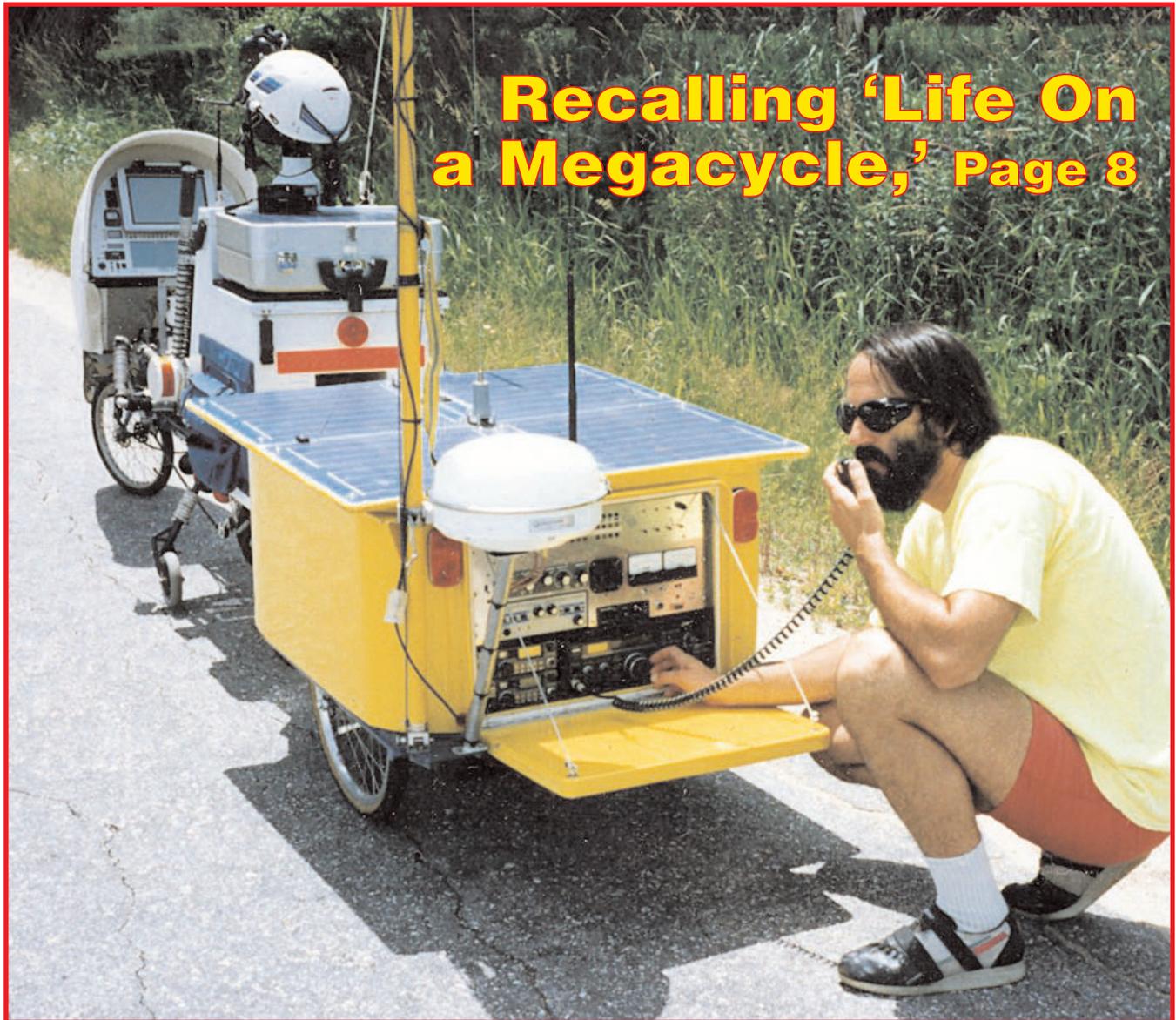


# WorldRadio

**ONLINE**

Year 41, Issue 1

JULY 2011



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*NEWS • FCC • DX • SATELLITES • CONTESTS • HAMFESTS • AERIALS • CW*



## FCC Proposes Hike In Vanity Callsign Fee

A Notice of Proposed Rulemaking (NPRM) released by the Federal Communications Commission on May 3 calls for an increase in the fee for amateur radio vanity callsigns.

If the proposal is approved, vanity calls will hike to \$14.20 — a 90-cent increase from the current \$13.30. Amateur radio licenses must be renewed every 10 years.

The Communications Act of 1934 — as amended — authorizes the FCC to collect vanity callsign fees to recover the costs associated with that program. The vanity callsign regulatory fee is paid when applying for a new vanity callsign and upon renewal for a new term. Vanity callsigns issued prior to 1996 are exempt from having to pay the renewal fee. Instructions on how to comment on FCC NPRMs are available at: < <http://fcc.us/iUniqB> >. — *Multiple news sources.*

## American Amateur Shot Dead At Kabul Airport

U.S. radio amateur James McLaughlin, WA2EWE/T6AF, was among the nine Americans killed in a shooting at Kabul airport in April when an Afghan military pilot opened fire in an operations room of the Afghan Air Corps, according to Voice of America reporter and fellow amateur Steve Herman, W7VOA/T6AD.

According to Herman, the attack was the worst single episode of an Afghan turning against his coalition partners.

Writing from Seoul, where he is chief of the VOA bureau, Herman said McLaughlin, who was also a friend, was a career U.S. military officer working as a contractor training Afghan pilots. They first met August 2009, and were the only two hams operating in Kabul.

“Jim had put together a fine radio shack in his quarters,” Herman wrote, adding, “It was obvious from spending time with Jim that ham radio was an important morale-boosting pastime and (he) usually spent a couple of hours per day (on the air), logging thousands of QSOs.” — *CQ Newsroom*

## CBO: Price Tag of ARRL-Backed Study = \$1 Million

The nonpartisan Congressional Budget Office has projected that conducting the studies mandated by S.191, the Amateur Radio Emergency Communications Enhancement Act of 2011, will cost taxpayers approximately \$1 million in 2012, if passed and signed into law.

The bill, which is being heavily promoted by the American Radio Relay League, would direct the Department of Homeland Security to study the uses and capabilities of the Amateur Radio Service during and after a disaster or emergency, and would require the department’s Inspector General additionally to report on the cost of grant programs administered by the Federal

Emergency Management Agency and the extent to which these programs overlap with each other.

The CBO analysis was requested by the Senate Homeland Security and Governmental Affairs Committee. — *CQ Newsroom*

## Prominent Amateurs Become Silent Keys

Four amateur radio luminaries became Silent Keys in recent months:

**Paul Baran, W3KAS**, died in March from complications of lung cancer. Baran was one of the fathers of the Internet and of packet radio. He came up with the idea of packet switching, in which data to be transmitted is broken up into small segments, sent over sometimes varying routes and reassembled at its destination.

**Mike Koss, W9SU**, owner of Industrial Communications Engineers (ICE), died unexpectedly after collapsing on his workshop floor. ICE, well-known among hams as a manufacturer of line filters, surge protectors and more, temporarily suspended taking new orders while it reorganized the business in light of Koss’ passing.

**Roger Nichols, KE4BDA**, Grammy-winning recording engineer, died in April after a battle with pancreatic cancer. Nichols, 66, was best known for his work with Steely Dan and was honored with three Grammys.

**Leo Meyerson, WØGFQ (ex-W9GFQ)**, died in April — a few weeks after celebrating his 100th birthday. Meyerson founded and ran World Radio Laboratories in Council Bluffs, Iowa, producing the Globe line of transmitters, popular among hams in the mid-20th century.

*CQ Amateur Radio* columnist Joe Eisenberg, KØNEB, was a family friend of Meyerson’s. Joe shares reflections on the man who was also his personal ham radio mentor in his Kit-Building column in the magazine’s July edition. — *CQ Newsroom*

## Maritime Net Assists in Rescue of Man and Dog

A 77-year-old sailor and his dog were rescued by the U.S. Coast Guard after being stranded at sea, with help from ham radio operators of the Maritime Mobile Service Net, according to a posting on the CQ Newsroom blog: < <http://www.cqnewsroom.blogspot.com/> >.

On March 21, net member Rex Weinheimer, KC5AGO, picked up a weak distress call on 14.300 MHz from a disabled sailing vessel. ‘AGO told ABC News conditions were very poor and it was nearly impossible to get information clearly.

With the help of several other net members, the group was able to piece together the boat’s location and condition. The USCG was notified and the man and his dog were eventually rescued by helicopter. Neither the name of the sailor nor his dog’s was released. — *ABC News, CQ Newsroom*



# SAVE SOME GREEN

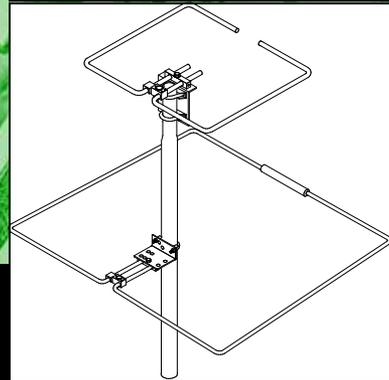
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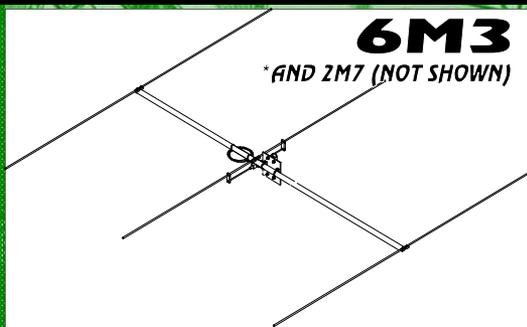
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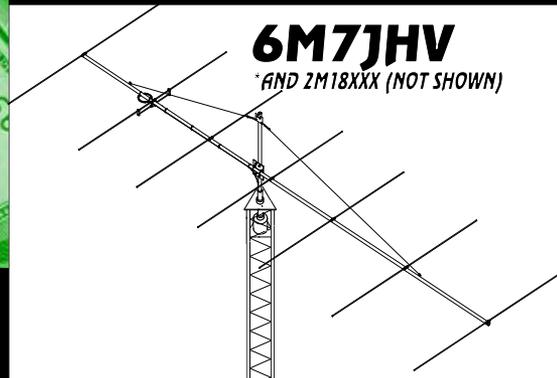
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# WorldRadio ONLINE

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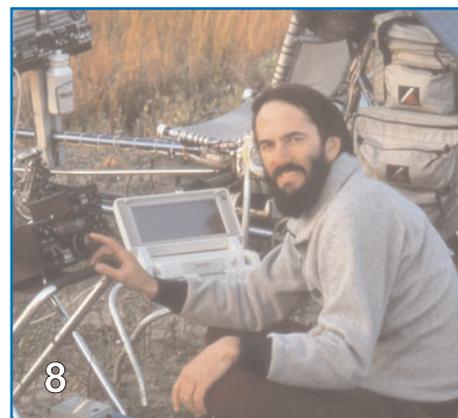
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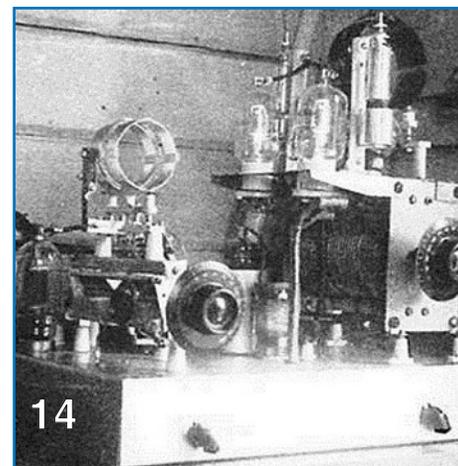
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**On the Cover:** Steve Roberts, N4RVE’s, \$1.2 million BEHEMOTH – featured in this month’s *Station Appearance* – now resides in the *Computer History Museum* in Mountainview, California – Silicon Valley. (Courtesy of N4RVE)

# The perfect combo, without compromise.

HF/6m/2m/70cm/23cm<sup>1</sup> Transceiver

## IC-9100

For years, the attention to receiver design focused on the HF bands, leaving the upper bands a bit neglected. Icom changed the ham world with the introduction of the IC-7800, which incorporated a new front-end design just for 6m. Now, Icom's introducing the newly FCC approved IC-9100, extending the latest in front-end technology up to more of the VHF/UHF bands. 2m, 70cm, and 23cm<sup>1</sup> enthusiasts can now benefit from high-end IF-DSP performance too! And for those interested in satellite communication, it's the perfect time to try out your new '9100 on the ARISSat-1 when it launches into orbit during the next EVA in July 2011.



100/100/100/75/10<sup>2</sup> Watt Output<sup>2</sup>

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## The End of One Chapter, As We Open Another

### A Sad 'Goodbye'

Cheryl Muhr, NØWBV, launched into *column-dom* in the pages of *WorldRadio* in November 2002 — back in the print era of this magazine.

She modestly introduced herself to readers as the new *YLS* columnist in one paragraph on Page 31, tucked at the end of a two-page spread. Under the small headline, *A bit about this columnist*, she gave us a snapshot:

First licensed in '93 as a Tech-Plus. Now an Extra. ARRL Rocky Mountain Division Public Information Coordinator. District 10 Chairwoman for the Young Ladies Radio League. Oh, she did publicity on the side for YLRL, as well. ARES®. World traveler. And it went on . . .

“All aspects of amateur radio — DXing to contesting to HF to VHF and more — fascinate me.”

*Good grief.* How can anyone whose plate is *that full* have room for dessert as *WR YLS* columnist?

Remarkably, Cheryl has had her eyes and ears glued to the *YLS* scene for *WorldRadio* and *WorldRadio Online* for almost a decade. Sadly, this month she says *goodbye*.

Cheryl leaves an incredible portfolio of *YLS* news and features, which have enriched the pages of this magazine and has become a standard, we believe, by which others are measured.

Her down-to-earth writing style, sprinkled with touches of humor, made her bi-monthly *YLS* not only accessible, but a joy to read. She knew her audience. And, quite proudly, *her audience knew her*.

Cheryl has been a valued and trusted reporter — accurate, complete and always fair. An editor's dream.

In her introduction almost nine years ago, Cheryl wrote: “If I ever get bored with amateur radio, it will be my own fault!” Somehow, we can't imagine that a possibility.

We sincerely thank her for serving *WRO* readers so selflessly and wish her nothing but the best — perhaps with a plate not quite so full.

### A Happy 'Hello'

As saddened as we are to see a valued columnist's departure, we're thrilled to welcome **Jennifer Oliver O'Connell, KI6OIL**, as she receives the *YLS* baton from NØWBV.

You'll get to know Jennifer in this month's *YLS*, and appreciate the depth she brings to *WRO* as a seasoned writer and reporter — among many, many other interests.

I think it's fair to say Jennifer married into amateur radio, and is often seen with her OM, Lynn, KG6DNY, at ham-related events across California.

Without doubt, she's an amateur radio *do-er*. Involved and enthusiastic. Jennifer's world-view will serve her, as well, having had her passport stamped on mission trips to Sri Lanka, Haiti and Ghana. “My hope is to do a DXpedition one of these days,” she says.

*Thank you, Jennifer. We'll be happy to come along for the ride.*

### Here's to a Great Staff

Up and down the line, *WRO* is extremely fortunate to have a team of such outstanding columnists and writers. The nine-year legacy of NØWBV is a reminder and testimony to the fact.

As **KI6OIL** joins the team, we all look forward to bringing you continued solid coverage of the interesting people and many facets of amateur radio. *The best is yet to come.*

— Richard Fisher, KI6SN

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# Which SteppIR Product is Best for You?

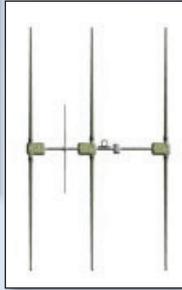
## 2, 3, and 4 Element Yagis

For the hams who are fortunate enough to have towers in their backyards. Gain and directivity is yours with a SteppIR Yagi.



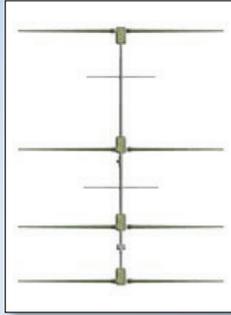
### 2 Element 20m-6m Yagi

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.

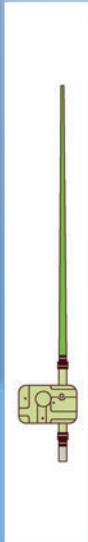
## Vertical and Dipoles

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.



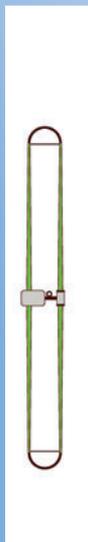
### SmallIR Vertical Antenna 20m-6m

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



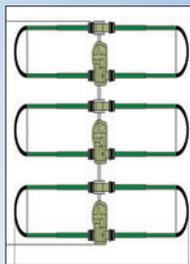
### 20m-6m Dipole

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



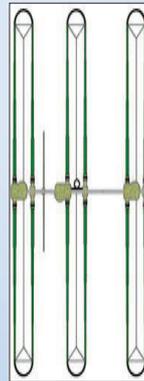
### 40m-6m Loop Dipole

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



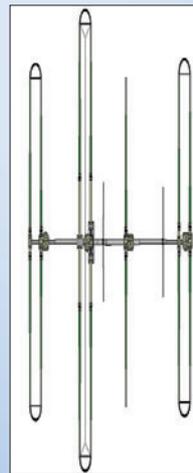
### DB11 Yagi Antenna

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.



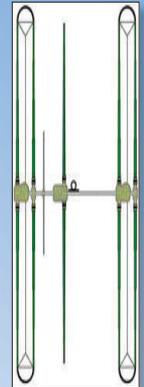
### DB18E YAGI

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.

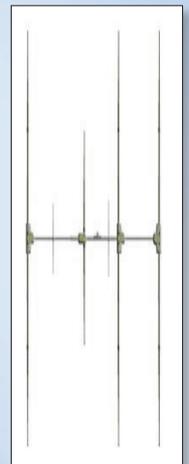


### DB18 YAGI

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.

### MonstIR 4 Element Yagi 40m-6m

MonstIR 4 element Yagi, 40m-6m continuous coverage with full length elements; 34ft boom, 70 ft longest element, 39.7 ft turning radius, 23.9 sq ft wind load, 160 lb; SDA 100 controller included.



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# N4RVE / Bicycle Mobile USA: ‘Life On a Megacycle’

Steve Roberts, N4RVE, hastens to say this is not his current setup. At the moment he’s “building an (amateur radio) operating console into a 44-foot sailboat.” Another story.

But there was a time ‘RVE had a most interesting mobile operation, pedaling recumbently 17,000 miles around the United States between 1983 and 1991. And playing with ham radio.

“I used to joke about ‘Life on a Megacycle.’” As you’ll see, when then-WN4KSW first set roots in a world of electronics and computing it would lead to his own version of Jack Kerouac’s “On the Road” — only ‘RVE’s “beat generation” marched to the cadence of a different drummer.

Are you as proud of your station’s appearance as N4RVE? 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](mailto:WorldRadioOnline@gmail.com) > and we’ll consider them for publication in Station Appearance in an upcoming edition of WRO.

If there’s a You Tube video to accompany the still pictures, let us know and we’ll set up a link.)

Home for Steve Roberts is Camano Island, Washington. For almost a decade in the ‘80s and ‘90s, though, it was any one of the thousands of miles he pedaled his recumbent bicycle around the United States — outfitted with amateur radio gear — as a modern-day nomad.

“It began in Kentucky in the early ‘60s,” Roberts recalls on his Web site. “I was a ham radio operator known as WN4KSW — a skinny, burr-headed prisoner of school, isolated in the cultural drought of the Midwest.” Test scores showed Roberts was “a smart little bugger,” but he was told he had attitude problems; not working to his potential.

“With the exception of science fairs, my academic performance was apparently disappointing to authority figures,” he said.

He had “a brief flirtation with engineering school, dabbled in careers, started a microcomputer consulting business called Cybertronics after designing and building an 8008 (byte-oriented microprocessor) system in 1974, fiddled endlessly with homebrew music synthesizers, wrote technical articles and a few books, and pulled all-nighters of coffee-wired hacking around every seductive new *gizmological* marvel. But through it all, one image kept coming back to me: An assemblage of communication and computing equipment symbolic of freedom . . . a toolset for escape.”

In 1983, Roberts decided to “trash my suburban lifestyle and head out for parts unknown on a computerized recumbent bicycle.” With advances in technology and networking at the time, he realized “for the first time in history, one could wander endlessly while remaining connected enough to keep a business afloat.”



**Heading down the U.S. east coast in 1988, N4RVE took a break from pedaling the *Winnebiko II* — the second version of Steve Roberts’ computerized bike — for some on-air ham radio relaxation. (Courtesy of N4RVE)**

“The bike had to be fabricated from scratch, as the few recumbents of the day were too delicate for the anticipated abuse,” he said. “I hired a wizard frame builder to braze a strong and well-balanced substrate. . . I liquidated my suburban lifestyle, assembled a camping system and a simple electronics package powered by a 5-watt solar panel, established a base office and basic network protocols and hit the road.”

Roberts would go on to ride his specially-designed *Winnebiko* — followed by the *Winnebiko II* and *BEHEMOTH* — around the country with amateur radio as a constant backdrop.

With the *BEHEMOTH*, for example, “the trailer carried a full ham radio station, with HF, VHF, UHF, amateur television, audio filtering . . . along with a hacked 3-watt cell phone with standard loop-start RJ-11 interface for the cordless handset, answering machine, fax/modem and credit-card verifier,” Roberts recalls.

An author, while on the road, he was selling books and subscriptions to his *Journal of High-Tech Nomadness*, “and it was

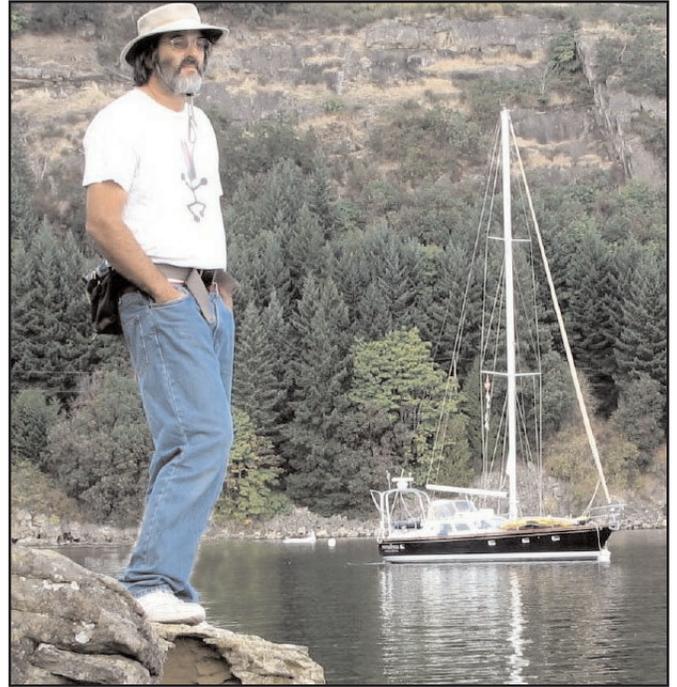


**Steve Roberts is self-described here as a geek kidlet, circa early 1960s.**

(From N4RVE's Web site: <<http://bit.ly/l6rWpg>>)

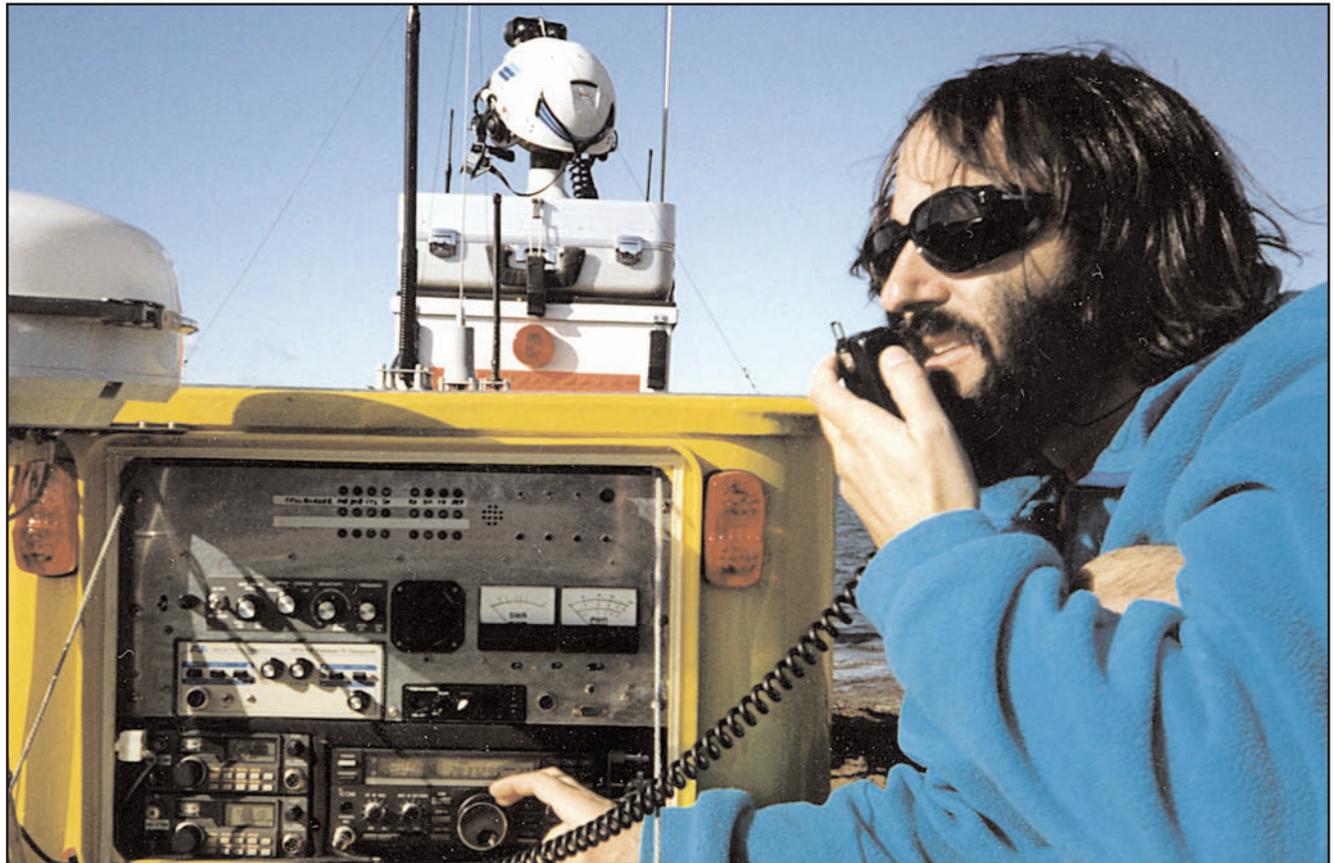
important to be able to take plastic. I actually made a few sales to people who didn't believe this was possible: 'Well, give me your credit card,' I would say, 'I'll demonstrate.'"

His custom recumbent "sprouted a whole antenna farm, with a folding HF dipole on an extendable fiberglass pole mounted on the stern, CB/security-pager 'rubber duckie,' dual-band whip



**Today, N4RVE is focusing his efforts on the nautical — a 44-foot sailboat that will have amateur radio as a key component.**

(From N4RVE's Web site: <<http://bit.ly/jB8PkL>>.)



**This picture, providing a look at the amateur radio gear carried on his recumbent bicycle-trailer named *BEHE-MOTH*, shows N4RVE making a phone contact in 1991 during his near-decade-long trip around the United States.**

(Courtesy of N4RVE)

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- Optional RF  $\mu$ -Tune Units for 160 m, 80/40 m and 30/20 m Bands

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Fully automatic, Ultra-sharp, External  $\mu$ -Tuning Preselector (optional) features a 1.1" (28 mm) Coil for High Q

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Shown with after-market keyer paddle, keyboard, and monitor (not supplied).



DMU-2000 Data Management Unit (option)

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HF/50 MHz 100 W All Mode Transceiver

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With Built-in Automatic Antenna Tuner

**NEW** Illuminated Key buttons

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Large informative Front Panel Display, convenient Control knobs and Switches  
The IF DSP guarantees quiet and enjoyable high performance HF/50 MHz operation



Handy Front Panel Control of Important Features including:

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**Manual NOTCH**

Highly-effective system that can remove an interfering beat tone/signal.

**NEW**

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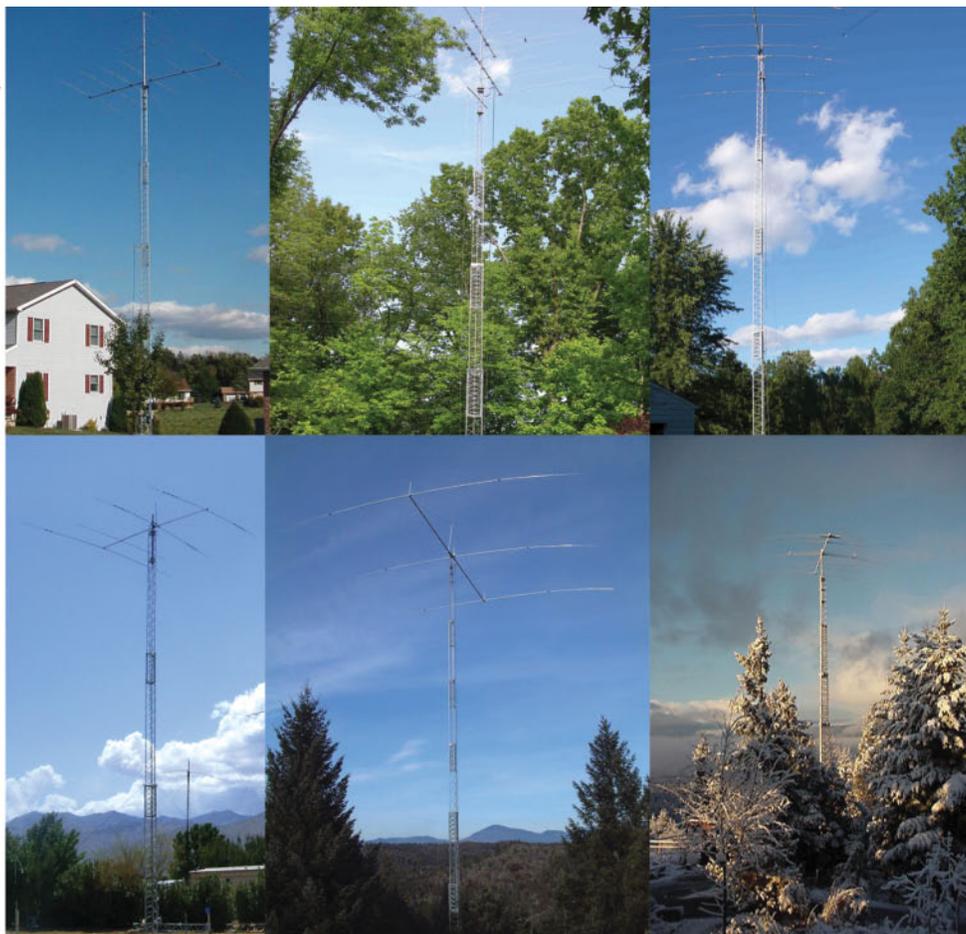
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for ham radio, cellular whip, separate 2-meter half-wave for the console rig, 9600-baud UHF radio link between backpack and bike, a VHF wireless full-duplex intercom and white plastic radomes for GPS and the Qualcomm OmniTRACS satellite station that carried my email traffic.

“Everything was powered by the 72-watt photovoltaic array that comprised the lid of the trailer, with 45 amp-hours of sealed lead-acid batteries, smart charge controller and 115-V inverter.”

After almost a decade of nomadic life, however, Roberts realized “quite simply, *I had been there before*, many times, and the whole bicycle touring lifestyle was routine.

“The road had become the equivalent of living room walls,” he said. “Riding into a new town no longer represented a panoply of intoxicating options. Camping was a hassle, muscling expensive gear through narrow motel room doors a nuisance, doing the *show ‘n tell* for new friends tiresome and much too familiar.”

He had also formulated “Roberts’ Law of Applied Mobile Gizmology:” *If you take an infinite number of very light*

*things and put them together, they become infinitely heavy.*

It was time for a change . . .

*(For many more details of the N4RVE story, the next chapter, and more on the intricacies of his groundbreaking two-*

*wheeled mobile computing, visit Roberts’ Web site: < <http://bit.ly/l6rWpg> >. Check out his latest venture, as well, taking place aboard his 44-foot sailboat, where amateur radio will have a home: < <http://bit.ly/jB8PkL> > – Ed.)*



**A view inside the pilothouse shows the kind of environment Steve Roberts will be enjoying when taking N4RVE onto the amateur radio airwaves — this time maritime mobile. (From N4RVE’s Web site: < <http://bit.ly/jB8PkL> > .)**

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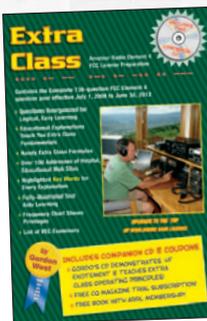
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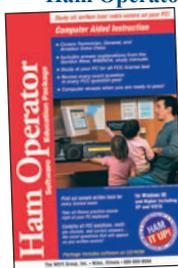
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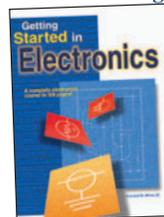
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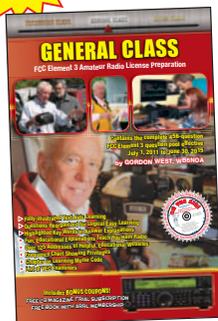
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# I Remember the 1930s – Amateur Radio’s ‘Golden Years’

## Commentary

By Jim Pepper, W6QIF

**D**o you remember when? To borrow a line from Dickens’ *A Tale of Two Cities*, “It was the best of times, it was the worst of times . . .”

Just as the country was just coming out of the Great Depression, clouds of war were gathering on the horizon. It was the late 1930s.

Radio’s popularity in the amateur ranks was ever growing. Television hadn’t yet become a viable medium. Cell phones were only a dream. Computers were in the crudest mechanical forms.

I received my first ham license in 1937 when I was in high school. Unlike many of my friends, I hadn’t yet built my transmitter. They constructed their rig and were on the air even before their license arrived in the mail. We called them *bootleggers*.

My first contact was on 80 meters. I still remember it. I worked a station in San Luis Obispo, California, about 300 miles from my house. *What a thrill.*

Becoming a radio amateur in the ’30s meant passing an exam many people believe is more rigorous than today’s.

In most cases, becoming a ham back then meant going to a Federal Radio Commission (FRC) or Federal Communications Commission (FCC) office in a federal building known as a Custom House, located in cities around the country.

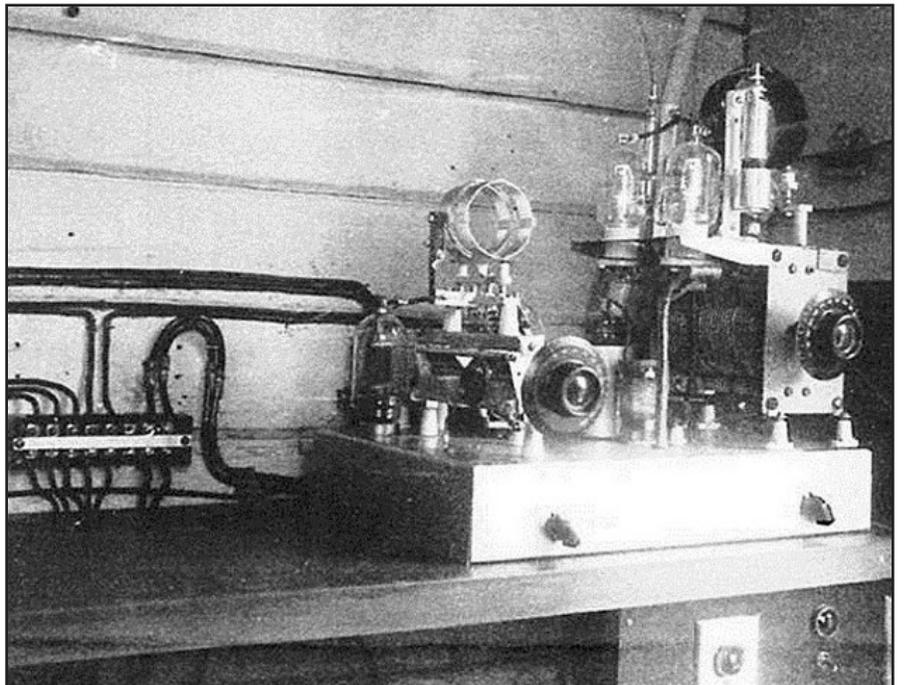
By the way, the Communications Act of 1934 established the Federal Communications Commission, which would replace the FRC.

At the exam site, you’d first take the Morse code receiving test. To pass, at least one minute of the three minutes of text had to be copied perfectly. If you got over that hurdle, the examiner would ask you to send code — at the receiving speed, or higher.

Next: The written test. But it was not the multiple-choice exam we see today. I remember being asked to “draw the circuit diagram of the type of transmitter you are planning to use and briefly explain its operation.”



A homebrew receiver, lower right, was part of Jim Pepper, W6QIF’s, station layout in decades gone by. (Courtesy of W6QIF)



In 1948, shielding wasn’t much of a concern at W6QIF. Television was in its infancy at the time. A pair of HK-24 triodes provided the “umph” in this beautiful, open-air homebrew transmitter. (Courtesy of W6QIF)



Watch William Wiegand, WØVLZ, of Rochester, Minnesota, put a vintage National SW-3 regenerative receiver through its paces in a crosstown QSO with Melvyn Larson, KCØP. < <http://bit.ly/lmniisp> >. (You Tube video screen grab)

In 1933, the FRC established three classifications of amateur radio license. Class A was the highest and authorized its holder full privileges.

Class B was an equivalent to today's General Class license, with broad privileges, except for operation on phone frequencies reserved for the Class A operator.

Class C had the same privileges as Class B operators, but were examined by other radio amateurs, rather than having to travel to a federal Custom House. To qualify, applicants had to prove they lived more than 125 airline miles from the nearest examination office. Their code and written tests were given by a Class A or B amateur operator, or some otherwise-qualified FRC or FCC official.

Class B licensees had to wait at least one year before being eligible to take the Class A exam, which consisted of more difficult technical questions.

All the classes were permitted to operate on 160 meters — 1750 to 2000 kilocycles, or kc. Today we call them kilohertz — kHz, but that's another story.

Other bands were available, with certain restrictions. The phone portion of the 80-meter band was known as 75 meters, and required a Class A license. The same was true for 20 meters. Can you imagine: 40 meters was CW-only. And mobile

operation was restricted to frequencies above 28 megacycles, Mc. — what we refer to as megahertz (MHz) these days.

In the VHF realm, there were the predecessors of the 6- and 2-meter bands — known back then as 5 and 2.5 meters.

There were nine call districts — one shy of today's 1 through Ø. All prefixes were W, with the exception of U.S. possessions, which began with K. Hawaii, for example, was K6. Alaska was K7.

In 1951, the FCC created six classes to replace the A, B and C tickets we knew.

Many newcomers to amateur radio started out on 80 meters — building their transmitter, which was often crystal controlled. After calling *CQ*, we'd tune the entire band to see if anyone was responding to our call. Often, two stations in QSO were at opposite ends of the band.

The next move was often to 160, where the addition of a modulator would put us on AM phone. Of course, we'd have to change crystals and inductances in our 80-meter transmitter circuit, as well.

Going from an 80-meter, half-wave antenna to 160 meters meant only tuning it *against ground*. If you didn't have a half-wave, then a Marconi (quarter-wave) was the next best thing.

Newcomers with the financial means would buy their receiver — while those

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without deep pockets generally had to build. Popular at the time were the National SW-3 and FB-7 and Hallcrafters Sky Buddy and Sky Champion. There was the Bretting 12, Patterson PR10, Hammarlund HQ120 and RME69. Almost everyone, though, built their transmitter.

It was a friendly time — especially on 160. Conversations dealt mainly with signal reports and description of your transmitter, from microphone to final amplifier tube.

Power was measured, but in the form of input to the final stage. It was not output *power-to-the-antenna* we use today.

There was seldom profanity. As I remember it, "*Get off my frequency*" and other raucous outbursts were not part of the radio amateur's operating procedure back then.

Transmitting music was allowed, as I recall, for radio testing and only for short periods of time. *Ah, the 1930s.*

I certainly have enjoyed my 73 years as a radio amateur and still find time to design and build gear. And, of course, getting time on the air to see how it all works!

(*Jim Pepper, W6QIF, lives in Orinda, California. — Ed.*)



## And They're Off: Horse Racing in the 21st Century

By Carl Luetzelschwab, K9LA

When I lived in the Dallas-Fort Worth area from 1979 through 1988, I used to horse race with Mike Krzystyniak, K9MK/5. No, we didn't hop on our trusty steeds and gallop to a finish line. We horse-raced in the sense of comparing the strength of our signals received in faraway places.

I had transferred from Schaumburg, Illinois to Texas with Motorola in April 1979, and Mike followed suit about a year later. He moved about five miles west of me.

In December 1981, Mike helped me put up my first tower. By the way, it is certainly nice to be able to do outside work in winter!

The tower was four sections of Rohn 25 topped with a Cushcraft three-element, 10-meter monobander at 40 feet and a Cushcraft three-element, 15-meter monobander at 45 feet.

Mike had a Telrex TB5EM tribander on a Wilson telescoping tubular tower at 70 feet. I think it could extend higher, but he played it safe.

My old logbook indicates we horse-raced a lot on 10 meters in late 1981. This period was about two years past Cycle 21's maximum — the smoothed sunspot number during December was still around 140.

As for the horse races, Mike beat me most of the time. A typical report from Japan was K9MK at S6-7 and K9LA at S5-6. I didn't feel too bad about this. It was a reasonable result for a guy whose antenna was roughly half the height of Mike's. I

came away thinking I was pretty competitive for a medium-height tower.

There's no reason why you couldn't do this kind of horse racing today with a buddy to evaluate your station's capability. But 30 years is a long time since Mike and I rounded the track, and technology has progressed to where there are other — and even better — ways to compare your signal to your buddy's.

That's the focus for this month: To review present-day technology to assess how strong your signal is at a distant location. Along the way we'll see that these technologies can determine *right now* if a path is open, and provide a direct *Antenna A versus Antenna B* comparison, as well.

### Remote Possibilities

The first technology that we'll look at is a remote receiver. As its name implies, it's simply a receiver at a designated location without someone there sitting by it.

Two things make it special — it's coupled to the Internet and it can be controlled independently by many users. You'll see the acronym SDR tied to these remote receivers (software-defined radio) — a technology that makes the *controlled-independently* feature a reality. Thus you and others can listen to different signals simultaneously. Let's see what we can do with a remote receiver.

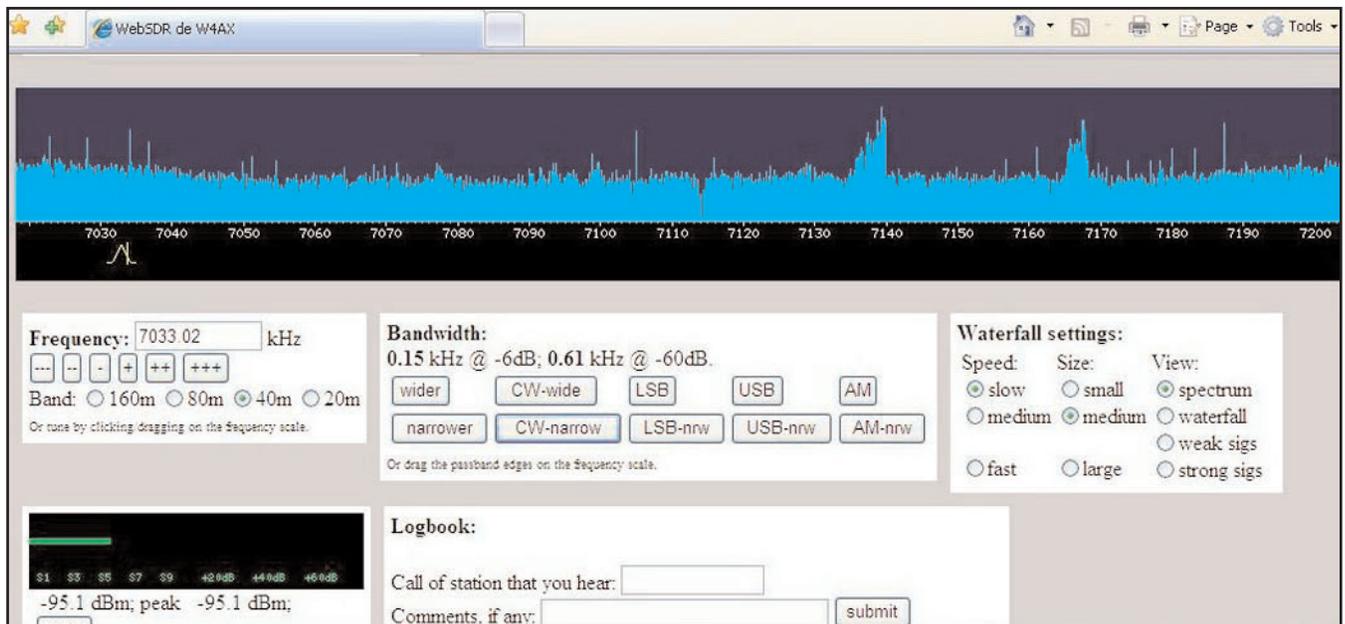
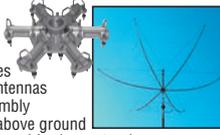


Figure 1: W4AX Remote Receiver Display.

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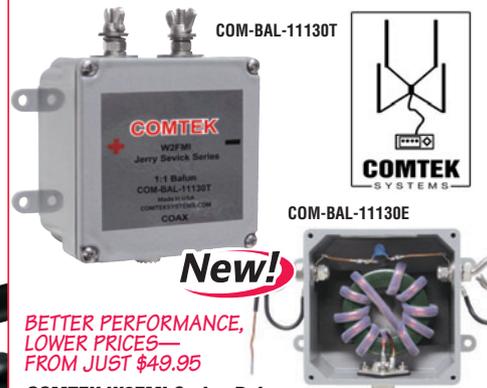
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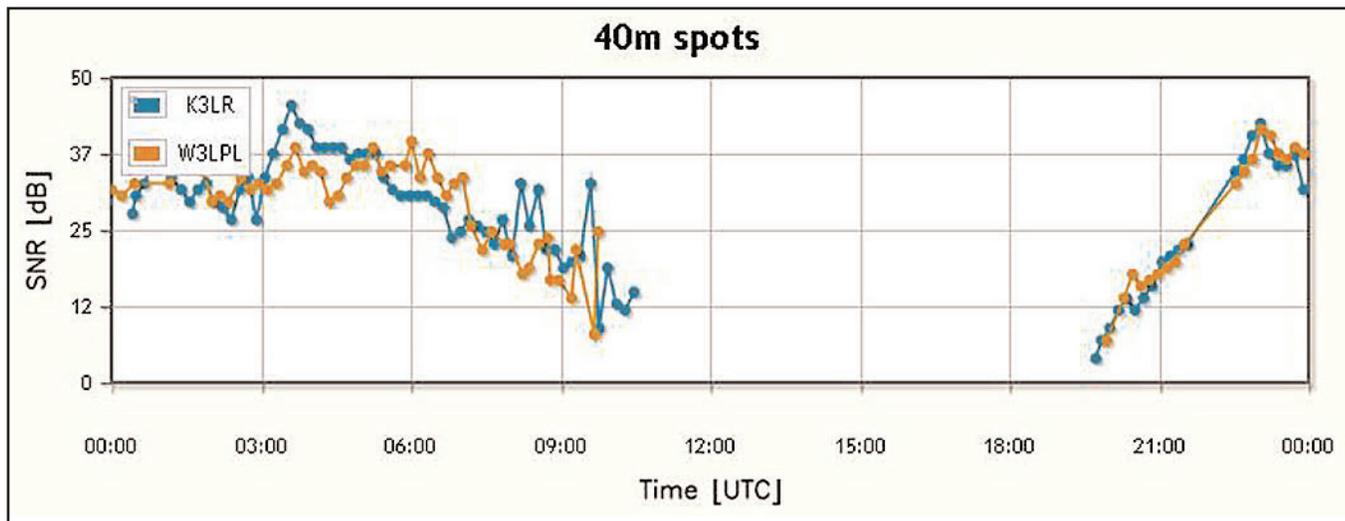


Figure 2: W3LPL versus K3LR in 2011 ARRL DX CW.

I visited < <http://www.websdr.org> > and selected the W4AX remote receiver in Atlanta. **Figure 1** is a screen shot of the W4AX display.

The window at the top is frequency versus signal level — which can be either a true signal or noise. I've selected 40 meters, a narrow CW filter bandwidth (0.15 kHz), and the spectrum view.

The horizontal axis goes from 7030 kHz to 7200 kHz (if you have trouble reading the frequency scale in **Figure 1**, don't worry — it's clear on a computer screen).

I tuned the receiver to 7033.2 kHz as indicated by the filter icon below the frequency scale. The frequency is also annotated in the box below the left side of the spectrum view.

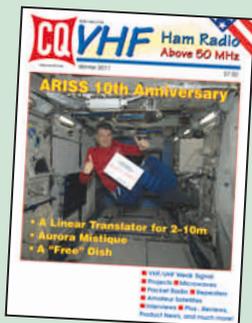
There's no signal where I tuned the receiver (you can see a signal just above 7033.02), and the level of the noise is -95 dBm (about S5, and this is given in the box at the lower left) in the 150 Hz bandwidth.

When I keyed my rig (100 watts to an inverted-V at 55 feet), a signal appeared on the spectrum view. It measured about -90

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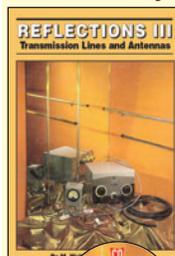
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dBm (about S6). This was on a Sunday evening in mid-April around 6:30 p.m. when there was still lots of daylight.

So here's a way for you and your buddy to compare signals. Key your rig and note your signal strength. Then have your buddy do the same thing. There are other remote receivers at this Web site (see the map there), and some are outside the U.S.

You can also check for propagation to the remote receiver location. And you can easily compare two antennas at your location. But watch it here. To achieve true results, you need to confirm that the antennas don't interact.

Of course, when performing such experiments, pick your frequencies and plan your tests to minimize QRM to other stations.

### Bringing Home the Beacon

The second technology we'll look at is the reverse beacon network (RBN). To me it is best used as an after-the-fact analysis tool rather than a real-time comparison tool.

The RBN uses SDRs to view large chunks of our radio amateur bands, decode the CW, record the calls (*spots* in the PacketCluster vernacular), measure the signal level and frequency and then save all this data.

You can then pick a receiver location, select calls to evaluate, and then compare signal levels. Let's go through an example.

I went to < <http://www.reversebeacon.net> >, selected *DX spots* at the top, and then I clicked on *spots analysis tool*. Next I selected February 19, 2011 — the first day of the ARRL CW DX Contest — chose the DK9IP Reverse Beacon (mostly because it had collected a lot of spots on the desired date) and added the calls W3LPL and K3LR in the call box. **Figure 2** is the 40-meter plot that popped up.

Frank Donovan, W3LPL, and Tim Duffy, K3LR, are two big multi-multi contest stations that go head-to-head in the major contests. The plot shows their signal strengths as measured by the DK9IP receiver on 40 meters in Germany. (Actually, it's the signal-to-noise ratio, but since the noise is the same at DK9IP for both K3LR's signal and W3LPL's signal, the SNR in the plot is directly correlated to the signal strength.)

Overall, their signal levels are pretty comparable, but there are times when one is louder than the other. That's not surprising since K3LR and W3LPL are more

than 200 miles apart, and propagation can be different over this distance.

All of this data is derived from the decoded spots, so you'll see plots for those bands on which the selected call has been spotted.

One caveat: When I first tried the RBN, a window popped up saying my Internet Explorer browser would result in extremely slow results. I can certainly confirm that. The window suggested using Firefox or Chrome as the Web browser, so I downloaded Firefox. Sure enough, the RBN results were instantaneous with Firefox. I highly recommend using one of these browsers if you're serious about using the RBN.

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### A Little Homework, and You're Ready to Go

So there you have it. Two interesting technologies are yours to assess station capability — whether it be a signal comparison between you and your buddy or a comparison made from your own location.

Regardless of the reason, I'm guessing you'll have fun with these new technologies. But before you start, be sure to read the background information at the two referenced Web sites — it will give you a more thorough introduction to these technologies than the summary I've given you in this month's column.

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# The Rules Say...

John B. Johnston, W3BE

## Callsigns on the Ocean Blue

**Q** I am taking an extended Caribbean cruise during which I intend to take an HF rig and antenna along. As I understand it, I will have to append /WW to my callsign for the station identification announcement. That would make it W4\*\*\*/WW. Is this correct?

A. No, that is not an obligation as far the FCC rules are concerned. Section 97.119(a) states:

“Each amateur station, except a space station or telecommand station, must transmit its assigned call sign on its transmitting channel at the end of each communication, and at least every 10 minutes during a communication, for the purpose of clearly making the source of the transmissions from the station known to those receiving the transmissions. No station may transmit unidentified communications or signals, or transmit as the station callsign, any callsign not authorized to the station.”

According to your license grant shown on the FCC ULS, your station’s FCC-assigned callsign is W4\*\*\*. Your station, therefore — at least while it is transmitting solely under the authority of your FCC-issued license grant — is obligated only to transmit that unadorned FCC-assigned call sign when making the station identification announcement.

**Q. But I anticipate that an indicator appended to my station’s call sign might help in making more QSOs. I want to alert my listeners on the band that I am aboard a Caribbean Sea cruise ship. Otherwise, they may not realize my station is at sea and overlook its transmissions. How should I add one?**

A. Just say something like: “This is W4\*\*\*, slant mark, aboard the cruise ship Colossal Mermaid of the Caribbean Sea,” or whatever.

**Q. But I only intend to work CW. That wordy indicator has too many characters to key. I need something a whole lot shorter. What should I use?**

A. Section 97.119(c) states:

“(c) One or more indicators may be included with the callsign. Each indicator must be separated from the callsign by the slant mark (/) or by any suitable word that denotes the slant mark. If an indicator is self-assigned, it must be included before, after or both before and after, the call sign. No self-assigned indicator may conflict with any other indicator specified by the FCC Rules or with any prefix assigned to another country.”

To make it meaningful, you need for the listeners to your station’s ID announcement transmissions to comprehend what it is you are trying to tell them. That’s where the identifier appendage comes in. It might give them a clue that your station is transmitting from somewhere other than your postal mailing address shown on the ULS.

For a station transmitting from a vehicle traveling in a place where our amateur service is regulated by the FCC, BE Informed

No. 52 < <http://bit.ly/ep2x96> > recommends appending to your station’s FCC-assigned callsign WW for waterborne vehicles. That selection is within the ITU-assigned nationality identifier series WA-WZ assigned to the United States.

Do not use the letters M or MM. They are the I.T.U.-assigned nationality identifiers for the United Kingdom of Great Britain and Northern Ireland. Their use by a FCC-licensed station would conflict with prefixes assigned to other countries and be non-compliant with Section 97.119(c). Respect the amateur operators in those countries and our DXers who rely upon those nationality identifiers while stalking the bands.

**Q. But I don’t like WW for an identifier. What else can I use?**

A. It’s your choice among everything except those that conflict with an indicator specified by the FCC rules or with any prefix assigned to another country. Even though /M and /MM are prohibited on CW and digital modes, “marine mobile” or “maritime mobile” are just fine on voice modes. Whichever indicator you choose to append to your FCC-assigned call sign, you want your listeners to understand its meaning.

**Q. What are the indicators specified by the FCC rules that I can’t choose?**

A. They are:

AE, AG and KT are for recent upgrades. Read Section 97.119(f).

AAA-AEZ and ALA-ALZ, AFA-AKZ, NAA-NZZ are for non-FCC Government amateur stations. Read Section 2.302.

KH0, KH1, KH2, KH4, KH5, KH5K, KH6, KH7, KH9, KL7; KP1, KP2, KP4, KP5, W0, W1, W2, W3, W4, W5, W6, W7, W8 and W9 are for reciprocal aliens. Read the FCC webpage *About Amateur Reciprocal Operating Arrangements*.

**Q. Would W4\*\*\*/WW cover both a saltwater ocean and a freshwater lake?**

A. Yes. If it is important to you that your listeners know whether your station is onboard a vehicle afloat in salt or in freshwater, try /WWS (salt) and /WWF (fresh).

**Q. What else should I know about cruise ship operating?**

A. Be knowledgeable of Section 97.11, *Stations aboard ships or aircraft*. It states:

“(a) The installation and operation of an amateur station on a ship or aircraft must be approved by the master of the ship or pilot in command of the aircraft.

“(b) The station must be separate from and independent of all other radio apparatus installed on the ship or aircraft, except a common antenna may be shared with a voluntary ship radio installation. The station’s transmissions must not cause interference to any other apparatus installed on the ship or aircraft.

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“(c) The station must not constitute a hazard to the safety of life or property. For a station aboard an aircraft, the apparatus shall not be operated while the aircraft is operating under Instrument Flight Rules, as defined by the FAA, unless the station has been found to comply with all applicable FAA Rules.”

You could very likely encounter some complex regulatory circumstances with which to contend. First and foremost, there are the rules of the country in which the ship is registered. If you are uncertain whether or not the master of the ship is aware of those rules when approving your installation and operation, check with the communications regulatory agency of the ship’s country of registry. While you are aboard the ship, you may be obligated to observe those rules. If you are unable to do that, do not cause or allow your station to transmit.

When the ship is within the territorial limits of the United States, you are, moreover, also obligated to comply with the FCC’s Part 97. The operative rules in this situation are our Part 97, but not to exceed any limitations set forth by the master of the ship.

Sections 97.5(a)(1) and (2) state:

“(a) The station apparatus must be under the physical control of a person named in an amateur station license grant on the ULS consolidated license database or a person authorized for alien reciprocal operation by §97.107 of this part, before the

station may transmit on any amateur service frequency from any place that is:

“(1) Within 50 km of the Earth’s surface and at a place where the amateur service is regulated by the FCC;

“(2) Within 50 km of the Earth’s surface and aboard any vessel or craft that is documented or registered in the United States.”

Do not presume your cruise ship is registered or documented in the United States just because it sails from a U.S. port.

### Q. What if the rules of the ship’s country are different from the FCC’s rules?

A. The more restrictive of the two sets of rules apply. The same pertains while on the high seas unless the regulations of the country of the ship’s registry allow otherwise.

The Caribbean is within ITU Region 2. Should your cruise be in the Mediterranean, for example, you would be within ITU Region 1. A cruise far into the Pacific could be in Region 3. Fortunately, Sections 97.301 and 303 take these regions into account in authorizing transmitting frequencies and specifying sharing requirements.

Then there is the circumstance where the ship is within the territorial limits of a country with which the United States has reciprocal operating arrangements. The operative rules in this situation are those of that reciprocal country. The regulations of that hosting country apply exclusively, including station identification requirements. These countries — which include numerous Caribbean destinations — are listed on the FCC Web site.

Also, subject to the regulations in force in the country visited, a U.S. citizen holding a General, Advanced or Amateur Extra Class operator license granted by the FCC is supposed to be authorized to utilize temporarily an amateur station in a European Conference of Postal and Telecommunications Administrations (CEPT) country that has implemented certain recommendations with respect to the United States. The person must have in his or her possession a copy of FCC Public Notice DA 09-2031 dated September 10, 2009; proof of U.S. citizenship; and evidence of the FCC license grant. These documents must be shown to proper authorities upon request. Read Section 97.3(a)(12).

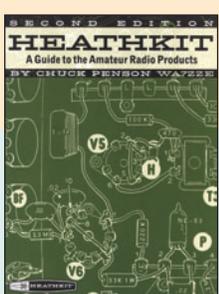
For a U.S. citizen to operate an amateur station in a country belonging to the Inter-American Telecommunication Commission or Comisión Interamericana de Telecomunicaciones (CITEL), there is an International Amateur Radio Permit. It is a document issued pursuant to the terms of the Inter-American Convention on an IARP by a country signatory to that Convention, other than the United States. Read Section 97.3(a)(24).

Finally, there is the circumstance where the ship is within the territorial limits of a country with which our United States does not have a reciprocal operating arrangement. Unless there is some other understanding between the ship’s country of registry and your hosting country, you are on your own. The regulations of that hosting country apply. You might also check with the master of the ship.

*Bon voyage!*

### 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](mailto:john@johnston.net) >.



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# Passing the Torch On the YL Beat

*This month we say a sad goodbye to a tremendous YL columnist, and hello to a new face and voice for the future. For more, see this month's Editor's Log on Page 6.*

By Cheryl Muhr, NØWBV

## A Fond Farewell

In 2002, I took over writing the YL column for *WorldRadio* — when it was still a printed magazine.

In that time, I have had the pleasure of making many new friends — both from people contributing to the column and those who sent in comments upon reading it.

I have one thing to say: Thank you!

After nearly nine years of authorship, it is time to pass the torch and keep this column fresh. I have enjoyed finding out what all the YLs are doing in amateur radio and plan on reading all the new happenings.

I hope to even find myself doing something worth contributing to Jennifer O'Connell, KI6OIL, as she proceeds with keeping us up-to-date with YL events, contests and much, much more.

I haven't given up ham radio or being involved! I'm a regular at the Buckeye Belle/YLRL (Young Ladies' Radio League) booth at the Dayton Hamvention® and plan on attending the YLRL Convention in Boston this month.

Of course there is still the matter of finishing up my YL Friendship Award for 2011 and I have my color all picked out to give as an exchange. Plus I have yet to hit the "unofficial" YL net on Thursday nights for this year. So much left to pursue! (*The Thursday Night YL Net is at 0100 UTC daylight time or 0200 UTC standard time on 14.288 or 7.193 MHz depending on band conditions.* — Ed.)

It has been a pleasure to be your contact with the YL world of amateur radio for so long and I hope to meet you on the bands in the future.

For now, *so long* and here's a warm welcome to Jennifer, KI6OIL, as the new YL columnist for *WorldRadio Online*. Keep sending her YL news!

33 & 73

Cheryl, NØWBV

## 'Allow myself to introduce . . . myself'

That's a line from one of my favorite movies — 1997's *Austin Powers: International Man of Mystery* — and a way of telling you I'm not only an avid YL, but a film junkie too!

This is Jennifer Oliver O'Connell, KI6OIL, and I am humbly taking the reins from Cheryl. These are big shoes to fill, and I hope you find my offerings both interesting and worth the read.

My affair with amateur radio started back in 2006 when my boyfriend invited me to come to one of his W6SD San



**Cheryl Muhr, NØWBV, works phone from Svalbard in the Arctic Circle.** (Courtesy of NØWBV)

*Fernando Valley Amateur Radio Club* meetings. Fortunately, as I fell in love with him, I also fell in love with this hobby. Being a woman who doesn't have hobbies, I decided it was worth pursuing.

With my OM Lynn O'Connell, KG6DNY's, encouragement, I finally took the Technician class exam, passed and got my ticket. Lynn also upgraded to *husband* right around that time. In 2009, I upgraded to General class, and once I learn Morse code and get more practical experience, I plan to go for my Extra.

Because we're often mobile, I spend most of my time on 2 meters with a little hand-held ICOM IC-V8, making use of repeaters to check into nets and get the lowdown on the Southern California ham community.

It is my hope not only to write about all the news on YLs around the nation — and world — but to do profiles of YLs who are actively making a stamp on this hobby.

My OM and I regularly provide communications for a stage of the annual *Baker to Vegas Challenge Cup Relays*

< <http://www.bakervegas.com/> >, using an HTX-212, 2-meter mobile transceiver.

Joy Matlack, KD6FJV, is the communications director for the event and does a tremendous job. If I can ever pin her down, I hope to get an interview so you can read about her work.

Our last ham adventure was in early May for the *Military Radio Collector's Group* annual retreat in San Luis Obispo, California < <http://www.mrcgwest.org/> >.

I love the aspect of seeing how communications has changed the course of wars and our society, and seeing all those well-preserved and restored radios on display from World War I, World War II, the Korean War and other conflicts.

Lynn Fielding, KE6JZD, coordinates this event every year, and I sat down with her to get a few words and pictures, as well as talked to some of the YLs who attend with their OMs and share in this lovefest. So stay tuned to this column for a write up on this enjoyable weekend.

As for life outside of ham radio: I am a writer, musician, Yoga instructor and reinvention coach — *say that five times fast!*



**Jennifer Oliver O'Connell, KI6OIL, with OM Lynn O'Connell, KG6DNY.**  
(Courtesy of KI6OIL)

I regularly write the *Faith & Community* page for Examiner.com, and I was editor of the ARRL LAX-Section-wide newsletter for two years.

I've traveled to Sri Lanka, Haiti and Ghana on mission trips, so my hope is to do a DXpedition one of these days.

In the meantime, I know some YLs

planning a DXpedition this year, so writing about them will suffice for now.

I look forward to communicating with you through this column and maybe on the air!

33 & 73

Jennifer Oliver O'Connell, KI6OIL

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## A European Adventure As Electric As It Was Eclectic

By Richard Fisher, KI6SN

A year ago this month, **Dominic Baines, M1KTA**, and his wife bicycled from Andermatt, in the Swiss Alps, to Hoek Van, Holland, on the North Sea, racking up 1,068 miles, a whole lot of QSOs and memories galore.

It was a trail-friendly ride, for sure, with lightweight amateur radio gear aboard and battery-charging power coming from the bicycle itself. *Pedal power*, for real.

From Holland they took a ferry to the United Kingdom and finished their ride home to Cambridge, England. So, “add another 100 miles or so,” Baines said.

“I was operating /P — not /M! — as I went using self-generated power only and QRP (low power amateur radio) the whole way,” KTA said. *(For regulations regarding the use of /M and /MM as an identifier on CW, see this month’s Rules and Regulations column. — Ed.)*

Baines used a hub dynamo electric generator < <http://bit.ly/jhDSZj> > on the front wheel of his bicycle and a bottle dynamo < <http://bit.ly/kZow8Y> > on the rear, through a voltage tripler to recharge two, 12-V SLA (sealed lead-acid) batteries — one, 1.2 AH; the other, 4.2 AH.

“One of the photos is showing how when static, (fixed mobile) I can maintain charging if slowly hand cranking the bicycle,” Baines said. In the picture, “the rear wheel is spinning and it looks like there are no spokes!” Baines assures *there are*.

KTA’s gear included an FT-817 transceiver and antenna tuning unit. He used a bicycle-mounted, ATX100, base-loaded whip antenna or a W3EDP for multiband operation. *(A description and analysis of the W3EDP antenna by Charles Lofgren, W6JJZ, can be found at: < <http://bit.ly/mvj09e> >. — Ed.)*

“I was (on the air on) CW, SSB and PSK-31 from HB9 (Switzerland), HBØ (Liechtenstein), OE (Austria), DL (Germany), F (France) and from PA (Netherlands) along the Rhine river “from the bridge at Arnhem” — made famous in the 1974 Cornelius Ryan book, *A Bridge Too Far*, and the 1977 Richard Attenborough-directed movie by the same name.

*(Visit M1KTA’s Internet blog at: < <http://bit.ly/lc0bik> >. — Ed.)*

### Kudos On A Fine Antenna Article, But What About DTV?

**Dennis Kagel, WA2JWO**, writes from Schuylerville, New York that he had “just read your *Trail-Friendly Radio* column on the 440 coat hanger antenna. (“*A Coat Hanger Beam to Hang Your 440 MHz FM Signal On*,” April 2011 WRO, Page 22. — Ed.)

“It is an excellent article and instructions on how to build the antenna. Thank you!

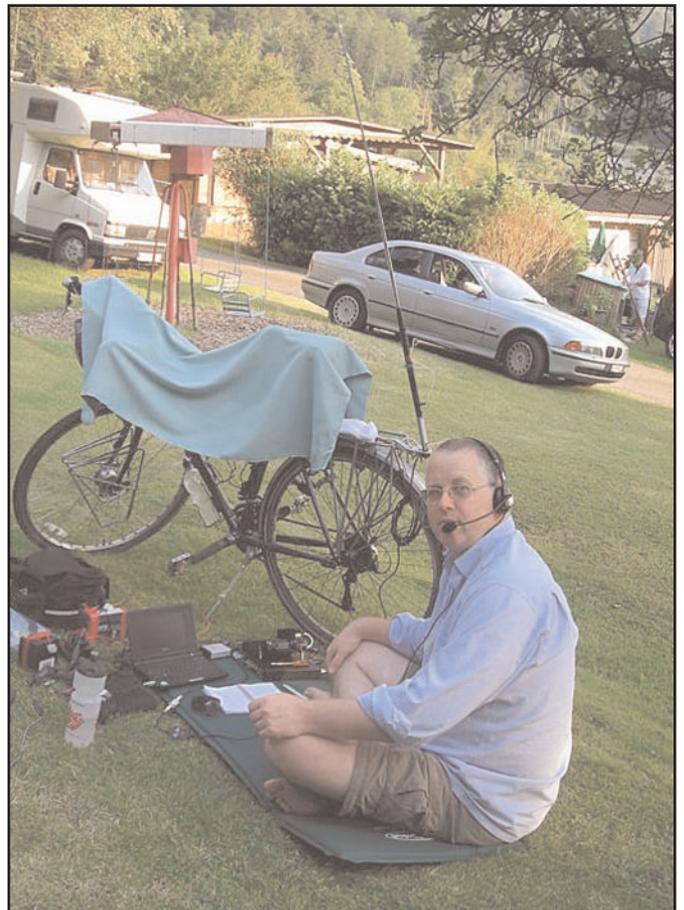
“I am about to build two of them. One is for me, and the other is for a friend who lives in a condominium and has extreme

restrictions on antennas. I think he will be able to use this antenna as a portable when he wants to get on 440 MHz.

“Here’s my question: You mentioned a digital TV (DTV) version of this antenna. Do you have the element lengths and spacing available for that antenna?”

“Even though I am a captive subscriber to the local cable and Internet system, I would like to experiment with the over-the-air digital TV.”

**FROM KI6SN:** Dennis, the kind words are greatly appreciated. We have gotten quite a reaction to the article and are glad to know UHFers such as you are finding it inspiring and useful.



**A base-loaded, ATX100, mobile whip antenna is mounted on the back of Dominic Baines, M1KTA’s, bicycle for on-air operation during a 1,100+ mile ride in Europe a year ago this month. (Photographs courtesy of M1KTA)**

20M SSB

TX

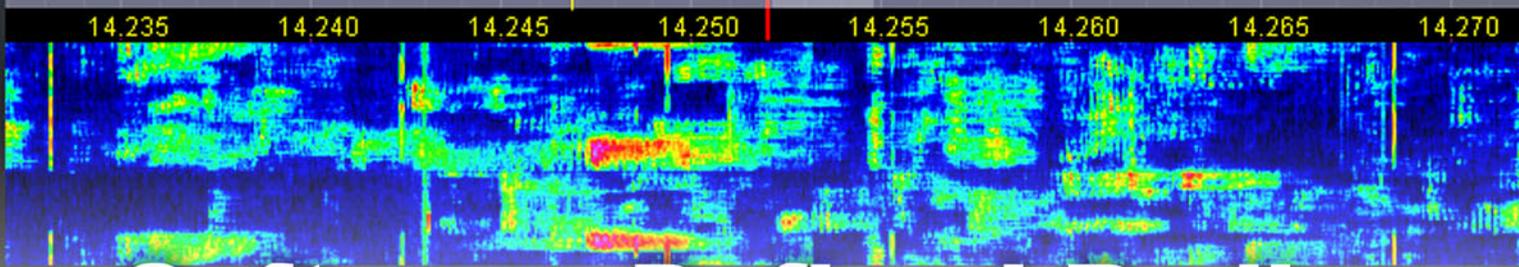
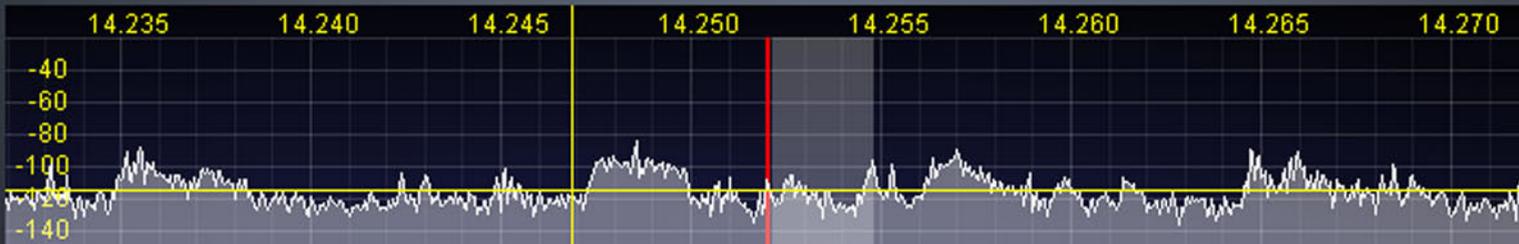
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Restore

TX

20M Ext/Adv SSB



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Even when mobile-at-rest, M1KTA is able to charge his amateur radio station's batteries by hand cranking his inverted bicycle's back wheel to activate a small generator. No, that's not a spoke-less wheel you're seeing. He's cranking so fast, you can't see them.

The DTV antenna alluded to in the column is actually completely different from the 440 MHz FM antenna, however. About the only resemblance in design is that there are coat hangers sticking out both from everywhere.

You're in luck, though. I've written a construction piece about the DTV antenna for the August 2011 edition of *Popular Communications* magazine — available at many bookstores and newsstands, or from CQ Communications < <http://www.popular-communications.com/> >.

DTV DXing is very interesting, and this little guy does a very nice job pulling in distant stations. I'm regularly receiving more than 100 free DTV channels from my QTH midway between Los Angeles and Palm Springs in Southern California.

So when you can, grab a copy of August's *Pop'Comm* and you'll find out everything you need to know to make a coat hanger DTV antenna of your own. You never know: It might pull in stations to rival your cable company's line-up.

### LWDR Twinlead 2-Meter J-Pole . . . Yikes!

Don Dorward, VA3DDN, of Pickering, Ontario, Canada, "was quite interested to read the article on the Loose-Wire,

Double Radiator, (LWDR) 300-ohm, twinlead, 2-meter, J-Pole antenna in January 2011 WRO's Trail-Friendly Radio. ("In Reprise, That Little 2-Meter, 300-Ohm, Twinlead J-Pole," Page 43 – Ed.)

He did an analysis and didn't like what he saw:

"From what I understand, this is a modification of a J-pole, modeled by the late L.B. Cebik, taking into account the unconnected *loose wire* opposite the normal half-wave radiator.

"This design is also based on what Cebik calls a *non-standard J-pole* design, where the half-wave element is made shorter than a *normal* half wavelength, and the quarter wave matching section is made longer than a *normal* quarter wavelength.

"What concerned me, however, was that the build dimensions published for the J-pole construction appear to be those taken from what Cebik calls his *bare-wire proof of principle model*," Dorward said . . . "In other words, Cebik does not expect his *bare-wire proof of principle model* to be built *as-is* without substantially modifying the theoretical dimensions — to account for the effect of both wire insulation and, most importantly, the velocity factor of the particular twinlead used."

Dorward goes on to say how surprised he is to read the testimonials about the antenna's good performance from amateurs who have built it, based on the T-FR piece.

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A long way from his home in Cambridge, England, M1KTA made frequent stops to get on the air during his bicycle trip from Switzerland to Holland last summer.

In his narrative — posted in full on the *Trail-Friendly Radio Extra* Web site — VA3DDN describes his experience in duplicating the LWDR based on our dimensions and the serious performance issues he encountered. (*HINT: They're not good.*)

Dorward presents a chart of measurements, as well, documenting his findings: < <http://www.TrailFriendlyRadio.blog.spot.com> >. Very interesting and very useful. His piece is *must reading* for sure.

We'll have more on this little antenna in an upcoming column.



On a 2007 visit to Switzerland prior to his bicycle trip, operation from HB9/M1KTA/P yielded about 100 SSB QSOs — with the flagpole to the right as a support for a 40/20-meter dipole. "If I had taken a 2-meter Yagi, it would have been an amazing location as line of sight was more than 80 miles — the Eiger and Jungfrau summits (Bernese-Oberland region of Switzerland) are in the photo over my right shoulder." (*From the M1KTA Internet blog*)



# A View From the Other Side of the Pile-up

By Kelly Jones, NØVD

This month's *DX World* is a bit of potpourri. First, *WRO Promotion and Recruitment* columnist Devere "Dee" Logan, WIHEO, takes a moment to reflect on his recent DXpedition to Aruba, P4.

Having been on the other side of pile-ups myself, I can relate to what Dee endured. As he points out, before you jump in, always keep in mind what is happening on the DX side. Having that knowledge will certainly help get the QSO in the log.

## A DXer Gives Back

Dee writes: "After 40-plus years of DXing, and achieving No. 1 DXCC Honor Roll status, it occurred to me that a great many DXers had provided me with those needed contacts. Many had endured major risks, spent lots of money and seldom complained about their DXpedition's difficulties in providing a 'rare one.'

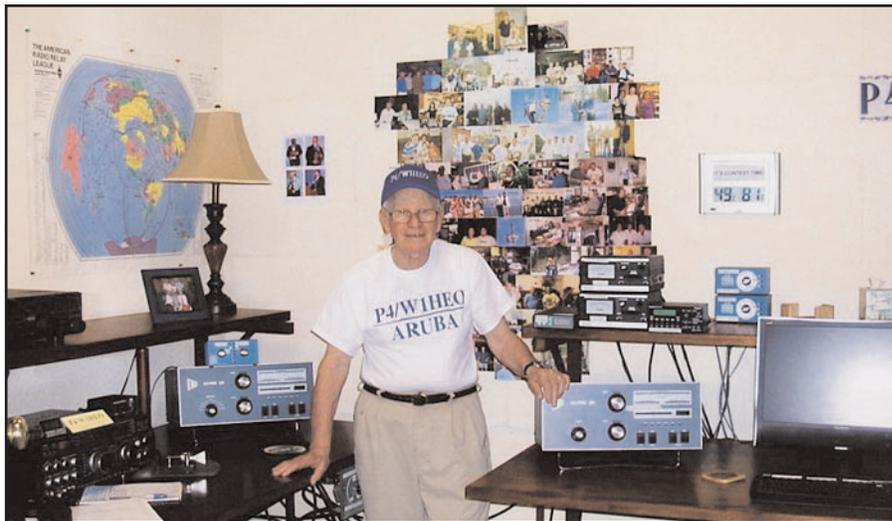
"So I decided it was time for me to make a contribution — small though it would be. I decided to leave my cozy radio shack and head for a Caribbean island. As a senior, I couldn't handle the heavy lifting of carrying my own gear, so I found a top contest station, P4ØV, that was available for rent.

"From April 2-16, my XYL and I were away from snowy Ohio, prepared for two weeks of mostly ham radio and very little time in the sun.

## From 'The Other Side'

"We discovered that life on the other side of the pileup is certainly different. Instead of listening for a single DX station, we were the DX station and picking out individual calls was often difficult.

"At times, we had to go by call numbers in order to weed out the dozens of callers. One thing we tried to do was to announce *QRZ* after completing a contact in order to signal we were listening, not transmitting. This one point is worth stressing to new DXers: *listen, listen and listen some more.*



Devere "Dee" Logan, WIHEO, *WRO Promotion and Recruitment* columnist, poses in the Aruba contest station P4ØV, where he operated during a recent DXpedition to the Caribbean island. (Photographs courtesy of WIHEO)

"We would suggest that the stations with an advantage often called on the edge of the pileup, or gave their calls quickly before the pileup volume became too high, or were even the last to give their call.

"While partial calls are discouraged by many DX veterans, there were times when that's all I could hear, and so I called them.

## True to Their Mission: 2K QSOs

"Our goal was to give an Aruba contact to as many as we could. At times, working stations rapidly without a break would wear us out, so we had to *QRX* (standby) to catch our breath. Yet, despite taking time out for meals and some sight-seeing, we managed to work almost 2,000 stations over the two weeks.

"As I work through piles of QSLs, I do note a few common errors. First, please send an *SASE* or return postage. The DX station simply may not have the funds to handle it. Also, keep your station clock accurate and on *GMT* — and be sure the

date is correct. We had many *QSL* cards with errors, requiring a log search.

"The next time you work a DX station, pause to reflect on what that operator is contributing to your *QSO*. It's probably not a casual stroll on the beach!"

## The Art of Listening

Thanks to Dee for his insights and retrospective. He is a veteran DXer and author of the book *Tips to the Top From DX Pros* and points out a couple of noteworthy items — the most important being about the importance of *listening*.

I bring this up because recently I was working around the shack and had the rig on for background noise. I was listening to a relatively common DX country on 17M, but rare enough that the operator was able to run a small pileup.

It was obvious the DX station had plenty of experience handling pileups as he was able to work guys at a pretty good clip. However, at one point it became obvious he was having a little problem copying calls so he decided to *work-by-the-numbers*. The idea behind this, as Dee



Wearing his DXpedition colors proudly, W1HEO takes a break from the action at P4/W1HEO on Aruba in April.

points out, is to thin the number of callers to a smaller group which makes picking out calls on the DX side much easier. (*The DX station specifies he or she wants, for example, only operators with '7' in their callsign or from certain areas to transmit. — Ed.*)

There are some who believe this is a good idea, while others tend to disagree — I won't go into the ideologies around working by the number, but it is effective in limiting the number of callers — *assuming everybody cooperates*. That brings me to my point.

### Conduct 'Unbecoming'

As this particular DX station began working by the numbers, there was one station in New Jersey that would call the DX station regardless of who was being worked or what call area was being requested.

At first I ignored the fact this DXer was calling out of turn, but it got to the point where it became obvious he was blatantly ignoring the situation. By the time the DX station began working 7s, I had to jump in and ask why this particular 2 would call after every QSO.

I pointed out that the DX station was working by the numbers and that New Jersey in 2-land was not part of 3, 4, 5, 6 or 7-land. Of course this upset the W2 and he chastised me for questioning his operating habits. He finally stopped calling, though, until the DX station came back around to 2s.

Here's the thing: If the DX is asking for a callsign — or partial callsign — and

it's not you, *don't call*. If the DX station is *working by the numbers* and you're not in that call area — *don't call*.

This is not just simple courtesy, but it also affects *everyone* trying to work the DX. *What?* It affects *everyone*? Yes. I'll explain.

If the DX is asking for call area 4, then he only wants stations located in call area 4 to answer him. This decreases the size of the pileup on his end making it easier to pick out a callsign.

Because he is able to pick out calls quicker, simple math tells us he will be able to work *more* callers. This increases your chance of getting into the log.

Now, if the DX is asking for call area 4 and you're in call area 2, then all you're doing is making QRM for him — and *decreasing* his ability to pick out callsigns and lowering the chance of not only you getting in the log, but everyone else as well.

The longer it takes for him to get a call, the fewer stations he will be able to work. In fact, there have been countless times when I've listened to DX stations simply QRT (*leave the air*) because operators in the pileup would not cooperate.

Now, not only did *you* not get in the log because you were in the wrong call area, but *everyone else* is boxed out because the DX operator became frustrated and simply turned off the radio.

The same things hold true if the DX station can get only a partial call. How many times have you heard the DX ask, *who's the Papa Charlie?* If your callsign does not contain the letters P and C, then standby.

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The antenna farm at P4ØV is ready for harvest, and Dee Logan, W1HEO, made the most of it during his DXpedition.

Both of these scenarios involve *listening, listening* and *listening some more*. Understand what the DX is asking for and respond only if it's applicable to you. Not only is it common courtesy and good operating practice, but you'll have a better chance of getting into the log — and very likely a lot quicker than by simply calling over and over again.

### Convention Time in the Great Southwest

Finally this month, if you happen to be in the southwestern United States during the first weekend of August, be sure to check out the 2011 ARRL Rocky Mountain Division Convention in Taos, New Mexico.

This year's convention will be held at the Sagebrush Inn and Convention Center, August 5-7. I was fortunate enough to be a forum speaker during the 2009 Division Conference and will once again be bringing a few DX topics to the 2011 conference.

A couple of *celebrities* will also be in attendance: Former FCC Special Counsel for Amateur Radio Riley Hollingsworth, K4ZDH, and DXpeditioner extraordinaire Chip Margelli, K7JA, are a couple of confirmed guest speakers.

There are many activities scheduled through the weekend. Complete details can be found on the convention website: < <http://www.2011convention.org/> >. It seems like a perfect way to wrap up your summer activity calendar.

*That's it for this month's column. A special thanks to Dee Logan, W1HEO, for sharing his recent DXpedition experiences. 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](mailto:n0vd@dxcentral.com). I'll do my best to include it in and upcoming column. Look for me on Facebook or Twitter, as well, and until next time, see you in pileups!*

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## DX Predictions

July 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/Toyko, Oceania-Australia/Melbourne, Europe-Germany/Frankfurt, and South America-Brazil/Rio de Janerio. Smoothed sunspot number = 50.

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	(17)	*17	*18	(15)	*20
12	22	*13	*16	19	18
14	25	*16	*15	21	*24
16	27	*19	(14)	23	*29
18	*29	16	(14)	22	*32
20	*29	*22	28	19	*34
22	*24	*24	*34	15	*33
24	20	*25	*35	13	*29
2	18	*25	*35	(12)	*24
4	*19	*24	*34	*17	*21
6	24	*22	*29	*20	*18
8	20	*20	*20	*17	*16

### CENTRAL U.S.A.

UTC	AFRI	ASIA	OCEA	EURO	SA
8	(16)	*18	*19	15	*17
10	(19)	*14	*17	*18	*17
12	23	*16	*16	*21	*21
14	26	18	*15	*23	*26
16	28	15	(14)	*24	*30
18	*29	(14)	(14)	*23	*33
20	*28	18	28	*22	*34
22	*24	21	*33	*19	*34
24	20	23	*35	*16	*30
2	*18	*24	*36	*14	*25
4	*19	23	*34	*14	*21
6	20	20	*29	*17	*19

### EAST COAST

UTC	AFRI	ASIA	OCEA	EURO	SA
7	19	17	*23	14	*17
9	22	(15)	*18	*17	*18
11	*28	19	*16	*21	*21
13	*31	*20	(15)	*23	*26
15	*34	17	(14)	*24	*30
17	*34	(14)	(14)	*24	*32
19	*31	18	(20)	*23	*34
21	*26	21	31	*21	*34
23	*22	23	34	*18	*31
1	*19	23	35	*16	*26
3	*16	21	*35	*13	*22
5	*23	*20	*29	*17	*19

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# Digital Repeaters: It's Time to Talk 'Turkey' – Part I

*Repeater Coordinators Set the Table, But Great Challenges Loom Ahead*

By Bill Pasternak, WA6ITF

**OK**. I know it's only July and that November is usually the season for turkey talk. But we're not talking about the two-legged kind. We're referring to reality as we know it today. It's the reality that says there are a growing number of hams who want to experiment with digital audio repeaters, but there's precious-little space to put them in the frequency spectrum.

Well, I have some ideas as to how to handle this latest *pseudo-crisis* in our hobby, but I can guarantee that just about nobody is going to like what I say. That's because it is going to hit hard on a lot of folks' ego — the unkindest cut of all.

In Part I, we'll explore a bit of the evolution of the wildly popular VHF/UHF repeater coordination landscape we see today.

In Part II, we'll focus on the impact of *paper repeaters*, take a snapshot of amateur radio's struggle to define where digital repeaters fit into today's frequency picture, and explain how the nation's judicial system may be the final arbiter of where digital ultimately resides.

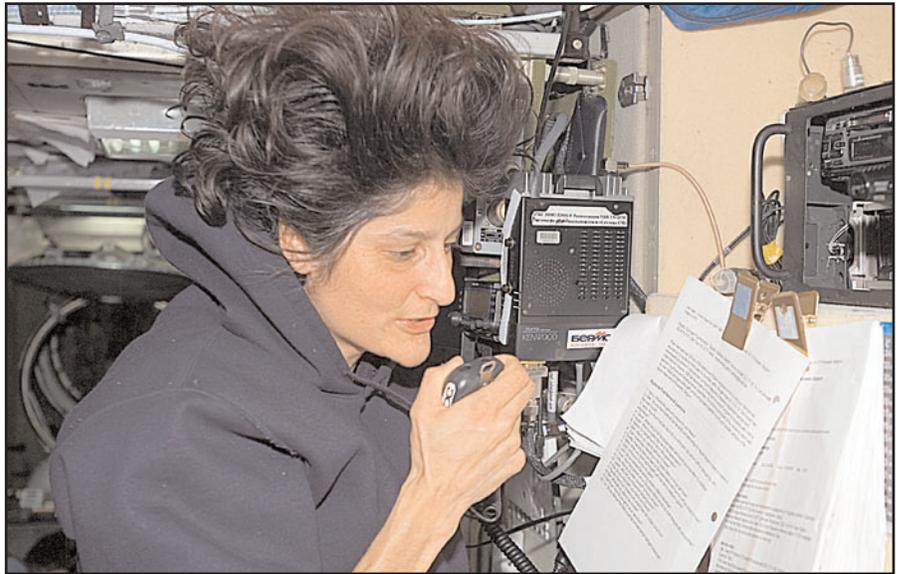
## Who Are We, Anyway? Is This Our Resumé?

In the world of repeaters there are really four groups.

First, there are the repeater coordinators. Then hams who already own one-or-more repeaters. There are the hams who want to put up a new repeater.

Finally, there is the user. He or she really doesn't care who owns or coordinates a repeater as long as it's there for personal use.

Historically, until all the new — *digital* — modes came along, the work of repeater coordinators was fairly simple because band plans were simple. There were not a lot of modes vying for space in the world above 10 meters HF. Really, only four: CW, AM, FM and SSB.



**Astronaut Sunita L. Williams, Expeditions 14 and 15 flight engineer, talks with students at the International School of Brussels in Belgium during an Amateur Radio on the International Space Station, or ARISS, in the Zvezda Service Module. (Courtesy of NASA)**

Those involved in the world of relay communications confined their interests to the FCC-mandated sub-bands where FM and repeaters operated and for the most part ignored everything else.

Early coordination issues revolved around repeater input to output separation, the amount of spectrum that should exist between repeaters, the geographic distance necessary to avoid interference between two repeaters on the same or adjacent channel pairs and protecting simplex — direct — channels from being interfered with by repeaters. Yes, there were some coordinators who got involved in broader band-planning issues, but they were the minority.

## The Big Change

Until about 1983, that was the way things stood. Then it all began to change as two things occurred that would pro-

foundly alter how the ham radio bands at 2 meters and above were utilized.

The first was the popularization of packet radio. The other: The introduction of numerous amateur radio satellites and manned operation from in-orbit.

For a while, the repeater coordination community simply ignored both these issues. After all, these operations were outside the self-declared purview of what repeater coordinators did.

As time wore on, though, these issues began to haunt the coordination community as more and more individuals involved in packet demanded their own safe haven. At the same time, international agreements were being formalized between various groups involved in amateur radio space communications aimed at designating specific frequencies or bands of frequencies for ham radio in space operations.

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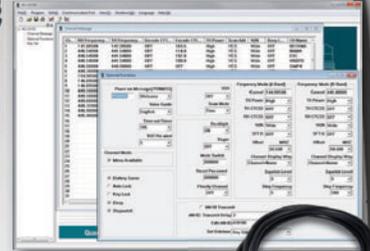
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These negotiations — which at times included national telecommunications administrators — led to the *ham radio in space international agreements* that we live with today.

In the late 1980s and early '90s, interest in packet began to fade as the Internet evolved and was made available to anyone who could afford to buy a PC or a Mac. It's likely that packet would have vanished all together if not for the work of Bob Bruninga, WB4APR, and his development of the Automatic Packet Reporting System — APRS.

According to its Web site, *APRS is a two-way, tactical, real-time digital communications system between all assets in a network sharing information about everything going on in the local area. On ham radio, this means if something is happening now, or there is information that could be valuable to you, then it should show up on your APRS radio in your mobile. APRS also supports global callsign-to-callsign messaging, bulletins, objects email and voice because every local area is seen by the Internet system. APRS should enable local and global amateur radio operator contact at anytime, anywhere and using any device.*

Not only was this very exciting, but impressive enough where several prominent ham radio equipment manufacturing companies were born because of APRS. More recently, several major manufacturers have begun incorporating APRS operation directly into *off the shelf, ready to go* ham gear. A leader in this latter group is Kenwood, though others, including Vertex-Standard (Yaesu), are beginning to make major strides in that direction.

APRS is a digital mode that uses an FM modulation scheme. As such, it was adopted by a sector of the FM com-



**Astronaut Owen Garriott, W5LFL, makes amateur radio history by working 2-meter FM from the Space Shuttle Columbia in late 1983. (Courtesy of NASA)**

munity long before others not involved in the VHF/UHF spectrum discovered it. But to survive and prosper, it required a *protected* home base frequency or set of frequencies. In the United States that became 144.39 MHz and most repeater coordinators soon embraced it in local and regional band planning. APRS had a home.

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## Space: The Final (Amateur Radio) Frontier

In November 1983 the paradigm for coordinators shifted once again, though nobody quite knew it at the time. The event was the first manned ham radio contacts from a human being in Earth orbit to hams worldwide on the ground.

The flight of astronaut Owen Garriott, W5LFL, carried a modified Motorola handi-talkie feeding a window-mounted cavity antenna on Shuttle Mission STS-9. The vehicle carrying him and his ham gear was the Space Shuttle Columbia.

Garriott was followed about a year and a half later by Tony England, WØORE, who brought slow-scan TV on the STS-51F shuttle mission aboard the Challenger. The flight was nicknamed the *Shuttle Amateur Radio Experiment*, and became an ongoing program with the acronym SAREX.

Over the years SAREX accounted for numerous space shuttle-to-school contacts that introduced youth to the marvels of both spaceflight and ham radio.

Again, for this program to be successful required dedicated spectrum and specific radio channels, now encompassing two ham radio bands.

In the U.S. and the Americas, the primary voice frequencies used during these missions were 145.55 MHz for transmissions from the spacecraft to the ground (*the downlink*) and 144.95 MHz for transmissions from the ground to the spacecraft (*the uplink*).

Digital packet and SSTV operated on these same frequencies while space flights with a fast scan ATV television uplink were to be limited to the 70 cm (440 MHz) amateur radio allocation.

Again, even though this was outside the nation's frequency coordinators' self-imposed spectrum oversight, most agreed to do all they could to keep this band space clear for manned amateur radio space operations.

## Even Tacit Approval Made Them Spectrum Managers

Because of the advent of these two programs, the role of the coordination community outside of the traditional FM subbands was taking root.

Whether FM repeater coordinators wanted the job of total spectrum management or not, by the 1990s it had been thrust upon them. There was no longer any way for them to ignore other modes

because no matter what the problem, the ham community turned to them.

While a few small packet coordinating bodies had sprung up *hither and yon*, in most places overall band planning fell at the feet of the old repeater coordinators — whether they wanted the added responsibility, or not.

## Looking Ahead to Part II

And so it was when digital audio relay in the form of D-Star, and to a lesser extent P25, were introduced to amateur radio. And the repeater coordinators —

some of whom by now had been re-christened *spectrum managers* — were handed the daunting task of fitting these requests into their local sphere of coordination responsibilities.

Not wanting to disturb the *FM status quo*, some came up with novel ideas on where to place digital voice repeater inputs and outputs in the repeater frequencies smorgasbord.

But stay tuned for August's **WRO: That's where we'll pick up the story in Part II.**

— de Bill Pasternak, WA6ITF

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# Rhode Island Prepares For a QCWA Invasion

By Dave Hayes, VE3JX



(Courtesy of QCWA)

**I**t's true! Rhode Island will experience an invasion of sorts come September. However, before you call out the National Guard, let me tell you that it is a friendly invasion. And, these invaders have been invited!

*By whom?* By five New England Chapters of the Quarter Century Wireless Association! Annually, QCWA has had a National Convention for many decades. Last year was the only exception, where the main QCWA function of the year took place in conjunction with the Dayton Hamvention®.

In 2011, the QCWA National Convention is being hosted by QCWA's *Yankee Chapter No. 112* serving Eastern Massachusetts and Rhode Island; *Pine Tree Chapter No. 134* in Maine; *Twin States Chapter No. 146* from New Hampshire and Vermont; *Nutmeg Chapter No. 149* in Connecticut; and *Pioneer Chapter No. 183* serving Central Massachusetts and north central Connecticut. The dates are: **September 9-11.**

*Convention Central* will be the Crowne Plaza Hotel at the Crossings, 801 Greenwich Ave., Warwick, Rhode Island. Warwick is quite close to Providence, the state capital of Rhode Island and T.F. Green Airport is only minutes away. The airport is serviced by Air Canada, Continental, Delta/Delta Connection/Northwest Airlines, Southwest, United and US Airways. Or, if you prefer rail, connections are available for Amtrak and ViaRail.

Free hotel shuttles to and from both the airport and rail station are available.

## What is a QCWA Convention Like?

While the social aspect is high on the agenda, national conventions are also fun and educational events. The convention committee works hard at providing activities that are of great interest to its members, as well as to the spouses of their members. Here is a synopsis of the "spoils."

**Social Events:** There is a *Meet and Greet* with lots of *hors d'oeuvres* on Friday evening. The speaker this year is Kay Craigie, N3KN, President of ARRL. Both Kay and her husband, Carter, N3AO, are QCWA members.

The next evening is the *Saturday Banquet and Dance to the Hits From Our Younger Days.*

Riley Hollingsworth, K4ZDH, retired Special Counsel for the FCC, will be the speaker. For the meal, one can choose between New York steak, chicken saltimbocca and scrod.

Finally, there is a Sunday morning *Farewell Buffet Breakfast.*

We obviously won't starve! There is also an assortment of prize drawings planned.

## Programs

There are lots of outstanding programs presented at QCWA Conventions. The educational aspect of these annual events is



**Crowne Plaza Hotel in Warwick, Rhode Island is QCWA Convention Central this year.**

(Courtesy of VFM Leonardo Inc.)



**The restored coastal spark station "PJ" (Point Judith).**

(Courtesy of New England Wireless and Steam Museum)

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what attracts many attendees. Here is a partial list of what you will enjoy in Warwick:

**QRP Made Easy**, by **Steve Kerchel, AA4AK** — Steve will explain the surprisingly many advantages of QRP operations, how to make propagation work to



**Kay Craigie, N3KN, ARRL President, is guest speaker Friday evening.** (Courtesy of ARRL)

your advantage and the many techniques for working worldwide DX using simple wire antennas.

**My Father 3ZI, 1912-1985**, by **Al Coderman, W3ZD** — Al will present a history of his father's operation from 1912 to 1985. Roy Coderman was a real pioneer ham. There are many photos from operations and antennas used throughout the years.

**Vintage Radio Museum**, by **John Ellsworth, Director** — John will talk and show photos of the Vintage Radio and Communications Museum of Connecticut and will have equipment on display.

**HandiHams**, by **Phil Temples, K9HI** — Phil will discuss his volunteer work with the HandiHams Program and what he has gained from it. He will show a video made at a HandiHams summer camp that shows the success and enthusiasm of the participants.

**Stepping Up to the SteppIR DB-36**, by **Ray Makul, K1XV** — Ray will describe and show photos of the process of replacing his large beam arrays with a new SteppIR DB-36.

**QSL Card Checking**, by **Steve Kerchel, AA4AK** — Steve will check cards for

DXCC, WAS, WAC and VUCC. Bring your cards!

**Tangier Island 2011 IOTA DXpedition**, by **Vic Culver, W4VIC** — Vic will present an illustrated talk about the trip made by Team Chapter 119, from logistics to the celebration after.

There is something of interest for me in *all* these presentations. Being a radio history lover, I am very pleased to see two programs scheduled in that sphere of interest.

One other important item would be QCWA's Annual Membership Meeting.

## Tours

Tours are often arranged for the primary benefit of members' spouses. And yet, it seems there are some in this schedule certain to catch the eye of the members, as well:

**Thursday:** 1 p.m.-5 p.m. — Tours of **Federal Hill**, the **harbor**, **Brown University** and a stop at the **Rhode Island State House**.

**Friday:** 10 a.m.-4 p.m. — Tour of **Newport** with a guided tour of one of the **mansions**. **Lunch** (on own) and **shopping** in Newport.



**Here are some of the shortwave receivers on display at the New England Wireless and Steam Museum.** (Courtesy of New England Wireless and Steam Museum)

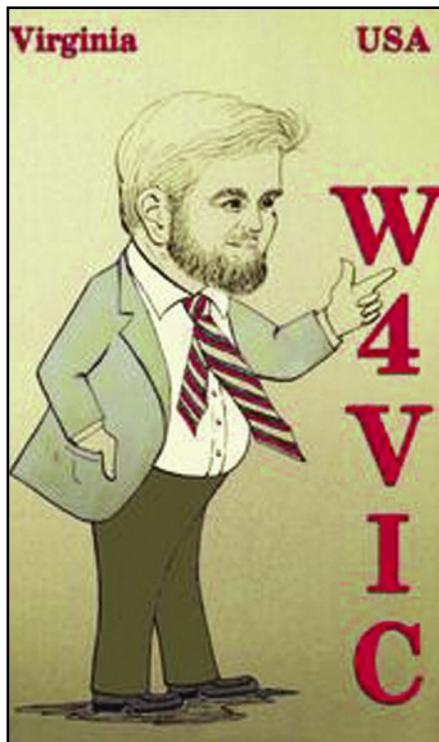
**Saturday:** 11 a.m.-4:30 p.m. — Trip to the *New England Wireless and Steam Museum* and *QCWA picnic*, box lunch included.

**Sunday:** 1 p.m.-4 p.m. — Trip to *Herreshoff America's Cup Museum* in Bristol. Includes admission.

**Monday:** Special post-convention trip to *ARRL Headquarters* and an opportu-



**Vic Culver, W4VIC**, will give a presentation on the *Tangier Island 2011 IOTA DXpedition*. (Courtesy of *Virginia QCWA News*)



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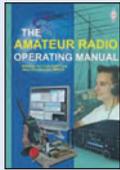


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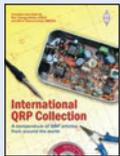
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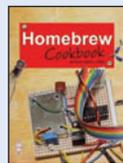
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nity to *operate* WIAW (bring a photocopy of your license).

When I first saw the tours and the programs I was worried there might be a conflict. I am referring to the tour Saturday, possibly conflicting with the programs listed. I have been assured by the convention committee that they are scheduling the programs so as to avoid conflicting with the QCWA picnic lunch at the New England Wireless and Steam Museum. *That's great.* Most of us will want to do both.

The museum has the fully-restored Point Judith (call letters: PJ) coastal spark station. I have seen it in pictures. You should see the "pump handle" on the telegraph key there. The museum also has an extensive inventory of early wireless equipment on display.

## No Rush to Get Home?

Most conventioners will be returning home on Sunday. However, if you're in no hurry, there is the Monday special post-convention tour of ARRL Headquarters in Newington, Connecticut. It includes the possibility of operating the

Hiram Percy Maxim Memorial Station, WIAW. This station has been faithfully serving the amateur radio community with on-air bulletins and code-practice sessions for many decades. Maxim was founder and first president of the American Radio Relay League.

## On the Other Hand . . .

There is a tour arranged for early-birds to the convention, as well, on Thursday. This would be of special interest to the spouses of directors and executive members, since the annual board meeting is on that day.

## Allure of 'The Ocean State'

The QCWA Convention Committee made these comments about the area:

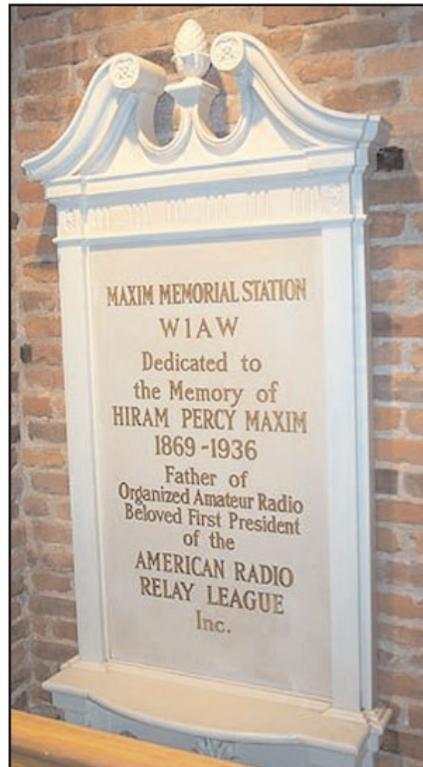
*Rhode Island offers many interesting places to visit if our tours do not interest you such as: Museums, zoo, parks, shopping and great beaches to name a few. The "Creative Capital" of Providence, Rhode Island has indeed been reborn in the last decade, as residents have reclaimed derelict buildings and two of the city's three rivers, created waterside walkways and welcomed brand-name shopping.*

*When you add in a burgeoning dining scene, rich New England history, the new Chace Center at the Museum of Art — Rhode Island School of Design (it displays twice as much art as before), a monthly gallery night and a renowned performing arts scene, this underrated city seems tailor-made for a quick and fulfilling getaway."*

## Join the Invasion

If you have had your appetite whetted sufficiently to attend, the best thing to do is visit the QCWA Web site: < <http://www.qcwa.org> >. On the home page, you will see the link: "Sep 9 to 11 - QCWA Convention, Warwick, RI." That will take you to a PDF document containing an application form for the convention, its social events and tours. Then select what you want for an awesome weekend.

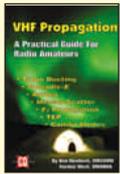
Annual National Conventions are just one perk of QCWA membership. If you were first licensed as a radio amateur in 1986 or before, and are currently licensed as one, why not consider joining QCWA and enjoy the camaraderie of other fellow veterans of our great hobby? You'll be glad you did.



A sign at WIAW at ARRL Headquarters in Newington honors Hiram P. Maxim, founder of the League. (Courtesy of ARRL)

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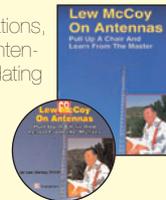
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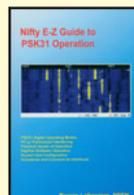


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# The Celly: Using EMR and Topography to Prove a Point

By Carole Perry, WB2MGP

In the six years since I've retired from teaching *Introduction to Amateur Radio* to sixth, seventh and eighth graders, I've been very impressed with the changes in curriculum, especially in the sciences.

As technology changes, science teachers incorporate the changes in their lessons — along with changes in motivations, because society and its children continue to change, as well.

I've had many opportunities to visit schools across the country and to observe some of the new and timely issues and concerns — such as energy conservation, radiation exposure, digital communications and so on — being included in lessons and discussions in the classroom.

Always on the lookout for candidates for the Radio Club of America *Young Achiever Award*, I go to science fairs and speak with students who have demonstrated creativity in wireless communications. I have compiled a very interesting collection of student-driven and teacher-inspired experiments that can be used by teachers or instructors who have included ham radio in their curriculum.

Back in the 1980s, I could thrill my students with demonstrations of a 2-meter autopatch. In today's classrooms, teachers have to remind the students to shut off their electronic devices — that are always with them. So the smart teacher uses today's technology and helps the kids better *understand* what they're "plugging into."

### 'How Well Can You Hear Me Now?'

Here is a popular experiment that the students loved working on at a school in Florida. I watched it being introduced and am pleased to pass it along as a project you can modify to best apply to your own class.

The topic is *Cellular Phone EMR and Topography*. The materials needed are: two people, each with a cell phone; wrist-watch with second hand, a detailed map of your area and a notebook.

The teacher taught a few days of back-



**Students participating in the *Cellular Phone EMR and Topography* experiment have no trouble using the device central to the exercise — the cell phone. It seems every kid has one. (Photographs courtesy of WB2MGP)**

ground by having the students identify cell towers in their neighborhoods. They had previously done a lesson on microwave towers in their town.

Cell phones use radio signals that are received and transmitted through communications towers, each of which services a small zone called a *cell*. You can see cell towers all over the country. The call is passed along from one cell tower to the next as it moves through an area's cells.

Cell phones have low-power transmitters in them — usually operating at 0.75 to 1 watt of power. The radio waves that send the encoded signal are made of electromagnetic radiation.

The function of an antenna is to launch and receive radio waves. In this case, these waves are sent from your cell phone and picked up by a receiver in the cell phone tower.

Electromagnetic radiation (EMR) is made up of waves of energy moving at the speed of light — 186,000 miles per second. These waves can be bent, deflected, focused or even blocked, depending on certain geographical conditions.

The teacher stressed that with today's technology it's possible to geo-locate a person using a cellular phone down to a range of a few meters, anywhere on the globe.

With a basic understanding of the technology involved, over the course of a week the students made calls from different locations to a stationary location. The calls were made at the same time of day. Coverage quality was rated according to how quickly the connection was made, the clarity of the people's voices, and the consistency of signal (no breaking up).

The hypothesis is that coverage will vary according to topographical features present in the initiating caller's location.

Over the course of a week, a daily two-minute call time was coordinated with a friend. Morning is best since later in the day increased radio-wave *traffic* from other devices can degrade your connection and skew your results.

The class then used a local area map and chose eight locations, which varied each day — near buildings, in an open area, from a high place, between trees,

near water and so on. The weather was not a factor. It was mild every day.

The signals were rated on a scale from 1 to 10, with the higher numbers indicating a better signal. Students wrote their numbers on the map they had used and compared the signal strengths with the topography of the area.

As predicted, the topography influenced the quality of the cell phone signal. Most signals that were rated 1-4 were from buildings — especially when surrounded by other tall buildings. It was also observed that the height of the transmission played a role in the signal strength. Since higher places have fewer

obstacles, the strength of the signal increased from rooftops.

While calls from the wooded area of a park were not generally very good, the signal of the cell phone increased greatly when the students went into an open field.

I referred the teacher to a *WorldRadio Online* column I wrote in September 2009 highlighting the experiment done by the ARGYL (Amateur Radio Group for Youth in Lowell) kids with their teacher Al Eckman, WW8WW. They did a *Let's go Mobiling* presentation at my Dayton Youth forum where they described how they had tested the signals from their hand-held radios in different locations, such as

a hot air balloon, a locomotive and a plane.

The teacher was then able to show her students how a cell phone is really a radio. There's not a big difference between a cell phone and a simple three-transistor walkie-talkie that most of us probably played with as kids.

Because of the use of towers in each cell, there is more extensive frequency reuse across a city, which means millions of people can use cell phones simultaneously.

### Tips to Remember

Always make technology lessons appropriate and relevant to the age level of your students. What could be more relevant to teens in today's world than working with the technology of cell phones to introduce studies about radio?

Be sure to share your interesting classroom experiments with the rest of who are interested in high motivation technology lessons. Also, be on the lookout for me for that technically-gifted and creative youngster in high school or middle school who might qualify for an RCA Young Achiever Award. Visit the RCA Web site: < <http://www.radioclubofamerica.org> >.



Kids at age eight are already thoroughly immersed in mobile technology.



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**OKLAHOMA CITY, OKLAHOMA — 36th Annual Ham Holiday 2011**, July 29-30. Presented by the **Central Oklahoma Radio Amateurs Inc.**, at the Biltmore Hotel/Conference Center, I-40 and Meridian, Oklahoma City <<http://www.biltmoreok.com>>. From 4 p.m. to 8 p.m. Friday, July 29; and 8 a.m. to 3 p.m. Saturday, July 30. Technical and nontechnical programs, DXCC/WAS card check, VE testing, flea market. Pre-registration \$8; at door \$10; flea markets \$15/table in advance; \$20/table at door (if available). Online registration available in early May. Under 16 years of age free with adult. Talk-in: 147.03 (+ offset, PL 167.9Hz). Additional information and registration forms available on the CORA Web site: <<http://www.HamHoliday.org>>. Vendors, contact <[kc5qev1@att.net](mailto:kc5qev1@att.net)> for details. See the CORA webpage <<http://hamholiday.org>> for preregistration information.

**OSHKOSH, WISCONSIN — Special Event Station W9ZL**, from **EAA Airventure 2011**, July 27-31, 1500-0000 UTC. World's largest airshow and fly-in. Fox Cities Amateur Radio Club, Inc., will operate W9ZL from the EAA grounds on 14.250 and 7.250 MHz, and 52.550 MHz FM. Certificate available. Send QSL and large SASE to FCARC AirVenture 2011, PO Box 2346, Appleton WI 54912.

**OAK CREEK, WISCONSIN — South Milwaukee Amateur Radio Club 44th annual SWAPPFEST**, July 9, 6:30 a.m. to at least 2 p.m. CDT, American Legion Post No. 434 grounds, 9327 S. Shepard Ave. Free parking, picnic area, extremely limited free overnight camping. Hot and cold beverages, and donuts and sandwiches available. Admission: \$5 per person. Prizes will include \$100 at noon. Talk-in: 146.52 simplex and local repeaters. Free flyer with map: The South Milwaukee Amateur Radio Club Inc., Post Office Box 222, South Milwaukee, WI. 53172-0222. On website: <<http://www.qsl.net/wa9txe>>.

**NORTH BEND, NEBRASKA — Pioneer Amateur Radio Club 14th Annual Flea Market** at St. Charles Parish Center. North Bend, Nebraska. July 30 from 9 a.m. to 12:30 p.m. Free coffee and tea. Admission \$2. Each table is \$5 in advance or \$7 at door. Prizes. Complete details: <<http://www.k0jfn.com>>.

**OAK CREEK, WISCONSIN — South Milwaukee Amateur Radio Club Summer Swapfest**, July 9 at American Legion Post No. 434, 9327 S. Shepard Ave., Oak Creek, Wisconsin. 6:30 a.m. to about 2 p.m. Limited free overnight parking. Breakfast and lunch served by the auxillary. Flyer and a map with a link to Mapquest: <[www.qsl.net/wa9txe/](http://www.qsl.net/wa9txe/)>. There is a \$100.00 prize given away at noon. Contact: WB9TIK, <[wb9tik@sbcglobal.net](mailto:wb9tik@sbcglobal.net)>.

**KIMBERTON, PENNSYLVANIA — Valley Forge Hamfest and Computer Fair**, July 17 at Kimberton Fire Company Fairgrounds, Rt.113, Kimberton, Pennsylvania. Sponsored by The Mid-Atlantic ARC. Full details including a printable flyer can be

found at <<http://www.marc-radio.org>>. Sellers, 7 a.m. Buyers 8 a.m. Talkin: 145.13/- and 147.06/+ ctcss 131.8. Contact Mike Pilotti, KF3CD at <[kf3cd@arrl.net](mailto:kf3cd@arrl.net)> or (610) 696-5040.

**INDIANAPOLIS, INDIANA — Indianapolis Hamfest**, July 9. Gates open 6 a.m. Air-conditioned commercial building, large outdoor flea market, MARS meeting, forums, contest, dual-band HT given away each hour. More information: <<http://www.indyhamfest.com>> or (317) 261-6658.

**NORTH BEND, NEBRASKA — Pioneer Amateur Radio Club 14th Annual Flea Market** at St. Charles Parish Center. North Bend, Nebraska. July 30 from 9 a.m. to 12:30 p.m. Free coffee and tea. Admission \$2. Each table is \$5 in advance or \$7 at door. Prizes. Complete details: <<http://www.k0jfn.com>>.

## AUGUST

**HUNTINGTON, WEST VIRGINIA — Tri-State Amateur Radio Association Hamfest and Computer Show**, August 13, 8:30 a.m. to 1 p.m., Veterans Memorial Field House, 2590 5th Ave., Huntington, West Virginia. ARRL-sponsored exams. Talk-in: 146.76, (PL 131.8). Admission: \$6. Table fee: \$10 each. Information: <<http://www.qsl.net/tara/>>. Contact: Judy Taylor, WD8EOP, (304) 525-4237.

**ALLIANCE, OHIO — Special Event Station W8LKY**, Alliance Amateur Radio Club, is celebrating **Alliance Carnation Days**, Alliance, Ohio. August 20 from 1400Z to 2100Z on 7.045, 7.240+/-, 14.045, 14.200, 21.250. For certificate, write: AARC-W8LKY, P.O. Box 3344, Alliance, OH 44601.

**MONTEZUMA PASS, ARIZONA — Special Event Station W7SVD**. Operating August 27 from Montezuma Pass high in the Huachuca Mountains of southeastern Arizona at Coronado National Memorial. Commemorating the **establishment of the National Park Service in 1916**. Portable operation will be from 1500-2300 UTC on 7.225, 14.275, 21.285 and 28.350 SSB; 7.050, 14.050, 21.050 and 28.050 CW, PSK31 and JT65 on 40, 20, 15 and 10 meters. Send QSL and SASE to: W7SVD, 1955 Santa Teresa Dr, Sierra Vista, AZ 85635. Additional information: <<http://www.w7svd.net>>.

## SEPTEMBER

**CHICAGO, ILLINOIS — Radio Expo 2011**. Hosted by **The Chicago FM Club**. September 10-11, Boone County Fairgrounds. Radios, computers, electronics. 8 a.m. to 3 p.m. both days. VE Testing both days. Advance tickets \$8. At the gate: \$10. Tickets good for both days. Talk-in: 146.760/147.255 (PL 114.8) and 146.550 simplex. For more information, e-mail: <[cfmc.radioexpo@yahoo.com](mailto:cfmc.radioexpo@yahoo.com)>, or call (224) 353-9721.

## OCTOBER

**DENISON, TEXAS — Special Event Station W5I**. October 15 from 1500Z-2300Z in celebration of the **121st birthday of Dwight Eisenhower**, 34th President of the United States. Frequencies: 14.250 MHz. For QSL card, send QSL and SASE to David Booth, 409 Umstead, Colbert, OK 74733.

**Have your hamfest or special event listed . . .  
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# CONTEST CORNER

**CONTEST:** RAC Canada Day  
**DATE & TIME:** 0000-2359Z 1 Jul  
**BANDS/MODE:** 160-2M CW/SSB/FM/AM  
**POINTS:** 2 Pts outside Canada; 10 Pts Canadian Contacts; 20 Pts Contacts with RAC official stations  
**MULTIPLIERS:** CA Provinces/Territories (13 possible)  
**EXCHANGE:** Canadians give RS(T) and Province/Territory; All others give RS(T) + Serial #  
**ENTRY CATEGORIES:** Single op - Single band; Single op - QRP (5W max); Single op - Low (100W max); Single op - High; Multi-op, Low (<100W); Multi-op High (>100W); Multi op - multi XMTR  
**ENTRIES:** 31 July Radio Amateurs of Canada 720 Belfast Road, Suite 217, Ottawa, Ontario, Canada K1G 0Z5  
 Entry forms and Cabrillo format guidelines available at: [www.rac.ca/en/rac/programmes/contestsCanada](http://www.rac.ca/en/rac/programmes/contestsCanada)  
 E-mail: [canadaday@rac.ca](mailto:canadaday@rac.ca)  
 Rules at: <http://www.rac.ca/en/rac/programmes/contests/files/2011%20Canada%20Day%20Rules-Entry%20Form.pdf>

**CONTEST:** DL-DX RTTY  
**DATE & TIME:** 1100Z 2 Jul – 1059Z 3 Jul  
**BANDS/MODE:** 80-10M RTTY/Digital  
**POINTS:** 5 Pts. own country; 10 Pts. other country, same continent; 15 Pts. other continent  
**MULTIPLIERS:** DXCC countries each band; Call areas in VK, VE, JA and U.S. each band  
**EXCHANGE:** RS(T) + serial #  
**ENTRY CATEGORIES:** Single op, Multi-band; Multi op, Multiband; Club  
**ENTRIES:** 10 Aug. Cabrillo logs to: [logs@drcg.de](mailto:logs@drcg.de)  
 Rules at: [http://drcg.de/index.php?option=com\\_content&task=view&id=24&Itemid=36&lang=en](http://drcg.de/index.php?option=com_content&task=view&id=24&Itemid=36&lang=en)

**CONTEST:** MI QRP 4th of July Sprint  
**DATE & TIME:** 2300Z 4 Jul - 0300Z 5 Jul  
**BANDS & MODES:**  
**POINTS:** 2 Pts. non-member sta; 4 Pts. non-member, DX contacts; 5 Pts. member sta's  
**MULTIPLIERS:** States/Provinces/Countries each band  
**EXCHANGE:** RST + QTH + member # (non-members give power)  
**ENTRY CATEGORIES:** A = <250mW; B = 250mW - 1W; C = 1 - 5W; D =>5W  
**ENTRIES:** 30 Days Hank Greeb, N8XX 5727 11 Mile Rd. NE, Rockford, MI 49341-9502  
 E-mail: [n8xx@arrl.org](mailto:n8xx@arrl.org)  
 Rules at: [www.qsl.net/miqrpclub/contest.html](http://www.qsl.net/miqrpclub/contest.html)

**CONTEST:** FISTS Summer Sprint  
**DATE & TIME:** 2000 – 2359 EDT 8 Jul  
**BANDS/MODE:** 80-10M CW  
**POINTS:** 2 Pts non-member sta; 5 Pts. QSO with FISTS members  
**MULTIPLIERS:** State/Provinces  
**EXCHANGE:** RST + State/Province/DXCC Country + Name + FISTS # (non-members give power)  
**ENTRY CATEGORIES:** QRP (<5W); QRO (>100W); Club  
**ENTRIES:** 30 Days Gil Woodside, WA1LAD 30 Hilltop Ave., West Warwick, RI 02893-2825  
 E-mail: [wa1lad@cox.net](mailto:wa1lad@cox.net) (Cabrillo or ASCII)  
 Web site: [www.fists.org/sprints.html](http://www.fists.org/sprints.html)  
 Rules at: [www.fists.org/sprints.html](http://www.fists.org/sprints.html)

**CONTEST:** IARU HF World Championship  
**DATE & TIME:** 1200Z 9 Jul - 1200Z 10 Jul  
**BANDS/MODE:** 160-10M CW/SSB  
**POINTS:** 1 Pt. own ITU zone; 3 Pts Same continent, different ITU Zone; 5 Pts. Different continent and zone  
**MULTIPLIERS:** ITU Zones + IARU HQ sta;s  
**EXCHANGE:** IARU Member society HQ stations give RS(T) + society abbreviation; All others give RS(T) + ITU Zone  
**ENTRY CATEGORIES:** Single op - Phone, CW or Mixed; Multi op - Single XMTR, Mixed Mode only!  
**ENTRIES:** 9 Aug. IARU HF Championship IARU International Secretariat Box 310905 Newington, CT 06111-0905  
 E-mail: (Cabrillo format) [iaruhq@iaru.org](mailto:iaruhq@iaru.org)  
 Rules at: [www.arrl.org/iaru-hf-championship](http://www.arrl.org/iaru-hf-championship)

**CONTEST:** DMC RTTY  
**DATE & TIME:** 1200Z 16 Jul – 1200Z 17 Jul  
**BANDS/MODE:** 80-10M RTTY  
**POINTS:** 1 Pt. per QSO  
**MULTIPLIERS:** DXCC, JA, W, VE, VK (One time only!)  
**EXCHANGE:** RS(T) + serial #  
**ENTRY CATEGORIES:** Single op, All bands, QRP, Low (<100W) High (>100W), 12-Hour or 24 Hour; Multi op, All-bands, Single XMTR  
**ENTRIES:** 21 Aug DMC Contest Committee P.O. Box 8 6000 Stara Zagora, Bulgaria  
 Cabrillo logs to: [dmcrtty@digital-modes-club.org](mailto:dmcrtty@digital-modes-club.org) or [dmc@digital-modes-club.org](mailto:dmc@digital-modes-club.org)  
 Rules at: [http://digital-modes-club.org/index.php?option=com\\_content&view=article&id=58&Itemid=56&lang=en](http://digital-modes-club.org/index.php?option=com_content&view=article&id=58&Itemid=56&lang=en)

**CONTEST:** North American QSO Party  
**DATE & TIME:** 1800Z 16 Jul - 0600Z 17 Jul  
**BANDS/MODE:** 80-10M RTTY  
**POINTS:** 1 Pt. per QSO  
**MULTIPLIERS:** State/Provinces/Territories/NA Countries  
**EXCHANGE:** Name + State/Province/Territory/NA Country; non-NA sta's give name only  
**ENTRY CATEGORIES:** Single Rules at: [www.ncjweb.com/naqprules.php](http://www.ncjweb.com/naqprules.php)  
 op; Multi op, 2 XMTRS (100W power limit for all categories)  
**ENTRIES:** 14 Days Mark Aaker, K6UFO 300 Berry Unit 100, San Francisco, CA 94158-1668  
 Cabrillo to: [rtynaqp@ncjweb.com](mailto:rtynaqp@ncjweb.com)  
 Rules at: [www.arrl.org/iaru-hf-championship](http://www.arrl.org/iaru-hf-championship)

**CONTEST:** CQ Worldwide VHF Contest  
**DATE & TIME:** 1800Z 16 Jul - 2100Z 17 Jul  
**BANDS/MODE:** 6 & 2M  
**POINTS:** 1 Pt. 6M; 2 Pts 144 MHz  
**MULTIPLIERS:** Grids per band  
**EXCHANGE:** Maidenhead Grid Locator (4 digit)  
**ENTRY CATEGORIES:** Single op - single band (6 or 2M); Single op - QRP (all bands); Single op - All band portable limited (6 Hrs max continuous); Rover; Hilltop; Multi op; Club  
**ENTRIES:** 1 Sep CQ VHF Contest 25 Newbridge Rd., Hicksville, NY 11801;  
 E-mail: (Cabrillo format) [cqvhf@cqww-vhf.com](mailto:cqvhf@cqww-vhf.com)  
 Web page: [www.cq-amateur-radio.com](http://www.cq-amateur-radio.com)  
 Rules at: <http://www.cqww-vhf.com/rules.htm>

**CONTEST:** Run for the Bacon  
**DATE & TIME:** 2100-2300 PM Eastern 17 Jul  
**BANDS/MODE:** 80-10M CW  
**POINTS:** 1 Pt. non-member QSO; 3 Pts. Flying Pig member; 5 Pts. FP member different continent  
**MULTIPLIERS:** States/Provinces/Countries  
**EXCHANGE:** RST + State/Province/Country + FP #; (non-members give power)  
**ENTRY CATEGORIES:** Single band; All band  
**ENTRIES:** Must be submitted via Autolog at: <http://www.fqqr.com/autolog.php>  
 Rules at: <http://www.fqqr.com/fqqrprun.php>

**CONTEST:** NAQCC Sprint  
**DATE & TIME:** 0030-0230Z 22 Jul  
**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 (antennas other than simple wire antenna)  
**ENTRIES:** 4 Days John Shannon, K3WWP, 478 E. High St., Kittanning, PA 16201  
 E-mail: [naqcc33@windstream.net](mailto:naqcc33@windstream.net)  
 (Submit log as plain text, NO attachments!);  
 Online logger (preferred method) at: <http://naqcc.info/sprintlog.html>  
 Rules at: [http://naqcc.info/sprint\\_rules.html](http://naqcc.info/sprint_rules.html)

**CONTEST:** MARAC County Hunters  
**DATE & TIME:** 1200Z 30 Jul – 0600Z 31 Jul and 1200-2359Z 31 Jul  
**BANDS/MODE:** 160-10M SSB/CW  
**POINTS:** Fixed sta's - 1 Pt. U.S. fixed, 2 Pts. non- U.S., 15 Pts. U.S. mobile; Mobile sta's - 1 Pt. U.S. fixed, 5 points for non-U.S., 15 Pts. U.S. Mobile; DX – 1 Pt. U.S. fixed, 15 Pts. U.S. mobile  
**MULTIPLIERS:** Total of U.S. Counties (3,077)  
**EXCHANGE:** U.S. sta's give RS(T) + County + State; DX gives "DX"  
**ENTRY CATEGORIES:** Single op only!  
**ENTRIES:** 31 Aug Scott Petty 2063 N. turnpike Rd., Dalton, PA 18414  
 E-mail: [ka3qlf@comcast.net](mailto:ka3qlf@comcast.net)  
 Rules at: <http://marac.org/cwrules.htm>

**CONTEST:** RSGB IOTA  
**DATE & TIME:** 1200Z 30 Jul - 1200Z 31 Jul  
**BANDS/MODE:** 80-10M CW/SSB  
**POINTS:** 3 Pts own IOTA Reference or non-island sta's; 15 Pts. Other IOTA islands  
**MULTIPLIERS:** Total of different IOTA references each mode  
**EXCHANGE:** RS(T) + Serial # + IOTA reference # (if applicable)  
**ENTRY CATEGORIES:** Single op - 12 HRS (CW, SSB or mixed); Single op - 24 Hrs (CW, SSB or mixed); Single op - 12 Hrs, Assisted (CW/SSB/Mixed); Single op - 24 Hrs Assisted (CW/SSB/Mixed); Multi op – Mixed; All categories – QRP (<5W), Low (<100W), High  
**ENTRIES:** 21 August RSGB IOTA Contest, Radio Society of Great Britain, 3 Abbey Court, Fraser Road, Priory Business Park, Bedford, MK44 3WH, UK  
 Cabrillo to: [iota.logs@rsgbhfcc.org](mailto:iota.logs@rsgbhfcc.org)  
 Rules at: [www.rsgbcc.org/hf/rules/2011/riota.shtml](http://www.rsgbcc.org/hf/rules/2011/riota.shtml)  
 Free logging software at: [www.rsgbcc.org/hf/sd.shtml](http://www.rsgbcc.org/hf/sd.shtml)

*Click here for information on listing your contest in the next issue of WRO!*

## 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](http://www.w0tx.org) 01/12

### MICHIGAN

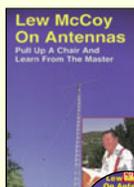
**Muskegon Area Amateur Radio Council** meets the 1st Thursday of every month at 7 PM at our clubhouse at 2888 Scenic Drive. Visit our website: <http://w8zho.org> 01/12

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# BOOKS

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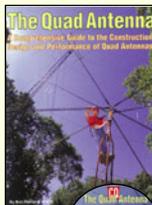
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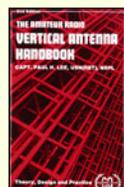
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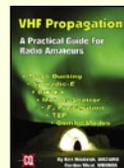


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# VE EXAMS

As a service to our readers, WorldRadio Online presents a feature listing of those VE exams, times and locations which are sent to us. Please remember that our deadline for publication is two months in advance. For example, if your group is scheduling an exam for December, please have the information to us by October 1st. *World Radio Online*, VE Exams, 25 Newbridge Road, Hicksville, NY 11801. List the location (city and state), any information examinees should have (advance registration, etc.) and the name of the person to contact for further information. Examinees should bring their original license (along with a photo copy), two forms of identification (at least one should be a photo), and required fee.

p/r pref. = pre-register preferred but w/i OK  
p/r = pre-registration only-no w/i

w/i = walk-in only  
w/i pref. = w/i preferred to p/r

CITY	DATE	CONTACT	NOTES	CITY	DATE	CONTACT	NOTES
<b>ARIZONA</b>				<b>NEVADA</b>			
Mesa	3rd Mon	Steve KY7W, 480-804-1469, kj7wk@cox.net	w/i	Stagecoach	2nd Sat	Jack, AC6FU, 775-577-2637 ac6fu@arrl.net	
Phoenix	4th Sat	Gary Hamman, 602-996-8148, K7GH@arrl.net		<b>NEW JERSEY</b>			
<b>ARKANSAS</b>				Roselle	4th Sat	Gerry, AA2ZJ, 732-283-2795, aa2zj@arrl.net	
Sherwood	1st Sat	James Cope, KE5OVE, 501-796-3910	w/i	Winslow	4th Tues	Mark, K2AX, 609-820-1523, JTRA@comcast.net	
Vilonia	3rd Sat	James Cope, KE5OVE, 501-796-3910, ke5ove@arrl.net	p/r pref.	Pennington	7/16	Don, AA2F, 609-737-1723, aa2f@arrl.net	
<b>CALIFORNIA</b>				<b>NEW YORK</b>			
Highland	7/16	Ed, WU6I, 909-864-0155, wu6i@arrl.net	p/r pref.	Bethpage	2nd Tues	Bob, 631-499-2214, w2ilp@optonline.net	p/r
LaVerne	Last Sat	Frank, K6FW, 909-628-8661, k6fw@arrl.net	p/r	Canandaigua	1st Wed	Squaw Island ARC, David A. Foster, 585-398-0216, www.siacr.us	w/i
Long Beach	3rd Sat	Louise, N6ELK, 562-429-1355	p/r	Valhalla	Call	Stanley, WA2NRV, wa2nrv@weca.org	
Manteca/Tracy	4th Sat	David, N5FDL, 209-835-6893, n5df@arrl.net	p/r	Yonkers	Call	Paul, AC2T, 914-237-5589, w2yrc@hotmail.com, www.yarc.org	w/i ok
Redwood City	Call	Al, WB6IMX@arrl.net, www.amateur-radio.org	w/i	<b>NORTH CAROLINA</b>			
Sacramento	Hotline!	916-492-6115, n6na@arrl.org		Fayetteville	Call	Patricia Edwards, N4UGH, n4ughpat@aol.com, 910-584-1801	w/i
San Francisco	See site	www.hamcrams.com	p/r pref	<b>OHIO</b>			
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Sebastopol	Hotline!	Recording 707-579-9608		Sandusky	Call	Luther, N8HC, 419-684-7864, n8hc@arrl.net	p/r
Sunnyvale	Visit Site	Gordon, W6NW, Sv@amateur-radio.org, www.amateur-radio.org	w/i	<b>OREGON</b>			
<b>COLORADO</b>				Astoria	Call	AA7OA, 503-338-3333	p/r
Englewood	1st Sat	Dave, N0HEQ, 303-795-5718, n0heq@arrl.net, Commerical Exams also	p/r pref	Bend	Weds	Joe, K7SQ, 541-385-3152	p/r
<b>FLORIDA</b>				Lincoln City	1st Sat	Carl, w7li@arrl.net, 503-965-7575	w/i ok
Longwood	4th Sat	James, N4ZKT, 407-333-4245	w/i ok	McMinnville	Call	Mark, AC7ZQ, 503-843-3580	w/i only
Melbourne	1st Sat	John, AA8IS@earthlink.net, 321-412-2779	w/i pref.	Sisters	Call	Dave, N7IYO, 541-549-7831	p/r
North Port	Call	Bill Norris, KC7TSG, 941-426-0214	w/i pref.	Tigard	Call	John, KS0F, 503-626-7399	p/r
St. Pete	Call	Mark, NP3R, 727-528-0071		<b>PENNSYLVANIA</b>			
Sanford	4th Sat	James, N4ZKT, 407-333-4245, n4zkt@bellsouth.net		Erie	3rd Sat	Ron, KB3QBB, 814-833-6829, kb3qbb@arrl.com, www.wattsburg-wireless.us	p/r
<b>HAWAII</b>				Lebanon	3rd Sat	Wa3gpm@arrl.net	
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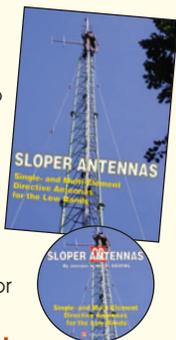
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# Which to Choose? The 1:1 or the 4:1 Balun?

By Kurt N. Sterba

**H**arry McGavran, W5PNY, of Los Alamos, New Mexico, writes about the book *The Easy Way — HF Antenna Systems*, by John Haerle, WB5IRR (SK) and published by WorldRadio Books.

“He states in several places that a really good way to feed multiband antennas is with a tuner in the shack, a short piece of coax to a 4:1 balun and 450-ohm line to the antenna.

“While I really support the information in the book and am glad to see another attempt to dispel all the misinformation about antennas one gets when talking to most hams, I think that is one statement that isn’t quite on.

“I’ve found references to this occasionally among the antenna savvy types, but not often. I’m guessing a 1:1, 50-ohm balun is a better choice. So except for the 4:1 balun, I agree with what he is saying.

“Why? I’ve found if one does full spectrum scans with something like an AIM 4170 < <http://bit.ly/ix2FhR> > at the end of a typical 450-ohm line to a multi-band antenna he will see wide excursions in the impedance — but what is interesting is that they usually have very narrow peaks and wide valleys.

“This means most of the time the impedance one sees at the end of a 450-ohm line to such antennas is much closer to 50 ohms than to 450 ohms. So, for most frequencies, it seems to me you’d be better off with a 1:1 balun.

“What do you think?”

*(Unfortunately, as far as we can tell, “The Easy Way — HF Antenna Systems” is no longer in print. You may want to check online auction sites for a copy. — Ed.)*

## The Krusty One Responds . . .

Kurt has always advised using a 4:1 balun in this setup so he agrees with the book’s author. To see why, let’s look at a 40-meter dipole and its impedance on other amateur bands.

The dipole is high enough above ground, so its feed point impedance on 40 meters is 75 ohms. And, to keep things simple, the 450-ohm feeder is a half-wave on 40.

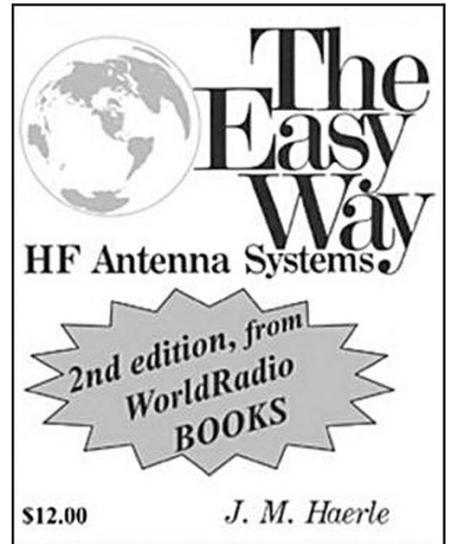
The ARRL *Antenna Book* has a plot of the impedance of a 5-MHz dipole over a large frequency range. Kurt has changed the dipole frequency to 7 MHz and converted the R + jX figures to the actual impedance for the major amateur bands. Then, using the TLW (Transmission Line for Windows) computer program, he found the impedance at the transmitter end of the 450-ohm transmission line. Refer to the accompanying chart. (*The SWR figures are based on a short run of 50-ohm coax between the transmitter and balun. — Ed.*)

It is apparent that on the harmonic frequencies the antenna impedance is much higher than on the fundamental frequency (except for 21 Mhz). The transmission line changes the impedance some but it is still high. The SWR on the coaxial cable going to your tuner is mostly a lot higher using a 1:1 balun than for a 4:1 balun. This is why a 4:1 balun is preferred.

The numbers change for other lengths of transmission line but, generally speaking, you will have lower SWR with the 4:1 balun — and Kurt recommends it.

## Radiation Resistance

Donald Chester, K4KYV, of Woodlawn, Tennessee, comments on Kurt’s recent kolumn, *The Power Play: Non-Resonant vs. Resonant Antennas* (April 2011 *WRO*).



“I wish to point out a slight error in the statement regarding increasing the length of the antenna, but otherwise the explanation is perfectly correct.”

Kurt wrote: *Now, suppose the dipole is too long for the frequency. Now it looks like Figure 1(b), the same radiating resistor as before but with an inductor in series. This inductor’s reactance increases rapidly as the antenna is lengthened and can be much more than 70 ohms.*

K4KYV writes:

“Actually, the radiating resistor will be different from before. It will not stay exactly the same when the length of the radiator is changed. If only a few feet are added to or subtracted from the antenna length, the difference will be small, but there will still be a difference.

f, MHz	Antenna Impedance	Transmitter-end Impedance	1:1 Balun SWR	4:1 Balun SWR
3.5	1,000 Ω	1,000 Ω	20	5
7	75	75	1.5	2.6
14	3,700	2,400	48	12
21	100	100	2	2
28	1,900	1,500	25	7.5

"If we lengthen or shorten the antenna to a large degree, the effective change in value of the 'resistor' will be large. For example, if the total length of the dipole is shortened from a half-wave to a quarter-wave the radiation resistance will drop from 72 ohms in free space down to about 12 ohms.

"The reactance can still be tuned out as described and the antenna will take a load, but the efficiency will take a drop because resistive losses in the system become a much larger percentage of the total."

### Kurt's Turn . . .

K4KYV is absolutely right and has explained it very well. Of course, when we are looking at just one amateur band the change is small. Possibly two or 3 ohms change from one end of the band to the other.

Meanwhile the reactance may change 200 or 300 ohms. But when you move to another band there is a big difference.

Look at the table for the 40-meter dipole. On 80 meters the impedance is shown as 1,000 ohms. Kurt simplified this — the actual figures are 1,000-ohms reactance and 15-ohms resistance. This is quite a drop from the 75-ohms resistance on 40 meters.

This rarely is a problem with dipoles because we usually can make them fairly long in wavelengths and with heavy-enough wire to have low loss resistance.

But vertical antennas on the low frequency bands are another matter. A 30-foot vertical is nearly a quarter-wave on 40 meters and will have a radiation resistance of about 36 ohms.

That same vertical on 160 meters, though, will have a radiation resistance of about 6 ohms. When you consider that a modest backyard radial system is likely to have more than 15-ohms resistance, you can see right away that your antenna's efficiency suffers because of that low radiation resistance.

In this case, for 100 watts into the antenna you get only 29 watts radiated. And that's for a good installation.

On these bands, always try to keep that radiation resistance up by making the vertical as high as you can and then use top loading to make it look even higher. "T" and inverted "L" arrangements are easy ways to do this.

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

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