (Canada), and countries, and may also be extended to include other subdivisions as justified by competitive entries. U.S. Rover certificates are issued on a regional basis.

Plaques again will be awarded to the highest scoring stations. They are offered in various categories on a sponsored basis. Clubs and individual plaque donors are sought and may find information on how to sponsor a CQ WW VHF Contest plaque at <http://www.cqww-vhf.com/ plaques.htm>.

X. Club Competition: Credit your club for aggregate club score. See <http:// www.cqww.com/clubnames.htm> for a list of registered clubs. Follow directions for registering your club if not already registered.

XI. Miscellaneous: An operator may sign only one call sign during the contest. This means that an operator cannot generate QSOs by first signing his call sign, then signing his daughter's call sign, even though both call signs are assigned to the same location.

A station located exactly on a dividing line of a grid locator must choose only one grid locator from which to operate for exchange purposes.

A different multiplier cannot be given out without moving the complete station at least 100 meters.

Making or soliciting QSOs on the national simplex frequency, 146.52 MHz, or your country's designated national simplex frequency, or immediately adjacent guard frequencies, is prohibited. Use of commonly recognized repeater frequencies is prohibited. Recognized FM simplex frequencies such as 146.49, .55, and .58, and local-option simplex channels may be used for contest purposes.

Aeronautical mobile contacts do not count.

Contestants should respect use of the DX window, 50.100–50.125 MHz, for intercontinental QSOs only.

UTC is the required logging time.

XII. Declaration: Your submission of a log entry affirms that: (1) you have abided by all the rules of the contest as well as those of your country's licensing authority; (2) you accept any decisions made regarding your entry by the contest's adjudication process which are official and final.

XIII. Log Submissions: Log entries must be submitted by **August 3, 2014** to be eligible for awards. Submit your electronic log in the Cabrillo format created by all major logging programs. Send via e-mail attachment to <cqvhf@cqww-vhf.com>. Subject line: Call sign [the call used in the contest] only.

Entrants are reminded to be sure your log indicates your operating location. For USA/VE stations, be sure to indicate the state or province of your operation. If you have a problem submitting your log, please contact <help@cqww-vhf.com> for assistance.

It is strongly recommended that paper logs be entered on-line for automatic Cabrillo submission. Click on the "Web Form for Typing in Paper Logs" link on the contest website at <http://www.cqww-vhf.com>. Computer-generated logs must be e-submitted. Call signs of electronic logs received are posted and updated daily on the website.

For those without web access, paper logs may be mailed to: Paper Logs, P.O. Box 481, New Carlisle, OH 45344. Questions may be sent to <help@cqww-vhf.com>.

A trip to your local lumber yard, some basic tools and minimal woodworking skills are all you need to build this field antenna support.

The Versatile, Handy Portable Antenna Stand

BY GARY "JOE" MAYFIELD,* KKØSD

This handy portable antenna stand was built in an afternoon and has proven to be very useful for 20-plus years. I would never begin to describe myself as a carpenter; this stand can be built well with simple hand tools for a minimal expense by the novice woodworker.

First, a little history: In 1991, the Mesilla Valley Radio Club of Las Cruces, New Mexico, decided to try Field Day at North Star Mesa in the beautiful Gila Wilderness. It is an awesome but primitive site. As a young—okay younger—satellite enthusiast, I headed the satellite station with some experienced guidance from Bob Creason, W5XR, and Jim Grove, N5BKW (SK). North Star Mesa is a rocky and often windy site, so we needed a way to deploy the antennas without putting stakes in the ground and without much of anything to tie down to. These were fairly large antennas designed for working AO-13 and AO-10. On top of this, the stand had to fit in the back seat of the sports car I was driving at the time. We talked about using a commercially made tripod, but were concerned the base would not be as stable we needed. I came up with the idea for this stand (see photo A), and with a little help from Bob, the rest, as they say, is history.

Tools and Materials

Enough storytelling, so let's get to building. The parts list is shown in Table I. If you walk out of the lumber yard with these items, you will have all you need. If you would rather scrounge some or all of the parts, I can totally relate.

*17296 447th Ave., Watertown, SD 57201
e-mail: <kk0sd@amsat.org>

Photo A. Antenna stand at Field Day 2013

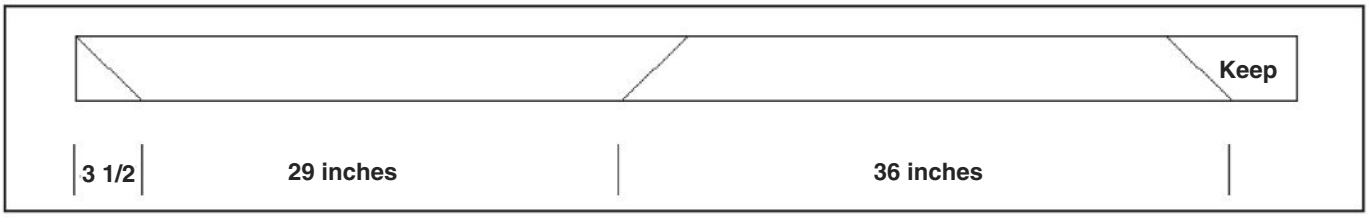

Fig. 1. Support cutting diagram

(2) 8 foot 2" × 4" lumber
(2) "Stud Length" 92 5/8" x 2x x 4" lumber
(2) 8 foot 1" x 4" lumber
(4) 3 1/2 inch wide strap hinges w/screws
(8) 1/2 inch by 3 inch bolts
(4) 1/2 inch by 4 inch bolts
(12) 1/2 inch washers
(1) Bottle of Wood Glue
(12) 1/2 inch tee nuts
(1) Small box 2 inch sheet-rock screws
(1) 20-foot piece of lightweight rope
(5) 1-inch heavy duty screw in eyes
(1) 2-inch paint brush
(1) Quart of exterior paint
(1) Small bag large enough to hold all the bolts

Table I. Parts list

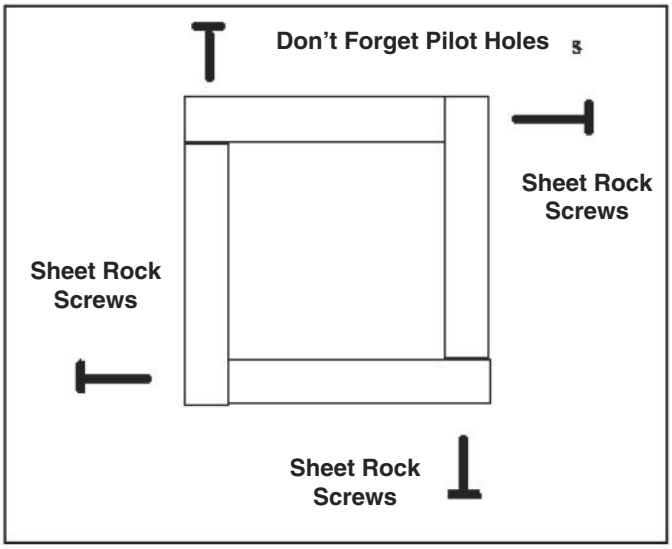

Fig. 2. Wooden tube end view

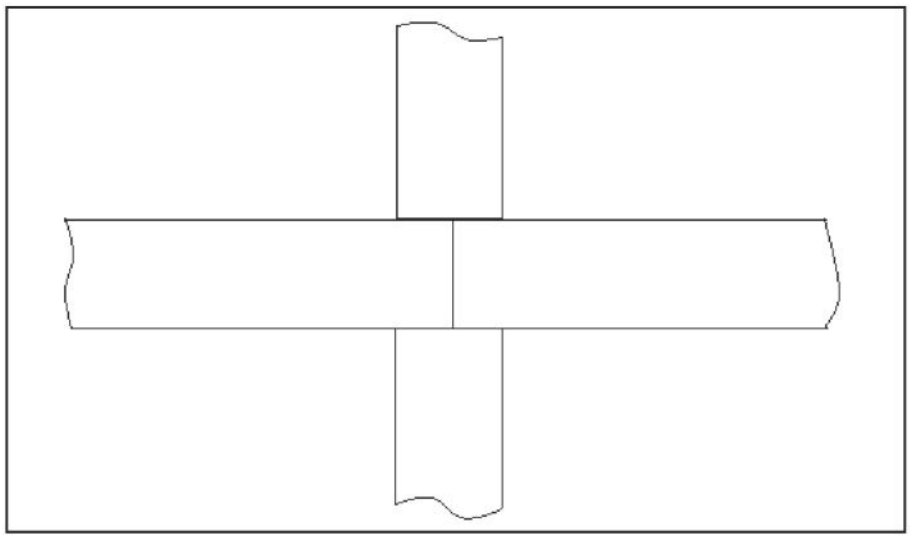

Fig. 3. 2×4 placement

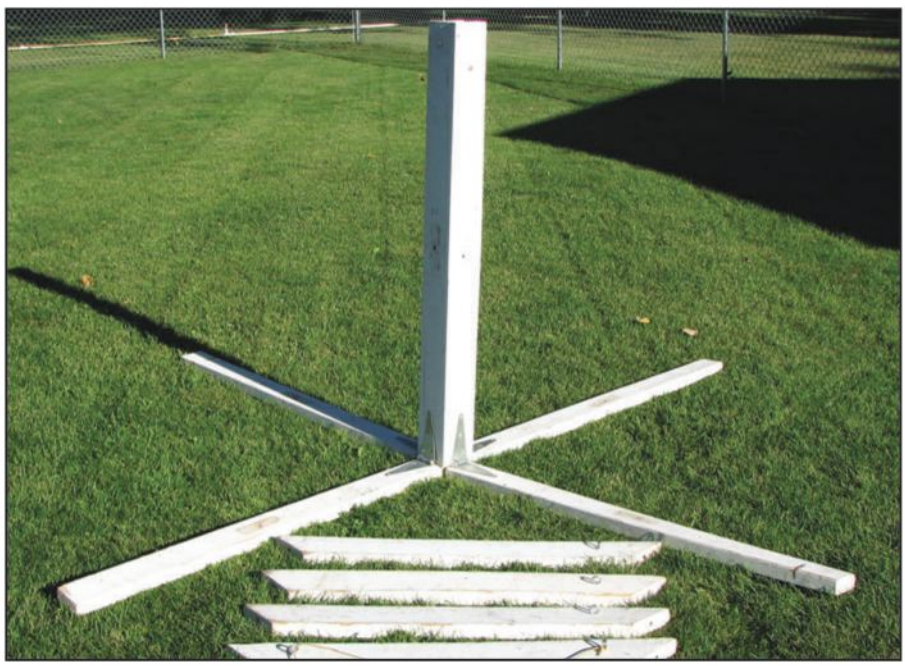

Photo B. Antenna stand without supports attached

I am going to assume you have a drill, drill bits, tape measure, saw, hammer, and the other tools most folks have. If you have more advanced tools and know-how, by all means use them!

There isn't a lot of wood to cut and there will be very little left over. Please make sure to use all of your tools safely. Eye and hearing protection are mandatory when dealing with loud power tools.

First, we will make each 8-foot board into a pair of 4-foot boards. Nothing is real critical, but I always try to make the cuts as square as possible and cut the boards as close to exactly the same length as I can. This should result in four 1" × 4" boards and four 2" × 4" boards that are all 4 feet long.

Next you need to cut the "stud length" 2" × 4" boards into the side supports. These are 45-degree cuts and a good place to use your miter saw if you have one. I used "stud length" because they are cheaper at my lumber yard. Again, any length will work as long as the short edge of the "keep" piece is at least 6 inches long. Cut the 45s so the long edges are 36 inches. Check the cutting diagram in fig. 1 for guidance. When done, you will have four trapezoids that are 36 inches on the long side. Save the two "keep" pieces, as we will use them in a minute.

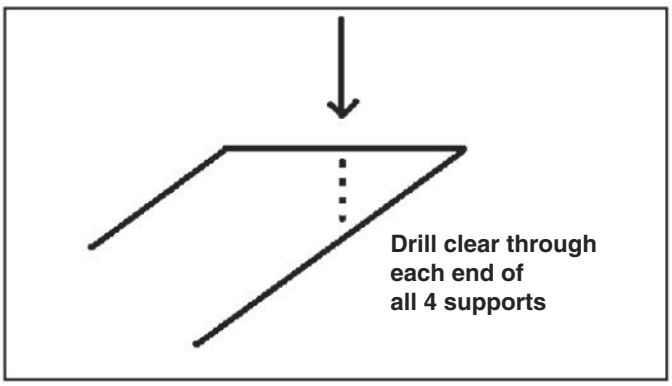

Fig. 4. Drilling pattern for angled supports

Photo D. Block shown inside tube during assembly

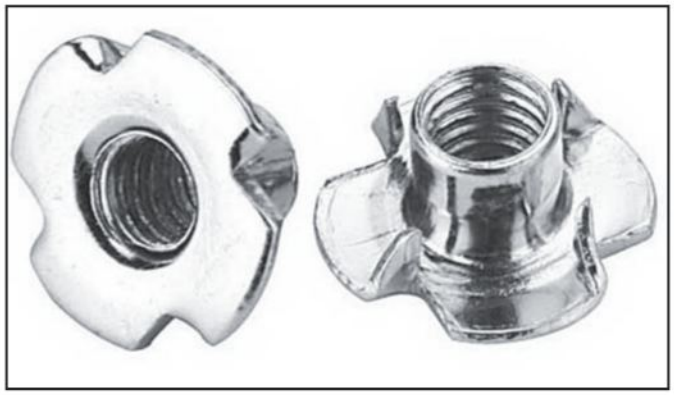

Photo C. Tee nuts

This next step was added 20 years after the original construction, but provides for a better, sturdier stand at essentially no additional cost. It is not essential, but it is recommended. Cut each "keep" piece into a 6-inch-long rectangle. Glue and clamp the 6-inch pieces together to form a $3\frac{1}{2}" \times 3\frac{1}{2}" \times 6"$ block. Carefully trim the block to $2\frac{3}{4}" \times 2\frac{3}{4}" \times 6"$ after the glue has set, and then drill a hole lengthwise through the center of the block for drainage. I used a $\frac{1}{4}$-inch spade bit.

Assembly

Once the sawing is complete, it is time to start assembly. You are going to make a square tube with the $1" \times 4"$ lumber. The tube is constructed for maximum symmetry and held together with sheet-rock screws. Do not use any glue, as you will

be taking it back apart a couple of steps from now. I strongly recommend drilling pilot holes where you place the screws to help prevent the wood from splitting.

Fig. 2 shows the end view of the wooden tube. You will want to use at least four evenly spaced screws along each side of each tube.

Once you have the tube constructed, place the 4-foot-long 2" × 4" pieces on the ground with the ends butted together as shown in fig. 3. Stand the tube upright where the four 2×4s come together. Center the tube over this spot and attach the hinges between the tube and the 2" × 4" pieces. The result will be a very wobbly antenna stand as shown in photo B.

Looking again at photo A, it should be pretty clear where we are going at this point. Our wobbly tube needs some support. Real carpenters are going to cringe at how I do the next couple of steps. If you have true carpentry skills, by all means do it as you see fit. My steps are just one method to make everything fit. Take the four trapezoid pieces and drill straight down through the center of the angled edge that you cut as shown in fig. 4. This will result in drilling eight holes, one in each end of each trapezoid-shaped support piece. Drill a hole slightly larger than 1/2 inch so the bolts will slide in.

Put the supports in place up against the wobbly tube. A brick or weight of some kind can be placed against the support on the 2" × 4" base piece to hold the support in place. Mark the tube and the base pieces where the holes in the supports line up. You should be able to reach a pencil through the holes to mark the wood underneath. If you have my skills, the supports will not be interchangeable, but the holes will line up if you do it this way. You should label the tube sides and their corresponding supports. Mine are simply labeled a, b, c, and d. Each support now has a 1" × 4" hinged to an associated 2×4.

Next, drill slightly larger than 1/2-inch holes into the tube and through the base pieces where you have marked. While you are at it, drill another hole in the center of each side of the tube about 4 inches down from the top. These holes will hold the "keeper" bolts that keep your mast from spinning and/or wobbling.

Now for the trick: Remove the sheetrock screws holding the tube together. Hammer tee nuts over the holes on what would be the inside of the tube. If you are not familiar with tee nuts, they can be seen in photo C. Once I hammer the tee nuts in place, I like to put a little paint on them just to remind them of where they are supposed to stay. The remaining tee nuts should be hammered over the holes on the bottom of the base pieces.

Photo E. Pieces ready to bundle up for easy portability

The next step is to reassemble the tube with the tee nuts securely mounted inside. When reassembling the tube, place the block we created at the "bottom" of the tube. This will give the hinge screws something a little beefier to screw into, as shown in photo D. I added glue to the pieces when doing this assembly.

After assembling my stand, I painted it with exterior house paint just to make it hold up longer. As I mentioned, my side supports only fit one way, so be sure to re-label them after painting. The final step is to screw two eyes into one side support and a single eye into the others. This will allow you to lay out the pieces as shown in photo E and then roll them up into an easy-carry bundle as shown in photo F. I added a small fabric bag to hold the hardware.

An Excellent Support

The stand has proven to be real handy for Field Day and other times when you just need something to hold up a mast. As an added feature, you can attach just three of the supports, insert your mast, mount your antenna, and then tip up the stand with mast and antenna assembled. Then simply add the fourth support and you are ready to operate.

Photo F. All bundled up and ready to go

When NY6DX "takes it to the field," he really takes it to the field … a minor league ballfield!

Contesting With the Ducks: A Whole New Ball Game

BY JOHN NISTICO,* NY6DX

My name is John Nistico, NY6DX, and I am an electrician on Long Island, New York. For eight seasons, I have serviced the field lighting (photo A) for the Long Island Ducks baseball team (www.liducks.com) at Bethpage Ballpark in Central Islip, NY. The Ducks are an independent minor league team that plays in the Atlantic Division against teams from around the northeast region. Many times, while perched atop the park's 130-foot lighting towers (photo B), I would look to the northeast at the water and wonder what a signal would be like from there.

Once the 2011 season ended, I got to find out. After chats with the management, a small series of three contest operations was scheduled. With the height and space available, I figured it would be best to start with the CQ World-Wide 160 Meter Contest. I set up a wire vertical 125 feet tall with eight radials, each 130 feet long, for the first antenna. The feed point (photo C) was at ground level and had a clear path to the operating position (photo D). A 220-foot run of LMR-400 coax did the trick. The hardest part would turn out to be getting to the top of the light tower to pull up the vertical.

Two days before the contest, a cold front moved in, causing the temperature to drop and leaving two inches of snow behind. Braving the cold and the elements, I climbed to the top of the 130-foot light tower and—with some help from a co-worker—pulled the #12 wire up until it was tight and vertical. After a little trimming, the VSWR was great and I eagerly waited for the contest to begin.

A Night of Surprises

The beginning was as expected, with strong VE and stateside signals, followed by Caribbean stations building as the night moved on. What came next was unexpected. … Shortly after 0300 UTC I was calling CQ when European

*email: <electric911inc@hotmail.com>

Photo A. The author servicing field lighting at the Long Island Ducks baseball team's home field in Central Islip, New York. (Photo by Mario Nistico)

Photo B. Those lights sit atop 130-foot poles … imagine them as antenna supports (the author did!) (Photo by Mario Nistico)

← *Photo C. A 220-foot run of LMR-400 feedline connected the station (in photo D) to the antenna, a 125-foot vertical with eight 130-foot radials. (Photo by the author)*

stations started to call me. Within an hour, signals were 5/9 plus and, being in an industrial area with no line noise, hearing was easy, even without a separate receive antenna. At the end, I posted my best 160 score ever, for both the SSB and CW weekends.

More Contesting Fun

Next was my favorite contest of all, the CQ WW WPX SSB Contest. I needed to decide beforehand which band I was going to operate, as this time I would have to put up and take down the antennas by myself, and had to have them down the Monday after the contest. I chose to put up a 40-meter dipole facing east-west at 130 feet. (A 2-element beam would have been better, of course, but beggars can't be choosers.) The antenna worked very well—well enough, in fact, to set the second call area single operator record.

The following season, I did the same three contests with some minor changes. On 160, I added a 250-foot long dipole at 130 feet, strung between the two poles I'd used to support the 40-meter dipole the previous season, along with the vertical. For WPX, I decided on 80 meters, using a 126-foot long dipole. The results were records set in all of the contests on the second call area and national scale.

Just Ducky!

While it was not an expedition to some far-off land or some rare, unheard-of, island, my contest experience at the Ducks stadium was one of the highlights of ham radio for me and something I will not soon forget. I hope to see you all in the log…

Photo D. At the other end of the feedline … the author's transceiver and logging computer inside the stadium. (Photo by the author)

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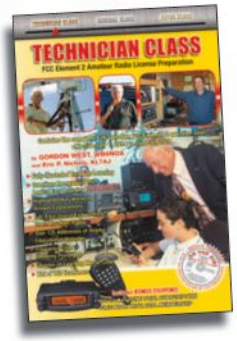

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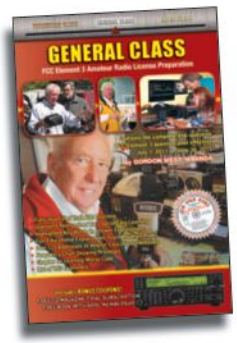

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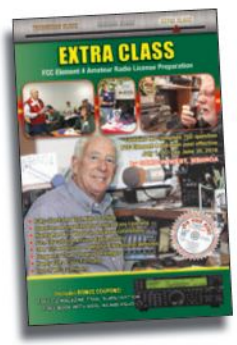

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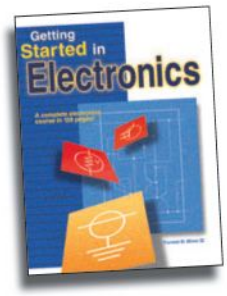

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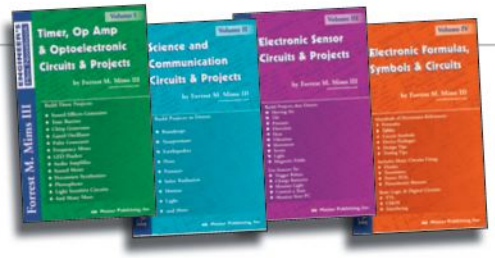

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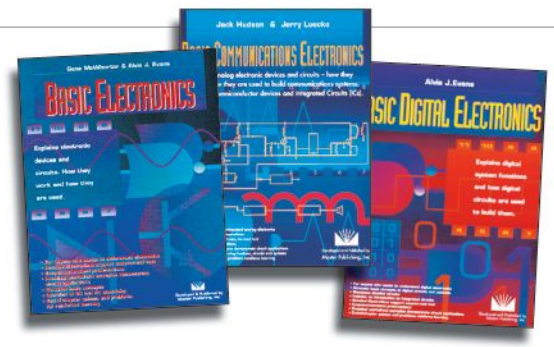

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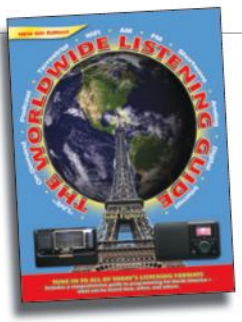

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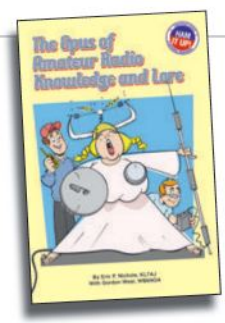

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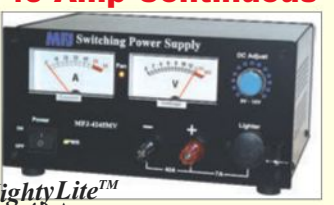

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In true ham tradition, KJ6TJY made a couple of mods to adapt a classic handheld antenna design to fit the materials he had on hand. And in true ham tradition, well, one thing led to another…

The Handheld Foxhunter:
A Tape Measure Antenna for Radio Direction Finding

BY STANLEY CHASSAGNE,* KJ6TJY

Last November, I participated in my first Sierra Amateur Radio Club (SARC) T-Hunt[1] in Ridgecrest, California. I used a hand-held tape measure Yagi antenna which was lent to me by my former instructor, Mike Herr, WA6ARA. I really enjoyed the experience and to build my own tape-measure antenna for the next SARC T-Hunt event. Thus, WA6ARA e-mailed me an article by Joe Leggio, WB2HOL, entitled "Tape Measure Beam Optimized for Radio Direction Finding."[2]

Joe's design uses a 1-inch-wide tape measure. The one I had on hand was a 3/4-inch variety. I noticed that the smaller tape measure fit well *inside* the tee and the cross-tee of the director and reflector elements, so I thought I could use corks to anchor the tape elements inside their respective supports, thus replacing four clamps. Finally, instead of soldering the terminals of the RG-58 coaxial cable directly to the halves of the driver element, I used a chassis-mount female BNC connector screwed onto a small bracket I had made, which I clamped on the driver cross-tee. Here are the construction details:

Preparing the Parts

Photo A shows the BNC male-to-TNC male cable, the TNC female-to-SMA female union, the tape-measure, and my Baofeng UV-5RAX transceiver. The following materials I used can be seen in the other photos: two cross-tees and one tee for 1/2-inch PVC pipe; one chassis-mount BNC female connector; four one-

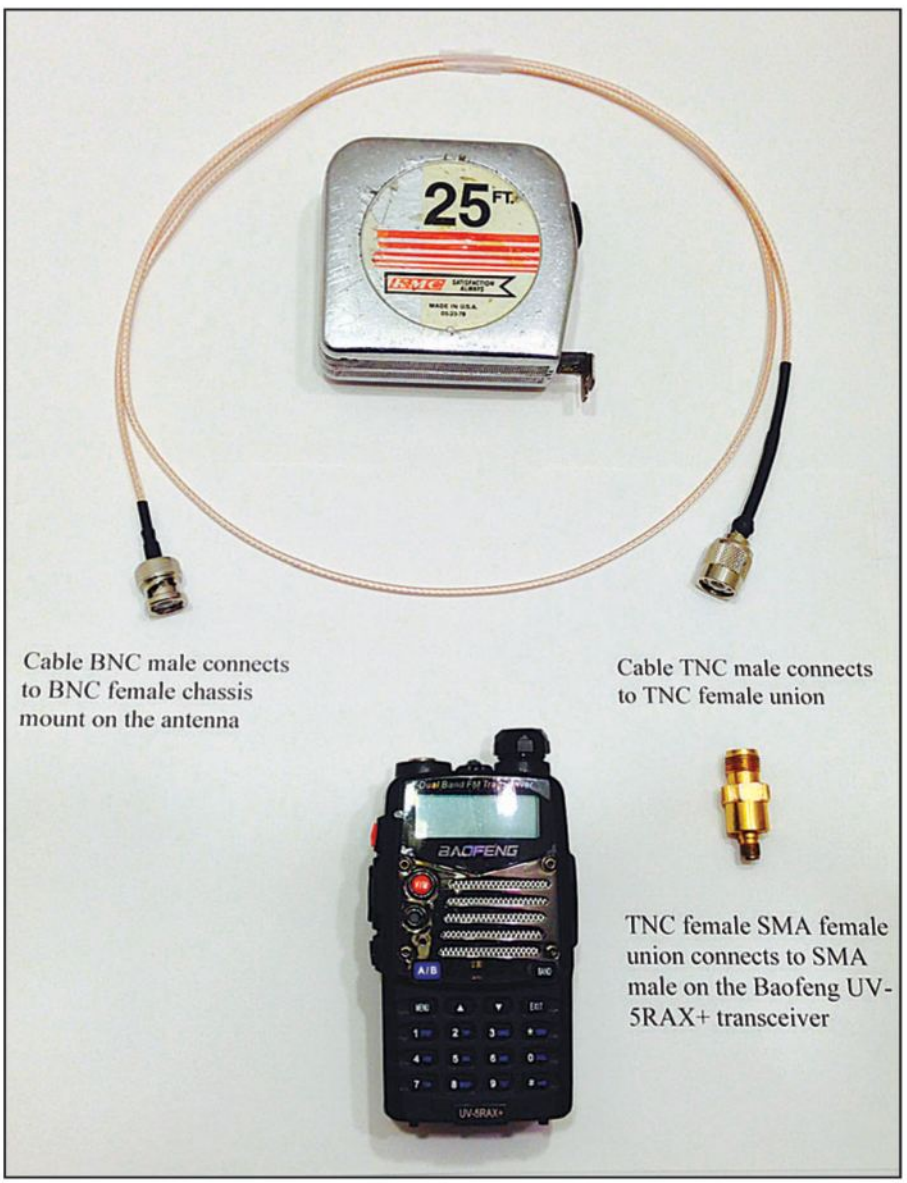

Photo A. Tape measure, Baofeng UV5-RAX transceiver, and union.

*1528 W. Las Flores Ave., Ridgecrest CA 93555
e-mail: <stanleychassagne@gmail.com>

liter-wine-bottle corks, cut to about three-quarters of an inch, to secure the reflector tape and director tape inside the cross-tee and the tee, respectively; a bracket cut from sheet metal; two 1/2-inch clamps to secure each half of the tape of the driven element; one 1/2-inch clamp to secure the bracket on the cross-tee of the driver element; and a 7-inch cut plus an 11 1/2-inch cut of 1/2-inch PVC pipe. The following parts connect the antenna to the tripod: one 1-inch PVC tee, one 1-inch to 1/2-inch PVC reducer, one 8-inch long section of 1-inch PVC, one 1-inch PVC cap to screw onto the tripod, and one 3-inch long section of 1/2-inch PVC pipe from the reducer in the 1-inch tee to the reflector cross-tee.

Assembling the Elements

I took the following steps to construct the tape-measure antenna:

First, I cut to size the inner portion of the tape measure, as specified in Joe's article: one length of 41 3/8 inches for the reflector element, two lengths of 17 3/4 inches for the two halves of the driven element, and one length of 35 1/8 inches for the director element. I then sanded and tinned the tips of each of the halves of the driven element, preparing them for soldering. I covered the remaining tips of the cuts with black electrical tape for safety. See photo B.

I centered the 41 3/8-inch cut tape of the reflector inside the reflector cross-tee. I then secured the tape by sliding and pushing in a 3/4-inch length of cork on either side of the cross-tee. Photo C shows the cork pressing against one side of the element inside the wall of the reflector cross-tee.

Next, I centered the 35 1/8-inch cut tape of the director inside the director tee. I then secured the tape with corks as I did on the reflector.

On to the driven element: From a piece of #10 gauge wire (green insulation), I cut a length of 5 inches for the hairpin match. I removed 1/4-inch of insulation from each end and then made a U with branches 3/4 of an inch apart. Then I sanded and tinned the tips of the U-shaped hairpin. I had previously sanded and tinned the tips of the halves of the driven element. I clamped each half of the tape of the driver on each side of the cross-tee,

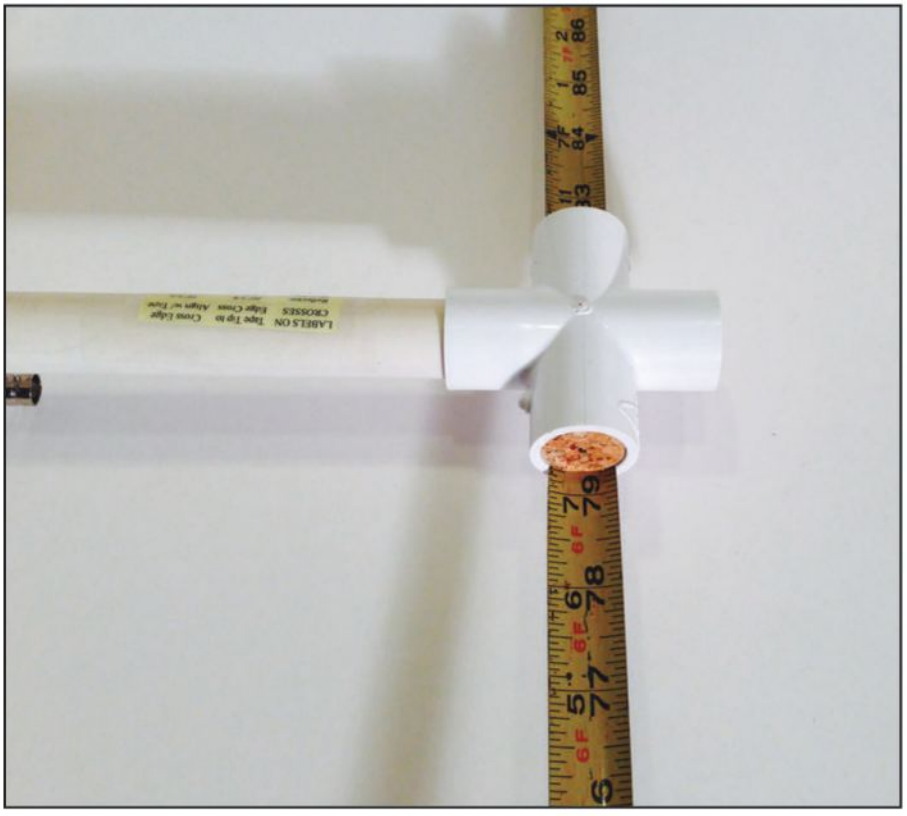

Photo C. Two corks hold the tape measure inside the reflector cross-tee.

Photo B. Tip of element with black vinyl electrical tape for safety.

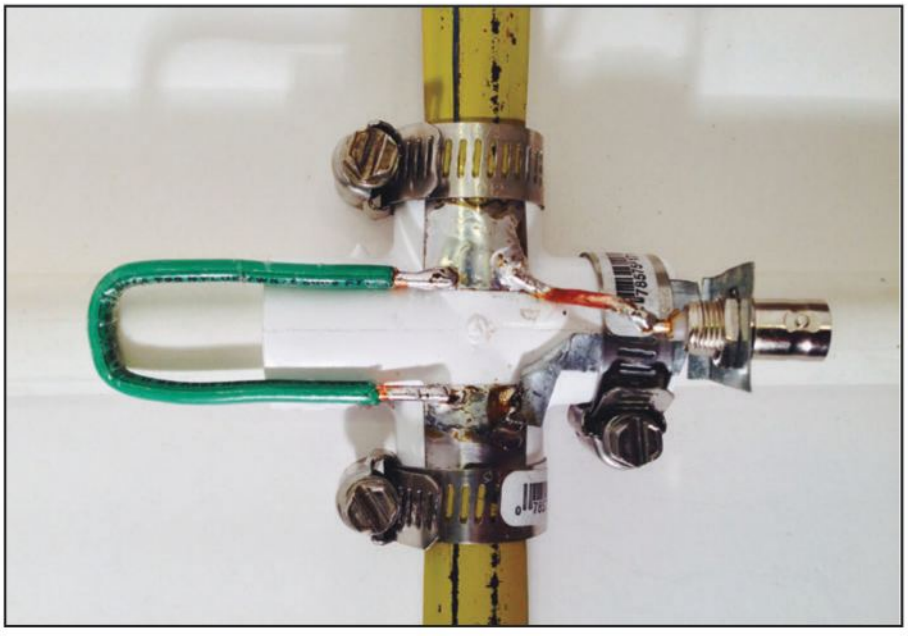

Photo D. Driven-element assembly side view at an angle.

keeping the tips of the tape halves about 3/4 of an inch apart. I then soldered the tips of the hairpin onto the tips of the tape halves, as shown in photos D and E.

Now, instead of connecting the RG-58 cable directly to the driver element halves across the hairpin match, as Joe did for his antenna, I cut a bracket from sheet metal in which I drilled a hole to fit a female chassis mount BNC connector that WA6ARA had given me. I clamped the bracket on the driver cross-tee between the two halves, then twisted, sanded, and tinned the tip of the base of the bracket and soldered it to one tape half of the driver. I cut a 1-inch-long S-shaped piece of #10 wire, and sanded and tinned the tips. Then I soldered one end to the base of the BNC socket and the other end to the other half of the driver.

Next, I cut a 7-inch piece of 1/2-inch PVC pipe and inserted and pushed up the ends against the stop inside the cross-tees of the reflector and the driver. The distance between the stop and the center (axis) of each cross-tee is 1/2-inch, while the distance between the

Photo E. Driven-element assembly bottom view.

Photo F. RDF tape measure antenna oriented for vertical polarization. It may be rotated for horizontal polarization.

outside rim and the inside stop is about 1 inch. Therefore, the total length between the reflector and the driver is 8 inches. I cut an 11 1/2-inch piece of 1/2-inch PVC pipe and did the same thing between the stop inside the cross-tee of the driver and tee of the director. The distance between the stop and the center (axis) of the cross-tee, or the tee, is 1/2-inch, so the total length between the driver and the director is 12 1/2 inches.

Putting It All Together

Once completed, the pieces are assembled together in a tight fit—no glue, only three clamps, no screws. The reflector cross-tee is connected, using a 3-inch-long 1/2-inch PVC pipe to a 1-inch PVC tee through a 1-inch to 1/2-inch reducer. An 8-inch-long, 1-inch diameter PVC pipe joins a 1-inch cap, screwed onto the top of the tripod, to the center of the 1-inch tee. Instead of the tight fit, one could use threaded fittings (1/2-inch and 1 inch) and a 1-inch threaded cap to connect the tripod to the antenna. The antenna can be mounted on the tripod or be removed from the cap and hand-held. Photo F shows the antenna positioned for vertical polarization. It can also be oriented for horizontal polarization. The handheld transceiver is attached to the tripod with hook-and-loop straps.

I used the antenna on January 25, 2014 at the SARC T-Hunt event and on February 3, 2014 at the Indian Well Valley Net check-in, both with excellent results.

Safety, Safety

I want to stress the importance of safety in the construction of this simple "inoffensive" antenna, especially if you have it mounted on a tripod, or standing on a table, at eye-level height. Remember that the thickness of the tape measure is 1/64-inch or less. Therefore, the tape is hardly visible sideways. You can easily bump into the tape at eye level, so be careful. Wear goggles for safety or make sure the antenna is positioned above eye level.

I want to thank Mike Herr, WA6ARA, for referring me to WB2HOL's article, for his help in this radio-direction-finding antenna project, and for encouraging me to seek publication for this article.

Notes

1. T-Hunt: Short for transmitter hunt; also known as foxhunting, bunny hunting or, more generically, Radio Direction Finding, or RDF.

2. See <http://theleggios.net/wb2hol/projects/rdf/tape_bm.htm>

BY IRWIN MATH,* WA2NDM

PTT Investigations

Recently the need to interface an FRS radio with an existing fiber-optic intercom system we manufacture came up, and since this is somewhat related to amateur radio, we thought we would pass along the result of our project.

The FRS radio we chose was a Motorola "Talkabout" unit, since it was waterproof, rugged, and ideal for the customer's application. The interface was unusual to us and, as I just mentioned, it is possible that some amateur radio HTs use the same technique, so you might find this interesting.

When we got the FRS unit we found that it had a 2.5-mm stereo jack which could be used with a push-to-talk remote microphone/headset. This looked like a simple project (we thought) and fig. 1 was our quick take on just what was necessary. As you see, this is approach was pretty straightforward and we were sure it would work with little or no effort.

Upon close examination of the radio input, however, we found that the 2.5-mm jack was actually not standard as we had originally thought, but required a plug that was longer than the standard run-of-the-mill stereo plug. In fact, the shaft had to be about 1/32 inch longer. To prove this we tried a common 2.5-mm plug, but it would not make proper contact and no audio was present when the plug was inserted and we measured the signal at the terminals.

Searching the internet, we found that others had the same problem and the solution (from several sources) was to take a standard plug, put it in a drill press or hand drill and with a small file turn on the drill, and carefully take off 1/32 inch. In practice, this actually was not too hard to do, as there was plenty of material and the whole process took less than a minute.

Now when the plug was inserted into the HT, audio was available and an electret microphone would work properly. A replacement plug of the correct size, by the way, cost almost $7 (compared to a decent quality $1.29 all-metal standard stereo plug).

Fig. 2 shows the actual connections to the stereo plug for this particular radio. You will note (as we did immediately) that there is no connection for the

*c/o CQ magazine

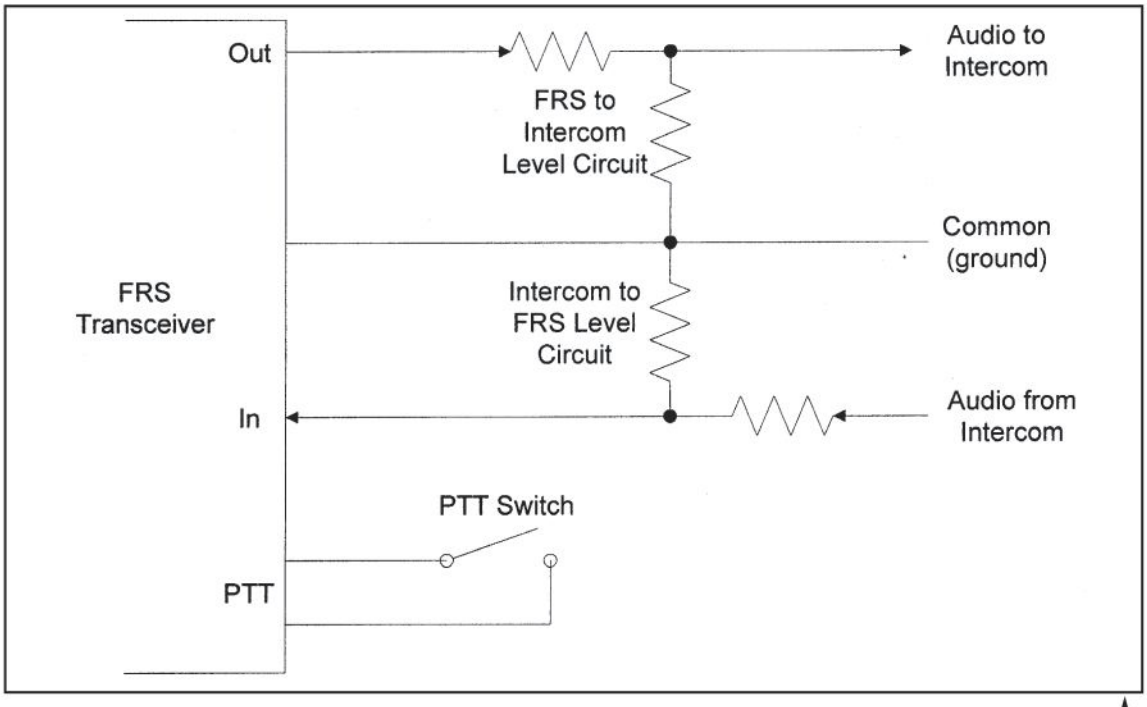

Fig. 1. First PTT approach

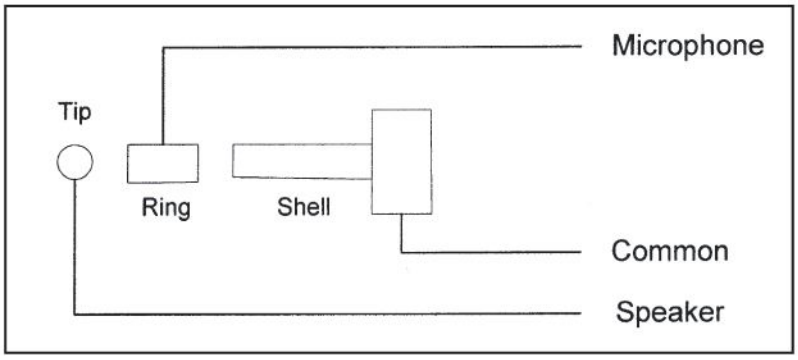

Fig. 2 Connections to the accessory stereo plug

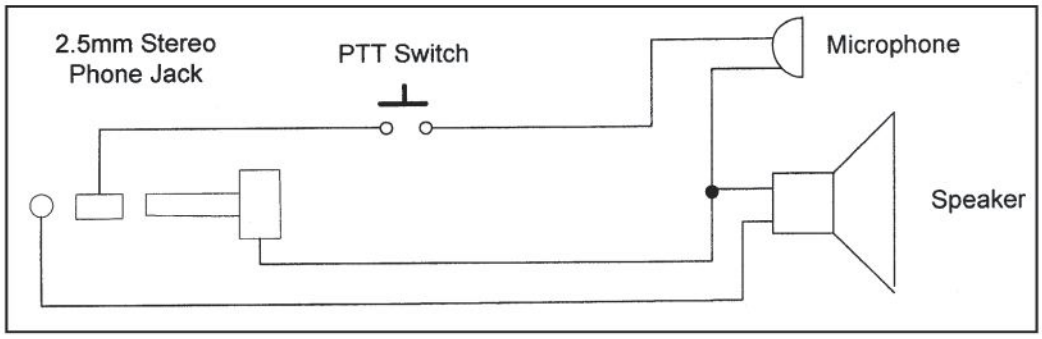

Fig. 3. Wiring of accessory PTT microphone/speaker

PTT switch! What was going on? We knew that an external speaker/microphone with an integral PTT switch that we bought worked, so how was the PTT switch connected? Well, at this point we had no choice but to open the external unit to determine what was going on. Fig. 3 is the schematic of what we found (less an accessory jack for an external set of headphones which was simple-wired to the speaker). The PTT switch itself was actually wired in series with the microphone lead.

When the microphone was connected, the FRS radio transmitted. When it was not, the radio reverted to the receive mode.

After scratching our heads, we finally came up with the solution. Fig. 4 shows this. When the microphone was disconnected, the voltage at the base of a PNP transistor in the radio was equal to the emitter voltage (Vcc) and the transistor was cut off. The DC present was 0 volts and the PTT circuit therefore was not activated. When the microphone was connected, however, the base of the transistor was now connected to the collector supply through the impedance of the microphone, and the transistor conducted. Now DC voltage was present and enabled the PTT circuit as well as allowing audio to pass to the transceiver modulator. Pretty clever!

Our final interface is shown in fig. 5. This, by the way, worked quite well with this radio. I don't know how many amateur radio HTs use this particular scheme, but it is quite clever, and if you come up with an interface problem like this you will now know how to proceed.

73, Irwin, WA2NDM

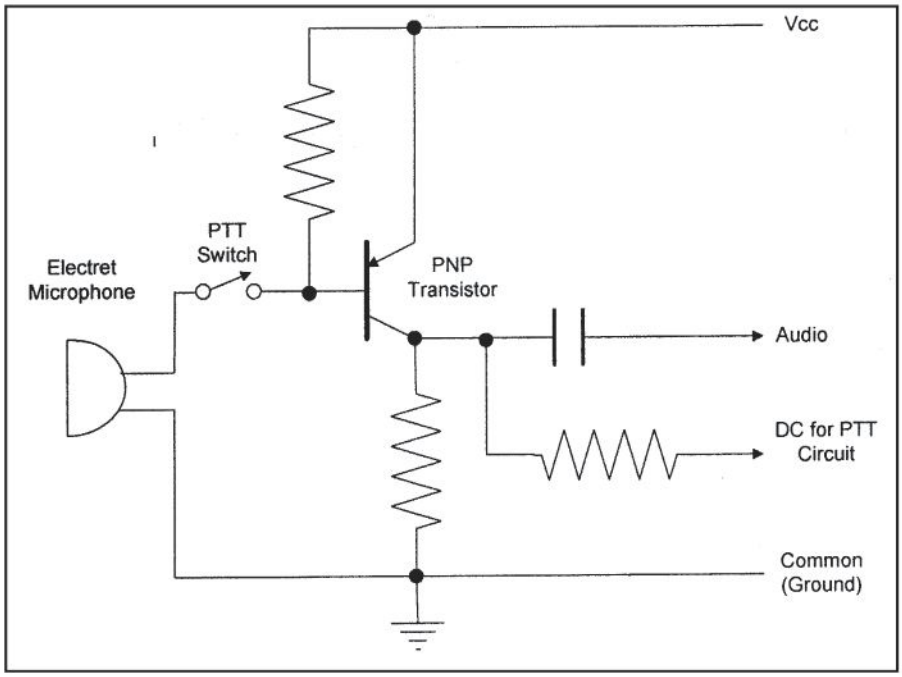

Fig. 4. Circuit for PTT switch

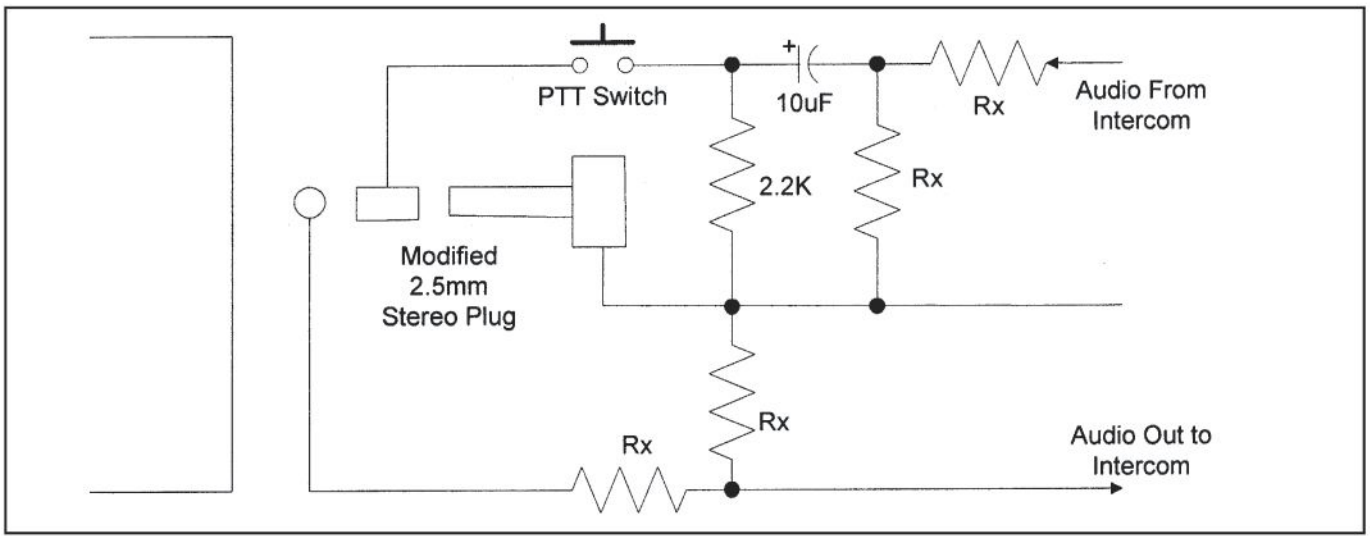

Fig. 5. Final interface circuit

BY RICHARD FISHER,* KI6SN

Take it to the Field Special

20 Years Ago, Field Day Took an Ugly Turn in the Mountains of Southern California

In this "Take it to the Field" special, we look back two decades to ARRL Field Day 1994 when a group of QRP operators high in the mountains of southern California found themselves in the path of a raging forest fire. As K6MDJ eplains below, their quick action put fire-fighting officials on alert within minutes of spotting the smoke. In the end, 13 homes and some 3,000 acres were burned, but there was no loss of life, surely due in part to the quick thinking of the Zuni Loop Mountain Expeditionary Force.– *Richard Fisher, KI6SN*

The Wrightwood Fire

Friday night, high atop 7,300-foot Table Mountain in the San Gabriel Mountains in southern Cali fornia, the Zuni Loop QRP Mountain Expeditionary Force was poised and ready for ARRL Field Day 1994!

The Zuni-Loopers, as we've become affectionately known, compensate for our pint-sized power with truly killer wire antenna arrays, such as a 20-meter "Six-shooter" that is made up of three phased half-wave dipoles, one half-wave over three more!

Our 40-meter cannon was a four-element "Quagi"—a full-wave driven diamond loop with half-wave inverted-V reflector and directors up about 80 feet. To our knowledge, this antenna was untried on 40 meters. Eighty meters, our old nemesis, would be taken on with a 700-foot sloping delta loop. We get serious about antennas.

Silence and slumber gradually fell over our pristine mountaintop in those wee hours prior to the contest and little could we know that contesting would be the least of our concerns the following morning.

Dawn broke beautifully in the cool mountains while the California interior cooked in an unusually intense heat wave. The morning was spent putting final touches to our preparation and then ARRL Field Day 1994 was under way.

A Shout of "Fire!" and Everything Changed

Suddenly, just 45 minutes into the contest, the alarm rang out from our 40-meter site: *"Fire!"*
An awesome plume of black and orange smoke filled the sky off the eastern end of our 7-MHz multi-element array. We had often mused about setting the forest on fire with our milliwatts and 12dB gain, but this was not funny.

We quickly accessed and cleared the Table Mountain 2-meter repeater where our "CQ Emergency" was answered by an operator in Ridgecrest—some 70 miles to the north—who quickly had us linked with a State Forestry Service staff member who, ironically, was a radio amateur as well.

We stood by when the coordinator advised us that he was diverting a spotter aircraft from the other side of the mountain range where tankers

Even the Zuni Loop Mountain Expeditionary Force's mammoth wire antennas were no match for the raging wildfire that threatened its ARRL Field Day location in June 1994.

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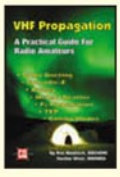

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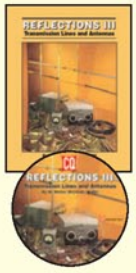

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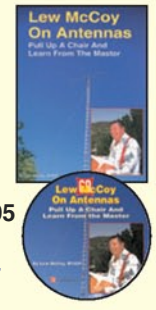

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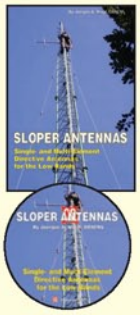

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Fred Turpin, K6MDJ, right, was one of the radio amateurs playing a key role in notifying California Department of Forestry officials about the intense wildfire that had broken out in the San Gabriel Mountains of Southern California in June 1994. That's CQ "QRP" Editor Cam Hartford, N6GA, with Fred in this Zuni Loop picture taken in 2007.

were working another wildfire. Within minutes, the aircraft appeared, making several circular passes which helped to define the fire's parameters for us. The word was this fire was right in our lap!

Moments later our contact came back advising us that the fire was two to three miles from us in rugged terrain and burning out of control. It had already consumed 300 to 500 acres and was moving rapidly in our direction, driven by the hot thermal updrafts from the desert floor far below.

We were advised to prepare to evacuate on a moment's notice. Our troops quickly fanned out to notify other campers, who numbered in the hundreds each weekend at this time of year.

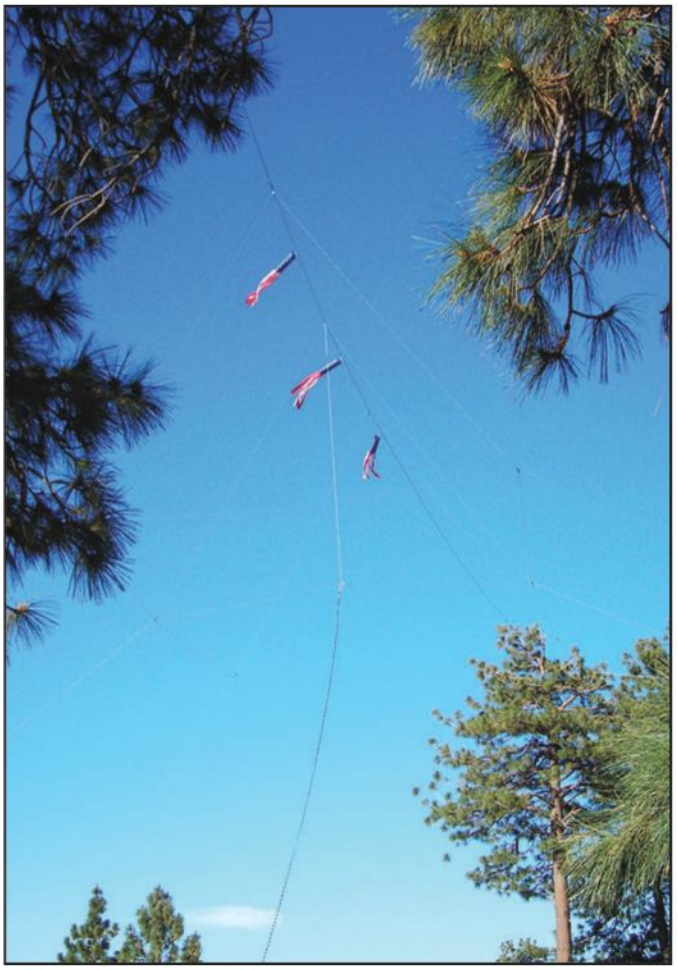
Word spread quickly as other radio amateurs, on the mountain for ARRL Field Day and monitoring the repeater, let other campers know.

Reluctantly, we began to break down the Zuni Loop Field Day operation. The decision was made to abandon our large wire arrays. They were too labor intensive to dismantle in a hurry. Likewise, several large tents were the last things to come down as time allowed.

Air Tankers to the Rescue

The first aerial tanker arrived on the scene in less than 30 minutes after our initial report, coming in low over the trees

A deep layer of pine needles provides a lot of fuel for wildfires on Table Mountain.



The Zuni Loop Mountain Expeditionary Force's 20-meter delta loop beam strikes a beautiful pose against the California sky, a wonderful antenna when not threatened by an out-of-control wildfire.

In fewer than 30 minutes, air tankers like this one were dropping fire retardant on the approaching wildfire in June 1994. This is a picture of a C-130 assisting in the fight against the 2012 Waldo Canyon Fire in Colorado, where radio amateurs played a key role in communications, as well. (Courtesy of Staff Sgt. Stephany D. Richards, U.S. Air Force)

and dropping its load of fire retardant, a scenario that would be repeated over and over throughout the afternoon. By 2 p.m. it appeared the good guys were winning. At least that was the case on the high side of the fire, as confirmed shortly by campground personnel who reported that the campground and ski lodge were no longer in imminent danger. The fire was now moving around the southeastern side of the slope and away from our location.

Cautiously, our band of die-hards began to recover enough equipment to get back on the air on a limited basis, all the while keeping a wary eye on the orange glow throughout the evening and night.

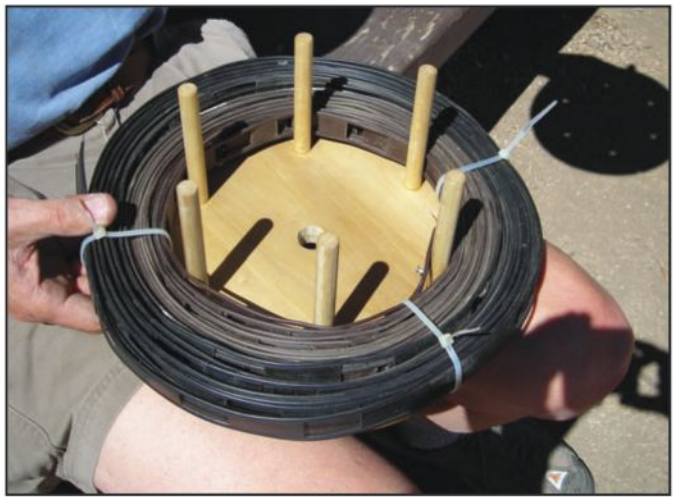
On Sunday morning, this *not to be denied nemesis* made another run on our side of the mountain. This time, the fire attacked with vengeance! *That did it!* Antennas came down in record time and *everyone* made tracks.

The Wrightwood Fire, as it would become known, went on to threaten the mountain community of Wrightwood, consuming 13 homes and some 3,000+ acres before being contained a couple of days later.

Serious Damage, But No Loss of Life

Ultimately, everyone and everything got off the mountain safely, but not without the indelible memory and lessons learned at ARRL Field Day 1994. The root purpose of amateur radio and public service were alive and well in this annual exercise and contest, especially at the Zuni Loop, where everyone around knew a little bit more about the value of amateur radio and "those guys with all that wire in the air."

This story, now 20 years past, pretty much describes an ARRL Field Day disaster. Factor in the many learning experiences that 1994 provided, though, and it was one of the most interesting and useful Field Days of all. It was certainly one of the most memorable!



Just rolling up the feed lines at the Zuni Loop Field Day operation can take a significant amount of time. Thankfully, the team had enough time in 1994 to tear down the operation before flames got close.

Those attending were Ralph Irons, AA6UL, and his family—Kim, KD6WJK, and children Sarah and Carl, then 7 and 5 years old, respectively. They'd come from Bakersfield. Today the Irons are in Charlottesville, Virginia, and Ralph is N7RI.

Bill Young, WF7D, came with his then 11-year-old grandson, Chris, who was visiting from Virginia. Rob Roberts, N7FEG, from San Bernardino, California, had not even gotten unpacked before the fire broke out! His VHF scanner proved invaluable. He's living in Aurora, Utah today.

Keith Clark, W6SIY, a Zuni Loop regular from Ridgecrest, and Wayne Burdick, N6KR, of San Carlos, who would become a founder of Elecraft, were a tight CW team in '94, despite the fire drama.

Clark Turner, WA3JPG, and Belinda Morrill, KC6TKO, came to Table Mountain from Irvine, California and covered any operating position that needed to be filled. Twenty years later, they're in Los Osos, California. Hendricks QRP Kits' Doug Hendricks, KI6DS, of Dos Palos, California, was also on the '94 team.

Staying 'On Task' and Field Ingenuity

Our mission, going into ARRL Field Day 1994, was to be a mix of contesting, socializing, and ringing out all the homebrew rigs represented:

- N6KR's NorCal Sierra transceiver, with built-in keyer and metering
- An Oak Hills Classic dual bander
- Several NorCal-40 transceivers, including KI6DS's highly-modified version
- A handful of New England QRP Club kit transceivers

Of course, there were accessories galore, and anything can happen when great minds come together—even back in 1994:

W6SIY and N6KR teamed up to solve a mismatch problem when using the Six-shooter on 15 meters. They researched, designed, and built the ultimate RF transformer—dubbed the Zuni Loop Agrinomic RF Transformation Device—using a dead branch and a hank of wire "going nowhere" from the engine compartment of W6SIY's VW bus. Adjustment con-

sisted of moving the coils over the numerous worm holes, which Keith assured became RF highways. They did get a 1:1 SWR match!

Things to Think About

ARRL Field Day 1994 was the first year I'd taken our 17-foot-long travel trailer to the Zuni Loop. I'd have to think long and hard about doing that again.

If the fire had continued its course toward us and cut off the only road on and off the mountain, the only way out would have been a fire road. My 4-wheel-drive pick-up could have handled that, but not pulling a trailer. I'd have had to abandon the 17-footer. What a sober thought, to this day.

I've learned to think "total mobility." QRP Field Days with an emphasis on compactness and light weight can have a lot of positives. In fact, how about Field Day with everything toted in a backpack? Zip it open and you're practically on the air. Zip it closed and you're out of there. Mr. Mobility, that'll be me.—*Fred Turpin, K6MDJ*

- . - . - - . -

Back to the current day…

Malaysian Operators Assist in MH370 Communications

Radio amateurs from the Malaysian Amateur Radio Emergency Service provided vital communications in the early days of the search for Malaysian Airlines flight MH370. According to IARU Region 3's Jim Liton, VK3PC:

When flight MH370, ex-Kuala Lumpur bound for Beijing, disappeared from the air traffic control radar, the MAS Emergency Management Center (EMC) at Kuala Lumpur Airport provided accommodation for all next-of-kin at the Everly Hotel at Putrajaya.

The Malaysian Amateur Radio Transmitters' Society President Mohd Aris Bernawi, 9M2IR, said MARTS was asked to provide a link between the airport and the hotel.

Mohd said at the hotel MARTS quickly set up a station, led by Zanirul Akhmal Zanirun, 9M2PRO, and Azizi Samsuri, 9W2ZZE, was the MAS team leader.

NESRAC, a club from Negeri Sembilan, provided the volunteers for the station at the airport's Emergency Management Center.

MARTS provided a cross-band VHF/UHF link to avoid any unnecessary interference from the public services. An HF link was later added.

During the call-out there were 11 volunteers at EMC and 23 volunteers at the hotel, on a shift roster for the link.

9M2IR, who oversaw the entire process, said MARTS (an IARU member society) was pleased to be able provide the link on the very tragic occasion.

Finis . . . for this Month

Heroics of the Zuni Loop Mountain Expeditionary Force and the Malaysian MARTS and ARES are just three of a googolplex of amateur radio EmComm success stories. Why not share yours with a googolplex of *CQ* readers in an upcoming installment of "Public Service"?

Please let us know what you or your organization has been up to and we'll take it from there. Whether it's an EmComm reality, exercise, or support of a community event, share your stories and photographs by writing to <ki6sn@cq-amateur-radio.com>. We look forward to hearing from you soon.

73, Richard, KI6SN

BY WAYNE YOSHIDA,* KH6WZ

Take it to the Field Special

Creative Solution Comes from Unusual Inspiration

Summer is finally here and this means portable and roving operation. As I began to sketch out plans for my next roving operation, I started thinking about the power requirements for my station equipment. For some reason, my mind started to wander with random thoughts, and I remembered Chip Angle's (N6CA's) vehicle decoration (photo A). It was a funny gift from Chip's wife, Margaret, N6SNA. After laughing at this new vehicle decoration, I thought about using a similar idea to route vehicle power from the car battery under the hood and out to my portable station equipment; just stick it under and out the door or hood or trunk!

Operating while "stationary mobile" sometimes presents a challenge in obtaining enough voltage and current to supply all station equipment, and it must be easily connected and disconnected. For rovers, this may mean dozens of station setup and teardown cycles. Of course, too, if using the vehicle starting battery, you must always have enough battery power to start the engine, since getting stranded 200 miles away from home can ruin an otherwise great roving contest effort.

A Common Connection

I have Anderson PowerPole® connectors on all of my 12V operated devices, from HT accessories such as battery chargers to mobile radios and GPS units. Having one common connector for everything using 12VDC simplifies the connection between the power source and the station equipment.

Finding a single and convenient place to "pull" power from the car seemed to be a challenge, especially when operating a roving or portable contest station, when many pieces of gear need power. Basically, I needed a way to create a convenient, temporary, robust, and high-current "power strip" for 12VDC.

Past Experiences and Frustrations Necessitate Change

Previous solutions included connecting power cables to a small RIGrunner® installed under the driver's seat, but that was quickly abandoned, since it was very time-consuming when arriving at an operating spot to crawl under the car seat, connect the power cables, work a few contest stations, and then repeat the process in reverse while packing the gear into the car to go to the next destination.

A more recent power cable utilized an old pair of jumper cables, connecting directly to the battery, and then terminating to Anderson PowerPole® connectors (photo B). This was faster, but I never trusted the clipping action and always had to worry about short-circuiting something if something were to become unclipped at the wrong moment.

From Humorous Inspiration to Useful Solution

The "arm sticking out of the trunk" idea changed into the simple bundle of wires, connectors, and fuses, eliminating the battery clips, and bolting to

*e-mail: <kh6wz@cq-amateur-radio.com>
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Photo A. The funny fake arm sticking out of N6CA's vehicle inspired a power cable solution for a portable power source from the car battery.

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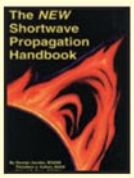

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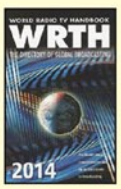

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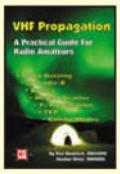

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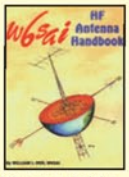
by Bill Orr, W6SAI



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!

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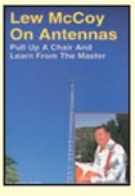
McCoy on Antennas

by Lew McCoy, W1ICP



Unlike many technical publications, Lew presents his invaluable antenna information in a casual, non-intimidating way for anyone!

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The Short Vertical Antenna and Ground Radial

by Sevick, W2FMI

Small but solid guide walks you through the design and installation of inexpensive, yet effective short HF vertical antennas.

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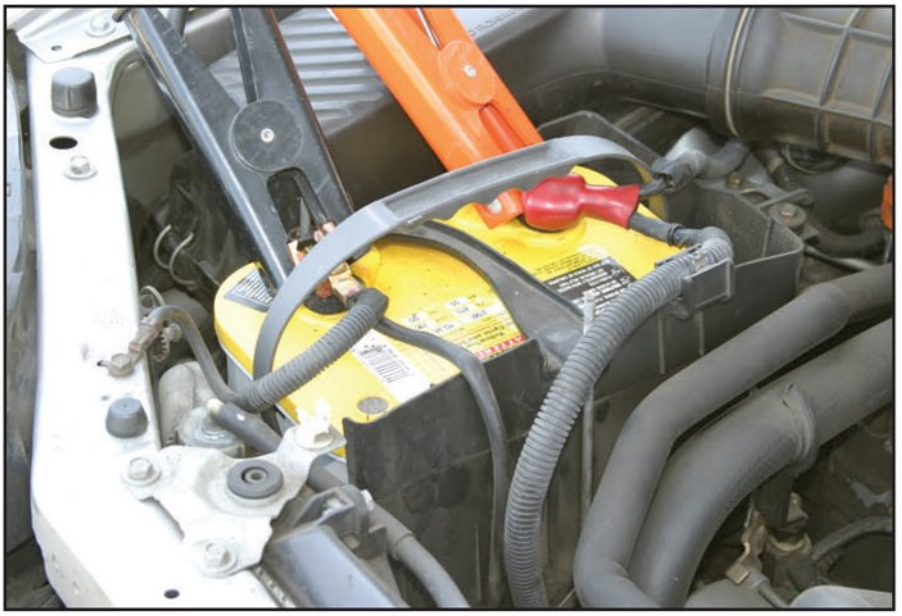

Photo B. A modified set of possibly unreliable jumper cables were used at KH6WZ while roving in the past. A safer and more secure solution was needed.

the car battery as shown in photo C. The larger wire bundle (red and white insulation) can partially be seen just behind the headlight. In the same picture, you can see the small pair of wires going through the grille; these connect to a set of solar panels to help keep the car battery charged.

The cable consists of multiple pairs of number 12 stranded wires. There are enough connectors to power two stations, plus some spares. Each station is wired up with a double-pair of 30A PowerPoles (I call this the "quad configuration" for increased current and decreased voltage drop).

There are a total of eight individual wires with 30A connectors on the "equipment end" of each cable. On the "battery end," I soldered large ring terminals to the plus bundle and the minus bundle, and bolted the ends to the battery terminals. Photo D shows the wiring harness in use. Notice the hood is closed; there is no need to keep the hood open. If you look closely, there is

Photo C. Here is a safer, cleaner way to access power from the car battery. Multiple wires are routed from the battery terminals and under the car. The gray wire on the right is a small-gauge pair of wires going to a set of solar panels.

Photo D. The power cable in use during a recent ARRL 10 GHz and Up contest, somewhere in central California. This sticking-out-of-the-hood cable streamlines setup and teardown in a roving contest operation. Power directly from the battery is available from a connection port right in front of the grill. No need to open the hood.

a small solar panel on the ground between the car and the dish antenna station (10 GHz).

Automotive-type blade (ATO) fuse holders with fuses in each positive lead protect the vehicle and each piece of equipment in case something goes wrong. Weather-proofing is not included, since this installation is meant to be used in fair weather and is removed when a contest is over. A more permanent installation should include a way to keep moisture and road debris out of the connectors, and some way to prevent curious (or malicious) individuals from accessing the battery power.

Now it is a snap to make an operating stop in a good grid square. I just find a suitable place to park, set up the equipment, plug the rigs into the PowerPoles peeking out of the front of the vehicle, and start contesting—no need to crawl under the seat, and no need to worry about the giant clips popping off the battery terminals. Tear-down is a snap and helps reduce the time it takes to move to another location.

By the way, in case you were wondering about the sanity of using the vehicle battery for rig power and risking killing the battery to start the car, I have always connected a solar panel (or several) to the battery in the daytime, and at night I run the engine to keep the battery topped off. In addition, the traditional car battery is replaced with an Optima® YellowTop deep-cycle, sealed lead-acid battery, made for monster car audio installations or off-road vehicles. As a back-up in case something happens, I keep a spare gel-cell in the vehicle for additional power or for jump-starting the car if needed. The battery is a sealed deep-cycle unit, rated at 12V and 75Ah.

Where does your project inspiration come from?

73, Wayne, KH6WZ

References

RIGrunner by West Mountain Radio: <http://www.westmountainradio.com/RIGrunner.htm>

Anderson Power Products® PowerPole®: Part numbers 1330 for 30A housing in red, 1330G4 housing in black, and contact 1331 for 30A contacts for 12 to 16 AWG wire. <http://www.andersonpower.com/>

An equivalent power connector, made by AMP, a Tyco Electronics company: Power Lock connectors, part numbers 53894-4 for 30A housing in red, 53894-2 for the housing in black, and 53892-4 for 30A contacts for 12 to 18 AWG wire. <http://www.tycoelectronics.com/>

Optima® YellowTop batteries; <http://www.optimabatteries.com/>

BY JEFF REINHARDT,* AA6JR

Take it to the Field Special

The Richest Person in America

As spring turns into summer, my travels have me convinced the richest man in America is not Warren Buffet or Bill Gates. No, my keen powers of observation tell me it's the unidentified person who sells orange-and-white-striped construction barrels to state highway departments for placement along the nation's highways. The old joke goes, America has two seasons; winter and road construction. If you cover any amount of ground over the next few months, you will find them slowing traffic, narrowing lanes, and marking your turtle-speed progress along the next 5, 10, or 20 miles of interstate. Whoever makes them has to have a very big smile as he or she drives by each one. Sadly, I am not that person.

No need for despair, however. Those barrels are usually a sign that there are people working and that's good for the economy; the roadway is being improved, and that's good for your wheel alignment, and when the work is done, we all enjoy a better ride to our destination.

Making Your Mobile Better

Thus, if highway construction is challenging baseball for designation as "America's summer pastime" status, we hams can get in the spirit by constructing a better mobile installation for our respective vehicles. Maybe you've purchased a new car or maybe just want to rethink the setup in your current car or truck; regardless, summer is a great time to get it done. Maybe you've been wondering why your transmitter's range doesn't seem as good as it once was. It could be those corroded power connections or fuse holders under the hood. Maybe it's that antenna that's seen a bit too much road salt or rain through the winter—and maybe a few winters before that. The bottom line is, stuff gets old and slowly deteriorates, not so much that you notice overnight, but there's wisdom to be found in the title of that old Neil Young Album "Rust Never Sleeps." Ask me, as for a few years, I watched a Plymouth Volare disappear before my very eyes. By the time I sold it, only two-thirds of it remained.

While many hams seem to be happy with the functionality of their mobile installations, I am hearing from more and more operators who are also concerned with how their installation looks. Over the years, we have chronicled in this column how challenging today's cars and trucks can be for mounting a mobile setup that not only works well but looks good, too. There are several reasons. As vehicles continue to climb in price, a messy installation can detract from the enjoyment of your car. When you lay out 20, 30, 40, or more thousand dollars for the new conveyance, the days of just sticking a mobile radio on the console or beneath the dash are long gone. Even if you're somewhat okay with a "rugged" look, you likely have a spouse who is not.

Then, of course, we need to consider where a unit can be mounted, how to route power and antenna cables, stay clear of today's complex automotive electronics, and make sure our gear is away from the ever-expanding number of airbag deployment zones. Whew!

Fortunately, this column has had the benefit of several helpful hams willing to share their experi-

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KD7TMX linked two control heads to fit onto the dash of his vehicle. The results speak for themselves in a very nice design that looks like it came from the factory.

The Chevy HHR packs a lot into a small package. Plus, its rear battery makes for easy power access. It's also a pretty good antenna platform.

ences and hints on how to integrate a mobile station into a vehicle and make all the pieces fit well.

One such generous operator is Clifford R. Schneider, KD7TMX, of Tucson, Arizona, who wrote to share how he built a fold-down mount for his mobile rig, a Yaesu 857D/ATAS120: "The fold down mount is homemade from PVC/aluminum and the control head mount is made from hardboard and wood. I get lots of good signal reports from as far away as Australia"

Take a look at the clever design at work in the photos Clifford provided. Also, you can't argue with the results. Wouldn't it be nice to exchange pleasantries with an Australian ham during your daily commute? Besides being enjoyable, it sure makes for interesting coffee break conversation.

Anyone who has traveled a moderate amount can usually share a story or two about "surprises" at the rental car counter. Perhaps I've had more than my share. For the uninitiated, the car you think you're reserving is not always the car you get. In some cases, the surprise is an unexpected upgrade to a luxury car. In other instances, it's a downgrade to a smaller car that's just not suitable for the job (but is all that's available). I once had to explain that the Lincoln Town Car I reserved for transporting a carload of engineers to a trade show was really needed and, while I appreciated the offer of a new Mustang for the rental, neither the engineers nor the trade show materials and our luggage would have done well with the sports car. The compromise was a rather

The HHR's interior is a challenge, but WØRMS found a spot that was "just right" for a control head and microphone mount. The speaker is also in a good location. Note how everything is located away from airbag deployment zones.

blasé mini-van. Another time I had reserved a mid-size car but was told they were all gone. Instead, I was given a Chevy HHR as retro-design vehicle that turned out to be a pleasant surprise in terms of its versatility.

CQ reader Ernie Chiles, WØRMS, also discovered the HHR and shares his experience installing a pretty nifty setup, again using the popular and versatile Yaesu 857D:

Please see the photos of the mobile installation in my Chevrolet HHR. I have installed a Yaesu FT-857D transceiver, a Yaesu ATAS-120A antenna, and a VHF/UHF antenna in the center of the roof. You can see from the pictures that the control head for the 857D fit perfectly in an existing opening in the center console. The microphone was attached with Velcro®, and the rest of the radio is placed under the passenger seat. The ATAS-120A was mounted on the back hatch at a point that allows it, when collapsed all the way down, to enter the garage with minimum bending. I usually keep a quarter wave on the mount in the center of the roof for the same reason, and attach a 5/8-wave antenna when I'm on a trip.

The HHR radio installation was made a lot easier by having the car battery located in the trunk area. I have located an external speaker on the console just behind the front seats to focus the sound forward. The installation turned out to not be a bad one at all, given the relatively small space available to mount radios. With the antennas that are mounted, I can cover 40 meters through 440 MHz. This installation has proven satisfactory when used in our ARES exercises, as well as normal ham radio activities. To this point, I have been very satisfied with the performance of the ATAS antenna, having worked several European DX stations on 40 meters and up.

Thanks, Ernie. Your installation shows a little "hamgenuity" can go a long way in making the most of a mobile installation in a smaller vehicle. (I wonder if his callsign also promotes a fishing bait enterprise?)

Shopping

Be sure to make a visit to your local ham store, or leaf through the catalogs we all seem to get in the mail this time each year. There are many new products that will enhance mobile operations, from cup-holder inserts that can hold a HT or mobile microphone, up through new and useful mounting gear. My recent visit to a ham store provided a number of surprises and ideas on how to make that gear work in my next mobile installation.

Share Your Photos

"Mobiling" is a quarterly column, so there's plenty of time to take some photos and send them to me at the e-mail address shown at the bottom of the first page of this article. We depend on hams sharing their "tips and tricks" for the benefit of others who want to take ham radio on the road. Please send a brief description of your gear and how you installed it, along with a few photos.

That's all for this visit. Avoid those orange barrels, have fun on the radio; hopefully you'll enjoy a summer vacation trip, and maybe I'll hear you on the air. 73, Jeff, AA6JR

BY TOM SMERK,* AA6TS

Take it to the Field Special

A Mobile Demonstration Trailer in the UK and Ham Radio News from Around the World

I was reading a thread on one of the popular ham radio portals that was discussing whether ham radio is "dead." Since I had just finished compiling stories that wanted to include in this month's column, I knew the answer without any reservation: Ham radio is alive and well, as you will see as you read some of the exciting news this month!

We begin with a story about how a good thing can still get better. Most clubs would love to have a demonstration trailer that they can take to events and promote our hobby, but what if you were able to get a major manufacturer to equip it with radios and repeaters?

ICOM UK makes donation to GX3RCM Amateur Radio Demonstration Vehicle

After receiving a "demonstration trailer" from the Radio Society of Great Britain (RSGB), the Sheffield Amateur Radio Club is pleased to have recently received a donation of the latest D-STAR digital and HF amateur radio equipment from ICOM UK.

The club plans to take the trailer to schools to be used as a teaching tool to introduce young people to the amateur radio hobby and to promote amateur radio to a wider audience at rallies and events. So far the club has taken the "GX3RCM Amateur Radio Demonstration Vehicle" (photo A) to local schools during National Science Week and it has attended local summer festivals and hamfests.

Formed in the 1920s, the Sheffield Amateur Radio Club now has 70 members of all ages and from all walks of life. At events such as Jamboree-On-The-Air for the local scout group, the club promotes amateur radio by using HF and VHF equipment to contact other radio amateurs all over the world.

The new vehicle—which is a trailer full of the latest ICOM equipment such as the ID-RP2C

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e-mail: <aa6ts@cq-amateur-radio.com>

Photo A. GX3RCM demonstration trailer (Photo courtesy of GX3RCM)

Photo B. Vertical incidence HF radar antenna used for ionospheric research in Chile (Courtesy of CE5BQD)

Repeater Controller and duplexer, the IC-9100 HF/VHF/UHF Base Station Transceiver, and the IC-E2820 D-STAR dual-band mobile transceiver—will allow the club to demonstrate the latest D-STAR digital amateur radio technology to the public and hopefully interest some of them enough to take up the hobby.

More information about the Sheffield Amateur Radio Club, including photos of the GX3RCM trailer, is available at the club's website: <http://sheffieldarc.org.uk/>.

Foundation Training with Chelmsford Amateur Radio Society

Last month, we looked at a few of the events and training happening within the Essex ham community in the UK. Another Essex group is the Chelmsford Amateur Radio Society (CARS), which is offering six Foundation license training courses, all run by volunteers. Those attending have said that not only are they learning theory and practical skills, but are also having a lot of fun! It's always nice to read about groups like this that are continuing to invigorate our hobby!

More information about the training courses at CARS is at <http://www.g0mwt.org.uk/training/>.

Also for CARS, January brought the first CARS Skills Workshop. The purpose was to provide help and advice for new hams while allowing experienced hams to share their skills. Forty-five people attended this first event, which was largely a social get-together, but included demonstrations of topics such as Echolink, APRS, Morse code training, homebrew projects, and logging software. Those attending the first meeting received questionnaires and were asked to vote on topics that they would like to see presented, and some of the more popular choices were presented at the second workshop.

The second workshop was held February 17, with over 40 people in attendance. The third workshop was scheduled for March 17. The Skills Workshops are open to all, and there's no charge to attend. Photos are available for viewing at <http://www.essexham.co.uk/skills-jan14> and more information about the Skills Workshops can be found at <http://www.hamskills.co.uk>.

Also from the Essex area, the Loughton and Epping Forest Amateur Radio Society (LEFARS) had all ten out of ten candidates pass the Foundation exam over the weekend of January 25–26. LEFARS welcomes newcomers and offers training courses and monthly meetings. Read the full report at <http://lefars.org.uk/WPblog/2014/01/29/lefars-27th-foundation-license-course-25_26-january/>.
[EssexHam, M0PSX. LEFARS Blog]

RSGB Annual Construction Competition

Also from Great Britain, a chance to get out the tools and have some fun building!

It's time again for the annual Radio Society of Great Britain (RSGB) Construction Competition, an event designed to encourage home construction, experimentation, design, and innovation. Any member of the RSGB is eligible to enter

The projects must have an amateur radio context, such as receivers, transmitters, transceivers, antennas, etc., and must be home-constructed, tested, complete, and working. Entrants for each of the four categories (listed below) must demonstrate the functionality of their entry by either providing a short video showing it working or by demonstrating it to the judges at the convention. Each project must be accompanied by a one-page summary description of not more than 250 words.

There are four entry classes: Designer, Craftsman, Beginner, and Junior Member. RSGB members may submit more than one entry. The closing date for entries is September 30 and judging will take place at the RSGB Convention in October. Prizes will be awarded to the winners of each category and to other highly commended entries. The Pat Hawker G3VA Trophy will be awarded to the best overall entry. The RSGB website is at: <http://www.rsgb.org/>.
[Southgate Amateur Radio News]

New Ham Radio Licenses Increase in Germany While Total Numbers Decline

A recent report from Germany's Deutscher Amateur-Radio Club (DARC) contains useful information about the amateur radio licensing trend in that country. Although 829 more new people joined the hobby in 2013 than in 2012, the total number of German amateur radio licenses fell by 2255 (3.2%) in 2013. Here are the numbers over the past four years: 68,191 in 2013, 70,446 in 2012, 71,659 in 2011, and 72,293 in 2010. Another part of the report explained how the German DN callsigns are held by amateur radio trainers and are used by unlicensed people operating under the direct control of the trainer. The DN callsigns showed an increase in 2013 with 2711 DN calls issued, 183 more than the 2528 in 2012, up from 2126 in 2010.
[Southgate Amateur Radio News]

Also from Germany …

German Hams Question Emissions Testing

In Germany, what we know as "Broadband over Powerlines" (BPL) is known as PLT, or "Power Line (Data) Transmission."

The method used to test and certify equipment for emissions standards is being questioned by the DARC. The society claims that measurements on PLT devices are carried out partly in standby mode with no data being exchanged. This may give the misleading impression the equipment meets the emission standards.
[Southgate Amateur Radio News]

It also seems that every month brings news of changes in the radio spectrum, usually some welcome frequency additions. This month brings good news for hams in France, Bulgaria, Poland and South Africa:

New Frequencies for French Radio Hams

The national organization for amateur radio enthusiasts in France, REF (*Réseau des Émetteurs Français*, which in English would literally mean "Network of French Radio Transmitters") met in March with the French regulator, *The Autorité de Régulation des Communications Électroniques et des Postes* (ARCEP). Some new frequency allocations were announced and others are still being discussed.

French radio amateurs have gained access to 472–479 kHz with 1 watt output in Region 1 (Europe) and territories in Region 2 (the Americas). In addition, 435–438 MHz is now allocated to the amateur-satellite service for both Earth-to-Space and Space-to-Earth. The 2400–2415 MHz band is now allocated to radio stations in the amateur-satellite service in French territories in Region 2.

Discussions also covered the possibility of an amateur allocation across the whole of 1.8–2.0 MHz and possible future allocations at 5.5 MHz and 70 MHz.

Also discussed were the Galileo GPS satellites, which broadcast across 1260 to 1300 MHz, the fact of which may make a case for allocation of a portion of the 1.2-GHz band to the amateur services.

Minutes of the meeting between ARCEP and REF on March 7, 2014 in Google English can be read at <http://tinyurl.com/REF-ARCEP-Minutes-2014-03-07>.
[Southgate Amateur Radio News]

New Amateur Bands for Bulgaria and Poland; Update in South Africa

The band plans continue to change! Just in, an announcement that Bulgarian hams will be able to use 472 to 479 kHz, 5.250 to 5.450 MHz, and 70.0 to 70.5 MHz. In addition, the 160-meter band will be extended up to 2 MHz, all on a secondary (non-interfering) basis.

Beginning February 18, Polish hams gained access to the 472–479 kHz band (but only up to 1W ierp), and the 122.250–123.000 GHz band—both allocated to the amateur service on a secondary basis.

South Africa's telecommunications regulator, Independent Communications Authority of South Africa (ICASA) has confirmed that all 2-meter amateur radio repeaters must comply with 12.5-kHz channel spacing. Most do, but there are still a few that still use the older 25-kHz inter-system spacing.

Also from South Africa, ICASA has announced that amateur radio license renewals—including repeaters and beacons—had to be filed by February 28, 2014. Failing to do so would result in cancellation of the license.
[Southgate, IARU Region 1, SARL]

Nauryz DX Contest 2014

I received some news about a DX contest tied to one of the oldest holidays on Earth. Nauryz, "Celebrating the Coming of Spring and Abundance," is celebrated in middle and central Asia. This year it was the theme for the Nauryz DX Contest, held on March 23 and sponsored by the Association of the Amateur Radio Services of Kazakhstan. It was the second running of this event. Hams from all over the world were invited to take part on the 80-, 40-, 20-, 15-, and 10-meter bands using CW and SSB. The contest provided for 11 entry categories.

So far this is the only central Asian international contest aiming at promoting HF activity celebrating the coming of spring. More details about the contest can be found at <http://www.nauryz-dx-contest.com>.
[KZ1R on eHam]

HF Radar Antenna Installed

From South America, I discovered a link to "The Adventist Radiogram," a newsletter published in Chile, where I was excited to read about a joint project between two universities.

Following an official inauguration ceremony a few months ago, and thanks to a pact between Carlos Figueroa and Alberto J. Foppiano, CE5BQD, from the Department of Geophysics, Faculty of Physical and Mathematical Sciences, University of Concepción (UdeC), Concepción, Chile and Carlos Villalobos from the Faculty of Education and Social Sciences, Chile Adventist University (UNACH), Chillán, Chile, the two schools have installed a vertical incidence HF radar antenna (ionosonde) on the UNACH campus, which is about 10 kilometers east of Chillan, and have been making observations of electronic ionospheric concentrations every 15 minutes since last year. The radar (ionsonde) and associated antennas (two crossed deltas; photo B) are installed on a 30-meter high mast (just under 100 feet high).

[Dr. Alberto J. Foppiano from The Adventist Radiogram – 1st Quarter 2014, Used with permission from Jim Hofler. KW8T]

New Brunswick Passes Exemption for Mobile Radio Legislation

And finally, I just discovered some news I have been watching for concerning something that will most likely be a matter of concern to all hams who operate mobile. This story is not over yet, but I'm sure that like me, you will want to continue to watch what could become a matter of precedent:

Following a much-anticipated meeting at the Gallery of the Legislature on March 18, 2014, Radio Amateurs of Canada (RAC) confirmed that the New Brunswick provincial government has passed legislation to provide an exemption to that province's distracted driving law for ham radio mobile operations.

Minister of Justice Troy Lifford invited amateur radio operators in the area to attend the meeting. RAC member Alan Thurber, VE1AKT, was formally recognized in the legislature and spoke on behalf of the ham community.

There has been a concerted effort by RAC, local amateur radio clubs, and amateur radio operators in New Brunswick to have the ban on mobile radio operations lifted. Exemptions exist in other provincial jurisdictions in Canada thanks to the efforts of local amateurs and RAC's national strategy to address distracted driving legislation.

One of the arguments in favor of the exemption is that the ban on the use of mobile radios while driving may lead to less capability in providing emergency communications. Len Morgan, VE9MY, RAC Deputy Director for the Atlantic Region stated: "The lifting of the ban will enhance public safety and bring New Brunswick in line with the rest of Canada."

The RAC announced on its website that it hopes the New Brunswick government will make this a permanent exemption. The Radio Amateurs of Canada is Canada's national voice for amateur radio.

This is good news for hams everywhere, as other states and countries might attempt to override such an exemption and we need to be able to cite other decisions that have passed.
[Radio Amateurs of Canada (RAC)]

Summary

Thank you for choosing *CQ* magazine as a trusted source of amateur radio news. I particularly hope you enjoy reading about all of the things we have in common with each other all over the world as we pursue our hobby. Please keep sending your stories and announcements to <AA6TS@cq-amateur-radio.com>. I'd like to stay and chat, but I have to run and get my radio gear packed for Field Day! See you next month!

73, Tom, AA6TS

CQ Reviews:
Heil Ham Radio Handbook, Second Edition

BY RON OCHU,* KØØZ

One of my favorite lines from the comedy film *Three Amigos* is when "El Guapo" asks his assistant, "Jefe," if he knows the meaning of the word "plethora." (A short clip depicting this scene can be found on You Tube at <http://www.youtube.com/watch?v=tyBUMntP6DI>.) I make reference to this line because there is a plethora of books and articles devoted entirely to amateur radio. For new and experienced hams alike, trying to make sense of everything associated with amateur radio can be a somewhat daunting task. Fortunately for us, Bob Heil has ridden to the rescue!

For many hams, the name Bob Heil may be associated with a fine line of ham radio microphones and associated audio equipment. His name may also be associated with the "Ham Nation" program on the Internet (<http://twit. tv/hn>). If so, then you'd be right, but for some of us, the name Bob Heil is also associated with a 10-meter FM handbook and numerous do-it-yourself construction articles. I am fortunate to know Bob, and I believe that he'd agree that one of his biggest thrills in life is to take some difficult concept and explain it in a way that anyone is quickly able to grasp the concept. Truly, for Bob, it is a thrill to see that light of understanding suddenly appear on someone's face and then to exclaim out loud, "Now I get it! Why was it so hard before for me?"

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

Heil to the Rescue!

Toward that goal of helping everyone of various skill levels become more knowledgeable about the practical aspects of ham radio, Bob Heil, K9EID, has released the second edition of his *Heil Ham Radio Handbook* (photo A), published by Heil Sound, Ltd. It is a 128-page, easy-to-understand, well-written, nicely illustrated, and fun-to-read handbook covering many of the major aspects of amateur radio. The book has 15 chapters focusing on the new ham radio licensee; band characteristics; antenna systems; VHF antenna systems; mobile operation; dB, Hz, and other curiosities; the microphone; simple electronics; setting up shop; homebrewing techniques; printed circuit boards; building enclosures; proper grounding and RFI (radio frequency interference); simple electronic projects; and troubleshooting. Bob also includes a

Photo A. Heil Ham Radio Handbook, Second Edition

very handy section on useful charts and commonly used formulas. Suffice it to say there's a chapter (and more!) of interest for everyone.

Easy Explanations

What sets apart Bob's handbook from all the rest is his unique ability to take a complex concept and make it easy to understand, but not in an oversimplified, "talk down to me," fashion. For example, let's take an excerpt from page 80 of his handbook about analog to digital converters:

"You have discovered how simple it is for a digital signal to be converted to an analog signal and now you can demonstrate the reverse of that the analog to digital converter," Bob writes. "The best example of an application is the digital readout of a modern day transceiver, a digital thermometer or speedometer."

In this excerpt, Bob introduces his readers to the world of digital electronics by first establishing a concept, in this case, going from an analog signal to a digital one and then immediately following it up with a concrete, easy-to-understand, practical application such as a transceiver's frequency readout. This approach allows the reader to more readily grasp the new concept by associating it with an already known and familiar use of it.

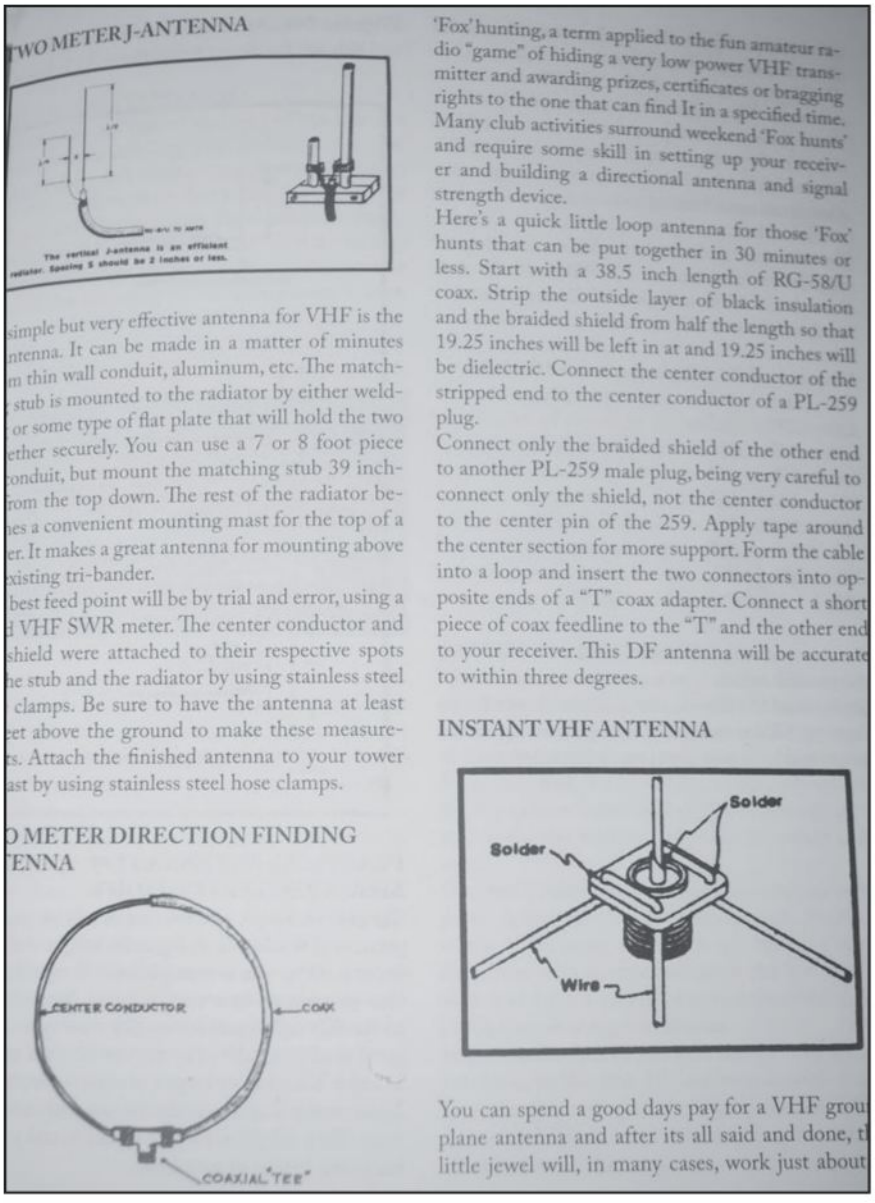
Getting On The Air!

This approach to learning is evident throughout the handbook and especially so in Chapter 1, entitled "New Ham Radio Licensee." Bob begins by offering the newcomer to amateur radio some very practical suggestions as to how to lay out the radio room. Attention is paid to desk size, number of electrical outlets, lighting, and service entrances for coax as well as station grounding. An often overlooked aspect of station setup is proper microphone placement. Bob points out, "All microphones in amateur radio stations are to be very close-talked. Don't get into the habit of sitting back three feet and thinking you are in a recording studio."

Once the station is established, K9EID walks the reader through the first steps to making that all-important, very-first on-the-air contact!

A Primer on Propagation

Chapter 2 is a brief, but very informative overview of high-frequency propagation characteristics along with a nice description of phase distortion caused, in part, by the ionosphere. This description transitions nicely into the next chapter, on a topic near and dear to every ham radio operator's heart—antenna systems.


TWO METER J-ANTENNA

simple but very effective antenna for VHF is the
ntenna. It can be made in a matter of minutes
n thin wall conduit, aluminum, etc. The match-
stub is mounted to the radiator by either weld-
or some type of flat plate that will hold the two
ether securely. You can use a 7 or 8 foot piece
onduit, but mount the matching stub 39 inch-
rom the top down. The rest of the radiator be-
es a convenient mounting mast for the top of a
er. It makes a great antenna for mounting above
xisting tri-bander.
best feed point will be by trial and error, using a
VHF SWR meter. The center conductor and
shield were attached to their respective spots
he stub and the radiator by using stainless steel
clamps. Be sure to have the antenna at least
et above the ground to make these measure-
s. Attach the finished antenna to your tower
st by using stainless steel hose clamps.

O METER DIRECTION FINDING
ENNA

CENTER CONDUCTOR
COAX
COAXIAL "TEE"

'Fox' hunting, a term applied to the fun amateur radio "game" of hiding a very low power VHF transmitter and awarding prizes, certificates or bragging rights to the one that can find It in a specified time. Many club activities surround weekend 'Fox hunts' and require some skill in setting up your receiver and building a directional antenna and signal strength device.

Here's a quick little loop antenna for those 'Fox' hunts that can be put together in 30 minutes or less. Start with a 38.5 inch length of RG-58/U coax. Strip the outside layer of black insulation and the braided shield from half the length so that 19.25 inches will be left in at and 19.25 inches will be dielectric. Connect the center conductor of the stripped end to the center conductor of a PL-259 plug.

Connect only the braided shield of the other end to another PL-259 male plug, being very careful to connect only the shield, not the center conductor to the center pin of the 259. Apply tape around the center section for more support. Form the cable into a loop and insert the two connectors into opposite ends of a "T" coax adapter. Connect a short piece of coax feedline to the "T" and the other end to your receiver. This DF antenna will be accurate to within three degrees.

INSTANT VHF ANTENNA

Solder
Solder
Wire

You can spend a good days pay for a VHF grou
plane antenna and after its all said and done, t
little jewel will, in many cases, work just about

Photo B. Two-meter antenna illustrations and explanations from page 49 of the handbook.

HF Antenna Systems

K9EID devotes 42 pages in Chapter 3 to HF antenna systems. He begins by writing that having the biggest signal on the band is less about the total amount of power and more about the antenna concentrating the maximum amount of the power going to that antenna toward the ionosphere so that the power is reflected to the desired spot. To help readers understand this concept more easily, Bob covers the topics of propagation, phase, polarization, proper loading, feed-line characteristics, and a very good explanation of angle of radiation. Heil includes a number of antenna examples such as a Yagi, broadside and end-fire vertical arrays, MIT's Double Bazooka antenna, trap antennas, and a description of phasing networks.

Bob then goes into an explanation of SWR (standing wave ratio), noting that "There are so many misconceptions, mostly because of the fact that the subject is so misunderstood." Bob brings the topic of SWR down to Earth, and his handbook is a fine place to begin to learn about the nature of SWR and how it can be applied to understanding baluns.

VHF Antenna Systems

Chapter 4 is dedicated to VHF antennas, exploring loops, Yagis, verticals, and the ever-popular "J-pole" antenna. Rotors and masts are also covered in this seven-page chapter. As with the previ-

ous one, this chapter is nicely illustrated with plenty of examples (photo B).

Mobile Operation

I haven't met a ham yet who doesn't want to take his/her hobby along for the ride. Installing a VHF/UHF mobile system generally can be done without too many difficulties. However, installing a mobile HF system can be a bit more problematic. Chapter 5 delves into mobile operation by first examining ignition noise suppression in the vehicle, then moving on to proper antenna placement and impedance matching. This chapter is only three pages long, but it does offer a good place from which to start learning more about the joys of mobile radio operations.

Getting a Handle on dB, Hz, and More

Chapter 6 is four pages long and it is entitled, "The dB, Hz and Other Curiosities." In this chapter, Bob simplifies the nature of the decibel and how it is applied to amateur radio. Lately, you may have noticed that power measurements are increasingly being reported as dBm (a decibel referenced to one milliwatt) and the handbook gives a good explanation as to why, along with a handy reference guide to the more popular watts-to-dBm conversions used in amateur radio.

A bit further into the chapter, K9EID explores the realities of S-meter readings, nicely debunking the misconception that power is where it is at in ham radio. For example, Bob writes, "If a 50 watt transmitter receives an S7 report, raising its power to 800 watts would only boost the S-meter to an S9."

Microphones

Since decibels represent power levels that the human ear can detect, it is only natural that Chapter 7 should be about a subject near and dear to Bob Heil's heart—microphones and equalization. Bob gives us a very brief, but entertaining, history of microphone development and then he launches into choosing the right microphone for the job.

Simple Electronics

After introducing readers to audio, K9EID tackles the task of introducing simple electronics in Chapter 8 of his handbook. Bob's approach is to explore the functions of common electronic components found in ham radio such as resistors, potentiometers, capacitors, and semiconductors, and how they function in a circuit. He offers practical tips such as how to determine the anode side of a diode, or where pin #1 can be found on an integrated circuit. Bob devotes over three pages to digital electronics, which provides a great introduction to common digital components used in ham radio such as gates, flip-flops, inverters, NOR and NAND gates, and others.

Setting Up Shop

Chapter 9 devotes a few pages to tools that should be on a ham radio enthusiast's workbench. Drills, bits, diagonal cutters, soldering irons, screwdrivers, hole enlargers, RF probes, and a cable tester are discussed. Although this isn't an exhaustive exploration of workbench tools, the chapter does offer ideas and suggestions for the newcomer and it is a place from which to start.

Homebrewing Techniques

Presumably one would want to put together a workbench to facilitate homebrewing. Chapters 10 through 12 are devoted

our readers say

"Look, Ma!"

The following letter is from Glenn Brown, NN8G, designer of the kit described by W2VU in the March/April edition's "Makers" column:

Editor, *CQ:*

Just had a fellow ham send a PDF file of your March/April *CQ* magazine "Makers" article to me. Thanks for the wonderful words, Rich.

Yes, I do sell the kit, and, no, it probably won't work past your own back yard. They do still sell quite well, although I try to make sure the buyers understand this is way down in output. Does make for a lot of fun building, refreshing soldering and reading skills, and even a little woodworking, as you mention. The kit now comes with a different design coil, which is prewound here.

Thanks so much, Rich! 73 es BCNU!

Glenn Brown, NN8G
<pastimeprojects@yahoo.com>

Heading in the Right Direction

The following is in response to W2VU's interview on the "Ham Radio Now" program, explaining the recent difficulties here at CQ and describing the steps being taken to resolve them.

Hi Rich,

I've just been watching your appearance on the "Ham Radio Now" show. I agree with your whole analysis. Just want to wish you good luck during the transition period.

73, Yannick Devos, XV4Y

Editor, *CQ*:

I received the March/April issue on April 19th, which is a vast improvement over the last six months or so, what with the magazine arriving months late. I am happy to be able to read Prof. Emil Heisseluft's byline while still in the month of April! Thanks for getting things back on track.

73, Jim Rubin, KC2LMH

Frequency Chart

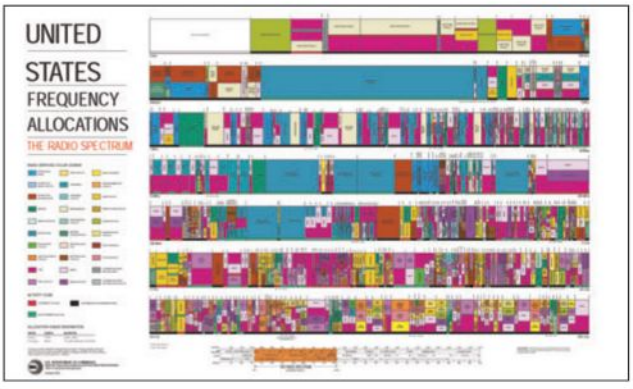
Editor, *CQ*:

I found the attached on the FCC web site. It has to be printed full-scale in order to see all the details. I took the file to a local office supply store to have it done (they also laminated it for me). It's a great addition for the listening post. I bet your readers will enjoy it, too!

73 de Klaus Spies, WB9YBM

W2VU replies:

Thank you, Klaus. Actually, the frequency allocation chart originates with the Office of Spectrum Management at the National Telecommunications and Information Administration (NTIA). A more up-to-date (October 2011) copy may be downloaded as a PDF from <http://1.usa.gov/1jBOtRP>, or a printed copy may be ordered for $12 from the U.S. Government Printing Office at <http://1.usa.gov/1s4rxM1>.



to the art of building your own equipment. Soldering and coil winding, along with making your own printed circuit boards, are explored and illustrated in these chapters, as are building enclosures (boxes), using Greenlee punches, mounting parts and hardware, and panel labeling.

Proper Grounding and RFI

It seems that for many amateurs, there's a lot of bad luck to go around when it comes to proper grounding and RFI (radio frequency interference), so it seems appropriate for this topic to be covered in Chapter 13! Although this chapter is nowhere near being an exhaustive study of grounding, it does offer a basic understanding of just what proper grounding techniques should be employed when it comes to amateur radio.

K9EID does a good job of pointing out that when it comes to grounding, there are two grounds to consider—namely, Earth ground and RF (radio frequency) ground. The concept of two different grounds can, at first, be a bit tricky to get a mental handle on, but Bob does a good job of explaining the two different grounds and why they are important to understand.

Simple Electronic Projects

With chapters one through thirteen behind us, Chapter 14 gives us some simple electronic projects to build. A few examples include a 555 timer project, an audio amp using the LM 380 IC (integrated circuit), an S-meter, a tone decoder, a basic repeater controller, a solid-state switching circuit, solid-state power-supply regulation, and a crowbar circuit.

Troubleshooting

If you stay with the ham radio hobby long enough, you will most certainly have some type of equipment failure. Bob Heil's Chapter 15 offers some strategies to test the failed piece of equipment before sending it off to the manufacturer for repair. If you can fix it yourself, why spend the money and the time to ship it off?

Reference Charts

No handbook would be complete without a chapter devoted to handy reference charts. Chapter 16 provides nine pages of charts ranging from metric multiplier prefixes and approximate safe working tension (lbs) for various halyard materials, to phonetics, clearance drills for machine screws, pilot lamp data, and coax losses. No shack workbench should be without these charts!

In Conclusion

Bob, K9EID's, *Heil Ham Radio Handbook, Second Edition* is a fun-to-read, nicely-illustrated book. It covers many of the topics that confront someone new to ham radio and offers down-to-Earth, easy-to-understand explanations. This handbook is not a comprehensive engineering text, but it doesn't claim to be one. That's not the theme of this handbook. Bob is offering practical, understandable explanations on some complex topics that will initially answer anyone's questions. If more information is needed, then his handbook will serve nicely as a springboard to more complex and detailed explanations.

It retails for $14.95 at many ham radio stores, including Universal Radio <http://bit.ly/1jCEmZm>, DX Engineering <http://bit.ly/1prCRpx>, and Radio-Mart <http://bit.ly/1hkSxVJ>.

73, good reading, and see you next month

de Ron, KØZ

"Scoping Things Out"

BY JOE EISENBERG,* KØNEB

When building kits, good test equipment makes life a lot easier. Having a good digital multimeter is helpful, but one piece of test equipment stands out as being extra helpful when troubleshooting. The oscilloscope seems like something most hams think of as being in the past, but it still has great value when finding problems or evaluating your kit's performance.

A 'scope lets you actually see what your circuit is doing. You can see if there is any distortion in the waveforms, what the peak-to-peak voltage of the signal is, and on many 'scopes, you can even measure the DC and AC voltages. A lot of 'scopes have A and B inputs (or channel 1 and 2 on Tektronix 'scopes). The two inputs can be used to simultaneously display things such as the input and output of a part of an amplifier circuit so you can evaluate its gain or distortion. To me, there is nothing like actually seeing the waveforms to speed up troubleshooting and learning what is going wrong or measuring the performance of your circuits.

Good 'scopes used to be very expensive and way out of the reach of most hams, but I have found a lot of great used and working 'scopes at hamfest flea markets often for under $100. Make sure it works, and that there is a probe with the 'scope, as probes often can cost as much as some used 'scopes. Some hamfests have a test bench, so you can test a radio that is for sale to see if it works, and testing a 'scope can be done easily as well. Most good 'scopes have a test signal built into them and touching the probe to the test terminal should display its waveform on the screen. Some 'scopes have a sine wave output and others a square wave that can be used to also calibrate the screen for measuring signals. Make sure the waves are steady once the adjustments are made and ask for help if needed.

I was fortunate to have worked for an employer that decided to get rid of a closet full of Tektronix 'scopes about 12 years ago, and rather than let them go into the dumpster, they ended up in my car. My Tektronix 465 is what I use on my bench for kit building and is a very reliable 'scope. The Tektronix 465 is a 100 MHz 'scope, meaning that it displays waveforms accurately up to 100 MHz. My portable 'scope now is a Tektronix 2335, also a 100 MHz 'scope. When looking at 'scopes, the higher the frequency, the better the results will be. Don't dismiss a 10 MHz 'scope, though, as it is still quite useful for troubleshooting. All of the bargain 'scopes you will find at hamfests use a CRT (cathode ray tube) for a display. The newer ones use LCD displays and are amazingly light and small when compared to CRT-based 'scopes.

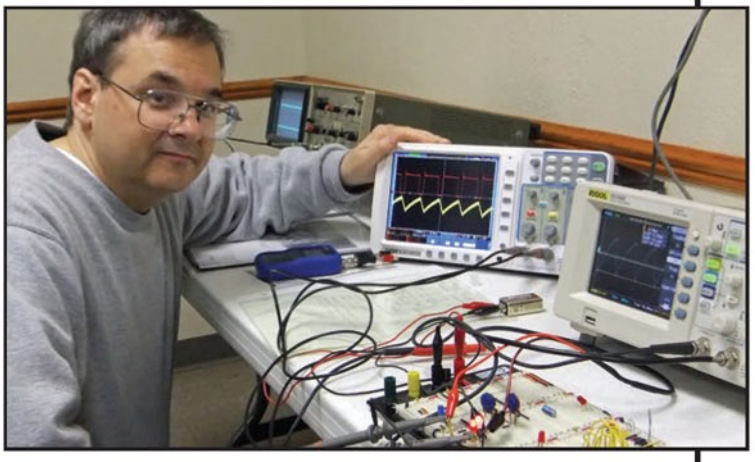
A new oscilloscope can be had for about $400 with a full color LCD display and the ability to capture screen shots for use on your computer. Newer LCD 'scopes also can measure the voltage of your displayed waveform without you having to count the scale marks. This feature is called the cursor, and it can also be moved to read the voltage at various points in the displayed waveform.

The HBQRP group in Nebraska recently held a workshop on 'scopes with a number of different types brought in to be displayed and demonstrated. It was a great time to ask questions from the experts and see how to use a 'scope in real world situations. The attendees got to have a hands-on demonstration and learn all about using an oscilloscope. Plan on having a 'scope day at your club soon for a great time and a fun learning experience!

Ozark Patrol RX Kit

At the 2014 Ozarkcon QRP convention held in Branson, Missouri, the buildathon project was the Ozark Patrol regenerative receiver kit. Designed by David Cripe, NMØS, this kit is unique in its construction method.

Dar Piatt, W9HZC, demonstrates his computer-based oscilloscope adapter and test board



Jim Kilby, KGØRD, tries out two newer LCD 'scopes

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

The front panel of the radio is also the main circuit board, and the components are soldered to the back of it in a fashion similar to "Manhattan" construction, but without having to glue islands to the board. Instead, this board is etched and silk-screened like most good PC boards. In this method, however, the board has pads already attached and the interconnections between them are already done. All that the builder needs to do is solder the parts to the pads and trim the leads.

This method of construction is now called "Pittsburg," named for the Kansas hometown of Joe Potter, WØMQY, who came up with the idea for the Four State QRP Group. Soldering the parts to the board like this has the advantage of making desoldering a snap, as the part leads can easily be lifted from the pad with your hot soldering iron tip. Using solder wick can speed this process even more.

This is a really fun project for either the individual builder or a group kit-building experience. If you are doing the Ozark Patrol as a group project, be sure to allot about three hours' time to assemble and test each one. There are two "gimmick" capacitors that are used to create a value that is between about 1 pF and 10 pF. A gimmick is made by simply twisting two insulated wires around each other like a pigtail. The capacitance value of a gimmick is adjusted lower by unwinding and trimming the wires. If you make it too short, you can always quickly make another and try again. A gimmick capacitor reminds us that any two conductors near each other can exhibit a very low capacitance value, and is why in RF construction, component leads are often kept very short at VHF and UHF frequencies. The main advantage of using a gimmick for such low capacitance values is the extremely low cost as compared to using low-value trimmer capacitors.

The Ozark Patrol features a speaker as well as a headphone output and is made with just three transistors. Connecting a wire antenna brings in many shortwave broadcasts as well as

Dar Piatt, W9HZC, and Darrel Swenson, KØAWB, pass out kits and manuals to begin the kit building session at Ozarkcon 2014 in Branson, Missouri.

Attendees at Ozarkcon 2014 assemble the Ozark Patrol regenerative receiver.

The finished Ozark Patrol!

a few ham bands. The front panel mounts to a wooden base that holds it in place as well as providing a place for the antenna and ground connections. There is one toroid to wind, and it is easy. Just be sure to thoroughly remove the insulation from the ends of the wire with an emery board and form and pre-tin the ends before soldering to the board. There are also holes provided to mount the Ozark Patrol in a complete cabinet for all of you woodworkers.

You can order the Ozark Patrol from the Four State QRP Group at <http://www.4sqrp.com> , with price and shipping costs to be announced soon. The Ozark Patrol joins a growing lineup of great kits from 4SQRP.

Going Transatlantic…

This month, I am traveling to Friedrichshafen, Germany for the annual ham radio convention. This is my first overseas trip in over 43 years, and I look forward to meeting my readers from Europe. I'll be in the Dayton Amateur Radio Association booth, so look for my famous "Cat In The Hat" and say hi!

Until next time, 73 de KØNEB

The wiring side of the Ozark Patrol front panel. All parts solder to pads that are pre-mounted on the board.

BY MATT STULTZ,* KB3TAN

Some Differences Between Hams and Makers

Makers Editor KB3TAN continues to be very busy at his day job, so CQ *Editor Rich Moseson, W2VU, fills in once again.*

One of the purposes of this column is to showcase the similarities between hams and "makers," in an effort to promote cross-pollination between the two like-minded communities. But as I have read more maker publications and started to get involved with a maker group in my community, I have begun to see some differences as well. Most of these come down to money and mindset.

I recently bought the April/May issue of *Make:* magazine (despite its $10 cover price), drawn in by its cover, which promoted "High-Tech DIY" and an article on building your own "PiPad" tablet around a low-cost Raspberry Pi computer. I'm not in the habit of criticizing other magazines, but what I saw really illustrates my point here.

First, I was disappointed that most of the projects require access to high-end tools, such as CNC machines (precision computer-controlled routers). "I happened to have access to a CNC machine, some 1/2 -inch Baltic birch plywood, and a relatively large sheet of scrap carbon fiber lying around to form the basis of the frame," wrote the author of the PiPad article. Of course, don't we all? He offers no alternatives for the rest of us.

Another article—on building your own laptop from scratch—was written by a leader in the maker community who said his goal was to meet the challenge and that "low cost is not an objective." Along those lines, there was also an article on setting up a "makerspace" for kids, which called for a budget of between $11,000 and $23,000! Then there was the feature on building a $3,000 machine for digitizing old film (granted, commercial versions are much more expensive).

[CQ*'s "Ham Notebook" editor and active maker Wayne Yoshida, KH6WZ, points out that "(m)any Makers have 'day jobs' in the high technology sector—where exotic materials such as titanium and carbon fiber and UHMW (ultra-high-molecular-weight polyethylene) are readily available as scrap. Machines and tooling, such as laser and plasma cutters, and CNC mills, also are in this 'donated surplus' category."*

But he also sees a culture focused on making things that make money. "When my team first exhibited at the Bay Area Maker Faire," he notes, "several visitors wanted to know 'What are you selling?' When we explained that we (were) not selling anything … only demonstrating things we build and use, they would look at us in a funny way."]

A recent issue of Make: *magazine brought to mind some of the differences in mindset between hams and the broader maker community.*

The bottom line is that, for us hams, being frugal (OK, cheap) is an artform that is as much a part of our culture as is building or modifying our own gear. Likewise, profit generally is not the motive behind our building efforts. Not so in the broader maker community, or so it appears.

Furthermore, several of the projects in this and other issues of *Make:* are either incredibly complex (such as building your own CT scanner) or "because we can" projects without real practical use. The frugal ham in me wonders why one would go to the effort and expense of designing and building something that isn't really useful to you when it's finished. Nothing wrong with that if you enjoy the process, but it's just one other area in which hams and makers are not always on the same page.

Getting Local

Both of these differences have been reinforced at meetings of my local makers' group. Make no mis-

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take, this is a great bunch of guys (unfortunately, this particular group seems to be all-male), who have been very welcoming to me—even though I'm "the radio guy," the only one whose projects aren't connected to computers—and they're very interested in my radio projects. But I'm beginning to feel like I'm out of my economic league.

Perhaps it's just where I live, or this particular group, but again, the financial commitment seems to be significantly higher than what most ham groups would expect. There were a few e-mails discussing the possibility of asking members to put in $30 or $35 a month (my budget for such things tops out at about $35 a year!), and at the last meeting I attended, discussion turned to finding a place to create a *makerspace*, and the group leader said, "One thing we can try to do is find five guys who can put in $100 a month and rent a space in (a nearby town). I'm willing to do that." I'm glad he can spare that kind of cash on a monthly basis, but it's well beyond my budget, and if those are going to be the group's expectations, then I'm quickly going to be priced out of participating.

I wonder how groups in other parts of the country are dealing with these issues. I realize that space costs money and that equipment—such as CNC machines or 3D printers—is expensive. But so are club stations and repeaters, and I don't recall being asked by any ham clubs for more than about $30 a year to help support those. What are we doing differently? How are other maker groups dealing with these issues? Or is this "new" hobby that is supposed to be democratizing manufacturing really mostly the purview of folks with lots of money to start with? Of course, the same can be said of ham radio, but what I'm seeing is exponentially more expensive, along with the mindset that cost is not a major consideration and the goal is a salable product.

My purpose here is not to be negative about maker groups, a particular magazine or the maker community as a whole. Rather, I want to point out a few differences in mindset that I've observed, and perhaps highlight some areas in which hams—who have decades' more experience sharing costs among members of a group—might be able to provide some meaningful assistance to maker groups, especially those just starting out. Your thoughts are welcome. E-mail me at <w2vu@cq-amateur-radio.com>.

BY TONY EMANUELE, WA8RJF

The Challenges Ahead

We welcome Tony Emanuele, WA8RJF, as our new VHF Plus Editor as of this issue. For more on Tony and his background in VHF/UHF ham radio, please see his introduction in last month's "VHF Plus" column. — *W2VU*

Immediately after I agreed to become the new editor of the "VHF Plus" column, panic struck as I quickly started to think of all the challenges associated with writing a monthly special-interest column. The most obvious challenge is to maintain the high standard set by previous column editor Joe Lynch, N6CL. We all owe Joe a debt of gratitude for his 22 years of service to that portion of the hobby that we all hold near and dear to us. Thanks, Joe!

The next in a long list of challenges is how to ensure that this column continues to be relevant in the seemingly ever-changing world of instant communication and social media. This challenge is not unique to this column or this publication, as all print media face this challenge. As Rich Moseson, W2VU, noted in last month's column—*"waiting three months to hear about a band opening is so 20th Century."* For most, our expectation is that we want our news and we want it as close to real time as possible. However, despite this expectation, I believe this column can and will continue to be relevant as long as its overarching theme is to promote activity on the VHF and above bands, explore new methods and technologies, and educate its readers on the wide range of topics related to that portion of the RF spectrum that we call home.

First Impressions

Although the global amateur radio population as a whole continues to grow, our challenge as VHF-plus weak-signal operators is to attract new licensees and HFers to our playground. Imagine the newly licensed amateur or the experienced HFer pressing the 50-MHz button for the first time on a newly acquired HF+ 50 MHz all-mode transceiver. Unless it is a contest weekend or during the summer sporadic-*E* season, and assuming they know what frequency to spin the tuning knob to, the likely result is that they will be greeted by nothing other than white noise. The experience will likely be the same for those who venture off the repeater frequencies on either 2 meters or 70 centimeters. Not exactly the impression we want to impart.

How do we overcome this first impression? Unfortunately, there is no easy answer, and it is made all the more complicated by the very nature and definition of weak-signal operation. Is weak-signal operation chasing new countries on 50 MHz; working new states and provinces via tropo or meteor scatter on 144, 222, or 432 MHz; working new grids on the microwave bands via aircraft or rain scatter; bouncing signals off the moon; or building equipment for use on the mm-wave bands? Of course, the answer is all of the above and more, and that is what makes promoting weak-signal operation so challenging; at its core, weak-signal operation is multifaceted.

VHF Plus Calendar

MAD Microwave Activity Day Saturday June 7
ARRL VHF Contest June 14–16
ARRL Field Day June 28–29
CQ WW VHF Contest July 19–20t
Central States VHF Conference July 24–27
Austin, TX

The Way it Was…

Twenty or thirty years ago, the typical weak-signal operator could be found on the bottom three or four bands. Commercial gear for 220 MHz was non-existent, and anyone running more than a few tens of watts on 432 MHz was probably using a home-built amplifier. The microwave bands were inhabited by the truly adventurous and often the more technically oriented amateur. Moonbounce was the exclusive

CQ's new VHF Plus Editor, Tony Emanuele, WA8RJF

c/o CQ magazine
e-mail: <wa8rjf@cq-amateur-radio.com>

purview of those capable of flying lots of aluminum and running big power on 144 or 432 MHz. Although EME (Earth-Moon-Earth) on all the bands through 10 GHz had been achieved by this time, the majority of the microwave EME activity was on 1296 MHz.

The typical weak-signal operator's year started in January with the *Quadrantids* meteor shower and ARRL VHF contest. Depending on where we were in the solar cycle, the spring equinox often could be counted on for a bit of aurora. April brought not only spring showers but the *Lyrids* meteors, and by mid/late May many would start to experience the beginnings of the summer sporadic-*E* season on 50 MHz. With the sporadic-*E* season in full swing by June and on into July, the dedicated and lucky op had the possibilities of working *Es* on 144 MHz. For many, August marked the start of the tropo season, and by mid-month the *Perseids* were lighting up the night sky and the bands. There was more tropo in September and October and more meteors in November with the *Leonids*. The year came to a close with the December *Geminids* and "winter *Es*." Most meteor-scatter activity was coordinated on 75 meters and most EME activity was scheduled during the weekly 20-meter EME net.

The Way It Is…

In 2014, the weak-signal operator's calendar is still driven to a large extent by natural phenomena such as meteors, sporadic-*E,* and tropo, but it is further enhanced and extended by advances in technology and operating practices. Take, for example, meteor scatter. Although most activity is still centered on the peak of a major shower, the use of WSJT has resulted in activity over a wider period of time and by much more modestly equipped stations than in the past. As evidenced by the Ping Jockey website (<http://www.pingjockey.net/cgi-bin/pingtalk>), meteor-scatter QSOs take place daily.

Likewise, the landscape—or should I say moonscape—has changed for EME, as it is no longer takes the biggest toys in the sandbox in order to send RF to the moon and back *(See "EME From the Beach" elsewhere in this issue.—ed.).* Readily available and affordable low-noise pre-amps are the rule on all the bands up to and including 24 GHz. Panadapters permit us to "see" the band and WSJT enables modestly equipped stations in terms of power and antenna to join in the fun. Activity is no longer concentrated on just 144, 432, or 1296 MHz. Although EME activity on any band will never rival the activity found on 20 meters during an HF contest, it is amazing to find hundreds of stations on 144 MHz, nearly a hundred stations on 1296 MHz and nearly that many QRV on 2.3 GHz during an EME contest.

It is reasonable to conclude that, in the aggregate, there is a healthy level of activity on the VHF-plus bands … *if* you know when and where to look and listen. Our collective challenge, therefore, is to attract/direct others to our corner of the playground. My intent in the coming months is to explore and promote ideas that will not only increase our numbers but also increase activity on our favorite portion of the RF spectrum.

My Personal Weak-Signal Operating Challenge

While looking over my log book a few years ago, it occurred to me that I had spent a considerable amount of time in front of the radio but I had little to show for it when measured by the number of contacts logged on 50 MHz. Like many Magic Band aficionados, WAS had been achieved, completion of DXCC was in process but would have to wait for Cycle 24

what's new

littleBits Logic and Wireless Modules

littleBits, a manufacturer of easy-to-assemble electronic kits, has introduced two new series to its popular module line: Wireless and Logic.

Wireless modules consist of a transmitter and a receiver and can be used as remote control for your projects. The transmitter has three independent channels and can send a signal up to 100 feet away. The receiver also includes three independent channels and can receive signals from 100 feet.

littleBits Logic modules can be used to build a digital circuit and as a teaching aid for software design. There are three different Logic modules, NAND (Not And), NOR (Not Or), and XOR (Exclusive Or). Most of the Logic modules have two inputs and one output and can be used to build a simple computer.

In addition, littleBits has teamed up with NASA and now offers the Space Kit. The littleBits Space Kit will enable anyone to build his/her own space investigations with little to no engineering knowledge. Included is a 30-plus-page booklet with step-by-step instructions for 10 projects like the ISS and Mars Rover. The kit also contains two 9-volt batteries and cables — everything you need to get started right out of the box.

The full parts list includes:

Bits Modules:
- 1 DC Motor
- 1 Light Sensor
- 2 Powers
- 2 Wires
- Bright LED
- 1 Microphone
- IR LED
- 1 Number
- 1 Remote Trigger
- 1 Speaker

Accessories:
- battery and cable
- motorMate
- screwdriver
- 30-plus-page booklet

The retail price for the Space Kit is $189 and is available now. For more information contact littleBits, 60 East 11th Street, New York, NY 10003. Website: <http://littlebits.cc>.

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.*

(or maybe even Cycle 25), and with well over 600 grid squares worked, I found myself just trolling the band looking to add to my grid square count. In a good year, that meant three to five new grids. I no longer went up the band to call CQ, no longer worked meteor scatter, and no longer ran to the shack when there was aurora. In short, I had become part of the problem.

While attending the Central States VHF Society Conference that year, I became aware of the Society's States Above 50 MHz Award. Its purpose is simple: To promote activity on 50 MHz and above by recognizing anyone who works 30 or more states/provinces on the VHF-plus bands in a one-year period starting July 1st and concluding the following June 30th. QSLs are not required and participants simply submit a band summary sheet to the society by the mid-July deadline. Additional details and forms can be obtain at the CSVHF Society website: <http://www.csvhfs.org/>.

For most, working 50 states and as many provinces as possible in 365 days on 50 MHz is a formidable challenge. It is one that requires taking advantage of as many as possible of the propagation modes that occur over the course of any given year, including sporadic-*E*, AU, tropo, meteor scatter, EME, and in some years, *F2*. So challenge yourself, starting July 1st, to see what you can accomplish in 365 days on your favorite band or bands. If we happen to run across each other on the air and I ask you for your state or province, you will know it is the direct result of my pursuit of the States Above 50 MHz Award. The results of the program will be summarized and published in a future column.

Operating Activities

Microwave Activity Day: Many years ago, accomplished rover and dedicated weak-signal operator Bill Seabreeze, W3IY(SK), recognized the need to promote activity on the microwave bands. He declared that the first Saturday of every month would be known as Microwave Activity Day, or MAD. All microwave ops should take to the air, he said, be it from home or the field, between the hours of 7 AM and 11 AM local time. Since MAD is not a contest, there is the freedom to take as much time as necessary to work a new grid, test a piece of gear, or try a new path. Bill encouraged coordination on 144.260 MHz, which since has become the unofficial microwave calling frequency. Please e-mail me with the details of your efforts and notable QSOs for possible inclusion in this column. As Bill was fond of saying, "Listen for the weak ones."

VHF Contests: Two of the more popular VHF contests are the ARRL June VHF Contest and the CQ WW VHF Contest held in July. Whether or not you are a contester, it is a good time to be on the air, as the activity levels will be high during both events. Most participate for fun, but I strongly recommend that you submit your log regardless of your success as a way of showing your support for weak-signal operation. Contest activity is one way we demonstrate to others that our playground is not only in use, but that the weak-signal community is a vibrant part of the hobby.

Another great opportunity for finding a lot of VHF/UHF activity is ARRL Field Day, which will be held this year on June 28–29. Although technically not a contest, Field Day does have an incentive for promoting activity on 50 MHz and above. Take this opportunity to demonstrate the joys of the Magic Band to your local club or group. Field Day also provides an opportunity to lead by example by moving up in frequency off the calling frequency and politely reminding your group that calling CQ Field Day on 50.125 MHz or in the DX Window for the weekend is not considered acceptable operating practice.

Events

The Central States VHF Society Conference will be held this year July 24– 27 in Austin, Texas. It is always an excellent conference with a fine technical program, noise-figure measurements, and antenna range. There is plenty of opportunity to socialize with like-minded individuals, and the conference has a history of a fine family program. For anyone new to VHF and above, the program includes a session entitled "VHF 101." Featured luncheon speakers are Gerald Youngblood, K5SDR, of FlexRadio, and Jim Klitzing, W6PQL, of Klitzing Electronics. Famed DXpeditioner Jimmy Trebig, W6JKV, is the banquet speaker. For more information see: <http://www.csvhf.org/2014conference/index.html>.

And Finally…

Please send me your suggestions for future column topics, any noteworthy activity reports, and announcements pertinent to the VHF-plus community for possible inclusion in a future column. Also, step away from the computer, turn on your radio, and call CQ on your favorite band. 73 & CU on the bands.

Tony, WA8RJF

BY TED MELINOSKY,* K1BV

Awards and County Hunting Hints, Tips, and Info . . . plus Awards from Romania and Italy

We begin this month with valuable information for those who chase awards and are county hunters. Then we move on to a short-term award from Romania and another award from Italy.

Hints, Tips, and Info

Finding special event stations on the air: Many short-term awards require one or more contacts with special stations. They are very difficult to find by just scanning the bands. *Tip:* Use one or two of the websites that continuously collect and list "spots" of interesting DX stations, for example: <http://www.dxsummit.fi/>. Using this site's SEARCH function, just enter the word AWARD, and specify that the search applies to ANY COLUMN. Also specify ALL BANDS and 25 SPOTS. The results will list the last 25 spots that contain the text AWARD. Twenty-five spots will usually cover a couple of days, so the information will be dated, but will give you a clue where to look and the times that these special event stations are active. Most are spots from stations self-spotting or promoting their affiliation for an award. Click on the callsign and go to the QRZ.com page, where you can get more details, even the rules of the award.

What is a QSL for USA-CA Purposes? Fred Kemmerer AB1OC, recently asked this question via e-mail. My answer: A valid "QSL" can include:

1. a traditional paper QSL card
2. a MRC (mobile reply card), the kind that you complete, listing up to ten or more contacts with the same mobile. You provide a self-addressed, stamped envelope or place a stamp on the card. The mobile/portable station receives the card, checks the log, signs the card, and drops it in the mail.
3. E-QSL confirmations
4. A signed letter the mobile/portable operator sends to you listing contacts made.

What is the charge for a USA-CA Endorsement? The charge for any number of endorsements has remained unchanged for many, many years. It is $1.25, or one current IRC. Therefore, if you have the basic award for confirming 500 counties, then miraculously finish up, you will get seals for 1000, 1500, 2000, 2500, 3000, and "ALL 3077." If all of the contacts were made on CW, SSB, or JT65 and you request a special endorsement, the cost is still $1.25. (You get a home-made seal for the mode.)

USA-CA Plaque Price Increase: For the past 15 years, I have been doing business with a small company in Michigan. It provide a solid-walnut base plaque with a gold/brass plate. Due to the dramatic increase in US Post Office shipping costs, the new price for the plaque is now $50.

*12 Wells Woods Rd., Columbia, CT 06237
e-mail: <k1bv@cq-amateur-radio.com>

USA-CA Special Honor Roll

Ronald C. Evett, N1QY
USA-CA All Counties #1243
January 27, 2014

Larry Robinson, N7LFX
USA-CA All Counties #1244
February 21, 2014

USA-CA Honor Roll

500

N1QY	3632
K3NSA	3633
F6ARS	3634
SMØGNZ	3635
I1RJP	3636
N7LFX	3637
SV5DKL	3638
IK2RGT	3639
K8CY	3640

1000

N1QY	1854
YV5OIE	1855
N7LFX	1856

1500

N1QY	1556
N7LFX	1557

2000

N1QY	1441
N7LFX	1442
OM2VL	1443

2500

N1QY	1356
N7LFX	1357
DL3DXX	1358

3000

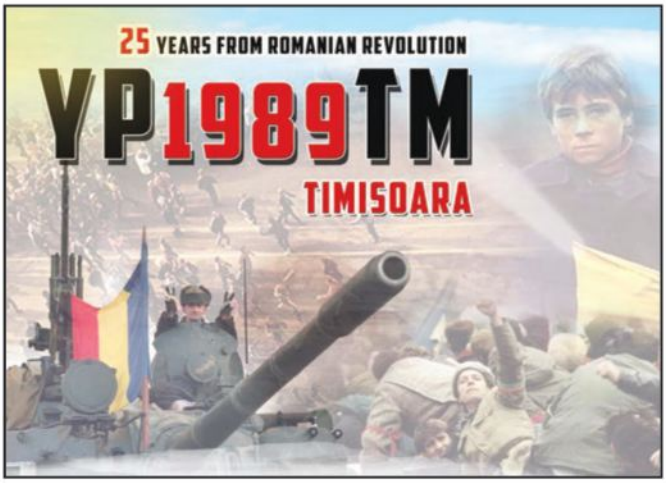
N1QY	1268
N7LFX	1268
DL3DXX	1269

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.

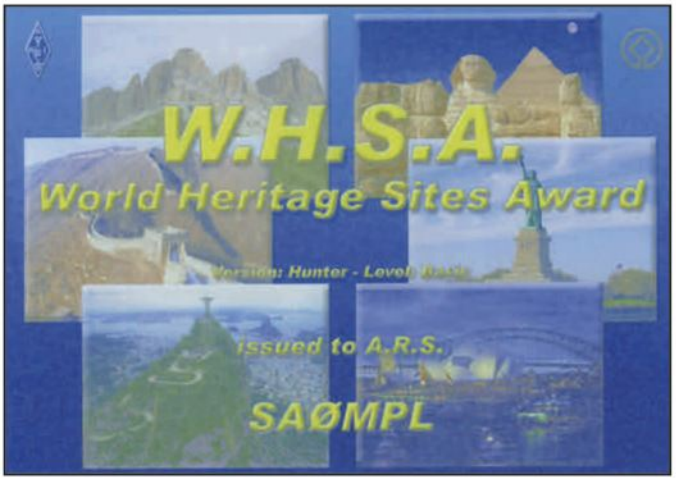
Romania's 25th Anniversary of the Romanian Revolution of 1989 Award

Short-term awards, such as this one, commemorate every sort of event. The run of the mill ones publicize rather obscure fairs and anniversaries. Some, like this one, celebrate significant events in the history of their country, and in this case, the award is sponsored by the city that was central to the events below.

The Romanian Revolution began as a series of riots and protests in Romania in December 1989 which started in the city of Timisoara and spread throughout the country. Twenty-five years ago, on December 16, 1989, the population of Timisoara got out on the streets. It resulted in the violent overthrow and execution of longtime President of Romania Nicolae Ceausescu and his wife. It was the only Warsaw Pact country uprising that forcibly



The QSL card of special event callsign YP1989TM marking Romania's 25th anniversary of the Romanian Revolution of 1989 Award.



A sample of the World Heritage Site Award sponsored by the ARI, the Italian National Amateur association, and their pending affiliation with UNESCO and World Heritage Sites.

overthrew the country's government and resulted in the death of its leader.

This was the beginning of the Romanian Revolution. In honor of the victims of the fight against the forces of the former regime on the first days of Timisoara's popular movement, the special callsign YP1989TM was activated commemorating 25 years from the fall of the communist system and the establishment of democracy in Romania. Also during 2014, special callsigns using the prefix YP25 will be active to celebrate the occasion.

A diploma has been developed and will be issued at the end of the year. To qualify for the diploma, you must make one contact with the special call YP1989TM and two additional contacts with other YP25 stations.

For YO stations, the cost of the printed diploma is 5 Lei; *the electronic version is free.* For foreign stations, the cost of the printed diploma is 5 USD/EURO; *the electronic version is free.* For the free electronic-issued award, send log extract to <club@yo2kqt.ro>. For a printed award, please send diploma request to: YO2KQT. Radioclubul QSO Banat Timisoara, PO Box 1-100, Timisoara 300790, Romania.

E-mail: <club@yo2kqt.ro>; Internet: <http://www.qrz.com/db/YP1989TM>.

Italy's The World Heritage Site Award (W.H.S.A.)

In recent years, we've reported on awards for contacting islands, castles, nature parks/preserves, covered bridges, and more. The latest undertaking comes from the ARI, the Italian national amateur association and its pending affiliation with UNESCO and World Heritage Sites. It turns out that UNESCO has designated 4,488 sites as deserving protection and recognition as World Heritage Sites. This is a worldwide listing encompassing some 160 countries all over the world which because of its history or characteristics are worth preserving as having significant cultural value.

The aim of the W.H.S. Award is to increase the knowledge of the UNESCO World Heritage Sites of the world through amateur radio activities. Amateurs will activate the sites in accordance with the official reference list, operating from the sites or in reasonably close proximity of these sites, as permitted by the site owner. (Refer to the website listed below for operating protocol and respect for the sites.) In the reference list are islands as well; the activators and their equipment must be on the island. Operations from these sites must last at least three hours and only one site per day will be permitted. The aim of the activators should be to put in the log the maximum number of contacts during the activity.

The award requires stations to "activate" such sites, operating their mobile/portable radios in reasonably close proximity to the site. This can be very easy or very challenging. Many famous USA national parks are on the list, as is the Statue of Liberty, on Liberty Island, NY, and Independence Hall in Philadelphia, PA. The basic award requires just 10 confirmations or 5 activations. I suspect that given the backing of the ARI and worldwide aspect involved, this will be the "next big thing" in the game of ham radio.

Criteria: References are based on the official list of UNESCO World Heritage Sites. Since they are of different natural, cultural, and mixed venues, it has been necessary to adopt some criteria to identify the references. For Natural Sites, one or more references are allocated due to size and characteristics. The website <http://whc.unesco.org> was used to create the list. For example, the Loire Valley in France consists of a huge area, so the river was divided into eight sections. The Dolomites in Italy appear with nine locations and a reference is given to each element present in these locations inscribed in the area defined by UNESCO map.

The sites are identified by a code made with the letters WH (World Heritage) followed by the ISO 3166-1 alpha-2 code and three numbers—e.g. for Italy: IT001, IT002, etc.; for Germany DE001, DE002, etc;. for Great Britain GB001, GB002, etc.

The List: ARI looks for the collaboration of the radio amateur associations to collaborate on this worldwide project. For requests of inclusion of new references or modification/deletion of existing ones, please e-mail: <ik2uvr@ari.it>. The list is found at: <http:// www.whsa.info/references/country/>.

Rules of the W.H.S.A: Based on the UNESCO official list, a reference list of all World Heritage Sites has been prepared. Each reference in the list can be activated by radio amateurs in possession of a valid license and in accordance with the laws of their countries. The code of the references is made with the letters WH (World Heritage), hyphen, the ISO 3166-1 alpha-2 code of the country followed by three numbers—e.g. WH-GB001 (Great Britain), WH-HR005 (Croatia), WH-CN023 (China) and so on. The list is published on the W.H.S.A. website and is constantly updated following the UNESCO World Heritage Sites list.

Award Structure:

1. Basic Award—Award hunters must contact at least 10 two-way contacts with the activators. The evidence of these contacts is the logs of the activators. SWLs can get the award with only 5 HRDs, but they must be in possession of the confirmations (either paper or electronic).

The award is free and will be sent to the applicants as PDF file. No one is allowed to request money for W.H.S.A.

2. Higher level certificates are provided for each 100 references worked (WHSA-100, WHSA-200, and so on).

Activators: Rules for activators are found on the website of the sponsor. It is interesting to note that activators are asked to provide electronic logs to the sponsor using the "Expeditioner Page."

Look for stations on all popular operating modes that identify themselves something like this:

1. In Phone mode: "CQ World Heritage Award, calling IUØXXX from IT001, QRZ?"

2. In CW or digimodes: "CQ DE IUØXXX WH-IT001 QRZ?"

Project Manager & A.R.I. HF National Award Manager: Pier Luigi Anzini, IK2UVR, e-mail: <ik2uvr@ari.it>

WHSA Award Manager: Cristiano Cerimedo, IW2NZX, e-mail: <cri@iw2nzx.it>

Log: <log@whsa.info>

Sked: <sked@whsa.info>

Info: <info@whsa.infoInternet>; <http://www.whsa.info/rules/>

In Conclusion for This Month

We are always interested in learning of new awards for this column. Please contact me with any details; a URL on the internet would be fine. Please see my contact information on the first page of this column. 73, Ted, K1BV

Adolf Kerschbaum, OE5KE
USA-CA All Counties #1242
January 17, 2014

I was born in 1940. At the age of 12, I started to build simple receivers and when I torned 18, I listened to local amateur radio stations and became infected by the shortwave bacillus. Using old parts from WW II radios, I built various receivers and they grew better and better.

In 1961 I took the amateur radio examination, and while waiting for the callsign I started building a transmitter. As a student, I could not afford to buy the tubes for the modulator, and it was AM time, so my first contacts had to be CW, and were made in the CQ WW DX Contest. After about 300 contest QSOs I had become a CW enthusiast, and CW still is my favourite mode.

Around 1980 I had a list of awards with remarks about the difficulty to get them. The USA-CA All Counties Award was classified as "almost impossible." However, I found 600 counties already confirmed in my QSL collection. Therefore, I applied for the basic award in 1987, and together with my friend Carl, OE5CA (SK), I became a regular participant on the County Hunters Net.

In 1991, I visited the U.S. on vacation with my family. John WB6ABW, an active county hunter of those days, loaned me his rig and I was on the air for two weeks from Honolulu, Hawaii, and then two weeks from about 30 counties in Nevada and California. I have five Last County Awards. I remember my visit to Ken, KB7QO, in Las Vegas, who was probably the most active mobile station at that time.

By 1995, I had about 2900 counties confirmed, but then I reduced my activity on the CHN. I did a lot of work on 2 meters meteor scatter, and also on 160 meters. I believe that I have given many U.S. stations their first OE on Top band. Now I have 255 countries on this band.

In 2009, we moved to a new QTH with a 20-meter tower. I was already retired and decided to finish USA-CA. The operations on the CHN were very different from what I remembered from 20 years ago.The various online information sites are a great help, and so I finally worked K5YAA/M in Elliot, Kentucky as my last county.

Adolf Kerschbaum, OE5KE, USA-CA All Counties #1242

I am the second OE station to work all 3077 counties. The first one was OE2EGL. I say "Thank you" to all who helped me to reach my goal.

What will be next? In spring I will put up my 10-GHz transverter with a 60-cm dish on the tower and start with rainscatter, another challenge. *—Vy 73, Adolf, OE5KE*

BY WAYNE MILLS,* N7NG

Another Visit to Visalia

Every year since 1979, I have traveled to the San Joaquin Valley of California to attend what has become known as the Visalia International DX Convention, or simply IDXC. In the beginning, 1949, and for many years, "Visalia" was "Fresno," and it was the joint annual meeting of the Northern California and Southern California DX Clubs. Until the early sixties, it included a DX meeting as well as some degree of extracurricular activities *(The Technical Culture of Ham Radio, Dr. Kristen Haring, The M.I.T. Press, 2007 [pp. 4 –42]).*

As far as I know, those activities have become a thing of the past, although the tradition may have survived in some quarters. I never knew! Nevertheless, it wasn't until about 1979 that the meeting took on the appearance of an international convention. My experience that year was enough to keep me coming back for a long time.

While the venue alternated a bit in the early 1980s, the Airport Holiday Inn on the outskirts of Visalia eventually became the regular home of the International DX Convention. The event is alternately hosted by the Northern and the Southern California DX Clubs. Last year, after many years at the smaller Holiday Inn, the convention was held at the Visalia Convention Center in downtown Visalia. This year, the convention, hosted by the Southern California DX Club, was again held in the convention center. Although the cost is higher, the facility garners favorable reviews, primarily because of its more than ample space for all of the usual convention activities. The Holiday Inn has been a fine location, but it long has been too small for the often over 700 DXers who attend. Strong words are now heard when suggestions to return the smaller facility are made. Interestingly, the attendance was down a bit this year, with slightly under 700 conventioneers attending the Saturday evening banquet and main presentation.

This year's program included presentations on Navassa Island, Past, Present and Future; DXpedition IT; "How to Blow Up Your Balun," by Dean Straw; and descriptions of DXpeditions to Lakshadweep and Myanmar by Krish, W4VKU, and Paul, N6PSE. Jay, W2IJ, presented the T33A DXpedition. Doug Grant, K1DG, updated the audience on the 2014 WRTC, scheduled for July.

The Saturday evening banquet and Sunday morning breakfast featured the recent Amsterdam Island (FT5ZM) and Wake Island (K9W) DXpeditions by Bob, K4UEE, and John, N6MM, respectively.

*P.O. Box 1945, Jackson, WY 83001-1945
e-mail: <n7ng@cq-amateur-radio.com>

Scenes from the 2014 International DX Convention in Visalia, California. Rusty Epps, W6OAT, immediate past President of the Northern California DX Foundation, with Chip (Force 12) and Janet (HRO) Margelli, K7JA and KL7MF. (Photo by N6TV)

The DX University

For the third year, the convention activities were kicked off on Friday morning by a running of the DX University. This year a different format was presented. The first half of the daylong program was basic DXing aimed at newcomers and casual DXers. We believe that a large majority of DX chasers are in the casual class. The afternoon session consisted of a seminar allowing attendees to express and discuss their views with the University's "professors." Unfortunately, along with the attendance at the DX Convention itself, the attendance at the DX University was down as well, particularly in the morning session. It might be that aiming a class on beginning DXing is not well thought of among such august attendees. (The primary mission of the DX University is to assist smaller groups in producing local classes, sort of a format for mentoring.)

The DX Forum

Another presentation of interest to your editor was the DX Forum. This forum is a mainstay of the convention, usually drawing a large crowd. This year was no exception, as a large audience was present on Saturday morning when ARRL DX Advisory Committee (DXAC) Chairman Arne Gjerning, N7KA, and committee members Ken Anderson, K6TA, Ned Stearns, AA7A, and Bob Beaudet, W1YRC, faced the audience.

In July 2013, the ARRL board assigned to the DXAC the task of reviewing all DXCC program rules and suggesting areas of potential change. The DXAC report is to be delivered in July 2014, after which the board will consider possible changes. There were no commitments.

For the DXAC, two issues loom over the DXCC program. The first is that of political entity status, known as Point 1 status. Point one countries are those independent countries that exist on their own merit as DXCC entities. One matter still pend-

ing after being in limbo for more than six years is Kosovo. Through changes madefor non DXCC reasons; in the Point 1 criteria, Kosovo is unlikely to ever be added to the DXCC list unless changes in the rules are made (*Note: Kosovo* does *count as a separate entity for CQ awards and contests—ed.*). Since there are other entities which could in the future face a similar fate, it seems important to make changes that will relieve this situation.

The other matter pressing for clarification is that of remote control operation as it relates to DXing. The original DXCC rules stated that all QSOs must be made from within your own DXCC country. Shortly after the introduction of the rules, that rule was changed to restrict the area from which one could make QSOs to a radius of 150 miles surrounding the "original location." This rule was in place until 1977 when it was liberalized to, yes, the original rule!

Now, in the 21st century, we have hugely improved technology that per-

The WPX Program

CW

3523	MMØDXH	3529	SP9FWQ
3524	JA3RAZ	3530	WA1GPO
3526	UN7BK	3531	RT3M
3527	K4MIJ	3533	SMØLPO
3528	AB4FH	3534	VK2PN

SSB

3466	IK5ZUK	3485	EB1EWE
3474	HB9FBG	3486	RT3M
3475	N4ACK	3487	N3KHK
3476	R7FK	3488	IWØECV
3477	N4WMB	3490	SMØLPO
3479	DL6ZBN	3491	EA7JW
3481	N9FJB	3492	HZ1SK
3482	N4KXO	3493	KD2BXD
3483	K4MIJ	3495	HZ1TT
3484	WE8P	3497	SQ8KEZ

Mixed

2739	AB4GE	2759	SP9FWQ
2742	N4WMB	2760	SV2BBO
2743	NW4KU	2761	JF2OHQ
2744	JA3RAZ	2762	WA1GPO
2745	DF8FT	2765	N3KHK
2746	KA1SAW	2769	SMØLPO
2748	N6MM	2770	EA7JW
2749	IW3GJF	2771	HZ1SK
2751	AB9QU	2772	AG2AA
2752	N4KXO	2773	VA2TY
2753	K4MIJ	2774	K7DF
2757	AB4FH		

Digital

304	LU6XQB	314	W4MHA
305	DL4ZAB	315	N8YQX
306	NW4KU	317	SMØLPO
308	IW3GJF	318	WB5TOI
309	K4MIJ	319	W2OO
312	SV2BBO		

CW: 350 UN7BK, JF2OHQ, R2ADI. 400 AB4FH. 450 W4MHA. 500 SMØLPO. 550 JA3RAZK, K4MIJ. 600 SP9FWQ, RT3M, VK2PN. 850 HB9FBG, JE3CYH. 1450 EA2AAZ. 1900 W2OO. 6500 K2VV.
SSB: 350 N4KXO, AC7JM. 400 VA3VF, N6MM, DF8FT, EB1EWE. 550 K6VXI, EA7JW, SMØLPO. 600 RT3M. 650 N6ETO. 750 N4FNB. 800 K3CWF. 850 N4WMB, HZ1SK. 900 WB9IWN. 1200 MMØDXH. 1450 HZ1TT. 1500 K4MIJ. 2050 PT7ZT, W2OO. 2750 DL8AAV. 5600 K2VV
Mixed: 450 SV2BBO. 500 KA1SAW, IW3GJF, N4KXO, N8YQX. 550 K6VXI, EA7JW. 600 KE5AKG, SP9FWQ, K6KZM. 650 JA3RAZ, R2ADIS. 700 AC7JM. 750 KH6SAT, N4FNB. 800 VA3VF, DL6ZBN, K7LY. 850 N4WMB, W4MHA. 900 W4ASE, 7L4VYK, WB9IWN. 1000 RT3M, SMØLPO. 1050 HZ1SK. 1100 HB9FBG. 1150 SQ8KEZ. 1300 MMØDXH. 1350 K3CWF. 1400 K4MIJ. 2650 W2OO. 3250 7K3QPL. 7450 K2VV.
Digital: 400 W2OO. 450 SV2BBO, K4ED , SMØLPO. 500 IW3GJF, AC7JM, W4MHA. K4MIJ. 600 VA3VF. 750 W4ASE, KH6SAT.

160 Meters: HB9FBG, K3CWF, K4MIJ, SQ8KEZ
80 Meters: HB9FBG, SP9FWQ, RT3M, K4MIJ, SQ8KEZ
40 Meters: W4ASE, SP9FWQ, KH6SAT, RT3M, K4MIJ, WB9IWN
20 Meters: HB9FBG, SP9FWQ, K3CWF, RT3M, K4MIJ, HZ1TT, SMØLPO, WB9IWN
17 Meters: EA2AAZ, K4MIJ, HZ1TT
15 Meters: W4ASE, HB9FBG, VA3VF, MMØDXH, K3CWF, RT3M, K4MIJ, HZ1TT, SQ8KEZ
12 Meters: EA2AAZ
10 Meters: KH6SAT, KA1SAW, EA2AAZ, K3CWF, RT3M, N6ETO, K4MIJ, HZ1SK, WB9IWN, SQ8KEZ
6 Meters: EB1EWE

Africa: HB9FBG, EA2AAZ, RT3M, K4MIJ
Asia: HB9FBG, EA2AAZ, JF2OHQ, RT3M, K6KZM, N6ETO, K4MIJ, HZ1TT, SMØLPO, SQ8KEZ
Europe: HB9FBG, VA3VF, MMØDXH, N4WMB, AB4GE, KA1SAW, IW3GJF, SV2BBO, SP9FWQ, AB4FH, K4ED, RT3M, EA7JW, VA2TY, K4MIJ, HZ1TT, HZ1SK, SMØLPO, SQ8KEZ
Oceania: JF2OHQ, RT3M, K6KZM, K4MIJ

North America: HB9FBG, N9FJB, NW4KU, KA1SAW, N6MM, WE8P, RT3M, EA7JW, K6KZM, N3KHK, WB5TOI, K4MIJ, AG2AA, HZ1TT, HZ1SK, K7DF, SQ8KEZ
South America: RT3M, K4MIJ

Award of Excellence: RT3M
Award of Excellence with 160 Bar: WF2S
30M Bar: WF2S

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-4003, 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, S50A, 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.

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-4003, 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, S50A, 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, K0DEQ, K6SKI, AB1OC, 9H1SP, EA2AAZ, KØMD, RL2A.

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 April 1, 2014 1865 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:

K3SWZ AA1V W8XD

The top contenders for 5 Band WAZ (zones needed on 80 or other if indicated):

K1LI, 199 (24)	RWØLT, 199 (2 on 40)
K3JGJ, 199 (24)	JA1CMD, 199 (2)
N4NX, 199 (26)	I5REA, 199 (31)
KØQC, 199 (26)	RZ3EC, 199 (1 on 40)
W4DC, 199 (24)	W1FJ, 199 (24)
N4WW, 199 (26)	K2EP, 198 (23,24)
W4LI, 199 (26)	WC5N, 198 (22,2
K7UR, 199 (34)	ZL2AL, 198 (36,37)
IK8BQE, 199 (31)	W6OUL, 198 (37,40)
JA2IVK, 199 (34 on 40)	EA5RM, 198 (1,19)
IK1AOD, 199 (1)	N8LJ, 198 (17,24)
VO1FB, 199 (19)	EA5BCX, 198 (27,39)
KZ4V, 199 (26)	G3KDB, 198 (1,12)
W6DN, 199 (17)	JA1DM, 198 (2,40)
W3NO, 199 (26)	9A5I, 198 (1,16)
RU3FM, 199 (1)	G3KMQ, 198 (1, 27)
N3UN, 199 (18)	N2QT, 198 (23,24)
W1FZ, 199 (26)	OK1DWC, 198 (6, 31)
SM7BI, 199 (31)	W4UM, 198 (18,23)
EA7GF, 199 (1)	US7MM, 198 (2,6)
JA5IU, 199 (2)	K2TK, 198 (23, 24)
RU3DX, 199 (6)	K3JGJ, 198 (24,26)
N4XR, 199 (27)	F5NBU, 198 (19,31)
HA5AGS, 199 (1)	W9XY, 198 (22,26)
JH7CFX, 199 (2)	KZ2I, 198 (24,26)
RA6AX, 199 (6 on 10)	W9RN, 198 (26,19 on 40)
RX4HZ, 199 (13)	W5CWQ, 198 (17,18)
S58Q, 199 (31)	UA4LY, 198 (6 and 2 on 10)
K8PT, 199 (26)	JA7XBG, 198 (2 on 80 & 10)
N8AA, 199 (23)	JA3GN, 198 (2 on 80 & 40)
IZ1ANU, 199 (1)	N4GG, 198 (18,24)
IN3ZNR, 199 (1)	K4JLD, 198 (18,24)
JK1BSM, 199 (2)	NS6C, 198 (17,22)

The following have qualified for the basic 5 Band WAZ Award:

IZ3ENH (173 zones) W7CT (160 zones)

5 Band WAZ updates:

F4GTB (200 zones)	F5CQ (200 zones)
K1LD (200 zones)	F8AFC (200 zones)
KØQC (200 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>.

Don Beattie, G3BJ, and Justin Snow, G4TSH, stopped in Visalia on their way back to the UK from the Ravaivae, OC-114 in the Australs of French Polynesia. (Photo by N6TV)

Tom Berson, ND2T, recently elected President of the NCDXF is seen accepting a very generous donation from the Southern California DX Club. (Photo by N7NG)

CQ Plus columnist Carl Luetzelschwab, K9LA, presenting "Fundamentals of Propagation" at the DX University session at the IDXC in Visalia. (N7NG Photo)

mits effective and low-cost remote operation at very little cost. As a result, we are faced with a very different DXing world. Remote transmitters, remote receivers; you name it, it has been, and will continue to be done. How does this affect DXing, and how can we regulate it? Or should we regulate it? If we try, how will be even detect its use? These are matters of great importance to serious DXers, and are now being considered and discussed. With that background, on to the DX Forum…

As forum moderator, I began by setting the agenda for the hour-long session. The committee members had indicated that they wanted to seek input from the attending DXers on the two primary issues discussed above.

The discussion could have gone on for hours. Members of the audience were offered the microphone to make statements of opinion and ask questions. Opinions were probably lengthier, but in the end, with a little friendly coercion, I think we struck a reasonable balance. The committee members seemed pleased with the response, as did the audience. For those who didn't have the opportunity to speak (or those who had more to say), be sure to write to your DXAC representatives with your ideas.

Number Five Activated

In late January, Amsterdam Island was activated. Amsterdam was number five on the most-wanted countries list. By all accounts, it will drop many notches in ranking. The operation was carefully planned and superbly executed, yet it was not without its difficulties. From the DXers' end, it appeared to be one of the worst ever in terms of a lack of discipline among callers in the pileups. There was deliberate QRM, mostly in Europe, and the usual miscues perpetrated by the "deserving" all over the world. Escalated exponentially by the effect of rarity, the brawl over Amsterdam was a pitiful scene for several days.

However, much of the disarray was aesthetic. Much of what DXers hear is of little consequence in the overall picture. Even the worst of the worst is not always as bad as it seems. Indeed, there are different points of view; different perceptions of the operating and operation. From the Twin Cities DX Association's "Grayline Report" come these words from Ralph Fedor, KØIR, and the leader of the FT5ZM DXpedition:

> DXers and DXpeditioners perceive things differently. DXers hear what's happening on the DXpedition's transmit frequency. DXpeditioners hear what's

The WAZ Program

12 Meters SSB

47 .....F8AFC

17 Meters SSB

55 .....F8AFC

10 Meters CW

209 .....K8VFV
210.....KJ6P
211 .....W7CT

12 Meters CW

82 .....W7CT

15 Meters CW

356 .....W7CT
357.....K7CU

17 Meters CW

104 .....W7CT

20 Meters CW

624 .....W7CT

30 Meters CW

125.....F8AFC
126 .....W7CT
127 .....AA1V

40 Meters CW

299 .....W7CT

30 Digital

001.....F4GTB

160 Meters

444 .....NØFW (40 zones)
445 .....K3SWZ (36 zones)
446 .....UY5AA (34zones)

All Band WAZ

Mixed

9099 .....W1IE
9100 .....WA4DT
9101 .....JAØKJD
9102 .....DK4FP
9103 .....K6KZM
9104 .....JE2RBK
9105 .....N4JRG
9106 .....EA1DFP
9107 .....W3ZJ
9108 .....AB1QB
9109 .....JK7LXU
9110 .....EA4DEI
9111.....ZL4PLM
9112 .....I8YAV
9113.....IK2EGL

SSB

5287 .....DHØMB
5288 .....PY2CC
5289 .....IZ7UMS
5290.....YB1UUN
5291.....WB2DLF
5292 .....AB1OC
5293.....KJ 4YLO
5294.....EA4DAU

CW

748 .....WR7Q
749 .....BV7CW
750 .....KJ6MBW
751.....JE1NGI

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happening on their receive frequency. My perspective is this: Callers were generally courteous and behaved in an orderly manner. If I struggled with a call, others generally stood by until I completed the QSO. I experienced no jamming on my receive frequency. If I called for a specific continent, I generally experienced cooperation. Of course there was an exception from time to time; perhaps just a simple mistake. So, in my personal experience, pileups were a pleasure to work—worldwide.

Of particular note In the Amsterdam effort was its Top band (160-meter) effort. After an initial operating session met with moderate success, the original 18-meter antenna was replaced by a more effective 28-meter monster. On the first day using the improved antenna system, I heard FT5ZM with an S-9 signal in northwestern Wyoming. After discovering that my amplifier was not functioning properly, I nevertheless called, running only the transceiver at 200 watts. The operator, Nodir, EY8MM, came right back with a "Hi." It seems that we were blessed—during the whole expedition—by the propagation gods. Who would have thought a 160-meter QSO with the deep Indian Ocean would be so easy? Nodir, by the way, is a true Topband devotee. It takes exceptional patience to sit night after night calling CQ and listening to noise much of the time to get nearly 3,600 Top band QSOs in the log. Successful 160-meter operators must be highly dedicated.

In the end, the Amsterdam Island effort netted just over 170,000 QSOs. A unique rate of 21.3%, while historically low, is a quite common number when such a high total number of QSOs are

CQ DX Awards Program

CW

1154 .....N5KAE

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.

Looking Ahead in CQ plus

Here are some of the articles we're working on for upcoming issues of *CQ*:

- **Results, 2014 CQ World-Wide RTTY WPX Contest**
- **Rules, 2014 CQ World-Wide RTTY DX Contest**
- America's Off-Limits Islands, Part II
- "An Inexpensive 75-Watter" Revisited

… and in the new CQ-Plus:

- Hobby Broadcasting and the Digital Revolution
- An LED Flasher and Battery Tester You Can Build
- Circa 1922: U.S. AM Broadcast Radio's Chances for Survival
- Yesterday, Today and Tomorrow – a VHF Timeline

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.cq-amateur-radio.com/cq_writers_guide/cq_writers_guide.html>.

made. Once again, it is clear that if the QSO rate and the accuracy are good, the apparent mayhem on the band is mostly inconsequential. The total number of QSOs probably wouldn't have been much larger even if everyone had called "one at a time." Of course, damage done to DXing by using excessive amounts of the bands is never a good thing and should be avoided. There were some instances of excessive usage, particularly on the 12- and 17-meter bands, but overall control was very good.

The ability to mount such an expedition, with such great success, was due in great part to the excellent planning and execution of the effort. It required much manpower and expertise. It also required a large investment. The budget for the expedition came in at roughly $450,000 US. Looking at in another way, the expedition cost about $2.31 US per QSO, much lower than many recent DXpeditions and estimates for large future expeditions. Of course, the cost-per-QSO figure is of great significance to DXers, and considering the overall cost, that cost-per-QSO figure should be a target for future DXpeditions.

By now, the DXing season in the Northern Hemisphere is about over, although the CQ DX Marathon is in full swing, and the higher bands are beginning to suffer the summer doldrums. Top band is long gone, and plans are being made for next season. Still, some good DX is appearing from time to time, so keep listening!

Currently Scheduled

Now to September or later, W7WNN scheduled to be active as 9N7NN ZS1KX is now on Marion Island and has applied for the call ZS8KX. QSL via home call direct only.

July 7–15, KV1J will be /FP at St. Pierre. QSL via LoTW or home call direct.

73, Wayne, N7NG

THE WPX HONOR ROLL

The WPX Honor Roll is based on the current confirmed prefixes which are submitted by separate application in strict conformance with the CQ Master Prefix list. Scores are based on the current prefix total, regardless of an operator's all-time count. Honor Roll must be updated annually by addition to, or confirmation of, present total. If no up-date, files will be made inactive.

MIXED

6777 9A2AA	4344 VE3XN	3265 OZ1ACB	2476 K5UR	1818 KX1A	1276 XQ7UP	1002 IK8YFU	712 ISØEBO	647 PAØQRB	
6769 K2VV	4290 I2PJA	3252 W9IL	2338 I2EAY	1667 SQ7B	1272 KA5EYH	978 V51YJ	711 AG1T	644 KWØH	
6111 W1CU	4276 N6JV	3250 4L1MA	2248 AE5B	1655 SV1DPI	1269 K5WAF	976 KM6HB	710 WS5J	636 ZS2DL	
5570 9A2NA	4129 S58MU	3151 N6QQ	2199 K6ND	1627 K6UXO	1233 HK3W	964 K8ZEE	707 W1/E740F	634 UA3LMR/QRP	
5388 EA2IA	4108 N8BJQ	3042 N6FX	2192 N2SS	1593 S55SL	1217 AB1QB	924 IW9HII	706 OE8TLK		
5102 KF2O	4022 N9AF	3007 W2WC	2133 KØKG	1499 K4HB	1201 IT9ABN	908 K4JC	700 N4FNB	629 WB4SON	
4969 N4NO	3966 IK2ILH	2956 IK2DZN	2060 DG7RO	1462 DL4CW	1196 9A2GA	900 N7ZO	694 KG4HUF	620 PI4DHV	
4860 VE1YX	3943 WB2YQH	2946 YO9HP	2040 W2FKF	1446 DF3JO	1148 W9RPM	899 K4JKB	684 FG4NO	617 PY5VC	
4778 S53EO	3809 SM6DHU	2905 AB1J	2017 AB1OC	1400 NKØS	1116 YU7FW	825 KD4W	682 AI8P	616 DL5JH	
4764 YU7BCD	3786 KC9ARR	2853 N1RR	2016 N2WK	1394 K4CN	1114 K1DX	815 KL7FAP	682 N8HM	615 KØBAM	
4722 YU1AB	3780 K1BV	2736 WD9DZV	2003 VE6BMX	1384 K3CWF	1107 PY2MC	808 W6PN	670 WW3QB	605 IW2FLB	
4563 I2MQP	3429 W2OO	2575 W6OUL	1961 W7CB	1383 IWØHOU	1075 N6OU	807 VA3VF	662 JA7OXR	604 WH7DX	
4444 I5RFD	3429 K9UQN	2705 KG1E	1918 NXØI	1368 LU5OM	1071 K6HRT	751 YB2TJV	662 KJ4BIX	600 IK1RKN	
4442 WA5VGI	3412 9A4W	2532 N3XX	1906 HA8QC	1331 YB1AR	1066 9A3ST	726 K5IC	662 SP8HKT	600 KB9OWD	
4438 ON4CAS	3335 JN3SAC	2515 AG4W	1862 VE9FX	1329 DK8MCT	1066 JA1CKE	725 WK3N	653 KK3Q	600 K9OHI	
4389 W9OP	3305 JH8BOE	2512 N3RC	1838 NE6I	1322 AA4FU	1035 KØKL	723 KØDAN	650 N3YZ		
4389 KØDEQ	3269 W3LL	2499 VE6BF	1818 AK7O	1282 N5KAE	1010 VE3RZ	716 NA1DX	649 RA9OO		

SSB

5297 IØZV	3187 I8KCI	2573 W2OO	2141 N6FX	1861 JN3SAC	1410 S55SL	1089 IT9ABN	883 WA5UA	640 UA9YF
5146 K2VV	3208 KØDEQ	2568 SM6DHU	2098 K5UR	1825 KQ8D	1408 N3XX	1083 KX1A	875 K7SAM	637 K5WAF
5133 OZ5EV	3108 I4CSP	2519 DL8AAV	2094 I8LEL	1800 W6OUL	1386 IK4HPU	1042 IZØBNR	833 DK8MCT	625 4L1MA
4756 VE1YX	2972 SV3AQR	2497 S58MU	2093 W2WC	1641 AE9DX	1386 NXØI	1031 IK8OZP	814 K3CWF	606 KJ4BIX
4542 F6DZU	2939 WA5VGI	2494 KI7AO	2077 AG4W	1623 VE9FX	1258 N1KC	1031 K4CN	802 N6OU	600 WA2BEV
4429 9A2NA	2903 IN3QCI	2493 N6QQ	2076 K2XF	1622 K5CX	1189 NKØS	1022 NW3H	758 IV3GOW	600 WA3PZO
4258 I2MQP	2900 W3LL	2451 EA3GHZ	2057 PT7ZT	1618 AB1OC	1187 IZ1JLG	1017 N5KAE	735 K6HRT	
4208 I2PJA	2873 KF7RU	2376 W9IL	2040 W2FKF	1611 W2ME	1166 NE6I	1012 KU4BP	724 W3TZ	
4113 KF2O	2857 4X6DK	2335 KG1E	2040 AE5B	1550 IK2RPE	1155 DG7RO	1004 K4HB	717 KØDAN	
4011 EA2IA	2711 LU8ESU	2326 CX6BZ	1955 EA3NP	1480 AB5C	1150 VE6BMX	978 EA7HY	717 N3JON	
3607 N4NO	2652 I3ZSX	2209 IK2QPR	1935 SV1EOS	1464 VE7SMP	1146 SQ7B	965 VE6BF	714 YB2TJV	
3335 CT1AHU	2650 IK2DZN	2201 NQ3A	1913 K9UQN	1463 I2EAY	1145 EA3EQT	931 YB1AR	700 N4FNB	
3323 OE2EGL	2613 N8BJQ	2156 YO9HP	1879 K3IXD	1450 K6ND	1098 K4CN	919 KA5EYH	694 KG4HUF	
3274 YU7BCD	2595 EA1JG	2146 N1RR	1873 N3RC	1421 WD9DZV	1089 IZ8FFA	893 W9RPM	690 W6PN	

CW

6197 K9QVB	3918 VE7DP	3214 SM6DHU	2502 JA9CWJ	2081 N6QQ	1505 R3IS	1223 KX1A	884 AE5B	718 AB1OC
5983 K2VV	3828 WA5VGI	3059 K9UQN	2478 W9IL	2069 N3RC	1480 WO3Z	1220 AA4FU	821 HB9DAX	695 S55SL
5951 WA2HZR	3820 W8IQ	2894 IK3GER	2424 W2WC	2029 W6OUL	1447 EA2CIN	1210 DL4CW	813 VE9FX	665 K6HRT
4634 YU7LS	3750 VE7CNE	2880 JN3SAC	2414 N6FX	2010 WD9DZV	1443 WA2VQV	1205 VE1YX	794 LA5MDA	629 IV3GOW
4502 N4NO	3676 S58MU	2862 IØNNY	2381 I2MQP	2010 K5UR	1428 NE6I	1186 NXØI	783 YB1AR	615 JH6JMM
4252 N6JV	3664 KØDEQ	2811 OZ5UR	2373 VE6BF	2008 YO9HP	1389 IT9ELD	1125 IØWOK	753 F5PBL	608 W9RPM
4063 EA2IA	3504 YU7BCD	2805 KA7T	2311 W9HR	1983 EA7AAW	1350 W3LL	1098 LU5OM	743 JA5NSR	600 IK2SGV
4057 LZ1XL	3417 I7PXV	2723 EA7AZA	2212 AC5K	1848 I2EAY	1342 VE6BMX	1078 AG4W	732 SQ7B	
3988 KF2O	3324 N8BJQ	2632 W2ME	2173 N1RR	1607 K6UXO	1283 K6ND	1049 K5WAF	728 KN1CBR	
3964 9A2NA	3234 4L1MA	2560 W2OO	2139 N3XX	1549 AF5CC	1247 DG7RO	891 DK8MCT	720 K4CN	

DIGITAL

2050 W3LL	1546 KF2O	1160 W2OO	1009 GUØSUP	866 SQ7B	778 JN3SAC	697 EA2IA	660 WA5VGI	
1809 N8BJQ	1351 AG4W	1130 N3RC	929 N3RC	834 K3CWF	753 K9UQN	672 K9AAN	601 VA3VF	
1709 N6QQ	1333 YO9HP	1112 AB1QB	924 KØDEQ	810 HK3W	751 KH6SAT	670 IV3GOW		
1676 WD9DZV	1328 IK2DZN	1047 RW4WZ	916 AB1OC	783 YB1AR	737 W9IL	668 KA5EYH		

BY GEORGE TRANOS,* N2GA

Contesting Jargon

Every occupation and hobby has its own language with specific nuances, acronyms, and terminology. Knowledge of this jargon helps people show that they understand and belong. Amateur radio in general, and specifically contesting, is no different. Knowing and using the terms, phrases, and slang are fundamental aspects of the contesting lexicon. Thus, here's a quick guide to help the newer contester feel more conversant and provide a little review to old-timers as well:

Big Gun—A larger station normally running high power with big antennas. A big gun can hold a frequency for an extended period of time and normally is a top scorer in the contest.

Cabrillo Format—Cabrillo is an interface between logging program authors and contest sponsors. It is a simple and practical modification to the ARRL electronic log format, intended to simplify the automation of log collecting and reporting of contest results. With Cabrillo, all computer-generated logs are submitted in a common format so that they can be processed with a greater degree of automation, leading to more accurate and timely publication of the final results.

Claimed Score—The score calculated by the operator and claimed as his/her total. This score is before the entered log has been reviewed by the log checkers.

Contest Club—A minimum of three (ARRL contests) or four (CQ contests) entries from qualified club members must be submitted for a contest club to qualify to be listed for a given contest. Contest clubs are normally divided into subcategories based upon size. An unlimited club must have 51 or more entries (ARRL) and be within a designated size area (175-mile circle for CQ or ARRL). A medium club must have 50 or fewer entries (ARRL) and be within a designated size area (175-mile circle for ARRL). A local club submits 10 or fewer entries and be within a designated size area (35-mile circle for ARRL).

Contest Robot—The computer that receives and automatically screens and scores all electronically submitted contest submissions. The robot will generate a reply e-mail to tell the operator that his/her log has been received, or to request missing information.

Dupes—Duplicate contacts; contacting the same station more than once on the same band and mode is normally not allowed in a contest. This

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Calendar of Events

All year	**CQ DX Marathon**	**http://bit.ly/vEKMWD**
May 24-25	CQ WW WPX CW Contest	http://www.cqwpx.com
June 7	Maritime QSO Party	http://bit.ly/XuxrtY
Jun. 7–8	10-10 PSK Contest	http://www.ten-ten.org/oseason/oseason.html
Jun. 7–8	Alabama QSO Party	http://www.alabamaqsoparty.org/2014/2014Rules.pdf
June 7–8	SEANET Contest	http://bit.ly/1qGOMhb
June 7–8	VK Shires Contest	http://www.wia.org.au/members/contests/wavks/
June 14	Asia-Pacific SSB Sprint	http://jsfc.org/apsprint/aprule.txt
June 14-15	Portugal Day Contest	http://www.rep.pt/portugal_day_contest/rules.html
June 14-15	GACW WWSA CW DX Contest	http://www.wwsatest.org/basesingles.htm
June 14-15	DRCG Long Distance Contest (RTTY)	http://bit.ly/1hn06si
June 14-16	ARRL June VHF QSO Party	http://www.arrl.org/june-vhf
June 14-15	West Virginia QSO Party	http://bit.ly/1oYhYfX
June 21	ARRL Kids Day Contest	http://www.arrl.org/kids-day
June 21	AGCW VHF-UHF Contest	http://bit.ly/1lFdRW0
June 21-22	All Asian CW DX Contest	http://bit.ly/1guffKl
June 21-22	Six Meter Int'l Radio Klub (SMIRK)	http://www.smirk.org/contest.html
June 28-29	ARRL Field Day	http://www.arrl.org/field-day
June 28-29	His Maj. King of Spain SSB Contest	http://bit.ly/1cKAR5V
June 28-29	Ukrainian DX DIGI Contest	http://www.izmail-dx.com/
June (28)???	Championship Guadeloupe 10M SSB	http://bit.ly/XbrQrq
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	Venezuelan Ind. Day Contest	http://yv5rcv.org/reglasindep.aspx
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 6	DARC 10 Meter Digital Contest	http://bit.ly/18gGDIM
July 12-13	IARU HF Contest	http://www.arrl.org/iaru-hf-championship
July 19-20	**CQ WW VHF Contest**	**http://www.cqww-vhf.com/**

duplicate contact is worth zero points. There is a disagreement over whether it is faster to tell these stations that they are a dupe or just work them again for zero points. Sometimes this is determined by the length of the contest exchange. (*But please do not be insulted if a station that you call responds, "You're a dupe." —ed.*)

Entry Class—The specific category defined by the sponsor of the contest that you are entering. Normal entry classes are broken down by single operator and multi-operator, high and low power, operating with or without spotting assistance, single band or all band, single mode or all mode. This varies based on contest.

Exchange—The actual information sent and received. The contest exchange is normally set by the contest sponsor. This is the official data that must be reported as part of the contest log.

High Power—Normally more than 100 or 150 watts. High-power entrants are scored and shown separately from the low-power entries.

Little Pistol—A smaller station normally running low power that has a harder time holding a frequency or may only "search-and-pounce" and not "run" at all during a contest. (See below for definitions of "run" and "search-and-pounce.")

Log—The list of contacts made during the contest. The log should include the date and time of the contact (expressed in Coordinated Universal Time [UTC]), the callsign of each station, the frequency in Megahertz (or amateur radio band expressed in wavelength), the mode (CW, RTTY, SSB, etc.), the exchange sent and received. The log is what is submitted to the contest sponsor to enter the contest.

Low Power—Normally less than 100 or 150 watts. Low-power entrants are scored and shown separately from the high-power entries.

Multiplier—A station that increases your score by being of a special nature such that it multiplies the point value of the contact. Multipliers can be unique countries, states, prefixes, CQ zones, or any other special type as defined by the contest sponsor. Without multipliers, every contest would just be a competition to see who can make the most contacts. Multipliers create the need for an operating strategy.

Operating Strategy—Your specific plan to determine how to obtain the best possible score. This includes determining when to run and when to search and pounce, which band you should be on at what time, when you should take rest and meal breaks, etc.

Packet Cluster—A system that allows the passing of the callsign and frequency of a needed station via packet radio. These wireless computer networks used AX.25 data link layer protocol. As time went on, many of these spots were passed over the Internet as well. Using packet spots puts you into an "assisted" category.

Point and Click—The operating style employed by operators using spotting assistance in which they highlight a spot and then use their computer mouse to click on it. This puts the selected station into their logging window and changes the frequency of their radio to the selected station. The spots are potential contacts. Some logging programs show multipliers in a different color to indicate a higher value for that contact.

QSO Points—The number of points assigned to each contact. Some contests may have a different point system for CW contacts than SSB contacts. Some may assign point values per contact based upon whether the other station is on a different continent. Other contests (such as the CQ WPX) assign points based upon band, where lower frequencies have higher values per contact.

QTC—A QTC is the report of a contest QSO back to another station. QTCs are not used in most contests. The only large contest that uses QTCs is the Worked All Europe (WAE) contest. For every QTC series that is transmitted or received, the QTC number, time, and frequency band of the QTC transmission must be logged. If any of this data is missing from your log, no credit will be given for this QTC series. The QTC is treated like a multiplier in the WAE contest.

Radiosport—A competitive amateur radio operating event. This is another word for contesting! The object is to work as many stations as possible in as many places as possible as quickly as possible.

Rate—The number of contacts per hour that you make. Average rates are sometimes shown as the contacts per hour for the last 10 contacts, for the last 100 contacts and for the last entire hour. Having a high rate means you are making lots of contacts and this increases your likelihood of doing well in the contest. Maintaining your rate is the biggest challenge for the big gun contester. Any drop in rate may cause a change in operating plan, creating the need to change bands or switch to search-and-pounce.

Results—The final scores as reported by the contest sponsor. Your actual score may be different from your claimed score. It is often reduced after log-checking. The score may be changed based upon the UBN report. UBN stands for *unique, broken and not-in-log* (see below for explanation).

Reverse Beacon Network (RBN) —Instead of beacons actively transmitting signals, the RBN is a network of stations listening to the bands and reporting what stations they hear, when and how well. You can see band openings in near-real time on an animated map. You can call a quick CQ, and see which reverse beacons hear you and how strong you are. The real breakthrough is in the database of past "spots." You can instantly find out what stations, from a given country or zone, have been heard, at what times and on what frequencies. You can see when you've been spotted, who spotted you, and how loud you were. (For more info, see <www.reversebeacon.net>).

Run—The ability to call CQ and respond to stations calling you. Running stations are those that hold a frequency and continue to make contacts one after the other. During a good run, the station may not even call CQ but may just give its callsign. This is enough for the waiting stations to know that they should give their callsign to answer.

Score—The total computed number of points for the contest. This is normally determined by taking the number of contacts (QSOs) and calculating the total QSO points and then multiplying that amount by the number of multipliers. Some contests also factor in a power multiplier (or other additional point multiplier). The total score is used to determine the winner of the contest.

Search-and-Pounce—The method of searching the band for stations to contact and then working them for contest credit. Operators who search and pounce are sometimes looking for multipliers to enhance their contest score. For a contact to be made, a running station has to be called by a station that is search and pouncing.

Single-Band Entry—Entering a contest by making contacts only on a single amateur radio band. The results for single-band entrants are scored and shown separately from all-band entries.

Skimmer—This is a multi-channel Morse code (CW) decoder and analyzer program that uses a sensitive CW decoding algorithm based on the methods of Bayesian statistics, which allows simultaneous decoding of all CW signals in the receiver passband. The callsigns are extracted from the decoded

messages and can be utilized for spotting assistance. Some CW skimmers also feed their output to the DX spotting assistance network.

SO2R—Single Operator, 2 Radios. The use of more than one radio at one time allows an operator to listen to a second band while running on the primary band. This allows turning "down time" while a CQ is being sent into productive time to search for multipliers on the second radio.

Spotting Assistance—The use of any technology or other source that provides callsign 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 callsign and frequency decoding technology (e.g., CW Skimmer or Reverse Beacon Network), or operating arrangements involving other individuals. The use of spotting assistance generally puts you into an "assisted" category.

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 (for CQ contests). Antennas must be physically connected by RF transmission lines to the transmitters and receivers.

Top Ten—The top ten highest scoring stations in a given entry class.

UBN Report—A report generated by log checking done by the contest sponsor. The sponsor's computer checks your log against the logs of the other stations. If a contact in your log is not in the other station's log, you suffer a "not-in-log" penalty. If the callsign that you report is different than the actual callsign, you suffer a "broken" call penalty. If a callsign you work is only shown in your log, it is classified as a "unique" call. While unique calls are possible, log-checking has shown that most unique calls are really broken calls and while penalties are not normally assessed for uniques, they are shown for your review. Someone with a large number of unique calls in his/her log may be scrutinized further.

Summary

Knowledge of contesting jargon will help the operator be aware of the contest rules and develop his/her skills to be more competitive. If you can "talk the talk," then you can "walk the walk." Know and use the right jargon to improve your contesting vocabulary!

73, George, N2GA

what's new

Book Corner: ARRL Releases Slew of New Books

The publishing arm of the ARRL has not been resting on its laurels as it has published a slew of new titles in print and on DVD.

Topping the list is the ARRL Repeater Directory for 2014-2015. Every repeater in the U.S. is listed by state, frequency, and mode. It is available in spiral bound or pocket-sized books.

The ARRL has also released all of its 2013 periodicals on a single DVD. This DVD consists of 12 months of QST, 6 months of National Contest Journal, and 6 months of QEX. In addition, the DVD contains source code for software projects and PC board patterns, Section News, and Contest Soapbox and Results. The DVD can be read by Mac and Windows and requires Adobe Reader.

Next on the print side is Your First Amateur Radio HF Station by Steve Ford, WB8IMY. Your First Amateur Radio HF Station is geared toward newer hams. There are six chapters dealing with topics from antenna choices to accessories like microphones, headphones, and a station log. WB8IMY writes extensively on antenna choices, noting that "The quality of my antenna system will have the greatest impact on the effectiveness of my station." In other chapters, WB8IMY explains how to buy your transceiver, whether you need an amplifier, and how to set up your computer to work with your HF station.

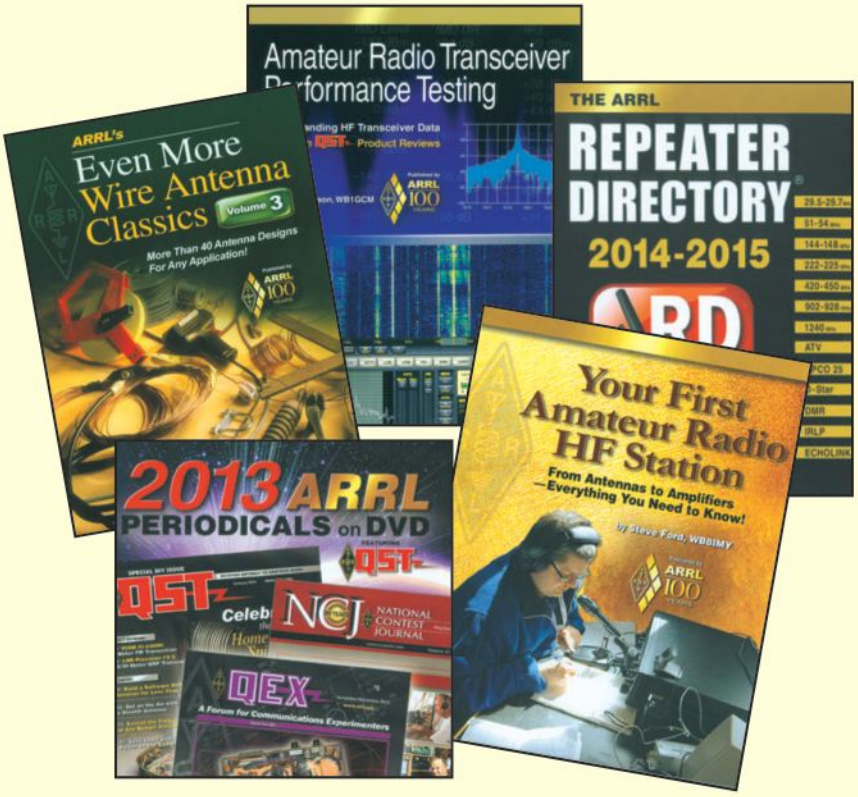
Understanding Radio Transceiver Performance Testing is a compendium of data from QST's product reviews. However, Bob Allison, WB1GCM, ARRL's Laboratory Senior Test Engineer, also explains, in detail, the specification and performance tables inside those reviews.

In addition, he explains how the major tests are conducted, the significance of each of the tests, and what the numbers mean.

Even More Wire Antenna Classics, Volume 3 has over 40 antenna designs culled from the pages of QST from 2002 through 2013. Some designs include portable antennas, directional antennas, multiband antennas, single-band antennas, and stealth antennas.

For more information contact ARRL, 225 Main Street, Newington, CT 06111-1494. Website: <http://www.arrl.org>.

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.*



BY TOMAS HOOD,* NW7US

Take it to the Field Special

Field Day Fun, Again!

A Quick Look at Current Cycle 24 Conditions

(Data rounded to nearest whole number)

Sunspots
Observed Monthly, March 2014: 92
Twelve-month smoothed, September 2013: 73

10.7 cm Flux
Observed Monthly, March 2014: 150
Twelve-month smoothed, September 2013: 132

***Ap* Index**
Observed Monthly, March 2014: 6
Twelve-month smoothed, September 2013: 8

One Year Ago: A Quick Look at Solar Cycle Conditions

(Data rounded to nearest whole number)

Sunspots
Observed Monthly, March 2013: 58
Twelve-month smoothed, September 2012: 58

10.7 cm Flux
Observed Monthly, March 2013: 111
Twelve-month smoothed, September 2012: 119

***Ap* Index**
Observed Monthly, March 2013: 9
Twelve-month smoothed, September 2012: 8

The annual ARRL Field Day is June 28 and 29. The official Field Day 2014 introduction discussed how much we've seen change in the last one hundred years, and our radio technology hobby has seen incredible advancement.

However, the core objective of Field Day, established since the earliest days of amateur radio, has not changed that much. As is spelled out by the ARRL, the Field Day exercise is to "work as many stations as possible on any and all amateur bands (excluding the 60, 30, 17, and 12-meter bands) and to learn to operate in abnormal situations in less than optimal conditions. Field Day is open to all amateurs in the areas covered by the ARRL/RAC Field Organizations and countries within IARU Region 2. DX stations residing in other regions may be contacted for credit, but are not eligible to submit entries." This translates to plenty of fun, and opportunity for skill-building.

Figs. 1 and 2 are examples made with the propagation modeling software ACE-HF Pro version 2.06 (see <http://hfradio.org/ace-hf/>) of area coverage using two modes of operation from Omaha, Nebraska during Field Day 2014. In the first area coverage map, a plot is made of a 100-watt SSB signal on 20 meters at 1800 UTC. Yagi antennas are assumed, with the expected smoothed sunspot count for June 2014. The predictions were run with a goal of 50-percent reliability, meaning you'd have a 50-50 chance that your signal would be heard in the area-coverage footprint. At 1800 UTC, I can expect that 50% chance of reaching both coasts of the United States of America.

The second map (fig. 2) plots a 5-watt PSK31 signal on 20 meters at the same time of day. Notice the extended range of coverage on the digital signal (and, yes, this is correct: we're talking a 5-watt, QRP signal!). In addition to reaching more potential stations, the Field Day rules afford extra points to stations running digital modes. By running PSK31 at 5 watts, you will out-perform (in terms of area coverage) a SSB station running 100 watts, and you will get all those bonus points for each contact! Don't forget that running CW is also worth extra points, and will give you much the same efficiency advantage as gained when running digital.

Running ACE-HF models on 15 and 10 meters, the forecast is dismal. Even with digital modes, the *F*-layer mode propagation models on these upper HF bands indicate limited openings, if any, from the Omaha, Nebraska location. Of course, I am certain that this year will be like most years in which

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LAST-MINUTE FORECAST

Day-to-Day Conditions Expected for June 2014

	Expected Signal Quality			
Propagation Index.....	(4)	(3)	(2)	(1)
Above Normal: 2-4, 9-10, 16-17, 20-25, 27, 29-30	A	A	B	C
High Normal: 1, 5, 8, 11-12, 18-19, 26, 28	A	B	C	C-D
Low Normal: 7, 13, 15	B	C-B	C-D	D-E
Below Normal: 6, 14	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 good (B) in June 1st, excellent (A) on the 2nd through the 4th, good (B) on the 5th, 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.

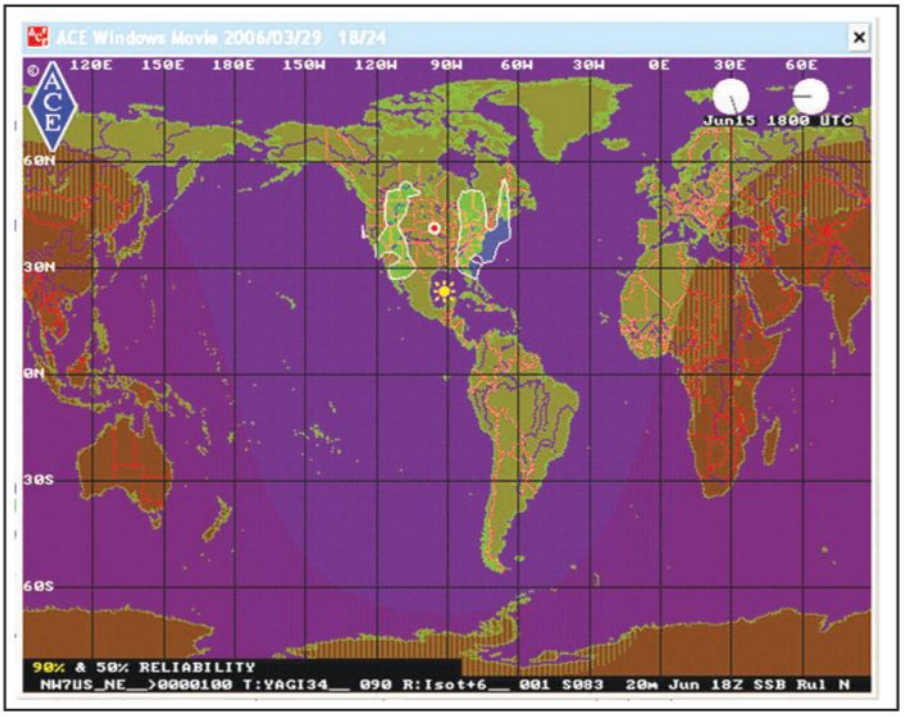

Fig 1. The area in which a 100-watt SSB Field Day signal can be heard in June 2014 on 20 meters at 1800 UTC from Omaha, Nebraska. This assumes a 50% reliability factor with a transmitting Yagi antenna. (Source: ACE-HF Pro, by NW7US)

sporadic-*E* propagation will enable openings on 10 and 6 meters, possibly giving great short-range and some long-range (North American) path openings.

One of the best available methods to predict HF propagation conditions in advance is the 27-day recurrence tendencies of geomagnetic, solar, and ionospheric conditions. It is not an absolute method, but it does give a very good indication of what is expected. This column is being written in April, about three 27-day solar rotation cycles away from the start of the Field Day weekend. Based on a study of the patterns expected during the next three rotational periods of the Sun, it looks as if conditions for Field Day, June 28–29, will be good to excellent with low geomagnetic activity due to coronal activity.

Predictions for one 27-day rotational period are far more accurate than for three 27-day rotational periods. Be sure to carefully check conditions on June 1 and 2, since this would be one rotational period before the Field Day weekend. There is better than a 90-percent chance that conditions observed on those days will recur during the event weekend. Remember, also, that short-skip propagation often by the sporadic-*E* (*Es*) mode is a big part of Field Day on-air activity, especially on the higher HF bands and even on low VHF bands.

If you wish to maximize your on-air efforts, you'll want to check out the Last-Minute Forecast on the first page of this column. Use this chart, as well as a good forecasting and analysis software tool, such as ACE-HF <http://hfradio.org/ace-hf/>, to help you prepare operating guides for your Field Day operations. For the very latest update on conditions, take a look online at my up-to-the-day Last-Minute Forecast chart, available on my Space Weather and Radio Propagation Center <http://SunSpotWatch.com> (the chart is in the left panel on the main page).

June Propagation

June marks the changeover from equinoctial to summertime propagation conditions on the shortwave (HF) bands. Solar absorption is expected to be at seasonally high levels, resulting in generally weaker signals during the hours of daylight when compared to reception during the winter and spring months.

When using the Last-Minute Forecast chart, realize that you should use either the (3) or (2) column, as we are in a phase of the moderately active phase of the solar cycle. Use the (2) column if the flux is averaging around 80 to 120 for a few days or more, but use the (3) column when the flux is higher than 120.

Ten-Meter propagation to DX locations far to the east and west is a rare event during the peak of summer. With the low to moderate solar activity at this stage of the cycle, I don't expect to see

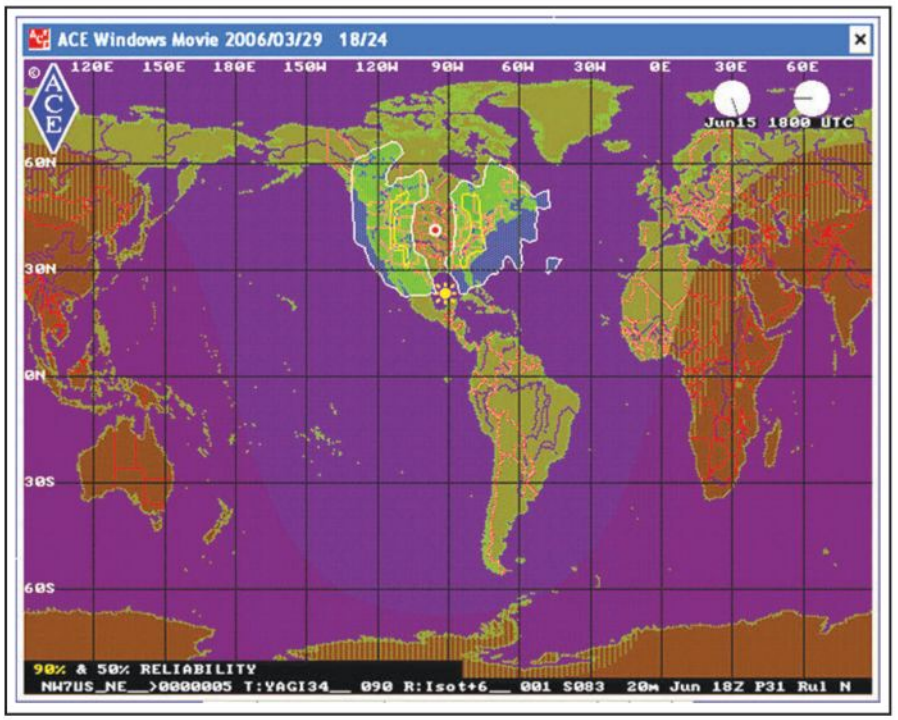

Fig 2. The much greater area in which a 5-watt (yes, that is correct, five watts!) PSK-31 Field Day signal can be heard in June 2014 on 20 meters at 1800 UTC from Omaha, Nebraska. A PSK-31 or a CW Morse code signal is much more efficient than an SSB signal with all other conditions being the same. Get double points, and more contacts, working CW and/or PSK31! (Source: ACE-HF Pro, by NW7US)

much on 10, except via sporadic-*E* short-skip propagation. Solar activity just won't create a high-enough maximum usable frequency (MUF) on most *F*-layer DX paths. North and south paths on 10 meters may yet present opportunities for limited and short-lived DX, especially around sunrise and sunset.

Seventeen and 15 meters will be just a bit more reliable than 10, holding some promise, but these will still be a challenge with the decreased solar activity.

Twenty meters will be poor to fair during the hours of darkness, and good to fair during daylight hours. The best openings on 20 will be the hours around sunrise and sunset.

Recurring coronal holes will cause occasional periods of geomagnetic storminess during June, degrading higher latitude signal paths more than middle- and low-latitude paths. Coronal holes and the associated high-speed solar winds containing clouds of plasma released by the coronal holes are the bane of propagation. These geomagnetic storms will play rough on HF propagation. In addition, noise from electrical storms increases considerably during June and the summer months. These higher static levels will make DXing on 40, 80, and 160 more of a challenge.

announcements *(from page 9)*

ing lot in Flushing Meadows Corona Park. Contact: Stephen Greenbaum, WB2KDG, (718) 898-5599 (nights only). Email: <wb2kdg@arrl.net>. Website: <http://www.hosarc.org>. Talk-in 444.200 repeat (PL 136.5). VE exams.

PLANO, TEXAS — HamCom Inc. will hold the **Ham-Com Amateur Radio Convention** Friday, June 13; and Saturday, June 14 at the Plano Center. Contact: Ham-Com Inc., P.O. Box 260721, Plano, TX 75026. Website: <http://www.hamcom.org>. VE exams.

KNOXVILLE, TENNESSEE — The Radio Amateur Club of Knoxville will hold the **48th Annual Knoxville Hamfest & Electronics Exposition** and **ARRL Tennessee State Convention** Saturday, June 14 at the Kerbala Temple. Contact: Radio Amateur Club of Knoxville, P.O. Box 50514, Knoxville, TN 37950-0514. Lou Dreinhoefer (865) 995-1588. Email: <wb3jkq@arrl.net>. Website: <http://www.w4bbb.org>. VE exams.

LIME RIDGE, PENNSYLVANIA — The Columbia-Montour Amateur Radio Club will hold the **24th Annual CMARC and Bloomsburg Hamfest** Saturday, June 14 at the Lime Ridge Community Center. Contact: Randy, N3JPV, (570) 759-2306. Email: <n3jpv@verizon.net>. Website: <http://www.qsl.net/cm-arc/>. Talk-in 147.225+ (PL 85.4). VE exams.

ORCUTT, CALIFORNIA — The Satellite Amateur Radio Club will hold the **Santa Maria Ham Radio Swapfest and BBQ** Saturday, June 14 at the Newlove Picnic Grounds. Website: <http://www.satellitearc.com>. Talk-in 145.14- (PL 131.8).

PORT LUDLOW, WASHINGTON — The Port Ludlow Amateur Radio Club (N7PL) will hold its **8th Annual Old Fashion – Tailgater Swap Meet** Saturday, June 14 at the Grace Christian Center Parking Lot. Website: <http://www.n7pl.org>. Talk-in 146.520 simplex.

POST FALLS, IDAHO — The Kootenai Amateur Radio Society will hold its **Hamfest 2014** Saturday, June 14 at the American Legion Hall-Post Falls. Contact: Jim Monroe (208) 755-2100. Email: <n7esu@arrl.net>. Website: <http://www.k7id.org>. Talk-in 146.98- (PL 127.3). 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, June 15 at the Albany Street Garage. 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).

MONROE, MICHIGAN — The Monroe County Radio Communications Association will hold the **Monroe Hamfest and Computer Show** Sunday, June 15 at the Monroe County Fairgrounds. Contact: Fred VanDaele, KA8EBI, 4 Carl Drive, Monroe, MI 48162. Email: <ka8ebi@yahoo.com>. Website: <http://www.mcrca.org>. Talk-in 146.72-.

WHEATON, ILLINOIS — The Six Meter Club of Chicago will hold its **57th Annual Hamfest** along with the **Antique Radio Club of Illinois Swap Meet**; and the **Midwest Classic Radio Net Hamboree** Sunday, June 15 at the DuPage County Fairgrounds. Contact: Six Meter Club of Chicago, 3532 Raymond Avenue, Brookfield IL 60513-1204. Phone: (708) 442.4961. Email: <wd9gjk@arrl.net>. Website: <http://www.k9ona.com>, <http://www.antique-radios.org>. Talk-in 146.52 or 146.37+ (PL 107.2). VE exams.

LOWELL, MICHIGAN — The West Michigan Youth Club will hold the **WMYC Hamfest** Saturday, June 21 at Lowell High School. Contact: Al Eckman, 725 Bowes Road, Apt. K6, Lowell, MI 49331. Phone: (616) 450-4332. Email: <al.eckman@comcast.net>. Website: <http://www.westmichiganyouthclub.org>. Talk-in 146.620- (PL 98.8) or 145.270- (PL 94.8). VE exams.

MILFORD, OHIO — The Milford Amateur Radio Club will hold the **24th Annual Milford Hamfest** Saturday, June 21 at the Eastside Christian Church. Contact: Jim, WB8RRR, (513) 831-6255. Email: <wb8rrr@arrl.net>. Website: <http://www.w8mrc.com>. Talk-in 147.345+. VE exams.

NEWINGTON, CONNECTICUT — The Newington Amateur Radio League will hold **NARL Fest 2014** Saturday, June 21 at St. Mary's School. Website: <http://www.narlhamfest.org>. Talk-in 145.450. VE exams.

PISCATAWAY, NEW JERSEY —The Raritan Valley Radio Club will hold the **W2QW-Hamfest** Saturday, June 21 at Piscataway High School. Contact: Drew, W2OU, (732) 801-4654 (call before 9 p.m.). Email: <drumor@optonline.net>. Website: <http://www.w2qw.org>. Talk-in 146.625-, 442.250- (PL 141.3), or 146.520 simplex. VE exams.

STAR CITY, WEST VIRGINIA — The Mon County Amateur Radio Club will hold its **HAMfest** Saturday, June 21 at the Saint Mary's Catholic Church Outdoor Pavillion. Contact: Mon County ARC, P.O. Box 364, Dellslow, WV 26531. Talk-in 147.075 (PL 103.5).

TIMONIUM, MARYLAND — The Mid-Atlantic Antique Radio Club will hold **RadioActivity 2014** Thursday, June 26; Friday, June 27; and Saturday, June 27 at the Holiday Inn Timonium. Contact: Chris Kocsis, 7315 Oriole Avenue, Springfield, VA 22150-4302. Phone (703) 913-9143. Email: <chrisk33@cox.net>. Website: <http://www.maarc.org>.

Friedrichshafen, Germany — Ham Radio at Lake Constance & Maker World, DARC Conference, June 27–29. For details, go to: <http://www.hamradio-friedrichshafen.de>/.

Special Event Listings:
For additional and more comprehensive special event listings, visit: <http://www.CQPlusSpecialEvents.blogspot.com>.

The 30- and 40-meter bands should offer good DX conditions during the early morning, late evening, and the nighttime hours despite higher static. Look for Europe and Africa as early as sunset. After midnight, start looking south and west for the Pacific, South America, and Asia. Short-skip should be possible out to about 750 miles during the daytime.

Expect some openings on 80 meters, similar to how 40 meters will be acting. Fairly frequent short-skip openings up to 1000 miles are possible during darkness, but expect very few daytime openings with all the static and absorption.

Sporadic-*E* propagation starts to peak during June. Expect an increase in the number of short-skip openings on HF, and often on 6 and 2 meters, with paths open between 50 and 2300 miles.

VHF Conditions

The summertime sporadic-*E* season for the Northern Hemisphere begins in force in May. By June, things could well be hot on 6 meters and there might even be openings on 2 meters. During the late spring and summer months, a sharp increase at mid-latitude of *Es* propagation occurs. Through June you can expect to see 20 to 24 days with some *Es* activity. Usually these openings are single-hop events with paths up to 1000 miles, but June's *Es* openings are often double-hop. Europe can generally be worked from the East Coast throughout June.

During the daylight hours, monitor 6 meters for transcontinental openings, as well as between Hawaii and the western states, and the Caribbean and Central and South America. The best time to look for these is during the afternoon hours, especially when conditions are High Normal or better.

There is usually a seasonal decline in transequatorial (TE) propagation during the summer months, but some 6-meter openings may still be possible in June. The best time to catch an opening across the geomagnetic equator is between 8 and 11 PM local daylight time.

Refer to the Last-Minute Forecast for those days in June that are expected to be in these categories. Point your antenna north when this condition exists. You will find that CW is the modulation and mode of choice, as the signals you will hear on aurora will be raspy and distorted.

Current Solar Cycle Progress

The Royal Observatory of Belgium reports that the monthly mean observed sunspot number for March 2014 is 92.2, down from February's 102.8. That is still up from the many months previous to February. The 12-month running smoothed sunspot number centered on September 2013 is 73.1. The forecast for June 2014 calls for a smoothed sunspot count of 83, give or take 7 points.

The Dominion Radio Astrophysical Observatory at Penticton, BC, Canada, reports a 10.7-cm observed monthly mean solar flux of 149.9 for March 2014, down a bit from February's 170.3. The 12-month smoothed 10.7-cm flux centered on September 2013 is 132.3. The newly released predicted smoothed 10.7-cm solar flux for June 2014 is 139, give or take 7 points.

The observed monthly mean planetary *A*-index (*Ap*) for March 2014 is 6, down from the more active 12 of February. The 12-month smoothed *Ap* index centered on September 2013 is 7.8. Expect the overall geomagnetic activity to be varying greatly between quiet to minor storm levels during June.

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

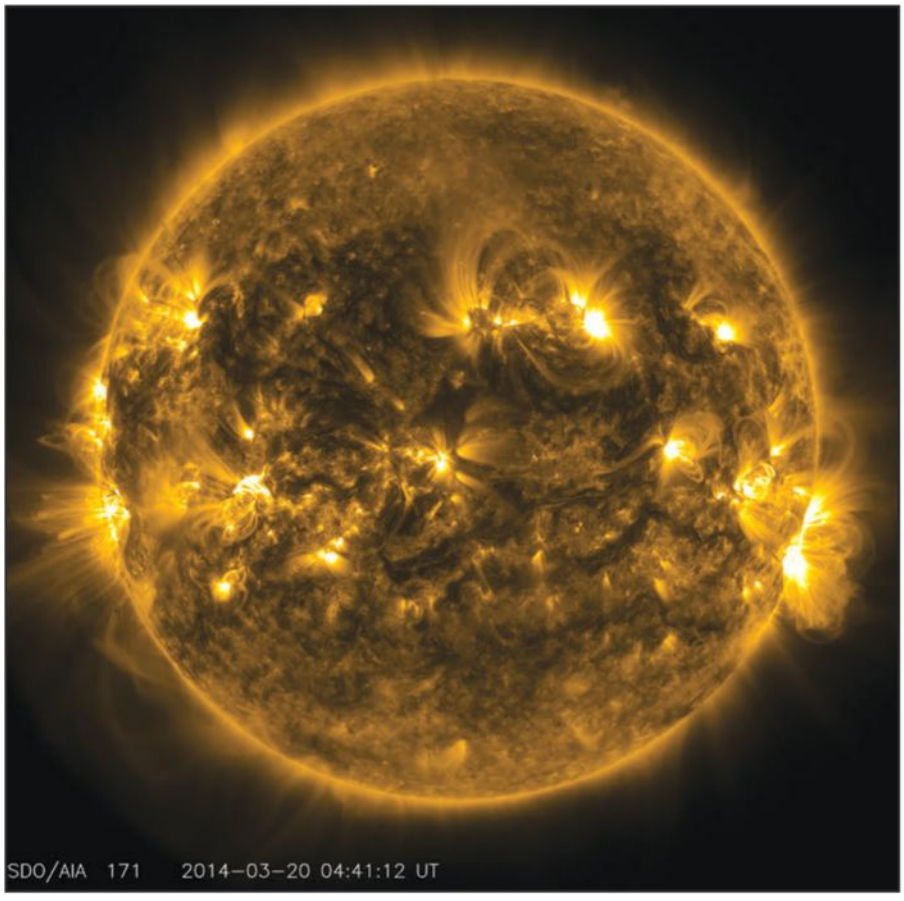

Fig. 3. The Sun as seen by the Solar Dynamics Observatory's Atmospheric Imaging Assembly (SDO/ AIA) on 20 March 2014, revealing a fair number of sunspot regions as revealed by the stunningly beautiful magnetic fiels lines (colored artificially by SDO; this image is filtered at 171 Angstroms in extreme ultraviolet, EUV). During February and March solar activity increased significantly, indicating a second peak in sunspot Cycle 24. Such activity came with a series of x-ray flares and associated cornonal mass ejections and resulting geomagnetic actiivity. However, overall, this activity has increased the upper-shortwave propagation over many paths globally. (Credit: SDO/AIA)

What You've Told Us…

The survey in our February issue—the first containing our *CQ Plus* digital supplement and including readers from *Popular Communications, CQ VHF* and *WorldRadio Online*—asked about your interests in the broader radio hobby, your start in radio and your preferred device for reading a digital magazine.

It was no surprise that 84% of the readers who responded currently enjoy HF amateur radio, followed by VHF ham radio at 66% and radio technology (including building and restoring equipment) at 42%. Close behind (at 41%) was shortwave listening—confirming our belief that many hams are also SWLs—followed by VHF/UHF scanning/monitoring and broadcast band DXing, at 27% each; broadcast history (14%), personal 2-way radio—such as CB or FRS—(12%) and other (9%).

Asked how you got *started* in the radio hobby, 39% of you responded shortwave listening, followed by HF amateur radio (15%), personal 2-way radio (12%), broadcast band DXing (9%), friends or relatives who were hams (8%), VHF/UHF ham radio and VHF/UHF scanning (5% each).

Moving to the changes in our publications, 69% of the survey respondents said that prior to the February issue, they were already *CQ* subscribers, while 35% had been subscribers to *Popular Communications*, 28% to *WorldRadio Online,* 27% to *CQ VHF* and 20% to none of our magazines. Clearly, there was quite a bit of overlap here, further confirming our belief leading up to the merger that many of our readers have multifaceted interests in the broad radio hobby.

Finally, we asked your preferred device for reading a digital magazine, and tablets (such as iPads) took the top position at 41%, followed by desktop computers (30%), laptops (12%), none (8%), smartphones (5%) and e-readers (such as the Kindle Fire) at 4%.

This month's free subscription winner is Jim Grazulis, KA3KSP, of Carnegie, Pennsylvania.

Reader Survey
June 2014

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

*** Respond online** at <www.surveymonkey.com/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:** June Reader Survey, CQ magazine, 25 Newbridge Rd., Hicksville, NY 11801.

We will continue to select one respondent to each survey to receive a free one-year subscription (or extension) to *CQ*. This month, our "Take it to the Field" special focuses on some less-common portable operations ... or at least, we think they are … which is why this month's survey deals with your portable passions…

1. About how much of your overall operating (including listening) is done away from your home station?

100% 1
76–99% 2
51–75% 3
26–50% 4
1–25% 5
None 6

2. Where do you do most of your away-from-home radio activities? (Choose one)

At a club station, school station or friend's home station 7
In a fixed portable location (e.g., vacation home or hotel) 8
In an RV or camper 9
In my personal car, truck or motorcycle 10
In my work vehicle 11
On a bicycle 12
On a boat or ship 13
On a trail or other off-road location 14
On an airplane 15
Other (please tell us what) 16
None 17

3. Which of these modes do you enjoy while operating away from home? (Choose all that apply)

Amateur television 18
CW 19
Data modes (e.g., RTTY, WSJT) 20
Digital voice (e.g., D-STAR) 21
FM voice 22
SSB voice 23
Other (please tell us what) 24
None 25

4. Which of these activities do you enjoy while operating away from home? (Choose all that apply)

Activating islands, summits, castles or similar locations (xOTA programs) 26
Activating lighthouses 27
Amateur Radio Direction Finding (foxhunting) 28
Contesting 29
DXing 30
EME (Moonbounce) 31
Emergency/Public Service 32
FM/Repeaters 33
HFPack (HF operating from a hike-to location) 34
QRP (low power) 35
Satellites 36
Other (please tell us what) 37
None 38

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

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Effective with the 2/14 issue, content from *Pop'Comm*, *CQ VHF* and *WorldRadioOnline*, will be incorporated into *CQ*'s digital edition as a supplement called "*CQ Plus*" — making *CQ* the single source for articles on the broader aspects of hobby radio, from shortwave listening and scanner monitoring to personal two-way services and Internet radio, as well as amateur radio.

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washington beat

COMPILED BY RICHARD FISHER, KCQ6PC

FCC Commissioner Calls for Peace with TV Broadcasters

In early May, FCC Commissioner Ajit Pai wondered "If it's time to call Dr. Phil and see if he is available to mediate" the growing tension between TV broadcasters and the FCC.

At issue is the imposition of stiffer regulations on business partnerships between local TV stations. In April, National Association of Broadcasters President Gordon Smith suggested that the FCC views the television industry as "a dinosaur that needs to be put out of business," according to a story in the *Los Angeles Times*.

"Every segment of the industry we regulate should have confidence that the Commission will give them a fair hearing," Pai said, "and none should be under the impression that the FCC is out to get them." ***(FULL STORY:*** *<http://lat.ms/1fPWu6N>. – KI6SN.)*

WH2XBA Issued for VLF Radio Testing in Nine States

New licenses to cover experimental operations that include Very Low Frequency (VLF) have been issued by the FCC's Office of Engineering and Technology, according to *TV Technology*.

WH2XBA allows operation in the 27- to 59-kHz band for fixed and mobile amateur radio testing to designated stations in Massachusetts, New York, North Carolina, Alaska, Arizona, Texas, Virginia, Alabama, and Connecticut. ***(DETAILS:*** *<http://bit.ly/1inJPSL>. – KI6SN.)*

Republicans On Tech Panel Ask Commission to Back Off on 'Big Two'

Republicans on the U.S. House of Representatives Technology Panel are calling on the FCC to dump plans restricting the top two U.S. wireless carriers — Verizon and AT&T — in the sale of airwaves, according to Reuters.

"House Energy and Commerce Committee Chairman Fred Upton and every other Republican on the communications and technology subcommittee echoed the arguments of Verizon Communications Inc. and AT&T Inc. in a letter to FCC Chairman Tom Wheeler ahead of a May 15 FCC vote on the rules for next year's auction," the story reported. ***(FULL STORY:*** *<http://reut.rs/1invtC6>. – KI6SN.)*

FCC Seeks $48,000 Fine Against Alleged Florida Cellphone Jammer

The FCC issued Jason R. Humphreys a Notice of Apparent Liability for Forfeiture to the tune of $48,000 for allegedly using a cellphone jammer during his daily commute between Seffner and Tampa, Florida.

The FCC charged Humphreys with three counts of illegal signal jamming — one for each of the days he was monitored. Each violation carries a maximum penalty of $16,000. Operating a cell phone jammer impedes public safety, as it prevents citizens and emergency personnel from making 911 or other emergency calls, the FCC said. The Commission called Humphreys' actions "egregious." ***(THE FCC CITING:*** *<http://fcc.us/1kIADLy>. – KI6SN.)*

Former Illinois AM Station Owner Agrees to $185,000 Fine for Misrepresentation

The former owner of a Rockford, Illinois AM station has agreed to pay a $185,000 fine "to resolve allegations that it misrepresented a show that promoted products and services on the air," according to a report in *The Rock River Times*.

An FCC order released in April said Maverick Media failed to disclose to listeners that some guests on *Stateline Showcase* "paid the station to appear and push their products," the story said. "The show was hosted by longtime Rockford radio personality Doug McDuff."

"The Sponsorship Identification Laws establish the general obligation of a broadcast station to air sponsorship identification announcements whenever any 'money, service, or other valuable consideration' is paid or promised to the station for the broadcast of program material," the order reads. ***(FULL STORY:*** *<http://bit.ly/1o2CL5P>. – KI6SN.)*

CQ plus

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BY GERRY L. DEXTER*, WPC9GLD

Greece Has the Word — 'NERIT' From Now On

The question has hung around the shortwave news circuits for months. Now it appears to have been resolved, so we'll have a new, legitimate name for Greek radio and it should be on the air now, never mind that Greek radio stayed on the air throughout the tumultuous broadcast affair.

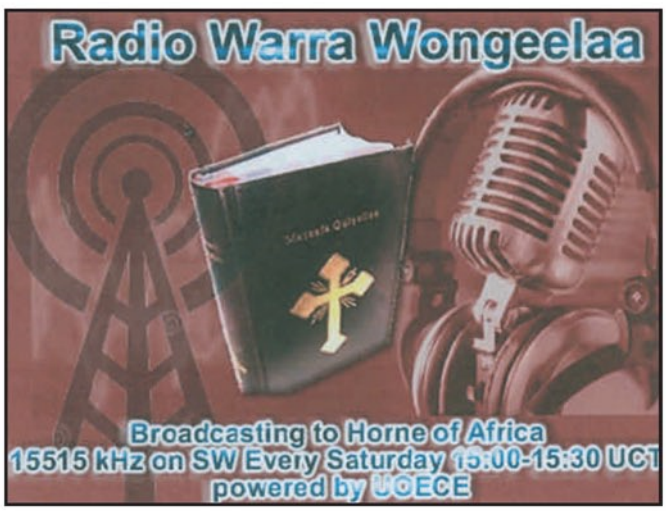
Greek radio is now appearing under the "NERIT" flag, which, I presume, is an abbreviation for "Greek Public Radio and Television."

Thanks, BBC: Another Fiscal Smackdown

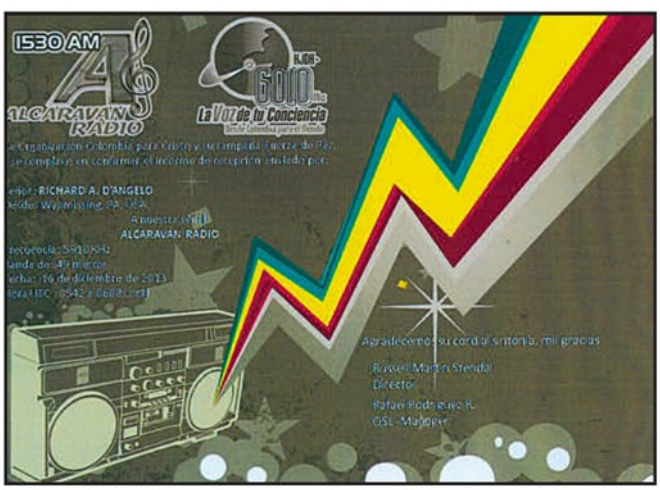
More than a decade ago — 2001 to be precise — the BBC announced that it was ending its broadcasts to North America. That single announcement was enough to make the "main stream" media take one of its rare notices that shortwave even so much as existed. It's been all downhill from there.

Languages were scratched, personnel made "redundant." Relay sites were trashed in almost annual massacres, (Cyprus, Seychelles, Ascension are down, if not yet completely out). Now comes the latest negative: the BBC will undergo further belt tightening, to the tune of $15 million. Those savings will be directed to adding or improving new video and digital services. Peter Horrocks, BBC's Director of Global Issues, said achieving these changes will be "a real stretch." He notes that they need to plan for yet another $8 million in cuts and admits there'll be a "further reduction in shortwave transmissions." Talk about writing on the wall ... *or would you believe a slap in the face?*

*<gdex@wi.rr.com>



Ralph Perry got this quick QSL from Radio Warra Wongeelaa, broadcasting to the Horn of Africa.



Rich D'Angelo got this attractive verification card from Al Caravan Radio in Colombia (5910).

This Month's Shortwave-lets:

The rarely (if ever) heard **Bhutan Broadcasting Service**, which has been silent for more than a year, is active again according to AWRs Adrian Peterson. He notes that several DXers in India are hearing BBS at various times on 6035. In North America, our best shot occurs around 1200-1300, depending on the amount of QRM.

Another new opposition broadcaster is **Radio Al Kul** (Radio For All), a Syrian-oriented station operating 24 hours and based in Instanbul, Turkey. Apparently, the station is limited to Internet feeds only, though it is said to also re-broadcast on several local FM channels.

Bangladesh Betar no longer employs 7250, but now transmits to Europe, opening at 1745 on 13580.

The VOA has increased its broadcasts to the **Central African Republic** due to the political violence going on there. Newscasts in French to Africa

GIG Is the Best — Bar None!

We believe the *Listening Post* — month after month — offers more logs than any other monthly SW publication. (Just over 200 shortwave broadcast station logs were processed this month!)

Why not join the fun and add your name to the list of Listening Post reporters? (We'll all get used to this digital stuff eventually and soon get back on track.)

Send your logs to Gerry Dexter, The Listening Post, 213 Forest St., Lake Geneva, WI 53147 or email them to <gdex@wi.rr.com>. See the column text for formatting suggestions.

The reborn ELWA from Liberia replied for D'Angelo with this e-mail verie for 4760.

Pirate Hard Tack Radio QSL'ed for D'Angelo with this card.

The Sri Lanka Broadcasting Corporation QSL'ed for D'Angelo with this card saluting the Trincomalee site, which once relayed other broadcasters.

The QSLing Queque

The QSLing Queque is a new monthly feature of *The Listening Post* that will highlight one reporter's unsuccessful efforts to snare a reply from some of the most obstinate, unfriendly, and uncooperative broadcasters out there.

First off is Bob Brossell, of Pewaukee, Wisconsin, who lists the current nemesis stations that are keeping him awake at night and driving him to drink:

Radio Turkmenistan, to which he's been reporting regularly since 2006

Radio Aparecida, Brazil, which has not replied in 23 weeks through two follow-ups

Radio Roraima, Boa Vista, Brazil, which has ignored seven follow-ups

Opposition broadcaster **Radio Free Chosun** in Seoul, Korea, which is untouched through nine follow-ups

Sichuan PBS, China, which hasn't replied after 13 weeks and one follow-up

Cuba's Radio Progresso which has ignored reports for 21 weeks and five follow-ups, despite (the presumed/promised) assistance from a well-known Cuban radio personality.

Good luck on these bad guys, Bob! – ***WPC9GLD***

Listen to streaming audio of Radio Aparecida online at <http://bit.ly/1ICYteg>.

have been increased. VOA in French is presently on the air from 0530-0630, 1100-1130, and 1830-2130 over various relay sites and frequencies, mostly Greenville, Botswana, and Sao Tome.

Radio Andernach, beamed to the German armed forces. It's on the air via Nauen on 6040 in encrypted DRM mode from 2115-2315, serving the Horn of Africa.

All India Radio's outlet at Leh is back using 4760. Now they can resume their QRM tussle with AIR-Port Blair (Andaman Islands).

Radio Bolivar in Ciudad Bolivar, Peru, has been reactivated on 5460 and is being noted by some during our early evening hours.

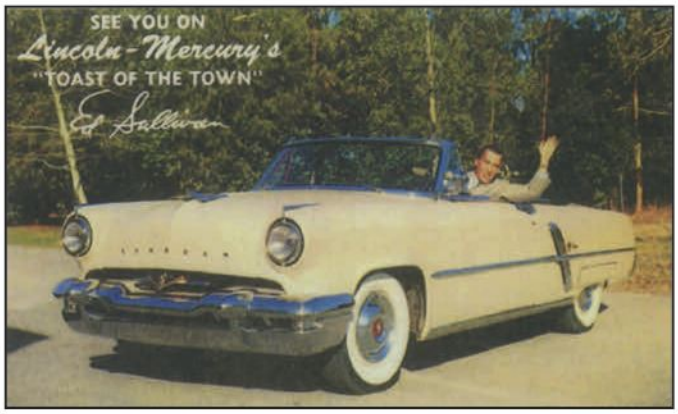
Don't Miss 'The QSLing Queque'

Please note *The Listening Post's* new feature, The QSL Queque. If you have

In Times Past

Here's your "blast from the past" for this month:

ANGOLA — Radio Clube de Benguela, Benguela, CR6RF, 9502 on at 0502 with its one kilowatt domestic service in PP on May 12, 1962.



The Radio City pirate also confirmed for D'Angelo. Ed Sullivan was NOT the verie signer!

PJC Radio International (originally a program on Radio Netherlands) confirmed D'Angelo's reception via Trincomalee, Sri Lanka.

a QSL "hit list" you'd like featured in the coming months, let me know at my email address. For that matter, reports on QSLs you've received are also welcome. Just be sure they are clearly marked as such.

It's Your Turn ...

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 to be returned, station schedules, brochures, pennants, station photos, QSLs received and anything else you think would be of interest. And how about sending a photo of you at your listening post? It's your turn to grace these pages.

See complete shortwave listings at <http://cqplus listeningpost.blogspot.com>.

SWL Listings:
For the latest SWL loggings, visit:
<http://www.CQPlusListeningPost.blogspot.com>.

Build the 2014 NB6M Miniboots Amplifier and Carry More Power and Versatility to the Field

BY RICHARD FISHER, *KI6SN

easy does it

There's a chow line saying that goes: "Take all you want, but eat all you take."

We can flip that to the inverse when thinking about amateur radio field operations: *"Carry as little as you want, but be fully equipped with what you carry."*

Many trail-friendly radio operators like to keep the weight of their gear to a minimum, but at the same time must be careful not to shortchange their ability to communicate. A 1-or-2 watt transceiver may do nicely with your finely tuned and highly-strung antenna at home. But what about the minimalist wires you're likely to carry on the trail?

Let's face it, with the often-crummy propagation we're experiencing, and the vagaries of operating locations in the field, sometimes a watt or two just isn't going to cut it. How nice would it be to have a simple RF amplifier for your CW rig to boost power to a full QRP 5-watt "gallon," or even to 10+ watts if the going gets really rough?

Master designer Wayne McFee, NB6M, now of Mount Vernon, Washington, in 2000 introduced to the QRP community a simple amplifier called the Miniboots. It was really popular at the time — especially with its readily-available parts and implementation of the inexpensive IRF510 MOSFET power transistor that was, and still is, in the parts bin at RadioShack®.

What is particularly attractive about the Miniboots is that it is a circuit that can easily be replicated by hams new to homebrewing.

- There are no transformers. Its three toroids are each a single winding.
- A transmit/receive relay is easy to wire and inexpensively obtained from RadioShack®.
- Most of the parts are very common. You may have 'em in your junk box already.
- Because it is made up of four distinct sections, the Miniboots is pretty easy to troubleshoot.

We could go on, but you get the idea. For this special *CQ* "To the Field" edition, it made a lot of sense to reprise NB6M's Miniboots circuit to give T-FR (trail-friendly radio) operators the option of carrying a bit more RF firepower on the trail. At KI6SN, we added a little bonus to the circuit.

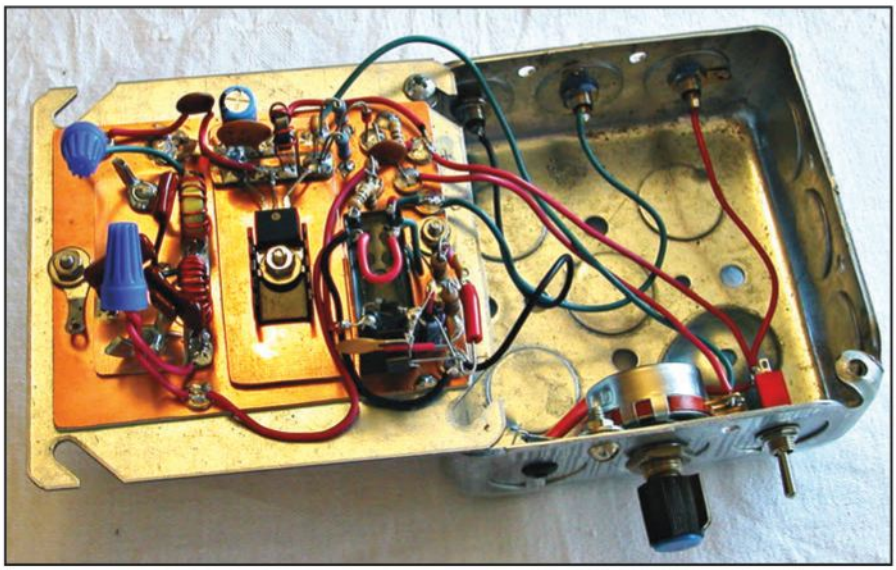
Inside the Miniboots 'Modules'

Looking at the accompanying schematic, you get a sense of the Miniboots' internal organs:

- At upper left is the IRF510 amplifier circuit.
- Upper right is the Chebyshev output filter, circled in RED.

* email <ki6sn@cq-amateur-radio.com>

The KI6SN 2014 version of the NB6M Miniboots RF amplifier is small enough to hold in your hand, but can deliver 10+ watts of output power when the going gets tough out on the trail.



Housed in a 4-inch square drawn box from the Home Depot, the circuitry is mounted to the underside of the top lid. When switching bands, the lid is removed, flipped over, and mounted temporarily to the side of the main chassis with one screw.

• Middle left is the input attenuation and power adjustment circuitry.
• Across the bottom is the transmit/receive relay driver circuitry.

NB6M's 2000 design provided a two-band version that was output filter-switchable using a common DPDT (double-pole, double-throw) toggle. In the 2014 KI6SN version of the NB6M Miniboots, the output filter is a removable module, so any HF band from 160 to 10 meters can be accommodated.

The amplifier circuit is straightforward and easy to duplicate, which is why it was so popular more than a decade ago. Subsequently there have been spin-off imitators, but they suffer from complications of trifilar transformer windings and much-harder-to-find parts. For its simplicity and utility, you can't beat NB6M's Miniboots — even after almost 15 years. The 2014 KI6SN version — with its interchangeable output filter modules — is *even more* versatile.

Variations on a Theme

The Miniboots here was designed for 1 to 2 watts of drive. There is a version for transceivers with three-quarters to 1-watt output, but it's a bit more complicated than this one. If you'd like to see the lower-input-power version, visit <http://bit.ly/1msnEja>.

*(**NOTE:** At KI6SN we've used this higher-input power version of the Miniboots with a NorCal-40A transceiver putting out just 850 milliwatts. The 'Boots easily boosted output to a full 5 watts. If you want to get into the 10+ watt output range, though, you'll need to drive the Miniboots with a solid 1 to 2 watts of RF. – KI6SN.)*

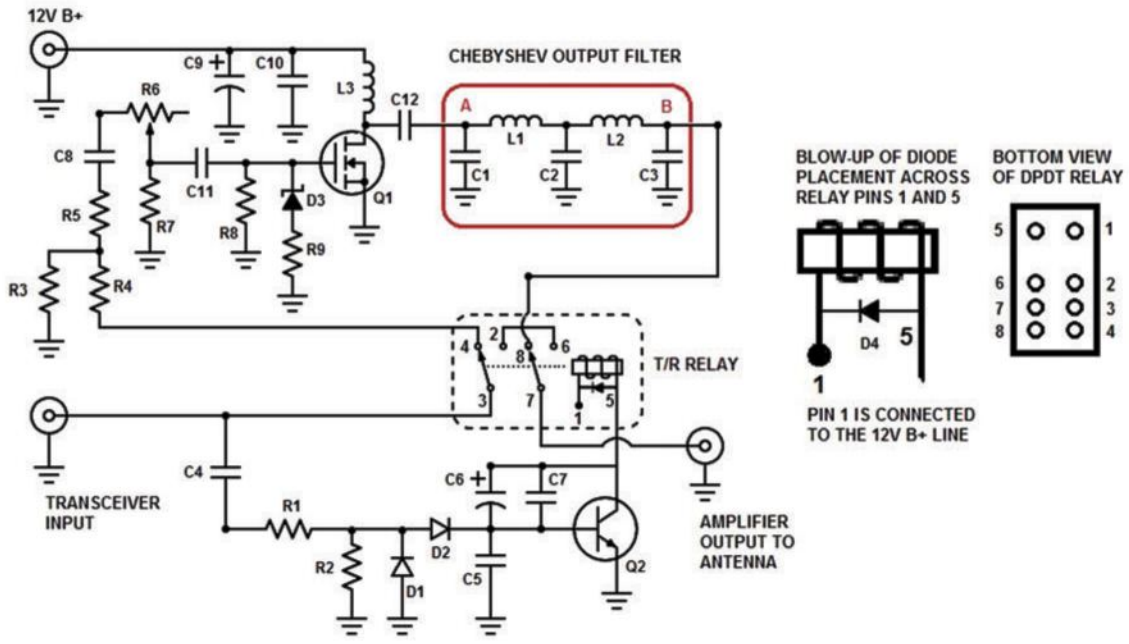
The Miniboots was once offered as a kit by one of the national QRP clubs. But that's no longer the case. Builders will need to make this Miniboots version from scratch. Don't be scared off by that, though. It's really a snap to build if you take your time and lean on an Elmer if you need to.

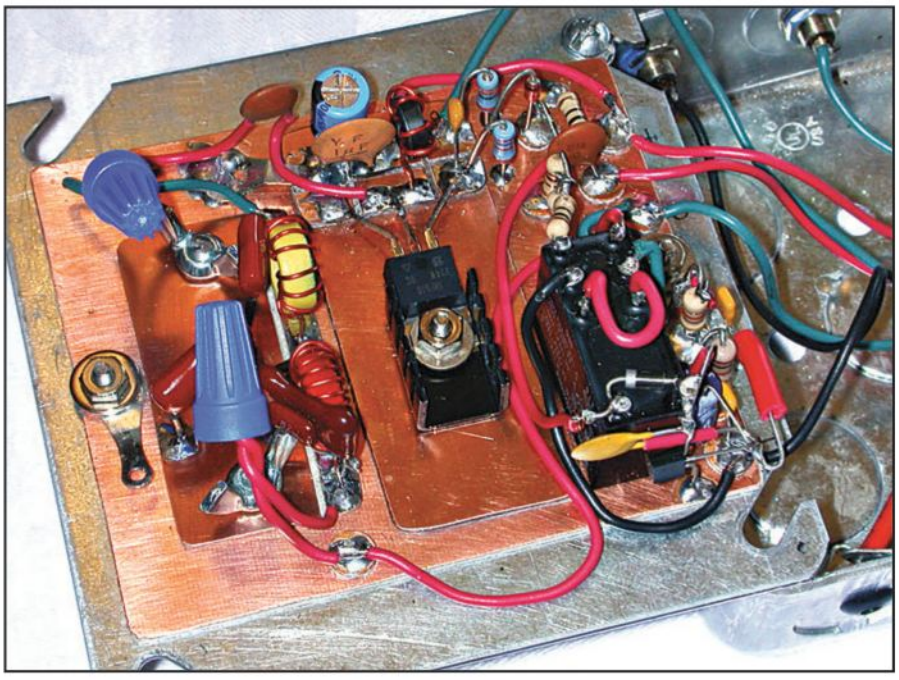
The 2014 Miniboots

The accompanying photographs show the internal pieces of the Miniboots and the housing that became its home.

In our millions of trips to the Home Depot, we'd always wondered if those

NB6M Miniboots QRP+ RF Amplifier for the Field



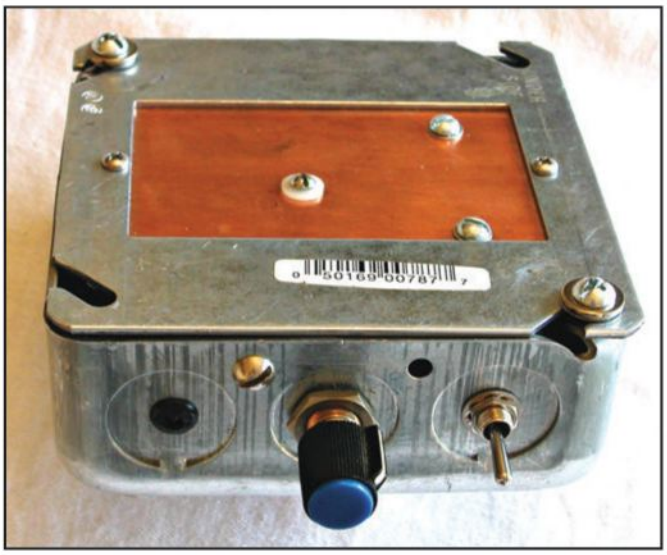


Close examination of the parts placement shows the interchangeable Chebyshev filter to the left, the IRF510 MOSFET RF amplifier in the middle and the T/R and driver attenuation and power adjustment circuitry to the right. Wires from the PC board go to the components and connectors mounted inside the main chassis.

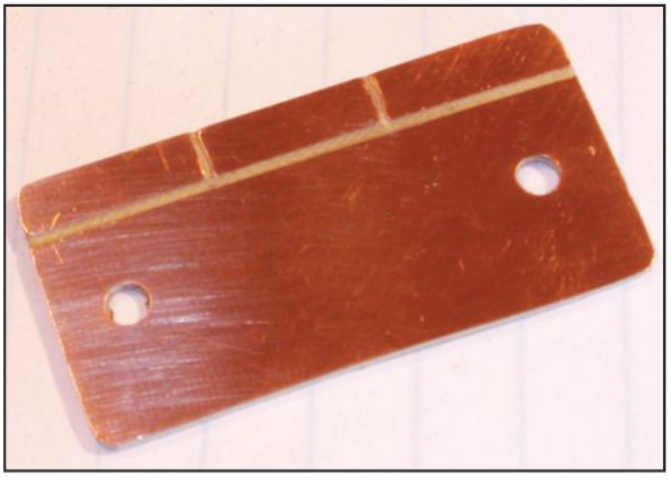
Parts List: 2014 KI6SN Version of the NB6M Miniboots

C4, C5 – 0.001 disc ceramic capacitor
C6 – 2.2uF/16v electrolytic
C7 – 0.01 disc ceramic capacitor
C8, C10, C11 – 0.1 disc ceramic capacitor
C9 – 100uF/16v electrolytic
R1 – 1K resistor
R2 – 4.7K resistor
R3 – 150-ohm resistor
R4, R5, R9 – 10-ohm resistor
R6 – 100-ohm potentiometer (Mouser 652-93R1A-R22-A05L <http://bit.ly/1k7uZE5>
R7 – 33-ohm resistor
R8 – 2.7K resistor
D1, D2 – 1N914 diode (1N4148 is OK, too) (RS 276-1122 <http://bit.ly/1gP1jYx>)
D3 – 1N4742A 12-V, 1-Watt Zener Diode (RS 276-563 <http://bit.ly/1idiw3f>)
D4 – 1N4004 diode (RS 276-1103 <http://bit.ly/1jvdk5Z>)
Q1 – IRF510 MOSFET transistor (RadioShack® RS 276-2072 <http://bit.ly/1msIn6r>)
Q2 – 2N3904 transistor (RS 276-2016 <http://bit.ly/1fknYvh>)
L3 – FT37-43 toroid (5 turns of No. 22 enameled wire) – (Amidon <http://bit.ly/1nHpqwQ>
T/R RELAY – 12-V DPDT relay (RS 275-249 <http://bit.ly/1r9ND0N>)

Notes: Chebyshev output filter components L1, L2 and C1, C2 and C3 are listed separately by band in Table 1. See text for where to find toroid cores. Also, many operators don't include LED indicator lights to their field gear to save on battery power consumption. An LED is not shown on the 2014 NB6M Miniboots schematic. If you'd like to add an LED to your Miniboots, refer to "Ready for Your First Homebrew Project?" beginning on page 13 of the November 2013 edition of CQ. It covers basic LED installation. RadioShack® has a variety of LEDs and holders from which to choose. Visit <http://bit.ly/1gTNS9B>.



When the output filter modules have been changed, simply turn the lid over and attach it snuggly to the main chassis with two mounting screws.



An easily-etched piece of double-sided PC board serves as the template for each of the output-filter band modules.

inexpensive shiny electrical boxes would make a good chassis for T-FR projects. For the Miniboots we decided to give one a try.

It's 4-inches square and a 1.5-inches deep — just right for the vision we had for our little 'Boots. The chassis has rounded edges, as well, which are very kind to backpacks.

This box had pre-drilled holes in many places — very handy — and 12 half-inch diameter knockouts. The big question was: Are those knockouts solid enough on which to drill? The answer is *yes.* And while the metal may look impenetrable, it's really quite easy to ply with an electric drill and decent bit.

The separate top plate we selected at the 'Depot has a pre-cut rectangular hole that was perfect for mounting the ground plane on which the 'Boots circuit was built. The hole is about 3 inches by 2 inches. There are many other "lid" styles from which to choose.

The nice thing about this configuration is that the top lid can be flipped open during construction and for easy band switching once the project is done. Two screws hold the plate in place when it's packaged for on-the-trail operation. Remove them and you can turn the circuitry over and affix it to the main chassis during "maintenance," securing it with one screw. When your work is finished, flip the lid back over, insert the holding screws and you're good to go again.

Let's Get Homebrewing

OK, the main ground plane on which each module is mounted is 3.5 by 3 inches of double-sided printed circuit board. It fits nicely under the pre-cut rectangle in the top plate.

Three homebrewing techniques were employed in building the 2014 Miniboots:

- Ugly <http://bit.ly/RFEalR>
- Manhattan <http://bit.ly/1msrFEp>
- Dead bug <http://bit.ly/1eXmfkV>

We chose to use each one because it suited the particular homebrewing need at a particular stage. You can use any technique you'd like as a means to reach your end.

The Automatic T/R Circuitry

When we were helping NB6M prototype his fabulous Miniboots in 2000, the original design had a DPDT toggle for switching from receive to transmit and back. That seemed laborious, so Wayne came up with a smooth, efficient RF-actuated T/R circuit using a 2N3904 NPN transistor to drive a DPDT relay. It was a stroke of genius.

You can see that the relay (RadioShack® RS 275-249 <http://bit.ly/1r9ND0N>) is glued to the ground plane with its connection points sticking up in the air, like a dead bug. The rest of the T/R driver components are mounted ugly style, for the most part.

*(**NOTE:** The 1N4004 diode — D4 in the schematic — is shown enlarged in the accompanying schematic because it appears pretty small in the circuit drawing. Just know that its anode is attached to Pin 5 of the T/R Relay. D4's cathode is attached to Pin 1. Note, as well, that Pin 1 is connected to your 12-V B+ power source to energize the relay. – KI6SN.)*

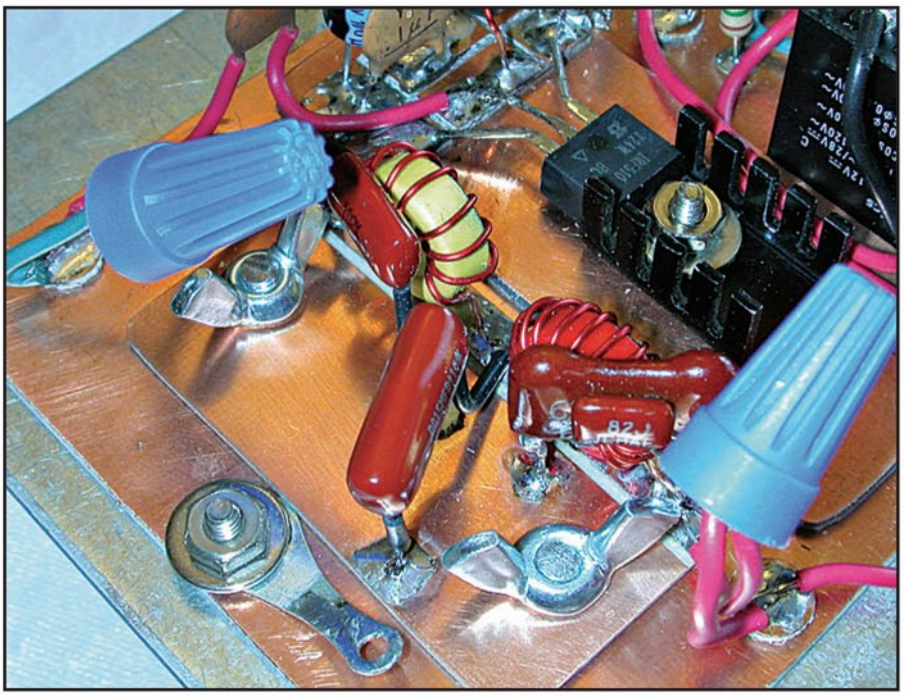
RF Attenuator Module

The RF attenuator circuitry, used to adjust the drive of the signal your transceiver is providing to the IRF510 power transistor, is built primarily using Manhattan-style construction. The 100-ohm potentiometer can adjust the Miniboots' output from 0 to 10+ watts with sufficient drive. Some builders have noted that as many as 14 watts can be easily generated by this circuit.

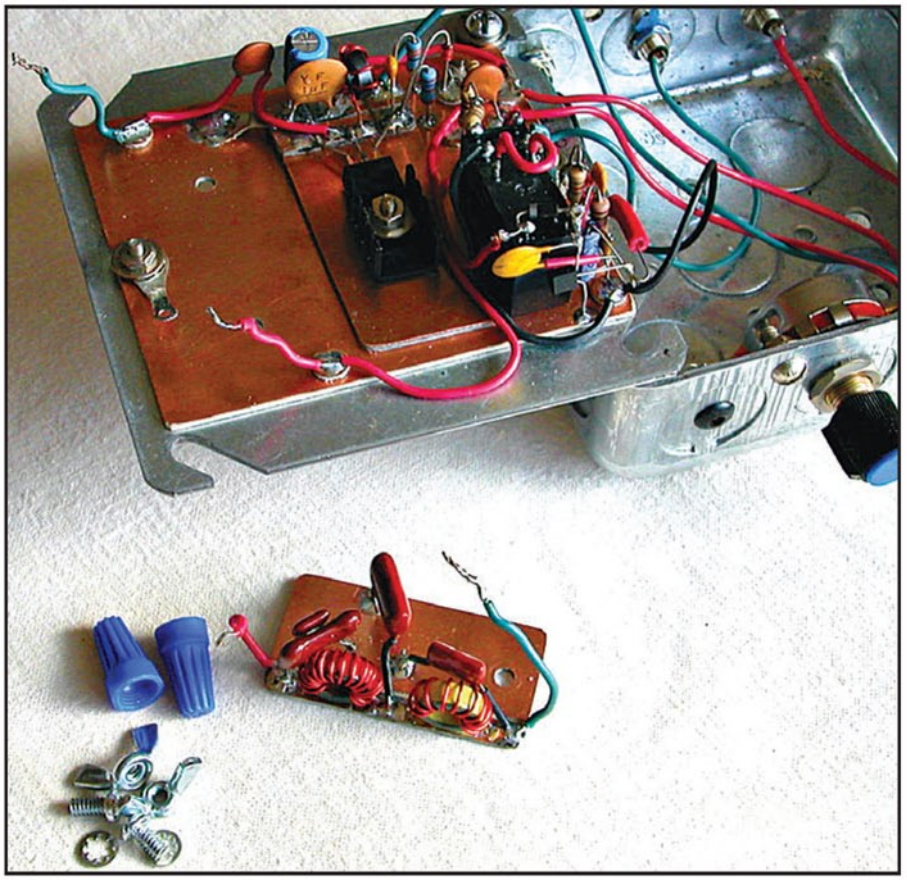
The IRF510 Power Amplifier

The IRF510 MOSFET (RadioShack® RS 276-2072 <http://bit.ly/1msIn6r>) transistor can heat up to the point of burnout if a proper heat sink is not employed. What makes this component a bit challenging to work with is that its metal housing cannot be grounded.

The heat sink is affixed to that housing, *so what to do?* In the KI6SN 2014 Miniboots, the MOSFET amplifier circuitry is mounted on single-sided PC board material. This allows the amp to sit "above" the ground plane. Care is taken to shield from ground the metal screw attaching the metal housing to the heat sink. Small plastic washers were used on the heat sink screw to keep it out of contact with ground. So in the end, the black flanged metal and the single-sided PC board defer heat from the IRF510.



A close-up of the Chebyshev filter shows the placement of the wingnuts and blue connector caps, which are removed when changing bands.



Here is the 40-meter band module removed from the NB6M Miniboots. Note that the input and output wires are color coded on the module and on the PC board to take the guesswork out of in which direction the filter goes — green for the input and red for the output.

Table 1. *Here is 2014 NB6M Miniboots Chebyshev output filter toroid winding and capacitor data. Figures for L1 and L2 in the table show the number of turns and type of toroid. For example, for 40 meters, L1 has 10 turns of No. 22 enameled wire on a T50-6 toroid.* →

2014 NB6M Miniboots Output Filter Values by Amateur Radio Band

Band	C1	L1	C2	L2	C3
80	2000	15T / T50-6	2700	22T / T50-2	1462
40	1000	10T / T50-6	1462	15T / T50-2	720
30	680	8T / T50-6	1000	13T / T50-6	470
20	500	7T / T50-6	680	11T / T50-6	360
17	400	6T / T50-6	550	10T / T50-6	275
15	330	6T / T50-6	470	8T / T68-2	240
12	280	5T / T50-2	400	8T / T50-2	200
10	250	5T / T50-6	340	8T / T50-6	180

NOTE: All capacitors are silver mica and listed in pF. Toroids are wound with No. 22 enameled wire.

Additional circuitry providing the 12-volt B+ line to the IRF510 is mounted on a small piece of PC board etched with a hacksaw, Manhattan style.

The Interchangeable Chebyshev Output Filter

Manhattan-style construction was used with the Miniboots Chebyshev output filter. It is held in place using wingnuts and twist-off connection caps — both available from the Home Depot. The filter is outlined in RED in the schematic.

Using a hacksaw and an awl, isolation pads were hand-etched into the double-sided PC board material. This pattern can be duplicated for an output module for each band.

Changing bands is as easy as twisting off the blue connection caps and wingnuts and pulling the filter from the amplifier. Grab a module for a different band, swap it into place and you're ready to QSY (change frequencies).

The RED letters A and B indicate where the filter is connected to the rest of the circuit using the blue twist-on connection caps.

Those Toroid Inductors

Depending on how many band modules you'd like to build, there can be either a handful or a bucket-load of toroids in the 2014 KI6SN version of the NB6M Miniboots. *Where do you find them?*

There are many sources. One mail order company to consider is Amidon, which carries the FT37-43 <http://bit.ly/1nHpqwQ>, T50-6 <http://bit.ly/1nHpwVb>, T50-2 <http://bit.ly/1jD8Avg>, and T68-2 <http://bit.ly/1jD8NP3> cores needed for all-band Miniboots operation. Amidon's homepage is <http://bit.ly/1prQ4hP>.

Off-Board Chassis Components

From left, across the front of the updated Miniboots are:

- LED "On" indicator held in place with a small rubber grommet (both optional)
- Power adjustment potentiometer (100 ohms)
- ON/OFF toggle switch

Across the back panel are RCA-style phono jacks for, from left:

- 12-volt B+ input
- Amplifier RF output
- Transceiver RF input to amplifier

There is nothing magic about placement of the off-board parts. We tried to use some of the holes that had been pre-drilled in the box. Leads from chassis-mounted components to the amplifier modules on the ground plane

A short video on the YouTube CQ Channel shows the 2014 NB6M Miniboots' power output with just 850mW of RF drive from a NorCal-40A transceiver.
WATCH and LISTEN: *<http://youtu.be/GoiZ0q8qnWY>.*

RCA-style phono jacks were mounted on the Miniboots' back panel for, from left, 12V B+ power, Miniboots RF output, and transceiver input drive.

After passing a bin full of 4-inch square drawn boxes at the Home Depot for the millionth time, KI6SN finally took the leap to give one a try as a chassis — in this case, for the 2014 version of the NB6M Miniboots. The circuit fit like a glove. Be careful, though. "Take the same precautions you would when building a boat in your basement," he said. →

need to be of sufficient length to allow the lid to be loosened, flipped and temporarily mounted to the side of the main chassis.

You've got to be careful that none of the components on the PC board ground plane come in contact with panel-mounted parts. That could result in lots of smoke and headaches as you're identifying and replacing shorted parts. It's kind of like building a boat in your basement. *Before you get carried away, be sure you've got the clearances necessary to get it in and out of there.*

2014 Miniboots on the Air

The beauty of this robust RF amplifier is that you can include the Miniboots in your RF chain without ever turning it on. If your 1 to 2 watts are sufficient for contacts, just let the amplifier sit there, taking up space. But if you need a bit more power, simply turn it on and your QRP transceiver will activate the IRF510 with the push of the key.

In its "idle" mode — whether B+ is applied to the amplifier or not — the Miniboots automatically bypasses the amplifier, allowing your "barefoot" rig to receive by directly connecting to the antenna via the unactivated position of the relay.

Leave the B+ for the Miniboots OFF and the same thing applies when transmitting from your QRP transceiver. It bypasses the amp, going directly to the tuner or antenna.

Turn the B+ ON, though, and the Miniboots goes into amplification mode. Using the 100-ohm chassis-mounted potentiometer you can adjust your amplified output from 0 to 10+ watts. ***(WATCH and LISTEN:*** *A video of power tests of the 2014 KI6SN version of the NB6M Miniboots RF Power Amplifier is posted on the YouTube CQ Channel at <http://youtu.be/GoiZ0q8qnWY>. – KI6SN.)*

The amplifier can be useful, as well, in varying the power of your transceiver to below its rated output. With the power adjustment potentiometer, you can "turn down" your 1-watt output to mere milliwatts.

The T/R relay is smooth and fast. It's of very nice design, and you won't be disappointed.

How About an NB6M Miniboots for SSB?

If you take a run at building the 2014 KI6SN version of the NB6M Miniboots, please drop an email and let us know how things worked out. We can all learn from one another's successes and challenges.

Meanwhile, we'd like to know if there's enough interest in building an NB6M Miniboots designed specifically for SSB operation. Would you like to add more RF power to your QRP phone work at home or in the field? Drop an email to <ki6sn@cq-amateur-radio.com>. We'd greatly appreciate hearing from you.

– Richard Fisher, KI6SN

Set up to detect incoming Soviet bombers during the Cold War, the DEW Line — also known as the Early Warning Line — was a system of radar stations in the far northern Arctic region of Canada, with additional stations along the North Coast and Aleutian Islands of Alaska, in addition to the Faroe Islands, Greenland, and Iceland.

A Radio Astronomy Renaissance Man

BY JEFFREY M. LICHTMAN, KI4GIY*

A Renaissance man is:

- A cultured man of the Renaissance who was knowledgeable, educated, or proficient in a wide range of fields <http://bit.ly/1hhh90m>.
- (Sometimes lowercase) a present-day man who has acquired profound knowledge or proficiency in more than one field.

I first heard from Robert Stephens in the early 1980s. He had picked up *"Amateur Radio Astronomers Notebook"* authored by myself and Robert M. Sickels, published in 1975.

Rob phoned me — a mid-winter phone call, late one evening. Why do I remember that call? The person on the other end was 750 miles north of Alberta, British Columbia, Canada. The actual location, a DEW Line over-the-horizon radar site in Hay River on the shores of Great Slave Lake.

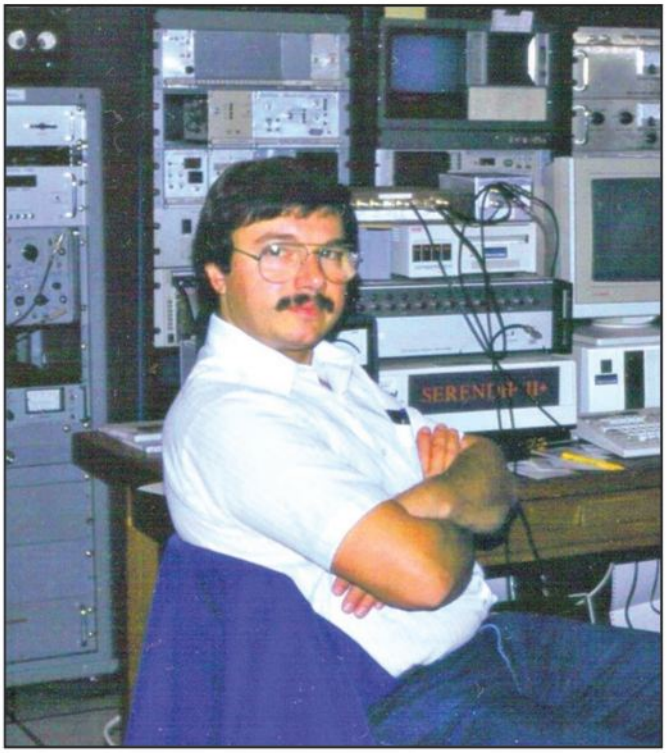
Email c/o <ki6sn@cq-amateur-radio.com>

The Distant Early Warning Line (DEW), also known as the DEW Line or Early Warning Line, was a system of radar stations in the far northern Arctic region of Canada, with additional stations along the North Coast and Aleutian Islands of Alaska, in addition to the Faroe Islands, Greenland, and Iceland. It was set up to detect incoming Soviet bombers during the Cold War, and provide early warning of any sea-and-land invasion.

The DEW Line was the northernmost and most capable of three radar lines in Canada and Alaska; the joint Canadian-U.S. Pinetree Line ran from Newfoundland to Vancouver Island, and the Mid-Canada Line ran somewhat north of this, <http://bit.ly/1bMzdLn>.

Robert W. Stephens, Founder and President of IEI (Interstellar Electromagnetics Institute), developed a plan to establish a professional caliber astronomical radio observatory to conduct Canada's first full-time SETI (Search for Extraterrestrial Intelligence) microwave space exploration program.

In 1985 Stephens was able to realize his goal by establishing the IEI, a federally incorporated non-profit research



This photograph of Rob Stephens was taken before his excursion to Hay River.

A line of variously pointed dishes was the backdrop for this photograph of Rob Stephens.

corporation. Simultaneously, he was able to acquire a decommissioned DEW line tropospheric scatter communications site with two large 18-meter, parabolic dish antennas located in Canada's Western Arctic, and after an enormously ambitious and resourceful retrofit, operated the newly established Hay River Radio Observatory (HRRO).

A close and old friend of 30-plus years, I'm constantly amazed by his work with Tesla coils, radio astronomy, mechanical and electro engineering, and wind generators. Rob is one amazing, knowledge-filled individual. Over the years, he has demonstrated what one can do and achieve with little to no help.

"There were many cold, lonely days and nights," Jeffrey Lichtman writes, "but, Rob kept the lights on and the equipment warm. This was financed mostly by him and some donations."

Rob is self-taught in astronomy, physics as well as mechanical areas and welding. He told me that while he was employed as a technician for Northwest Tel, one of his outings led him to the area. Being interested in radio astronomy and the SETI program, his thoughts were to see what could be a possible electronic lab and radio observatory. A little investigating and it became a reality.

Rob had accumulated surplus electronic test equipment and various receiving equipment that would come in handy in his new venture.

He decided his work and research needed to be a full-time venture and with his real interest in radio astronomy and SETI, this was the best place to do it. So, the big tropo-scatter antennas and receiving equipment were put in place.

There were many cold, lonely days and nights but, Rob kept the lights on and the equipment warm. This was financed mostly by him and some donations.

In the beginning of the 1980s, the facility had the distinction of operating the second-largest collection aperture microwave radio telescope in Canada, next behind the National Research Council's (NRC) 46-meter telescope at its Algonquin Radio Observatory (ARO). HRRO promoted public education and

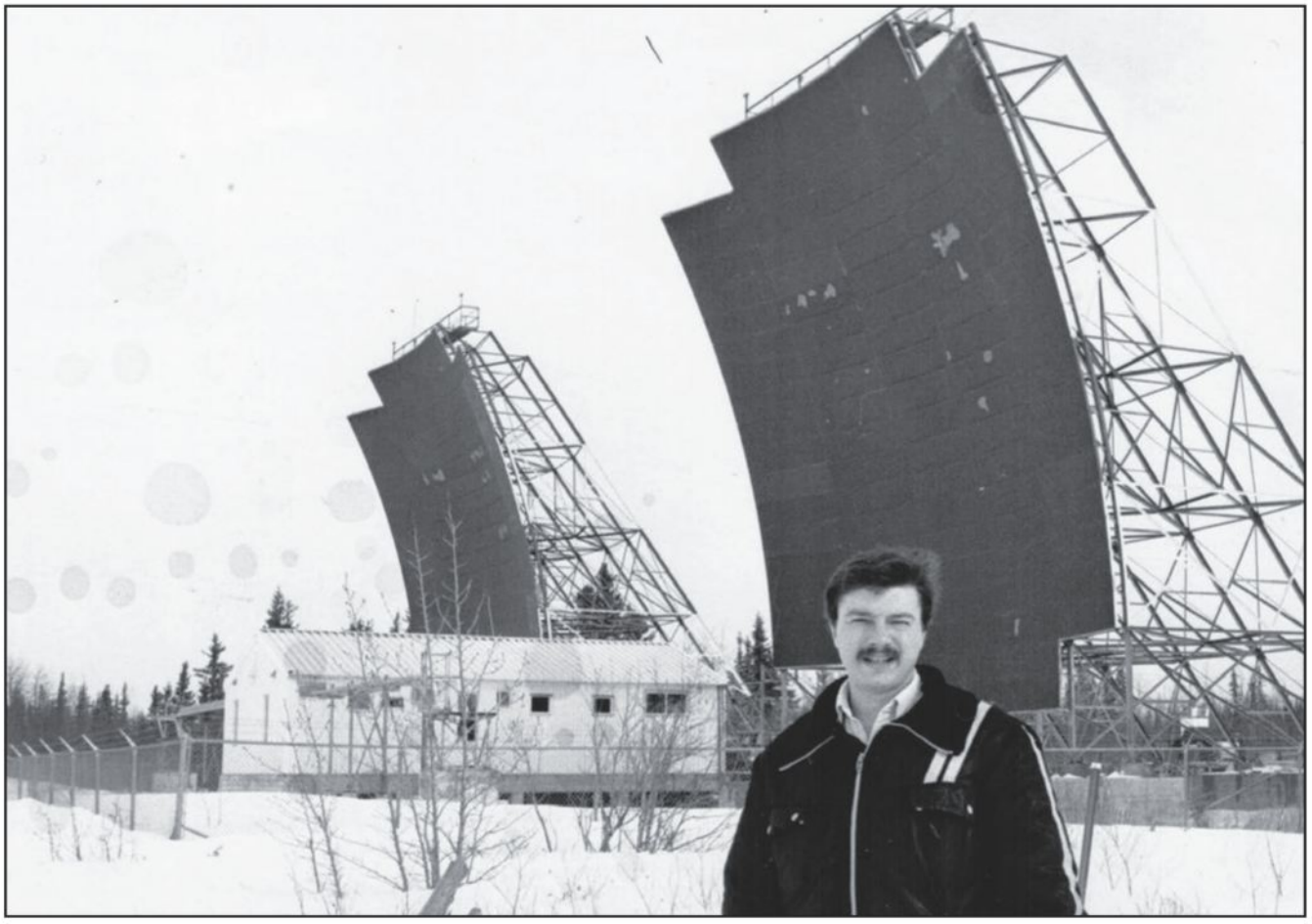
experience in radio astronomy, as interest from public media grew around Stephens' work. The project was covered in various publications, including *Omni* magazine, the *Globe and Mail*, the *Edmonton SUN*, the *Nova Scotia Monitor*, and on TV and radio, including CBC and NBC to name but a few.

The HRRO even hosted an undergraduate student under Professor Bill Lonc for two months in 1986, from St. Mary's University of Halifax, Nova Scotia. H. Peter White, then Bachelor of Science Honors student in Physics and Astronomy has since earned his Ph.D. from York University and is employed as a research scientist at Natural Resources Canada. Dr. White presently sits on the IEI Board.

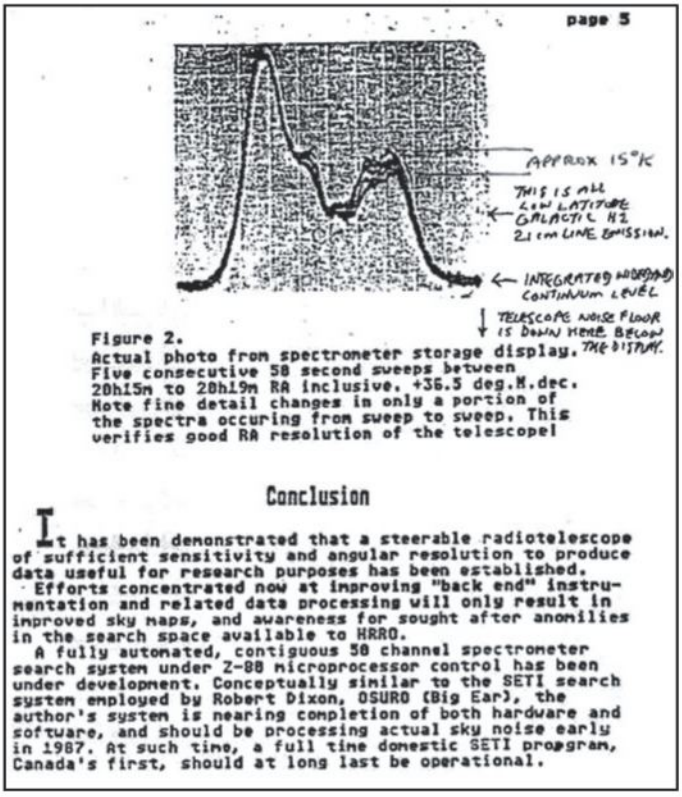
Algonquin Radio Observatory

In 1988, Stephens managed to secure the donation of a 20-meter radio telescope dish from the Department of Astronomy of the University of Toronto. The large antenna was located in a specially selected radio quiet location deep in Algonquin Provincial Park next to the NRC's own radio telescopes.

This photograph, dated 2 MAR 2012, is a look down on gear at HRRO in more contemporary times.



The Hay River Radio Observatory (HRRO) at first had the appearance of a desolate outpost in the wilderness — which it was.



Rob Stephens was the first amateur astronomer in the world to detect an atomic emission line from deep space in the microwave spectrum — the 21-cm emission line from cold ground state neutral hydrogen atoms out in the spiral arms of the Milky Way Galaxy. Stephens published a paper in the February 1986, Journal of The Society of Amateur Radio Astronomers, titled "Early Observations of Neutral Atomic Hydrogen in Emission at the Hay River Radio Observatory" written December 1985.

There was no lack of iron at the Hay River Radio Observatory site.

With a special arrangement negotiated with the NRC, by the fall of 1988, the relocated Hay River SETI Program was installed at the ARO and operating under the formal name Project TARGET (Telescope Antenna Researching Galactic Extraterrestrial Transmissions). In near ideal circumstances, Project TARGET operated successfully for three years, making important astronomical observations and maps of the Milky Way while searching for artificially-generated signals.

In 1991, the program met an untimely and abrupt end when the Canadian Federal Government closed ARO in an across-the-board cost cutting measure. Project TARGET, Canada's only full time SETI program may have temporarily been put on hold but Stephens wasn't about to give up.

Following ARO, Stephens spent a couple of years at Professor John Kraus' famous "BIG Ear" radio telescope of Ohio State University where he applied his knowledge and talents improving systems on the giant radio telescope the size of three football fields, and home to the USA's longest running SETI program.

His significant contributions included a 250-foot-long railway track feed positioning system that allowed the telescope to track radio sources of interest across the sky for extended periods of time and a thermal shielding system for the receiver that improved stability and sensitivity.

First Amateur Detection of the 21-cm Line

Stephens was the first amateur astronomer in the world to detect an atomic emission line from deep space in the microwave spectrum.

His prize was the 21-cm emission line from cold ground state neutral hydrogen atoms out in the spiral arms of the Milky Way galaxy. Stephens published a paper in the February 1986, *Journal of The Society of Amateur Radio Astronomers,* which he was a member of at the time entitled, *Early Observations of Neutral Atomic Hydrogen in Emission at the Hay River Radio Observatory* written December 1985. From the paper the first sentence following the Abstract reads, "*The Neutral Atomic Hydrogen (H1) spectral line (1,420,405,751.800 +/-0.028 Hz) has at long last been detected by this researcher in emission during the early morning hours of November 05, 1985."*

This was long before off-the-shelf equipment and computers make this task easy for today's advanced amateurs. Stephens had no mentor at the time to teach him the ropes and he did it entirely with custom-built instrumentation he figured out how to and then proceeded to build by himself by modifying telephone company surplus gear originally used to carry long distance telephone circuits between microwave towers.

The resulting DIY microwave spectrometer became the heart of the HRRO SETI telescope and received glowing praise for its quality of output data from NASA professionals including Dr. Bernard Oliver, vice president of the Hewlett-Packard Company, and head of NASA's SETI program office.

Currently, Stephens resides a day's drive from Toronto. In the past couple of years, he took on another massive project: the building of a couple of wind generators.

*(**ABOUT THE WRITER:** Jeffrey M. Lichtman is the founder and owner of Radio Astronomy Supplies and Founder Emeritus of the Society of Amateur Radio Astronomers. Contact him via email at <jeff@radioastronomy supplies.com>.)*

Even in an electrical wire-rich environment, a 5-band end-fed antenna system, barely visible here in red, can reap some pretty amazing results — all the way from 75/80 to 17 meters. All you need are some easy-to-find pieces of hardware, a tape measure, and some free time. Oh, and a tree.

A 5-Band, End-Fed Antenna That is Great for the Trail or at Home

BY RICHARD FISHER, KI6SN

February *CQ's* "QRP Special" included plans for building a tuner specifically designed for end-fed, half-wave (EFHW) antennas from 17 through 40 meters. It incorporated a nifty SWR bridge to sweeten the pot. *(**SEE:** "A QRPer's 40- through 17-Meter EFHW Antenna Coupler With Super-Sensitive SWR Bridge, beginning on page 48. – KI6SN.)*

For this month's "To the Field" edition, we thought describing a multi-band antenna to go along with that tuner would be a nice thing to do. EFHWs are great antennas for field operation. They are efficient, easy to make and carry and need only one support to keep 'em flying.

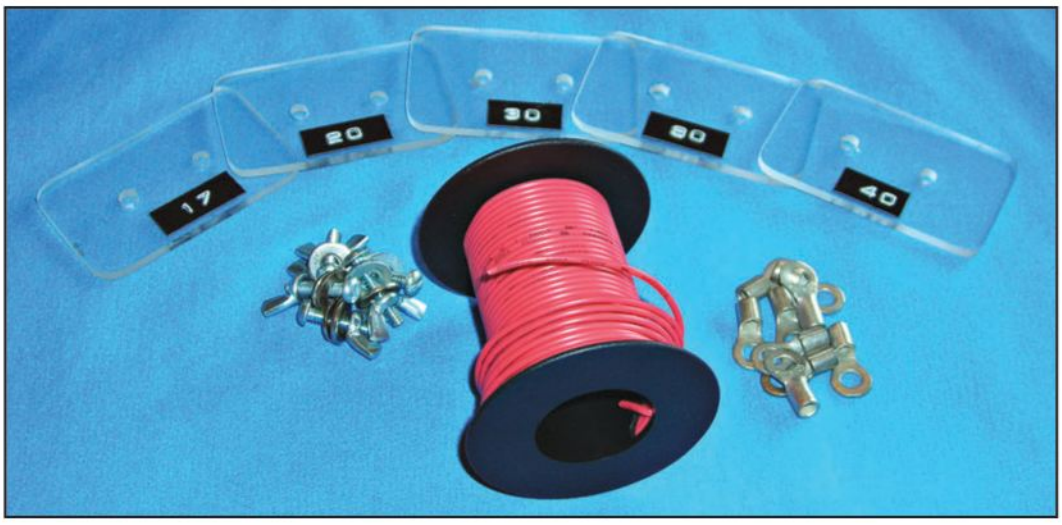
This KI6SN version of an end-fed antenna *system* covering 17 through 40 meters fits the criteria and more. With a 9:1 unun matching unit — described in a separate article in this "To the Field" edition — you can add 75 and 80 meters to the mix, as well. *(**IN DEPTH:** An unun is an impedance transformer between an unbalanced feed line — such as your coax — and an unbalanced load line — such as an end-fed wire <http://bit.ly/1rv5ihW>. – KI6SN.)*

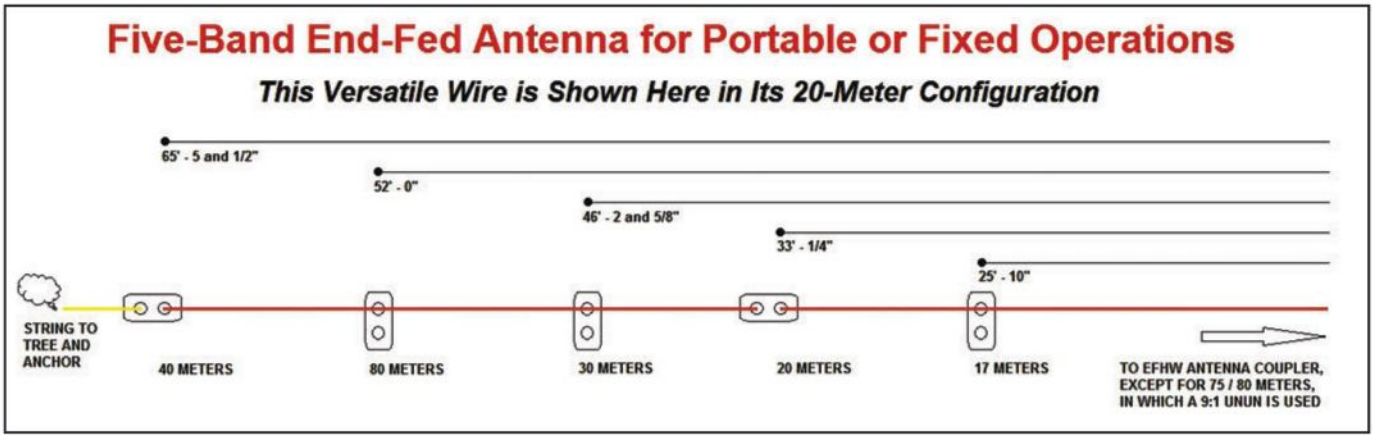
Why *This* Wire?

An EFHW is just what its acronym says it is: A half-wavelength antenna that is fed at one end by the signal coming from your rig. There is no feed line, so coaxial or other feed line losses are eliminated. The EFHW does, however, require a counterpoise (CP). We'll be describing a counterpoise system here that may blow your mind. Take the notion that CPs need to be at least a quarter wavelength and throw it out the window. *But first things first.*

We'll not wade too deeply into the theory behind the EFHW. Steve Yates, AA5TB, of Fort Worth, Texas, is the world's leading expert on these antennas, and delves fully into the nuts and bolts of how they work — and don't. Visit: <http://www.aa5tb.com/efha.html>.

The parts needed to build this multi-band antenna for home or the field are: A roll of No. 22 stranded hook-up wire; 6 sets of wing nuts, bolts, and washers; 9 solder lugs; and 5 pieces of insulating material drilled with two holes each. Note that the insulators are marked for each band and appear in this picture in the order in which they are used along the end-fed antenna's length.





To make a multi-band EFHW at KI6SN, we simply designed a half-wave wire for 40 meters and provided breakouts along its line for 17, 20, and 30 meters. By using plastic insulators, solder lugs and bolts, washers and wing nuts, it is quite easy to make a portable antenna that covers four bands in half-wavelength sections. And it's a snap to change bands. No tools required.

Theory Behind the 'System'

We'll explain the antenna's 80/75-meter capabilities separately, as it becomes a whole new animal electrically when the EFHW tuner is replaced by the 9:1 unun.

Referring to **Table 1**, you'll see figures for 40, 30, 20, and 17 meters. The frequency each band was modeled upon is the center of each band. For 40, for example, it's 7.150 MHz.

So, a half-wavelength antenna modeled on 7.150 MHz is 65-feet, 5-1/2-inches long, as shown in the second column. The third column is the length of the counterpoise for each band. We'll get to that in a minute.

It would be possible to carry into the field a separate EFHW for each band. If you think about it, though, that's awfully wasteful. If you've already got 65-plus feet for a 40-meter EFHW, why not slice a piece of that wire for, say, 30 meters — 10.125 MHz? An EFHW for 30 meters is 46-feet, 2-5/8-inches long. You've got that length, and more, with the 40-meter EFHW already, right?

By adding insulators along that 65-plus-foot line, we can essentially "cut" EFHWs for 30, 20, and 17 meters right out of it. The insulators can be used or bypassed by simply configuring the wiring through the use of easy to add and remove bolts, washers, and wing nuts. You won't even need a screwdriver.

In Practical Terms . . .

Referring to the accompanying photographs, you see that the KI6SN 5-Band, End-Fed Antenna System is merely carefully-measured lengths of No. 22 stranded, insulated hookup wire. A 90-foot roll — more than enough wire for our 5-band system and the counterpoise system — is as close as your local RadioShack® (RS 278-1218 <http://bit.ly/1nsqck5>.)

From the 65-plus-foot 40-meter line, we trim it incrementally to 52 feet, a bit over 46 feet, about 33 feet and just under 26 feet for 75/80, 30, 20, and 17 meters, respectively.

Each plastic separator/insulator is 2-5/8-inches by 1-1/2-inches for both the antenna and counterpoise systems — with two holes drilled in each one. There's nothing magic about the plastic. You can use any insulating material you'd like, so long as it can be configured to either pass the wire through or "break" the line at a specific length.

Making the 5-Band, End-Fed Wire for the Field

To construct this antenna accurately, at KI6SN we began by cutting a 25-foot, 10-inch wire for 17 meters. A solder lug was affixed to one end. The other end was left bare to connect directly to the EFHW tuner's ANTENNA binding post, or to the 9:1 unun.

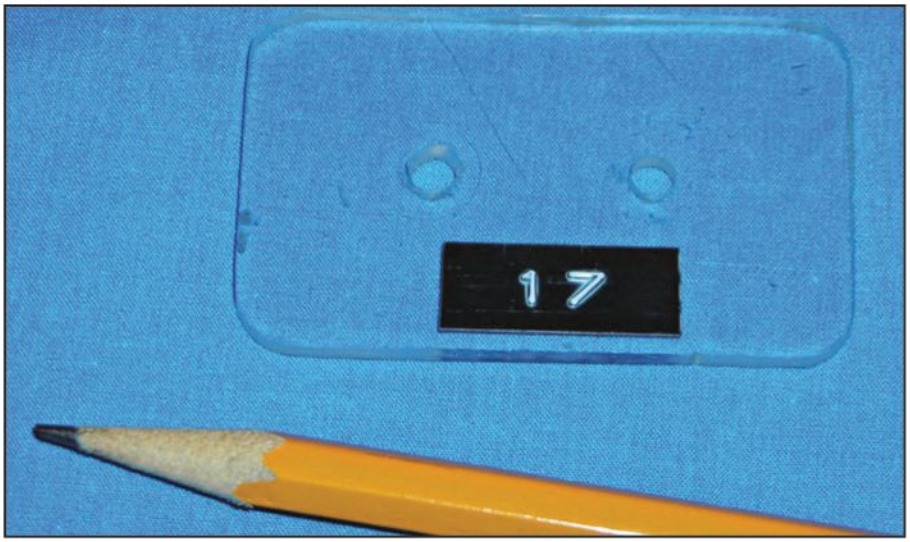
Using a bolt, two washers and the wing nut, tighten down the wire to the insulator marked for 17 meters.

Wire and Counterpoise Lengths for A Five-Band End-Fed T-FR Antenna

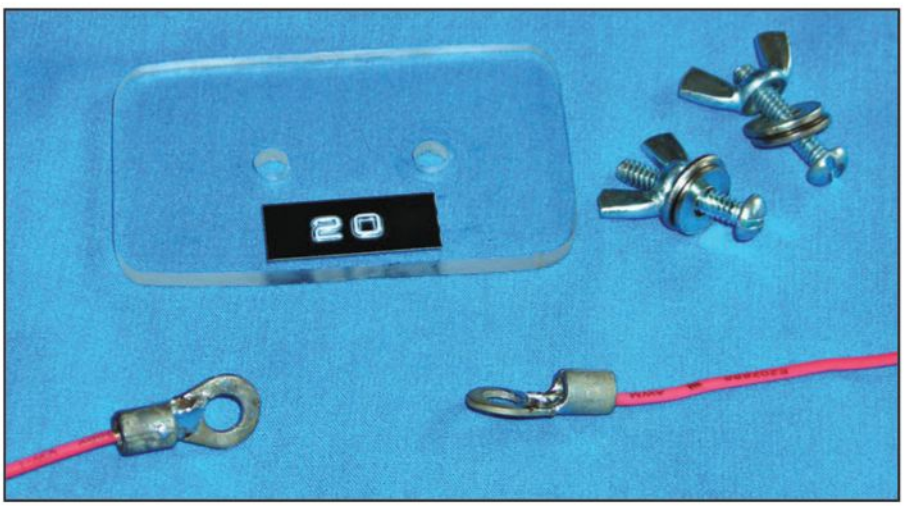
Band / Frequency	EFHW Antenna	Counterpoise
40 / 7.15 MHz	65' - 5 and 1/2"	6' - 10 and 5/8"
80 / 3.75 MHz	52' * (not half-wave)	No counterpoise
30 / 10.125 MHz	46' - 2 and 5/8"	4' - 10 1/2"
20 / 14.175 MHz	33' - and 1/4"	3' - 5 and 5/8"
17 / 18.118 MHz	25' - 10"	2' - 8 and 1/4"

** 52' is a length used successfully for an end-fed wire for 75 / 80 meters when using a 9:1 un-un and antenna tuner with a rig whose output power is significantly above QRP power output levels. (See text.)*

Table 1.



The insulators at KI6SN were made from 1/4-inch-thick plastic measuring 2-5/8-inches by 1-1/2-inches. Holes were drilled with sufficient spacing for the wing nuts used to attach the antenna's wire segments.



Here is the 20-meter insulator being readied for taking its place along the antenna line.

Next, solder a lug on the end of the roll of No. 22 hookup wire and connect it to the bolt and wing nut holding the end of the 17-meter half-wave wire to its insulator.

Now, measuring the wire from where it connects to the tuner's binding post, walk out to a total of 33 feet, 1/4-inch. Notice that you've crossed over the 17-meter insulator to get to those 33-plus feet. Clip the hookup wire at that point and solder on another lug.

OK, time to stop and think:

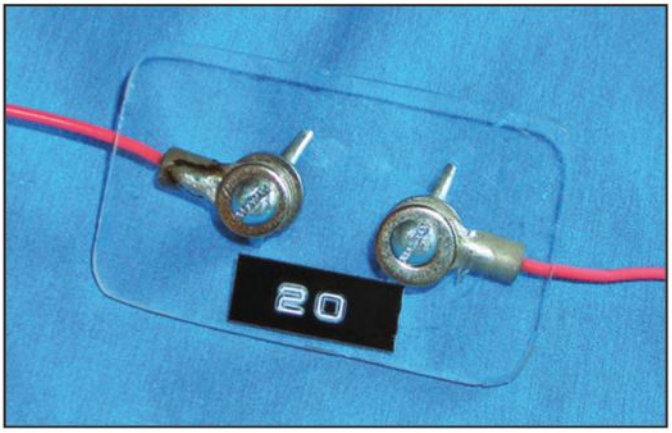
We have a 17-meter EFHW as the first leg of this multi-band antenna that is 25 feet, 10 inches long. Connected to that is another wire which extends the *total length* to 33-plus feet, which constitutes the 20-meter EFHW.

If we want to work 17 meters, what do we do? Simple: we remove the bolt and wing nut connecting the two lengths of wire and separate them by utilizing the second hole in the insulator. We've isolated the 17-meter antenna from the rest of the line.

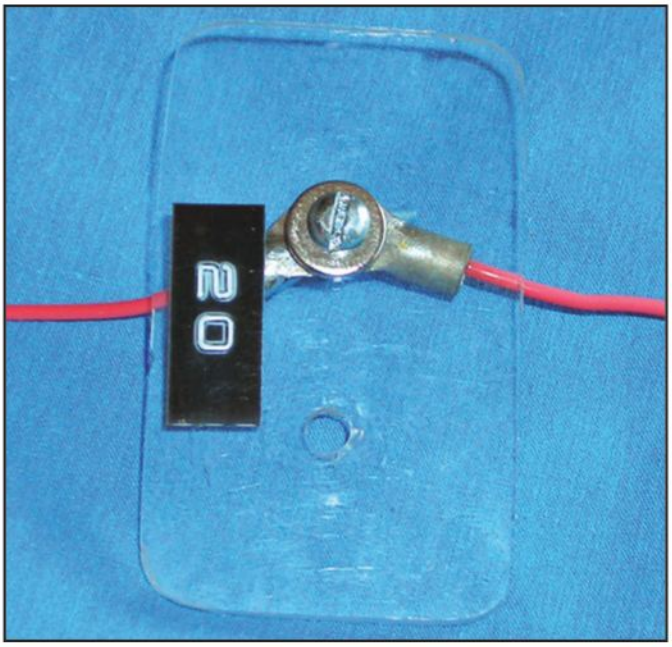
In similar fashion we add wire, solder lugs, insulators, and hardware for each of the other bands "up the line" until we reach the full length of the 40-meter EFHW — 65-feet, 5-1/2-inches.

This antenna is merely a series of EFHW increments for 17 through 40 meters. We can add or subtract segments depending on the lowest band on which we'd like to operate. *Simple, and versatile.*

The accompanying photographs help to tell the story if you're having trouble envisioning this.



When "breaking out" the 20-meter length for 14 MHz operation, the wire sections are separated. The side going to the tuner includes both the 17- and 20-meter segments. The portion of the antenna that has been separated from this segment now includes the 30-, 80-, and 40-meter segments, which now is no longer part of the antenna, serving, instead, as a support line going to, say, the top of a tree.



If the 20-meter segment of the end-fed wire is being bypassed to help form, say, the 30-meter half-wave antenna, both solder lugs are affixed to the same hole in the 20-meter insulator.

The Counterpoise That Defies Convention

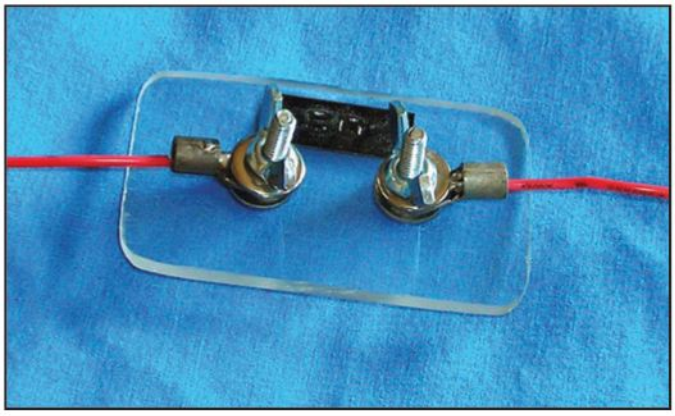
After *"A QRPer's 40- Through 17-Meter EFHW Antenna Coupler With Super-Sensitive SWR Bridge"* appeared in February's *CQ*, a thoughtful email arrived from Pat Byers, VE3EUR, of Ottawa, Ontario, Canada. He wrote in part:

"All too often I see recommendations of either quarter-wave counterpoises or no counterpoises at all for EFHW antennas and there can be a lot of spirited debate on that topic. Steve Yates, AA5TB, in his excellent article which you referenced <http://bit.ly/QCtX94> addressed this issue and found empirically that a resonant, properly adjusted EFHW antenna needs a counterpoise of at least 0.05 wavelength but that quarter wavelength counterpoises *are too long.*

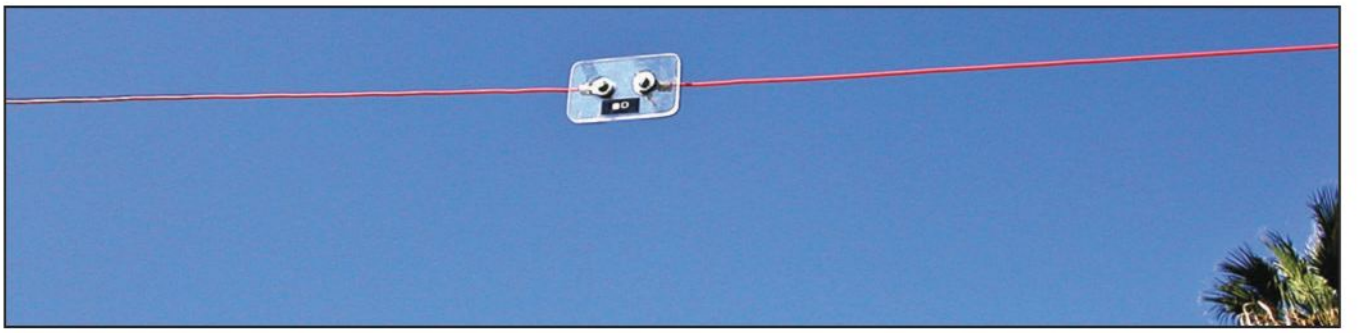
"A big advantage of this type of antenna is its easy deployment — so why use a long counterpoise if it's not needed? Who wants to unnecessarily drag along another big piece of wire into the field?

"What I got from Steve's website was that care should be taken to determine the resonant length of the driven element and after the tuner has been properly adjusted the antenna can be relied upon for field operations with a short counterpoise. Steve's method of determining the proper wire length is simple and effective.

"I found the same thing with my experiments. This type of antenna requires attention to set up. Table values will get you into the ballpark but a bit of additional work is required for optimization."



Wing nuts make changing bands quick and easy. Just be sure the holes you've drilled in your insulator allow enough clearance so the "wings" don't touch one another.



Here's what the insulator looks like in the air when it is separating a band segment from the rest of the line.

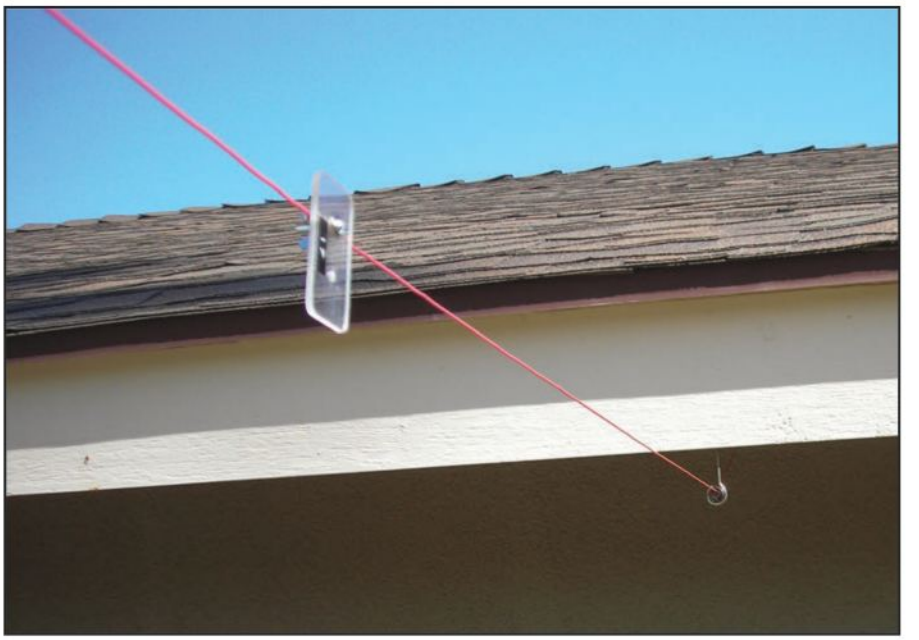
After reading and re-reading AA5TB's treatise on short counterpoises, we were intrigued.

For this "To the Field" antenna system we built the counterpoise system in the same way as the EFHW — in band-by-band increments. You'll see the total length of the CP system is 6-feet, 10-5/8-inches.

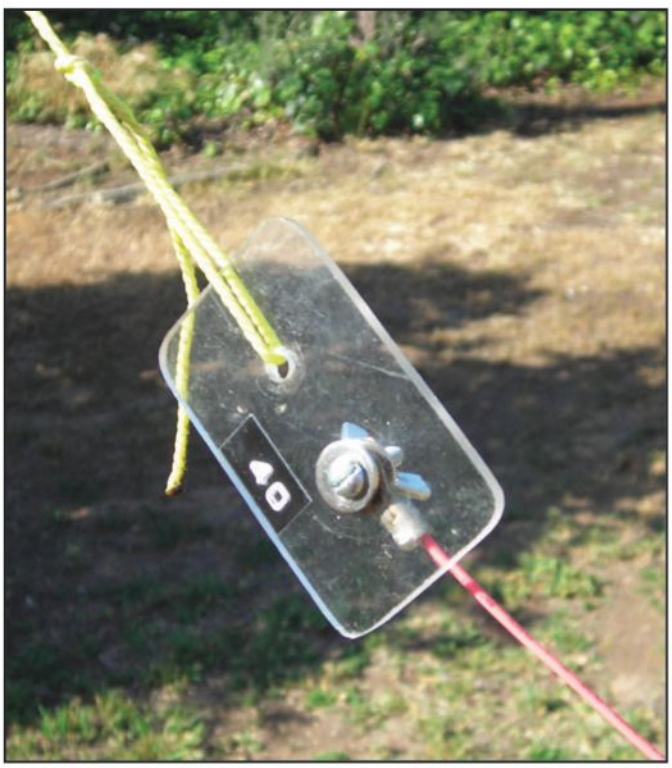
What? That's right. Ancient wisdom that an EFHW's counterpoise needs to be at least one-quarter wavelength has been questioned to the point of debunking.

As AA5TB points out, a counterpoise just 0.05 wavelength can work beautifully. So, why tote all that extra wire

When in "bypass" mode, the solder lugs are connected via the wing nut and bolt, in this case making the 20-meter segment just another part of the longer antenna.



As part of a fixed station antenna, stand-off TV-style insulators are used to keep the antenna wires away from the eave of the house. Visit: <http://bit.ly/PI3tSy>.



At the "end of the line" is the 40-meter insulator, whose second hole is used to tie-off the antenna line using light-weight string. The full-length antenna weighs next-to-nothing, so no heavy rope or concrete footings are needed to keep the antenna in the air. A tree will do just fine.

when a CP of just under 7 feet in length is all you really need for 40 meters, as VE3EUR asks. Seven feet vs. a quarter-wavelength of about 33 feet sure sounds more manageable.

Does a Short CP Work?

AA5TB goes into great detail on why and how this dramatically-shortened counterpoise system is a solid performer. At KI6SN we were quite skeptical, but seeing — and using the antenna system on the air — is believing. Shorter CPs *really do work* — and well.

Referring again to **Table 1**, the CP lengths for 17, 20, 30, and 40 meters are shown in the right-hand column.

To keep things simple, AA5TB suggests using this formula:

- CP length = 49.2 divided by frequency in MHz
- Or, for 40 meters: 49.2/7.150 = 6.881
- That's 6.881 feet, or 6 feet, 10-1/2-inches

Each CP length in **Table 1** was calculated in this way, and sliced and diced out of the total length of just under 7 feet of wire for 40 meters, creating the counterpoises for 30, 20, and 17 meters. The same hardware and plastic insulators were used as those in the main antenna.

So when you go through the exercise of changing bands with the EFHW system, go through precisely the same procedure with the counterpoise system, as well. *Voila.*

The End-Fed Antenna on 75 and 80 Meters

Believe it or not, this antenna works — and works well — in the 3.5 to 4 MHz amateur band. Note in the chart that the end-fed wire for 75/80 meters is 52-feet long, without a counterpoise.

what's new

Pasternack Expands Product Offering

Pasternack Enterprises, Inc. recently bolstered its lineup of electronic components by adding two new products: The X Band High Gain Power Amplifiers and 1-watt and 2-watt broadband amplifiers.

Pasternack's new line of coaxial X-band high gain power amplifiers are packaged inside hermetically-sealed metal enclosures that contain a hybrid microwave integrated circuit design and GaAs pHEMT technology. The categorized SMA amplifier modules are unconditionally stable and include built-in voltage regulation, bias sequencing, and reverse bias protection for added reliability. The power amplifier over-voltage protection is installed externally for easy repair.

These RF amplifiers are fully matched internally for 50-ohm input and output, which eliminates any need for additional sensitive external RF tuning components.

The new amplifiers have a frequency range from 8 to 12 GHz and offer 30 to 41 dB small signal gain over a temperature range of -30 to 70 C. The gain flatness ranges from 0.50 dB to 1 dB and the IP3 output performs up to 44 dBm. They are available in 1 watt and 4 watt designs depending on the configuration.

Pasternack's new line of medium-power broadband amplifiers are offered in 1- and 2-watt models and range in frequency from 2 to 18 GHz depending on the configuration. Designed with a hybrid microwave integrated circuit and GaAs pHEMT technology, these amplifiers are stable and include built-in voltage regulation, bias sequencing, and reverse bias protections for added reliability. In addition, they are fully matched internally with 50-ohm input and output. Over-voltage protection circuits are built externally to ease repair.

The family of 10 amplifiers is built into hermetically-sealed modules and will operate from -55 to 85 C. The gain ranges from 32 dB to 48 dB, and gain flatness from 1 dB to 2 dB at the higher frequency range of 12 to 18 GHz and IP3 levels of 39 to 42dBM.

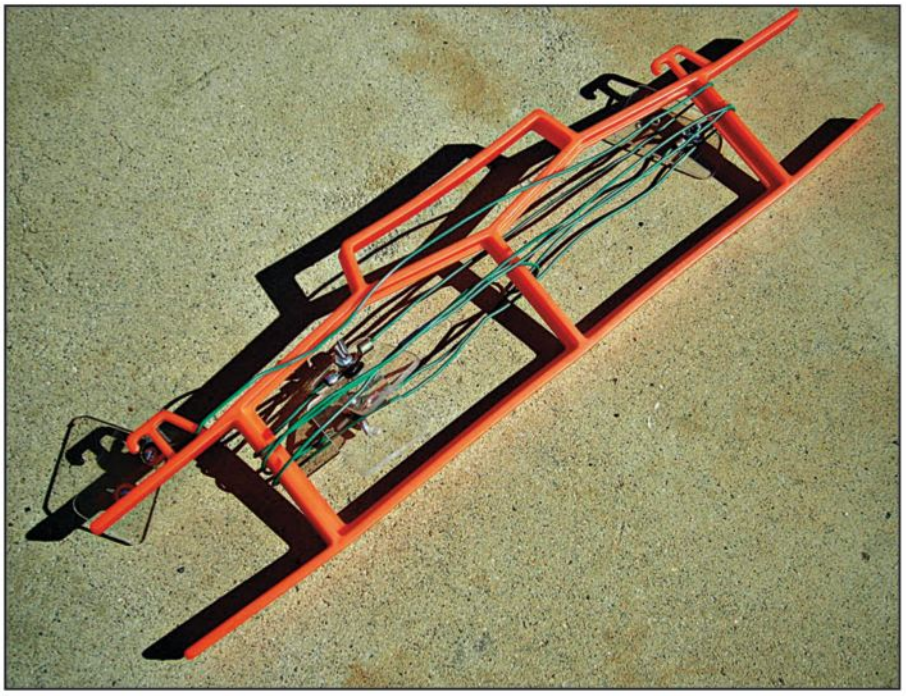
For more information on availability and pricing contact: Pasternack Enterprises Inc., 17802 Fitch, Irvine, CA 92614. Phone: (866) 727-8376. Email: <sales@pasternack.com>. Website: <http://www.pasternack.com>.

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.*

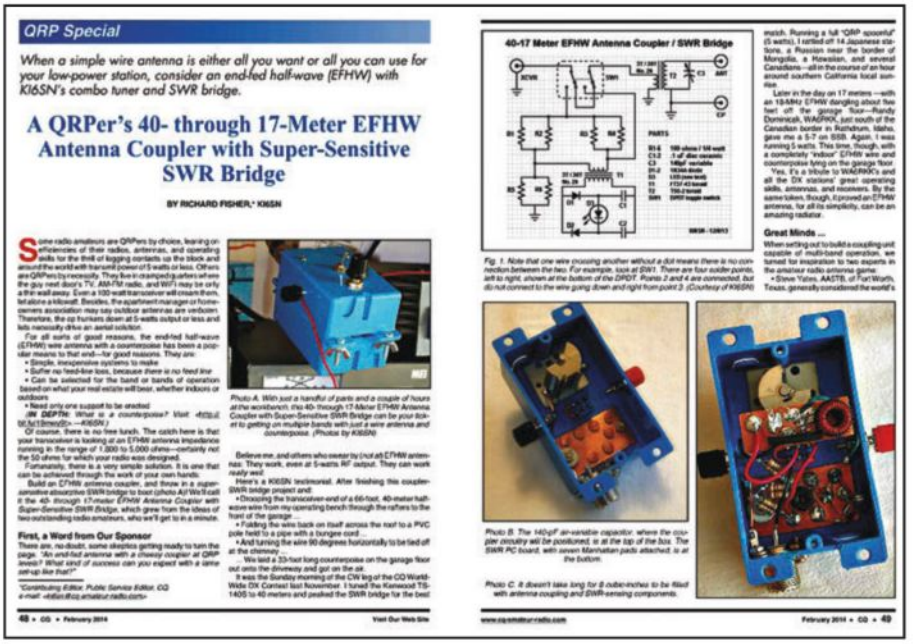
For operation here, we're going to remove the EFHW tuner and SWR bridge and replace them with a 9:1 unun matching network, a higher-power transceiver and an antenna tuner. Instructions for making a 9:1 unun appear elsewhere in this "To the Field" special edition.

At KI6SN, the 52-foot length for the end-fed wire was determined by sheer experimentation. Other people who have played with short end-fed wires and 9:1 ununs say a length of between 22 and 30 feet is good.

You can come up with your own "ideal length. "It's a chance for your own scientific discovery in determining the optimum length for your 75/80-meter section. Just remember, when you're snipping and adjusting, the total length



The full multi-band counterpoise — less than 7 feet in length — takes a tiny portion of the space on this hardware store wire organizer. The full end-fed wire antenna can be wound on there, as well, with room to spare.



QRP Special

When a simple wire antenna is either all you want or all you can use for your low-power station, consider an end-fed half-wave (EFHW) with KI6SN's combo tuner and SWR bridge.

A QRPer's 40- through 17-Meter EFHW Antenna Coupler with Super-Sensitive SWR Bridge

BY RICHARD FISHER,* KI6SN

40-17 Meter EFHW Antenna Coupler / SWR Bridge

February 2014 CQ "QRP Special" featured details on building a simple antenna coupler for the 17, 20, 30, and 40-meter portions of this end-fed antenna.

of this end-fed, multi-band wire must remain 65-feet, 5-1/2-inches in total.

Using a Kenwood TS-140S and MFJ-969 Deluxe Versa Tuner II, a 1:1 SWR was easily achieved with the 52-foot-long section of the antenna attached to the 9:1 unun. No counterpoise was used.

A call on 75-meter phone got responses of disbelief from stations in a roundtable copying me. It is important to note that ununs are notorious for being *lossy.* So trying QRP (low power) RF output into the system on 75/80 may be disappointing. But if you're in a position to put out, say, 50 or 100 watts there, you may be surprised by how a short end-fed wire can open low-band possibilities.

This antenna is so lightweight, a couple of bricks and string are almost overkill to affix it over the top of a tree.

A 90-foot roll of No. 22 stranded hook-up wire is on the shelf at RadioShack® — more than enough wire to make both the antenna and counterpoise for the KI6SN 5-Band, End-Fed Antenna System.

On the Air ... Unqualified Success!

An EFHW has been used at KI6SN for several years. It performed nicely in the CQ WW DX Contest on 40-meter CW last November, with Japanese and Russian stations ending up in the log.

The multi-band version was tried out on Marconi Day, April 26. Again, we were working 40 meters and heard the amateur station at the Maritime Historical Society (MHS) <http://bit.ly/1IWTgAP> running a string of special-event style contacts on 7.050 MHz.

The EFHW, configured for 7.150 MHz, was used along with a NorCal-40A transceiver putting out 850mW to make the call. K6KPH is north of San Francisco, 475 miles from our Southern California location <http://www.QRZ.com/db/K6KPH>.

"QRZ?" was the initial response from the MHS station. At least he was hearing my 850mw. On our second call, we kicked in the 2014 NB6M Miniboots RF Amplifier (featured elsewhere in *CQ Plus*) and got an immediate response to our 5-watt QRP "gallon."

We received a 579 RST — quite respectable for a 475-mile path in mid-afternoon on a 40-meter band that was crazy with signals fading up and down (QSB).

This end-fed antenna tunes up nicely on all of the other bands, as well. And it's a thrill making every contact with such a simple wire.

Want an antenna that's a solid performer in the field as well as on the home front? The KI6SN 5-Band End-Fed Antenna System is well worth your attention.

IN REVIEW: Kaito KA550 — A Terrific Humanitarian and Emergency Multiband Receiver

BY MEHMET BURK*

Relief Analysis Radio just had a unique opportunity to review Kaito Electronics' KA550 World Receiver, which features AM, FM, SW, and NOAA radio bands as well as a host of redundant power options.

Don't let the radio's appearance as of a somewhat retro analog AM/FM receiver fool you. This preparedness receiver is not digital, and does not have a "boxy" emergency radio-style shape, and quickly you'll find that this is a very good thing. This is a powerful and elegant piece of equipment.

A Radio in the Hand . . .

The ergonomics are outstanding. The receiver is lightweight and rugged, and the tuning knob is tight and strong — somewhat similar to a Tecsun PL-660. The radio is easy to hold, and sits sturdily on a desk. Plugging in the rechargeable batteries and turning the hand crank for 1 minute yielded more than ample power for an entire listening session.

The hand crank is smooth. A photovoltaic solar cell can be extended from the back of the receiver to allow for solar-powered listening in direct sunlight, and a ruggedized hand strap allows for easy carrying.

There are five — yes, *five* — ways to power this receiver:

- Via three AAA batteries
- The receiver's built-in rechargeable batteries that can provide strong power after only 1-2 minutes of hand cranking
- The solar panel
- Via adapter (not included)
- USB charge from a computer

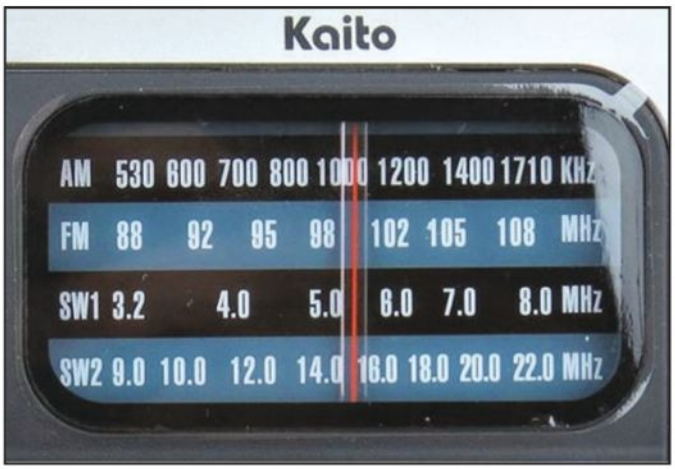
The radio also displays a variety of lighting options that are very useful in emergencies including a strong flashlight, a blinking red emergency beam, and an extremely useful ambient reading lamp. The USB output can also be enabled to charge cellphone and tablet devices. My Samsung Galaxy S3 docked immediately and went right into charge mode.

Around the Bands

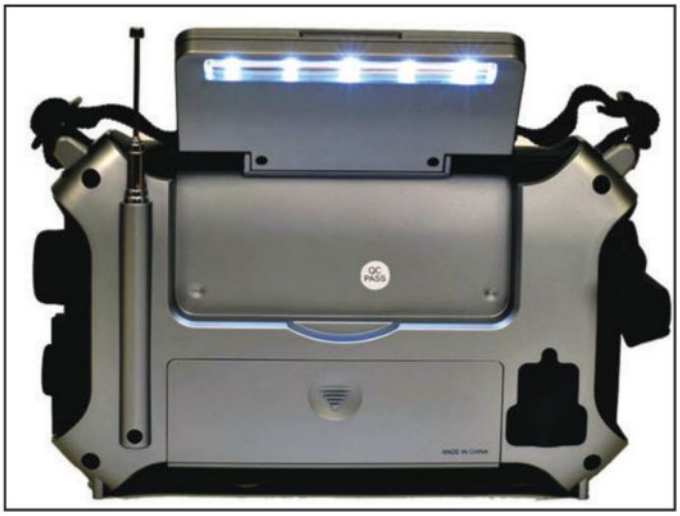
So with impressive ergonomics, redundant power, and lighting and charging options — how does the receiver actually fair as a multiband radio? The results were astounding.

The Kaito KA550 "preparedness receiver is not digital, and does not have a 'boxy' emergency radio-style shape, and quickly you'll find that this is a very good thing," writes Disaster DXing columnist Mehmet Burk. "This is a powerful and elegant piece of equipment." (Photography from Kaito Electronics website at <http://bit.ly/1flrTO8>.)

The receiver's front-panel band mode, and power options include, from left, seven Weather Band channels, Band selections including WX (weather), FM, AM, and short-wave bands SW1 and SW2; and power selections including replaceable AAA batteries (BATT), SOLAR/DC CRANK and NOAA Weather Alert.



The Kaito KA550 covers 530 to 1710 kHz of the AM broadcast band; 88 to 108 MHz FM; 3.2 to 8 MHz on SW1, the lower shortwave band; and 9 to 22 MHz on the upper shortwave band, SW2.



Five bright LEDs on a flip-up panel on the back of the KA550 can provide emergency lighting when the power goes out.

AM/FM Bands: Crystal clear and easy to tune into with the extremely convenient LCD tuning light. I'm located in the eastern U.S., about 600 miles away from Chicago and Boston — and WBZ Boston and ESPN's Chicago station tuned in impressive clarity. The audio quality on the receiver's speaker made for very enjoyable listening. All local FM stations sounded great. Sensitivity and selectivity were highly above the expectations for an analog preparedness radio. The implications for using this in an emergency are clear — this receiver can DX regional newsradio powerhouses with no issue.

NOAA Weather Bands: I was able to tune in three NOAA transmitters with sound quality at or better than my two NOAA weather radios I have in the house. Sound quality and signal reception were excellent. The receiver has a NOAA alert mode (optimal if you have an adapter). I don't plan to use this much, since I get my alerts through my Android device. But if I ever needed it, it's comforting to know that this radio could deliver.

On the Shortwave Bands: It's rare to see a multiband emergency receiver that contains the shortwave bands along

On the right side of the radio are knobs for analog dial tuning and volume control. Above the top tuning dial is a red emergency blinker and an LED flashlight that will help guide you around a dark area. Extending from the left side of the '550 is the hand crank for topping off the internal rechargeable batteries.

with weather radio. With this receiver, the SW band is no throw-in. With a frequency range of 3.2 to 8 MHz, then 9 to 22 MHz, the selectivity and sensitivity delivered the "big boomers" with a delightful sound quality.

Again the tuning LED is a good help here, and Radio Romania International, China Radio International, Radio Habana Cuba, and Voice of America sounded as good as the FM stations. One of my benchmarks — checking WWV frequencies on 5, 10, and 15 MHz delivered loud and clear results.

I wrapped the external antenna of my Tecsun PL 600 around the KA550's ample telescopic whip antenna and noticed a strong uptick in signal without overwhelming the receiver. You wouldn't use the KA550 to DX Voice of Turkey's Uighur broadcast to Central Asia, or to decode an HF weather fax (no USB/SSB/LSB), but for the major shortwave players still on the air, this radio is not just serviceable, it generates a terrific listening experience.

Uses for the KA550

This rugged, lightweight, analog receiver has multiple uses.

As an everyday receiver: I was surprised to discover this, but after living in the Pacific for years and using a digital NOAA Weather Radio (great for tsunami alerts), digital SW receiver (for Radio New Zealand Pacific News), and digital AM/FM receiver (for local content), I could have easily gone with the KA550 for all of my everyday needs. I would have lost nothing in terms of signal strength and listening pleasure, and in fact would have gained in both of these areas.

As a radio for humanitarian work/rugged international or domestic travel: This radio is light, rugged, and you have little worries about glass breaking and LCD leaking. If you are in Latin America, the Middle East/North Africa, Eurasia, the Asia Pacific, or Africa, you will have more than ample AM/FM/and SW capabilities, plus the benefits of redundant power, cell phone charging, and back-up lighting.

If traveling in the U.S. and U.S. Virgin Islands, the same is true except you will be able to easily pick up NOAA Weather Radio broadcasts. The receiver fits easily into a backpack or luggage, and would be a great companion in the outdoors or working the hotel circuit.

In a disaster: Personally speaking, if my household loses power and/or cell phone and Internet coverage, I'm going to this product immediately. If my household was involved in a regional-level disaster, I would have comfort that I could DX AM news radio powerhouses, shortwave broadcasters, and NOAA stations with clarity and sensitivity. In the past 10 years, I've experienced tsunami alerts, a 6.7 earthquake, 2 hurricanes, and 3 tornado warnings — one of which was very serious for my area. The KA550 would become a centerpiece for my family to charge devices, have ambient light at night, and to do an exceptional job in pulling in information from across the radio spectrum.

Many of the Kaito KA550's features are listed on its packaging.

Overall Impression

In summary, this multiband receiver gets 5 out of 5 STARS from me. In times of non-disaster it's like a radio Swiss Army Knife that performs way above expectations for each function.

For humanitarian or rugged travel, or in an emergency, this radio will very likely change the way you think about the power of analog. If the KA550 is your lifeline, it will get the job done brilliantly.

*(**MORE INFORMATION:** The KA550 is available from Kaito Electronics for $65.95. Visit: <http://bit.ly/1flrTO8>. – MB.)*

*(**NOTE:** Mehmet Burk writes the monthly Disaster DXing column in CQ Plus. – KI6SN.)*

An Unun-Told Story of Getting On the HF Bands Easily in the Field

BY RICHARD FISHER, KI6SN *

With the "Take It to the Field" *5-Band End-Fed Antenna That is Great for the Trail or at Home* in this edition beginning on page 139, you may have noticed an odd placing of a 75/80-meter leg of the wire between the 40 and 30-meter portion.

We suspect that raised a lot of eyebrows, but there's a method to the madness. In using that 52-foot portion of the full antenna, and replacing the end-fed, half-wave coupler with a 9:1 Unun (*UN*balanced to *UN*balanced) impedance transformer it is quite possible to put out a decent signal from 3.5 MHz to 6 meters.

Magical Transformation

The 9:1 unun, **Photo A**, creates an impedance *handshake* between the 50-ohm load your transceiver is providing to this antenna and the antenna itself, which has an impedance of many hundreds of ohms.

By including a garden-variety antenna tuner at the output of your transceiver and ahead of the 9:1 unun and long-wire antenna, it was easy to get a 1:1 SWR reading on 75 meters at KI6SN.

When it comes to 9:1 ununs, we're in the realm of complex impedance transformation, so we won't go deep into their theory. Suffice to say, they can be employed to make a very complicated situation tolerable — indeed, preferable — when you need to get on 3.5 to 4 MHz in a hurry and all you've got for an antenna is one long piece of wire.

As the accompanying photographs and schematic, **Figure 1**, show, the heart of this little wonder consist of a T130-6 toroid wound with 9 turns of three-conductor ribbon wire, **Photo B**. This is what's known as a trifilar winding. A standard coax connector, binding posts, solder lugs, a face plate made of PC board material, a handful of screws, and an enclosure are all you'll need. We threw in some rubber grommets for fun, **Photo C**. Heck, if you want to go "bare bones," skip the enclosure and hardware all together, **Photo D**.

Using Amidon cores — particularly TXXX-2 and -6 material mix — losses are reasonably low, but you'll likely need an antenna tuner. At KI6SN we used an MFJ-949E Deluxe Versa Tuner II to achieve our match to the 50-plus-foot wire. If you don't want to bring an antenna tuner to the field, use a 25-foot run of coax cable between the rig and the unun. The outer shield of the coax acts as a counterpoise. By the way, Amidon is at <http://www.amidoncorp.com>. There are many other sources for the T130-6 toroid as well. A Web search will show you where.

e-mail: <ki6sn@cq-amateur-radio.com>

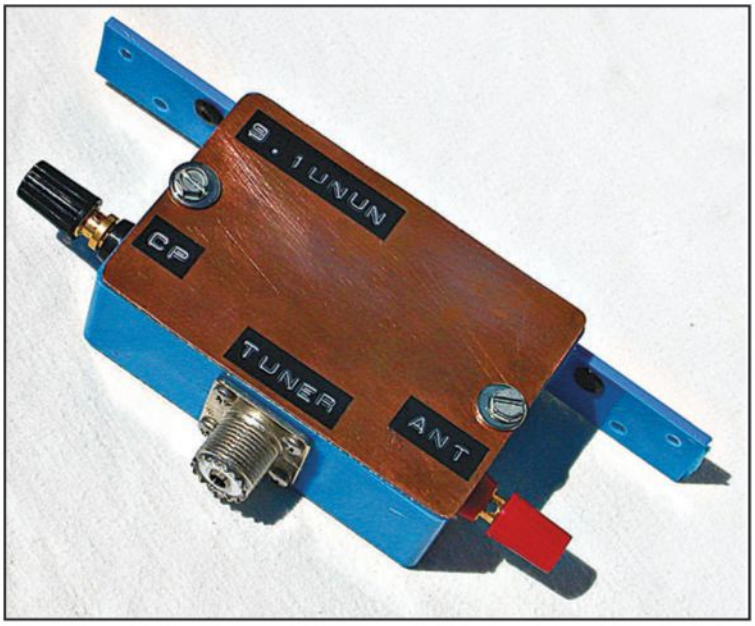


***Photo A.** With an easy-to-wind inductor and a handful of hardware, it is entirely possible to get on a wide range of high-frequency (HF) bands with a relatively short end-fed wire antenna. The secret weapon is a 9:1 unun impedance transformer. And you can build it! Yes, you can!*

Trifilar Windings and Connections Made Easy

Trifilar transformer windings are enough to drive lots of would-be builders to other projects. But here's a trick to keep things simple: Use multi-colored, multi-conductor ribbon wire. As you can see in **Photo C**, we started with four-conductor wire colored white, black, red, and green. By cutting away the white wire, you're left with three tidy wires — black, red, and green — that are joined by their insulation. Simply cut off a length that's enough to make nine turns on the T130-6 toroid and you're good to go.

Remember, every time the wires pass through the center of the "doughnut," it counts as a turn.

Once you've gotten the nine turns in place, it's a simple matter of following the color-coded wiring scheme shown in the schematic. Think of it this way:

- The trifilar winding, as shown, starts at the top of the toroid and winds its way to the bottom.
- Each of the colored wires — both from the top and bottom of the winding — is connected in a certain way to make this unun impedance transformer work.

Photo B. *With the barest minimum of parts, it is possible to nicely match the 50-ohm output of your transceiver and antenna tuner to a much higher impedance end-fed wire. It's all possible with the 9:1 unun.*

- The red wire at the top of the winding (R1), for example, is connected to the black wire from the bottom of the winding (B2). In the drawing, it crosses over G1, but is not connected to G1.
- G1 is connected to R2, and so on.

Configuration: Connecting the Dots

This "painting by numbers" method takes all the guesswork out of what-goes-where. G2 goes to the shielded side of your coax while B1 is where your long wire antenna is connected. The color "map" on the right side of the illustration boils it down to "input from your antenna tuning unit (ATU) and output to your antenna." Easy!

Being the *cheapos* we are at KI6SN, the local Home Depot provided the solution for what enclosure to use. It's in the home electrical section of the store, **Photo E**, and for just over $1, you won't go wrong.

There's nothing magic about mounting the toroid and hardware into the enclosure. Our 9:1 unun has a red binding post for the antenna wire, and a black one for a counterpoise, if we'd like to use one.

The coax fitting is on the bottom of the box. *Why?* Well, if we'd like to mount the unun high in the air, it makes sense to have the coax from the antenna tuner dropping down from the impedance transformer, right?

There were holes pre-drilled in this blue plastic box, so a few grommets were pushed through them. The idea here is to have a nice, soft siding for wires that might be threaded through them for stress relief — one side for the antenna and the other for the counterpoise.

The face plate was custom cut from single-sided PC board, and old school labels were made as a reminder to the user what's inside the box, and what goes where.

To hold the T130-6 toroid in place, a hefty plastic nut and bolt — from the Home Depot — were used. On the back side of the box, you can see the head of the bolt protruding through the blue plastic, **Photo F**. That impedance transformer isn't going *anywhere.*

On the Air

With our Kenwood TS-140S powered down to 5 watts the MFJ-949E tuner, 9:1 unun, and 52-foot-long wire creating our RF chain, we tuned up and asked to be recognized by a roundtable of hams on 75 meters. The antenna, by the way, was strung about 10 feet above the backyard between the eave of the house and a fig tree.

The hams were scattered up and down the West Coast and it was amazing to hear their comments. My SSB signal was S9 in Santa Maria, California,

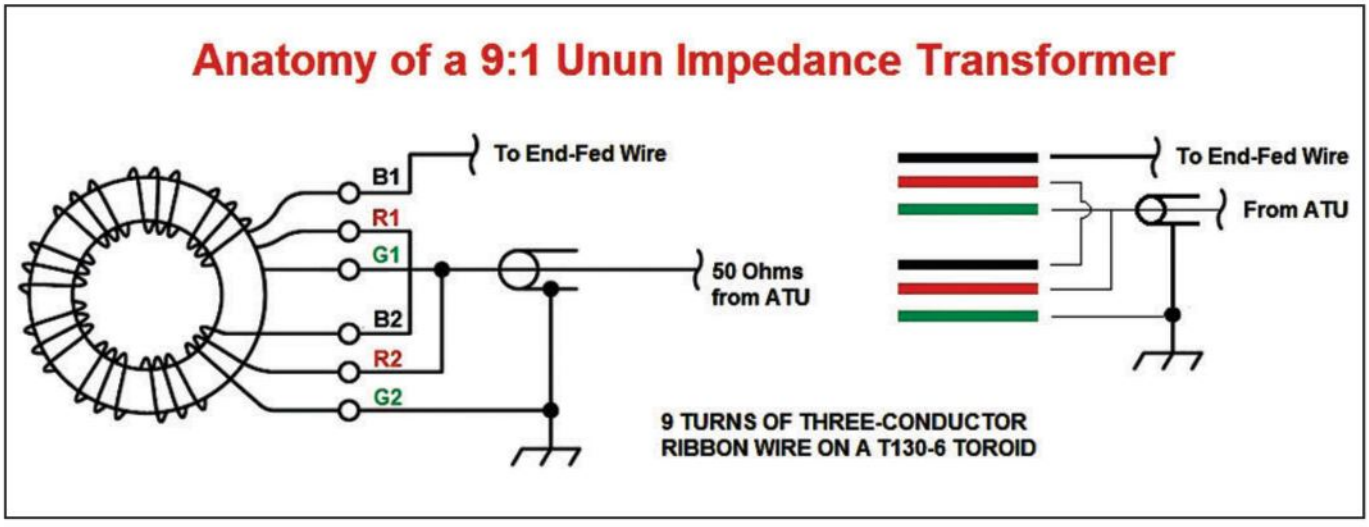


Figure 1.

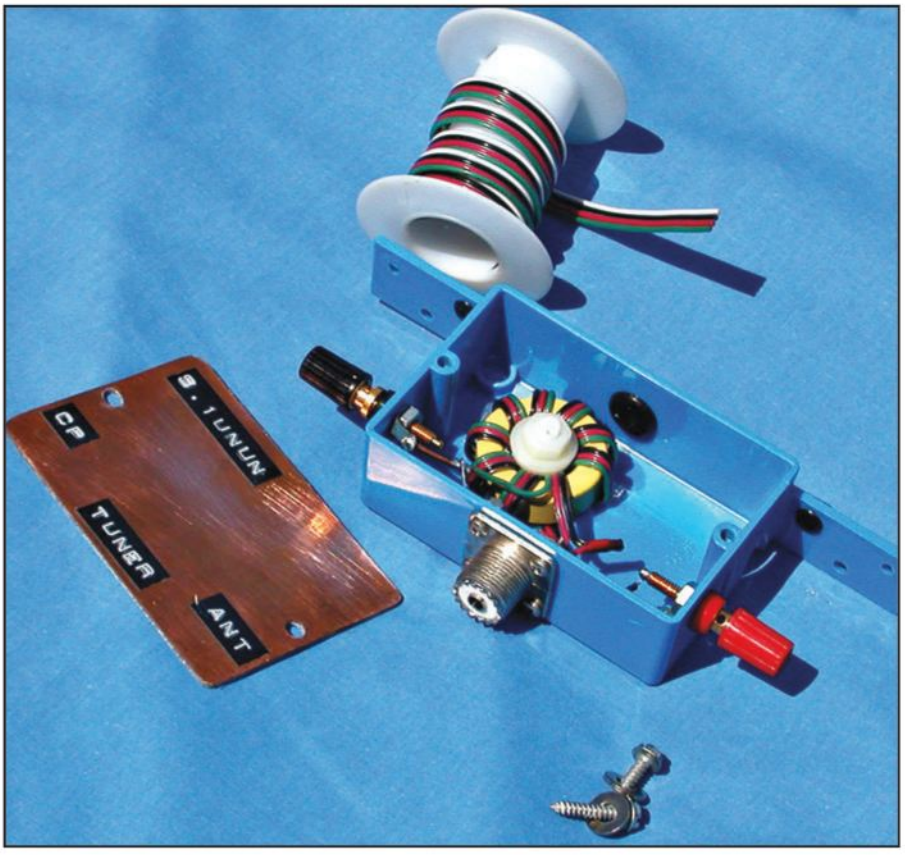


Photo C. *A plastic box from the electrical department of the local Home Depot yielded the $1.16 enclosure for the unun. Four-conductor ribbon wire, with the white wire subsequently removed, was used to create the three-conductor winding on a T130-6 toroid.*

Photo D. *If you want to go bare bones for a 9:1 unun, leave out the enclosure and other hardware. It can be as primitive as this — and still work!*

about 200 miles north of us. Similar "solid copy" reports were received by almost everyone who could hear our signal. There was no doubt we were getting out — and nicely — with this short antenna and nifty impedance matching transformer. What a thrill.

OK, low power (QRP) isn't for everyone. Don't be afraid to crank up the power through a 9:1 unun. Just be sure to choose hefty-enough wire to handle your power going around the T130-6 toroid.

Reasonable Tuning Expectations

Multiple experiments with the 9:1 unun — by multiple hams using an antenna tuner and about 52 feet of antenna wire — have raised these expectations in the way of SWR:

- 160 meters (1.8 MHz)/1.6:1
- 75/80 meters (3.7 MHz)/1.4:1
- 60 meters (5.3 MHz)/1.2:1
- 40 meters (7.1 MHz)/1.1:1
- 30 meters (10.1 MHz)/1.5:1
- 20 meters (14.2 MHz)/1.1:1
- 17 meters (18.1 MHz)/1.9:1
- 15 meters (21.2 MHz)/1.2:1

"The Tower" Looks To Raise Up Power Options

The Art of Power, Inc. has introduced "The Tower," a 30- to 36-inch power stand that has four standard power outlets (NEMA 15-5R) and two USB jacks (2.1A at 5 VDC) to charge portable devices. Surge protection is built-in with a resettable 15A circuit breaker as well as EMI and RFI noise filters.

Designed for people with limited flexibility and strength to easily access the sources of electricity to power their electronics, The Tower is adjustable by manually controlling the telescoping mechanism built into the supporting pole. The base of The Tower is weighted to avoid tip-over. An on/off switch controls all devices and USB ports. A right-angle plug has a low profile to fit easily in tight spaces and behind furniture. Indicator LEDs are used for power, surge protection, and proper grounding.

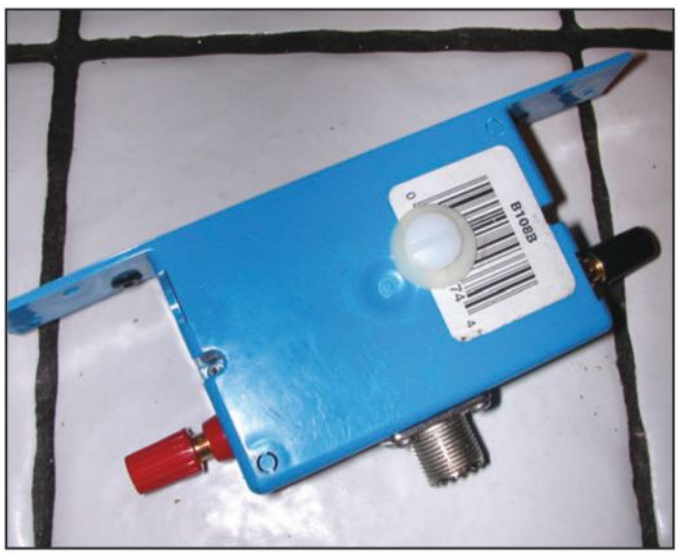
The Tower is rated by the UL and cUL and is ready for U.S. and Canadian use: 125VAC, 60Hz. An optional caddy/pocket holds a standard sized tablet and mobile phone while they are charging.

The retail price of The Tower is $99.99. For more information visit <http://www.theartofpower.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.*

Photo E. *This Single Gang Bracket at the Home Depot was drafted as the enclosure for the 9:1 unun at KI6SN.*

Photo F. *A nylon bolt and nut were used to firmly affix the T130-6 toroid inside the plastic housing.*



- 12 meters (24.9 MHz)/1.1:1
- 10 meters (28.5 MHz)/1.7:1
- 6 meters (50.1 MHz)/1.1:1

Rather Consider a Kit?

The Emergency Amateur Radio Club in Hawaii — EARCHI — sells a kit that is essentially the same configuration as the homebrew unit described here. If you'd like more information, visit <http://bit.ly/1o9Vsll>. It's called the End Fed HF Antenna Matchbox Antenna and if you scroll down, there are lots of testimonials on how well a good impedance transformer and short wire can perform.

There are some commercially-made units from which to choose, as well. Simply Google "9:1 unun" and let the search begin.

Now, It's Your Turn

So, whether you're homebrewing, building a kit, or thinking about buying a ready-built 9:1 unun, isn't it time you gave this short-wire *pathway to the low bands* a try? You bet it is!

Please keep us posted on your experiences. We'd like to hear how things turned out. Keep in touch. Drop an email to <ki6sn@cq-amateur-radio.com>. And we'll see you on the bands!

Learning CW from the Boy Scout Twin Signal Set, Circa 1950

BY RANDALL NOON, KCØCCR

Back in the 1950s, one of the ways a person could learn Morse Code, and also earn a Boy Scout merit badge, was to purchase an Official Boy Scout Twin Signal Set and learn by sending and receiving Morse Code with a buddy — a forerunner of the FISTS Code Buddy program, perhaps.

As pictured in **Figure 1**, the Twin Signal set consisted of two battery-operated practice buzzer telegraph keys. A person can practice Morse Code by himself using a single buzzer key.

Alternately, the two keys can be connected by two long strands of bell wire so that two people, presumably Boy Scouts seeking merit badges, can practice sending and receiving top-secret messages to each other.

The original Twin Signal Set, catalogue number 1098, cost $3.95 in stores that sold Boy Scout supplies. The price later ballooned up to as much as $4.90, as shown in **Figure 2**. Sharp-eyed readers will note that this box has been re-priced two times over the price originally printed on the box. Newer hams may notice the lack of any bar code or quick response square on the box, and that it plainly states that batteries are included.

If a person wants to buy one of these vintage Official Boy Scout CW learner sets now from one of the various internet auction sites be prepared to pay anywhere from $20 to $100, depending upon condition. Despite the fact that some people consider this a vintage collectable, this price is still not much more than what a person would pay for a new, single practice buzzer key at a ham radio supply shop, from an online ham equipment supplier, or at a hamfest. However, in this case a person gets two keys, that is, if the set being sold is complete.

An interesting feature of the Twin Signal Set is that not only did the telegraph keys activate a buzzer, but there was also a setting where a light could be activated with the buzzer or the light could be activated by itself. As it says on the box top in **Figure 1**, "FOR TWO WAY SIGHT OR SOUND COMMUNICATION."

Sending Morse Code by light using an Aldis Lamp, sometimes called a blinker, or something similar has been used by ships at sea since the late 19th century and continues into the present era. Communication by light signals provides communication by line of sight with other ships without having to break radio silence. Some modern versions of Aldis lamps now use infrared light instead of visible light and a person uses special goggles to see the signal. The unaided eye of an enemy then cannot spot the light signals if he is close to the line of sight.

Figure 4 shows what is in the box when opened. The two Morse Code keys are plain to see. The instruction booklet is in the middle and obstructs the view of a two rolls of bell wire and the four "D" cell batteries. This unit had empty slots where the four "D" cell batteries would be. Each key used two "D" cell batteries.

The booklet contains good advice about how to learn Morse Code. For example, it states on page 1:

A radio instructor once said, "There is no easy way to learn Morse, but there is a less hard way." First you and a buddy decide whether you are going to learn by ear or by eye — by buzzer or by blinker. Then throw away any alphabet with dots and dashes alongside the letters. Instead, use the code given. Now you are on the "less hard" train, because you

Figure 1. *Top view of the Twin Signal Set.*

Figure 2. *Side view of Twin Signal Set box showing a price tag of $4.90.*

Figure 3. *On the back of the box, within the circle on the right it says, "IT'S EASY — IT'S FUN."*

are going to learn the Morse language without the useless step of translating it into dots and dashes.

The instruction booklet contains a number of other good tips about learning Morse Code. On page 3, for example it states:

Send single letters at first. Send them slowly so that the listener may learn to recognize each character quickly and without hesitation. Always remember to divide the work evenly. It is easy to become lopsided, having a great deal more proficiency in sending than in receiving.

The last line is certainly true. CW beginners often send faster than they are able to receive. In sending, a person has already decided in his brain which letter will be tapped out. The necessary "brain time" is prior to the physical sending action of the hand. In receiving, however, the ear has to first hear the signal, the brain has to make sense of the sound, and then the sound has to be associated with a letter.

More apparent "brain processing time" is needed in receiving than sending. However, in experienced CW operators, the reverse is often true: they can receive by ear faster than they can physically send using a straight key. For this reason, sometimes as a courtesy it is better to send CW to a new CW operator just a bit slower than he is sending CW to you.

Figure 5 shows the settings on one of the keys. Wire connections are to the left of the key. The switch to select light, buzzer, or sounder is on the right. The blinker light bulb is next to the thumb in the picture, and a list of code characters is embossed in the plastic cover. The "L" setting is for the light; the "B" setting on the right is for the buzzer sound; and the "C" setting, covered by the metal contact switch, is for a regulation telegraph key sounder effect.

Figure 4. *With the lid up, looking into the box.*

The instructions further say:

Try to have the material sent at a slightly faster rater than you can copy easily. This will keep you alert and active. Use one group of characters at a time; take it easy and learn by SOUND. In copying, write each letter as you receive it. Do not write down dots and dashes! … If you miss a letter, leave the blank and go on, and don't worry about it or try to figure out what it might have been.

Don't practice too long at one session. Half an hour a day on a regular schedule is better than cramming exhausting labor into one evening.

After you have obtained reasonable proficiency, try tuning in on the radio [such as W1AW practice sessions]. Many commercial sets have a shortwave receiving attachment by which you can tune into the lower bands which carry code work. Good operators are usually copying several words "behind" the signals to which they are listening.

Figure 5. *Closer view of a one of the Scout keys.*

Figure 6. *Despite its 60 years plus age, the bulb in this key worked just fine.*

Despite the instructions being just four, quarter-size pages, the instructions are a fine CW learning aid. In addition to the advice quoted in the preceding, which is still good advice today, the instructions list procedures for radio and blinker use, the International Morse Code used by ham operators, and some lesson group words for learning the code.

The sound that the key makes when the contact switch is in the "B" position and fresh batteries are installed is similar to that of an old-fashioned door buzzer or the sound made by an MFJ-557 practice key. The sound that the key makes in the ""C" position is a click that is supposed to sound like the sounder in an old fashioned telegraph office. The "click" sounds not when the key is depressed, but when the key is lifted after being depressed. Last, in the "L" position, the bulb, despite its 60-year plus age, lit nicely.

Having said all this, the question some CW operators might have at this point is, did you use the key to make QSOs? The answer is, of course. I couldn't resist. Please note **Figure 7** where the Boy Scout Key was substituted for my usual Ameco straight key at the home station. The given gap between the key's upper rest position and the contact point is large. However, the spring return action of the key is not stiff and after a bit I simply held the key after contact just above the contact point. Sending was not difficult and I made several QSOs using the key. However, I did remove the batteries. The buzz, click or light was distracting.

The Official Boy Scout Twin Signal Set is over 60 years old, so it is auctioned, traded, or swapped on websites like eBay as a sort of vintage toy or antique Boy Scout memorabilia. However, the keys are fine for learning CW, alone or with a buddy (like the box says), and the instructions included with the set give solid advice about how to learn Morse Code.

Considering that a person gets two keys in the set that can also be used as straight keys with a transceiver, even paying eBay prices for a set, I think it is a good buy in comparison to some of the practice keys being sold to aid in learning code. And, it's sort of fun telling the operator at the other end of the QSO that I am using an Official Boy Scout Signal Set key to send CW.

Acknowledgements:

The instructions in the Set state that portions of the instructions were reprinted from the "Handbook for Boys," from the Boy Scouts of America in 1948. The portions of the instructions that came from the "Handbook for Boys" are not specifically indicated in the instructions, so I wish to note that it is likely that some of the quotations are from that 1948 handbook.

I also wish to thank my nephew, Thomas in Birmingham, Alabama, who was thoughtful enough to think I would be interested in the Twin Signal Set he had come across. Now, if he would just get a book and take the test. – ***KCØCCR***

Figure 7. *The Boy Scout straight key in action.*

disaster dxing

BY MEHMET BURK*

Applications of Broadcasting in Disaster Management and Humanitarian Assistance

In this edition of *Disaster DXing*, I want to highlight some of the true power of shortwave, and local (medium wave/FM) broadcasting within the context of emerging disasters and humanitarian operations.

To explore this important synergy, I'm going to focus on certain core humanitarian functions, and how the radio stations we may DX on a frequent basis can play a paramount role.

In this column, my methodology focuses on certain types of humanitarian analysis, and streaming Internet and terrestrial-based radio to prove how vital the medium of radio can be. I'd be 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>.

I'm piloting a new newsletter called, *SWL and Emerging Disasters*, and you can opt-in on either of those sites anytime.

Providing News to the Most Vulnerable

Perhaps no other news outlet symbolizes the potential humanitarian future of shortwave radio quite like **Radio Dabanga**, covering breaking news events in the volatile Darfur region of Sudan. With editorial operations centered in the Netherlands, and on-the-ground journalists operating in Darfur itself, this broadcast outlet is unique in that it provides news services *directly* to Internally Displaced Populations themselves.

Radio Dabanga's content stream is broadcast over the Internet, <http://bit.ly/1fSxncD> and, significantly, shortwave broadcasting is the outlet's preferred choice to bridge the digital divide, political obstacles, and logistical hurdles resulting from escalating conflict in Darfur. Shortwave broadcasts are triangulated in Darfur from powerful transmitters based in Italy, the United Arab Emirates, and Madagascar.

The Madagascar transmission can be heard fairly easily from eastern North America. Here is an audio clip from February 22, 2014 at 04:30 UTC in 11940 kHz from the Talata-Volondry transmitter. The opening part of the clip is Radio Dabanga's distinctive opening via the Internet, then the remainder is what I was able to pull in on a Tescun PL-660 with a modest extension of the receiver's external antennae. I gave the SINPO values for this logging a 2,4,4,4,2.5. *(**LISTEN:** <http://bit.ly/OnAKBE>. – MB.)*

While Radio Dabanga broadcasts in Sudanese and Arabic, the English language news stories on its website have provided invaluable insight in my humanitarian articles. In an article for *Devex* last year — an organization representing 500,000 international development professionals — I used a story to Radio Dabanga to suggest that Darfur was one of the world's Top 5 Emerging Food Security situations that the global community would be responding to in the near future (***READ**: <http://bit.ly/OnBQNH> - MB.)*

Radio Dabanga proves that shortwave broadcasting can have a pivotal role in reaching those most affected by and severe complex emergencies. **Photo A**.

Technology Redundancy

In an age of satellite communications and a universe of meteorological information products avail-

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Photo A. *Radio Dabanga's shortwave coverage of events in the Darfur region of Sudan is especially targeted to Internally Displaced Populations. (Courtesy of Wikipedia)*

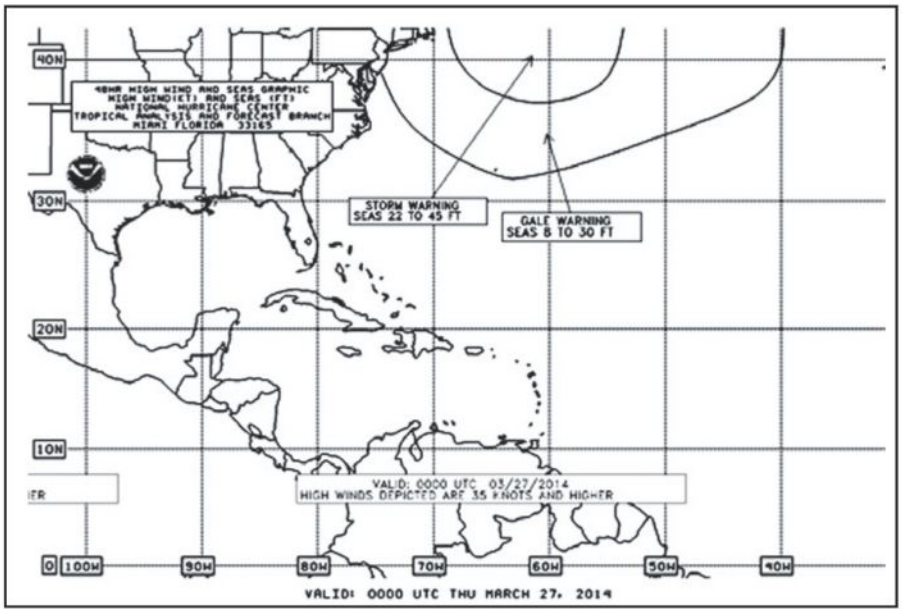


Photo B. *RadioFax technology provides the maritime community with redundant HF communications, which can be invaluable for severe coastal storms. (Courtesy of NOAA)*

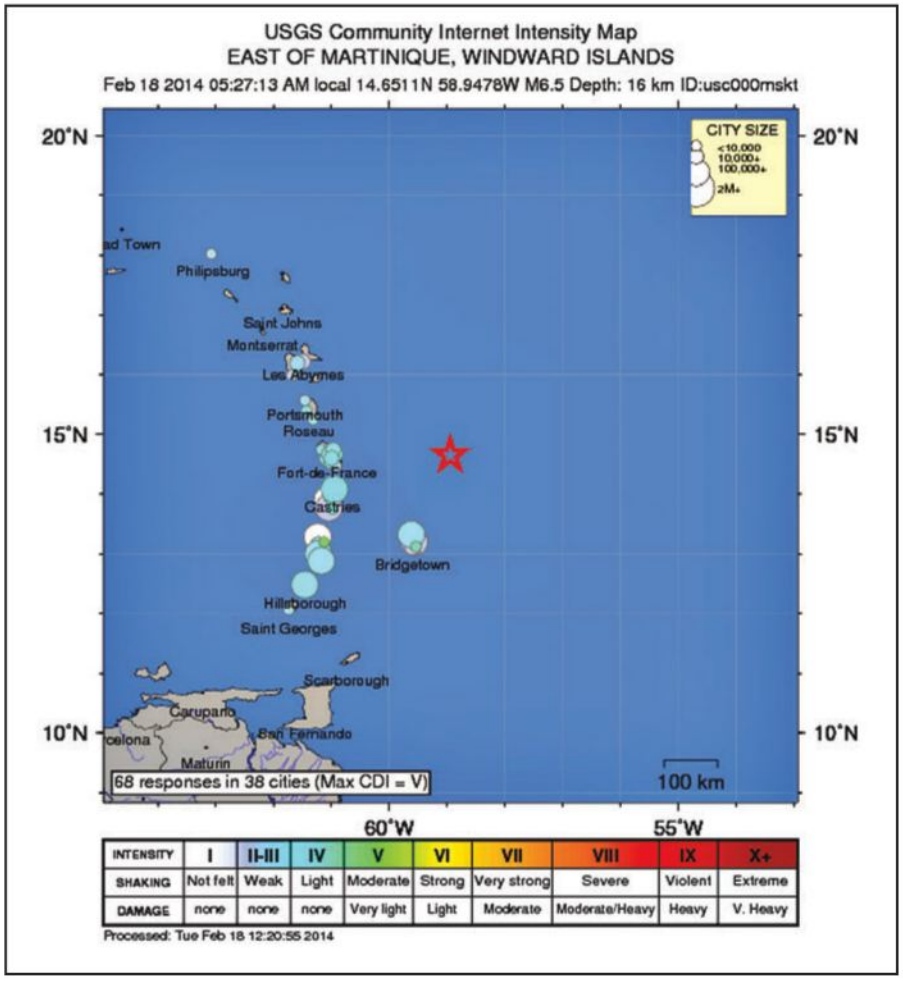


Photo C. *The Caribbean Broadcasting Corporation's FM station in Barbados provided outstanding coverage of 6.7-magnitude earthquake that struck the eastern Caribbean on February 18, 2014. (Courtesy of US Geological Survey)*

able on the Internet, the role of **High Frequency RadioFax** technology is still important to mariners on the high seas. The ability to tune a HF marine receiver or SW receiver to a reliable frequency far from any cell tower, and in any type of adverse condition to pull in weather charts, warnings, and forecasts is a comfort and necessity to the maritime community.

In fact, a new study by Yale researchers suggests that mariners in the North Atlantic Ocean have had to cope with over 40 storms that have reached hurricane force winds since October 2013. This an anomalous phenomenon that has raised average wind speeds over North Atlantic waters by over 12 miles per hour.

Advances in cell phone and tablet technology also hybridize the reliability of RadioFax technology. An application such as HF Weather Fax for Android can decode RadioFax transmissions just by holding the device close to a shortwave radio's speaker. With my Tecsun PL-660, I was able to use this application to decode weather warning products from the National Weather Service and U.S. Coast Guard out of Boston, Massachusetts — approximately 700 miles away from my location. This took some fine tuning in USB mode, but I was able to ultimately decode two forecast products on 6340 kHz and 9109 kHz. A representative RadioFax product from a recent Nor'easter that rapidly intensified in the George's Bank region off the New England Coast on March 27, 2014 is depicted in **Photo B**.

Post-Impact Analysis

In the immediate aftermath of many major disasters, the scope and scale of the situation is very much an unknown. Radio coverage, such as Radio Australia International's outstanding analysis of a major flood disaster in the Solomon Islands, can provide a window on the coming hours and days ahead for the impacted area. In this interview, Radio Pacific Beat interviewed the head of the Solomon Island's National Disaster Management Office (NDMO) on April 4, 2014. The NDMO described an unfolding emergency so great that international assistance would likely be needed from New Zealand and other partners. The interview concluded that the full scale of the disaster would not be revealed until daybreak until the following day. (***LISTEN:*** *<http://bit.ly/1jSKBff>. – MB)* The scene the following morning was indeed staggering. In a raw video from the *New Zealand Herald*, residents of the capital Honiara

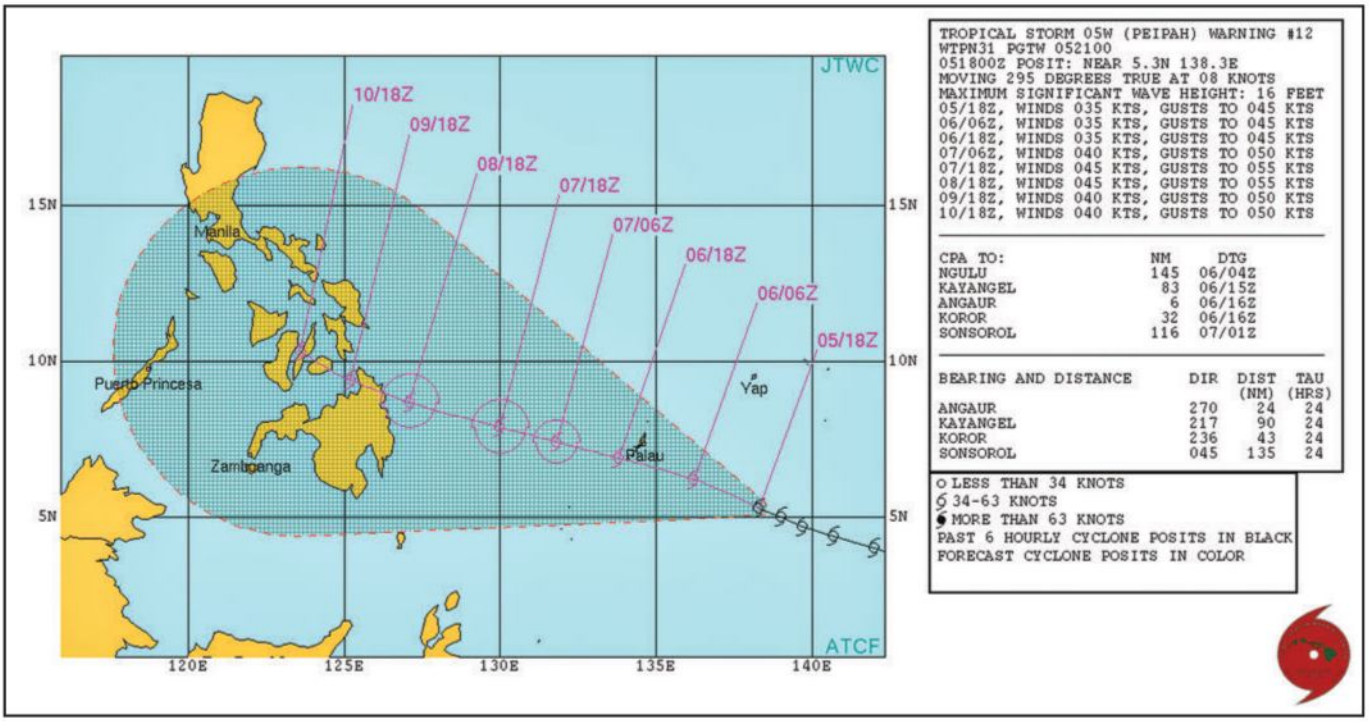


Photo D. *Cyclone Peipah churned toward Palau and the Philippines in late April 2014. The Voice of Palau FM station provides meteorological bulletins as these storms approach. (Courtesy of the Joint Typhoon Warning Center)*

struggle to cope with a truly serious catastrophic disaster. (***WATCH:*** *<http://bit.ly/1q1ZQ5s>. – MB).* Over one fifth of the capital took refuge in evacuation shelters at the height of the event according to Oxfam New Zealand.

In another example of the power of radio on post-disaster impact analysis, on February 18, 2014, a magnitude 6.7 earthquake shook Barbados and other eastern Caribbean island nations. The strong quake was even accompanied by a tsunami warning from the Pacific Tsunami Warning Center in Hawaii. In that particular situation, looking for information on the Internet was limited — many web-based media outlets flashed a "Breaking News" banner with the caveat in the story, "according to local media in Barbados." During those moments of great uncertainty, the international journalists were turning their attention to Caribbean Broadcasting Corporation Radio, a 10-kilowatt station on the FM band at 94.7 MHz. In a clip immediately following the earthquake, local broadcasters do a superb job in painting a picture of the situation to the international community. This situation truly illustrates how quickly a small radio outlet (with an ability to stream) can rise to prominence on the global stage.

*(**LISTEN**: <http://bit.ly/Qa1erx> – MB),* **Photo C**.

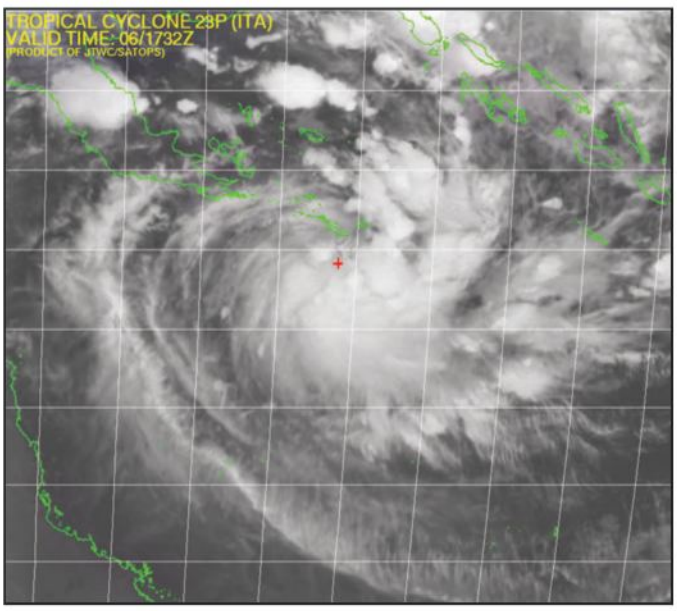


Photo E. *Here's a satellite view of Tropical Cyclone 23P churning across open water toward the Philippines.*

Cyclone Early Warning

In different cyclone zones around the world, small island nations can serve as "upstream" indicators of hurricane or typhoon impacts that can eventually impact larger areas. In the Atlantic Basin, nations such as Barbados and the Netherland Antilles can serve as important bellwethers of strengthening tropical cyclones that could ultimately make landfall on areas such as Haiti, the Dominican Republic, Cuba, or the U.S. Coastline. For impacts on the Philippines, the tiny Micronesian island nation of **Palau** can serve as the same indicator. Super Typhoon Haiyan's catastrophic impact on Tacloban last year was preceded by a strengthening over Palau just a few days before. In early April 2014, Cyclone Peipah steamed past Palau en route to an eventual landfall on the Philippines — fortunately one of limited intensity. As Peipah approached Palau, an official weather alert bulletin broadcast from the Voice of Palau at FM 87.9 MHz provided a detailed account of local conditions. This station is a gem to monitor when a storm is intensifying in the region. (***LISTEN***: *<http://bit.ly/1eebpGx> - MB*), **Photos D** and **E**.

Changes in Climate Patterns

This month at ReliefAnalysis.com, I've worked on some articles with other outlets exploring the potential impacts of an emerging El Nino and what that would mean for human-

Photo F. *Concerns in Vietnam continue to mount about a potential spread of H7N9 bird flu from China. (Courtesy of Wikipedia)*

itarian operations worldwide. At the present time, one of the strongest "Kelvin Waves" in recent history — a pulse of warm water below the surface of the Pacific — is moving from west (near the Philippines) to east (the Pacific coast of South America). If this Kelvin Wave surfaces off the coast of Peru and Chile, it could stimulate a very strong El Nino event — implications for humanitarian operations worldwide. (***READ****: "The Next Black Swan?" and "El Nino Geopolitics" at ReliefAnalysis.com <http://bit.ly/QTG5TB>)*

The coverage of outlets such as Radio Australia International and New Zealand International on climate-related topics in the Pacific is often outstanding. In a clip from Radio Australia, a researcher from the University of Albany provides a detailed analysis of the Kelvin Wave and prospects of a "Super El Nino" on par with a similar event in 1997. RNZI and Radio Australia International's web-based and shortwave coverage of these types of climate shifts in the Pacific can provide important clues to the worldwide meteorological patterns. From my humanitarian writing perspective, I found this clip especially insightful about potential weather changes that may be afoot in the coming months. (***LISTEN****: <http://bit.ly/1ITkF5L> – MB)*

Indicating Disease Patterns

Concern continues to mount in Vietnam regarding the spread of a new strain of bird flu named H7N9. While fortunately the spread of the virus has slowed in terms of recent human-to-human transmission in China, the Voice of Vietnam regularly covers national efforts to prevent the disease from developing within Vietnam's borders. This coverage can be accessed through the Voice of Vietnam's website, or logged easily in eastern North America on 6175 kHz in intervals between 01:00 and 04:00 UTC via relay from Wooferton, United Kingdom. This broadcast is quite easy for me to log on my Tecsun PL-660 from eastern North America. Obtaining national-level perspective on disease outbreaks provides intriguing indicators of the spread of transnational infectious disease patterns.

If any readers have had success in DXing coverage about Guinea's Ebola outbreak from outlets such as Deutsche Welle's transmitter out of Kigali Rwanda, or Channel Africa's coverage out of South Africa, please let me know. This is a situation that would be extremely interesting to monitor from a humanitarian perspective over the coming months. (***LISTEN:*** *<http://bit.ly/1jYqAWa>. – MB.)* **Photo F**.

Post-Disaster Communications

At ReliefAnalysis.com, I've been very excited to support some outreach on behalf of a special project being undertaken by the High Frequency Coordination Committee (HFCC). On June 4-5, 2014, listeners can attempt to log an international test being organized by the HFCC for the **International Radio for Disaster Relief** (IRDR) project. During these dates, the IRDR will be tested on the shortwave bands at the *Media Summit on Climate Change, Information and Communication Technologies, and Disaster Risk Reduction in Jakarta, Indonesia*.

The IRDR will simulate a major disaster occurring in Southeast Asia, and multiple international broadcasters will be cooperating to support coordinated humanitarian coverage for the impacted region.

It is extremely intriguing prospect that the international broadcasting community could be uniting to provide coordinated and unified transmissions to assist areas decimated by a major disaster. There is the possibility of QSLs for the SWL community during this event. For more information, from ReliefAnalysis.com and the HFCC. As the date approaches, I will be sending additional updates out to my e-mail subscribers as I receive them — feel free to contact me at any time, and I'd be most interested to connect with you. (***READ:*** *<http://bit.ly/1oQS82K> – MB)*

BY CORY GB SICKLES, *WCQ2CS

A Blast to Radio's Past, When There Was 'Magic in a Bottle'

"Real radios glow in the dark." – Ed Mustoe

For those of you who grew up with solid-state electronics, where everything is powered by 13.8 volts or less, some of this month's column may be lost on you. You simply grew up too late to experience the warmth, the glow, the simplicity — dare I say the *romance* — of thermatron-powered electronics.

What are thermatrons? Well, in some parts of the world, they are known as "valves," but in the States, we call them "tubes," **Photo A**.

Having a TV repairman come to your home with a full set of tools, plus well-stocked tube caddy, **Photo B**, and — after spending an hour kneeling behind the set — utter the unforgettable phrase "It has to go back to the shop" is something you'll never hear these days.

Here's a trip you probably never made: Being a do-it-yourself kind of person, you head to the back of your local RadioShack® or electronics store to spend some time with the tube tester and find out which one was bad in your radio.

Knowing the *Zen* of being patient while your transceiver "warms up" and stabilizes over the course of the first 30 minutes brings a certain sense of calm and allows you to blissfully embrace the concept of delayed gratification.

Unknown is the art of pre-planning, making the perfect pot of coffee and perusing today's newspaper as you casually sat down for a morning or evening of communications with friends.

So, too, just studying, appreciating and understanding circuits with the elegant simplicity of easy-to-read discrete components with point-to-point wiring — here too, you may have no frame of reference. These are things you missed out on and while such moments cannot be pleasant memories of a time past, you may find opportunities to experience those moments anew — with technology that journeys you into the past — in the way of a well-cared-for or restored 23-channel CB rig.

As I covered in a past column, such radios are still usable today. With high-impedance micro-

*<wa3uvv@gmail.com>

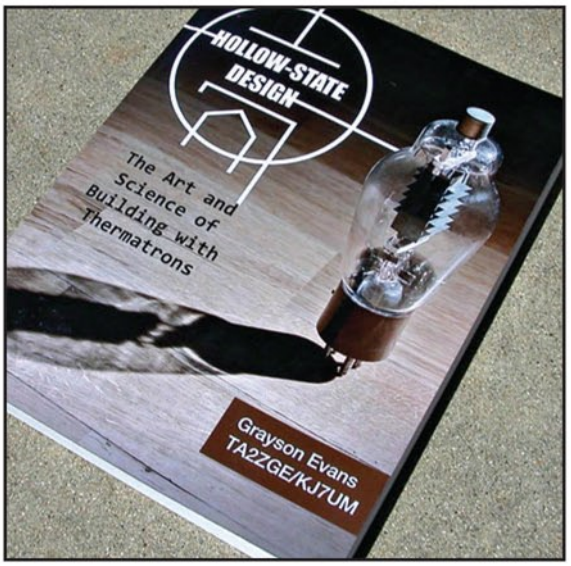


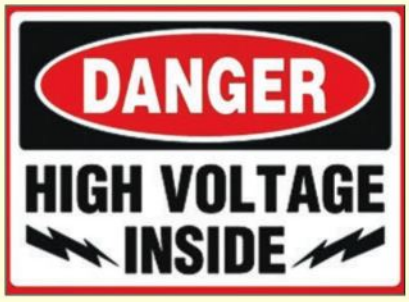
Photo A. *An excellent treatment on thermatrons, for those who like to experiment with older technology, is "Hollow State Design" by Grayson Evans. Visit his website for more on the book and "all things tubes" at <http://hollowstatedesign.tumblr.com>.*

Photo B. *My collection of tubes is actually in overflowing drawers, but many NOS (New Old Stock) tubes that were popular with TVs of the day are kept in my tube caddy. In a simpler time, when doctors and television repairmen made house calls, black bags and tube caddys were common sights.*

Photo C. *Watch and listen to a vintage* B&K Cobra CAM 88 Tube-Type CB radio in this YoutTube video at *<http://bit.ly/1kpgDNX>. The radio was made from the 1960s to 1971 by the B&K Division of Dynascan Corporation. (Internet screen grab)*

Always, Always, Always — Safety First!

BY CORY SICKLES, WA3UVV



Unlike solid-state electronics, which operate with lower voltages and relatively high currents, hollow-state electronics operate with high voltages and relatively low currents. In a CB rig, it is not uncommon to find voltages between 150 to 350 volts — perhaps more.

If you are going to put your fingers inside the cabinet, please do so when the set is off and unplugged. While the high-voltage power supply should have a bleeder resistor to slowly discharge the electrolytic capacitors that filter such voltages, things happen when radios age — or others fool around with "golden screwdrivers" and that resistor may not be there, as designed.

Never put yourself in a position where a high-voltage to ground discharge can occur through your chest — commonly by placing one finger on a connection while the other hand is touching ground. That's effectively how a defibrillator works. While it's great to start a stopped heart, it can also stop one that's running — *not so good..*

The best overall rule is to make sure you keep one hand behind your back or in your pocket. At the very least, keep it "out of range." Plus, stay aware of where the mains — voltage — connections are. You don't want to casually encounter one of those exposed points, either. Also, be aware that tubes get hot, not just warm. Bottom line, watch where you put your fingers.

The upside is that such radios are easy to work on, especially when compared to surface mount technology. The circuits are well-spaced, large component designs that are easily traced and understood. Kids like me learned electronics by experimenting with circuits that were laid out point-to-point.

With all the questions I used to ask the TV repairmen who showed up, I'm surprised they never charged my family for the "educational content" of their visits. Some were even kind enough to "share" some parts now and then, including the ham who let me have a pair of used chassis' for the foundation of my first amateur radio transmitter.

phones, a plethora of crystals and manly T/R relays, you can talk on such classics from Lafayette, Johnson, Browning, Courier, Hallicrafters and more. *(**WATCH and LISTEN:** To a B&K Cobra CAM 88 Tube-Type Citizens Band radio at <http://bit.ly/1kpgDNX>, **Photo C**. – WA3UVV.)*

In the mix of correspondence I get from readers like you are many references to tube-based gear, whether owned and operated by a parent, another family member, or by you.

Many have such radios as part of a collection, sitting on shelves, although even more are still in use today. Such enthusiasts know the joys of sending their voices into the ether via a 6AQ5A final, or some similarly glowing glass envelope. Such joys are vibrantly shared by many in the amateur radio community, by the way.

A recent trip to my local (independent) CB radio shop rewarded me with a nice selection of classic AM rigs. Having such a store near you is a blessing. It's a place where you can try out new equipment, find a service department with parts, and socially interact with other CBers, plus a few hams on occasion.

If you're not the handiest person with a soldering iron, getting your new microphone wired is available for the asking — and a reasonable bench charge. Need some technical advice or recommendations? Looking to take a break with some coffee and donuts? *(**SUGGESTION:** That's something you should provide every so often, thus increasing the "smile factor" whenever you walk in. – WA3UVV.)* Here too, is just the place.

On my visit I found an old classic. It needs a bit of restoration, but nothing I can't handle. *(**MUST READ:** See the accompanying story titled "Safety First." – WA3UVV.)*

Also, I have a suitable microphone for it. I'm sure I'll have it on the air is no time.

Previous on-air signal reports with tube-based gear have mentioned that my voice had a fuller, more dynamic sound than "normal." As someone who narrates and provides voice-over production services, that's a nicer compliment than you may initially think. When I mention the "tube" rig, Old Timers typically say, "That's what it is, it sounds like tubes. Your voice is warmer."

Perhaps we are used to a certain range of crystal-clear audio when it comes to solid-state electronics. Digital accuracy *should* sound better than plain old analog. CDs offer a sound reproduction that's technically superior to

Personal Communications and Off the Air columnist Cory GB Sickles, WA3UVV/WPC2CS.

A Welcome to New Readers

As *CQ Plus* is something relatively new for all of us, please allow me to (re)introduce myself and this column to our new readers — especially fellow hams.

In the early 1980s I worked for a company that marketed small (by the standards of the day) computer systems and peripherals, plus also refurbished IBM mainframes. All was well, until some dynamic with the partners changed. The turnover rate of employees — firing, hiring, and resignations — became so high that there was a new employee and telephone list distributed each week!

With our first child on the way, I was already talking about a more stable employment possibility with one of my clients, lest my name be stricken from the next list. In fact, one week the new list came out and the fellow I shared an office with discovered his name wasn't there. It seems he no longer worked for the company, but the list was handed out before they had a chance to let him know!

When the consolidation of *CQ VHF, Popular Communications,* and *World-Radio Online* into *CQ Plus* was announced, a table of contents for the February issue was referenced. One of the first things I did was go to that page, scan down the summary of columns and see if I was on the list.

Thankfully, both *"Off the Air"* and *"CB and More"* (with a new title) continue — in great part because they have been received so well. Not only do I enjoy writing these, I enjoy hearing from readers. In fact, most of my feedback comes from CB and GMRS enthusiasts.

One fact that really stands out, is just how many CBers are also hams — perhaps proving that CB is *still* a "gateway drug" to amateur radio.

No matter what form your two-way communications hobby interests take, be it CB, GMRS, amateur radio, or a healthy combination, I hope you find something of (continued) interest and entertainment each month — with *"Personal Communications."* ***– Cory GB Sickles, WA3UVV/WPC2CS***

Photo D. *Listen to a comparison between the fidelity and warmth of vinyl vs. CD in this YouTube video featuring David Bowie's classic "Hunky Dory," circa 1971. (Internet screen grab)*

Photo E. *If you look into the recesses of your local CB or radio repair shop, at a Coffee Break or hamfest, you just might find some classic radios that glow in the dark.*

vinyl LPs in every way. Yet, there is something *intangible* to many people — a certain *je ne sais quoi* — that leads them to prefer their music come from a turntable, instead of an MP3 player ... (***LISTEN:*** *To a comparison of vinyl to CD recording quality in a YouTube video featuring David Bowie's "Hunky Dory" at <http://bit.ly/PRjTYJ>,* ***Photo D****. – WA3UVV.)*

If you are looking for the latest digital signal processing technology in a receiver or voice compandering in your SSB transmitter, then a used AM rig from the 1960s may not be for you. However, if you have a desire to slow down, relax and "talk story" with some additional "warmth" in your voice, then shop around at your local CB store, local Coffee Break, or upcoming hamfest. You might find a well-worn transceiver, **Photo E** — one that holds many fond memories, waiting for a good home — where it can glow and click anew for you.

Another Grand Solar Minimum — What Does It Mean for Propagation?

BY CARL LUETZELSCHWAB, *K9LA

This month's column not only gives an update of the May 2011 column with three more years of data, but it also presents the data in a different format to see the possible tie to another extended solar minimum period and what could happen to propagation during this period.

I was reading an interesting article that appeared in *Forbes* magazine <http://www.forbes.com> titled "*Sun Flatlining Into Grand Minimum, Says Solar Physicist.*" The solar physicist referred to is Mark Giampapa, with the National Solar Observatory (NSO) in Tucson, Arizona.

Dr. Giampapa's belief that we are entering a grand solar minimum is based on seeing a continuation in the decline of the sunspots' mean magnetic field strengths and a weakening of the polar magnetic fields and subsurface flows.

Reading the Box Scores

I've been following this topic since reading the July 28, 2009 issue of EOS, which is the weekly newsletter of the American Geophysical Union (AGU). There was a short article in this issue by W. Livingston and M. Penn (both are also with NSO) titled "*Are Sunspots Different During This Solar Minimum?*"

The general thrust of the article was that the trend line (a running mean) of the maximum sunspot field strength declined from about 3000 Gauss in early 1992 to about 2100 Gauss in early 2009. Based on the fact that sunspots won't be seen when the field strength is below 1500 Gauss, Livingston and Penn postulated that we won't see any sunspots after 2015. This last sentence gave rise to the phrase "disappearing sunspots" that was reported on extensively.

This article in EOS was actually a brief summary and an update of Dr. Livingston's and Dr. Penn's original paper that appeared in a September 2006 issue of *The Astrophysical Journal,* titled "*Temporal changes in sunspot umbral magnetic fields and temperatures.*" Included in this original article is the explanation of how the magnetic field strength of a sunspot is measured.

Dr. Leif Svalgaard of Stanford University updates the Livingston and Penn data on his website at <http://www.leif.org/research> in Item H. The latest data at the end of 2013 continues to show the declining trend — but there appears to be an ever-so-slight tendency towards a leveling off of the strength. Extrapolating the declining trend line of the latest Livingston and Penn data says we won't be seeing any sunspots around the end of this decade — thus the 2009 prediction of sunspots disappearing by 2015 has moved out at least 5 years.

Using the Data to Draw Conclusions

Now we know that the correlation between the smoothed sunspot number and the smoothed 10.7-cm solar flux is very high (for example, see

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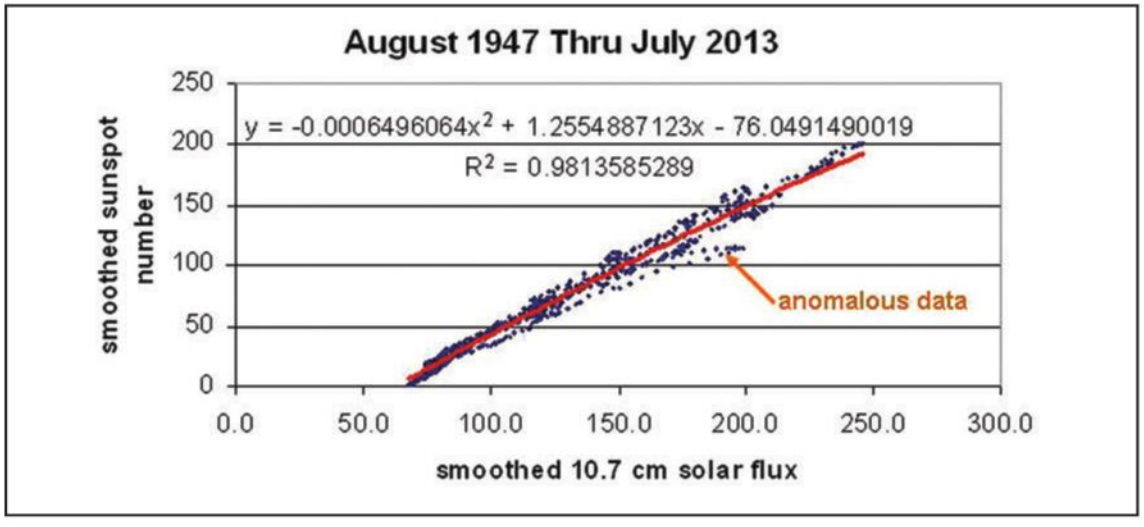


Figure 1. *Correlation with All the Data*

the figure on the last page of my article "*Correlation Between Solar Flux and Sunspot Number*" on my website at <http://bit.ly/1mSUN80>.

Thus, if we're going to have a problem seeing sunspots due to reduced magnetic field strengths, we would expect that the correlation between the smoothed sunspot number and smoothed 10.7-cm solar flux would degrade. Let's take a look at this.

Using smoothed sunspot numbers and smoothed 10.7-cm solar flux values from August 1947 (we began measuring 10.7-cm flux in February 1947 — thus the first smoothed value was for August 1947) to the present, the scatter diagram looks like **Figure 1**.

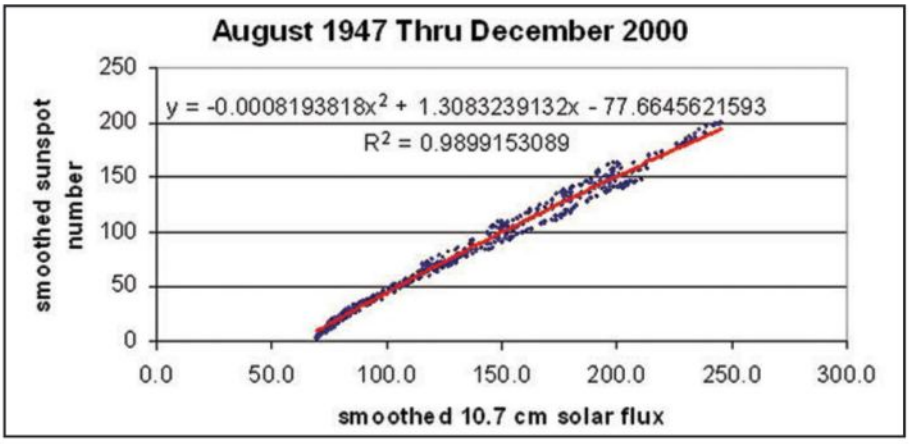


Figure 2. *Correlation for Data to December 2000*

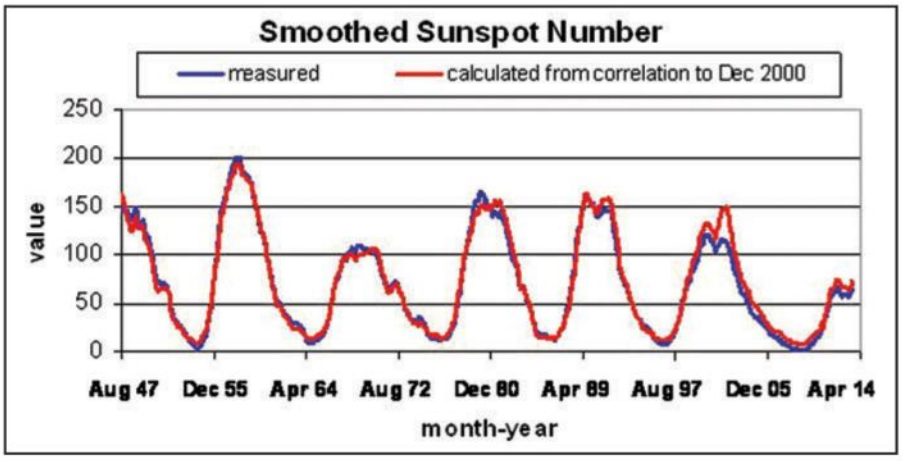


Figure 3. *Measured Sunspots versus Calculated Sunspots*

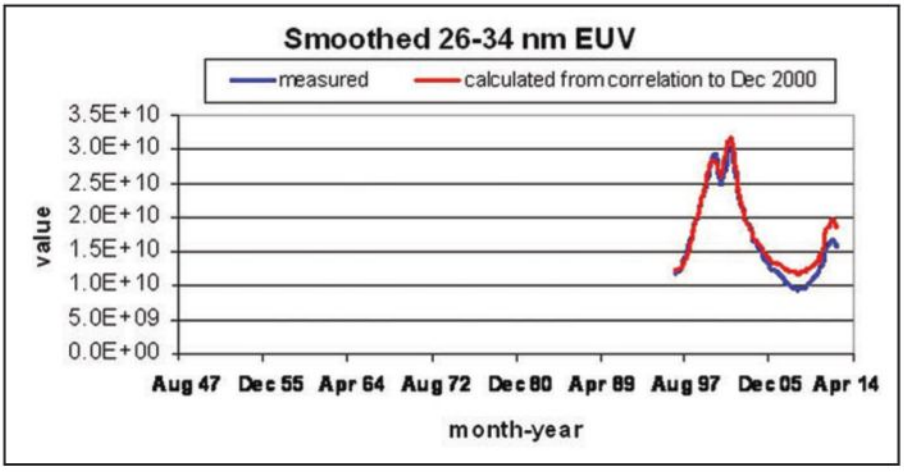


Figure 4. *Measured EUV versus Calculated EUV*

The blue dots are the pairs of smoothed 10.7-cm solar flux and smoothed sunspot number data. The red line is a second-order polynomial trend line, with the trend line equation and the R-squared correlation factor annotated on the plot.

Most of the dots fall near the trend line, except for a bunch of dots abnormally below the trend line (annotated in orange). They look out of place and suggest something happened to the correlation between the smoothed 10.7-cm solar flux and the smoothed sunspot number at some point in time.

From **Figure 1** and the raw tabular data, it's easy to ascertain that the "problem" started after the first peak of Cycle 23, which occurred in April 2000. So let's do a new scatter diagram for the data from August 1947 to December 2000. **Figure 2** does this.

The dots that look out of place in **Figure 1** are now absent in **Figure 2**. The R-squared correlation factor is now higher, too. Now what we can do is use the trend line equation in **Figure 2** (it calculates the smoothed sunspot number from the smoothed 10.7-cm solar flux) to calculate what the smoothed sunspot number should have been based on the higher correlation between the two from August 1947 to December 2000. See **Figure 3**.

Up until the first peak of Cycle 23, the measured and calculated smoothed sunspot numbers tracked extremely well. Yes, there are discrepancies at the solar maximums, but these are short-term discrepancies. Notice what happened at and after the first peak of Cycle 23 — the measured smoothed sunspot number has consistently fallen short of what was calculated based on the correlation up through December 2000 (this inherently assumes that the smoothed sunspot number changed, not the smoothed 10.7-cm solar flux — I'll have a comment on that later).

Interpreting What It All Means

So what's happening? Are we starting to not see sunspots as postulated by Livingston and Penn?

If so, is this the signature of entering an extended solar minimum period? Is there any other data that suggests we may be entering another grand solar minimum? Yes, there is, and it is based on what the three solar cycles prior to entering the minimum period do.

Although the sunspot data is somewhat sparse, the three solar cycles prior to the Maunder Minimum (1645 to 1715) appear to have had progressively smaller maximum values. That is what is happening now — Cycle 22 was big, Cycle 23 was smaller, and Cycle 24 will be even smaller.

We have to be careful with this sunspot data — Cycles 8, 9, and 10 exhibited the same successive decrease in maximum values, but Cycle 11 was almost as high as Cycle 8. Additionally, the Dalton Minimum (Cycles 5, 6, and 7) was not preceded by three successively smaller cycles.

An Assumption . . .

Although there appears to be more evidence in the sunspot number data that says we're *not* entering another extended solar minimum period, let's assume that we *are* on the verge of entering an extended solar minimum period.

Will propagation on the higher bands be nonexistent? To offer an opinion on this, we need to look beyond 10.7-cm solar flux values and sunspot numbers because they are proxies for the true ionizing radiation — UV (ultraviolet) and EUV (extreme ultraviolet).

Thanks to satellites launched in the Space Age, we can measure UV and EUV (we can't measure this radiation at these wavelengths at ground level because it is absorbed in the process of ionization). One of the detectors on board the SOHO (Solar and Heliospheric Observatory) satellite covers 26 to 34 nanometers. Radiation at those wavelengths ionizes about 50 percent of the F_2 region, so it's a good indicator of what the F_2 region is doing.

Yet Another Look at the Data

After downloading the 26- to 34-nanometer data (along with a lot of subsequent work), we can plot a scatter diagram of the smoothed 10.7-cm solar flux and the smoothed 26- to-34-nanometer radiation. The 26- to 34-nanometer data starts in July 1996 and goes thru August 2012.

The resulting plot (not shown) shows a similar anomaly as seen in the smoothed 10.7-cm solar flux and smoothed sunspot number data in **Figure 1** — there appears to be some outlying data beginning after the peak of Cycle 23. So I looked at data to December 2000, and used the trend line equation to calculate what the 26- to 34-nanometer EUV should have been. **Figure 4** is this data.

What's most obvious is there is much less EUV data available (as expected, since we had to wait for satellites to measure UV and EUV). So any conclusion should be viewed with caution.

The measured smoothed EUV and the calculated smoothed EUV (based on the correlation from July 1996 to December 2000) track very well initially — as they should since we're comparing the measured results against a highly-correlated trend line of the same data. But during the declining phase of Cycle 23, something happened. Either the smoothed 10.7-cm flux didn't change and the smoothed EUV decreased, or the smoothed EUV didn't change and the smoothed 10.7-cm solar flux increased.

Coming Full Circle

This brings us back to the earlier comment with 10.7-cm solar flux and sunspots — we assumed the 10.7-cm solar flux didn't change and it was the sunspot number that decreased. With the additional EUV data, it seems likely that again the 10.7-cm solar flux stayed constant and the EUV decreased — but not as much as sunspots. That makes sense as solar radiation at 10.7 cm is created in the outer solar atmosphere and has nothing to do with solar radiation deeper in the Sun that forms the ionosphere.

So here we are. We have some evidence that we are entering an extended solar minimum period, and we have some evidence that we aren't.

We also have evidence that sunspots may be disappearing concurrent with a smaller reduction in EUV. The latter suggests that a Maunder-type Minimum may still offer more F_2 region propagation on the higher bands than VOACAP predicts with zero sunspot ("zero sunspots" says 15 meters would be spotty at best, and 12 and 10 meters would be noise and no signals). Now that would be interesting.

Nothing Is Etched in Stone

I can't stress enough that all of this is speculation — we need more data. And we'll get that as we watch what happens in the next 10 or so years — that's the Cycle 24 decline through Cycle 25 maximum.

Additional Propagation Charts
For Tomas Hood's, NW7US's propagation charts, visit <http://www.CQPlusPropagation.blogspot.com>.

BY CAROLE PERRY, WB2MGP

An Update: From Dayton Youth Forum to 'Where Are They Now?'

Two years ago we introduced a new segment to the 2012 Dayton Youth Forum called "Where Are They Now?" Many of our young presenters ranging in age from 6 years old to 18 years old stay in touch during the years following their appearances at Dayton.

I have been so impressed with the choices many of them have made that we decided to highlight some of them with a power point presentation to motivate and inspire the youngsters in the audience. Many of our former speakers have gone on to technical colleges like MIT, and others have pursued technical careers, hobbies, and so on.

Nick Lance, KC5SWM, and Andrew Koenig, KE5GDB

Nick Lance, **KC5SWM**, is the son of good friend Nick Lance Jr. He was licensed at age 7, and in 2000, when Nick was 11 years old, he was a presenter at the Dayton Youth Forum, **Photo A**. His topic was "The Mirror of the Atmosphere."

He and his friend in fifth grade produced a short audio program in their science class for the radio program called "Earth and Sky" <http://www.earthsky.org>. Nicky's project won second place nationally.

Obviously, all grown up now, Nick recently visited me with his mom and dad. I got to see great slides of his outstanding performances as an Elite Ultimate Player. *(**WATCH and LISTEN:** To ESPN coverage of KC5SWM in the USA Ultimate (Frisbee®) International Championships Semifinals at <http://bit.ly/1md0ReD>, **Photo B**. – KI6SN.)*

Nick graduated from Georgia Tech in Atlanta, Georgia where he earned a BS in Electrical Engineering in May 2012. Today, Nick works at AMD (Advanced Micro Devices) at Ft. Collins, Colorado where he has been since May 2012.

Andrew Koenig, **KE5GDB**, was 16 years old when he spoke about some of his remarkable

*<wb2mgp@gmail.com>

***Photo B.** Watch and listen to ESPN coverage of Nick Lance during the USA National Ultimate Championships in this YouTube video at <http://bit.ly/1md0ReD>.*

***Photo A.** Nick Lance, KC5SWM, was front and center in this photograph taken with Director Carole Perry, WB2MGP, and fellow presenters at the 2000 Dayton Youth Forum.*

***Photo C.** A youthful Andrew Koenig, KE5GDB, impressed his audience with a presentation on "Youth and Amateur Radio Satellites" at the Dayton Youth Forum.*

Photo D. *Here is KE5GDB at the University of Texas, Dallas, where he is an active member of the campus amateur club, K5UTD.*

accomplishments at the Dayton Youth Forum. His topic was "Youth and Amateur Radio Satellites," **Photo C**. Today he is at the University of Texas at Dallas studying Telecommunications Engineering. He is active on campus with the K5UTD Amateur Radio Club, **Photo D**, and spends quite a bit of time in the shack.

"Being an amateur radio operator opened the door to work with a research physicist on campus to study upper atmospheric anomalies," Andrew said. He tells me that being in ham radio was the main influential factor in pursuing what he is doing now.

Some of Andrew's "sub-interests" in ham radio, such as IRLP, have given him a good background on Linux-based systems, repeater design, and networking. His presentation on satellite communications at Dayton was all part of his interest that was a key factor in his research work today. "My interest in amateur satellites and the various components of the hobby have helped me become much more well-rounded in areas that you wouldn't typically associate with amateur radio," Andrew said.

Rebecca Rich, KBØVVT

Last October I had the privilege of a reunion with Rebecca Rich, KBØVVT, who was on my Youth Forum at Pacificon in Silicon Valley, California, **Photo E**. She was 11 years old when she impressed the audience at the Dayton Youth Forum. Now at the age of 23, this talented young lady is the president of W6YX the Stanford amateur radio club.

Padraig Lysandrou, KC9UUS

In March 2014 I recommended Padraig Lysandrou, KC9UUS, for the IWCE (International Wireless Communications Exhibit) Young Person's Award at the Convention in Las Vegas, Nevada. At age 16 Padraig was a presenter at my Dayton Youth Forum. He spoke about the DXpedition he led to the divided island of Cyprus with his family at age 15.

Padraig contacted authorities and fully researched the laws regarding amateur radio use in the Greek part of the island. His story can be found in the May 2013 edition of *QST* magazine, **Photo F**. It was wonderful meeting with Padraig and his mother, Carolyn, KC9URR, and hearing about the college acceptances he's in the process of getting.

Two more former Youth Forum presenters who have remained in touch with me are:

Devlin Murray, KC2PIX, and Chris Blackwood, KD2CXC

Devlin Murray, **KC2PIX**, and **Chris Blackwood**, **KD2CXC**, who were presenters at the Youth Forum last year, **Photo G**, wowed the audience with their demonstration on "Combining Robotics, Amateur Radio and Public Service."

In November 2013 I invited them to give their presentation at the RCA (Radio Club of America) Technical Symposium at Orlando, Florida. They literally stopped the show. Folks in the audience rushed to the front of the room to view up close, what the robotic device looked like.

Photo E. *Rebecca Rich, was a speaker at Dayton when she was 11 years old. Today, at 23, she is president of W6YX, the Stanford University amateur radio club.*

what's new

RFMW Adds More Components

RFMW, always looking to expand its roster of electronic components, has added the Skyworks SMV2026 series of hyperabrupt tuning varactor diodes, Triquint's WLAN Front End Module (FEM), and Peregrine Semiconductor 8-GHz digital anntenuator.

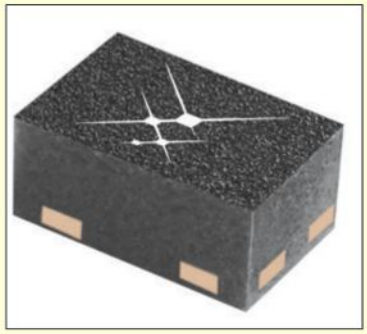
Skyworks SMV2026-079LF is offered in the SC-79 package while a smaller, SOD-882 package is available for space-constrained layouts. Low series resistance of 0.5 ohm at 5 volts enables low-phase noise in wideband VCO designs.

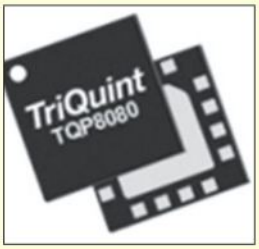
Triquint's new 5-GHz, 802.11 a/n/ac compliant WLAN Front End Module combines an LNA with bypass mode and a PA with integrated power detector through an SPDT T/R Switch. Optimized for next-generation WLAN integration, Triquint's Front End Module provides stable performance across temperature and voltage range due to a temperature bias network. Housed in a 2.5- x 2.5- x 0.4-mm QFN package, the FEM has an internally matched input and output ease design as does CMOS compatible control voltages.

Peregrine Semiconductor's PE43705 is a 7-bit, 31.75dB digital step anntenuator that offers a wide operational frequency range of 50 MHz to 8 GHz. Internal circuitry manages unequal on/off switch times, providing a "glitch-safe" design by eliminating the unknown attenuation issues that affect other DSAs. It can handle up to 51 dBM of instantaneous power with a CW power rating of 28 dBm. The PE43705 comes in a 5- by 5-mm QFN package and has a temperature range of -40 to 105 C and IP3 of 65 dBm.

For more information and pricing contact: RFMW, Ltd., 188 Martinvale Lane, San Jose, CA 95119. Phone: (408) 414-1450. Email: <info@rfmw.com>. Website: <http://www.rfmw.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.*





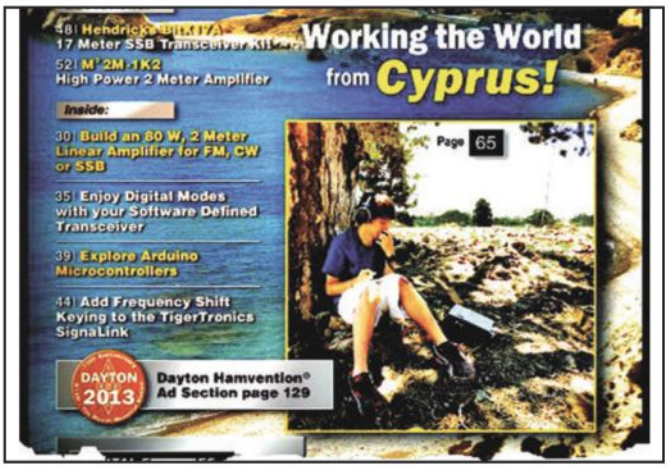


Photo F. *Dayton Youth Forum speaker Padraig Lysandrou, KC9UUS, gained international fame as the cover story in the May 2013 edition of QST.*

Photo G. *Devlin Murray, KC2PIX, and Chris Blackwood, KD2CXC, who were presenters at the Youth Forum last year, "wowed the audience with their demonstration on 'Combining Robotics, Amateur Radio and Public Service,'" writes WB2MGP.*

I have now invited these two very talented young people who presently attend NJIT, to be presenters at the ARRL Centennial Youth Forum in July.

Great Joy and Satisfaction

The follow-up on the lives of these technically talented and creative young people is just one more "reward" of working with and encouraging our young hams.

I am always on the alert and looking for recommendations for young hams 18 or younger who would make good presenters at one of the many venues we have made available to highlight their achievements.

Please forward these recommendations to me all during the year at <WB2MGP@gmail.com>. – ***Carole Perry, WB2MGP***

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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BY CORY GB SICKLES, *WA3UVV

In Our Lexicon, Common Lies, Grounded in History

I've taught a reasonable number of classes for people wanting to earn their Technician and General licenses. In almost every one, some questions get posed because some of the terms, abbreviations, and nomenclatures we use aren't clear to someone hearing them for the first time.

What consistently causes the most discussion is that there's actually a good bit of "false information" we share on an everyday basis about electronics and amateur radio — mostly cases where we say one thing, but really mean something else. They're not quite lies, but they're not quite true.

Ground

The ground is what you stand on outside. It is — in most cases — conductive and can provide a return path for electricity. When we think of an HF station, we think of the importance of a good ground. However, we also talk about ground when it comes to portable and hand-held radios.

I don't know about you, but I don't see too many hams driving a rod into the earth (which is what folks in the United Kingdom call ground) and connecting it to their radios. Even the International Space Station has ground connections.

Adding to the confusion are the terms "earth ground" (in the same way "soda" and "pop" get covered as "soda pop" in certain regions of the U.S.) and "chassis ground." Yes, even if the chassis isn't connected to actual planetary dirt, it still has a "ground."

What the term has really come to mean is a common voltage potential (usually negative) tie point or shielding reference, which is used as a return path for circuits. "Ground" is a bit easier to say though, isn't it?

To add a little more to this, sometimes the return path on a circuit board is isolated from the chassis, thus the term "floating ground" or simply "floating" is used. Nothing is actually flying or suspending gravity here. It's just not directly connected to the metal of the enclosure — typically for safety reasons. See **Figure 1**.

Perhaps if we borrow from our (proper) English-speaking friends and refer to anything that connects to the planet as "earth," with "ground" left to the chassis and "common" left to circuit boards, that will clarify things. *Perhaps not.*

12 Volts DC

We know that our solid-state transceivers and station accessories operate from 12 volts, whether at home or in our vehicles, right? That's because our power supplies provide 12 volts and our cars have 12-volt batteries. But wait a minute, what about 13.8 volts?

Yes, storage batteries, gel cells, stacks of AA batteries and other forms of portable power are commonly created to produce 12 volts. However, the typical power supplies we use — and — a car's alternator that charges the battery and really runs its electrical system, are 13.8 volts, **Photo A**.

Look at the specs of your transceiver and you'll see that the power out rating is done presuming 13.8 volts, not 12 volts. Using 12 volts to power it will result in less output and probably less efficiency.

Why then, do we call it 12 volts? It is because humans like round numbers. We used to commonly talk about 6- and 12-volt tubes — based on their filament voltages — which are really 6.3 volts and 12.6 volts. That's what the transformers of the day were designed to put out and it is where those tubes were most efficient. Those of us who still like playing with tubes know that, but we round off the numbers anyway.

Perhaps a "take away" from this one is that precision isn't always necessary to communicate the

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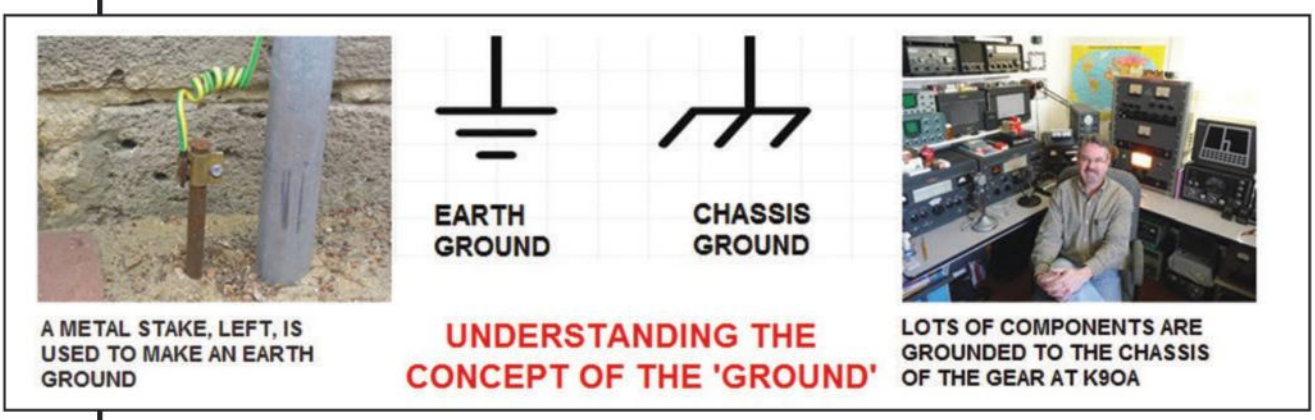

Figure 1.

Photo A. *While many hams refer to their 12-volt DC power source, in reality, most of the time it's 13.8 volts, as indicated in this Astron power supply data on the Ten-Tec website <http://bit.ly/PSebpx>. (Internet screen grab)*

facts. Maybe you can think of 12 as 13.8's nickname.

All this presumes that the power sources mentioned are adequately regulated in some way, to provide a consistent voltage within the range of loads that a particular supply is capable of handling.

If you are thinking of using a wall-wart labeled as 12 volts to power your latest QRP project, you may be in for some unpleasant surprises.

The Many Faces of the Balun

Balun is shorthand for a *BAL*anced to *UN*balanced transformer as used to match dissimilar RF impedances. Adding to the fun of this one is the fact that there are many types of Baluns. **Figure 2** shows the schematic of a "voltage balun," **Photo B**. For reasons more extensive than what I'm going to delve into here, voltage baluns should not be used with antennas. They are best employed with push-pull amplification circuits.

The "current balun" shown in **Photo C** is most popular for antenna matching use, whether at the antenna feed point or to feed balanced feed line (which more often than not isn't balanced due to external influences) that goes to the antenna.

In most schematics shown reading left to right, it would be more appropriate to refer to these as UNBAL — since it's converting from unbalanced to balanced. Don't start calling it an UNBAL though, people will look at you and shake their heads.

There is also a configuration in which we have a matching circuit going from an unbalanced input to an unbalanced output. This is not a balun at all. The term UNUN is commonly used to denote its purpose and acts as a somewhat better descriptor.

In yet a different case, there is a device known commonly as a "coaxial balun," but it too, is not a balun. Moreover, it's not an UNUN. It "matches" nothing. It's simply a number of loops of coaxial feed line intended to keep RF from "traveling" back down the shield of the feed line. It is better called a "choke" — not to be confused with the carburetor on your lawn mower. It "chokes" the RF from that path.

CW, By Any Other Name

Finally, for now, anyway, we come to a term that we use all the time, but don't think much about its meaning. One that takes some extra explanation.

CW stands for "Continuous Wave." But "wait" you say, CW is a form of communication using Morse (Vail, actually) code — which is formed with on-and-off keying. So, where's the "continuous" part in all of this?

To better understand this term, we have to go back to the beginnings of radio communications, when transmitters were based on motors and, or ignition coils — the heady days of spark-gap transmissions. Then, communication was accomplished by engaging and disengaging a controlled means of generating what we would term today as "static discharge" or "interference."

The rapidly buzzing sound of dampened code (more *dit darr* than *dit dah*) is what filled the headphones of primitive detectors and receivers. Until, that is, the electron tube came into play.

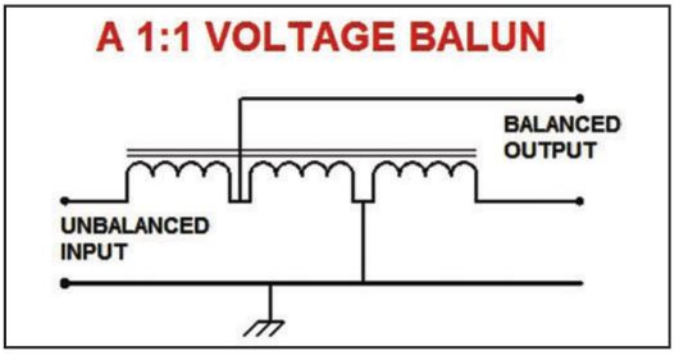

Figure 2.

Photo B. *A toroid wrapped with insulated wire is the heart of this 4:1 voltage balun. (Courtesy of Wikimedia Commons)*

Photo C. *A 1957 episode of "Father Knows Best" puts shortwave radio front and center when the Andersons notify the U.S. Coast Guard that they've heard a "Mayday!" from the cabin cruiser Betty Ann. Who says nothing ever happens in Springfield? Watch and listen at <http://bit.ly/1kPxb3s>.* ***Anyone know what shortwave radio that might be?*** *Email: <ki6sn@cq-amateur-radio.com>. Thanks! (Internet screen grab)*

happens in Springfield and she feels "like a real hick ... we live in a house in which nothing ever happens in a town in which nothing ever happens." But then: "Dad, dad! Come here quick," Bud calls out to the old man. It was the cabin cruiser *Betty Ann* on the shortwave radio he'd just gotten. The vessel would get into real trouble in a big storm. The Andersons would call the U.S. Coast Guard and relay the EmComm. Heroes, one and all. And she said nothing ever happens in Springfield! *(**WATCH and LISTEN:** To "Short Wave," from 1957, at <http://bit.ly/1kPxb3s>, **Photo C**. – KI6SN.)*

☹ Bad Day for One Antenna and Tower

What this *San Jose Mercury News* story didn't mention is whose tower and antenna took the hit when a car smashed into the side of a house in Campbell, California in late February 2014. We can only hope for the radio operator's sake that it was mended and back in the air in time for the ARRL SSB DX contest the following weekend. *(**IN DEPTH:** Read the Mercury News story at <http://bit.ly/1oa0flg>. **Photo D**. – KI6SN) (Internet screen grab)*

Photo D. *Ouch. T'was bad enough that a car took out a wall of this California house. Look in the background for more bad news: a tower and antenna crumpled to the ground on the Wednesday before the 2014 ARRL SSB DX Contest in February. The full story is at <http://bit.ly/1oa0flg>. (Internet screen grab)*


San Jose Mercury News

CRIME AND COURTS

News · Sports · Business · Entertainment · Lifestyle · Opinion · My Town

Campbell man crashes car carrying his family into house, faces attempted homicide charges

Photo C. *The MFJ Enterprises MFJ-918 is a popular current balun used in many antenna configurations. (Internet screen grab <http://bit.ly/1kvjVkn>)*

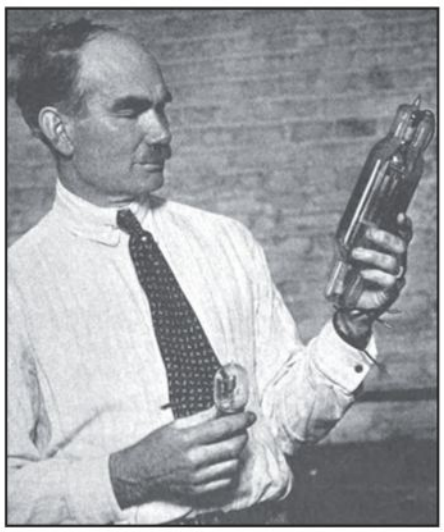

Photo D. *American inventor Lee DeForest is shown in this period photograph holding an Audion triode vacuum tube he invented — but did not fully understand. (Courtesy of Wikimedia Commons)*

Once a few folks figured out how to use this new component, they discovered circuits that could continuously oscillate and produce a consistent signal — on different frequencies — with a pure (*OK, some chirp*) signal that was eminently more pleasurable to listen to than spark.

These oscillators produced continuous waves of RF energy and became known as CW. By the way, Lee DeForest, **Photo D**, grabbed the patent on the Audion, or triode vacuum tube, but had no real idea how it worked.

So even though CW is keyed in *dits* and *dahs,* the term refers more to its origin than the way it's used. For trivia fans: spark is the only mode of communications that hams have ever used that today is outlawed on all but the most special occasions.

We Are Not Alone

Ham radio is not the only hobby or business that uses such "misinformation" or "loose terminology." You can find such things in many areas of interest. In my business — television production — there are components of an NTSC (*yes, this still matters*) color burst signal known as the "Front Porch" and "Back Porch." There's even a "Breezeway."

Don't expect someone fresh out of school to know the history of all these things. Look for the "salt and pepper" or missing hair. It's a sign of knowledge — even if you have to ask a few extra questions to learn the "truth" behind the "facts."

CQ's 6 Meter and Satellite WAZ Awards

(As of May 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	16,17,18,19,20,21,22,23,24,26,28,29,34
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	UX0FF	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>*

BY KURT N. STERBA*

Protecting Your Radio Gear from the Highly-Charged Vagaries of Nature

It seems that about this time each year, the Krusty One receives at least a few queries from readers worried about their station's antenna tower's vulnerability to a lightning strike. After all, what radio amateur wants to see his or her gear go up in a blaze of glory because steps weren't taken to avoid it?

Kurt's perennial suggestion to these forward-thinking hams is to employ a few loops of coax — formed in a 3-foot diameter — hung at the base of the tower just past an in-line lightning surge protector. It is a good, cheap investment in safeguarding transceivers, tuners, and the like.

This coil acts like a choke to current surges, which may not be protected by the arrestor. The theory behind this is:

- A coil is an inductor — not a transformer
- An inductor has reactance that is mea sured in ohms at radio frequencies
- This choke offers resistance to RF current, reducing its flow

The Krusty One underscores that a sharply-rising lightning surge has most of its energy at radio frequencies. So the coil will tend to prevent the lighting surge from traveling down the coax to your shack. Commercial radio stations do this all the time, sometimes putting ferrites over the coax to do the same thing.

So, here's Kurt's bottom line: fundamentally, we want to put an inductance in-line with the coax shield to make it a difficult path for the lightning surge. Between this inductance and the tower you put the best possible path you can make from the coaxial shield to ground. You can bet that the lightning surge will most likely take the easiest path.

Kurt has written about this in the past, and several readers have asked about comparisons to the coils often seen on telephone lines. Are they serving the same purpose? Probably not. They may be loading coils — inductances that are placed every 6,000 feet on lines that are more than 3-miles long. They compensate for the capacitance between the cable wires and improve frequency response. But that's a whole 'nother can of worms. Final thoughts: If your tower is grounded, it should be really well grounded. Even bonded to your home electrical ground, if possible. And be aware that the lightning arrestor and coaxial loop are effective for induced currents from nearby strikes. A direct hit would likely toast anything in or near its path.

'Why Not Use a Shunt Vertical?'

Years ago, a very short vertical for 1.8 MHz (160 meters) was part of the antenna farm at Krusty Acres. It was one-sixteenth wavelength tall.

The base was insulated from ground and it was fed with coax between ground and the base — using a loading coil to resonate.

"Why not use a shunt vertical instead?" a visitor wondered. In such a configuration, the tower is grounded. The end of the coax is at a distance from the tower. A slant wire — at about a 45 degree angle — connects to the tower at a certain height above the base. Ideally, a very low impedance RF path connects the coax shield to the base of the tower.

OK, Kurt asks readers to envision the triangle formed by the slant wire, the ground connection to the coax and the portion of the tower *below* the feed

* c/o <CQPlusDigital@gmail.com>

Especially at this time of year, lightning strikes need to be taken seriously when preparing your amateur station to withstand the travails of Mother Nature through the hot summer months. (Courtesy of Catalin.Fatu via Wikimedia Commons)

point. It acts as a coupling loop that transfers the RF to the tower. The inductance of the loop is tuned out by a capacitor in series with the slant wire.

Would this not be more efficient than using a base-loading coil? Capacitors have lower loss than coils, you know! Kurt's visitor said.

It's true that in the loss game, capacitors win. But shunt feed is only practical for towers about 0.2 wavelengths or more in height. Short towers have high capacitive reactance demanding high-induced voltage from the loop. "At this height the loading coil is small and, in practice, you'd probably add a little top loading to make the tower a resonant quarter-wave," Kurt advised. Remember, as well, that even at moderate power levels, that capacitor voltage will be quite high in a shunt-fed arrangement. A capable capacitor might be pretty challenging to find.

El Crustáceo Uno realizes one of the advantages of the shunt fed tower is that the structure is grounded. But consider the preceding section of this edition of *Aerials.* Do you really want to expose your tower any more than you have to to those nasty lightning strikes?

Yes, there is a lot of work involved in dealing with a slant-wire configuration. First you've got to determine its optimum height. Then, fiddle with the capacitance to get the perfect match.

As one with no desire to climb towers *ever again,* Kurt prefers to keep his feet on *terra firma.*

The Krusty One admits he's no help at all in this matter, however. Shunt feed can work really well and is certainly worth consideration.

Mr. Sterba welcomes questions from readers. Write to him at <CQPlusDigital@gmail.com>. The editors will assure it gets to Kurt at his Krusty Acres estate.

unwired

BY RICHARD FISHER, KPC6PC

'Moonlight Sonata' Flies to the Moon on the Wings of Morse

Scottish performance artist Katie Paterson has an other-worldly take on delivering music to the masses. Choosing part of Ludwig Van Beethoven's classic "Moonlight Sonata," she had the score translated into Morse code, had it transmitted to Moon, retrieved the bounced signal and had it translated to language a player grand piano can understand. The accompanying video shows the result. *(**WATCH and LISTEN:** To "Moonlight Sonata" after its approximate 478,000-mile roundtrip to the Moon and back <http://bit.ly/1hslwUg>, **Photo A**. – KI6SN.)*

Lovers of Beethoven's work will notice gaps in the EME version of the sonata. Ms. Paterson says this is due to portions of the transmission being lost in Moon craters. When the signal "came back, I thought it should go through another technology or translation," she said. "The player piano seemed kind of apt. Also because it has this strange, kind of ghostly effect."

CW operators who listen closely at the video's beginning will hear the letters "G" and "B" in Morse — presumably representing G-flat on the piano. Pretty eerie, indeed. *(Internet screen grab)*

Little Molly Ringwald On the Air and to the Rescue

When your daughter is a TV star and you can help sitcom writers to work amateur radio into a plot line in an authentic way, it's a PR bonanza of gargantuan proportion for hams.

A very young Molly Ringwald, co-starring in the immensely popular "The Facts of Life" took to the airwaves in an episode airing April 11, 1980 simulating a 2-meter FM contact using her father, Bob Rignwald's callsign — K6YBV. "The premise of one episode was that there was a flood and Molly was a ham radio operator," he writes on QRZ.com. "Naturally the writers had Molly's lines all wrong. I volunteered to write the ham talk to be authentic and they gratefully accepted. In the episode, Molly uses my call." *(**WATCH and LISTEN:** To "The Facts of Life" episode titled "Flash Flood" for amateur radio emergency communications [EmComm] with Molly to the rescue. <http://bit.ly/1hspAE1>, **Photo B**. Radio action begins at 4:50 of the show. – KI6SN.) (Internet screen grab)*

... And Not to Be Outdone: 'Father Knows Best' on the 'Short Wave'

So, Bud's got this multi-band receiver that the Anderson family is fooling around with in the Season 3, Episode 21 of "Father Knows Best" show titled "Short Wave." Betty complains that nothing ever

(Continued on page 162)

***Photo A. WATCH and LISTEN:** To the story behind Scottish performance artist Katie Paterson's rendition of "Moonlight Sonata" and its approximate 478,000-mile roundtrip to the Moon via Morse code at <http://bit.ly/1hslwUg>. (Internet screen grab)*

***Photo B.** Molly Ringwald's "ham radio buddy," K6YBV, is actually her father, Bob, in this 1980 episode of "The Facts of Life." Watch the full half-hour at <http://bit.ly/1hspAE1>. Molly, turns EmComm operator W2JIO — not really — at about 4:50 of the show. (Internet screen grab)*

The Day When *Everything* is Connected

BY ROB DE SANTOS, *K8RKD

What if 99 percent of the appliances, consumer electronics, household utilities, roads, cars, and indeed any device with a sensor in it (or which could have one added to it), were all connected? That is, devices connected by a network, able to send and receive data, and act according to what it "knows."

If the predictions from many sources are to be believed, that is where we are headed. This isn't just a home network — this is massive communication.

The Internet of Things (IoT) is on the horizon. (***BACKGROUND:*** *See "The Internet of Things," March. 2011 and "How 'Connectedness' Is Changing Our Lives," April, 2013 – each in Popular Communications. – K8RKD.)*

As we get closer to the day when the developed world is completely connected <http://bit.ly/1a7jr2i>, the issues are many. We've covered some of those in prior columns. This time though, we'll look at it a bit differently.

Our first stop is the data. There is now and soon will be even more incredible amounts of it. Even if all a device does is send a "status report" of a few bytes every hour, when you add that up over time, it quickly becomes huge. A simple sensor in your refrigerator, reporting on its "health," could easily generate tens or hundreds of megabytes per year. It was only three decades ago when the first hard disk in a PC was 10 megabytes, and that was considered overkill.

Multiply that by 25 or 50 billion devices and soon we are talking about more data per second that was created in all of human history prior to 1990. Clearly managing this data will require some effort.

Pipes and Closets

Two of the tools to manage the mega-flood of data are "cloud" storage and "bigger pipes." As the volume of data increases, we will have to find ways to move it around. Look for the internal capacity and speed of home networks to increase as well as use of new networking standards. *(**SEE:** "Get Ready: The Remarkable Wonders of Wi-Fi," March 2013 Popular Communications. – K8RKD).*

External to the home, the capacity of the pipe to the home and the wider Internet itself must continue to grow. While much of the data will be transient, almost all of it will need to be stored, at least temporarily. If you are in the business of building or managing big data centers, business will be good, very good.

You're probably thinking: *"But Rob, what about the cost?"* My best guesses are that you can count on two things: your Internet or data service bill will become your largest and most important payment each month after your residence and vehicle — and much of the initial cost will be built into the products you buy.

The cost of that next toaster, automobile, home security system, television, and so on, will include the hardware, software, and service cost to provide the connectivity. Like many technologies, adoption has been slow to this point, but not for much longer. The adoption curve will begin to accelerate.

Security and Keeping It Private

This has implications on so many levels. In fact, I'd argue that it is the Achilles heel of the IoT. Better and more pervasive security will have to be built-in at every level of the process, from the near field connections (NFC), Bluetooth, and Wi-Fi that allow you to connect devices together in your home, to the billing and transmission security needed for data to travel the wider Internet.

The data itself must be secured, plus the means to transmit it, the storage of that data, and the billing of any charges. It takes only an evening of news to learn about the latest breach of security for credit card numbers. Our lives will be "online" and we'll have to make sure that only people, businesses, and devices we authorize are able to access and use that information.

This also means education and responsibility on our part. Passwords or indeed any security tool, can no longer have "1111" or "password" as the key. As consumers, we will have to demand that vendors do it right or not do business with them. Ask your bank or credit card company if they have blocked use of such passwords and PIN. If they haven't, ask why not?

Do they use two-level authentication? If we don't demand better security, the potential for damage will escalate.

What Do We Do With the Data?

This is our final stop today. Creative people are already thinking of uses for the data generated by the IoT. A perusal through places like <http://www.Kickstarter.com> will quickly convince you that the revolution is well underway.

It presages a world where we can do much more than remotely program our DVR or turn off the lights in our house. The decision making can be much more sophisticated and it will all depend on the new horizons of communications.

Share with me your imagination for the IoT. Drop me a note using snail mail (c/o the magazine) or e-mail. Until we communicate again.

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