

WorldRadio

ONLINE

Year 41, Issue 4

OCTOBER 2011

The Art of Direct QSLing, p. 20



PLUS:

- **Buying Ham Gear in This Tough Economy, p. 8**
- **Smiles and Signals at Handiham Camp, p. 14**
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NEWS • FCC • DX • SATELLITES • CONTESTS • HAMFESTS • AERIALS • CW



Mumbai Official Looks to Hams for EmComm Support

After serial terrorist blasts rocked Mumbai, India — knocking out phone lines in July — Maharashtra chief minister Prithviraj Chavan said the State Home Department would purchase amateur radios for emergency communications, *rediff.com* reported at: < <http://bit.ly/qzayKU> >. It is estimated there are 16,000 ham operators in India.

The 200-member Mumbai Amateur Radio Society provides communication support during religious and social festivals, sets up quick response teams for communications during emergencies, and has monitored flooding during monsoon season.

“The organization was mobilized during the 2006 Mumbai train bombings, 2005 Maharashtra floods, 2004 Indian Ocean earthquake, and the 2001 Gujarat earthquake, to provide the necessary communication links after established modes of communication were severed,” the report said. (*rediff.com*)

More Than 2,000 Field Day Log Submissions Sets Record

The ARRL reports that a record 2,654 log submissions have been received for the 2011 ARRL Field Day.

According to ARRL Field Day Manager Dan Henderson, N1ND, this is the highest number of entries received for the annual emergency operations and contesting event.

The first ARRL Field Day was held nearly 80 years ago in 1933. (*ARRL*)

Force Behind Dayton CW Pileup Competition Becomes SK

Tom Hammond, NØSS, of Lohman, Missouri, died August 4 from cancer. He was 67. Mr. Hammond was the first life member of the Kansas City DX Club (KCDXC), playing a critical role in the club for more than three decades and creating his world famous CW pileup files each year for the annual CW Pileup Competition at the Dayton Hamvention®.

He was a life member of the American Radio Relay League and a member — by invitation — of the First Class Operators Club (FOC).

Mr. Hammond’s other affiliations included membership in the International DX Foundation; CW Operators Club; Amateur Radio Emergency Services®; and for many years was coordinator of the local Certified Volunteer Examiner program.

An obituary appearing on *NewsTribune.com* can be seen at: < <http://bit.ly/nvKW0> >.

He was also an avid and award-winning contester and a past president and current trustee of the Mid-MO Amateur Radio Club. Mr. Hammond served as a designer, trouble-shooter, and beta tester for Elecraft, Inc., of Aptos, California. (*ARRL, Missouri NewsTribune.com, KCDXC*)

High-Achieving 11-Year-Old Named ‘Young Ham of the Year’

Eleven-year-old Kaitlyn Cole, KS3P, of Harvest, Alabama, has been chosen Amateur Radio Newsline’s 2011 Young Ham of the Year. Among other noteworthy achievements, Cole

served as a Net Control Station during two weeks of emergency nets following the southeast tornado outbreak of April 27.

The award was presented at the Huntsville Hamfest in August. *CQ Amateur Radio* magazine is a co-sponsor of the YHOTY program, providing winners with a free week at SpaceCamp. Kaitlyn is the 26th Newsline Young Ham of the Year, and the youngest to date. (*CQ Newsroom*)

Antenna Accidents Kill One Radio Amateur, Injure 3 Others

One radio amateur was killed and three others were injured recently in two widely-separated antenna accidents. Tim Anderson, KØOR, was killed and Tom Embree, NCØK, was seriously injured when a 110-foot tower they were helping to disassemble in Hot Springs, South Dakota, collapsed on them.

According to the *ARRL Letter* and *Amateur Radio Newsline*, all but the bottom 30-foot section had been taken down when the accident occurred on July 16.

Both men were on the tower and fellow members of the Hot Springs Amateur Radio Club were beginning to release the guy wires when a gust of wind toppled the tower section.

In Texas, two hams taking down an inverted-V antenna at the Wichita Amateur Radio Society’s Field Day site received electric shocks after a strong wind gust blew a guy wire or the antenna’s feedline into a power line.

The *ARRL Letter* reports Danny Caldwell, AD5IP; and Mike Byrne, AE5CO, were taken to Parkland Hospital in Dallas for treatment and later released. Club officials said all safety precautions were being observed. (*CQ Newsroom, ARRL, ARN*)

Vanity Callsign Fee Jumps to \$14.20

The cost to obtain a vanity amateur radio callsign in the United States increased 90 cents on September 9 — jumping from \$13.30 to \$14.20.

The FCC announced the price hike for a 10-year amateur radio license term on August 10, allowing 30 days for implementation. (*ARRL, other sources*)

Heathkit Announces Return to Kit Business

Heathkit says it is re-entering the kit business that it abandoned almost two decades ago, according to a report on *Amateur Radio Newsline*.

According to a posting on Heathkit Educational Systems’ website < <http://www.Heathkit.com> >, the company has debuted a new line of do-it-yourself kits for common around-the-house items.

“Don’t look for ham radio gear to be a top priority,” the *ARN* report said, “even though the word on the street is that kits for the amateur radio market may be down the pike.

“Right now the company is starting off with more general interest kits with (its) first entry being a Garage Parking Assistant . . . (which) uses ultrasonic sound to locate a car as it enters the garage,” helping the driver position the vehicle. “The system signals to the driver using LED lights mounted on the wall when the car is detected and in the perfect spot for parking.

“Next on the market will be a Wireless Swimming Pool Monitor kit,” followed by many more items. (*ARN*)

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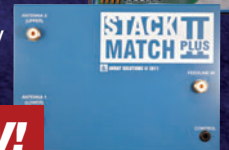
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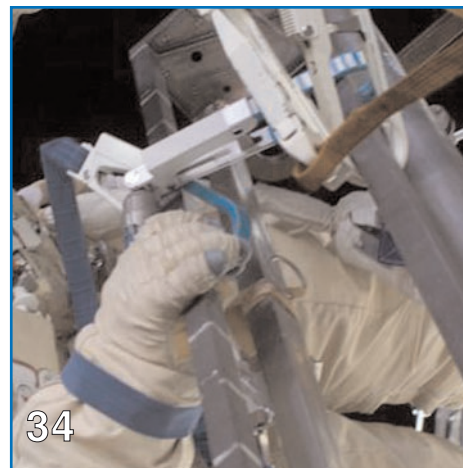
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On the Cover: Kelly Jones, NØVD, WRO's DX World columnist, offers tips this month on "Mastering the DXer's Art of Direct QSLing." With the dome at Amundsen-Scott South Pole Station as a backdrop, on the cover are some of 'VD's most cherished cards: KC4AAA, at the South Pole; HVØA, Vatican City State; E44DX, Palestine; and VK9NS, from "the voice of Norfolk Island, Jim Smith." (Photograph of Amundsen-Scott South Pole Station courtesy of Bill McAfee, National Science Foundation. QSL cards courtesy of NØVD)



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The 'Dumb Things' We Radio Geniuses Sometimes Do

“The biggest goof I did while a Novice,” wrote **Cory Sickles, WA3UVV**, from Glassboro, New Jersey, “was when I added a couple of neon pilot lights to the front of my Heathkit DX-20. It seemed like a good idea at the time.”

You know, some of the most entertaining moments during *WorldRadio Online's* monthly live Internet chat sessions come when great stories just pop out of nowhere. Cory's was classic.

In August, the group somehow got on a jag about the dumb things we've done as radio amateurs. We laugh about them now, as painfully embarrassing as they were at the time.

With 'UVV's transmitter powered up, and “slightly out of the case,” Cory had grabbed the front panel, wrapping his fingers around it, making contact with the power connection to those lights. Now in full *zap mode*, “I couldn't let go,” he said, “but somehow managed to run backwards until I had pulled the cables out.

“My grandfather came downstairs and wanted to know what the hell was going on and why I made such a loud grunting sound. When he saw me still sitting on the floor with the DX-20 on my lap, I didn't have to say a thing . . .”

Cory's story was especially uplifting to me. If such a move was a rite-of-passage in that ham era, he validated me as a radio amateur.

As a Novice in the mid-1960s, I'd removed the high-voltage supply from a discarded TV set and reconstructed it on an upside-down gray metal file tray — 5U4 tube rectifier and all. It would power the transmitter and receiver I was building at WN1DWL.

One day I lugged this 15-pound behemoth on the bus to school to show my ninth grade science class. Standing behind the experimentation table at the front of the room — wet bar, Bunsen burners, and all — I proudly displayed the power supply and with panache connected a foot-long piece of yellow hookup wire to the 350-volt DC terminal.

By the way, this was an extremely low budget, low intelligence project. Fuses not included.

For drama, the plan was to drag the exposed end of that yellow wire across the metal chassis — sparks flying everywhere. “What a crowd pleaser,” I thought, amid a chorus of “oohs” and “ahhs.” Oh, how the tables would turn.

“Hold it up,” shouted the kids in the back, wanting a better view. Happy to oblige, I managed in the process to somehow get my body between that 350-volt DC terminal and ground. Like Cory, I couldn't let go — locked in near *rigor mortis* with voltage, current and indescribable mortification coursing through me.

The power supply had mysteriously made its way above my head. In shocked terror, I shuffled wildly across the front of the classroom trying to let go — Michael Jackson-style.

It's not clear if the AC plug was ripped from the wall or my will to live gave me super power, but the supply eventually crashed to the floor. The 5U4 exploded in a flash. Two aluminum electrolytic capacitors now teetered loosely, like twin Towers of Pisa. The metal file tray was bent beyond recognition. Much like me.

Of course, the class erupted with delight. *Best show-and-tell ever*. I wasn't so sure.

The teacher — standing in the back of the classroom with arms folded across his chest — just shook his head. “Thank you, Mr. Fisher,” he said. “You may now take your seat.”

In the annals of amateur radio evangelism, probably not one of our prouder moments.

Not another word was said, until that painful bus ride home.

2 for 1: WRO-Pop'Comm Live Online Chat, October 2

For several months we've been conducting separate live online chat sessions for *WorldRadio Online* and *Popular Communications* magazines. They've been great places for the communications community of each publication to gather and digitally “chew the rag.”

Several participants have asked if it would be possible to combine both sessions into a *WRO-Pop'Comm* combo so readers of both publications can meet in the same place at the same time. *Let's give it a try*.

Our first *WRO-Pop'Comm Chat-a-Thon* will be **Sunday, October 2**. We'll be gathering at **8 p.m. Eastern time (0000 UTC)** on the *WRO Online Blog*: < <http://www.WorldRadioOnline.blogspot.com> >.

Simply go to the *Cover It Live* window there at chat-time, *click* and you're in. If you'd like, go to the site now and **sign up to receive an email reminder**.

Hope to see you October 2.— **Richard Fisher, KI6SN**

WorldRadio Online

EDITORIAL STAFF

Richard Fisher, KI6SN, Editor
(E-mail: worldradioonline@gmail.com)

Jason Feldman, Editorial Assistant
(E-mail: jason@popular-communications.com)

Richard S. Moseson, W2VU, Editorial Director
(E-mail: w2vu@cq-amateur-radio.com)

CONTRIBUTING EDITORS

Terry Douds, N8KI, Amateur Satellites
(E-mail: n8ki@amsat.org)

Richard Fisher, KI6SN, Trail-Friendly Radio
(E-mail: ki6sn@aol.com)

Gerry Gross, WA6POZ, 10-10
(E-mail: wa6poz@arrl.net)

Dave Hayes, VE3JX, QCWA
(E-mail: ve3jx@bell.net)

John B. Johnston, W3BE, Rules & Regs
(E-mail: john@johnston.net)

Kelly Jones, N0VD, DX World
(E-mail: n0vd@dxcentral.com)

Dee Logan, W1HEO, Promotion/Recruitment
(E-mail: deverelogan@gmail.com)

Carl Luetzelschwab, K9LA, Propagation
(E-mail: k9la@arrl.net)

Jennifer Oliver O'Connell, KI6OIL, YLs
(E-mail: joliveroconnell@gmail.com)

Randall Noon, KC0CCR, FISTS CW Club
(E-mail: rnoon@nppd.com)

Bill Pasternak, WA6ITF, VHF, FM & Repeaters
(E-mail: wa6itf@arnewline.org)

Carole Perry, WB2MGP, Hams With Class
(E-mail: wb2mgp@ix.netcom.com)

Bill Sexton, N1IN/AAR1FP, MARS
(E-mail: sextonw@juno.com)

Kurt N. Sterba, Aerials
(E-mail via: worldradioonline@gmail.com)

Patrick Tice, WA0TDA, With the Handi-Hams
(E-mail: wa0tda@comcast.net)

BUSINESS STAFF

Richard A. Ross, K2MGA, Publisher
Chip Margelli, K7JA, Director of Advertising
Sales and Marketing
(E-mail: CQAds@socal.rr.com)

Emily Leary, Sales Coordinator
Sal Del Grosso, Accounting Manager
Doris Watts, Accounting Department

CIRCULATION STAFF

Melissa Gilligan, Operations Manager
Cheryl DiLorenzo, Customer Service Manager
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PRODUCTION STAFF

Elizabeth Ryan, Art Director
Barbara McGowan, Associate Art Director
Dorothy Kehrrieder, Production Director
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Rod Somera, Production/Webmaster

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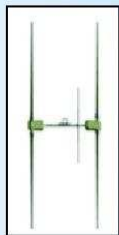
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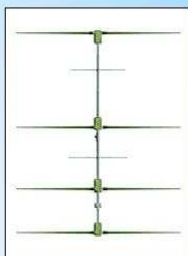
2 Element 20m-6m Yagi

2 element Yagi, 20m-6m continuous coverage; 57" boom, 36 ft longest element, 18.2 ft turning radius, 6 sq ft wind load, 30 lb; SDA 100 controller included.



3 Element Yagi 20m-6m

3 element Yagi, 20m-6m continuous coverage; 16 foot boom, 36 ft longest element, 19.7 ft turning radius, 6.1 sq ft wind load, 51 lb; SDA 100 controller included.

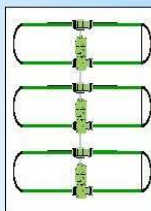


4 Element Yagi 20m-6m

4 element Yagi, 20m-6m continuous coverage; 36 ft longest element, 24.1 ft turning radius, 9.7 sq ft wind load, 99 lb; SDA 100 controller included.

Dream Beam Series Yagi's

The Dream Beam series offers antennas for both space limited Hams as well as the "Big Guns" who have the space and want the very best.

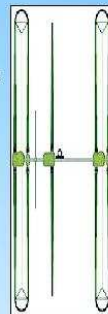


DB11 Yagi Antenna

DB11 Yagi, 18.5 ft element length, 11 ft boom, 10.8 ft turning radius, 61 lb, 5.9 sq ft wind load; 2 active elements on 20m; 3 active elements on 17, 15, 12, 10, 6m.

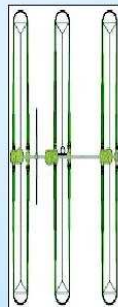
DB18 YAGI

Dreambeam DB18 yagi, 3 el on 20m-6m, 2 el on 40/30m, 18 ft boom; Does not include optional 6m passive element kit; Includes SDA100 controller.



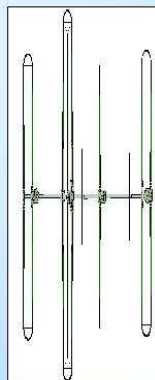
DB18E YAGI

Dreambeam DB18E, 3 el 30m-6m, 2 el 40m, three looped elements, does not include optional 6m passive element kit, 18 foot boom; Includes SDA 100 controller.



DB36 DreamBeam Yagi, 40m-6m

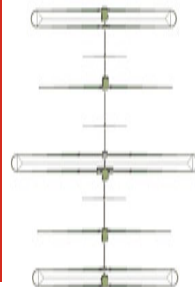
DreamBeam DB36 4 element Yagi, 40m-6m continuous coverage; 36ft boom, 48 ft longest element, 26 ft turning radius, 17.5 sq ft wind load, 160 lb; SDA 100 controller included.



NEW!!

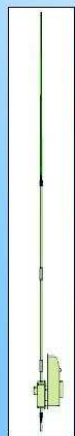
DB42 MonstIR PRO 5 Element Yagi

40m-6m continuous coverage, 80m dipole option available; includes SDA100 controller and connector junction box



Vertical and Dipoles

For the ham who may not have a tower, but a tree or two for a dipole. SteppIR verticals work great when there are no tall structures around to hang some wire. And, the low take-off angle can be your friend.



BigIR Vertical Antenna, 40m-6m

BigIR vertical antenna, 40m-6m continuous coverage, 32 ft length, 15 lb total weight, 2 sq ft wind load; EIA 222C wind rating when guyed; Comes with SDA 100 controller and 1.5" mounting pole; Does not include optional 80m coil.



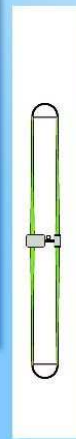
SmallIR Vertical Antenna 20m-6m

20m-6m continuous coverage, 18 ft total length, 12 lb weight, 1 sq ft wind load; EIA-222C wind rating without guys.



20m-6m Dipole

20m-6m continuous coverage dipole; 36 ft element length; Comes with SDA 100 controller.



40m-6m Loop Dipole

40m-6m continuous coverage, 39 ft total length; SDA 100 controller included.

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Strategies for Buying Ham Gear in Troubled Economic Times



By Cory GB Sickles, WA3UVV

Photo A: Sometimes a cup of change is all you need to buy used radio gear and accessories to get on the air. In this case, a vintage Heathkit DX-40 transmitter, Heathkit VF-1 VFO, homebrew keyer and a Hallicrafters S-38B receiver — all for about \$35. The computer mouse serves as the keyer paddle. (*Photographs Courtesy of WA3UVV*)

Amateur radio is so much like other interests or hobbies. You can start small and before you know it, fill a room with all the “goodies” you’ve acquired.

In the case of ham radio, it might be impressive to visitors, but could leave the impression that ours is an expensive hobby.

While you can certainly invest many thousands of dollars in radios, accessories and antennas, it is not a financial requisite to getting in on the fun. In fact, both new and experienced hams can assemble a station and make contacts for very little money. That’s certainly an advantage in these troubled economic times.

With some selective purchasing and heeded advice from an Elmer (mentor), you may find that you can happily be on the air for less than \$200. In fact, that figure could even be \$100 or less!

There are strategies for finding inexpensive radios, for incorporating everyday items as accessories and to funding your pursuits in an almost “invisible” way.

Whether you just passed the license exam — and if so, congratulations! — or you’re an Old Timer, a basic setup will consist of a transmitter, receiver, antenna system and power supply. If you think about it, the simplest of these combinations is found in a handheld radio. For about \$100, you can find a new 2-meter rig that fits in your palm. With some batteries, you are on the air.

Operation on high frequencies (HF) — 160 through 10 meters — is where it gets more challenging.

Tempering Goals and Expectations

To start working HF with as little cash outlay as possible, QRP (low-power output) and CW operation, kit building and wire antennas are natural options. While low power and Morse code may sound like too much of a challenge, remember for a moment that this is the path followed by many hams (including me) as we became members of the community through the Novice license.

In the early 1970s, when I became a Novice, I limited my activities to CW operation with 75 watts maximum input power (which, at best, meant for me about 40 watts output) on portions of the 80-, 40- and 15-meter bands. My transmitter was crystal-controlled. While this may not sound like the foundation of fun to some people, I assure you the thrill of my first QSO — between Pennsylvania and Texas with 15 watts — was an emotional event I still vividly remember today.

Change for the Better

Let’s return from this nostalgic moment and figure out how to pay for all this fun. Many household budgets seem stretched

these days. Students may feel this even more. However, there is a simple way to save up funds — spare change.

At the end of the day, take the change you have in your pocket and put it in a container that's just for ham radio. Over time, the amount will grow and you will soon discover there's enough in the jar, cup or box to help you get on the air. Yes, this takes some patience and self-discipline, but it's worth the effort.

When I was first married, money was a bit tight. But it was how I supported my ham radio "habit" in those early years.

Say that each day you put away just 75 cents. In about seven weeks you will have enough money for a QRP transceiver kit such as the RockMite < <http://www.smallwonderlabs.com> > or the Lil' Squall < <http://www.qrpme.com> >, and paid for with money you'll never miss.

If you have a little more patience and loftier goals, at the end of each day try depositing the \$1 bills from your wallet into the "bank." Chances are you'll have enough to buy a new multi-band/multimode HF rig in a year, or so.

Previously Owned Radios and Accessories

Let's take a look at some examples involving used gear.

In **Photo A**, there's a vintage Heathkit DX-40 transmitter, VF-1 VFO, homebrew keyer and Hallicrafters S-38B receiver. The computer mouse serves as a set of keyer paddles.

The DX-40 and VFO cost \$12 at a flea market. The receiver was found at a yard sale for \$15; the keyer was \$5 at a hamfest and the mouse was \$1. That brings our 40-watt, CW station to a total outlay of just \$33.

Another few dollars for a light switch (for transmit/receive changeover), an electrical box, connectors, some surplus 75-ohm coax (tube transmitters are perfectly happy with it) and wire completed it all and brought the total to \$45 — about what you see in the measuring cup in the photograph!

I've used this setup off and on for some time. While my solid-state digital gear has more bells and whistles, I have just as much fun — maybe more — with this bare-bones setup that brings back the thrill of those Novice-era contacts.

Notice also that the equipment was acquired from various sources. If you have a spare moment and find yourself near a yard sale, thrift store or outdoor market, you may find that stopping to take a look around is time well spent.

Acquiring Sideband Gear

OK, how about SSB? In **Photo B** is a Tempo One HF transceiver (circa 1970s). On top of it is an MFJ Enterprises MFJ-9420, which is a single-band, 20-meter, 12-watt rig.

The Tempo One and power supply were picked up for \$120. The used 9420 cost \$150.



Photo B: Five bands and 100 watts vs. a single-band transceiver running 12 watts: It's a multiband Tempo One with a mono-band MFJ Enterprises MFJ-9420 transceiver sitting on top of it.

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Photo C: While more than 30 years old, this five-band Swan 100MX transceiver — obtained for \$140 — “still works ’em just fine.”

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High Quality Is The Number 1 Customer Priority

With the Tempo One, you get 80, 40, 20, 15 and 10-meter operation with 100+ watts output. Why does the somewhat newer low-power rig cost more? I’m not entirely sure — it just does. That’s the way the marketplace values things. “Newer” takes precedence over “features.” Take advantage of it.

I spent another \$10 for a high-impedance microphone, cleaned up the Tempo One a bit and had it on the air later that day.

Rigs like the Tempo One are known as “hybrids” — they are a mix of solid state and tube technology. While not as stable as you would like for PSK operation, they are fine for other digital modes, such as RTTY.

One important note here: If you are at a hamfest or other venue and able to do a power-on test, then by all means do it. Some older equipment has been well taken care of and recently used. Other stuff has been abused and sat on a shelf for years.

Older electrolytic capacitors will dry up and need to be replaced. It’s better to know what you are getting yourself into as far as a potential “project” before you buy.

Digging for Diamonds in the Rough

Photo C brings us even a bit more current, with an all solid-state design in a 100+ watt radio — the Swan 100MX. For \$140, I was able to acquire this rig — which is also a five-bander.

With a little TLC (tender loving care) and some cotton swabs, it looks close to new. Another \$5 for a hand mike and a converted PC power supply (free) put me on the air in time to snag some eastern European contacts on 20 and 15 the next day with the rig set to 50 watts. (I need to find a bigger free power supply.)

Try It Yourself . . .

Even if you use spare change to purchase accessories, software or other fill-in pieces for your station, you might soon be amazed by just how easily and inexpensively you can assemble and expand your station and enjoy amateur radio for many years to come.

(We’d like to hear from other radio amateurs who have developed “creative” ways of funding their hobby. Let us know what treasures you’ve found, as well, and how much fun you’re having with them. Write: <WorldRadioOnline@gmail.com>. — Ed.)



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Signals and Smiles in the Air at Handihams' Radio Camp 2011

By Patrick Tice, WAØTDA

"Advise Mayberry PD that telephone communications are down at the National Weather Service. We have only limited data lines, but we do have amateur radio communications."

Don't panic! It was only an exercise, one of many amateur radio activities conducted at the Handiham Radio Camp this summer at Camp Courage near Maple Lake, Minnesota.

Handiham members gathered for the annual week of amateur radio education, on-the-air activities, fellowship, and camp fun in early August so they could take advantage of the wonderful Minnesota lake country and near-perfect weather.

In a sense, Radio Camp has returned to its roots at Camp Courage. Originally conceived as a weekend retreat in the late 1970s, the annual summer gathering has evolved over the years to include licensing classes taught in adapted formats for the people with disabilities who attend the camp and operating skills training ranging from getting on the air for the first time all the way up to the latest developments in technology for the experienced operator.

The transceivers set up at the several stations at camp include voice chips that speak the frequency for blind operators and operating desks designed to allow a motorized wheelchair user to get comfortably situated to operate the radios.

The Handiham office moved to Camp Courage in late 2009 after decades in the main Courage Center building in Golden Valley, Minnesota. It was a big move — but a good one — because it gave the program much-needed office and storage space and put us back in touch with our roots at Camp Courage.

Remote Radio Activity

We already had a 50-foot tower and beam antenna situated on top of the hill, the highest point in camp, so some of our infrastructure was in place when we arrived. Since then, the camp has become home to our popular Internet remote base high-frequency (HF) station WØZSW, which is available to Handiham members whose living situations make it difficult for them to put up HF antennas.

One of our operating skills training options this year was how to install the remote base software and operate the remote base from a computer. Handiham volunteer Lucinda Moody, AB8WF, was in charge of the small group training sessions that included working with several of our blind operators using a computer equipped with screen reading software. That would be the way that they operated the remote base from their home locations.

Volunteer Don Rice, NØBVE, had already installed an EchoLink-enabled, 2-meter repeater, but also took the time to return to camp to set up a 70-cm machine with an autopatch.

These additional resources enabled us to help campers learn how to use EchoLink from their handheld radios and how to use an autopatch.

Suzy White, WA6DKS, donated an IRLP board and Lyle Koehler, KØLR, our volunteer engineer, modified a Kenwood mobile radio and a tower computer to make up a complete IRLP simplex node for IRLP training.

Surprise! Know Code and an 'Emergency'

But guess what? New technologies notwithstanding, there was still enough interest in good old Morse to have several ses-



Instructors give "thumbs up" after a successful exam session for Technician candidates at Radio Camp 2011. Back row, from left, are Bill Rouch, N6HBO, instructor; Lucy Krecioch, KE6QNX, who upgraded to Tech from Novice; Bill Vokac, K9BV, instructor; Mary Cochran, new ham; John Hoenshell, NØBFJ, instructor; Pauline Betley, new ham; and instructor Larry Huggins, KAØLSG. Front row, from left: Mike Erickson, new ham; and Patrick Tice, WAØTDA, Handiham Manager. (Courtesy of K9HI)



Volunteer Handiham Radio Camp instructor and donor Dr. Dave Justis, KNØS, isn't fly fishing in the forest. He's launching the line that will pull the group's wire antenna into the trees. (Courtesy of K9HI)

sions of code technology and training. Ken Silberman, KB3LLA; and Bill Rouch, N6HBO, enjoyed helping several code newbies as well as some experienced (but slightly rusty) code operators!

ARRL Eastern Massachusetts Section Manager Phil Temples, K9HI, designed and organized a two-hour emergency communications simulation.

"It's a scripted exercise," explained Phil. "We ask camp staff stationed at each simulated location to open envelopes containing the instructions at specific times. Then the campers relay the necessary information about the situation in their own words. They are in charge of communicating, just as they would be in a real emergency."

Our exercise was a response to a flood in the fictional town of Mayberry. Our operators were challenged by rising water, a stranded motorist, the birth of a baby at a shelter, loss of communications at the Mayberry Police Station, a net control station challenged to decide whether it was more important to take traffic from the National Weather Service or the Mayberry Police, a house fire in a location blocked by flood waters, reports of looters, and queries to shelters about supplies and pet facilities.



Volunteers Lee Lorentz, WBØTRA; and Matt Arthur, KAØPQW, check some equipment just before the campers arrive. (Courtesy of WAØTDA)



Rachel Niedringhaus, KCØVBV, was unflappable as the voice of the fictional Pine Street Shelter during the EmComm exercise. "I knew I could do it!" she said. (Courtesy of WAØTDA)

"Does your shelter take horses?" asked Matt Arthur, KAØPQW, throwing in a little extra that was not part of the script.

"No, we do not take horses, only small pets," answered Rachel Niedringhaus, KCØVBV, without missing a beat.

It was the sort of thing you get in a real emergency, and it was clear to all of us that as the exercise proceeded, the participants were learning to think on their feet and operate with more confidence.

"We had originally planned to introduce some unintentional interference in the form of a couple of stations who would get on the repeater for a casual QSO, unaware of the emergency situation in progress," explained Phil. "But when the exercise looked like it might run a little long, we decided to drop the interference and we came out just right — we finished about three minutes shy of our allotted two hours."

Bon Voyage

Some parts of amateur radio cannot be learned without actually experiencing on-the-air activities. Running a station from a pontoon boat is not only a fun activity, but it teaches real-world operating skills, and no one knows that better than Handiham volunteer Bill Jones, NØCIC, our pontoon boat captain.

Bill is a regular on PICONET, a 75-meter SSB net and popular Upper Midwestern place to gather. He lives on a lake and has volunteered as boat captain at many Radio Camp sessions.



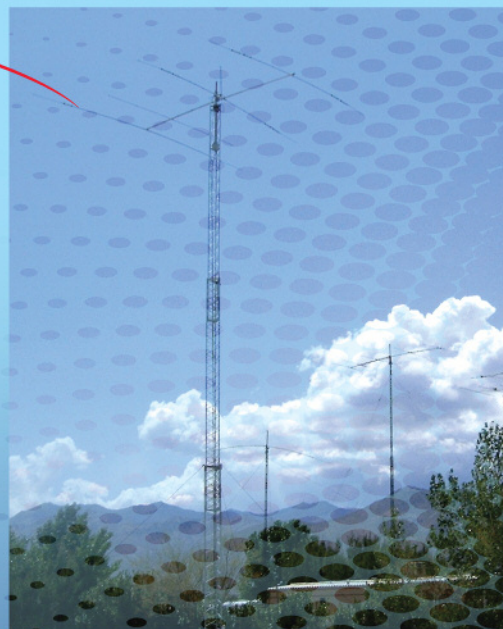
It's a long way down to his four-wheeler, and that's just how Don Rice, NØBVE, saw it from the top of the 50-foot tower at Camp Courage. (Courtesy of NØBVE)



Volunteer instructor and donor Phil Temples, K9HI, organized and conducted the EmComm training exercise during Radio Camp 2011. Phil is ARRL Eastern Massachusetts Section Manager and provides information technology (IT) support for Handiham.org. (Courtesy of WAØTDA)



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The hidden transmitter hunt at Camp Courage took teamwork. Working together, from left, are Al Zeinemann, KCØZBE; Patrick Tice, WAØTDA; and JoAnn Albaugh, KCØYMK. (Courtesy of Camp Courage)

Bill also helps us maintain a second remote base station, WØEQO, at Camp Courage North, near the headwaters of the Mississippi in northern Minnesota.

Tech Licenses Make for Happy Campers

Of course, the licensing classes are vital to the camp experience, as well. The Technician course introduces our campers ages 16 through adult to amateur radio. I consider it our most important class because its participants will be amateur radio operators when they pass their first exam.



Tom Howard, KI6IET, passed his Extra Class exam after studying under Dr. Dave Justis, KNØS, at last year's camp and with the online Handiham audio lectures. "Thanks for everything," Tom said. (Courtesy of WAØTDA)

We begin by teaching online with our own audio lectures and with the excellent ARRL and Gordon West study materials. During camp week, instructors Bill Vokac, K9BV; Larry Huggins, KAØLSG; and Bill Rouch, N6HBO, worked directly with our Technician candidates.

Out of seven, four passed and we were able to send them home with new dual-band HTs — thanks to the generosity of Handiham supporter John Glass, NU6P, who supplied us with the new Wouxun radios.

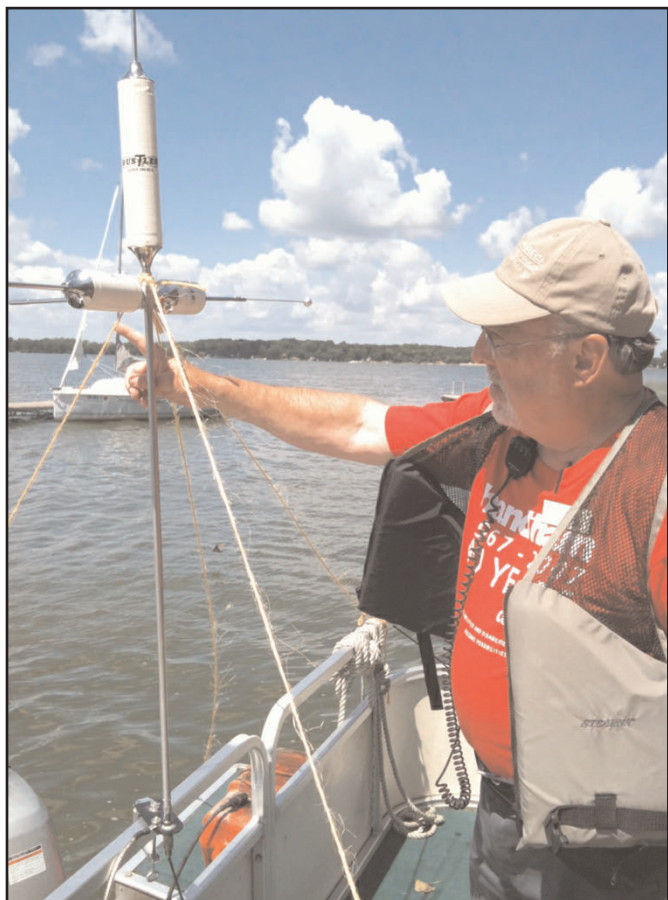
Providing Radios to Those in Need

But other campers needed radios, too, and that's where volunteer Lee Lorentz, WBØTRA, was able to help. He spent the week organizing and testing equipment that could then be sent back home with operators who needed it. Donated gear would thus find new homes and be on the air again!

Lee was also instrumental in helping us test and set up the camp stations at the beginning of the week and then taking them down again.

The time flew by. We welcomed the Stillwater Amateur Radio Association VE team, led by Shel Mann, NØDRX, and finished the week.

Sometimes I think these camps could even be a little longer. Hidden transmitter hunts, licensing classes, boat rides, emergency communications exercises, hands-on learning of new technologies, and even the traditional campfire with songs — it all makes for a great week of ham radio learning disguised as fun.



Volunteer instructor Bill Jones, NØCIC, is the pontoon boat captain. Here, Bill checks the twine supporting the mobile high-frequency antenna. (Courtesy of KAØLSG)

None of it would be possible without the help of hams helping hams — donors, volunteers, campers and Courage Center staff — all of us working together. It's really the best amateur radio has to offer!

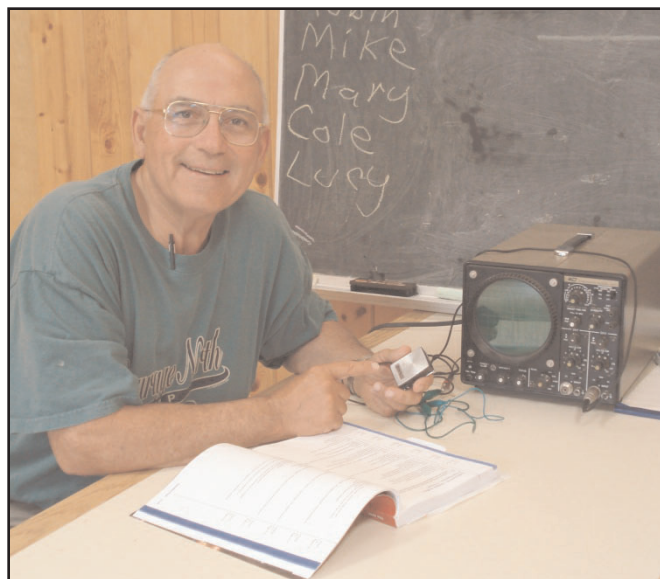
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Suzy White, WA6DKS, smiles with Colleen Bown, Courage North camp manager and “cruise director” for the week. (Courtesy of WAØTDA)



Volunteer instructor Bill Vokac, K9BV, taught the Technician course at Radio Camp 2011. Here he talks about waveforms. (Courtesy of WAØTDA)

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Mastering the DXer's Art of Direct QSLing

By Kelly Jones, NØVD

Recently at one of our local DX gatherings, a fellow DXer and I were discussing the topic of physical QSL cards versus Logbook of the World (LoTW).

As you may know, I'm a big fan of LoTW. However, there is also something very gratifying about receiving that coveted "postcard" in mailbox — especially for an "all time new one" or a new band country.

As the conversation became more in depth, he asked why my return rate for physical cards was so high. He mentioned that over the course of the past few months he had sent out many direct QSLs but was getting a very small percentage of them returned. As we discussed his situation, it became apparent he was unknowingly making several mistakes.

Now, I don't profess to be a QSLing expert, but there are several things I've learned over the years in the position of the one making the request as well as the one receiving requests from others.

While there are many facets to QSLing, I'll narrow things down to the "art" of direct QSLing.

Priority No. 1

Starting at the top of the list, the number one thing you can do to improve your chances of getting that coveted QSL card is to always, *always*, *ALWAYS* include some type of return postage.

There are people who argue that a QSL "is the final courtesy" and expect the other party to foot the postage bill for your return card, but the reality is most DX stations don't need your card.

Let's think about it for a minute: If a DX station (or DXpedition, for that matter) makes hundreds or even thousands of QSOs per year, just how badly does he need another card

from, say, Ohio or Illinois? Sure, he might be a county hunter, but he's likely to mention that he needs your county if he is.

Ultimately the DX station is likely providing you with a new country or band slot — it's his card that you're after, not the other way around. Do him (and yourself) a favor and include return postage for your card.

What, you might ask, should you include for return postage? The two most commonly-accepted modes are either U.S. dollars, often called "greenstamps," or what is known as an IRC (International Reply Coupon).

Not too long ago it used to be that \$1 USD (U.S. dollar) would cover return postage from nearly anywhere in the world. However, due to rising postage costs globally and the weaker dollar on the world market, it's advisable to enclose at minimum \$2 USD to ensure your card comes back.

There are even a few places that now require \$3 USD just to cover return postage to the U.S. Several countries in Europe, for example, now require the equivalent of more than \$2 in postage. With those kinds of costs, it certainly makes U.S. rates seem like a bargain!

OK, Not So Fast

Now, don't rush out and get a stack of \$1 bills just yet. There's more to consider. In some countries, having foreign currency is illegal. You also have to be keenly aware of postage theft.

In some lesser-developed countries, \$2-\$3 USD is a lot of money and their postal workers know how to spot "valuable" mail. This is where the IRC comes into to play.

An IRC is now selling for \$2.10 USD and can easily be purchased from the USPS website: < <http://bit.ly/8ZZbaV> >.

Theoretically, an IRC can be used in any country that is a member of the United Postal Union. The recipient is typically able to exchange an IRC for postage to cover a half-ounce letter. However, in some countries, exchanging IRCs can be a challenge — including here in the United States. So simply do a little homework on the destination of your QSL request and enclose a few "greenstamps" or IRCs as appropriate.

Strategies for Going Postal

Remember the comment about some postal workers being able to spot "valuable" mail? One of the dead giveaways is including any callsign, yours or the DX's, on the outside of the envelope.

It is always a best practice to leave this information out of addresses. Simply include the names and addresses leaving out any information that might indicate "valuables inside." In the event that postal theft is a large problem in the country to which you are about to send your request, consider using registered mail. Sometimes the official stickers will deter would-be thieves.



Many U.S. DXers use International Reply Coupons (IRC)s to cover return postage from a foreign amateur radio station.

Another trick that is often used to get past “questionable” postal workers is to disguise the envelope to look like a business correspondence. This can sometimes help quell the “valuables inside” notion, thus increasing the chances of your QSL request making it to its destination.

In addition to sending return postage, always include a self-addressed envelope. This may sound like a simple thing — and really, how hard can it be for the DX station to write your address on the envelope? But again, if you think about how many requests the DX operator or QSL manager may receive in a year, it could mean writing thousands of addresses, and that can translate into a lot of work.

The easier you make it for the DX to respond to your request, the more likely he or she will — and likely in a more timely manner. Also, if your return envelope must be folded, fold it in half placing the fold toward the bottom of the outer envelope. This will help prevent your return envelope from possibly being cut in half when the package is slit with a letter opener.

Making the Most of the ‘System’

If you are sending your QSL request to a stateside manager, it’s not necessary to include the return postage in dollars (although I’m sure they would be appreciative of your generosity). Certainly make sure the return envelope is stamped, however.

Since it can take several months for even stateside cards to be returned, if there is a postage increase scheduled in the near future, be sure to include the additional postage on your return envelope. The postage increase may be only a few pennies, but over the course of many hundreds or thousands of cards, those costs do add up and have to be covered by the DX station or its manager. A very good way to avoid this problem is to make use of the USPS “Forever” stamps.

Something to keep in mind, as well: If your card is going outside of the U.S., putting U.S. postage on a return envelope isn’t going to do anybody any good. If, for whatever reason, you are not comfortable with sending dollars or IRCs, one option is to use what are called “mint stamps.” They are new, unused stamps issued by the foreign country that your QSL request is being sent to.

For example, if you’d rather use a German postage stamp to cover the cost

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Often, "DXpeditions will sometimes take longer to reply to a QSL request," says Kelly Jones, NØVD. "In the case of 3XD2Z, it was several years! However, patience is a virtue in this hobby."

of the return postage, you would purchase a German mint stamp. As mentioned earlier, be sure the monetary amount is enough to cover the actual mailing costs. Finding places that sell mint stamps can be a bit of a challenge, but with a little searching you can be on your way to using foreign postage stamps as an alternative to sending dollars or IRCs.

Pushing the Envelopes

As long as we're on the topic of stamps and envelopes, it's a good practice to use the "security lined" envelopes. These are the ones that have blue or black "cross-hatching" on the inside that make it difficult to see the contents. This helps obscure the fact that valuables might be inside.

If the "bad guys" can't see the dollars, then there is a better chance your card will make it to its destination. However, I have had a difficult time locating "air mail" envelopes (the ones with the blue and red stripes) that have the security lining. So, in lieu of the air mail designation, I have been using plain white letter-sized envelopes with positive results.

Do keep in mind, however, that if you use the plain white envelopes, be sure to pick up some air-mail stickers from the post office. These are free and the post office will usually be happy to give you several sheets simply for the asking.

The stickers help ensure that your card request will go via air mail and not get

held up somewhere because it looked like domestic mail.

Pull, Fold, Seal

Another aspect to consider about the envelope is whether or not it has a glued flap or is the newer type with a peel-off strip. I never thought much about this as somebody making the QSL request; however, over the past few years I've begun to receive card requests for my various DX operations. I can tell you with great confidence that the DX station (or manager) will appreciate it if your return envelope uses the peel-off strip.

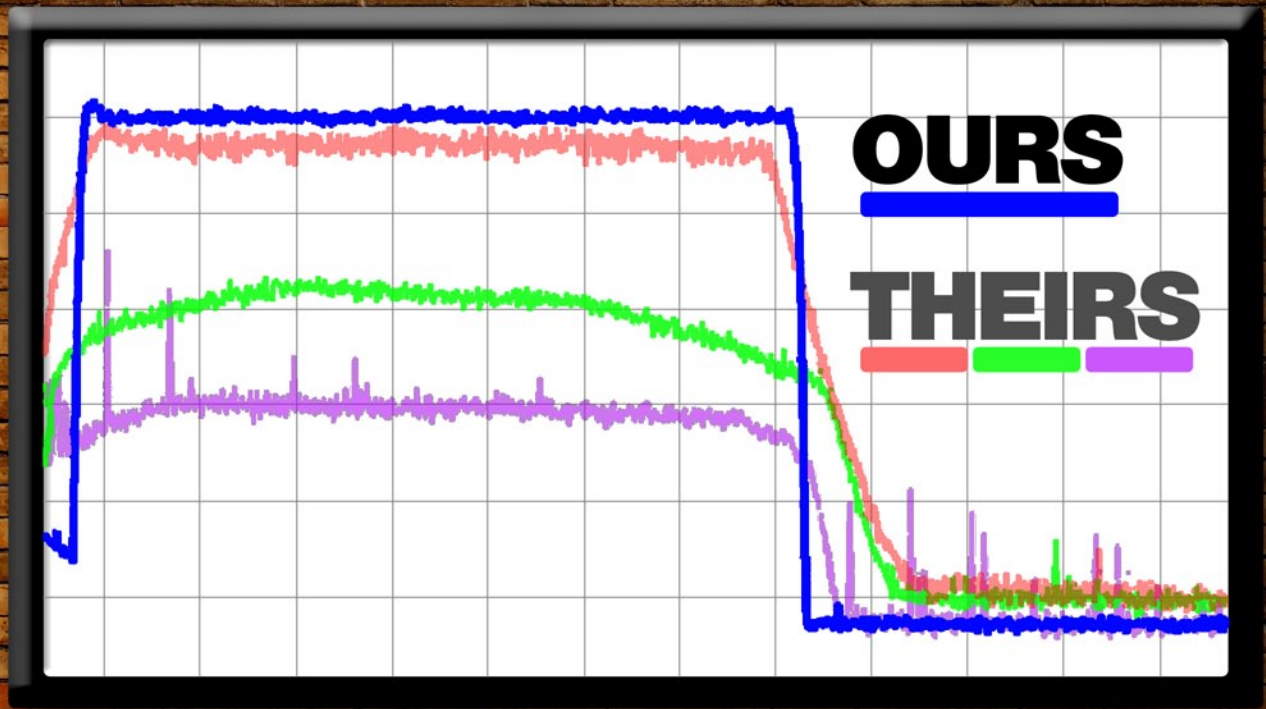
Imagine having to lick the flaps of hundreds of envelopes each day. Talk about needing to keep a glass of water on hand! I've even tried using a damp cloth or sponge and that just makes a bigger mess — water and glue everywhere! With the "peel-off" strip, it's just pull, fold, seal — envelope-ready to be dropped in the mailbox. No mess whatsoever — and my tongue isn't stuck to the roof of my mouth.

Time is of the Essence

A mistake that some beginning DXers make is writing the QSO time in local instead of UTC or GMT time (which are actually the same). It's very easy to accidentally log times in local, but the DX station will not find you logged at that time since he or she will be looking for the

brick wall /brĭk - wôl/ - *noun*

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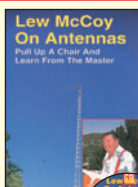
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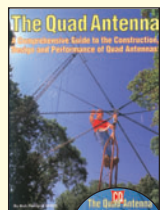
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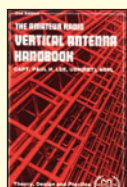
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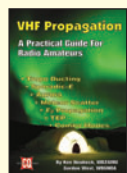


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Thank you very much for nice QSO
I hope to meet you on air again . 73 from mohsen

One of NØVD's most prized QSL cards is from EP3SMH. "I fully expected to be sending my request into a 'black hole' with no expectation of seeing a reply," Jones says. "However, several months later, Mohsen's QSL arrived in the mail — my first and only EP confirmation."



Chak Chadraabal, JT1CO, was NØVD's first 3.5-MHz QSO with Mongolia. "It took several attempts to finally get a reply," he says, "However, this card holds fond memories of working him on 80."

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QSO in GMT. So now the DX has to figure out the time difference and ensure the QSO is valid. This adds to his "workload" of answering QSLs.

Keep It Simple

Finally, one of the biggest mistakes I see being made is to request several calls in the same envelope — especially when sending to QSL managers. Many DX stations have multiple calls — personal, contest and maybe DXpedition.

When you request a QSL and include more than one call in the envelope, it slows the process down considerably. From my own experience and from what I've read from QSL managers, there is a workflow that takes place when answering QSLs.

For instance, I will separate all of the cards by callsign being requested. So, let's say I end up with four stacks. I now begin verifying the QSO data for each card.

However, if somebody requests a QSL for callsign A and callsign B, either on the same card or in the same envelope, I have to set that card and return envelope aside (and hope they don't get separated) and work on it separately. The reason for this is because as I'm working each pile, I have a given call's logbook open. Having to switch between logbooks is time consuming and interrupts the workflow.

Another scenario: Perhaps the manager has logs for callsign A, but not callsign B. So does he or she wait until the logs for callsign B are received, thus delaying the reply for callsign A? Or does the DXer send the reply for callsign A and foot the bill for callsign B when the logs come in? Or does he just ignore the request for callsign B altogether?

Now imagine a request for three or four QSLs in a single envelope. Unfortunately all of these scenarios cause your reply

to be delayed. So, even if you are sending cards to the same DX station or manager, please send separate "packages" for each call you wish to QSL.

The 'Six Month' Rule

Keep in mind that it can take several months for your reply to arrive, even when sending to stateside managers. Sending emails to them after the first week asking about the status of your card will not speed the process — in fact it will likely slow it down because now not only are there hundreds or thousands of QSLs to be answered, there are now lots of emails!

A general rule of thumb is to wait at least six months before sending a second request.

Lots to Process

You can see there are many things to consider when sending for a direct QSL confirmation, yet we've merely scratched the surface. However, I hope this gives you a few things to think about and helps to improve your return rate.

QSLing is still one of the great things about DXing. Once you start a collection of cards, it's always enjoyable to thumb through them on some cold, snowy afternoon with each card bringing back fond memories about that QSO.

That's it for this month's column. I look forward to hearing your comments, complaints or whatever is on your mind. If you have a story or opinion you would like to share, please send it to me at n0vd@dxcentral.com. I'll do my best to include it in an upcoming column. Look for me on Facebook or Twitter, as well. Until next time, see you in pileups!



See 'Aerials' this month as *The Krusty One* untangles mysteries of the 'twisted pair,' page 65

An Untwisted 'Twisted Pair' Feedline for Field Operation

By Richard Fisher, KI6SN

The big knock against the "twisted pair" feedline is the loss it introduces in an antenna system.

In pre-coax cable times, it was common for radio amateurs to twist insulated wire to make the feedline to connect their transmitters to the radiating elements of their antennas.

Unfortunately, in a fixed location with a long run to the antenna, twisted wires — or modern-day lamp cord or two-conductor speaker wire — can gobble up most of a signal in the feedline before it ever reaches the antenna.

In answer to a reader's question, Kurt N. Sterba has an excellent treatise on these feeders in this month's *Aerials*. (See page 65. — Ed.) You must read it.

Kurt got us thinking about a trail-friendly dipole made completely of two-conductor speaker wire — the kind you can readily find at retail stores. It would be lightweight, rugged, easy to make and easy to manage. A sort of untwisted "twisted pair."

But what about that bug-a-boo of loss? The Krusty One put us at ease: "If you can hold the feedline to 15 feet (in length), the loss would be only 0.1 dB," he said. "Instead of 2 watts to the antenna you'd have 1.95 watts. The listener couldn't tell the difference." Now we're talking.

At Walmart, a 50-foot roll of 16-gauge, clear, two-conductor speaker wire is \$5.65. (See < <http://bit.ly/p7FvTU> >. — Ed.) You order it online and it will be shipped free to your local store. RadioShack and many other retailers carry speaker wire, as well.

Based on a 50-foot supply of speaker line, here's a bit of calculation: Subtracting 15 feet for the feeder leaves you 35 feet of parallel wire to split apart to make a center-fed dipole. That's 35 feet per side for a total of 70 feet — more than enough for a 40-meter, half-wave dipole.

Of course, keeping the feeder at 15 feet, you can shorten the radiating elements to make an antenna for 30, 20, 17, 15, 12, 10 or 6 meters, as well. Do the math: $468 \div \text{frequency in MHz} = \text{Length of half-wave dipole}$. Divide that number by two to determine the length of each side of the dipole.

At KI6SN, we'd never used speaker wire for a trail-friendly antenna. But the "twisted pair" concept was looking better all the time.

Coax can be awfully heavy and diffi-

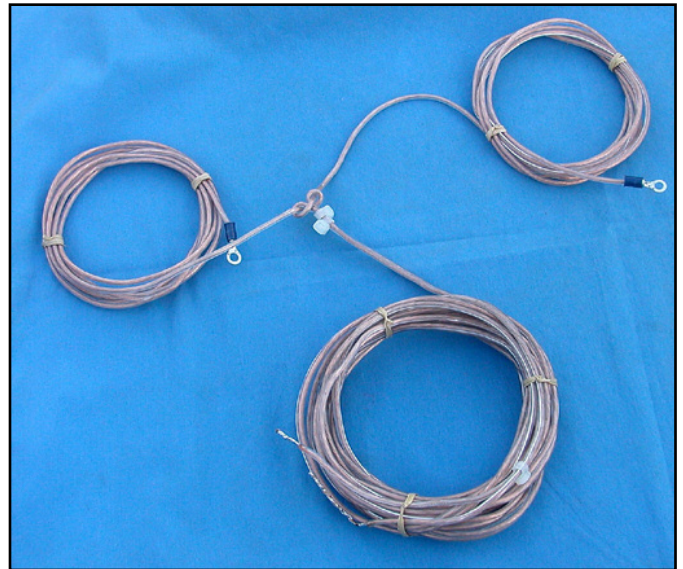


Photo A: All rolled up and ready to go, the trail-friendly speaker wire 10-meter antenna is a lightweight, efficient, easy to carry and easy to manage antenna for the field.

(Photographs courtesy of KI6SN)

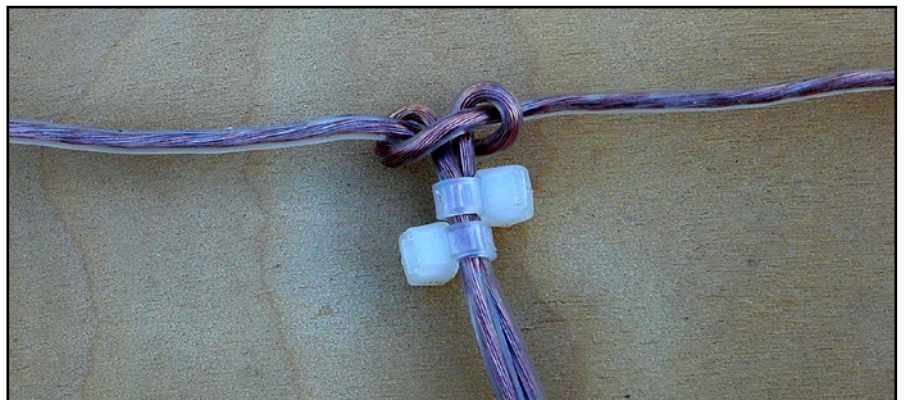


Photo B: Wire ties are cinched around the parallel wires at the point where the speaker wire separates to form each leg of the half-wave dipole. Meanwhile, using an "electrician's knot" eliminates the need for a center insulator with this speaker wire antenna. Notice, too, there are no solder connections where the feedline splits into the dipole's radiating elements — it's one continuous line. (For a color-coded view of the "electrician's knot" and tying instructions, see Kurt N. Sterba's *Aerials* on page 65. — Ed.)

cult to work with in the field. It weighs down a backpack in a hurry, tangles easily and just seems out of place. Even Twiggy-thin RG-174 coaxial cable dangling out of the sky can spoil a view. Clear speaker wire is much less intrusive.

At KI6SN, we decided to craft a trail-friendly, 10-meter dipole using 16-gauge, clear, two-conductor speaker wire.

Ten meters covers 28.000 to 29.700 MHz. The middle of the band is 28.850. A half-wave dipole cut for 28.850 is approximately 16 feet, 3 inches in length — about 8 feet, 1.5 inches per side. That can make for a very tidy package rolled up to carry to the field (**Photo A**).

Allowing for 15 feet of feedline and knowing that we'll be splitting the parallel conductors to make the 10-meter half-wave dipole, we rolled out 24 feet of the speaker wire, allowing for a little fudge room.

First, measure 15 feet and mark the

speaker wire. That's the point at which the parallel wires will begin to separate to form each side of the dipole. From that mark, measure 9 feet and cut the wire from the spool.

Remember, the first 15 feet constitutes the feedline. So from the end you have just cut from the spool, begin separating the parallel wires until you reach the mark you made at 15 feet.

At this point, we added a couple of wire ties to keep the parallel line from separating any further (**Photo B**). OK, we've now got 15 feet of feeder and 9 feet on each side of center for the dipole.

One of the neat things in Kurt's column this month is the introduction of an "electrician's knot" to cinch things up where a dipole's center insulator is normally installed. As you see, as well, in **Photo B**, one is not needed here.

Now it's time to trim the dipole's elements to proper length. We allowed for 9



Photo C: The MFJ Enterprises MFJ-902H Travel Tuner is just one of many commercially-produced antenna tuning units capable of handling balanced line feeders and covering 80 through 10 meters. (Courtesy of MFJ Enterprises)

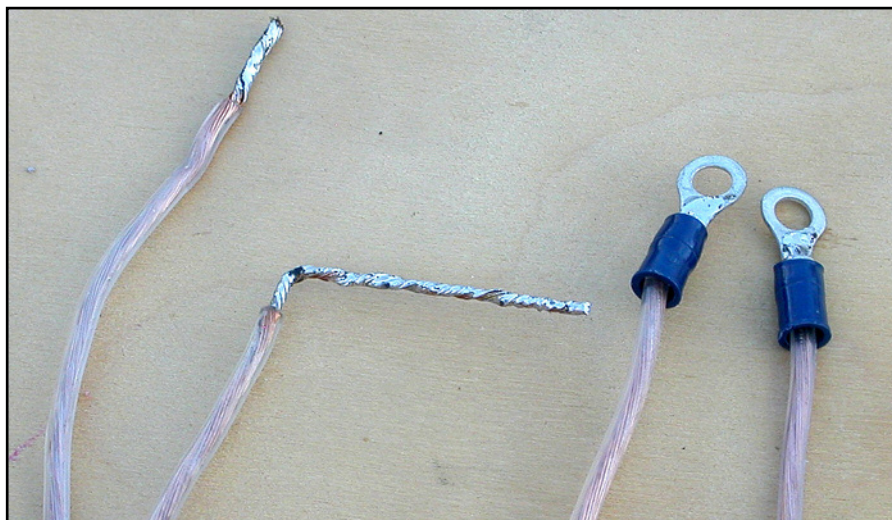


Photo D: Small connectors, right, are soldered to the end of each side of the dipole to provide a place to tie string or nylon cord for hoisting the antenna. The transceiver ends of the feedline, left, are tinned with solder, as well, to keep the 16-gauge wire from unraveling.

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feet per side of center. That's long for 10 meters.

Measure 8 feet, 1.5 inches from the center — from the “electrician’s knot” — and cut each element. You’ll be trimming about 10.5 inches from each side. Relax. This is not rocket science. Don’t worry if you’re off a little bit.

As Kurt tells us in *Aerials* this month, parallel speaker wire introduces far-different impedance than coax’s usual 50 or 75 ohms. So our twisted pair-style feedline requires a balanced-line antenna tuner to make the 50-ohm transmitter output see eye-to-eye with our 10-meter half-wave.

If you don’t already have one, you

might consider, for example, the MFJ Enterprises MFJ-902H Travel Tuner, equipped to handle balanced line feeders and covering 80 through 10 meters. (*See* < <http://bit.ly/oDzvam> >. — Ed.) (Photo C). Or build one. There are lots of designs on the Internet.

Now that the dipole’s elements are cut to proper length, we soldered small connectors to the end of each side. This is where we’ll tie string or nylon cord to hoist the antenna into the trees or up a canyon wall. The ends of the feedline are tinned with solder, as well, to keep the stranded 16-gauge wire from unraveling (Photo D).

With that, we’re ready to go. First we hoisted the dipole to about 13 feet in the air and connected the dangling feedline to the terminals of our balanced-line tuner. With the tuner connected to our trail-friendly transceiver we quickly tuned to resonance. SWR was 1:1. Nice. Things seemed to be working just beautifully.

Turning the tuner’s capacitors out of resonance resulted in a sharp drop of atmospheric noise from the receiver. Obviously we were squarely in the 28-29.700 MHz ballpark.

Yes, the “twisted pair” may be Public Enemy No. 1 in some situations, but on the trail, it can be a thing of beauty — both electrically and aesthetically.

Why not make the relatively small investment (if you don’t already have a roll of speaker wire in your junk box), invest 10 or 15 minutes into making a T-F dipole, grab a balanced-line tuner and T-F transceiver and let me know how things work out. Write: < KI6SN@aol.com >. We’ll relay your experiences to the T-FR community in an upcoming column.

Homework for November

So, you want a weekend of guaranteed band activity to test your trail-friendly radios and antennas? The American Radio Relay League’s **2011 CW November Sweepstakes** is made to order: November 4-5.

This contest and *CQ Amateur Radio’s World-Wide WPX Contest* (CW), held annually in May, are perfect venues for trail-friendly radio testing and contest operation.

Your homework for November is to familiarize yourself with the ARRL CW Sweepstakes contest rules, get your logging materials and dupe sheets in place (either on paper or via computer), and to think about strategies for making your contest field operation a success.

For full details about the ARRL November CW Sweepstakes, visit: < <http://bit.ly/rp0QVH> >.

To get a head start on *CQ’s* World-Wide WPX Contest (CW) for May 2012, go to < <http://bit.ly/ndsWiQ> >.

Next month, we’ll be focusing here on trail-friendly operating hints for those contest weekends.

Of course, your ideas are always welcome. Please send them to me at: < KI6SN@aol.com > and we’ll put them in a list of Strategies for T-FR Contest Success.

— TNX and 73, Richard Fisher, KI6SN

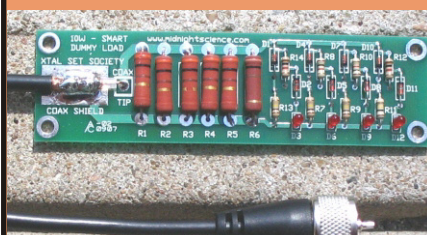
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DX Predictions

October 2011

Maximum usable frequency from West Coast, Central U.S. and East Coast (courtesy of Engineering Systems Inc., Box 1934, Middleburg, VA 20118). The numbers listed in each section are the average maximum usable frequencies (MUF) in MHz for contacting five major areas of the world centered on Africa-Kenya/Nairobi, Asia-Japan/Tokyo, Oceania-Australia/Melbourne, Europe-Germany/Frankfurt, and South America-Brazil/Rio de Janeiro. Smoothed sunspot number = 60.

Chance of contact as determined by path loss is indicated as bold *MUF for good, plain MUF for fair, and in (parenthesis) for poor. UTC is hours.

WEST COAST

UTC	AFRI	ASIA	OCEA	EURO	SA
10	(12)	10	*19	(10)	17
12	(11)	10	*17	(10)	16
14	23	10	*16	19	*29
16	27	*12	*20	19	*34
18	*28	12	(17)	(16)	*36
20	*28	*24	25	(12)	*36
22	23	*24	*31	(11)	*35
24	20	*23	*34	(10)	*32
2	*16	*20	*35	10	*26
4	*14	*13	*30	10	*22
6	(13)	12	*25	*11	*19
8	(12)	11	*21	(10)	*16

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UTC	AFRI	ASIA	OCEA	EURO	SA
8	(12)	10	*18	(10)	*16
10	(12)	10	*16	(10)	*16
12	24	10	*15	*19	*28
14	27	10	*23	*21	*32
16	29	(10)	20	*20	*34
18	*29	(10)	(17)	16	*36
20	*28	20	26	12	*36
22	*24	22	31	(11)	*35
24	*16	20	*33	10	*31
2	*14	13	*27	10	*26
4	*13	(12)	23	10	*22
6	(12)	(11)	20	*10	*19

EAST COAST

UTC	AFRI	ASIA	OCEA	EURO	SA
7	15	(10)	17	*10	*18
9	14	10	*16	(10)	*16
11	*30	10	*15	*19	*25
13	*35	11	*25	*22	*30
15	*37	(10)	21	*22	*33
17	*37	(10)	19	*20	*35
19	*31	(10)	(23)	17	*36
21	*26	19	29	12	*36
23	*20	19	33	*11	*33
1	*18	13	26	*10	*27
3	*17	(12)	22	*10	*23
5	*16	(11)	19	*10	*20

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Understanding Refraction, Absorption and Polarization

By Carl Luetzelschwab, K9LA

If someone asked you, “Is propagation on 160 meters different than that on 6 meters?” I’m sure you would answer with a resounding YES! But be aware there is common ground with respect to propagation over such a wide frequency range.

Electromagnetic waves from 160 meters to 6 meters follow the same laws of physics. So if you understand how refraction, absorption and polarization change over this frequency range (the three parameters that determine if a wave can get from A to B and how loud it will be), you’ll have more insight into propagation from 1.8 MHz to 50 MHz (and probably even at lower and higher frequencies).

Refraction

Most of our QSOs are via refraction. We do make QSOs via reflection and scatter at times, but we’ll focus on refraction since it is most prevalent. The underlying tenet for refraction is that for a given electron density profile the amount of refraction is inversely proportional to the square of the frequency. In other words, as the frequency is lowered the ray will bend more.

We can see this by doing ray traces, as **Figure 1** shows on the higher frequencies for a daytime path at solar maximum at an elevation angle of 2°.

Starting with the 49 MHz ray and proceeding down to the 28 MHz ray, **Figure 1** confirms that the lower the frequency the more the bending. More bending results in the ray beginning to refract sooner (at a lower altitude in the ionosphere), and thus the apogee of the ray trace decreases as the frequency is lowered. This also decreases the hop distance as the frequency is lowered.

Note what happens on 21 MHz and on 14 MHz. On 21 MHz, the E region starts coming into play by providing enough refraction to cause the ray to go a greater distance than the 42 MHz ray. And on 14 MHz, the E region ionization is sufficient

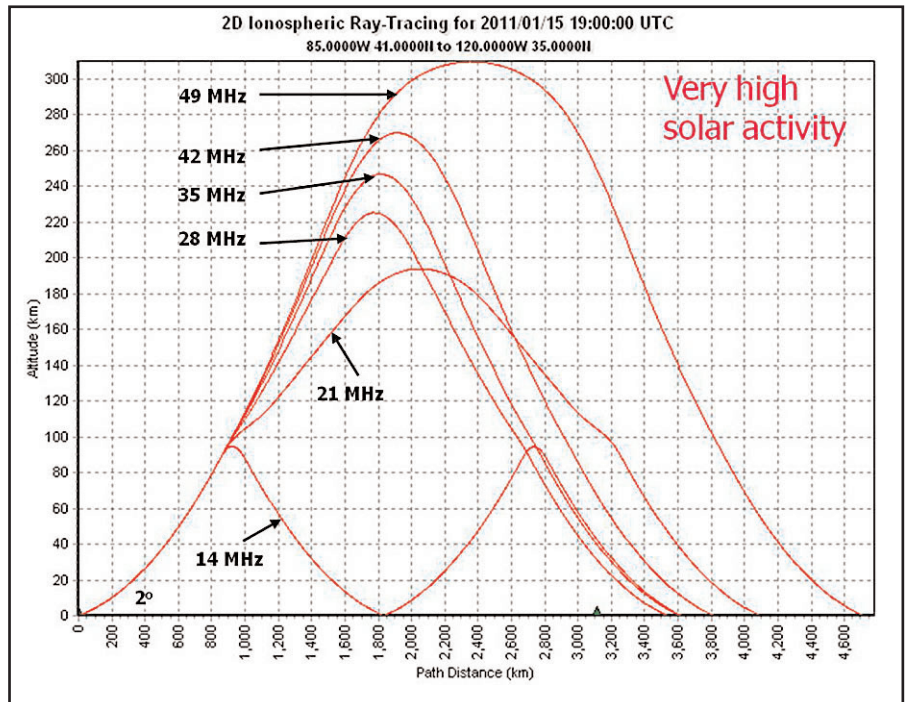


Figure 1: Daytime Ray Traces vs. Frequency

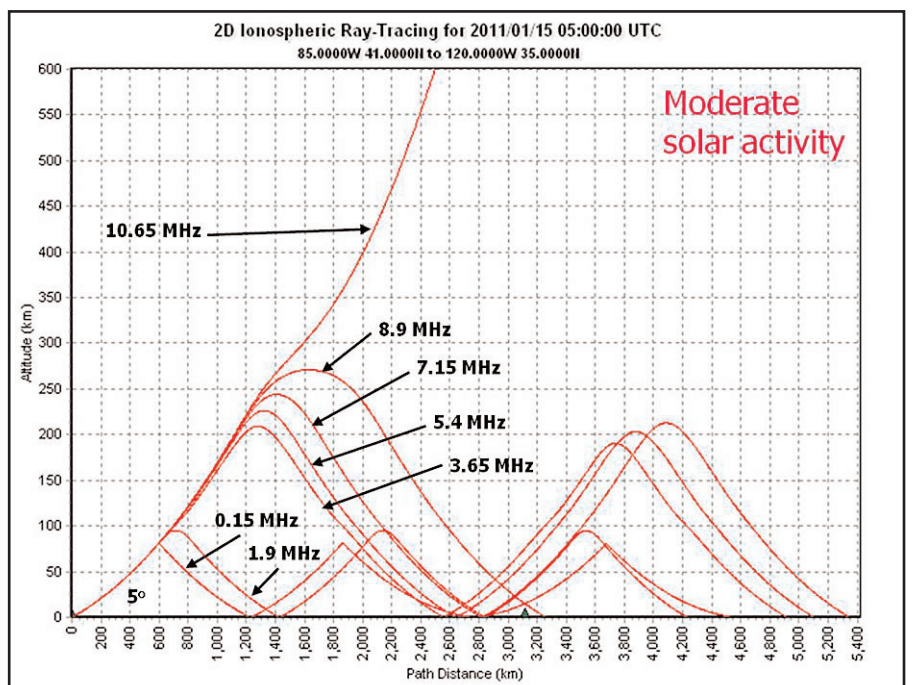


Figure 2: Nighttime Ray Traces vs. Frequency

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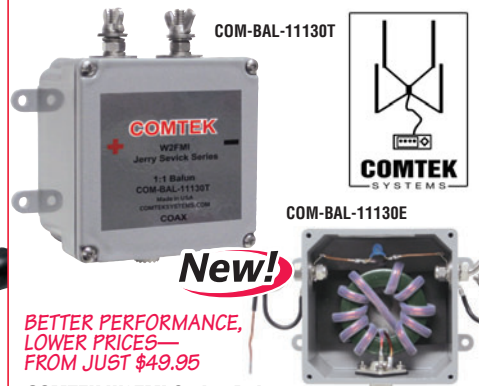
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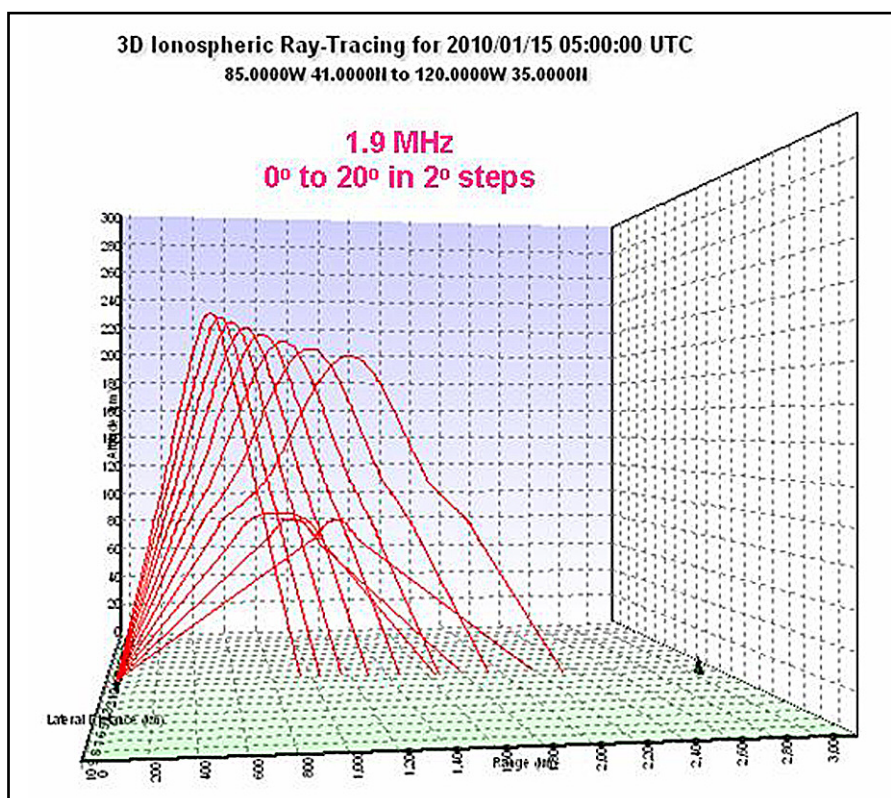


Figure 3: Nighttime Ray Traces on 160 Meters vs. Elevation Angle

to turn the ray back to ground, resulting in much shorter hops.

Figure 2 does similar ray traces, but at night on lower frequencies. All ray traces for this case are done at a 5 degree elevation angle.

We again see lower apogees and shorter hops as the frequency is lowered. Note that 10.65 MHz, for the conditions I've chosen (5 degree elevation angle, nighttime and moderate solar activity), goes through the ionosphere.

Also note that the two lowest frequencies (1.9 MHz and 0.15 MHz) don't get through the E region, resulting in extremely short hops. It's interesting to go into a bit more detail on 160 meters, and **Figure 3** does this by varying the elevation angle from 0 degrees to 20 degrees in 2 degree steps.

For the conditions I've chosen (1.9 MHz, nighttime and moderate solar activity), elevation angles greater than or equal to about 6 degrees make it through the E region to give F region hops. But elevation angles less than about 6 degrees are confined to E region hops. What this simply says is there is still enough nighttime E-region ionization (a typical nighttime critical frequency foE is approximately 0.4 MHz) to refract low

elevation angle rays on 1.8 MHz back to ground (per the secant law that relates the maximum useable frequency to the critical frequency).

Absorption

The underlying tenet for absorption is that for a given electron density profile, the amount of absorption is inversely proportional to the square of the frequency. In other words, as the frequency is lowered the absorption increases.

Doing ray traces versus frequency over a 1,500-km path during the night and over a 3,400-km path during the day while focusing on absorption gives the results in **Table 1**. The data is for F hops.

The data in **Table 1** confirms that the lower the frequency, the higher the absorption. But note the amount of absorption on 0.15 MHz (150 kHz) in the left-hand set of data. It decreases significantly compared to the absorption on 1.9 MHz. The reason for this is the 0.15-MHz ray does not get as high into the ionosphere (refer to **Figure 2**) as the 1.9-MHz ray — it bends more — and, in fact, it hardly gets into the absorbing region (which is the lower E region at night).

So when you see amateur radio reports

Jan 15, midnight, medium solar activity 1500 km hop		Jan 15, noon, high solar activity 3400 km hop	
frequency	o-wave absorption	frequency	o-wave absorption
0.15 MHz	4.0 dB	14 MHz	E hop
1.9 MHz	17.8 dB	21 MHz	6.3 dB
3.65 MHz	2.3 dB	28 MHz	2.4 dB
5.4 MHz	0.8 dB	35 MHz	1.4 dB
7.15 MHz	thru ionosphere	42 MHz	0.9 dB

Table 1: Absorption Results

of long distance QSOs on frequencies below 1.8 MHz, you'll know there's nothing magic going on — it's just the laws of physics (I don't mean to denigrate the effort that went into such a feat — you still have antenna efficiency issues and man-made noise issues to overcome below 1.8 MHz).

Polarization

When we send a signal on its way from our transmit antenna, it enters the ionosphere and couples into the two characteristic waves that propagate through the ionosphere — the ordinary wave and the extraordinary wave.

The polarization of these two waves progresses from circular on 50 MHz to highly elliptical (approaching linear) on 1.8 MHz. It's a gradual trend, and for all intents and purposes we can consider that these waves are circularly polarized all the way down to 3.5 MHz. When these two waves exit the ionosphere, the polarization at the exit point is what's presented to our receiving antenna.

Both waves propagate similarly through the ionosphere down to 3.5 MHz. But on 1.8 MHz the extraordinary wave incurs significantly more absorption than the ordinary wave due to being near the electron gyro-frequency (from 0.7 MHz to 1.7 MHz depending on where you are in the world), and as such it is usually considered out of the picture on 160 meters (that's only half the story — the extraordinary wave on 1.8 MHz also sees a significantly different index of refraction, and it takes a significantly different path through the ionosphere).

Summary and Implications

The **Summary Box** highlights the main points of the physics of refraction, absorption and polarization, along with some pertinent implications. Please realize these are generalities for the F region for a given electron density profile.

The fact that we have two major players (the F region and the E region) and disturbances to propagation adds intracasies to these generalities.

• Physics

- **Refraction:** The lower the frequency the more bending
- **Absorption:** The lower the frequency the more loss
- **Polarization:** Circular polarization for 3.5 MHz to 50 MHz and mostly highly elliptical (almost linear) polarization on 1.8 MHz

• Implications

- The often-quoted maximum F region hop distance of 4,000 km is most applicable to the high end of the HF range (12 meters and 10 meters). The maximum hop distance on 160 meters is around 2,500 km. On 6 meters, the maximum hop distance can be 4,500-5,000 km.
- In general, 160-meter RF takes short hops that are lossy and 6-meter RF takes long hops without much loss. At frequencies below 160 meters, less absorption is incurred due to the wave not getting as high into the ionosphere — but the hops will still be short.
- In general, vertical polarization works best on 160 meters for those at mid- and high-latitudes in the Northern hemisphere. This also applies to 80 meters and 40 meters, but those who can put a horizontal antenna up high on these bands will have good results. In general, horizontal polarization works best on 30 meters through 6 meters — not due to ionospheric reasons but due to elevation pattern issues and man-made noise issues.

Summary Box

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A Bumpy Ride For ARISSat-1 On Its Way Into Space

By Terry Douds, N8KI

As radio amateurs from around the world linked to NASA streaming Internet video August 3, the ARISSat-1/KEDR satellite was taken from the airlock aboard the International Space Station into the cargo bay — being readied for deployment in space.

It would be the culmination of a much-anticipated amateur radio event and the end of a long road. A very bumpy road, at that.

For many viewers, it appeared not enough care was being taken by the cosmonauts in charge of releasing the satellite as it banged into the sidewalls of the

cargo bay on the end of a tether. Many of those Earthlings worried there would be damage to ARISSat-1/KEDR.

And just as the satellite was about to be released, it was noted that an antenna appeared to be missing — apparently broken off at some point between delivery and deployment.

The 70-cm uplink antenna — receive only — was missing in action, and what is left on the bird is about a 1.5-inch stub enclosed in epoxy.

The space frame was returned to the airlock and rechecked. After inspection, which determined only the antenna was

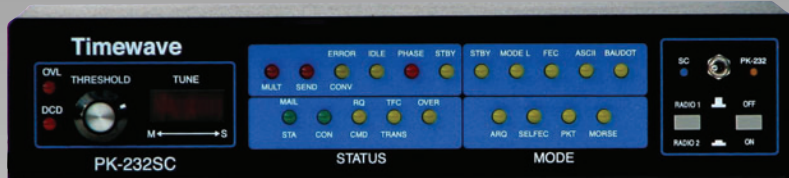
damaged, and factoring in that the next EVA (extra vehicular activity) wouldn't be until sometime in 2012, the decision was made to deploy. At 1843 UTC the ARISSat-1/KEDR took flight.

(Update: At press time, AMSAT officials were reporting ARISSat-1's battery was failing — rapidly. "The satellite experienced a reset during an eclipse period . . . When the satellite resets due to low voltage, the MET (Mission Elapsed Time) resets to zero. ARISSat-1 (was) running for only 111 minutes before going into low power mode and eventually resetting after entering eclipse." For



Cosmonauts focused on the tasks at hand during their EVA. (Courtesy of NASA)

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late updates, visit the ARISSat-1 website < <http://www.arissat1.org/v3/> > and CQ Newsroom: < <http://www.CQNewsroom.blogspot.com> >. – Ed.)

Pre-Deployment Testing

Prior to deployment, on-air testing of the satellite aboard the ISS was conducted over the weekend of July 30-31, and the results were very successful.

Reports were received universally from around the world. AMSAT-BB (the AMSAT mailing list/blog) listed reception reports from South Africa, Japan, Hawaii, Sweden, all across Europe, China, Brazil, Barbados, Czech Republic, United States and Ukraine. In all, more than 50 reports from 20 countries were received.

All information being transmitted was being received — telemetry, CW and voice beacons, and SSTV pictures. To see an example of the downlink on SSTV from PY4ZBZ in Brazil, visit: < <http://www.qsl.net/py4zbz/satelite/201107310146.jpg> >.

Then RSØ1S On the Air . . .

After its August 3 deployment, ARISSat-1/KEDR signals were beginning to be received quite well all over the globe and the transponder was found to work as well as it was intended — even with the stub of an antenna for receive. It is very sensitive and quite easy to access with very low power and omnidirectional antennas.

Originally, this satellite was to be the second in a series of “SuitSats” that would be housed inside an old Russian space-suit. The suit became unavailable, however, so an actual space frame was developed to house the electronics. Its callsign, as you can see in the SSTV photograph on the Web, is RSØ1S.

ARISSat-1/KEDR’s mission is educationally based. It includes a voice ID, voice, digital and CW telemetry, stored image and live camera images via SSTV, and various scientific experiments. FM transmissions are on 145.950 MHz that include the Voice ID, telemetry, 24 greetings in 15 languages, and SSTV images.

On 145.919 and 145.939 MHz, CW beacons transmit IDs, telemetry and callsigns of people actively involved with the ARISS program. Special SSB BPSK telemetry is sent on 145.920 MHz. Two speeds were considered: BPSK-1000 is active when the CW beacon is on 145.919 MHz, and BPSK-400 is active when CW is heard on 145.939 MHz.

A U/V linear transponder (70-cm uplink, 2-meter downlink) is available for use as well. It has a 16-kHz inverting passband, meaning that uplink signals should use LSB, and the downlink will be heard as USB.

It is specifically designed to work with low-powered transmitters and omnidirectional antennas. The uplink frequencies will be from 435.758 to 435.742 MHz, with reception from 145.922 to 145.938 MHz.

You can always find up-to-date information about the satellite at its webpage: < <http://www.arissat1.org> > or on social media sites, such as Facebook (Amateur Radio on the ISS (ARISS)) or Twitter (@ARISS_status).

Satellite Communications Updates

While on the subject of the Web and social media, there have been many updates in the past few months.

AMSAT-UK has launched a new website with many new features at: < <http://www.uk.amsat.org> >.

Following suit, AMSAT-SM in Sweden has updated its online access as well. Find its new website at: < <http://www.amsat.se> > or on Facebook at: < <http://on.fb.me/ocg2fA> > or on Twitter at < <http://bit.ly/oXqGaR> >. Remember, when looking on the web at pages that may be in another language, use your computer’s resources to your advantage! Using Google Chrome as a browser, I can translate most any page into English for my reading — my Swedish isn’t really up to par!

Open up Google Chrome, go to < <http://www.google.com/translate> >. It will ask you what languages you want to use (from/to), and asks you to enter the website URL. When I enter the AMSAT-SM Facebook page URL, it goes to the Facebook page, but nothing happens — nothing but the Facebook logo appears. I then put the URL back into the original browser address bar at the top, and the Swedish page reappears. However, if you right click on the page itself now, you’ll find a magic little destination in the drop-down menu — “Translate to English” — click on it! The whole page turns to English, and you are reading away! Give it a try . . .

Our Phones Are Looking Up

Some new smartphone apps are available for amateur satellite enthusiasts. The European Space Agency (ESA) has announced a new ESA App for iPhone and iPad users, which allows access to top news stories, videos, images, facts and figures, Twitter feeds, Flickr and Facebook links, and other information right at your fingertips. The app is available free of charge at the Apple App Store.

You can also turn your iPhone or Android phone into an ISS visible pass predictor with new apps that are available at < <http://simpleflybys.com> >, or on your computer via the web using the Simple Satellite Tracker at < <http://spaceweather.com/flybys> >.

A FOX Hunt of Your Own

AMSAT-NA’s next satellite, known as FOX, has an updated website as well. The new home page brings you the highlights of:

- Why do we need FOX?
- A link to the Project FOX presentation slides from Dayton
- AMSAT Forum



ARISSat-1/KEDR is deployed into space by cosmonauts aboard the International Space Station on August 3.
(Courtesy of NASA)



(Courtesy of NASA)

- A Project FOX donation widget
- FOX Project Status
- High level project design goals
- A call for volunteers to join the AMSAT FOX Team

You can view this informational summary of the AMSAT FOX project at: < <http://www.amsat.org/amsat-new/fox/> >.

Project FOX design goals include utilization of a standard one unit (1U) CubeSat, that will end up in a circular orbit of between 600-800 km above the Earth, using a 500-mW EIRP, Mode B (U/V) transponder that is software defined.

The hope is that the bird will be launched in 2013, and will replace the ailing AO-51, which is showing its age.

2011 AMSAT Space Symposium

AMSAT-NA is finalizing the information concerning the 2011 AMSAT Space Symposium, which will be held from Friday, November 4 through Sunday, November 6 at the Wyndham San Jose hotel in San Jose, California.

This is always a great time, with a great deal of information for beginners as well as experienced operators. Registration for the conference and the Saturday Night Banquet are available on the AMSAT website: < <http://www.amsat-na.com/store/SymposiumReg.php> >.

Special room rates are also available for the hotel. If you are making reservations online, use 1031FSJAM for the group code. The direct link to the hotel web page is: < <http://www.wyndham.com/hotels/SJCAP/main.wnt> >, or you can call the hotel directly: (408) 453-6200. The reservation code is "AMSAT."

2 From the 'Wow' Department

To wrap things up this month, I have two items from the "Wow" department.

First, NASA has released photos of the Space Shuttle Endeavour docked at the SS. These are the first-ever images taken of a space shuttle while still attached to the orbiting lab complex from the perspective of a crewed Russian Soyuz spacecraft.

The photos were captured by Italian astronaut Paolo Nespoli (see the August WRO cover) from the Soyuz TMA-20 vehicle

as he and two crewmates were departing the ISS for their return trip to Earth.

For me, it truly shows just how amazing this project has been and exhibits all that is wonderful about science and engineering! See: < http://www.nasa.gov/mission_pages/station/multimedia/e27depart.html >.

Second, in June, Copenhagen Suborbital, a group of amateur rocketeers, successfully launched the world's first amateur-built rocket made for human space travel! You can see videos of the launch from different perspectives at: < <http://www.universetoday.com/86306/copenhagen-suborbitals-launch-videos/> >. They had hoped for achieving a height of 15-16 km with this test launch, but only reached 2.8 km.

However, to do this with amateurs, utilizing contributions and volunteers, is amazing! The rocket and capsule was approximately 9.5 meters high, and weighed more than 2,000 kg.

The team launched the rocket from a floating "Sputnik" launch platform in the Baltic Sea near Denmark. They hope to eventually launch a larger rocket, with an astronaut inside, 100 km up in a suborbital ride into space.

This is an ambitious endeavor, but an exciting one as well. Could this be another opportunity for us to get amateur satellites into space? We will have to see.

That's all the room we have this month, but things are moving rapidly once again. Stay fixed right here on WorldRadio Online for more in-depth information, and I hope to see you soon on the birds!

Visit Your Local Radio Club



COLORADO

Denver Radio Club (DRC) meets 3rd Wed., 7:30 PM, El Jebel Shrine Temple, 4625 W. 50th Ave., Denver, CO. Learning/Tech sessions 6:30 PM. Oldest club in Colorado (1917). Net Sun 8:30 PM 145.490/448.625 rpt, w0tx@arrl.net: www.w0tx.org 01/12

MICHIGAN

Muskegon Area Amateur Radio Council meets the 1st Thursday of every month at 7 PM at our clubhouse at 2888 Scenic Drive. Visit our website: <http://w8zho.org> 01/12

Click here to have your club listed!



W2XN, Austin, Texas: Recalling His 15 Minutes of Fame, Circa 2002

Nearly 10 years ago, Fred Kalt, W2XN, was beaming ear-to-ear after seeing his tidy amateur radio station featured in WRO's "Station Appearance" — long ago, and far away from where 'XN now lives. While his radio gear today is packed in boxes, he fondly recalls his 15 minutes of fame on Page 34 of the January 2002 edition of *WorldRadio* — at that time a print magazine.

This month, with him we look back at the "retro gear" that made up many of our stations at the beginning of this millennium. Of course, at the time it was "nowtro."

Are you as proud of your station's appearance as W2XN was of his almost a decade ago? Or do you find your messy radio shack quite comfortable and the perfect retreat for some on-air relaxation? Send digital photographs of your station with details to: < WorldRadioOnline@gmail.com > and we'll consider them for publication in Station Appearance in an upcoming edition of WRO.

If there's a YouTube video to accompany the still pictures, let us know and we'll set up a link.

Answering a recent call for "Station Appearance" candidates on WRO's Facebook page, Fred Kalt, W2XN, wrote from Austin, Texas:

"How about a page on the Web of nothing but a picture of each and every ("Station Appearance") home station that has ever been submitted?" (Yikes! — Ed.)

"Maybe an index with a small icon picture identified by call-sign that could be clicked on to see a larger version," Kalt suggested. "It would be interesting to see all the stations that folks have submitted for publication. I have been a subscriber for about 30 years and enjoyed seeing the many submissions — mine was posted once, also."

Interesting, indeed. But as CQ Communications Editorial Director and *CQ Amateur Radio* magazine Editor Rich



The crisp and tidy layout of the amateur station of Fred Kalt, W2XN, caught the editor's eye almost a decade ago when it was chosen as the operating position to be featured in "Station Appearance" in the January 2002 *WorldRadio*.
(Courtesy of WorldRadio Print Archive)

Moseson, W2VU, pointed out: That would be an awfully tall order to fill, especially since *WRO* files don't contain the original pictures. We'd, "as they say," W2VU replied, "take your suggestion under advisement."

As it turns out, W2XN's operating position was highlighted in January 2002's *WorldRadio*. Since that time, "I no longer live in Florida," Kalt says, "but have moved to Austin to an apartment and no longer have the station set up. It's all in boxes now, unfortunately." How sad.

Digging through the *WR* and *WRO* archive, we managed to find W2XN's mini-spread and offer it this month to readers who have asked for "Station Appearance, Retro Edition" from time to time. A scan of the printed page gives a pretty good idea of how his station looked and how his spread appeared in the magazine. A bit grainy, but this is retro, after all.

In his 2002 narrative, Kalt explained that after he had retired "and moved to a manufactured home (in Florida), space was not as plentiful... so the built-in desk in the breakfast room was the ideal location" for his amateur station.

Circa 2002, W2XN's mini-layout consisted of (top shelf from left) a Philmore transmission monitor, MFJ-941D SWR meter-tuner and a Small Wonder Labs DSW-20 14-MHz transceiver on top of an Oak Hills Research OHR-100A for 40 meters.

Below it, from left, are "a Kenwood SP-23 speaker for the TS-450 (transceiver), a Kenwood TM-231A 2-meter mobile transceiver, a Modular System MK-2 keyer and my Kenwood TS-450S/AT HF (high-frequency transceiver with antenna tuner)."


On the desk under the shelves is "a homebrew single-paddle key for QRP, made from a hacksaw blade; and a Bencher Iambic keyer paddle for the TS-450."

On the desk to the far left is a Micronta 2.5-ampere power supply for W2XN's QRP radios and an Astron RS-20M 20-ampere power supply for the 2-meter rig and TS-450.


"Outside I have a 'stealth' antenna — a Hustler 4-BTV vertical, ground mounted with no radials, covered by a 2-inch (diameter) PVC pipe converted to a flagpole... where I proudly fly 'Old Glory.'"

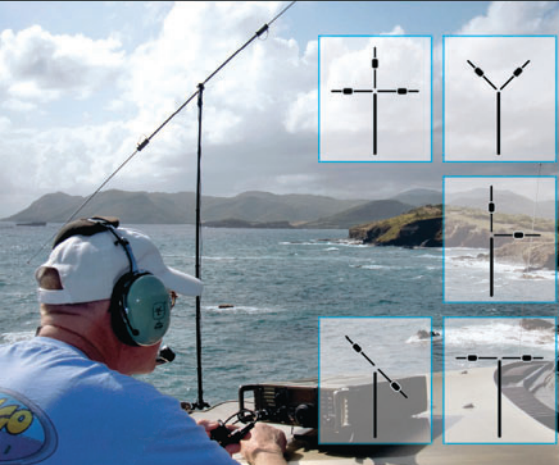
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— Richard Fisher, K16SN




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Station Appearance

Send *WorldRadio* a picture of your shack and the staff will choose a winner to receive a free one-year subscription to *WorldRadio*! Stations are judged by neatness (wires tucked away, etc.) and accessibility of equipment. Value of equipment is not a consideration.



Labs DSW-20 rig (20 Meters) kit and an Oakhills Research OHR-100A QRP rig (40 Meters):

On the shelf below is a Kenwood SP-23 speaker for the TS-450, a Kenwood TM-231A 2-meter mobile transceiver, a Modular System MK-2 keyer and my Kenwood TS-450S/AT HF.

On the desk under the shelves I have a homebrew single paddle key for QRP (made from a hacksaw blade) and a Bencher Iambic paddle for the TS-450.

To the left is a Micronta 2.5 amp power supply for the QRP rigs and an Astron RS-20M 20 amp power supply for the 2-meter and HF rigs.

Outside I have a "stealth" antenna — a Hustler 4-BTV vertical ground-mounted with no radial, covered by a 2-inch PVC pipe converted to a flagpole (which is a terrific "stealth" antenna) where I proudly fly "Old Glory."

Fred Kalt, W2XN

After I retired and moved from a site-built house to a manufactured home, space was not as plentiful. I needed a place for the shack" so the built-in desk in the breakfast room was the ideal location. Space was limited so I added a shelf for additional room.

On the top is a Philmore transmission Monitor, and MFJ-941D SWR Meter/Tuner with a Small Wonder



NEW!

• 4-Band Module (K1)
• Internal Battery (K1)

Here's how W2XN's station and story appeared on Page 34 of *WorldRadio*, nearly a decade ago. (Courtesy of *WorldRadio* Print Archive)



Determining HF Band Conditions Using W1AW

By Randall Noon, KC0CCR

If you operate CW on the high-frequency (HF) bands and you want to determine the “right now” condition of the HF bands without having to do anything more involved than operate an amateur radio transceiver and enter data into a spreadsheet, here is a no-muss, no-fuss, quick and simple way to estimate:

- The maximum usable frequency or MUF;
- The comparative attenuation levels of the various amateur HF bands; and
- An order of magnitude estimate of the necessary power levels to achieve a readable contact.

Fundamentally, the method utilizes the regular CW transmissions from the amateur radio flagship station of the American Radio Relay League, W1AW. These transmissions emanate from the same location — Newington, Connecticut — and are made simultaneously on 7 of the 10 amateur HF bands: 10, 15, 17, 20, 40, 80 and 160 meters. In essence, you have seven simultaneous HF beacons.

Of course, the value of this beacon information will vary with your proximity to Newington. If you’re 10 miles from W1AW, for example, this exercise isn’t going to be helpful. Most of us are hundreds or thousands of miles from Newington. And this is where things get interesting.

By measuring the relative power levels of these transmissions with your transceiver’s S-meter, the specific transmission attenuation pathway from W1AW to your station can be quantified. Further, by comparing one band’s pathway attenuation to the other six, the relative condition of the bands for one-hop contacts from your specific location can be quantified.

First, a review of some of the characteristics of your S-meter is in order. The S-meters on most rigs read from S-1 to S-9, and then have some room past the S-9 level for signals greater than S-9. Each unit from S-1 to S-9 is supposed to be a change of 6 dB in relative signal strength. **Table 1** shows what each ‘S’ measurement is supposed to measure.

S scale reading	Relative intensity	Received power @ 50 ohm impedance	Received voltage
S-1	-48 dB	8 x 10 ⁻¹⁸ watts	20 x 10 ⁻⁹ volts
S-2	-42 dB	32 x 10 ⁻¹⁸ watts	40 x 10 ⁻⁹ volts
S-3	-36 dB	128 x 10 ⁻¹⁸ watts	80 x 10 ⁻⁹ volts
S-4	-30 dB	512 x 10 ⁻¹⁸ watts	160 x 10 ⁻⁹ volts
S-5	-24 dB	2 x 10 ⁻¹⁵ watts	320 x 10 ⁻⁹ volts
S-6	-18 dB	8 x 10 ⁻¹⁵ watts	640 x 10 ⁻⁹ volts
S-7	-12 dB	32 x 10 ⁻¹⁵ watts	1.28 x 10 ⁻⁶ volts
S-8	-6 dB	128 x 10 ⁻¹⁵ watts	2.56 x 10 ⁻⁶ volts
S-9	0 dB	512 x 10 ⁻¹⁵ watts	5.12 x 10 ⁻⁶ volts
S-9 +5	5 dB	1.6 x 10 ⁻¹² watts	9.1 x 10 ⁻⁶ volts
S-9 +10	10 dB	5.12 x 10 ⁻¹² watts	16 x 10 ⁻⁶ volts
S-9 +20	20 dB	51.2 x 10 ⁻¹² watts	51.2 x 10 ⁻⁶ volts
S-9 +30	30 dB	512 x 10 ⁻¹² watts	160 x 10 ⁻⁶ volts

Table 1. S-Meter Readings for HF Bands (160 to 10 Meters).

As you may have noticed, I stated that the values in **Table 1** are what S-meters are supposed to measure. The incremental precision of an S-meter, however, is often a function of the age of the rig and the manufacturer of the S-meter.

S-meters in older, less expensive rigs tend to be less precise. Each S-meter’s whole number change may or may not be a precise signal strength change of 6 dB, especially at the low end of the scale as compared to the top end. However, as long as you use the same S-meter for all the measurements, and you recognize that there may be some fuzziness in the corresponding absolute numbers, go ahead and use whatever you have and throw caution to the wind. It’s only an approximation, for heaven’s sake.

As mentioned earlier, this method presumes you are not so close to the W1AW signal that you have to attenuate the received signal to avoid front-end overloading of your rig, or that you are receiving ground waves instead of sky waves. If you have to attenuate the incoming signal to prevent front-end overloading, you will have to check your rig’s manual to see what impact this has on S-meter measurement. Your rig, for example, may have buttons to reduce the incoming sig-

nal in 10 dB increments. If you are close enough to W1AW so that you receive ground waves instead of sky waves, this method does not work.

Determining Your Data and Plot Points

The CW transmissions from W1AW occur at the following frequencies: 1.8025; 3.5815; 7.0475; 14.0475; 18.0975; 21.0675; and 28.0675 MHz. This provides seven potential data points that can be plotted on a graph. There are transmissions Tuesday through Friday at 1300 UTC (9 a.m. Eastern time). Monday through Friday, there are CW transmissions at 2000, 2100, 2300, 0000, 0200 and 0300 UTC (4 p.m., 5 p.m., 7 p.m., 8 p.m., 10 p.m. and 11 p.m. Eastern). W1AW’s transmissions occur at the same local Eastern times throughout the year.

The fact that these transmissions contain useful and interesting information to CW operators is of no concern at the moment. All you need to do for this function is receive the signal and measure it on your S-meter.

When W1AW is transmitting CW on one of its scheduled times, simply dial in the frequency for each band and record

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the received signal strength as measured by your S-meter. For each frequency checked, also shift the dial slightly away from the W1AW signal to a nearby frequency with no traffic, and record the level of band noise also measured by your S-meter.

For each frequency band you will have two S-meter numbers: one indicating the W1AW signal strength received by your rig at your location, and one similarly indicating the band noise level.

If you can hear the signal on the 20-meter band, for example, but not on any higher band, then the maximum usable frequency at that moment between your location and Newington, Connecticut is equal to or a little higher than 20 meters but less than 17 meters. This is simple enough.

If you record the S-meter levels for both the received signal and the background noise level for each of the bands in a spreadsheet in order of frequency, and then choose a plotting option from the spreadsheet menu (I suggest you use one that connects the points with a smooth curve), you can quickly see the condition of the amateur HF bands at that moment at your location.

The two plotted curves allow you to infer the condition of the bands in all the “in-between” spots between the plotted points, and even estimate roughly where the MUF cutoff is by the way the S-meter number diminishes at the upper-frequency end of the plot.

Let's Get More Granular

Now comes the more interesting stuff. With some exceptions, the W1AW CW HF transmissions are generally at a power of 1,000 watts. The exceptions are 40, 20 and 10 meters where linear amplifiers used at the station are rated for the full legal limit: 1,500 watts.

Take the S-meter signal strength measurement for W1AW at a particular frequency, find the corresponding power level in **Table 1**, and divide this power level into either 1,000 watts or 1,500 watts, depending on the band.

For example, if on 17 meters the S-meter registered S-7, this corresponds to a power level of 32×10^{-15} watts. Dividing 1,000 watts by 32×10^{-15} watts gives 3.125×10^{16} . Now, take the base 10 log of that number, and then multiply the result by 10 to get decibels. Thus, in our 17-meter example, the attenuation from W1AW to your rig was about 165 decibels.

What if instead of 1,000 watts, the emitted power had been 100 watts — that is, 10 times less? Recall that the attenuation between the two points is about 165 decibels, which is, a reduction in emitted power by a factor of 3.125×10^{16} . Thus, dividing 100 watts by 3.125×10^{16} gives 3.2×10^{-15} watts at the receiving end. Going back to **Table 1**, it is seen that a power level of 3.2×10^{-15} watts at the receiving end falls somewhere between S-5 and S-6. Thus, a 100-watt transmission — instead of 1,000 watts — over the same path using the same antenna and receiving equipment would be received at a signal strength between S-5 and S-6.

If the band noise level on the same 17-meter transmission were measured to be S-2, this means that to readily receive a CW signal, the signal strength at the transmitting end should be such that the receiver registers perhaps S-3 or higher.

As **Table 1** indicates, an S-3 signal strength corresponds to a power level of 128×10^{-18} watts. Since the attenuation is 165 dB, or a factor of 3.125×10^{16} , this means that the power at the transmitting end should be about $(3.125 \times 10^{16}) \times (128 \times 10^{-18} \text{ watts}) = 4 \text{ watts}$ to be readily heard over the band noise. If your receiver has filters that can dig out a CW signal when it is even

Pounding Brass: WA6ARA

Do you have a favorite Morse key, bug or paddle you'd like to see featured in WRO's Pounding Brass? Send a photograph with a brief description and why it is special to you to: < WorldRadioOnline@gmail.com >.

“This is a photo of my favorite key,” writes **Mike Herr, WA6ARA**, of Ridgecrest, California. “It is a favorite as it was my father's before me and my uncle's (his brother) before him.

“The story goes something like this: George Herr (my uncle), licensed in the 1930s as W6MMA, used the key. His younger brother, Harold Herr (my father), then used it while bootlegging (George's) call in the '39 – '40 time frame.

“At the time, ham radio interest had waned with George but was taking off in Harold. World War II intervened. George did not renew his license and my father dropped it. Finally, my father came back to ham radio and was licensed in 1965 as WB6MNX.

“Those who knew him as WB6MNX also knew him as ‘Ben,’ an old school nickname from ‘Ben Hur.’ While throughout the rest of his life he could



“Both my uncle and my father are silent keys but I continue to use the key and nothing will replace it.” – Mike Herr, WA6ARA (Courtesy of WA6ARA)

copy and send well, my father never took up CW again.

“I inherited the key when I received my Novice license in 1970 (WN6ARA). I initially used the same 6L6 tube my

father had in 1940 — and still have the receipt.

“Both my uncle and my father are silent keys but I continue to use the key and nothing will replace it.”

with the top of the noise level, then a QRP output of greater than 1 watt would be sufficient.

If a person is adept with a spreadsheet, all of the ratios demonstrated in the preceding can be set up to be automatically computed. Then, all a person has to do is record the S-meter numbers on the HF bands when W1AW is transmitting CW and let the spreadsheet program generate the graphs and computations. I found this method useful on the Friday afternoon before Field Day, and used it to determine which band would provide the best reception for the ARRL's Field Day CW message.

By the way, the W1AW CW transmissions are preferred over voice or data so that there is a like-for-like brightness of the signal. Brightness, as you may recall from earlier columns, is equal to output in watts/signal bandwidth in Hertz. For the same wattage, CW signals are significantly brighter than voice signals.

From this basic and easy to obtain band performance data provided Monday through Friday by W1AW, you can:

- Generate a plot that provides a condition report of the amateur HF bands from your house to Newington
- Estimate your local MUF
- Estimate the S-meter level your rig will generate at the other end
- Estimate what minimum output wattage is needed at either end to be heard above the existing band noise.

Last, here are some general rules of thumb as to how to use the information to figure out paths other than from your house to Newington.

In mostly east and west paths across the continental U.S. and southern Canada, this method provides a reasonable estimate in comparing similar distance, one-hop contacts.

If the path is a single hop mostly southward from the continental U.S., the actual MUF will likely be a little higher than the estimate from the W1AW data.

If the path is a single-hop northward, the actual MUF will likely be a little lower than your W1AW estimate. Of course, this assumes your antenna attenuation is the same in all directions.

But then again, you could just send a CQ and see what happens.

October Reminders

Don't miss the **FISTS Fall Sprint** from 1700 to 2100 UTC on Saturday, October 8. Sprints don't require a marathon effort to be competitive, you don't have to have a "fist" that sounds like

a rapid-fire machine gun, and they are a lot of fun. If you have never entered a contest before, let this be the first one you try. For details, visit: < <http://www.fists.org/sprints.html> >.

On Sunday, October 9 is the **Pennsylvania QSO Party** sponsored by the Nittany ARC. The rules and details are posted at < <http://www.nittany-arc.net/paqsorules.html> >.

The **North American QRP Club** is celebrating its **7th anniversary** October 10-16. Listen for one of the club's operators on the CW subbands with one

of the special event call signs, N1A, N2A . . . up to NØA, and win a certificate. Details: < <http://naqcc.info/mainn3a.html> >.

Are you a bit shy about operating with Morse Code? Want to practice your code with a friend and build up your confidence? Consider getting a **Code Buddy**. Courtesy of the **FISTS** organization, code buddies schedule on-air QSOs with you at any speed to help you work on your code. There is no charge. All that is required is your time. Visit: < http://www.qsl.net/w9em/code_buddy_applicationprint.html >.



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HAMFESTS & SPECIAL EVENTS

OCTOBER

QUEENS, NEW YORK — The Hall of Science Amateur Radio Club Hamfest will be held October 2 at the New York Hall of Science parking lot, Flushing Meadow Corona Park, 47-01 111th Street, Queens, New York. Doors open for vendors to set up at 7:30 AM. Buyers admitted at 9 a.m. Free parking, door prizes, drop and shop, QSL card checking, food and refreshments. Free admission to museum from 10 a.m. to 11 a.m. or \$6 after with hamfest ticket. VE Exams at 10 a.m. Admission by donation. Buyers \$5. Sellers \$10 per space. Talk-in on 444.200 (PL 136.5), 145.270 (-600 kHz, PL 136.5). For further information: < <http://www.hosarc.org> > or call at night only: Stephen Greenbaum, WB2KDG, (718) 898-5599. Via e-mail: < WB2KDG@arrl.net >.

NORCROSS GEORGIA — Special Event Station N4V. October 8 from 10 a.m. EST to 4 p.m. EST to commemorate the manufacture of the Vibroplex bug in Norcross. The station will also be on air all week near traditional HF QRP frequencies. QSL to N4TRB with SASE.

WALLINGFORD, CONNECTICUT — The Nutmeg Hamfest and ARRL Connecticut State Convention will be held October 9 at the Mountain Ridge Resort, 300 High Hill Rd., Wallingford Connecticut. Doors open at 8 a.m. Celebrating its 19th year, there will be an indoor and outdoor tailgating event that will feature door prizes. Contact: John Bee, N1GNV, (203) 440 4973. Talk-in 147.360 (no PL).

MENA, ARKANSAS — Special Event Station W5HUM. October 1, 9 a.m. to 5 p.m. Celebrating the 80th anniversary year of Lum and Abner on the radio. Sponsored by the Ouachita Amateur Radio Association, W5HUM. Operating in the General class portion of 20, 40 and 80 meters. The first 25 contacts will receive a CD of Lum and Abner radio programs. Anyone wanting a special events certificate please send an SASE to Don Thomas, 117 Dallas Lane, Mena, AR, 71953.

DENISON, TEXAS — Special Event Station W5I. October 15 from 1500 UTC to 2300 UTC in celebration of the **121st birthday of Dwight Eisenhower**, 34th President of the United States. Frequency: 14.250 MHz. For QSL card, send QSL and SASE to David Booth, 409 Umstead, Colbert, Oklahoma.

SELLERSVILLE, PENNSYLVANIA — RF Hill ARC Hamfest will be held on October 16 at the Sellersville Fire House, 50 N. Main Street. Contact: Jim Soete, WA3YLQ, (215) 723-7294, FAX (215) 257-0724; email < wa3ylq@arrl.net >. Printable details at: < <http://www.rfhill.ampr.org> >.

LUFKIN, TEXAS — Lufkin Hamfest 2011 will be held October 22 from 8 a.m. to 1 p.m. at the Lufkin First Church of the Nazarene, 1604 S. Medford Drive. Admission, tailgating, parking and 1-indoor vendor table are all FREE. Visit: < <http://www.lufkinhamfest.com> > for full details or contact: Jerry Wilson, K5JLW, via email: < ac5zj@cs.com >.

NATIONAL WILDLIFE REFUGES — In commemoration of **National Wildlife Refuge Week**, October 9 to 15. Combine communication skills with enjoyment of the outdoors to help others learn about the National Wildlife Refuge System. Only authorized, safe, responsible access to refuges is sanctioned by this event. Complete details: < <http://www.nwrweek-radio.info> >. For questions and to submit your operating plan, write: < info@nwrweek-radio.info >.

NOVEMBER

WASHINGTON, PENNSYLVANIA — WACOM 20011 Hamfest will be held Sunday, November 6, from 8 a.m. to 6 p.m. at the Washington County Fairgrounds, 2151 North Main Street, Washington, PA 15301. Doors open early for vendor setup Saturday, 8 p.m. Food, door prizes, YL prize, DX and WAS card checker will be available. VE session starts at 10 a.m. To register contact: < n3zni@arrl.net >. Admission is \$5 for buyers, \$12 for vendors which includes a 6-foot table. Vendors contact: Bud Plants < bud@n3tir.com >. Talk in 145.49 MHz (no PL).

PINELLAS PARK, FLORIDA — The SPARC Hamfest will be held Saturday, November 12 from 8 a.m. to noon at the Freedom Lake Park, Pinellas Park, FL. Admission to the hamfest is free and VE exams will be given for a \$15 fee. Registration for VE exams is 8:30 a.m., photo ID required. For information regarding VE exams contact Mike Scott, K4ZPE, < k4zpe@jemke.com > or (727) 492-6454. For the hamfest, contact Tom Schaefer, (727) 437-2771 or < ny4i@arrl.net > or visit: < <http://www.sparc-club.org> >. Talk in 147.06 (+), (no PL).

HOLMDEL, NEW JERSEY — Special Event Station KC2LSD. November 11 at the New Jersey Vietnam Veterans'

JUNE 2012

Memorial & Vietnam Era Museum and Educational Center, 1 Memorial Lane Exit 16 off the Garden State Parkway from 13:00 to 20:00 UTC. Details: < <http://www.njvvmf.org> > Certificate sent for every contact. Cody Codianni, KC2LSD.

ALVATON, KENTUCKY — The Kentucky QSO Party will take place at 1400 UTC Saturday, Nov. 12 to 0200 UTC Sunday, Nov. 13. Details: < <http://www.wkdx.com> >. Contact: < wb4kli@arrl.net >. Bands: 160-6, Modes: SSB, CW, digital.

PISCATAWAY, NEW JERSEY — The Raritan Valley Radio Club, W2QW, Hamfest is June 16, at the Piscataway High School Lots 11/12 located at 110 Behmer Road. Hours are 8 a.m. to noon. Contact: Eric Lund, NW2P, < nw2p@w2qw.net >. Phone: (908) 251-3938.

Have your hamfest or special event listed . . .click here!



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Promotion Is a Team Sport

Tips for Organizing a Recruiting Drive for Your Radio Club

By Devere “Dee” Logan, W1HEO

Groups that stop growing can face a gloomy future. Radio clubs are no exception.

Our Amateur Radio Service must show healthy numbers to warrant protection and expansion of our spectrum from the FCC and other agencies.

We were reading a radio club newsletter recently that pointed out that its board was looking for ways to promote the group to new hams. Ideas were solicited, including “meaningful and desirable programs and activities for existing members.” That certainly makes sense. Without a variety of ways to recruit and retain members, clubs may wither and die.

So how can clubs do this and, most importantly, get members excited and motivated?

What’s the Plan?

An effective recruiting drive will begin with some type of plan that is understood and supported by members. Clubs with active members certainly have an advantage.

As we’ve noted, promotion is very much a team sport. Lone individuals are seldom adequate to conduct a broad campaign with a variety of activities. The more elements in the plan, the more people will be needed to make it work. This will require team coordination by a leader — someone to take charge of the recruiting drive.

Generally, most club members are happy to offer ideas, but not everyone is willing or able to step up and participate. So, motivating people to participate is important.

There are many ways to stimulate members to get involved. For example, offer free or discounted dues, cash awards and prizes of radio equipment or accessories.

The Cleveland chapter of QCWA ran a membership drive that awarded \$100 to the person who signed up the most new

“Amateur radio is a really interesting hobby, so giving dramatic examples of its fun aspects might convince your listeners to become licensed hams themselves.”



Inviting potential club members to events such as ARRL Field Day is a great way to expose oldtimers and newcomers alike to amateur radio. Here, members of the Arrowhead Radio Amateurs Club work together to raise a 60-foot radio tower at a roadside rest area just south of Duluth, Minnesota during Field Day 2007. (Courtesy of Paul M. Walsh via Wikimedia Commons)

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Displays featuring radio club activities can be part of a presentation to explain ham radio and position a radio club as a good place to learn more about our hobby. (Courtesy of WIHEO)

members. Your club treasury may not allow such a liberal prize, so be creative.

Some Sales Tools

Most effective selling jobs begin by knowing your “product.” So one of the first requirements is to have a standard set of reasons why someone should join your club.

These are your features and benefits. Or, in the case of a non-ham, what amateur radio is and what it offers — including fun and public service.

Everyone who participates in your recruiting program should know these features well and be prepared to discuss them. Often a printed handout can help. This would include the basic “who, what, when, where” information about your club, including a list of activities and recent programs.

If your club is losing members, a survey may reveal areas that need to be improved. Informal calls to ex-members will often expose areas that need to be changed. Issues such as long, boring meetings, uninteresting programs, or unfriendly attitudes are typical and should be faced and corrected before the recruiting begins. This step is helpful in building a “member friendly” club.

For non-hams, the usual recruiting materials are useful, many of which can

be provided by the American Radio Relay League or found in radio magazines such as *CQ Amateur Radio*, *WorldRadio Online*, *CQ VHF* and so on.

Showing a promotional video is an easy way to introduce people to ham radio. A DVD is available from the Ham Radio Promotion Project. Details are at: < <http://www.neoham.org> >.

The important thing is that everyone who is part of the recruiting drive is pro-

viding the same information — all of which is agreed upon beforehand by the membership. Certainly, every club member should be familiar with these selling points.

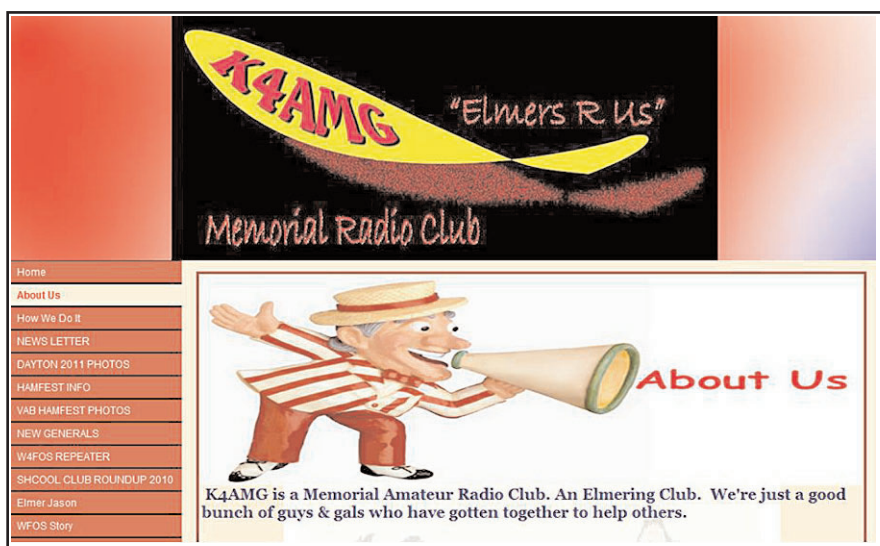
If your club has a website that provides contact names with telephone numbers or email addresses, complete recruiting information can be posted. Websites are handy for including the organization’s newsletters, lists of officers, meeting times and locations, etc. Use this as part of your promotion to area hams, former members and others.

Demonstrations of ham radio in action are probably the most effective showcase. This is why ARRL Field Day remains one of more popular activities with promotional potential. Offering invitations to scout troops, youth groups, senior centers, civic clubs and so on can pay big dividends.

Displays also provide an easy way to introduce the public to our radio service. Clubs can make their own promotional exhibit with lightweight portable two- and three-panel displays that can feature photographs of club activities, sample QSL cards and more. Often local libraries will welcome such a display and even develop a bibliography of amateur radio books available.

Following Through

After stimulating interest in your club — and ham radio — then what? How do you turn interest into new members or potential licensees? In the jargon of the



K4AMG Memorial Amateur Radio Club website offers people interested in our hobby an easy entrée into amateur radio. (Screen grab of K4AMG website)

circus, "You gotta get 'em into the tent!" In other words, how do you close the deal by signing up new members?

For licensed prospects, inviting them to a club meeting featuring an interesting program topic or guest speaker is a good way to start. Current club members should be encouraged to extend warm welcomes to arriving visitors and provide a short orientation about the club and its activities.

Coffee and doughnuts could be provided during a pre-meeting social hour, during which club officers might be introduced along with visitors and other members.

At some point, visitors should be invited to join the club. A special "introductory offer" such as free or reduced dues would help "close the sale." Having a new members' introductory package containing newsletters, rosters and so on would be a nice touch.

Some radio clubs "grow their own" members by recruiting non-hams. There are many ways to do this, as this column describes regularly. Certainly a publicity campaign that includes invitations to a public orientation on amateur radio and licensing classes is fundamental to the effort.

The Ham Radio Promotion Project provides member clubs with a 50-page Toolkit describing how to conduct a complete campaign. Details are on the organization's website.

One caution about recruiting young people: If your club is mostly "mature" seniors, try to make youth feel welcome. If possible, have your younger members offer special activities and gatherings apart from the regular programs.

Youth often feel uncomfortable in presence of older people, so try to recognize this fact and use a different approach to recruiting that's "on their wavelength."

Our traditional way of explaining the fun and excitement of ham radio should be modified to fit today's high-tech environment. Radio is still a wireless technology, but it's only one part of today's interconnected world of cell phones and Internet communication. Emphasize the benefits that make our hobby attractive.

The Promotional Panorama

Hamfests provide clubs with an ideal place at which to promote membership. The K4AMG Memorial Amateur Radio Club of Chesapeake, Virginia, had a booth at the Virginia Beach Hamfest.

Included were kit building for youth and a video presentation during an "Elmers R Us" seminar.

The *Technorazzi* magazine < <http://technorazzi.com/> > is inviting contributions from "geeks" describing their technical activities and experiments. While not targeted at hams, this publication would be interested in a radio club's educational activities that involve cooperation with schools, digital experimentation, kit building and so on.

For some ideas, go to: < <http://www.WeDoThat-Radio.org> >. The editor looks for stories that are "personal, creative, warm and positive" and may include links.

Remember to send your club newsletter to the press. Why? Sometimes it sparks reporters' interest in developing a story. Tracy Stephens, K14OZG, of the Calhoun County ARA, wrote an article in its newsletter about responses to the April 27 tornadoes. It stimulated a story in the local newspaper.

Devere "Dee" Logan, WIHEO, is an accredited member of the Public Relations Society of America, a veteran radio ham, active writer and radio club supporter.

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You Want to Be Part of the Disaster Action?

MARS Tries a New Approach to Deployment

Commentary

By Bill Sexton, N1IN/AAM1RD/AAR1FP

This column isn't just for Military Auxiliary Radio System (MARS) members. There may be something in it for *any* amateur — or prospective amateur — who yearns to play a more active role in disaster recovery.

Finding and winning such a role — the kind that delivers real public service — can be a challenge. It has been a particular challenge for MARS members, who often butt up against a tangle of rules, customs, security clearances and so on, that interfere with deployment.

Even a decade after the appalling communications failures at the World Trade Center, interoperating (a.k.a. teamwork) is still an issue.

With a stunningly simple strategy, Army MARS is clearing some of the roadblocks.

Headquarters has put aside tough issues like credentialing and liability. Instead, members are now encouraged to sign up with one of the established organizations that is already fully operational. That is, you take the MARS training and operational experience with you but leave behind the MARS chain of command for the duration of deployment and answer only to the incident commander.

It works. By all accounts, organizations like the Salvation Army, Southern Baptist Disaster Relief and American Red Cross have been functioning seamlessly, most recently in this spring's tornado and flood disasters. I have the story of a senior MARS operator who showed up at Joplin to join them (more on that in a minute).

At this point, if you're a reader not active in MARS, it's safe to jump to the accompanying sidebars that describe various emergency response organizations



Radio amateur volunteers, in the uniform of Sheriff's Special Deputies, man the Incident Communications Center at the site of the 2007 bridge collapse that killed 13 persons and injured 145 in Minneapolis. Sergeant John Smolenski, a volunteer with the amateur radio callsign NØYR, is shown at one of the five dispatcher positions. Behind him are volunteer Lieutenant Steve Hartman, WDØBOI, left, and Special Deputy Ken Henke, NØDLS. In the rear compartment is department Public Information Officer Kathryn Janicek.

(Courtesy of Hennepin County, Minnesota Sheriff's Office)

looking for recruits. But MARS has vacancies, too. Feel free to continue on here for a better understanding of the Army MARS take on teamwork.

Here, more than a few energetic and highly-qualified members were frustrated by their inability to pitch in while other hams were earning praise during the spate of tornadoes that terrorized Missouri and Alabama earlier this year.

The new approach on deployment takes advantage of the connections and accreditations already achieved by other

responders such as SATERN (the Salvation Army Team Emergency Radio Network). In return, the borrowing organizations win access to the MARS pool of operators schooled in interoperation and net discipline, many with military experience in crisis situations.

An Added Task for MARS

A member's status in MARS is not altered when he or she signs up to activate under the sponsorship of a state

Emergency Operations Center or county Emergency Management Agency (to cite other examples) during exercises and actual incidents. To use the military term, “two-hatting” is permitted. “This mission for MARS members must be emphasized,” a recent memo said. “Of course, this means MARS volunteers must meet certain (additional) training and background requirements.”

I’ll borrow another military term: “Embedding.” That one first appeared in print applied to the civilian news reporters who deployed on combat missions back in 1995, when some 24,000 U.S. forces helped rescue Kosovo from incipient genocide.

How It Worked in Joplin

By a memorable coincidence, a Kansas Army MARS member — Kent Dickinson, KØWEW/AAM7RT, was already demonstrating a personal partnership with the Salvation Army. He’d joined SATERN on his own initiative in 2008 but only received his first call-up after the killer tornado in Joplin, Missouri in May. That’s about 150 miles from his home station outside Kansas City, Kansas.

Dickinson is the MARS training coordinator for Region 7, which includes storm-prone Missouri, Nebraska and Iowa, as well. In devastated Joplin he not only pulled his shift as a radio operator but also shared the chores of food truck worker, driver’s helper, personnel transporter and general go-fer. Such total commitment is a given when embedded. (*See the sidebar: “I Wanted to Help . . . You Gave Me a Way . . .”* — Ed.)

“You may feel bad that MARS has not sent you to Joplin or some other disaster scene,” Dickinson said, “but there *is* a way you can give your service, provided you are willing to work for an organization that is sure to be called out. It became a deep and meaningful experience for me when I found myself out of my vehicle, walking through the devastation so that I could bring some comfort to the people who I saw working there, on steamy-hot summer days, in the midst of so much loss.”

Potential Partners Elsewhere

“Working there” in Joplin would have included — besides ARES® and RACES — volunteers from the American Red Cross, SATERN, Southern Baptist Disaster Relief, and possibly the Coast Guard Auxiliary and REACT, all of which include hams. (*See “Would You Like to Try On Another Hat?”* — Ed.)

Embedding may unravel a bureaucratic snarl, but it doesn’t come without potential cost. It could unravel MARS, too. At the Pentagon, it might not seem such a good idea to sponsor what could be perceived as a temporary employment agency for other relief organizations.

The post-Katrina document that governs the three MARS branches, DoD Instruction 4650.02 dated Dec. 23, 2009, does state that they “shall provide contingency radio communications support to civil authorities at all levels.” Loaning out MARS members surely falls within that rather vague specification. However, the embedding concept does not address other and arguably more compelling avenues of support.

Consider an extreme disaster that destroys normal communications over a multistate area. With 4,000 or so trained members spread across the U.S., the three branches of MARS (Army, Air Force, Navy-Marine Corps) are positioned to begin operating immediately on the shattered perimeter while federal and state responders are still mobilizing. But Army MARS currently vetoes field operation because of liability concerns. DoD pro-

vides no funds to cover injury or loss of property for a deployed MARS volunteer.

The Cost of Credentials

In the more likely kind of event that overwhelms civil resources — say, an extended siege of floods or severe storms — MARS can plug territorial gaps in local authorities’ coverage. But members lack the FEMA-recognized ID that clears the way at checkpoints and opens doors at EOCs and police stations. They have been told by headquarters that no funds are available to conduct the required background investigation. For what it’s worth, in some non-governmental agencies the individual pays for the criminal record search which, according to an industry source, costs as little as \$6 and usually only takes 24 hours. (FEMA accepts background clearances issued by designated private research firms.) I’d be willing to spring for that myself.

A third looming opportunity is establishing immediate links between deploying military units and the civilian authority managing the same event. To that task MARS members bring operational experience in both realms plus the equipment capable of interoperation. “Bring” is the critical word here. Liaison would have to be accomplished onsite. Again, credentials would be essential.

It Just Doesn’t Add Up

You can see the Catch-22: DoD mandates support in general terms, but when it comes to the specifics of support there’s no provision of necessities like background check, government ID and liability protection.

All three of those necessities are provided by the other “auxiliary” in federal orbit, the U.S. Coast Guard Auxiliary, as well as by the government-chartered American Red Cross.

At SATERN and Southern Baptist Disaster Relief, the background checks are fundamental.

About the Basic Background Search

The Basic Background Search is a package including the following:

- Social Security Number (SSN) verification and address history
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- Re-verification of criminal records
- Alias Name search

The SSN search validates the SSN that a particular applicant provides. The SSN search is vital to verifying the identity of an individual and any previous addresses.

The National Criminal Database has the potential to identify certain crimes that may have occurred outside any addresses found on the SSN search. The national search is not recommended as a stand-alone service in every state due to the limitations of the data being queried.

The National Sex Offender search will identify if an applicant is listed on a particular sex offender registry.

(*Courtesy of Protect My Ministry, a church cooperative agency*)

'I Wanted to Help . . . You Gave Me a Way . . .'

A MARS member's experience working within another disaster agency is shown in a story about tornado relief in Joplin, Missouri. Kent Dickinson was an Air Force Morse operator during Vietnam, serving in the eastern Mediterranean. He joined Army MARS after retiring from a business career. Earlier this year, Dickinson found himself in the middle of a disaster.

By Kent Dickinson, KØWEW/AAM7RT

My childhood friend, Paul Haney, and I were interested in broadcasting. We liked to play-act that we were on the radio, doing weather reports and playing records.

When we found out we could obtain licenses and really get on the air; that was what we had to do. So I got my Novice license — 1959, and I was 12 years old.

Decades later, after retiring from my own business, I joined Army MARS in 2004. I was looking for a way to use my high-frequency station for public service. Later I signed up with SATERN, too.

I had always held the Salvation Army in high regard for the work it does in communities helping people. I completed its required Emergency Disaster Services training in June 2007 and was issued a photo ID badge which verifies my credentials as a radio operator. But I wasn't called to an actual disaster until this year.

The call came in an email from Rich Britain NØENO, who was scheduling relief operators for Joplin's post-tornado cleanup. The deadly weather struck in May. My stint would be five days.

There was time to organize travel and get together the things I thought I might need. Since I hadn't deployed to an actual incident before, having the time was helpful. Now I would say I'll be better prepared.

In Joplin, I worked in several capacities. One was as a shadow for a Salvation Army officer. Another was as a transport, actually transporting personnel.

Once I was a fixed operator at a location called Oasis — a large tent located in the parking lot of a destroyed Salvation Army thrift store in the middle of the affected area.

But most of my work was on Canteen 6. Radio operations were conducted in highly-disciplined fashion through a 2-meter repeater. The net control station (NCS) used the tactical call-sign SATERN HEADQUARTERS. My canteen's call was CANTEEN 6. As amateur radio operators must do, our communications were ended with our actual ham callsigns.

Salvation Army canteens are vehicles that deliver needed supplies to people in the affected area. Every canteen needs a radio operator. During my first ride on Canteen 6 there was another operator assigned, and my job was in the working section of the Canteen, preparing and handing out food, drinks and other items such as sunscreen and insect repellent. On other days, I was the Canteen 6 radio operator, but, of course, I helped with any task.

As a SATERN volunteer I was required to fill out paperwork when I arrived. Insurance was not discussed. I did not waive liability. We signed in and out every day, just as employees would. I was offered hotel space, but stayed with friends. And meals were *never* going to be a problem on Canteen 6.

My MARS capability was with me. I had an HF mobile station in the car, plus a portable dipole that could have been set



Kent Dickinson, KØWEW/AAM7RT, of Shawnee, Kansas, went on what the military calls TDY (temporary duty — away from home base) to Joplin, Missouri after the devastating May tornado. He put his MARS training to use with the Salvation Army Team Emergency Radio Network. (Photo courtesy KDØKLD)

Kent Dickinson, a member of the Army MARS leadership team in Region 7 — Kansas, Nebraska, Iowa and Missouri — sits at his home station after returning from Joplin where he deployed with the Salvation Army. (Courtesy of Laura Dickinson)



up if needed. I had digital capability including MT63 for station-to-station traffic and WINMOR for MARS WL2K. It turned out not to be needed during the five days in Joplin, but this special capability was there and ready.

By the time I finished my deployment I felt a special closeness to those with whom I had volunteered, even though it was only for a few days. We had shared a story that included tragedy and rebirth, and we knew our service had impacted people's lives.

It didn't matter what kind of uniform anyone was wearing, or what church they went to. We had all played our essential part.

SATERN needed a report of my volunteer hours, and being a MARS member I instinctively filed a short After Action report with June Jeffers, our Kansas-Western Missouri SATERN leader, who also happens to be the person who brought me into SATERN.

"I deployed to Joplin to support the Salvation Army on June 2. Total hours worked during the 5 days was 50 . . .," I emailed her. "I felt as if all my training and experience to date prepared me to do this work. It felt very natural to be doing it. But I think this was one of those life experiences that will leave a deep and lasting impact . . . I wanted to help those people, and you gave me a way to do it."

For sharing his insights on embedding, I'm indebted to Kent Dickinson. "Although MARS did not deploy me, MARS arrived with me," he wrote. "All my radio training and experience came together in such a way that setting up and operating were second nature. I knew what I was doing was essential, and I knew how to do it even while adapting to new and unexpected circumstances . . .

"By the time I finished my deployment I felt a special close-

ness to those with whom I had volunteered, even though it was only for a few days. We had shared an experience that included tragedy and rebirth, and we knew our service had impacted people's lives. It didn't matter what kind of uniform anyone was wearing, or what church they went to.

"We had all played our essential part," Dickinson concluded, "and we knew that our team had done something magical."



Would You Like to Try On Another Hat?

By Bill Sexton, N1IN/AAR1FP

Sharing personnel and resources with other organizations isn't new at MARS. In fact, the Army in 2008 signed a formal agreement to provide Southern Baptist Disaster Relief (SBDR) with MARS operators if requested. In return, SBDR promised to feed and house them.

Dozens of alternative opportunities exist for a direct role in emergency response. It depends, of course, on the amateur's location and particular interests. In addition to familiar state and municipal agencies, there are dedicated NGOs (non-government organizations) ranging from smaller local entities like the Hennepin County Sheriff's Mobile Amateur Radio Corps in Minnesota to the sectional Tennessee Emergency Radio Association and all-embracing American Radio Relay League.

The Military Auxiliary Radio System — MARS — is the oldest governmental support unit, dating to 1925. The ARRL-sponsored NGO, the Amateur Radio Emergency Service® (ARES®), celebrating its 75th anniversary this year, is probably the largest.

The Radio Amateur Civil Emergency Service (RACES) is the civilian entity established by the government after, and as a result of, World War II. In the government reorganization following the terrorist attacks on September 11, 2001, it became an arm of the Federal Emergency Management Agency within the Department of Homeland Security.

RACES® and ARES® are the organizations perhaps most familiar to radio amateurs.

Following is a sampler of seven more of the many organizations that look to amateurs for communications assistance. For the most part, they already work with each other despite the divergent missions of the parent institutions.

The final two demonstrate innovative response to unusual local needs.

Salvation Army Team Emergency Radio Network

Salvation Army Team Emergency Radio Network — SATERN — can be found on the job anywhere an emergency erupts in the U.S. and Canada, coordinating relief supplies, shelters and feeding programs, and handling health and welfare traffic.

It started up in June 1988 with four hams, two American and two Canadian.

Major Patrick McPherson, WW9E, a Salvation Army officer and pastor, perceived amateur radio's relevance to his post as divisional disaster services coordinator at Dubuque, Iowa.

Arthur Evans, KA9KLZ, a local Salvation Army volunteer, helped get SATERN on the air and eventually became national net director.

SATERN somewhat resembles MARS with members organized into local and area units, hierarchical leadership, structured formal training programs, and HF nets operating daily.

Two differences: SATERN covers both the U.S. and Canada and has parallel organizations in a number of countries overseas. It also has “memoranda of understanding” (MOU) for operational coordination and mutual aid with the ARRL, American Red Cross, SBDR and REACT.

Membership and net information is available at: < <http://www.saturn.org> >.

This summer, after 23 years’ service, the widely-known and highly-respected McPherson retired, handing his special ministry to Canadian Disaster Services officer Major Rick Shirran, VE3NUZ, of Toronto.

The new director put in 12 years as a communicator in the Royal Canadian Navy before becoming an officer and pastor for the Salvation Army, a family connection in his native Newfoundland.

Shirran was ministering on Bermuda when Hurricane Fabian, the islands’ worst storm in 50 years, struck in 2004. With that experience under his belt he went on to become Territorial Disaster Services Director for Canada.

Southern Baptist Disaster Relief

Well more than 40,000 Southern Baptist congregations are distributed throughout the U.S., notwithstanding the “Southern” in their name. That coverage and the denomination’s biblical emphasis on giving aid in adversity make SBDR a potent relief and recovery force in disasters of every dimension.

Its training program tells the story, embracing subjects such as “Cleanup and Recovery,” “Chainsaw Operations,” and “Feeding Units.” There isn’t a special department for hams, but they have Sunday HF nets when not mobilized for emergency operations. (*For details, visit:* < <http://www.southbears.org> >. – Ed.)

Volunteers apply for membership through a local congregation. Each state organizes its own radio teams. Membership details vary from state to state, but a typical program calls for a one-time, \$30 fee to cover meals and materials at the training sessions as well as FEMA-required background investigation and ID badge effective for three years and accepted by FEMA.

“Most all of the state EOCs know who the SBDR is,” said Fred Kinsey, KC8RQK, a 40-year emergency responder who is National Coordinator.

Kinsey, a retired Ford Motor Co. technician from Monroe, Michigan, received his callsign 10 years ago just before 9/11. During three previous decades’ service he had to be “shadowed” by licensed hams.

A call from the Red Cross to borrow his four-wheel-drive truck during a severe blizzard was the beginning of his career in disaster relief. That led to joining the American Red Cross.

During Hurricane Andrew in 2004 he put on his second hat with the SBDR. The two organizations work closely.

“We provide manpower and the kitchens and the Red Cross provides supplies and logistics,” Kinsey said. It’s reported Southern Baptist churches and field kitchens prepared more than 8 million meals delivered by Red Cross units after Hurricane Katrina. SBDR also works closely with the ARRL, SATERN and FEMA. ARRL issues the alert on their behalf when ham reinforcements are needed.

American Red Cross

On the basis of statistics alone, there should be plenty of

opportunity to assist the American Red Cross in communications. The organization responds to approximately 70,000 emergencies every year.

It relies on radio amateurs on two levels: “Pre-accredited Disaster Relief personnel” are enrolled at individual chapters and may be dispatched anywhere for longer relief and recovery assignments. “Spontaneous volunteers” are recruited when major emergencies occur, subject to on-the-spot background and physical health checks.

National headquarters works with the ARRL when ham reinforcements are needed. Many local chapters also have arrangements with radio clubs in the vicinity. Contact the local chapter for Disaster Relief membership information. Addresses are at: < <http://www.redcross.org/en/volunteer> >.

U.S. Coast Guard Auxiliary

Established by Congress in 1939, the Coast Guard Auxiliary served throughout World War II with a peak of some 50,000 members providing homeland security. Today’s Auxiliary counts about 30,000 members who, along with the 32,000 active-duty coast guard members, now report to the Department of Homeland Security.

The Maritime Radio Service is central to Coast Guard operations so there’s no separate branch for licensed amateurs. However, interested radio amateurs are encouraged to check with the Auxiliary Flotilla in their area.

Membership requires a background check. Liability coverage is provided while on a mission as well as entry to the USCG equivalent of post exchanges — except for tobacco and alcoholic beverages. There is also access to the Coast Guard’s Mutual Assistance program, which provides low interest loans for emergencies and student loans.

Immediately after 9/11, the Auxiliary made maritime security its primary task. Its Strategic Plan 2011-2012 “reflects a change (back) to emphasis on recreational boating safety while continuing to contribute to the security of the United States.” For more information, visit: < <http://cgaux.org/mission.php> >.

Radio Emergency Associated Communication Teams — REACT

From its initial mission 48 years ago — monitoring the emergency Channel 9 on Citizens Band — the Radio Emergency Associated Communication Teams (REACT) — has cut loose from industry funding, earned nonprofit status, and achieved working arrangements with the National Weather Service, American Red Cross and Salvation Army along with numerous local governments. It has an MOU with the ARRL, as well.

REACT “frequently provide(s) communications and other support at public service events (and) during emergencies, act as severe weather spotters, and provide other types of assistance,” according to the REACT International, Inc. website. REACT is “not just ‘CBers.’ Many teams use also use GMRS (General Mobile Radio Service), Amateur (Ham) Radio and other types of communications. Yes, many of us even use cell phones!” Visit: < <http://www.reactintl.org> >.

Communication Innovation

Two organizations have provided innovative responses to special local needs:

Tennessee Emergency Communications Association: When a sudden ice storm wiped out telephone service to the Roane County, Tennessee 911 call center last winter, Director of Emergency Communications Bill Farnham summoned the Tennessee Emergency Communications Association (TNECA) to replace it.

TNECA (pronounced tin-ek'-uh) is an unusual sub-regional organization of highly-experienced hams based in eastern Tennessee where emergency responders are relatively thin on the ground.

Its mission is coordinating deployment by members of various organizations from RACES to ARES® to MARS and more. To emphasize, it is not a club and no dues are collected, but members must meet strict training and availability requirements as well bring some special skill to the team, such as Internet installation.

The latest count was 57 members representing 22 of Tennessee's 95 counties. Fundraisers and grants support their activation and equipment.

TNECA got its start in 2002 after a tornado devastated the public safety system in Cumberland County, which adjoins Roane. By 2005, the group was ready to respond to Mississippi with the communications vehicle it had outfitted and a four-operator crew. "While there, we used all available modes of communication and wore whatever hat was required — RACES, MARS, Red Cross, ARES®, etc.," said Paul Drothler, WO4U/NNNØFAA, one of the charter members and currently executive director.

The organization offers an interesting solution to a familiar

problem in amateur radio: How to manage multiple organizations in a locality that offers communications support but no unity in delivering it.

In TNECA's Cumberland and Rowan counties, local government was happy to have a third party draw on the best talent and get the job done. The served area is growing, Drothler said.

Member job skills run from radio repair to police dispatcher and include veterans of hurricane and flood deployment. Drothler is a retired AT&T senior executive, right at home establishing an alternate call center.

"Five of us set up in a small room adjacent to the Roane County EOC, mainly handling rescue calls," he said. "The team provided continuous service for 51 hours, catching a few hours of sleep on the floor."

Hennepin County Sheriff's Mobile Amateur Radio Corps: A fascinating model of innovative local or specialized ham support groups is the Sheriff's Mobile Amateur Radio Corps (MARC) serving the Minneapolis area.

MARC members, a uniformed all-volunteer group, receive the title of Special Deputy after completing training and taking the oath of office.

MARC members operate the department's 37-foot mobile communications command vehicle with five dispatcher positions and equipment to handle contingencies during both emergency and non-emergency public safety events.

The unit coordinates responding resources, as well, including other volunteer groups such as the County Emergency Squad, American Red Cross and Salvation Army. For information, email: < Jennifer.E.Johnson@co.hennepin.mn.us >.

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The Rules Say...

John B. Johnston, W3BE

Are Exams *Really* Necessary?

For over 27 years, under agreements with the FCC, our volunteer-examiner coordinators have recruited and accredited tens-of-thousands of volunteer examiners. Our 14 VECs must also cooperate in maintaining the question pools for our VEs. They have assembled themselves into the National Conference of Volunteer Examiner Coordinators < <http://www.ncvex.org> >, for which W3BE has served as Vice-Chairman. The following is from his report to the 2011 annual NCVEC conference held on July 29 in Gettysburg, PA.

“Good morning, volunteer-examiner coordinators! On behalf of our amateur service community, thank you for the great work that you do and thank you for being here. As our point of contact with the Federal Communications Commission, it is essential that VECs get together at least annually to review what you are doing, confer with our regulators, and make plans for the future.

“Let’s jumpstart this conference by focusing on our fundamental reason for being here. Recharge your mind from thinking about whatever it is that you otherwise would be thinking about over to concentrating on what it is that we should be doing to keep our volunteer examiner system on the right track.

“We will begin with our annual reality checkup. As coordinators supporting our 32,000 volunteer examiners who prepare and administer those hundreds-of-thousands of written examinations, the one question that we should always be prepared to answer is:

“Are Exams *Really* Necessary?”

Examinations are to enable our VEs to verify that every licensee is properly qualified for the privileges of an amateur operator license grant in places where the FCC regulates our amateur service. We will presume that everyone here believes strongly that examination is absolutely necessary.

As you contemplate that presumption,



Chairman Larry Pollock, NB5X, opens the 2011 NCVEC Conference.

please be mindful that our VEs make examination opportunities conveniently available practically everywhere. Consider also that our VECs do a splendid job in making known the content of our question pools. As it stands, when a person is even minimally qualified, he or she should have no difficulty in scoring at least our anemic D-minus passing grade.

But we know that not everyone shares our view. This divergence has to be addressed from time to time when we are challenged with arguments against our examinations and schemes to bypass them. They all have that one objective in common: make the exams go away for one group or the other who want access to our valuable radio spectrum.

You may have read the answers to some of these arguments. Here are five of the most popular that have been received and how they have been answered.

Argument No. 1: We want as many people as possible with FCC licenses. Those burdensome exams frighten away too many potential grantees and are bad for business. The naysayers predicted that doing away with the CW exams would ruin the hobby. That did not happen, just as it also would not happen were those written exams to disappear. Must we really have exams?

W3BE: Yes. < <http://bit.ly/8XEJQf> > states that each applicant must pass an

examination for a new amateur operator license grant and for every change in operator class. Each applicant for each class of operator license grant must pass, or otherwise receive examination credit for, certain examination elements.

The International Telecommunication Union Radio-communication Assembly, additionally, < bit.ly.pR3ILL > that administrations take such measures as they judge necessary to verify the operational and technical qualifications of any person wishing to operate an amateur station.

Argument No. 2: The ITU recommendation is just that: a recommendation. It does not even suggest written examinations. So, can’t the FCC change its rule?

W3BE: Yes, it certainly does have that flexibility. The Communications Act likewise does not stipulate examinations, *per se*. It only requires our regulator to prescribe the qualifications of station operators; classify them according to the duties to be performed; fix the forms of such licenses; and issue them to persons *found to be qualified*. The FCC, therefore, would have to decide that some different way — other than our written examinations — is preferable when finding a person qualified to hold an amateur operator license grant.

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The 2011 VEC Conference attendees gathered for this photo.

Argument No. 3: It is outdated reasoning that examinations are necessary to assure that hams will not construct interference-causing stations. That home-brewing era of circuit diagrams, piece parts, and soldering irons is history. Very few U.S. hams construct or repair their apparatus. They depend almost completely upon foreign-produced apparatus.

Those 74 percent passing grades underscore the futility of the examinations. It means that whichever one-quarter of our licensees' knowledge can be erroneous. The VEs are typically unconcerned about what it is that their examinee has just proven to have a flawed awareness. They seem to stand aloof from the content of your question pools' bank of needed knowledge.

Emphasis on the technical aspects of amateur radio is giving way to shoring up operational shortcomings for professional emergency communicators. Technical knowhow is irrelevant for them. Can't applicants just sign a statement of knowledge of the FCC rules?

W3BE: Possibly. The precedent is FCC Form 605 and NCVEC Form 605. They both require signing, among other things, this statement:

I certify that I have read and will comply with Section 97.13(c) of the Commission's Rules regarding radio frequency radiation safety and the amateur service section of OST/OET Bulletin Number 65.

The ITU Radiocommunication Assembly recommends that any person seeking a license to operate an amateur station should demonstrate theoretical knowledge of international and domestic radio regulations; radiotelephony, radiotelegraphy, and data and image methods of radiocommunication; transmitter, receiver, antenna, propagation and measurements radio system theory; radio emission safety; electromagnetic compatibility; and avoidance and resolution of radio frequency interference.

Our examination system, moreover, enables our administering VEs to follow-up with each successful examinee at each exam session. They can timely review all questions missed and remedy any misunderstandings that their neophyte may have.

Argument No. 4: Nothing is more important than safety of human life. If signing a certification is the right way to determine whether the person has actually read and truly understands something as vital as the RF safety rule, it must likewise be the right way to determine whether the person

has read and understands all of the rules.

W3BE: < <http://bit.ly/8XEJQf> >, however, states that each applicant must pass an examination for a new amateur operator license grant and for each change in operator class. Our VEs are responsible for preparing and administering those examinations. Our VECs' question pools, moreover, do contain several questions on RF safety.

Argument No. 5. Does the FCC even have the authority to require amateur operator examinations?

W3BE: The FCC obviously presumes that it does. Read the General Powers of the Commission in the Communications Act of 1934 at SEC. 303 [47 U.S.C.]. It states:

(1) Except as otherwise provided in this Act, the Commission from time to time, as public convenience, interest, or necessity requires shall —

(1) Have the authority to prescribe the qualifications of station operators, to classify them according to duties to be performed, to fix the forms of such licenses, and to issue them to person who are found to be qualified by the Commission and who otherwise are legally eligible for employment in the United States, except that such requirement relating to eligibility for employment in the United States shall not apply in the case of licenses issued by the Commission to (A) persons holding United States pilot certificates; or (B) persons holding foreign aircraft pilot certificates which are valid in the United States, if the foreign government involved has entered into a reciprocal agreement under which such foreign government does not impose any similar requirement relating to eligibility upon citizens of the United States.

(2) Notwithstanding paragraph (1) of this subsection, an individual to whom a radio station is licensed under the provisions of this Act may be issued an operator's license to operate that station.

As other questions are received, they will be answered in future columns and on the w3BEInformed webpage < <http://www.w3BEInformed.org> >.

"Mr. Chairman! These volunteers are fully recharged and anxious to confer. We may now proceed.

"Thank you and have a great meeting!"

Read the Rules — Heed the Rules

Visit < <http://www.w3BEInformed.org> > for links to rules and information sites. E-mail your questions about the amateur service rules to < john@johnston.net >.

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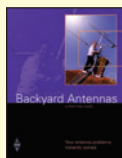
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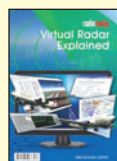
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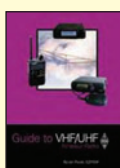
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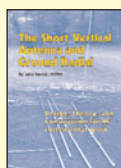
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CONTEST CORNER

CONTEST: TARA Fall Classic PSK Rumble

DATE & TIME: 0000-2359Z 1 Oct

BANDS/MODE: 160-6M PSK

POINTS: 1 Pt. per QSO

MULTIPLIERS: W/VE/JA/VK Call areas + DXCC countries, once per band

EXCHANGE: Name + Call Area; DX gives Name + Country prefix

ENTRY CATEGORIES: Single Op, single XMTR only! Normal - <100W; Great - <20W; Super - <5W; Novice, SWL; Team

ENTRIES: 29 Oct.

Use on-line score form at: www.n2ty.org/seasons/tara_rumble_score.html

Rules at: www.n2ty.org/seasons/tara_rumble_rules.html

CONTEST: EU Autumn Sprint

DATE & TIME: 1600-1959Z 1 Oct

BANDS/MODE: 80/40/20M SSB

POINTS: 1 Pt. per QSO

MULTIPLIERS: None

EXCHANGE: Both calls + Serial # + Name

ENTRY CATEGORIES: Single op only!

ENTRIES: 15 Days Dave Lawley, G4BUO, Carramore, Coldharbour Rd., Penshurst, Kent, TN11 8EX, England, UK

Cabrillo logs to: eusprint@kkn.net

Webpage: www.qsl.net/eusprint

Rules at: www.eusprint.com/index.php?page=140&lang=g

CONTEST: California QSO Party

DATE & TIME: 1600Z 2 Oct. – 2200Z 3 Oct.

BANDS/MODE: 160-2M SSB/FM/CW

POINTS: 2 Pts. SSB, 3 Pts. CW

MULTIPLIERS: CA sta's count States + Canadian Provinces,

All others count CA counties (58 possible)

EXCHANGE: CA sta's give serial # + County, All others give serial # + State/Province/Country

ENTRY CATEGORIES: Single op, QRP (<5W); Low (5-200W), High (>200W); Multi-Single QRP, Low, High; Multi-Multi QRP, Low, High; CA County Expedition; Mobile; School; Novice/Technician

ENTRIES: 31 October NCCC, c/o Rick Eversole, N6RNO, 1225 Vienna Dr. #119, Sunnyvale, CA 94089

Cabrillo (preferred) to: logs@cqp.org

Online server for log submission: <http://logs.cqp.org>

CONTEST: Oceania DX

DATE & TIME: 0800Z 1 Oct - 0800Z 2 Oct

BANDS/MODE: 160-10M SSB

POINTS: 3 Pts. 10M; 2 Pts. 15M; 1 Pt. 20M; 5 Pts. 40M; 10 Pts. 80M; 20 Pts. 160M

MULTIPLIERS: Prefixes, once per band

EXCHANGE: RS + Serial #

ENTRY CATEGORIES: Single op - All bands or Single band;

Multi-single - Multi-op, single XMTR; Multi - Multi - Multiple ops, XMTRS

ENTRIES: 8 Nov. Oceania DX Contest c/o Wellington ARC, P.O. Box 6464, Wellington, 6030 New Zealand

Cabrillo to: ph@oceaniadxcontest.com

Online log forms at: www.b4h.net/cabforms

Webpage: www.oceaniadxcontest.com

Rules at: www.oceaniadxcontest.com/rules.pdf

CONTEST: DX/NA YLRL Anniversary Contest

DATE & TIME: 1400Z 7 Oct - 0200Z 9 Oct

BANDS/MODE: All bands, all modes

(Note: YL to YL only! CW and SSB scored as separate contests)

POINTS: 1 Pt. ARRL section/Canadian Province QSO; 2 Pts. DX

MULTIPLIERS: Total of Sections/Provinces/Countries (QRP operation counts as a multiplier)

EXCHANGE: Both calls + Serial # + RS(T) + ARRL Section/VE Province

ENTRY CATEGORIES: QRP (>5W), Low (5-100W); High

ENTRIES: 30 Days Cheryl Muhr, NØWBV, P.P. Box 342, Littleton, CO 80160

E-mail: n0wbv@earthlink.net

Rules at: www.ylrl.org/ylcontests.html#DXYL

CONTEST: EU Autumn Sprint

DATE & TIME: 1600-1959Z 8 Oct

BANDS/MODE: 80/40/20M CW

POINTS: 1 Pt. per QSO

MULTIPLIERS: None

EXCHANGE: Both calls + Serial # + Name

ENTRY CATEGORIES: Single op only!

ENTRIES: 15 Days Karel Karmasin, OK2FD, Gen. Svobody 636 CZ-674 01, Trebic Czech Republic

Cabrillo logs to: eusprint@kkn.net

Webpage: www.qsl.net/eusprint

Rules at: www.eusprint.com/index.php?page=140&lang=g

CONTEST: FISTS Fall Sprint

DATE & TIME: 1700-2100Z 8 Oct

BANDS/MODE: 80 - 10M CW

POINTS: 2 Pts. non-member QSO; 5 Pts. member QSO

MULTIPLIERS: States/Provinces/DXCC once only

EXCHANGE: Name + State/Province/DXCC Country + FISTS number (non-members give power)

ENTRY CATEGORIES: QRP (<5W); QRO (5-100W); Club (Note: 100W maximum for all!)

ENTRIES: 30 Days Gil Woodside, WA1LAD, 30 Hilltop Ave., West Warwick, RI 02893-2825

Cabrillo or ASCII logs to: wa1lad@cox.net

Webpage: www.fists.org

Online entry form: www.fists.org/fists_entry_form.txt

Rules at: www.fists.org/sprints.html

CONTEST: Pennsylvania QSO Party

DATE & TIME: 1600Z 8 Oct. – 0500Z 10 Oct & 1300-2200Z 9 Oct.

BANDS/MODE: 160-2M SSB/CW/PSK/FM

POINTS: CW – 2 Pts. 160 & 80M, 1.5 Pts all other bands; SSB – 1 Pt.; PSK – 2 Pts; FM – 1 Pt.; 200 Pts. QSO with K3SMT

MULTIPLIERS: PA sta's count ARRL/Canadian Sections + PA Counties + 1 DX; All Others count PA Counties

EXCHANGE: Serial # + County or ARRL/Canadian Section

ENTRY CATEGORIES: Single op, QRP (<5W), Medium (6-150W), QRO; Single op, CW (<150W); Multi-single, Multi-multi; Single op, portable; Multi-multi, portable; Mobile; Rover

ENTRIES: 15 Nov. PA QSO Party, C/O NARC, P.O. Box 614, State College, PA 16804-0614

Online submission (format not specified): paqsolog@nittany-arc.net

Rules at: www.nittany-arc.net/paqsorules.html

CONTEST: Oceania DX

DATE & TIME: 0800Z 8 Oct - 0800Z 9 Oct

BANDS/MODE: 160-10M CW

POINTS: 3 Pts. 10M; 2 Pts. 15M ; 1 Pt. 20M; 5 Pts. 40M; 10 Pts. 80M; 20 Pts. 160M

MULTIPLIERS: Prefixes, once per band

EXCHANGE: RST + Serial #

ENTRY CATEGORIES: Single op - All bands or Single band, High or Low power; Multi-single - Multi-op, single XMTR; Multi - Multi - Multiple ops, XMTRS

ENTRIES: 30 Days Oceania DX Contest, c/o Wellington ARC P.O. Box 6464, Wellington 6030 New Zealand

Cabrillo to: cw@oceaniadxcontest.com

Online log forms at: www.b4h.net/cabforms

Webpage: www.oceaniadxcontest.com

Rules at: www.oceaniadxcontest.com/rules.pdf

CONTEST: North American Sprint

DATE & TIME: 0000-0400Z 9 Oct

BANDS/MODE: 80/40/20M RTTY

POINTS: 1 Pt. per QSO

MULTIPLIERS: States (no KH6!)/CA Provinces/NA Countries (USA and Canada do not count as countries!)

EXCHANGE: Both calls + Serial # + Name + QTH

ENTRY CATEGORIES: Single op – QRP, Low or High

ENTRIES: 16 Oct. Days Ed Muns, W2YK, P.O. Box 1877, Los Gatos, CA 95031-1877

E-mail: rttysprintmgr@ncjweb.com

Cabrillo logs: www.ncjweb.com/sprintlogsubmit.php

ASCII logs to: rttysprint@ncjweb.com

Paper to Cabrillo converter: www.b4h.net/cabforms/nasprintrtty_cab.php

Rules at: www.ncjweb.com/sprinrules.pdf

CONTEST: NAQCC Sprint
DATE & TIME: 0030-0230Z 12 Oct
BANDS/MODE: 80/40/20M CW
POINTS: 1 Pt. non-member QSO; 2 Pts. member QSO
MULTIPLIERS: States/Provinces/Countries
EXCHANGE: RST + State/Province/Country + Member # (non-members give power)
ENTRY CATEGORIES: SWA (Simple Wire Antenna); Gain
ENTRIES: 4 Days John Shannon, K3WWP, 478 E. High St., Kittanning, PA 16201
 E-mail: naqcc33@windstream.net (Submit log as plain text, NO attachments!)
 Auto-logger: http://naqcc.info/sprint_submit_log.html
 Rules at: http://naqcc.info/sprint_rules.html

CONTEST: Illinois QSO Party
DATE & TIME: 1700Z 16 Oct - 0100Z 17 Oct
BANDS/MODE: 160-2M Phone/CW/Digi
POINTS: 1 Pt. Phone; 2 Pts. CW/Digi
MULTIPLIERS: Illinois Counties; IL sta's count States/Provinces/Countries
EXCHANGE: IL sta's give RS(T) + County; All others give RS(T) + State/Province/Country
ENTRY CATEGORIES: IL Fixed, Portable, Mobile, Rover; Outside Illinois
ENTRIES: 18 November WIARC, P.O. Box 3132, Quincy, IL 62305-3132
 Cabrillo (preferred) to: n9jf@arrl.net
 Rules at: www.w9awe.org/ILQP%202009%20Rules.pdf

CONTEST: 10-10 International Fall/CW/Digital
DATE & TIME: 0001Z 15 Oct - 2359Z 16 Oct
BANDS/MODE: 10M CW/Digital
POINTS: 1 Pt. non-member; 2 Pts. member QSO
MULTIPLIERS: None
EXCHANGE: Call + Name + QTH + 10-10 # (if any)
ENTRY CATEGORIES: Individual; Club
ENTRIES: 31 Oct. Dan Morris, KZ3T, 131 Valencia Ln., Stateville, NC 28625
 E-mail: dbm72941@roadrunner.com
 Rules at: http://www.ten-ten.org/Forms/QSOPartyRules_082710.pdf

CONTEST: Run for the Bacon
DATE & TIME: 0100-0300Z 16 Oct
BANDS/MODE: 80-10M CW
POINTS: 1 Pt. non-member QSO; 3 Pts. FP member; 5 Pts. FP member different continent
MULTIPLIERS: States/Provinces/Countries
EXCHANGE: RST + State/Province/Country + FP #; (non-members give power)
ENTRY CATEGORIES: Not specified
ENTRIES: Online log submission only: www.fpqrp.com
 Rules at: www.fpqrp.com

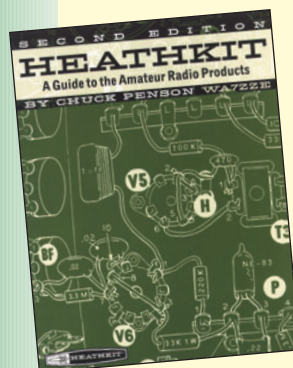
CONTEST: New York QSO Party
DATE & TIME: 1400Z 15 Oct. - 0200Z 16 Oct.
BANDS/MODE: 160-2M Phone/CW/Digi
POINTS: 1 Pt. SSB; 2 Pts. CW; 3 Pts. RTTY/Digi
MULTIPLIERS: NY sta's count NY Counties (62) + States/Provinces; All others count NY Counties
EXCHANGE: NY sta's give RS(T) + County; All Others give RS(T) + State/Province or DX
ENTRY CATEGORIES: Single op; Multi-single; Multi-multi; School; Mobile - All can use QRP (<5W), Low (6-100W), High (>100W)
ENTRIES: 14 Days
 Cabrillo only! to: logs@nyqp.org
 Online Cabrillo formatter: www.b4h.net/cabforms
 Rules at: www.nyqp.org/rules.php

CONTEST: CQ WW DX
DATE & TIME: 0000Z 29 Oct - 2359Z 30 Oct
BANDS/MODE: 160-10M SSB
POINTS: 1 Pt. Same Continent, 20/15/10M; 2 Pts. NA to NA contacts; 3 Pts. Other continents
MULTIPLIERS: Zones/Countries per band
EXCHANGE: RS + CQ Zone
ENTRY CATEGORIES: Single Op - Single Band; Single Op - All Band, QRP, Low, High; Multi Op; Multi Op - 2 XMTR's; Multi Op - Multi XMTR's; Xtreme (special rules apply); Team
ENTRIES: 1 Dec CQ WPX Contest, 25 Newbridge Road, Hicksville, NY 11801
 Cabrillo to: ssb@cqww.com
 Rules at: www.cqww.com/rules.php

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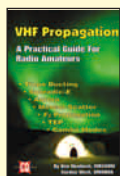
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CITY	DATE	CONTACT	NOTES	CITY	DATE	CONTACT	NOTES
ARIZONA				MISSISSIPPI			
Mesa	3rd Mon	Steve, KY7W, 480-804-1469, kj7wk@cox.net	w/i	Gulfport	1st Sat	Harrison Cty., Clay, W5ACS 228-863-2042 w5acs@arrl.net	w/i ok
Phoenix	4th Sat	Gary Hamman, 602-996-8148, K7GH@arrl.net		NEVADA			
ARKANSAS				Stagecoach	2nd Sat	Jack, AC6FU, 775-577-2637 ac6fu@arrl.net	
Sherwood	1st Sat	James, KE5OVE, 501-796-3910, ke5ove@arrl.net	p/r pref.	NEW JERSEY			
CALIFORNIA				Roselle	4th Sat	Gerry, AA2ZJ, 732-283-2795, aa2zj@arrl.net	
Highland	10/15	Ed, WU6I, 909-864-0155, wu6i@arrl.net	p/r pref.	Winslow	4th Tues	Mark, K2AX, 609-820-1523, JTRA@comcast.net	
LaVerne	Last Sat	Frank, K6FW, 909-628-8661, k6fw@arrl.net	p/r	Pennington	9/17	Don, AA2F, 609-737-1723, aa2f@arrl.net	
Long Beach	3rd Sat	Louise, N6ELK, 562-429-1355	p/r	NEW YORK			
Manteca/Tracy	4th Sat	David, N5FDL, 209-835-6893, n5fdl@arrl.net	p/r	Bethpage	2nd Tues	Bob, 631-499-2214, w2ilp@optonline.net	p/r
Redwood City	Call	Al, WB6IMX@arrl.net, www.amateur-radio.org	w/i	Canandaigua	1st Wed	Squaw Island ARC, David A. Foster, 585-398-0216, www.siac.us	w/i
Sacramento	Hotline!	916-492-6115, n6na@arrl.org		Valhalla	Call	Stanley, WA2NRV, wa2nrv@wece.org	
San Francisco	See site	www.hamcrams.com	p/r pref	Yonkers	Call	Paul, AC2T, 914-237-5589, w2yrc@hotmail.com, www.yarc.org	w/i ok
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Sebastopol	Hotline!	Recording 707-579-9608		Fayetteville	Call	Patricia Edwards, N4UGH, n4ughpat@aol.com, 910-584-1801	w/i
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COLORADO				Cincinnati	1st Sat	Dale, KC8HJL, 513-769-0789	p/r pref
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FLORIDA				OREGON			
Longwood	4th Sat	James, N4ZKT, 407-333-4245		Astoria	Call	AA7OA, 503-338-3333	p/r
Melbourne	1st Sat	John, AA8IS@earthlink.net, 321-412-2779	w/i ok	Bend	Weds	Joe, K7SQ, 541-385-3152	p/r
North Port	Call	Bill Norris, KC7TSG, 941-426-0214	w/i pref.	Lincoln City	1st Sat	Carl, w7li@arrl.net, 503-965-7575	w/i ok
St. Pete	Call	Mark, NP3R, 727-528-0071	w/i pref.	McMinnville	Call	Mark, AC7ZQ, 503-843-3580	w/i only
St. Petersburg	4th Sat	Thomas Wedding, A14QP, 727-867-8450	w/i pref.	Sisters	Call	Dave, N7TYO, 541-549-7831	p/r
Sanford	4th Sat	James, N4ZKT, 407-333-4245, n4zkt@bellsouth.net		Tigard	Call	John, KS0F, 503-626-7399	p/r
Venice	2nd Sat.	Jack, W4JS, 941-475-1929, w4js@juno.com		PENNSYLVANIA			
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Oahu Is.	Call	Lee, KH6BZF, 808-247-0587	p/r	Lebanon	3rd Sat	Wa3gpm@arrl.net	
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Kamiah	2nd Tues	Alan, 208-937-2222, Ken 208-935-8888		San Juan	Last Sat	Hotline: 787-789-4998, prarl@prarl.org	w/i
IOWA				SOUTH CAROLINA			
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Vinton	3rd Tues	Kenneth, N0EGV, 319-223-5739, n0egv@southslope.net	w/i ok	Charleston	2nd Sat	Riley Stone, 843-832-9105, k4hyy@sc.rr.com	w/i
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Lake in Hills	4th Sat	Jeffrey Dubin, N9MXT, 847-815-9407		WASHINGTON			
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Richmond	11/5	Mike, 765-969-3932, w1idx@arrl.net	w/i	WEST VIRGINIA			
MASSACHUSETTS				Parkersburg	2nd Mon	Dana Pickens, WV8G, 304-422-6101	w/i, p/r
Brookline	Call	Jim, N1ICN, 617-364-4658, n1icn@arrl.net	p/r	WISCONSIN			
Marlboro	3rd Sat	Bill, K1IJ@mmra.org, mmra.org/exam	w/i pref.	Racine	1st Sat	Robert, W0WLN, 262-886-8551	w/i pref.
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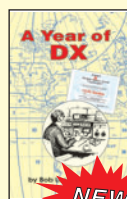
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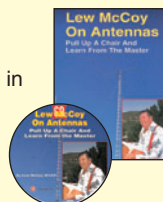
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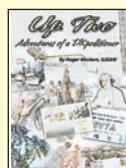
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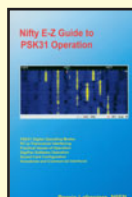
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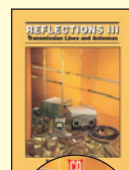
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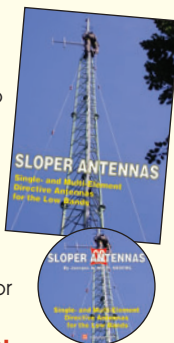
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Untangling the Mystery of the ‘Twisted Pair’

By Kurt N. Sterba

Mike Dorworth, K4XM, of Woodbury, Georgia, writes Krusty Olde Kurt:

“Why do we hear so little about twisted pair feedlines? I know that decades ago they got a bad rap because of the cloth covered rubber that the weather worked on so badly (lamp cord) and recently the losses in ‘zip cord.’ Ditto the RadioShack cheap speaker wire.

“I was able to take silvered Teflon® wire of 18-20 size and wrap the center around a nail. In a minute, I had a nice feedline after placing the other ends in a cordless drill and let it place about three twists to the inch.

“My question: Is not the bad rap due to poor quality insulation and the two wires embedded in the same dielectric?

We had RF-quality, No. 14 tin-coated and twisted telephone drop wires on lines hundreds of miles long and they lasted for decades with little loss at the railroad where I worked. I have used the same for feedlines, too.

“Coax costs a lot and the tiny RG174 has such high loss for portable work (QRP) that a homemade, low-loss line is easier and cheaper, not to mention *no* connectors. How about it?”

Now, the Krusty One . . .

Kurt agrees on the poor performance of “zip cord.” The trouble with it when used as an RF transmission line is the loss in the rubber insulation. Jerry Hall, K1TD, made some measurements on it back in 1979. First of all, the impedance of the line was found to be 105 ohms, not the 50 ohms we are used to in coaxial cables.

The losses were 1.5 dB on 40 meters, 2.5 dB at 10 MHz, and 7.5 dB on 10 meters. These measurements were made on 100 feet of line.

In comparison, RG-8 coax has 1/2-dB loss at 10 MHz. RG-8 was designed for use at RF. Lamp cord was designed for 60-Hz AC, not RF. As a matter of fact, the cloth-covered lamp cord may have been designed before radio even existed.

K4XM mentions the advantage of not having a connector. K1TD, in his *QST* article, shows how to transition from feedline to antenna when using the same wire for both. See **Figure 1**. This is an “electrician’s knot.” He explained that, to tie the knot, first use the right-hand conductor to form a loop, passing the wire behind the transmission line part and off to the left. Then pass the lefthand wire behind the left antenna wire, then in front of the transmission line part and through the loop already formed. Voila!



Figure 1: Jerry Hall, K1TD, in a 1979 *QST* article headlined “Zip Cord Antennas — Do They Work?” < <http://bit.ly/ppGUdO> > showed how to transition from feedline to antenna when using the same wire for both. This is an “electrician’s knot.” He explained that to tie the knot, first use the righthand conductor to form a loop, passing the wire behind the transmission line part and off to the left. Then pass the lefthand wire behind the left antenna wire, then in front of the transmission line part and through the loop already formed. Voila! (*Courtesy of K16SN*)

in front of the transmission line part and through the loop already formed. Voila!

You’ve got a transition from transmission line to dipole that keeps the zip cord from pulling apart and the twisted-pair line from untwisting — with no connector or center insulator.

Yes, you can make your own twisted-pair transmission line using wire with good insulation. Teflon® is a good choice, although rather expensive. Don’t use ordinary PVC hook-up wire because it is nearly as lossy as rubber.

The loss in insulators is listed in textbooks as “dissipation factor.” The smaller the number, the better. The larger the number, the larger the loss.

Here are dissipation factors (at 1 MHz) for some of the materials we could use:

- Pure vacuum (as in outer space) = Zero
- Air = Zero (Well, not quite but close enough for our purposes)
- Neoprene rubber = .038
- PVC = .016
- Polyethylene (used in most coax) = .0002
- Teflon = .0002

K4XM’s choice of Teflon®-covered wire was obviously a good one. But there is a problem with this cable: What is the impedance?

The impedance of the cable depends on the wire size, the insulation thickness, and the number of twists. Twisting lowers the lines’ impedance. Thicker insulation increases the imped-

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ance. Somewhere there may be a formula that allows you to design for a desired impedance, but Kurt is not aware of it. The best you can do is wind your cable and then measure it.

Understanding Dielectric Loss in Transmission Lines

Gary Sharpe, KA8DKT, of Lawrenceville, Georgia, writes: "Another ham and I have been having a discussion (argument) about dielectric losses in transmission lines.

"It is his basic contention that all dielectrics have the same losses (essentially none) whether they are air, foam, polyethylene or whatever. He also asserts that copper losses (including frequency-dependent skin effects) are the only losses in transmission lines at HF, VHF and UHF amateur band frequencies.

"He contends that the only reason different dielectrics are used in coax is to allow the use of larger center conductors, thus lowering copper losses, and further, that the larger wire is the only reason some coax cables are designated as "low loss."

"He also stated that open-wire line is only preferred because of the lower copper losses. He asserts that the losses in coax are greater because the characteristic impedance is lower and thus the currents are greater, leading to higher copper losses.

"I had always believed that various dielectric materials had different losses, even at high HF, and that one reason open-wire line was used was that air was a better dielectric than that found in coax.

"Emotionally, I hope I am right, but if not, I will have to change my belief. If I am wrong please set me straight."

Mr. Sterba Concurs

Krusty Olde Kurt agrees with you. Different dielectrics do have markedly different losses as the dissipation factors show.

There are losses in the insulation of coaxial cables. That's why manufacturers use low-loss insulation and why foam and spaced-bead cables have the lowest loss — more air and less plastic.

Air has lower loss than any solid material so open-wire line has the least loss of any transmission line.

Kurt welcomes questions of general interest from readers and will answer them in his kolumn. Write to him at: < WorldRadioOnline@gmail.com >