Big Rig, Small Digs, p. 34

# Amateur Radio

http://www.cq-amateur-radio.com

COMMUNICATIONS & TECHNOLOGY

NOVEMBER 2013

CQ

## Your First Homebrew Project, p. 13

## CW Results, 2013 CQ WPX Contest, p. 18

## CQ Mini-Reviews: Kenwood TS-990, PowerWerx DB-750X, p. 69

On the Cover: It's Thanksgiving time, but Chris Yody, KE7JBF, of Seattle, Washington, isn't looking up turkey recipes. She's setting up FLdigi to run digital modes on her laptop. Details on page 86.

$6.99US/CAN

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**CQ World Wide CW DX Contest Nov. 23-24**

# The EVENT HORIZON OF DX

# TS-990S

## Dual TFT Display & Dual Receiver HF/50 MHz Transceiver


The main receiver has an IP3 in the +40 dB class, and the sub receiver is the already famous TS-590S receiver. Capable of receiving two signals at once, on different bands. 7-inch and 3.5-inch color TFT displays allow displaying of independent contents. Simplification of complex operations at a glance. Make no mistake, this is not a toy. Finally a serious tool is available for getting the very most from your hobby, of course it's a Kenwood.

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- High-speed automatic antenna tuner.
- USB, Serial and LAN ports.
- Various PC applications (free software): ARCP-990 enabling PC control, ARHP-990 enabling remote control, and ARUA-10 USB audio driver.
- Clean 5 to 200 W transmit power through the 50 V FET final unit.
- Built-in RTTY and PSK.
- Three Analog Devices 32-bit floating-point arithmetic DSPs.
- DVI output for display by an external monitor (main screen display only).

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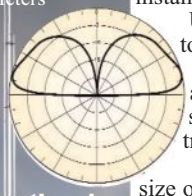
# New! Cushcraft R9 . . . *80-6 Meters*

R-9
$639.95
80-6 Meters

R-8
$539.95
40-6 Meters



**Omni-Directional**
low angle radiation gives incredible worldwide DX.

## *80 Meters . . . No Radials . . . 1500W*

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

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

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

**Use** full *1500 Watts* SSB/CW when the going gets tough to break through pileups/poor band conditions.

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

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

**Rugged Construction:** Thick fiberglass insulators, all-stainless steel hardware and 6063 aircraft-aluminum tubing is double or triple walled at key stress points to handle anything Mother Nature can dish out.

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

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

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

**R-8GK, $56.95.** Three-point guy kit for high winds.

### Matching Network

Matching

Broadband matching transformer keeps VSWR low.

Coaxial balun keeps RF off exterior of your coax.

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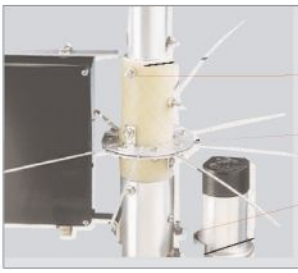
All Stainless Steel Hardware

Moisture Release vent

SO-239 Feedpoint

### Super Rugged Design



Stainless steel machine screws guarantee base integrity.

Dual plate mount makes it easy to install counterpoises.

Heavy duty stainless steel/aluminum interface plate mount keeps your antenna up for years to come.

# MA-5B *5-Band* Beam

## *Small Footprint -- Big Signal*

MA-5B
$499.95

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

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

# Cushcraft 10, 15 & 20 Meter Tribander Beams

A-4S
$699.95

A-3S
$599.95

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

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

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

# Cushcraft Dual Band Yagis

***One Yagi for Dual-Band FM Radios***

A270-10S
$169.95

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

A270-6S
$129.95

# Cushcraft Famous *Ringo* Compact FM Verticals

AR-2
$64.95

AR-6
$99.95

AR-10
$109.95

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

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## Hams Respond to Fires and Floods

Amateur radio emergency communicators in two western states were kept busy in August and September, providing backup communications—and sometimes the only communications—in response to wildfires in California and both fires and flooding in Colorado. Ham radio communication was briefly featured in an NBC Nightly News segment on the flooding around Boulder, Colorado, that as of press time had resulted in several deaths, several hundred missing people and massive property damage.

The Colorado flood disaster continues to unfold as we go to press. Stay tuned for complete coverage of these latest examples of amateur radio's emergency response in December *CQ*'s Public Service column.

## *73* Magazine Founder Wayne Green, W2NSD, SK

One of the most colorful and controversial people in the world of amateur radio became a Silent Key in mid-September. Wayne Green, W2NSD, was *CQ*'s RTTY columnist from 1951 to 1955, then served as this magazine's editor from 1955-1960, before leaving to launch his own magazine, *73*, which he published from 1960-2003. A tireless promoter of new technology in amateur radio and in society, Wayne also launched *Byte* and several other computer magazines in the 1980s, helping to popularize home computer use. Wayne was also a tireless critic of the ARRL, and frequently used his "Never Say Die" editorials in *73* to promote a variety of non-ham-radio causes and products with which he was involved. He was 91. (See this month's "Zero Bias" editorial for more on W2NSD.)

## Palomar Engineers President Jack Althouse, K6NY, SK

Also departing the ham radio scene in September was Jack Althouse, K6NY, president of Palomar Engineers, a leading supplier of ferrite and powdered iron toroids, baluns, antennas, and accessories. Jack was highly regarded not only for the quality of his products but for the depth of his knowledge about antennas and antenna systems. Earlier this year, he had moved to an assisted-living facility and began scaling back his business operations. The future of Palomar Engineers was uncertain as of press time (see "What's New" advisory on page 98 of this issue for information regarding current orders.)

## New Chief for Air Force MARS

Air Force MARS (Military Auxiliary Communications System) has a new Chief. David Stapchuk, director of operations for Detachment 1 of the 92nd Information Operations Squadron at Scott Air Force Base in Illinois, took command of the service on August 23. In his primary job, he is responsible for overseeing cyber operations in support of the detachment's communications security mission. In a message to all members, Stapchuk said he was excited about his new position and eager to work with the MARS volunteers "in fulfillment of the MARS mission to provide contingency radio communications support to U.S. government operations."

## Army MARS Invites Joint Participation in Exercise, Expands Support of National Guard

The Chiefs of both Air Force MARS and Navy-Marine Corps MARS were invited by their Army MARS counterpart to work jointly in a national communications exercise scheduled for early November. According to *Newsline*, the goal of the 48-hour exercise will be to measure the ability of MARS members to respond in the event that normal communications are disrupted throughout North America.

Army MARS is also in the process of phasing in direct support of Army National Guard units around the country, according to spokesman Bill Sexton, NI1N. Sexton says the group's regional directors were told in September by Chief Stephen Klinefelter that headquarters had already begun setting up contacts with individual state Guard organizations, as part of the Army's broader program of Defense Support for Civil Authorities.

## DHS Guidebook Offers Frequency Lists, More

A new guidebook published by the U.S. Department of Homeland Security's Office of Emergency Communications reportedly is chock-full of frequency information, operating procedures, and other important information that can be essential in a wide-scale emergency. According to *Newsline*, the *National Interoperability Field Operations Guide*, or *NIFOG*, was written by agency staffer Ross Merlin, WA2WDT, and is available in print or downloadable formats. Go to <http://bit.ly/15bYxHe> to download the book or find a link to request "reasonable quantities" of the printed version.

## MIT Designs Inflatable Antenna for CubeSats

Researchers at the Massachusetts Institute of Technology have developed an inflatable antenna for CubeSats that will reportedly permit the tiny satellites to operate in higher orbits and/or transmit information at higher data rates. For more on this development, see *CQ*'s "VHF-Plus" column on page 81 of this issue.

## Transatlantic Balloon Effort Falls Short

A ham from North Carolina trying to cross the Atlantic in a basket held aloft by 365 individual helium balloons took off from Caribou, Maine on September 12 and made it successfully across … the Gulf of St. Lawrence. "Landed safe, at an alternate location," Jonathan Trappe, KJ4GQV, posted on his Facebook page. That location, according to the *ARRL Letter*, turned out to be Newfoundland, only a few hundred miles from his liftoff point. Trappe's craft carried amateur radio beacons on 20 meters (RTTY) and 2 meters (APRS). No word yet as to when, or whether, he will try again.

## Could "Ambient Backscatter" Provide Free Power?

Researchers at the University of Washington say they have found a way to harness the energy in radio frequency signals in the air to power devices that also use that energy to communicate among themselves. The *ARRL Letter* reports that the UW team has developed devices that "form a network out of thin air," relying for power on what the group terms "ambient backscatter," allowing them to "repurpose wireless signals that are already around us into both a source of power and a communication medium." The group is looking to develop the technology for use in "wearable computing, smart homes, and self-sustaining sensor networks." More information, including a video, may be found at <http://abc.cs.washington.edu/>.

*Additional and updated news is available on the Ham Radio News page of the* CQ *website at <http://www.cq-amateur-radio.com>. For breaking news stories, plus info on additional items of interest, sign up for* CQ*'s free online newsletter service. Just click on "CQ Newsletter" on the home page of our website.*

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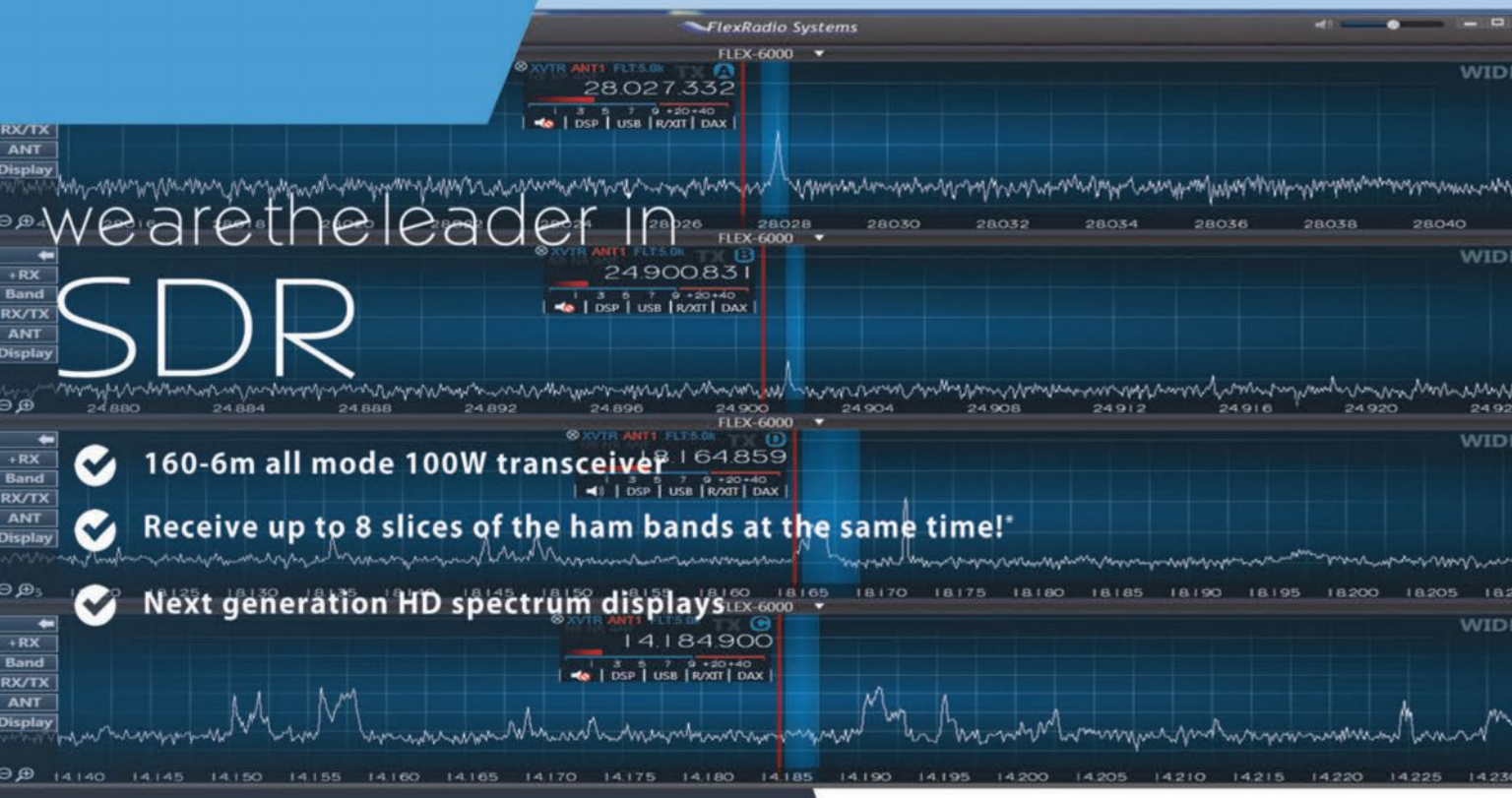


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- Receive up to 8 slices of the ham bands at the same time!*
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Never before in amateur radio has the advanced operator been given the ability to be on so many bands at the same time. Check into your favorite net... while chasing the latest DXPedition... while watching for a far away propagation beacon...all at the same time! The new FLEX-6000 Signature Series transceivers give you the ability to be there now. Our ultra low noise direct sampling receiver technology captures the entire HF spectrum then delivers sharp, crisp reception on up to eight (8) simultaneous band slices*. Advanced digital audio processing, plus a high linearity 100W power amplifier, delivers the punch to be heard. FlexRadio's Signature Series radio server platform technology with industry standard shack automation interfaces ensures your investment into the future.

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- New SmartSDR™ simple user interface
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# CQ contents

**NOVEMBER 2013**

p. 76

p. 18

## features

Vol. 69 No. 11



p. 81


p. 66

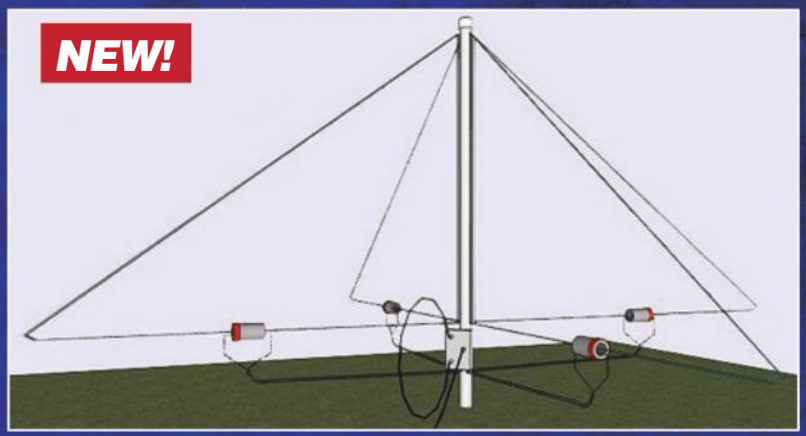
## departments

# Array Solutions

Your Source for Outstanding Radio Products

FT5ZM AMSTERDAM ISLAND 2014 DXPEDITION

## Professional Grade Equipment from Array Solutions




## Introducing the Shared Apex Loop Array™!

The Shared Apex Loop Array™ is a revolutionary receiving antenna that will change the way that you listen to the radio! The patented design provides performance in a size and over a range of frequencies that will please both the rag-chewer and DX'er alike.

Two models to chose from:

- AS-SAL-20 - optimized for VLF, BCB, Low Band DXing, shortwave to 15MHz, 20 feet tall and about 40 foot diameter
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## Fully Automatic Remote Antenna Tuners

NEW!

Exclusively from "RF Communication Electronics" in Germany, fully-automatic remote tuners for both balanced and unbalanced loads. Full legal limit power capability.

Visit our Webpage for more information!


## Rig Expert Antenna Analyzers

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See the full Rig Expert line including the new AA-170 on our Webpage!


## BEKO VHF and UHF Amplifiers


BEKO VHF and UHF amplifiers (2m and higher) are now available from Array Solutions. These are considered the best solid state amplifiers in their categories and we have them!

## New Analyzers from Array Solutions

### AIM *uhf* Analyzer


NEW!

NEW!

Expanded frequency coverage to 1.4 GHz
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Introducing the

### VNA *uhf* two-port Vector Network Analyzer

NEW!


- Frequency range from 5 kHz to 1 GHz
- Data plots include SWR, RL, R + X, series and parallel, magnitude, phase, and more
- Dual Smith charts with rotation and 20 markers
- Plots and calibration files can be saved and used anytime in cvs and dynamic formats.
- True TDR function.


NEW!

### PowerMaster II

- New Larger, Sharp & Fast LCD Display
- Reduced Energy consumption
- USB and RS-232 interface built-in
- New - Both 3kW and 10kW couplers on one display - switched
- Supports 2 like couplers simultaneously (3kW & 3kW, 3kW & V/UHF, 10kW & 10kW)

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

## FTM-400DR

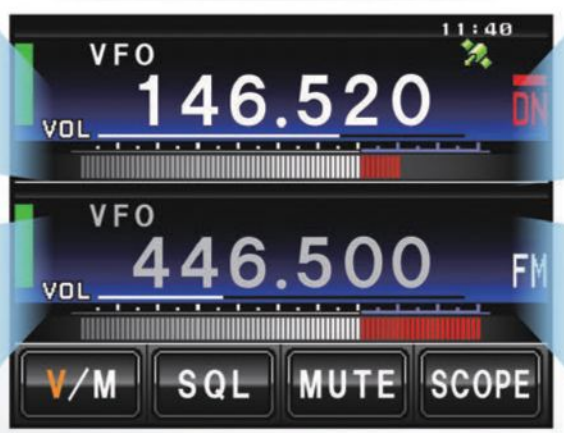

- Digital Group Monitor (GM) Function
- Smart Navigation Function
- Snapshot Function (Image Data Transmission)
- Built-in GPS with Antenna in the Controller
- Wideband Receive ( 108 MHz – 999.99 MHz )
- Equipped with microSD Card Slot

## Advanced visibility and operability with full color touch panel Operation


Band Scope Screen


Altitude Screen

### 3.5-inch full color touch panel operation




The icon symbols, multi-function key display and pop-up messages are all displayed in high-resolution color thanks to the full-color, high luminance TFT liquid crystal screen.

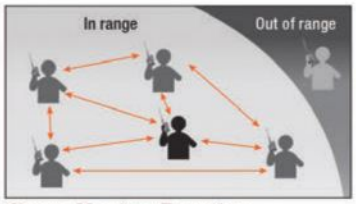

Smart Navigation Screen


Frequency Direct Input Screen

# New Functions Enabled by C4FM Digital Communication

## Digital Group Monitor (GM) Function

- Automatically checks whether members registered to a group are with the communication range.
- This function can be used to send messages data between group members.



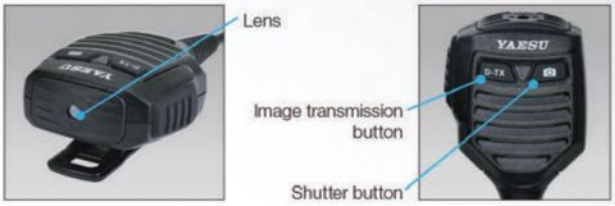
Group Monitor Function


## Smart Navigation Function

- Real-time navigation function enables Location checking at any time.
- Backtrack function that starts navigation facing a registered point.


## Snapshot Function (Image Data Transmission)

- Image data can be displayed on the screen.
- Image data can be sent easily to other C4FM FDMA digital transceivers.


## Additional operating and support features

### Wideband Receive Capability

Covers 108 MHz - 999.990 MHz (A(Main) / B(Sub) Band), VHF Marine, Aircraft, Public service channels, etc.

### Hands-free operation

Hands-free operation is available by using the optional wireless Bluetooth® unit and headset.

(Optional Bluetooth® unit (BU-2) and Headset (BH-2A) are required.)


C4FM Digital Clear Voice
Clear and Crisp Voice Technology

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

# FT1DR

- **Digital Group Monitor (GM) Function**
- **Smart Navigation Function**
- **Snapshot Function (Image Data Transmission)**
- **Built-in GPS with Antenna in the top**
- **Wideband Receive (504 kHz – 999.99 MHz )**
- **Equipped with microSD Card Slot**

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zero bias – a CQ editorial

BY RICH MOSESON,* W2VU

# Never Say Die

Back in 1971 or '72, my high school ham friends and I made our first "pilgrimage" from New York to Connecticut to visit ARRL headquarters and, more importantly, operate from W1AW. My friends all had General Class licenses, and the console of Collins gear beckoned to them as we walked into the station for the first time. I, on the other hand, was a lowly Technician, having passed my General theory exam but failed the code test (by two letters).

At the time, Technicians had absolutely no HF privileges; and W1AW at the time had virtually nothing to offer a guest op with a Tech license. No 6-meter station, no satellite station, just a crystal-controlled, 2-meter FM rig on the station manager's desk that he used to occasionally check into local traffic nets. So, while my friends were running pileups on HF, I got on one of the area's wide-coverage repeaters and said, "W1AW listening."

I got an immediate response, from W2NSD mobile-1 in New Hampshire. The room got kind of quiet and I wasn't quite sure why. I mean, I was impressed that I was able to talk from Connecticut to New Hampshire on 2-meter FM, but the QSO meant nothing more to me at the time. I had no idea I was talking to a ham radio celebrity, and—having no idea that he liked nothing more than blasting the ARRL in the pages of *73* magazine—the irony of contacting Wayne Green from W1AW was completely lost on me at the time. I do remember two things from that QSO:

1. Wayne's comment that it was highly unusual to hear W1AW on 2 meters (symptomatic of the HF-centric mindset that persists in Newington to this day), and
2. that he was having a great time driving under the speed limit in the left lane of whatever highway he was on, because New Hampshire had a strictly-enforced "no passing on the right" law and several dozen other drivers were backed up behind him. That, I later learned, was vintage Wayne … cantankerous, curmudgeonly, and in-your-face.

But Wayne was also a visionary. When he could discipline himself to write about ham radio in his "Never Say Die" editorials in *73*, he was virtually always on target. He saw where ham radio was heading, and where it needed to head, and helped move it in that direction. He also foresaw the impact that personal computers would have on society, launching *Byte* magazine and others in the 1980s.

For six decades, Wayne Green—W-2-Never-Say-Die—has been an outsize presence in amateur radio. To this day, at every hamfest I attend, at least three or four people will come up to me at the *CQ* booth, and ask me—even though he's had no connection with our magazine since 1960—"So, how's Wayne Green doing? Is he still alive?"

I've always answered, "Yes, he's still with us. I even hear from him now and then when he doesn't like something we've published." I'm saddened to report that that is no longer the case. On September 13, Wayne became a Silent Key at age 91. His passing was announced on his blog at waynegreen.com by his longtime friend, Daron Libby:

**FINAL–**Wayne Green passed away on the morning of September 13, 2013 in a peaceful, painless transition from this life on Earth. An eternal optimist, and one who loved to share his never-ending zest for life, he was a friend to many and will be missed greatly. Wayne was not afraid of dying and was very much ready to embark on his next great adventure to the afterlife. –73, **W2NSD (Sept 3, 1922 - Sept 13, 2013)**

Wayne was strongly opinionated, often caustic, and generally correct about amateur radio's present and future. The hobby owes a lot to him and his voice will be missed.


*Wayne Green, W2NSD/1 (SK), at the 1987 Dayton Hamvention®. (Photo by Joe Eisenberg, K0NEB)*

## Jack Althouse, K6NY

Less flamboyant but also a great contributor to our hobby, Jack Althouse, K6NY, became a Silent Key on September 15. Jack was the man behind Palomar Engineers, one of our premier sources of ferrite and powdered-iron cores, baluns, antennas, and antenna accessories. Jack's technical knowledge was immense, particularly about antennas and antenna systems, and he quietly served as a technical advisor to *WorldRadio's* Kurt N. Sterba when "the Krusty One" needed a little bit of backup (see Kurt's column in this month's *WorldRadio Online* for more on Jack and Kurt's take on the ARRL declaring him to be a Silent Key along with K6NY). Jack was always a gentleman and will also be missed by the ham community. Our condolences to both the Green and Althouse families.

## Gone Fishin' (for QSOs)

Regular readers of this column may recall that I've periodically shared my experiences in exploring a new (for me) area of ham radio—operating QRP (low power) from "the field." It's been a slow process, but I'm pleased to report that I finally managed to actually get out in the woods with my portable station during a summer weekend in Vermont, got on the air, and even made a couple of contacts. It was my first time but will not be my last. (If you're interested in the details, check out this month's issue of *WorldRadio Online*, in which I've written up the experience for KI6SN's "Trail-Friendly Radio" column. Visit <http://www.worldradiomagazine.com/> for subscription information.)

## Makin' It …

I'm writing this a couple of days before this year's World Maker Faire in New York City. I plan to be there, along with at least two *CQ* columnists. To bring us full-circle, one of Wayne Green's goals when he became Editor of *CQ* back in 1955 was "to get the magazine back into supporting building,"[1] something he felt was lacking at the time. We continue to support that portion of Wayne's legacy with project articles, and regular Makers, QRP, and Kit-Building columns. The ham community has noticed as well, since 30 to 40% of the *CQ* readers who respond to our surveys routinely list "Homebrewing and Kit-Building" among their ham radio activities.

## Happy Thanksgiving…

For our readers in the U.S. … best wishes for a Happy Thanksgiving from all of us at *CQ*. Let's be thankful for our great hobby and for all of the wonderful people and experiences it brings into our lives. And don't eat too much turkey! 73, Rich W2VU

1 - Green, "RTTY, Building and Contests," *CQ*, January 1995, p. 88

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

# hy-gain Antennas and Rotators

## HF Verticals

***Work amazing DX with these extremely low radiation angle omnidirectional antennas. All self supporting, 1500 Watts PEP SSB, low SWR. Heavy duty, slotted, tapered, swaged, aircraft quality aluminum tubing. Stainless steel hardware. Two year limited warranty.***

**AV-680, $549.95. 9 Bands: (6,10,12,15,17,20,30,40, 80 Meters). 26 ft., 18.5 lbs.** *Our most popular vertical now has 75/80 Meters! Lets you work exciting DX with a low 17 degree radiation angle!* Easily mount on decks, roofs, patios. *No ground or radials needed.* Extra wide 2:1 SWR bandwidths. *Each* band tunable. Auto bandswitching, handle 1.5kW, 80 MPH wind survival, low 2.5 sq. ft. wind surface. Aircraft aluminum tubing, stainless steel hardware.

**AV-640, $449.95.** Like AV-680 less 80M. 25½', 17½ lbs.

**AV-620, $349.95.** Like AV-640 less 40M. 22½'/10½ lbs.

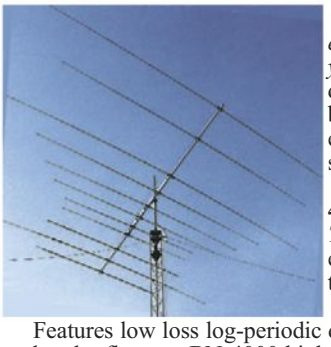
**AV-14AVQ, $179.95. (10, 15, 20, 40 Meters). 18 ft., 9 lbs.** *Classic* AV-14AVQ uses same trap design as famous Hy-Gain Thunderbird beams. 3 air dielectric Hi-Q traps with oversize coils give superb stability and 1/4 wave resonance on all bands. Automatic bandswitching.

**AV-12AVQ, $139.95. (10, 15, 20 Meters). 13 ft., 9 lbs.** Lowest priced *automatic bandswitching* tri-band vertical! Uses Thunderbird beam design air dielectric traps for extremely hi-Q performance in limited space.

**AV-18VS, $119.95. (10,12,15,17,20,30,40,80M). 18 ft., 4 lbs.** Hy-gain's *lowest priced vertical* gives you 8 bands. Easily tuned to any band by adjusting base loading coil.

***See our website for even more hy-gain vertical antennas!***

## HF Beams



**Hy-gain** beams are *stronger, lighter, have less wind surface and last years longer.* **Why?** *Hy-gain* uses durable *tooled* components -- massive boom-to-mast bracket, heavy gauge element-to-boom clamps, thick-wall swaged tubing -- no failures!

**TH-11DX, $1159.95. 11-element, 4.0 kW PEP, 10,12,15,17,20 Meters.** *The choice of top DXers.* With 11-elements, excellent gain and 5-bands, the super rugged TH-11DX is the *"Big Daddy"* of all HF beams! Features low loss log-periodic driven array on all bands with monoband reflectors, BN-4000 high power balun, corrosion resistant wire boom support, hot dipped galvanized and stainless steel parts.

**TH-7DX, $869.95. 7-Element, 1.5 kW PEP, 10,15,20 Meters.** 7-Elements gives you *the highest average gain of any Hy-gain* tribander! Dual driven for broadband operation without compromising gain. SWR less than 2:1 on all bands. Combined monoband and trapped parasitic elements give you an excellent F/B ratio.

**TH-3MK4, $469.95. 3-Element, 1.5 kW PEP, 10,15,20 Meters.** Gives most gain for your money in full-power, full-size *hy-gain* tri-bander! Impressive gain and a *whopping* average front-to-back ratio and still fits on an average size lot. 95 MPH wind survival.

**TH-3JRS, $359.95. Compact 3-Element, 600 W PEP, 10,15,20 Meters.** *Hy-gain's most popular and lowest-priced tri-bander fits smallest lot*, 14.75 ft turning radius, 21 lbs. Excellent gain and front-to-back let you compete with the "big guns"! 80 MPH wind survival.

## hy-gain Rotators . . . the first choice of hams around the world!

### HAM-IV . . . $649.95

***The most popular rotator in the world!*** For medium communications arrays up to 15 square feet wind load area. *New* 5-second brake delay! *New* Test/Calibrate function. *New* low temperature grease permits normal operation down to -30 degrees F. *New* alloy ring gear gives extra strength up to 100,000 PSI for maximum reliability. *New* indicator potentiometer. *New* ferrite beads reduce RF susceptibility. *New* Cinch plug plus 8-pin plug at control box. Dual 98 ball bearing race for load bearing strength and electric locking *steel* wedge brake prevents wind induced antenna movement. North or South center of rotation scale on meter, low voltage control, max mast size of 2 1/16 inches.

**HAM-VI, $749.95.** For medium arrays up to 15 sq. ft. wind load. Like HAM-IV but has *new* ***DCU-2*** *Digital Rotator Controller*. Just dial in your beam heading or let your computer control your antenna.

**HAM-VII, $799.95.** Like HAM VI but with ***DCU-3*** digital controller with *six programmable memories*.

### Tailtwister T-2X . . . $799.95

**For** large medium antenna arrays up to 20 sq. ft. wind load. Choose ***DCU-2*** *digital* controller (T-2XD2) or *analog* control box (T-2X) with *new* 5-second brake delay and *new* Test/Calibrate function. Low temperature grease, alloy ring gear, indicator potentiometer, ferrite beads on potentiometer wires, *new* weatherproof AMP connectors plus 8-pin plug at control box, triple bearing race with 138 ball bearings for large load bearing strength, electric locking *steel* wedge brake, N or S center of rotation scale on meter, low voltage control, 2 1/16" max. mast.

**T-2XD2, $899.95.** Tailtwister with ***DCU-2*** *digital* controller.

**T-2XD3, $949.95.** Tailtwister with ***DCU-3*** digital controller with *six programmable memories*.

**AR-40, $349.95.** For compact antenna arrays and FM/TV up to 3.0 sq. ft. wind load. Dual 12 ball-bearing race. Fully automatic.

**CD-45II, $449.95.** For antenna arrays up to 8.5 sq. ft. Bell rotator design gives total weather protection. Dual 58 ball bearing race.

## Digital Rotator Controller with *6 Programmable beam headings*

New!

DCU-3

$449.95

***New*** DCU-3 Digital Controller lets you program 6 beam headings! Gives you fully automatic or manual control of your hy-gain HAM or Tailtwister Rotators.

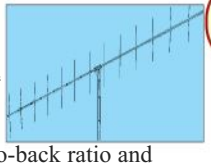
**Push** a memory button or dial in your beam heading or let *Ham Radio Deluxe* (or other program) control your DCU-3. Your antenna automatically rotates precisely and safely to your desired direction.

## hy-gain VHF/UHF Antennas

**V2R, $109.95.** 2-Meter *vertical* has two *in-phase* 5/8 Wave collinear radiators for exceptional high omnidirectional gain. It has two sets of quarter wave radials that decouple radiator from mast. Covers 138-175 MHz. SO-239, handles 500 Watts. 9 feet.

**V4R, $109.95.** UHF *vertical*. Like V2R but covers 400-475 MHz. Type N, handles 500 Watts, 4 foot.

**V42R, $169.95.** *Dual band* covers 144/440 MHz bands. Two 5/8 Wave collinears.



**VB-214FM, $89.95.** *14-element* 2-Meter FM *beam* antenna provides exceptional front-to-back ratio and maximum obtainable gains.

**VB-23FM, $49.95.** 3-element.

**VB-25FM, $59.95.** 5-element.

**VB-28FM, $79.95.** 8-element.

Threaded stub for feedpoints. Accepts up to 2 inch mast.

**DB-2345, $89.95.** Dual band 144 (3-elements) 440 (5-elements) MHz.

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# announcements

**ARANSAS PASS, TEXAS — The South Texas Amateur Radio Club 15th Annual Coastal Bend Hamfest**, Friday, November 1 and Saturday, November 2 at the Aransas Pass Civic Center. Email: <hamfest@n5crp.org>. Website: <http://www.n5crp.org/hamfest>. Talk-in 146.820- (PL 107.2).

**ENID, OKLAHOMA — The Enid Amateur Radio Club 2013 Enid Hamfest**, Saturday, November 2 at the Garfield County Fairgrounds – Hoover Building, 305 E. Oxford Avenue. Website: <http://www.enidarc.org>. Talk-in 145.290-.

**LAKEWOOD, COLORADO — The 285 TechConnect Radio Club (NAØTC) 2013 Fall TechFest**, Saturday, November 2, Lakewood Elks Club, 1455 Newland Street. Website: <http://www.na0tc.org>. Talk-in 147.225+ (PL 107.2).

**LAWRENCEVILLE, GEORGIA — The Alford Memorial Radio Club Stone Mountain Hamfest and Computer Expo**, Saturday, November 2 and Sunday, November 3 at the Gwinnett County Fairgrounds, 2405 Sugarloaf Parkway. Contact: AMRC, P.O. Box 1282, Stone Mountain, GA 30086-1282. Phone: (855) 786-8643. Fax: (678) 228-1885. Email: <hamfest@stonemountainhamfest.com>. Website: <http://www.stonemountainhamfest.com>. Talk-in 146.760- (PL 107.2) or 145.450-.

**LEESBURG, FLORIDA — The Lake Amateur Radio Association Hamfest/Tailgate**, Saturday, November 2 at 11146 Springdale Avenue. Contact: Mike Walker, K9SSL, <k9ssl@arrl.net>. Website: <http://www.k4fc.org>.

**LONDONDERRY, NEW HAMPSHIRE — The Interstate Repeater Society IRS Flea Market**, Saturday, November 2 at the Londonderry Lions Club, 256 Mammouth Road. Contact: Chris, (603) 434-6137. Email: <kb1qvm@yahoo.com>.

**APPLETON, WISCONSIN — The Fox Cities Amateur Radio Club (W9ZL) 2013 Swapfest**, Sunday, November 3 at the Monarch Gardens, 2311 W. Spencer Street. Contact: FCARC Swapfest, 773 Yorkshire Road, Neenah, WI 54956. Anthony L. Mach, AB9IO, (920) 722-0482. Email: <hamfest@fcarc.us>. Website: <http://www.fcarc.us/hamfest.php>. Talk-in 146.76 (PL 100).

**MASSILLON, OHIO — The Massillon Amateur Radio Club 53rd Annual Hamfest and Auction**, Sunday, November 3 at the Massillon Boy's & Girls Club, 730 Duncan Street SW. Contact: Terry Russ, N8ATZ, 3420 Briardale Drive NW, Massillon, OH 44646. Phone: (330) 837-3091. Email: <truss@sssnet.com>. Website: <http://www.w8np.org>. Talk-in 147.18+.

**PITT MEADOWS, BRITISH COLUMBIA, CANADA — The Maple Ridge Amateur Radio Club Maple Ridge Swap Meet**, Sunday, November 3 at the REC Building, 12460 Harris Road. Contact: Nick, (604) 465-9476. Email: <ve7te@mrarc.net>. Website: <http://www.mrarc.net>. Talk-in 146.800- (PL 156.7).

**WASHINGTON, PENNSYLVANIA — Washington Amateur Communications WACOM 2013 Hamfest**, Sunday, November 3 at the Washington County Fairgrounds, 2151 North Main Street. Contact: Bud Plants, N3TIR, (724) 350-6745. Email: <bud@n3tir.com>. Website: <http://www.wacomarc.org>. Talk-in 146.790.

**LEBANON, MISSOURI — The Lebanon Amateur Radio Club 2013 ARRL Midwest Convention**, Friday, November 8 and Saturday, November 9 at the Cowan Civic Center, 500 E. Elm Street. Website: <http://www.arrlmidwestconvention.com/>. Talk-in 146.700-.

**AZLE, TEXAS — The Tri-County Amateur Radio Club North Central Texas Emergency Communicators' Ham-festival (NCTECH) 2013**, Saturday, November 9 at the Azle Community Center, 404 W. Main Street. Contact: Paul Finch, <azlecomm@azlecomm.com>. Website: <http://www.wc5c.org>. Talk-in 147.160 (PL 110.9).

**CONWAY, SOUTH CAROLINA — The Grand Strand Amateur Radio Club** will hold the **Annual Grand Strand ARC Beachfest 2013 & Computer Expo**, Saturday, November 9 at the Old Pee Dee School/Academy of Hope, 3521 Juniper Bay Road. Contact Beachfest 2013, P.O. Box 2135, Myrtle Beach, SC 29578-2135. Vendors contact: Edward Jordan, (843) 458-3856. Email: <kf4eck@w4gs.org>. Jim Wood, (843) 340-1132. Email: <kf4cje@w4gs.org>. Website: <http://www.w4gs.org>. Talk-in 145.110 (PL 85.4).

**MARANA, ARIZONA — The Oro Valley Amateur Radio Club Tucson Hamfest 2013**, Saturday, November 9 at the Marana Middle School, 11279 West Grier Road. Website: <http://www.w0hf.com>.

**MONTGOMERY, ALABAMA — The Montgomery Amateur Radio Club 2013 Montgomery Hamfest**, Saturday, November 9 at the Alcazar Shrine Temple, 555 Eastern Boulevard. Contact: Scott Poole, W4SPA, (334) 262-0412. Email: <hamfest@w4ap.org>. Vendors contact: Lew Nyman, K1AZE, (334) 354-1933. Email: <hamfest@w4ap.org>. Website: <http://www.w4ap.org>. Talk-in 146.84-.

**PINELLAS PARK, FLORIDA — The St. Petersburg Amateur Radio Club SPARCFest**, Saturday, November 9 at the Freedom Lake Park. Contact: Clayton Parrott, KJ4RUS, (727) 215-8140. Email: <clayton_parrott@yahoo.com>. Website: <http://www.sparc-club.org>. Talk-in 147.06+.

**REYNOLDSBURG, OHIO — The All Ohio ARES Conference**, Saturday, November 9 at the Ohio Fire Academy, 8895 East Main Street. Contact: Scott, N8SX, <n8sx@arrl.net> or Matt, W8DEC, <w8dec@arrl.net>. Website: <http://www.arrl-ohio.org>.

**BILOXI, MISSISSIPPI — The Jackson County Amateur Radio Association, Inc. JCARA 2013 Hamfest**, Friday, November 15 and Saturday, November 16 at the St. Martin Community Center Contact: Dan Miller, AE5JG, (228) 539-4930. Email: <danbarb@bellsouth.net>. Website: <http://www.qsl.net/w5wa/>. Talk-in 145.110 (PL 123).

**FORT WAYNE, INDIANA — The Allen County Amateur Radio Technical Society 41st Fort Wayne Hamfest and Computer Expo** and **ARRL Indiana State Convention**, Saturday, November 16 and Sunday, November 17 at the Allen County War Memorial Coliseum Exposition Center, 4000 Parnell Avenue. Contact: ACARTS/Fort Wayne Hamfest, P.O. Box 10342, Fort Wayne, IN 46851-0342. Phone: (260) 579-2196. Website: <http://www.fortwaynehamfest.com>. Talk-in 146.88-.

**RAYTOWN, MISSOURI — The Raytown Amateur Radio Club Raytown Club 2013 Hamfest**, Saturday, November 16 at Our Lady of Lourdes Catholic Church School Gym, 8812 East Gregory Boulevard. Contact: Joel, KCØELZ, 8304 Ditzler Avenue, Raytown, MO 64138. Phone: (816) 674-8854. Email: <kc0vyt@arrl.net>. Website: <http://www.k0gq.com>. Talk-in 145.170-.

**GETTYSBURG, PENNSYLVANIA — The Adams County Amateur Radio Society** Special Event Station, **W3KGN**, Monday, November 18 to Wednesday, November 20 from 1400 to 2359 UTC to commemorate the 150th anniversary of Lincoln's Gettysburg Address. Frequencies include 3.863, 7.1863, 14.263, and 145.63 (FM Simplex). QSL to Perry Wood, 255 Chapel Road, Gettysburg, PA 17325, with a 9- x 12-inch SASE to receive a commemorative certificate. Website: <http://www.w3kgn.org>.

**FAIR LAWN, NEW JERSEY — The Fair Lawn Radio Emergency Service Auction**, Friday, November 29 at the Fair Lawn Senior Center, 11-05 Gardiner Road. Email: <w2npt@arrl.net> or <fairlawnres@yahoo.com>. Website: <http://www.flres.net>. Talk-in 145.470- (PL 107.2).

**CHICAGO, ILLINOIS — The Illinois Wing CAP** will air special event station, **W9CAP**, from 1700 to 2300 UTC, Saturday, November 30 to commemorate the 72nd Anniversary of the Civil Air Patrol. Frequencies include 18.125, 14.250, and 7.255. QSL a SASE to Major Ron Walerowicz, IL WING CAP, P.O. Box 397, West Chicago, IL 60186. Website: <http://www.w9cap.com>.

**EVANSVILLE, INDIANA — The Electronic Applications Radio Service (EARS)** and **The Ham Station 21st Annual Evansville Hamfest**, Saturday, November 30 at the Vanderburgh County 4-H Fairgrounds Auditorium, 202 E. Boonville-New Harmony Road. Contact: Neil Rapp, WB9VPG, 2744 Pinehurst Drive, Bloomington, IN 47403. Phone: (812) 333-4116. Email: <ears@w9ear.org>. Website: <http://www.w9ear.org>. Talk-in 145.150- (PL 136.5).

## DECEMBER

**PLANT CITY, FLORIDA — The Florida Gulf Coast Amateur Radio Council, 38th Annual Tampa Bay Hamfest**, Friday, December 6 and Saturday, December 7 at the Evelyn & Bastista Madonia Sr. Agricultural Show Center (Strawberry Festival Grounds), 2508 W. Oak Avenue. Contact: FGCARC, P.O. Box 22042, Tampa, FL 33622-2042. Website: <http://www.tampabayhamfest.org>. Talk-in 146.940- (PL 146.2).

**HARRISON TOWNSHIP, MICHIGAN — The L'Anse Creuse Amateur Radio Club 41st Annual Swap & Shop**, Sunday, December 8 at the L'Anse Creuse High School, 38495 L'Anse Creuse Road. Contact: LCARC Swap, 29729 S. River Road, Harrison Township, MI 48045. Email: <n8geo@arrl.net>. Website: <http://www.qsl.net/n8lc/>. Talk-in 147.080+ (PL 100).

**MINDEN, LOUISIANA — The Minden Amateur Radio Association Annual Christmas Hamfest**, Saturday, December 21 at the Minden City Hall, 520 Broadway Street. Website: <http://www.n5rd.org>. Talk-in 147.300 (PL 186.2).




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# MFJ 1500 Watt *Remote* Auto Tuner

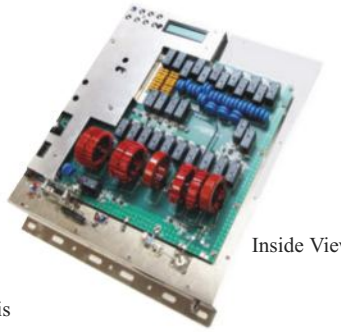
## *Place this MFJ-998RT remote tuner at your antenna to match high SWR antennas/long coaxes -- greatly reduce losses for high efficiency*

***. . . Match 12-1600 Ohms, 1.5 kW, SSB/CW, 1.8-30 MHz . . . Match coax/wire antennas . . . Weather-sealed . . . Remotely powered thru coax . . . Amplifier, radio, tuner protection . . . Output static/lightning protection . . . StickyTune™ always tunes when power folds back . . . DC power jack . . .***

MFJ-998RT
**$769.95**



Bottom Chassis



Inside View

### *Tune your antenna AT your antenna!*

***Get greatly reduced losses and high efficiencies with long coax runs and high SWR antennas with this new MFJ-998RT 1.5 kW Remote Antenna Tuner.***

### *Weather-Sealed*

**A** tough, durable weather-sealed ABS cabinet with over-lapping lips, sealing gasket and stainless steel chassis protects the MFJ-998RT from all kinds of weather.

### *No Power Cable Needed!*

**No** power cable needed -- remotely powered through coax. Includes MFJ-4117 Bias-Tee with on/off switch for station end of coax. Has 12 VDC jack for power cable, if desired.

### *Fully Protected*

**MFJ** exclusive algorithms protect your tuner, radio and RF power amplifier from damage.

**Automatic** inductor and capacitor limiting prevents tuning extreme loads which can destroy your tuner.

**Your** tuner will not tune if more than 75 Watts with SWR greater than 3:1 is applied or if more than 125 Watts is applied.

**Tuner** output is static electricity and lightning induced surge protected.

### *MFJ exclusive StickyTune™*

**Very** high SWR can fold back transmitter power and *prevent tuning* caused by extreme differences in loads (example: changing bands and other conditions).

**But** MFJ exclusive *StickyTune™ always* tunes with a simple on/off power cycle and re-transmit.

### *Tunes Coax fed and Wire Antennas*

**Tunes** both coax fed and wire antennas. Has *ceramic* feed-through insulator for wire antennas. 2 kV *Teflon*® insulated SO-239 -- prevents arcing from high SWR.

### *High Power, Highly Efficient*

**A** highly efficient L-network matches 6-1600 Ohms at *full* 1500 Watts legal limit SSB/CW 1.8 to 30 MHz with Hi-Q Ls, Cs.

### *MFJ-998RT Learns as you Operate*

**As** you operate, the MFJ-998RT automatically tunes for minimum SWR and remembers your frequency and tuner settings. The next time you operate on that frequency and antenna, its tuner solution is restored in milliseconds and you're ready to operate!

### *Highly Intelligent, Ultra-fast Tuning*

**MFJ** *InstantRecall*™ recalls stored tuning solutions from 10,000 memories. For new frequencies, MFJ *Intelli-Tune*™ measures your antenna impedance and instantly determines the correct matching components. If antenna impedances cannot be measured, MFJ *AdaptiveSearch*™ searches *only* the relevant components that can match your antenna giving you ultra-fast tuning.

**Field** upgradeable firmware. Requires 12-15 VDC at 1.4 Amps maximum or 110 VAC with optional MFJ-1316, $21.95. Weighs 9.5 lbs. 13¼Wx6¾Hx17½D inches.

## 600W *Remote IntelliTuner™*

MFJ-994BRT
**$399.95**

**MFJ-994BRT** -- perfect for 600 Watt SSB/CW amplifiers like Ameritron's AL-811/ALS-600/ALS-500M. Matches 12-800 Ohms. Coax/wire antennas, 1.8-30 MHz. Fully *weather-sealed* for outdoor use. Remotely powered through coax. Tough, durable, *built-to-last* cabinet, 9¼Wx3Hx 14¼D inches, 4 lbs. Includes MFJ-4117 BiasTee Power Injector.

## 300W *Remote IntelliTuner™*

MFJ-993BRT
**$299.95**

**MFJ-993BRT** handles 300 Watts SSB/CW and matches an *extra-wide* 6-1600 Ohm impedances. Coax/wire antennas, 1.8-30 MHz. Fully *weather-sealed* for remote outdoor or marine use. Remotely powered through coax. Tough, durable, *built-to-last* cabinet measures 9¼Wx3Hx14¼D inches. Weighs just 4 pounds. Includes MFJ-4117 BiasTee Power Injector.

## 200W *Remote IntelliTuner™*

MFJ-926B
**$279.95**

**MFJ-926B,** 200 Watts SSB/CW, matches 6-1600 Ohms, Coax/wire antennas, 1.8-30 MHz. Includes BiasTee.

## 200W *Remote Econo Tuner™*

MFJ-927
**$259.95**

**MFJ-927,** 200 Watts SSB/CW, 6-1600 Ohms, Coax/Wire antennas, 1.8-30 MHz. Weather-sealed, BiasTee. 7½Wx5¼Hx8½D in.

MFJ-2990
**$359.95**

## 160-6 Meters 43 foot Vertical Antenna

**Operate** all bands 160-6 Meters at full 1500 Watts with this self-supporting, 43 foot high performance vertical! Assembles in less than an hour. Low profile blends in with sky and trees -- barely see it. Entire length radiates. Exceptional low angle DX performance on 160-20 Meters and very good performance on 17-6 Meters. Telescope it shorter for more effective low angle radiation on 17-6 M if desired. One of these wide-range *MFJ automatic tuners* at the antenna easily matches all bands 160-6 Meters. There's no physical tuning adjustments on the antenna -- you *simply put it up!* Requires ground system, at least one radial, more the better. Includes balun and base mount. **MFJ-1932, $34.95.** All band ground radial system.

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*September's "Kit-Building" column inspired KI6SN to upgrade an "old friend" in his shack … and he hopes his experience can inspire you to pick up a soldering iron as well, even if you've never "done" homebrewing before..*

# Ready for Your First Homebrew Project?

## Come Along as We Lead an MFJ Tuner from Darkness into the Light

**BY RICHARD FISHER,* KI6SN**

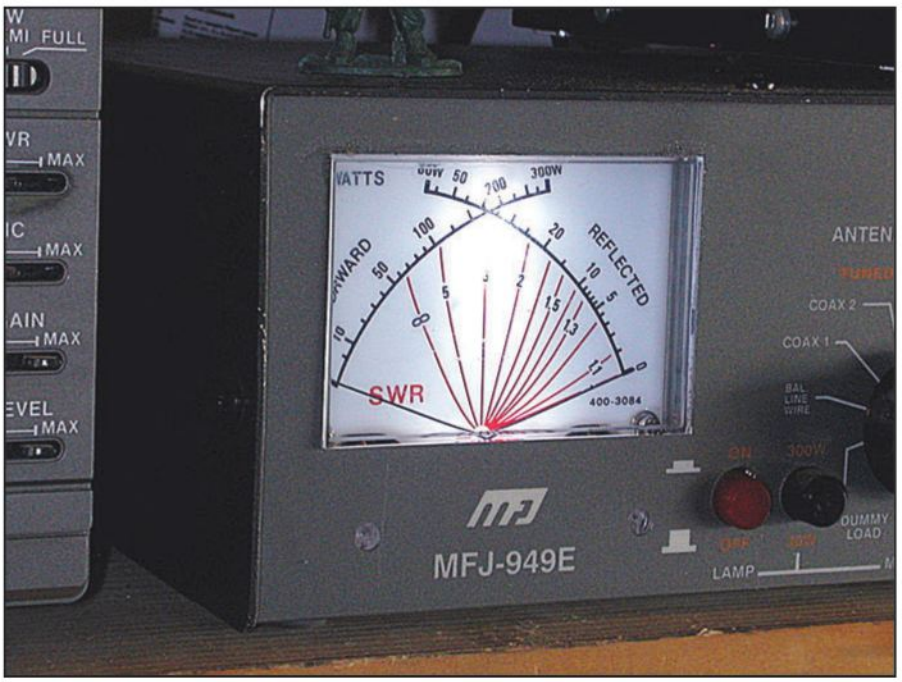


*Photo A. After being inspired by Kit-Building's Joe Eisenberg, KØNEB, an LED was used to replace a burned-out incandescent bulb in KI6SN's MFJ Deluxe Versa Tuner II. It showers a nice white light over the antenna tuner's SWR meters—illumination much like you'd see at a fine art gallery. (Photography by KI6SN)*

As one who likes to devour amateur radio magazines from cover to cover, I found Joe Eisenberg, KØNEB's *Kit-Building* in September's edition of *CQ* particularly yummy.

I wasn't in need of a new antenna tuning unit, but couldn't resist reading the story of Joe's construction of MFJ Enterprises' new MFJ-941EK *Versa Tuner II* kit. It's another incarnation of one of the most popular tuners in amateur radio—and for the first time recruits the purchaser as the builder. (***IN DEPTH:*** *See "'The Tale of the Tuner': Building the MFJ-941EK" beginning on page 60 of September's CQ. – KI6SN.)*

Joe's pieces are always fun to read and it is clear MFJ has another winner with the '941EK. For me, though, September's column became the catalyst for fixing an old MFJ "friend" in my radio shack. And it may contain the seed for your first building—*homebrew*—project, as well, should you choose to plant it.

### Tuning Cousins

At KI6SN, the MFJ-949E *Deluxe Versa Tuner II*—an older cousin of the MFJ-941EK—has been a fixture for decades. Rated for 300 watts, it works great at QRP levels, as well. That's 5 watts output or below.

A look through the '949E manual <http://bit.ly/1eons3F> gives a snapshot of why this tuner line has *versa* in its name. The unit's versatility in matching antennas on multiple HF (high-frequency) bands with a wide range of antennas and feed lines earns MFJ that naming right.

It was great to see MFJ pushing the *Versas* into yet another realm: Hands-on with solder smoke swirling around the homebrew bench.

### A Light Touch

One of the things I've always liked about the '949E is its meter illumination. Or more properly, *meters* illumination. Like Joe's '941EK, my tuner has dual meters in one SWR housing on its front panel—one for forward power readings and another for reflected power. Not only is it nice to have the meter movements lit when your shack is in low light,

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*Photo B. Only two parts are needed to add luminescence to any 12-V DC-powered project: a 1.2K-ohm resistor and an LED. A package of brown, red, red resistors was pulled from the KI6SN junk box, while the LED was obtained from RadioShack®.*

but showering the meter's face in light provides another source for that *warm glow* so many operators like at the operating position.

When the incandescent bulb went out on my '949E many years ago, I was sad—but not to the point of going to the trouble of replacing it. Let's face it: Incandescent bulbs can be hard to find and changing them can sometimes be tricky.

After reading Joe's piece, though, I was really inspired:

"MFJ does offer an LED (light-emitting diode) upgrade kit for some of its meters," KØNEB wrote in the MFJ-941EK feature. "We kit builders already know how to improve on our projects, and placing a 1.2K-ohm resistor in series with an LED will allow us to power it from 12-V DC and choose our own preferred color of LED for the meter illumination."

It was one of those *"Boing-g-g-g-g ... I should have had a V-8"* moments. Of course: two parts and we'd be in *Versa* darkness no more.

## Calling All First-Time Builders

If you've never built anything and want to give homebrewing a try, here's the perfect project. Fundamentally, this isn't about fixing an MFJ-949E *Deluxe Versa Tuner II*. You can't go wrong adding that *warm glow* to just about any powered project. In my case, the opportunity came in replacing that failed incandescence in the '949E with some 21st century joules, Photo A.

LEDs are easy and fun to work with and you get instant gratification every time the power switch is flipped. This first-time project can be used in conjunction with all sorts of gear, or all by itself. Anyone need a *flashlight?*

The first order of business is rounding up the parts. Resistors and LEDs are pretty common, but if you don't have a junk box as yet, don't worry. Both components are available from RadioShack®.

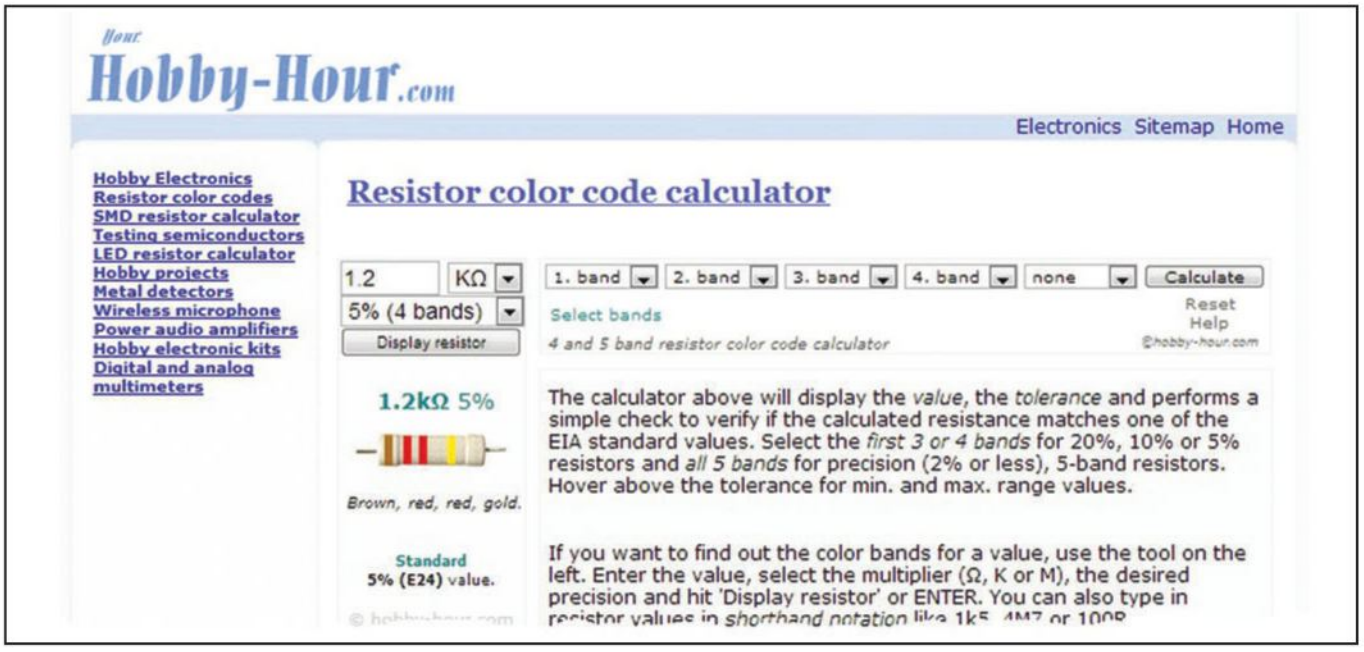


*Photo C. If you're new to the language of resistors, an excellent site to visit for help is Hobby-Hour.com <http://bit.ly/13R8RH7>. To find the color code of a 1.2K (1,200-ohm) resistor, put 1.2 in the left box at the top. To its right, click the down arrow and choose KΩ from the menu. Then press Display resistor. As you will see, a 1.2K resistor's color bands, left to right, are brown, red, red. The yellow band at the far right has to do with the component's value tolerance, which is not of concern with this project. (Internet screen grab)*

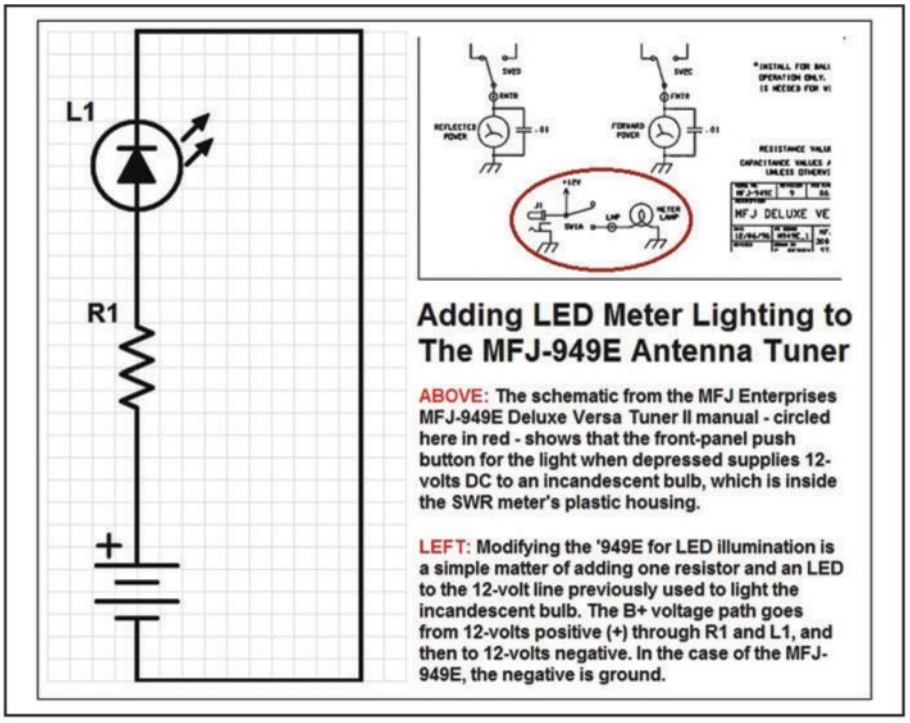


*Figure 1. Schematic diagram for this homebrew project, along with the location of the component it's replacing in the original circuit.*

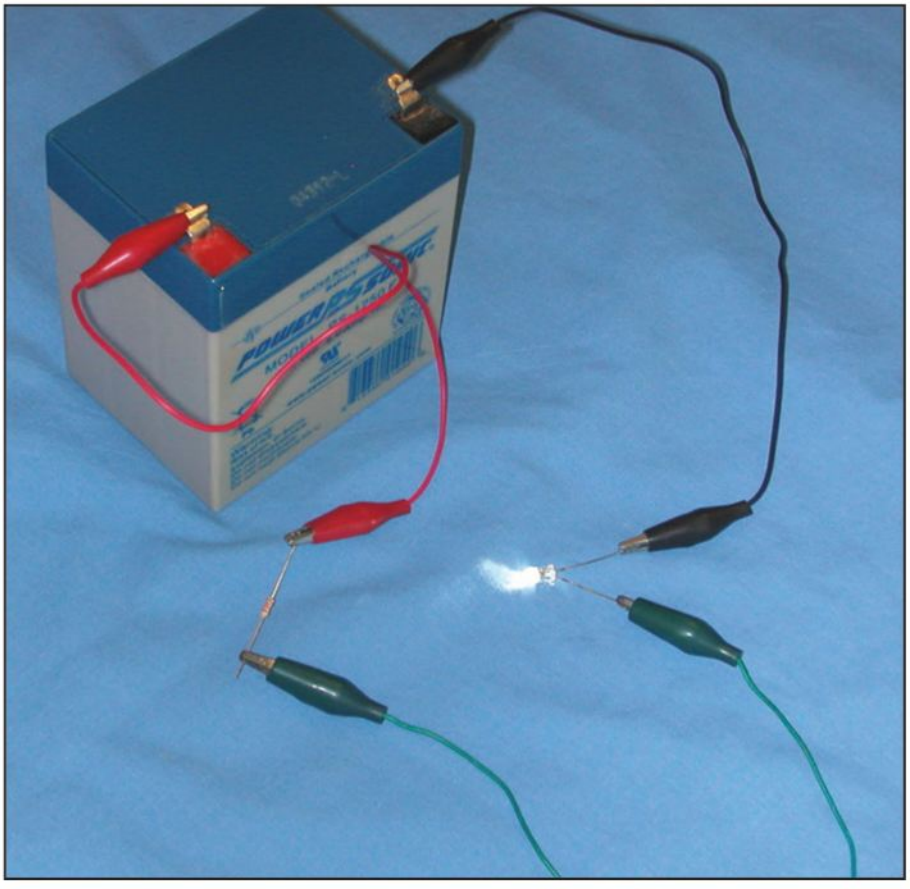

*Photo D. It's easy to test this LED circuit without having to use heat or solder. Simply use clip leads to connect the resistor, LED and battery in the right order and orientation. That way you'll be sure you've got components and their polarities positioned just right when it's time to install them permanently. See text.*

**LED**: I chose the 5mm-High Brightness White LED at my local store. A package of two is $2.49. Ask for Catalog No. 276-017 <http://bit.ly/17SGGsM>, Photo B.

**RESISTOR**: In my experience, a 1.2K-ohm resistor (that's 1,200 ohms) is a bit harder to find at The Shack. But here's a suggestion. A package of 500 common-value 1/4-watt resistors (Catalog No. 271-312) has at least five 1.2Ks <http://bit.ly/14Jycp4>. The collection is listed on RadioShack's website for $14.49. Buy it and you'll get the resistor you need, plus 499 more to add to—*or start*—your junk box.

If you opt for scrounging, there's a handy site on the Internet to assist you in determining resistor values. Link to Hobby-Hour.com at <http://bit.ly/13R8RH7>. Simply punch in the resistor value you need, Photo C. The site will immediately give you the combination of resistor color bands you're looking for. Don't be concerned about any color band beyond the first three. The yellow band at the far right in the picture has to do with resistor value tolerance—which is not important in our LED project.

## Playing By the Rules

To be successful in any electronic project, you've got to wire things in proper order. That's often mapped out in a schematic diagram. The drawing on the left in Figure 1 shows the schematic symbols for a resistor (R1) and LED (L1). The power source—in this case, 12-V DC—is the symbol with the plus sign (+) at its top. A portion of MFJ's '949E manual schematic—circled in red at the top of Figure 1—confirmed the unit's meter light was, indeed, incandescent.

You can't put in a resistor "backwards." It functions the same either way it is inserted in a circuit. The LED and battery, on the other hand, are another matter.

Of course, we all learned a long time ago that a circuit with a battery put in the wrong way won't work. Worse, it can fry everything to a crisp.

The same *polarity issue* holds true for LEDs. They'll illuminate only when put in a circuit "the correct way"—their anode and cathode in proper orientation.

Referring to the schematic, the side of the LED closest to "L1" is the cathode. The side connected to R1 is the anode.

So, how do you know which side is which? Hold an LED in your hand and you'll notice that the manufacturer makes one lead (leg) longer than the other. Generally speaking, it is standard

practice to designate an LED's shorter leg as its cathode (negative), while the longer leg is its anode (positive). So, in our project, the longer leg (anode) goes to R1 while the shorter leg (cathode) loops back to the negative post of the battery, or ground.

*(**NOTE:** Another way to determine or verify polarity is to gently run your thumb around the circular base of an LED's bulb. You'll find one side is flat. This is the cathode, or negative lead. **ALSO:** Some infrared LEDs have polarity opposite from the garden-variety LED used here. Infrared isn't what we want in this circuit. –KI6SN.)*

## Let's Take a Test Drive

You can experiment with this LED illumination circuit even before firing up the soldering iron. All you need are:

- The *brown, red, red* 1.2K-ohm resistor
- Standard LED
- 12-V battery (a 9V will work fine, too)
- Three clip leads

As you can see in Photo D, the red clip lead connects the battery's positive terminal (+) to one side of the resistor (R1). The green clip lead connects R1's opposite side to the longer leg of the LED (anode). The black lead connects the LED's shorter leg (cathode) to the battery's negative terminal—completing the circuit and lighting the LED.

In a permanent installation, of course, you will want to solder each of the components firmly in place.

## An Object Lesson: Putting an LED in the MFJ-949E

So, putting all of this knowledge into practice, the eight screws holding the lid to the chassis of the '949E were removed, exposing the tuner's inner sanctum. The SWR indicator's dual meters are in a white plastic housing. I noticed a small piece of plastic had broken away from a vertical stanchion that holds the meter in place on the front panel. Not good.

As I poked around with a small screwdriver trying to find a way into the plastic meter housing, more plastic fragments were sheared off.

*(**NOTE:** Don't jump to any conclusions about the quality of this tuner. If you lived in a garage for a couple of decades—exposed to temperatures frequently hitting the 120s F during the day, and dipping to the teens or single digits on winter nights—you'd be a little brittle, too. In every respect, the '949E has been a marvelous piece of gear. –KI6SN.)*

Before inflicting any more damage, I paused to look for a work-around. It was obvious the meter movements were recessed in two barrel-like housings at the unit's base. The meter's face was on the outside of the white housing. *Why not drill a hole in the center-top of the plastic housing and push the bulb of the LED through it?*

Choosing a drill bit a little larger than the diameter of the LED, a hand drill was turned gently to create the opening. A test insertion showed everything was going perfectly both inside and out.

There are two solder tabs protruding from the top of the meter housing—obviously the connections to the long-dead incandescent bulb. Those tabs would be the perfect anchor for the LED, Photo E.

The long-leg anode would be soldered to the tab on the left; the short-leg cathode to the one on the right, going to ground. Now it was merely a matter of connecting the 12-V DC line to one side of R1 and the other side of R1 to the left tab—home of the LED's long-leg anode, Photo F.

Power is supplied to the '949E's meter light via a 12-V DC cube, commonly called a *wall wart*. Before soldering R1,

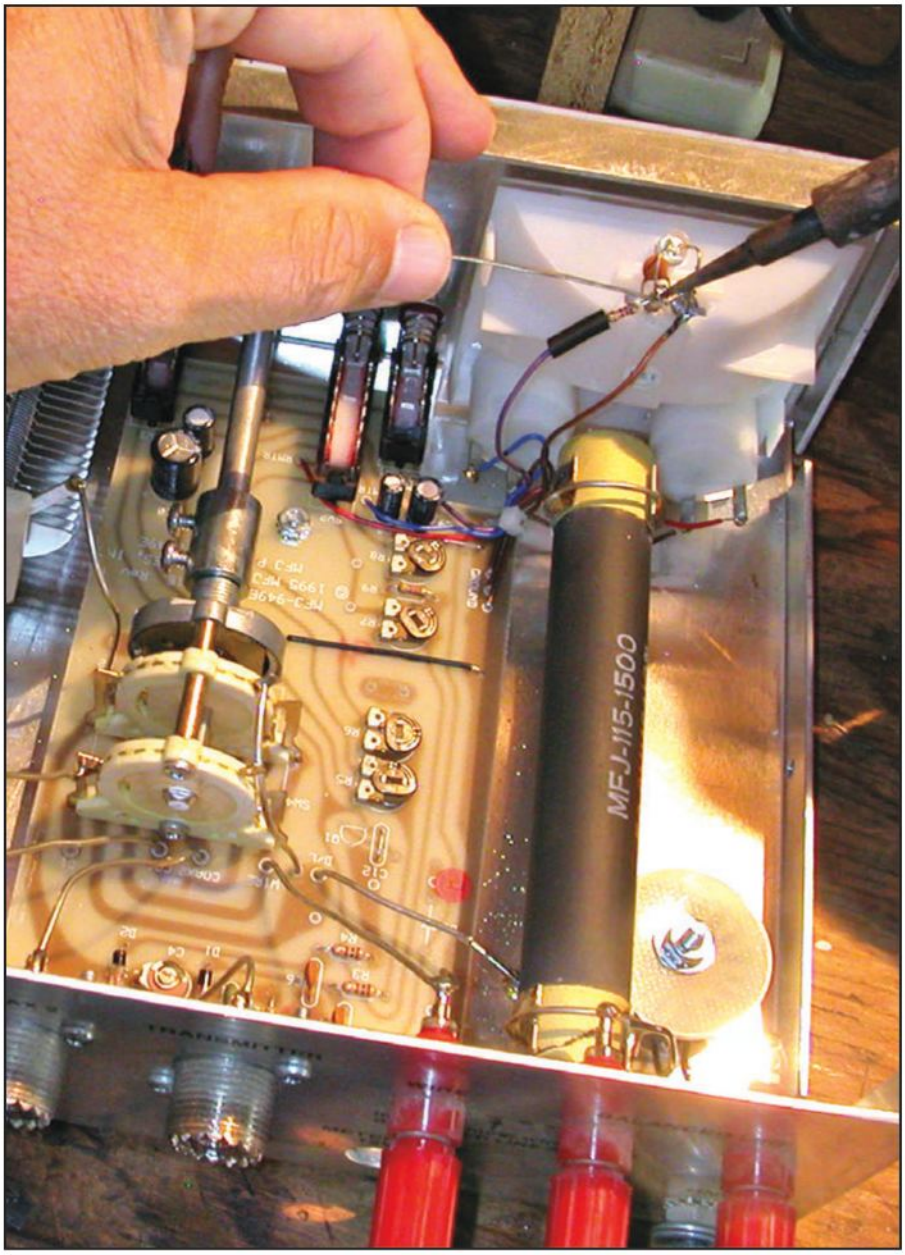


*Photo E. Solder tabs already mounted on the back of the MFJ-949E's meter housing became the perfect anchor for the newly-installed LED and accompanying 1.2K-ohm resistor.*

*Photo F. A close-up of the meter's plastic housing shows the LED pressed through the newly-drilled hole—like an ostrich with its head in the sand. A piece of discarded black wire insulation covers the exposed resistor lead in the purple 12-V DC line. The brown wire goes to ground. The round disc-ceramic capacitor across the tabs in the background is apparently for bypassing RF to ground. It was part of the original incandescent circuitry, and we opted to leave it there.*

a piece of discarded wire insulation was slipped over the 12-V DC wire. It would be slid up the lead snug to the resistor after soldering. We don't want DC circuitry unnecessarily exposed in any project. A 12-V DC short to ground could leave you with a cloud of smoke and a roasted "wart." Possibly a fried piece of gear, as well.

After double checking my work, it was time to plug in the 12-V DC line, say a prayer and push in the front panel's red LAMP button. *Let there be light. And there was light ... And it was good.* Ah, the Genesis of the MFJ Deluxe Versa Tuner II's journey from darkness.

## Lessons from the '949E Fix-It and KØNEB

Here are some things I was reminded of, or learned from this exercise:

- Reading a magazine such as *CQ* from cover-to-cover has great benefits. Even though a feature may not relate to you directly, there are *hidden treasures* in almost every article that can make your amateur radio experience a lot more satisfying—and, in this case, a lot brighter.
- Don't be afraid to try building things. For a minimal investment of time and money, you may be pleasantly surprised. You will likely pick up knowledge, as well, that will serve you throughout your entire amateur radio experience.
- Calculate risks, and act accordingly. In the case of the '949E, from all observation it appeared drilling a hole for the LED in the meter housing was the best way to go. In the end, it was the perfect choice.
- Push forward. If lighting an LED turns out to be your entrée to homebrewing, look for other opportunities to grow. Is there a project that requires three or four parts? You'll likely find that with an increase in sophistication comes an increase in satisfaction.
- Take a deep breath and *go for it!*

# Results of the 2013 CQ WW WPX CW Contest

BY TERRY ZIVNEY,* N4TZ

**2013** marked the thirty-fifth running of the CQ WPX CW contest. The thirty-fifth anniversary is often commemorated with coral. Of course, active hams automatically think about DX locations when they hear the word 'coral' (as in reef). While many do head for temporary DX locations during the contest, most are content to operate from home because this is the world's largest 'everyone works everyone for points' CW contest.

And, thousands did operate. 2013 saw the second highest number of logs received in the 35-year history of the CQ WPX CW contest, 4120, down slightly from the record 4323 logs received in 2012. Of course, last year's action found very favorable radio conditions. Many participants commented upon the relatively poor conditions this time out. Still, the high level of activity resulted in scores that would not have been dreamed of 35 years ago, when K7JA had the world-high score of 2.8 million points from KG6SW. Chip worked a grand total of 345 prefixes in that effort.

The WPX Contest now receives logs from more than 130 countries around the world, many sporting unusual prefixes. As might be expected, the two top single-operator scores led the way amongst individual operators with 1167 and 1133 prefixes, respectively. 74 stations worked at least 1,000 prefixes. It takes 300 prefixes confirmed on CW to qualify for CQ Magazine's WPX award, and 1,402 stations had at least 300 prefixes worked during the CW contest weekend. By comparison, 1,363 stations worked at least 300 prefixes during the SSB contest weekend. CW operators once again showed their ability to make contacts when the conditions are rough.

One of the traditions of the WPX contests is to use an unusual call or prefix. It's a fine balancing act between having a callsign that is unusual enough to attract attention on the crowded bands and having one that is too difficult to copy or too cumbersome to send. In this day and age, most of us want short recognizable callsigns, to minimize both the time in pileups and the number of characters that can be miscopied. Kudos to those who chose longer-than-usual callsigns, and still had fine scores. How many of these did you work? RU27IT, RU27CS, PI8ØØGTB, HF5ØØPILA, HF7ØØS, SFØ53ØCOH, LZ2ØTRC, LZ6ØRCP, LZ125VZ, and a whole lot of special FOC suffixes: VP9FOC, R75FOC, VK1FOC/6, HZ1FOC, E51FOC, DK75FC, BG75FOC, GS4FOC, S575FOC, EO75FOC.

Some "special club" callsigns don't have a rare prefix but commemorate something "special" to the members. George, K5KG says, "I used the call AB1HZ which is the callsign for the Dhahran Amateur Radio Club of America. Members of this club are former operators of HZ1AB previously located in Dhahran, Saudi Arabia. (I was an HZ1AB op from 1982 to 1987.) This was my fourth time using AB1HZ, and I always get good results with it, although AB1 is not a unique call in WPX. The only real problem I have with the call is when S&P'ing and having stations think I am signing A61HZ. When running, the skimmers picked up my call correctly, so I only encountered the A61 problem when S&P'ing." Ironically, George was so worried about people miscopying his AB1HZ call as A61HZ that he logged A65BR as AB5BR!

*e-mail: n4tz@cqwpx.com


*K5KG and friend ready to operate as AB1HZ.*

## Single-Operator All Band

Real estate professionals say the three most important words in the English language are: location, location, and location. The top three single op scores were turned in from African zones 33 and 35, from whence virtually all contacts receive the maximum point value.

UA5C took a turn at the controls of EF8M and came up only 6,171 points short of RD3A's record at the same station last year. Just one more 6-point low band QSO would have put Alexandr into the record books.

Three Canadian stations made the world top ten, with the 10 megapoint scores of VY2ZM and VY2TT separated by less than 40k points. Scott, KØDQ, found his normal home-away-from-home 'Battleship New Hampshire' in dry dock but commandeered the mighty KC1XX superstation and sailed under camouflage as KM3T/1 to a narrow victory over K1LZ and KC3R (LZ4AX, op). E73A piloted 4O3A to victory over LZ6C (LZ3FN, op) in Europe.

## Single-Operator Single Band

Summertime propagation conditions make the 10–meter and the 80- and 160-meter bands especially sensitive to location. IV3NVN used the north-south path from ZX5J to win 10 meters with a score of nearly 5 million points. In contrast, Mike, K9NW totaled 82k points to win the USA 10-meter plaque. ED3T (EA3AKY) was the highest European 10-meter score with just

## 2013 WPX CW TROPHY WINNERS AND DONORS

### SINGLE OPERATOR ALL BAND

**WORLD:** Steve Bolia, N8BJQ Trophy. Won by: **EF8M operated by Alexandr Gimanov, UA5C**
**WORLD Low Power:** Caribbean Contesting Consortium Trophy. Won by: **HD8A operated by Alexey Ogorodov, HC2AO**
**WORLD QRP:** Bill Parker, W8QZA Trophy. Won by: **PJ2T operated by Jim Fitzpatrick, WI9WI**
**USA:** Dennis Motschenbacher, K7BV Trophy. Won by: **KM3T/1 operated by Scott Redd, KØDQ**
**USA Low Power:** Ken Boasi, N2ZN Trophy. Won by: **Maury Peiperl, W3EF**
**USA QRP:** John T. Laney, K4BAI Trophy. Won by: **N2NT operated by John Crovelli, W2GD**
**USA Zone 3 High Power:** Northern California Contest Club Trophy. Won by: **NF6A operated by Bob Wolbert, K6XX**
**USA Zone 3 Low Power:** Arizona Outlaws Contest Club Trophy. Won by: **Willie L Baber, WJ9B/7**
**USA Zone 4 High Power:** Society of Midwest Contesters Trophy. Awarded to: **Tim Herrick, KQ8M**
**USA Zone 4 Low Power:** Society of Midwest Contesters Trophy. Won by: **Marvin Bloomquist, N5AW**
**USA Zone 5 High Power:** Paul Obert, K8PO Trophy. Won by: **Krassimir Petkov, K1LZ**
**EUROPE High Power:** Ivo Pezer, 5B4ADA/9A3A Trophy. Won by: **4O3A operated by Ivo Pezer, E73A/9A3A**
**EUROPE Low Power:** Vitor Santos, PY2NY Trophy. Won by: **MJ5Z operated by Kazunori Watanabe, JK3GAD**
**EUROPE QRP:** Bruce Olney, WY7N Trophy. Won by: **Slavko Celarc, S57DX**
**AFRICA:** Chris Terkla, N1XS Trophy. Awarded to: **CR3A operated by Jozef Lang, OM3GI**
**ASIA:** Rick Tavan, N6XI Trophy. Won by: **Masaki Okano, JH4UYB**
**NORTH AMERICA:** Louisiana Contest Club Trophy. Won by: **Michel Brunelle, FM5CD**
**NORTH AMERICA Low Power:** Dick Green, WC1M Trophy. Won by: **Derek Steele, J35X**
**NORTH AMERICA QRP:** Dale Martin, KG5U Trophy. Won by**: Osmany Glez Escobar, CO2OQ**
**OCEANIA High Power:** Lloyd Cabral, KH6LC Trophy. Won by: **Holger Hannemann, ZL3IO**
**OCEANIA Low Power:** Pacific DXers Trophy. Awarded to**: YJØPO operated by Bill Conwell, K2PO**
**SOUTHERN CONE (CE, CX, LU) Low Power:** LU Contest Group Trophy. Won by**: Daniel Neves, CX9AU**
**CANADA High Power:** Radio Amateurs of Canada (RAC) Trophy. Won by: **VY2ZM operated by Jeffrey T. Briggs, K1ZM**
**CANADA Low Power:** Contest Club Ontario Trophy. Won by: **Nick Lekic, VE3EY**
**JAPAN:** Wes Printz, W3SE/ZL3TE Trophy. Won by: **Katsuhiro Kondou, JH1GBZ**
**CHINA:** LZ9W Contest Team. Won by: **He Jun, BH4RQU**

### SINGLE OPERATOR, SINGLE BAND

**WORLD 28 MHz:** Steve Hodgson, ZC4LI Trophy. Awarded to: **ZX5J operated by Simone Candotto, IV3NVN**
**WORLD 28 MHz Low Power:** Six Stars Contest Station LS1D Trophy. Won by: **Sulaiman Saad ALjedaie, 7Z1SJ**
**WORLD 21 MHz:** Andrei Stchislenok, NP3D Trophy. Awarded to: **Jorge L. Prieto, HK1R**
**WORLD 14 MHz:** Gene Walsh, N2AA Trophy. Won by: **Vakhtang Mumladze, 4L8A**
**WORLD 7 MHz:** LZ2RF Memorial (OR2F sponsor) Trophy. Won by: **PJ4A operated by John Laney, K4BAI**
**WORLD 7 MHz Low Power:** Neal Campbell, K3NC Trophy. Won by: **Franci Gricar, S51F**
**WORLD 3.5 MHz:** Ranko Boca, 4O3A Trophy. Won by: **Emil Tafro, E71A**
**WORLD 1.8 MHz:** Dusko Dumanovic, ZL3WW Trophy. Won by: **Tomislav Polak, 9A2AJ**
**USA 28 MHz:** Paul Beringer, NG7Z Trophy. Won by: **Mike Tessmer, K9NW**
**USA 21 MHz:** Charlie Wooten, NF4A Trophy. Won by: **K3LR operated by John Golumb Jr., N2NC**
**USA 14 MHz:** Kansas City DX Club Trophy. Won by: **KJ3X/4 operated by Bill Kollenbaum, K4XS**
**USA 7 MHz:** Yankee Clipper Contest Club Trophy. Won by: **Carol Richards, N2MM**
**USA 3.5 MHz:** Darin Divinia, WG5J Trophy. Won by: **Steven Sussman, W3BGN**

### SINGLE OPERATOR ASSISTED

**WORLD:** D4C Station Trophy. Won by: **Juan Hidalgo, EA8RM**
**USA:** Ron Sigismonti, N3RS Trophy. Won by: **Steve Sluz, NY3A**
**EUROPE:** Martin Huml, OL5Y Trophy. Won by: **LZ8E operated by Boyan Petkov, LZ2BE**
**CANADA:** Anthony Ratajczak, VE1ZA Trophy. Won by: **John Sluymer, VE3EJ**

### OVERLAY CATEGORIES

**WORLD Tribander/Single-Element:** Helmut Mueller, DF7ZS Trophy. Won by: **VP9FOC, operated by Yuri Onipko, VE3DZ**
**USA Tribander/Single-Element:** Paul Newberry, N4PN Trophy. Won by: **NXØX/4 operated by Paul H. Newberry, Jr., N4PN**
**EUROPE Tribander/Single-Element:** Matija Brodnik, S53MM Trophy. Won by: **Martin Huml, OL5Y**
**WORLD Rookie:** Val Edwards W8KIC Memorial (K3LR sponsor) Trophy. Won by: **UA5B operated by Oleg Prelovsky, UA5B**
**NORTH AMERICA Rookie:** Chris Kantarjiev, K6DBGTrophy. Won by: **Michael Adams, N1EN**

### MULTI-OPERATOR, SINGLE-TRANSMITTER

**WORLD:** Steve Miller, NØSM Trophy. Won by: **P33W operated by UT5UDX, RA2FA, UA2FZ, UA4FER, RV1AW, RW4WR, and RA3AUU**
**USA:** Phil Allardice, KT3Y Trophy. Won by: **NY4A operated by AA4FU and N4AF**
**AFRICA:** Rhein Ruhr DX Association Trophy. Won by: **No Entry**
**ASIA:** W2MIG Memorial (NX7TT Sponsor) Trophy. Awarded to: **P3N operated by 5B8AD, RT9T, RT5K, RN3TT, RU4SU, RV3BA, R2DA, RØKOK, UU6JR, and R2AA**
**EUROPE:** YO3CTK Memorial by Andy Ruse YO3JR/YR1ATrophy. Won by: **CR2X operated by OM3BH, OM3RM, and OM7JG**
**NORTH AMERICA:** Nusret Abadzic E73N Memorial (Bosnia and Herzegovina Contest Club sponsor) Trophy. Won by: **PJ6A operated by G3SXW, K4UEE, VE7CT, and W6IZT**

### MULTI-OPERATOR, TWO-TRANSMITTER

**WORLD:** UA1DZ Memorial (W3UA Sponsor) Trophy. Won by: **CR3L operated by DK9IP, DL8LAS, and DL9EE**
**USA:** Florida Contest Group Trophy. Won by: **NR3X/4, operated by KU5B, WØUCE, N3ND, N4YDU, WA4PSC, and N1LN**
**AFRICA:** Walter Skudlarek, DJ6QT Trophy. Won by: **No Entry**
**EUROPE:** Tom Georgens, W2SCTrophy. Won by: **TM6M operated by F1AKK, F5MUX, F8DBF, F8FKJ, and N1UR**
**CHINA:** Andrey Sachkov, LZ2HM Trophy**. Won by: BY5CD operated by BA4ALC, BA5FB, BH1PAH, OH7WV, BG5CNH, and BD5CHU**

### MULTI-OPERATOR, MULTI-TRANSMITTER

**WORLD:** Steve Merchant, K6AWTrophy. Won by: **9A1A operated by 9A2DQ, 9A4WW, 9A5E, 9A5W, 9A6A, 9A6M, 9A7R, 9A9A, 9A7IMR, and 9A5DDT,**
**USA:** Jim Reisert, AD1C Trophy. Won by: **WW4E operated by W4LT, WC4E, WF3C, N4WW, N4KM , K1TO, K1CC, AD4Z, KØLUZ, and K8NZ**
**EUROPE:** Jeff Demers, N1SNB Trophy. Won by: **DR1A operated by DB6JG, DF6JC, DJ7EO, DK2CX, DL2HBX, DL2JRM, DL3BPC, DL3DXX, DL5LYM, DL6FBL, DL7ZZ, DL8WPX, PC5A, and SP3LPG**

### CONTEST EXPEDITION

**WORLD:** Phil Goetz, N6ZZ Memorial by Paul Goetz Trophy. Won by: **YJØPO, operated by Bill Cornwell, K2PO**

### COMBINED AWARDS

**WORLD Single Operator Combined Score: (SSB and CW)** Yuri Blanarovich, K3BU Trophy. Won by: **CF3A/XL3T operated by VE3AT**
**USA Single Operator Combined Score: (SSB and CW)** Bill Fisher W4AN Memorial (KM3T Sponsor). Won by: **KC3R operated by LZ4AX**
**WORLD Single Operator Combined Prefixes:** Norm Koch, WN5N Memorial by Gail M. Sheehan, K2RED Trophy. Won by: **6V7S operated by Vlad Zaitsev, RK4FF** (2169 total)
**CQ WPX Contest Triathlon Award:** (Single Operator Combined Score on RTTY, SSB, and CW). Rudy Bakalov, N2WQ Trophy. Won by: **John Bayne, KK9A** (21,072,852 points, 8072 QSOs)
**WORLD Club Score:** CQ Magazine trophy. Won by: **Bavarian Contest Club**

# SteppIR

*No traps. No tricks. No compromise.*

## SmallIR Vertical

- 20-6m Coverage
- 18ft element
- 12lbs / 1ft$^2$ wind load
- Available optional coils to cover 40m/30m or 80m/40/30m bands

## 2 Element Yagi

- 20-6m Coverage
- 2x36ft Elements
- 57inch Boom
- 30lbs / 4.0ft$^2$ wind load
- 18.2ft turning radius

## 3 Element Yagi

- 20-6m Coverage
- 3x36ft Elements
- 16ft Boom
- 51lbs / 6.1ft$^2$ wind load
- 19.7ft turning radius

*shown with optional 39ft 40m/30m dipole

## 4 Element Yagi

- 20-6m Coverage
- 4x36ft Elements
- 32ft Boom
- 99lbs / 9.7ft$^2$ wind load
- 24.1ft turning radius

## BigIR Vertical

- 40-6m Coverage
- 33ft element
- 15lbs / 2ft$^2$ wind load
- Available optional coil to cover 80m

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# SteppIR

*No traps. No tricks. No compromise.*

## DB36 Yagi

- ◊ 40-6m Coverage
- ◊ 4 elements
  3ea 40/30m, 4ea 20-6m
- ◊ 160lbs / 17.5ft$^2$ wind load
- ◊ 26ft turning radius
- ◊ 80m dipole option available

## DB18E Yagi

- ◊ 40-6m Coverage
- ◊ 3 Elements
  2ea 40m, 3ea 30-6m
- ◊ 19ft Boom
- ◊ 110bs / 12.1ft$^2$ wind load
- ◊ 21.58ft turning radius

## DB18 Yagi

- ◊ 40-6m Coverage
- ◊ 3 Elements
  2ea 40/30m, 3ea 20-6m
- ◊ 19ft Boom
- ◊ 96lbs / 10.1ft$^2$ wind load
- ◊ 21.58ft turning radius

## DB11 Yagi

- ◊ 20-6m Coverage
- ◊ 3x19ft Elements
  2ea 20m, 3ea 17-6m
- ◊ 11ft Boom
- ◊ 63lbs / 5.9ft$^2$ wind load
- ◊ 10.5ft turning radius

***Tired of dreaming about working DX? With SteppIR Dream Beam series antennas your dreams will come true!***

## DB42 Yagi

- ◊ 40-6m Coverage
- ◊ 5 elements,
  3ea 40-30, 5ea 20-6m
- ◊ 238lbs / 19.9ft$^2$ wind load
- ◊ 29ft turning radius
- ◊ 80m dipole option available

*shown as stacked pair

*Some antennas pictured with optional equipment and/or in custom configurations.

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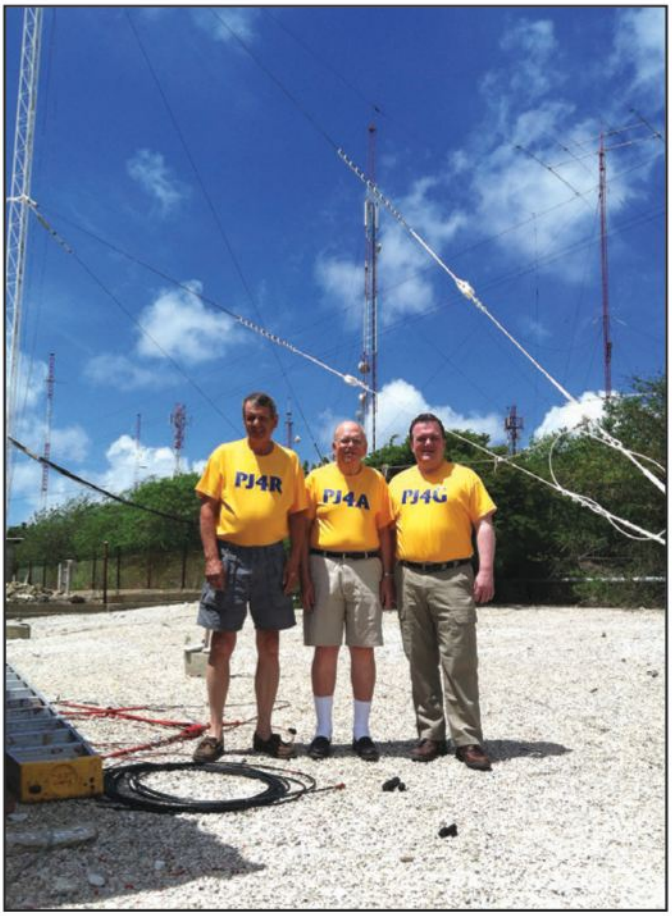
over 120k. The best locations for 80 and 160, on the other hand, were all in Europe, with E71A the 80-meter champ and 9A2AJ the king of the 160-meter band.

HK1R set a new world record for 15 meters, handily beating PJ4R (N4RR, op). However, stations from Kazakhstan (UN9GD), Cyprus (C4Z) , Japan (JO3JIS and JR4OZR), the United States (K3LR), Ukraine (UU7J) and Slovenia (S53A) also 'made the box' on 15 meters with multi-million point scores, making the WPX truly a world-wide contest.

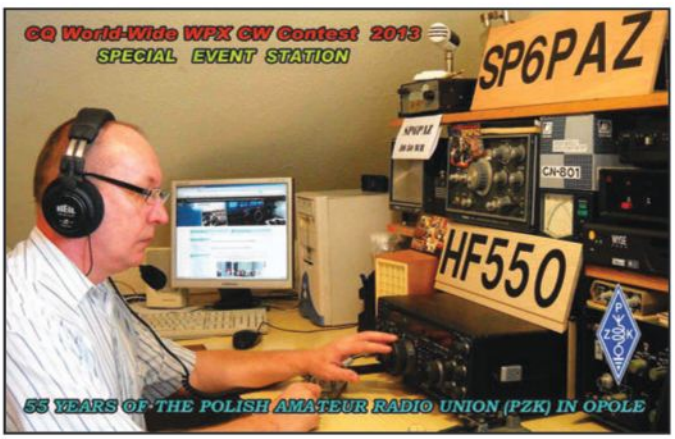
The highest single-band score was achieved on 40 meters by John, K4BAI operating at PJ4A. The key to victory here was the ready availability of six-point QSOs to the north, while the next eight finishers were located in Europe where a substantial portion of their contacts were of the two-point variety.

## Single-Operator Low Power

The most popular category by far is the single-operator unassisted low power all band. This year, over 1,000 people chose this classification. HC2AO showed up at HD8A to edge VE3DZ

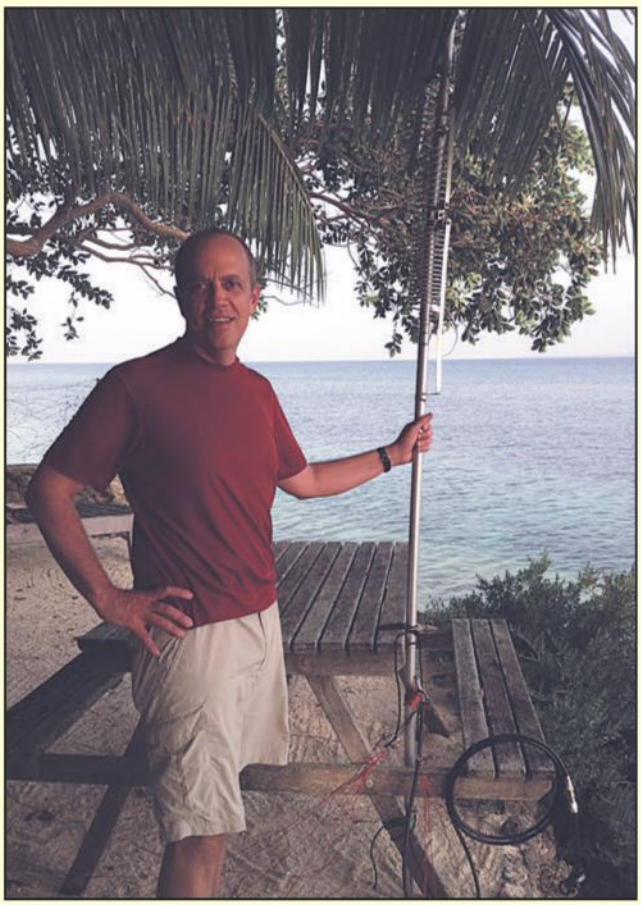



*PJ4R (N4RR), PJ4A (K4BAI), PJ4G (NA2AA) made Bonaire easy to work.*




*Slawek, SP6ZC, wins a certificate as HF55O in the 20m low power category.*

### YJØPO: K2PO's Visit to Vanuatu



*Bill, K2PO, racked up 2000+ QSOs from as YJ0PO from Vanuatu with this beachfront vertical, setting a new Oceania low power record.*

Bill Conwell, K2PO, travelled with his wife to visit his cousin in Vanuatu. Arrangements had been made in November, but their arrival on Wednesday before the contest found the beachfront bungalow in the middle of a construction zone complete with circular saws, backhoes, and jackhammers. He found another site, but without screens on the windows. During the contest his logging computer died, necessitating repeated trips to 'town' to borrow his cousin's laptop, then install software and finally download drivers over the 9600 baud internet connection. Since the contest ends during the middle of the Monday workday in that part of the world, he had to return the computer 5 hours before the end of the contest and with one hour of operating time still available to him.

Still, Bill ended up with the fifth highest low power score in the world, a new Oceania low power record, and the N6ZZ Memorial DXpedition plaque to remind him of a great first DXpedition.

# 2013 CQ WW WPX CW WORLD TOP SCORES

### Single Op All Band High Power
EF8M (UA5C) ..... 19,532,079
CR3A (OM3GI) ..... 17,878,740
6V7S (RK4FF) ..... 12,231,876
VY2ZM (K1ZM) ..... 10,350,232
VY2TT (K6LA) ..... 10,312,989
CT3KN ..... 9,486,334
XL3T (VE3AT) ..... 8,603,495
KM3T/1 (KØDQ) ..... 8,439,667
K1LZ ..... 8,395,912
KC3R (LZ4AX) ..... 8,341,085

### Single Op 28 MHz High Power
ZX5J (IV3NVN) ..... 4,855,437
CW5W (CX6VM) ..... 4,021,136
A65BD (G4BWP) ..... 2,292,030
LV6E (AI6V) ..... 1,679,461
BA8AG ..... 542,152
JA6WIF ..... 533,760
RØAA ..... 163,400
9M4DX ..... 144,627
NH2DX (KG6DX) ..... 125,355
ED3T (EA3AKY) ..... 120,832

### Single Op 21 MHz High Power
HK1R ..... 8,337,384
PJ4R (N4RR) ..... 5,946,534
UN9GD ..... 3,887,727
C4Z (5B4AIZ) ..... 3,778,800
JO3JIS ..... 3,137,112
JR4OZR ..... 2,622,976
K3LR (N2NC) ..... 2,497,343
UU7J (UUØJM) ..... 2,374,060
S53A ..... 2,365,880
OA4SS ..... 2,208,789

### Single Op 14 MHz High Power
4L8A ..... 6,220,292
PR5B (PY2LSM) ..... 5,298,170
CS2C (OK1RF) ..... 4,334,660
YT5W (YU8A) ..... 3,810,390
VK6LW ..... 3,521,564
YT3A (YU7AV) ..... 3,374,230
LS1D (LW9EOC) ..... 2,932,900
TM6X (F5VHY) ..... 2,724,799
OH1TX (OH2PM) ..... 2,666,196
YT1A ..... 2,494,800

### Single Op 7 MHz High Power
PJ4A (K4BAI) ..... 8,744,862
YT8A (YU1EA) ..... 5,653,896
TMØR (F6FVY@F6KNB) ..... 4,534,728
S5ØA ..... 3,531,461
S57Z ..... 2,614,768
9A6C ..... 2,506,680
M3W (G4FAL) ..... 2,460,648
SN8N (SP8HZZ) ..... 2,060,163
9A2L (9A2VJ) ..... 1,964,700
UA9OPU ..... 1,522,298

### Single Op 3.5 MHz High Power
E71A ..... 1,287,230
UT5UGR ..... 986,832
YT4A (YT1AA) ..... 899,584
LY2FN ..... 800,576
ED3O (EA3GXJ) ..... 732,732
F5VMN ..... 514,734
R3FX ..... 436,326
SO4R (SP4JCP) ..... 312,687
W3BGN ..... 275,328
YU1RM ..... 236,871

### Single Op 1.8 MHz High Power
9A2AJ ..... 260,736
OH1RX ..... 103,679
OG9W (OH2BCI) ..... 93,744
YO5AJR ..... 85,462
YO3FFF ..... 29,700
EW8RR ..... 20,995
M7A (LY4Y) ..... 20,995
R3QF ..... 18,655

### Single Op All Band Low Power
HD8A (HC2AO) ..... 10,740,028
VP9FOC (VE3DZ) ..... 10,299,040
EE8X (EA8AY) ..... 7,548,556
3V8BB (KF5EYY) ..... 5,543,328
YJØPO (K2PO) ..... 4,834,818
CT9/OM8AA ..... 4,769,856
W3EF ..... 3,822,280
MJ5Z (JK3GAD) ..... 3,508,252
4Z4DX ..... 3,259,740
LY6A ..... 2,843,450

### Single Op 28 MHz Low Power
7Z1SJ ..... 1,194,788
LU6UO ..... 624,445
LU1ICX ..... 242,087
VK4KW (VK4BAA) ..... 165,561
CA3KHZ ..... 143,533
YG1CRR ..... 128,700
ZS2NF ..... 123,552
UN6P ..... 104,781
9A3VM ..... 94,146
YB2EUZ ..... 88,404

### Single Op 21 MHz Low Power
D3AA ..... 2,772,456
J35X ..... 1,547,550
UK8AR ..... 1,212,596
JF3BFS ..... 726,624
UA9AFS ..... 592,721
S57KW ..... 560,622
WB4TDH ..... 521,170
UA9QM ..... 477,360
E77R ..... 476,064
UR6IJ ..... 450,867

### Single Op 14 MHz Low Power
CN8KD ..... 3,509,406
PY2NY ..... 1,146,718
YT7M (YU7RL) ..... 1,066,000
RWØAJ ..... 1,038,360
UN5C ..... 840,213
S54A ..... 834,548
UA9WOB ..... 781,100
HA6OA ..... 746,824
RA1OT ..... 736,488
HF55O (SP6ZC) ..... 674,440

### Single Op 7 MHz Low Power
S51F ..... 2,189,484
MØC (G3WGN) ..... 1,724,076
CO7EH ..... 1,195,278
SP6OJE ..... 1,134,958
W2EG ..... 1,063,390
PA2REH ..... 1,026,745
LZ7A (LZ1FY) ..... 1,023,030
DK2FG ..... 975,126
YL2PJ ..... 968,240
IZ1GAR ..... 947,139

### Single Op 3.5 MHz Low Power
OM3ZWA ..... 512,190
LY2T ..... 498,892
LY4T ..... 432,333
LY2GW ..... 337,608
YUØA (YU1RA) ..... 333,270
YU1ED ..... 225,081
E75A ..... 215,424
DL6KWN ..... 210,100
YL3FW ..... 181,000
RY3F ..... 152,149

### Single Op 1.8 MHz Low Power
UX5NQ ..... 75,336
SM7MX (SM5MX) ..... 69,552
OK1JOK ..... 41,844
HA1TI ..... 34,932
ER2RM ..... 20,176
RM5Z ..... 15,652
RA2FB ..... 11,760

### Single Op All Band High Power Assisted
EA8RM ..... 11,671,103
UPØL (UN9LW) ..... 11,205,370
LZ8E (LZ2BE) ..... 9,044,828
TC7C (R3GM) ..... 8,642,736
S53MM ..... 8,579,520
PW7T (PY8AZT) ..... 8,093,633
RT9A ..... 7,920,600
SN7Q (SP7GIQ) ..... 7,650,445
YP9W (YO9WF) ..... 7,528,864
IR2C (IK2PFL) ..... 7,438,956

### Single Op 28 MHz High Power Assisted
PY1NX ..... 2,718,225
LZ2HM ..... 299,624
ZL2BR ..... 286,405
BD7LMD ..... 245,050
EO1I (UT1IA) ..... 186,725
JA5FBZ ..... 177,660
OK1FPS ..... 158,865
DM3W ..... 139,909
YO3KIA (YO3GLH) ..... 126,720
DH8BQA ..... 115,419

### Single Op 21 MHz High Power Assisted
EA6URA (EA3AIR) ..... 2,742,773
OK5R (OK1RI) ..... 2,495,724
YT7Z (YU7EE) ..... 2,207,439
YR1A (YO3JR) ..... 1,934,632
S5ØR ..... 1,899,432
JH3AIU ..... 1,812,279
HG5D (HA8QZ) ..... 1,610,608
EI2CN ..... 1,603,296
KY4F (K4TD) ..... 1,513,332
SN5X (SP5GRM) ..... 1,482,850

### Single Op 14 MHz High Power Assisted
RM5A (RU4W) ..... 2,922,740
HA3DX (HA3UU) ..... 2,806,111
OL6P (OK2PP) ..... 2,678,040
LY5W ..... 2,444,379
UN2E ..... 2,334,514
RX9WN ..... 2,047,395
OM8DD ..... 1,908,872
JG3KIV ..... 1,849,126
SO4M (SP4DEU) ..... 1,847,352
RC7A ..... 1,669,986

### Single Op 7 MHz High Power Assisted
9A5Y (9A7DX) ..... 4,006,977
LP5D (LU5DF) ..... 3,845,475
YT4W (YU1DW) ..... 3,505,128
OL4A (OM6NM) ..... 3,461,028
9A5D (9A5DU) ..... 2,443,203
S56X ..... 2,427,615
RZ3BW ..... 2,401,808
RY3D ..... 2,073,703
NS1L/4 ..... 2,032,368
YP5T (YO5CBX) ..... 1,163,538

### Single Op 3.5 MHz High Power Assisted
DR1D (DL1NX) ..... 1,335,168
9A3B (9A1AA) ..... 1,115,000
YQ5C (YO5OHO) ..... 825,360
HA3LI ..... 771,969
EW8DJ ..... 659,277
S53V ..... 571,032
SP5ELA ..... 531,552
UT7E (UW5EGC) ..... 406,330
SP3GTS ..... 292,495
RA3M ..... 290,151

### Single Op 1.8 MHz Band High Power Assisted
US5WE ..... 240,700
DF2UU ..... 205,088
RA6XV ..... 13,013
9A2UZ ..... 11,826

### Single Op All Band Low Power Assisted
P4ØA (KK9A) ..... 9,449,674
VP53V (W5CW) ..... 7,005,145
YN2GY (K9GY) ..... 5,943,632
RT9S ..... 5,325,567
RV9UP ..... 4,842,236
S5ØC (S53CC) ..... 4,626,000
4Z5TK ..... 4,375,740
EA5AER ..... 3,252,040
LY3B ..... 3,187,188
LZ9R (LZ3YY) ..... 3,129,987

### Single Op 28 MHz Low Power Assisted
LU3EHR ..... 1,555,488
PJ4G (NA2AA) ..... 1,211,392
LO5D (LU8EOT) ..... 1,171,100
PY1MX ..... 657,020
PY3XX ..... 615,215
IØUZF ..... 133,278
LU2AYB ..... 101,100
HI3LFE ..... 58,826
PY2BK ..... 57,023
YT1BX ..... 32,508

### Single Op 21 MHz Low Power Assisted
PR3A (PY3OZ) ..... 3,047,424
PX4X (PY4XX) ..... 909,632
EA8AVK ..... 665,456
JA1BPA ..... 551,978
HB9EUY ..... 463,250
RU5TT (UA3TW) ..... 400,232
PY4FQ ..... 375,858
BD8SZ ..... 375,801
YO3ND ..... 299,968
ZM3T (W3SE) ..... 283,464

### Single Op 14 MHz Low Power Assisted
CE3AA (XQ4CW) ..... 2,631,200
RM5D ..... 1,114,495
LZ5X ..... 1,006,074
UAØWW ..... 974,848
SP4JCQ ..... 912,282
UA6LUQ ..... 851,322
RA1ABR ..... 653,132
EF5A (EA5FQ) ..... 581,625
LZ1FH ..... 506,825
SV4FFL ..... 409,734

### Single Op 7 MHz Low Power Assisted
YU2A ..... 2,137,878
YT2AAA ..... 2,033,752
DK8ZZ ..... 1,869,156
OK1UG ..... 1,298,212
UA3MIF ..... 952,504
Z33F ..... 894,852
TA7I ..... 762,895
YO4DW ..... 624,870
SP7LIE ..... 475,392
LY1M ..... 462,420

### Single Op 3.5 MHz Low Power Assisted
E74WN ..... 607,338
8SØDX (SMØDSG) ..... 520,899
HGØR (HAØNAR) ..... 196,282
SN5J (SP5JXK) ..... 172,602
RA7Y ..... 167,894
DL7URH ..... 132,660
UR5IHQ ..... 127,758
9A2GA ..... 27,830
EU2EU ..... 20,646
JG1LFR ..... 19,829

### Single Op 1.8 MHz Low Power Assisted
9A3R ..... 169,400
E77EZ ..... 96,192
IKØXBX ..... 95,309
YO2AQB ..... 36,864
UR5VR ..... 16,490

### Single Op All Band QRP
PJ2T (WI9WI) ..... 3,484,383
N2NT (W2GD) ..... 1,645,175
S57DX ..... 1,499,332
UU2CW ..... 1,475,131
RA3AN ..... 1,423,700
TM3T (F5VBT) ..... 1,281,840
UA7G ..... 1,091,948
DF5RF ..... 840,990
YL2CV ..... 688,444
N4CW ..... 648,462

### Single Op 28 MHz QRP
LU7HZ ..... 420,200
CX5CBA ..... 140,811
BMØQRP (BV3FG) ..... 33,000

### Single Op 21 MHz QRP
S54AA ..... 126,218
HG3IPA (HA3JB) ..... 104,976
ON/DL1EFW (DL1EFW) ..... 82,248
BD8ADT ..... 69,504
AC5O ..... 66,364
SP4GFG ..... 59,500
JH7RTQ ..... 57,531
JR1NKN ..... 48,544
IZ2JPN ..... 33,428
EI4II ..... 23,718

### Single Op 14 MHz QRP
VE6EX ..... 294,588
YT5T ..... 278,166
HA8MT ..... 254,698
G3LHJ ..... 150,965
UA1ATD ..... 89,856
DL4XU ..... 67,947
YU1OO ..... 47,684
OH7FF ..... 26,688
SP6BXM ..... 24,960
JR6HMJ/1 ..... 24,045

### Single Op 7 MHz QRP
YUØW ..... 861,630
DM2DX ..... 641,489
YO4BEW ..... 456,453
OK1FKD ..... 435,963
OL4W ..... 352,179
UR3QNV ..... 214,200
RC9YA (RW9Y) ..... 189,316
RT5R ..... 172,235
EU1AA ..... 146,448
IW3ILM ..... 117,160

### Single Op 3.5 MHz QRP
SP4GL ..... 218,736
UT5DJ ..... 33,916

### Single Op 1.8 MHz QRP
S53AR ..... 34,686

### Single Op All Band QRP Assisted
OK3C (OK2ZC) ..... 1,700,728
OK6RA ..... 1,437,830
OU2M (DK3WE) ..... 980,316
HG6C (HA6IAM) ..... 725,350
HA6PJ ..... 619,080
E77TA ..... 496,512
UX1UX ..... 460,047
W4QO ..... 408,918
SMØTHU ..... 395,780
UR5FCM ..... 358,832

### Single Op 21 MHz QRP Assisted
YU1LM ..... 218,736
JE2UFF ..... 183,306
HAØGK ..... 124,830
VE3XD ..... 59,796
F/E73CQ ..... 28,783

### Single Op 14 MHz QRP Assisted
UR5LAM ..... 309,448
RL3DZ ..... 231,868
UAØW ..... 222,678
MMØLGS ..... 212,833
IZ2QKG ..... 50,116
SP3IC ..... 35,030
VE3HG ..... 15,366

### Single Op 7 MHz QRP Assisted
UX5UU ..... 577,126
KU7Y ..... 15,768

### Single Op 3.5 MHz QRP Assisted
YU1XX ..... 132,010
S55W (S5ØXX) ..... 84,780

### Single Op 1.8 MHz QRP Assisted
OL1A (OK1CW) ..... 119,412

### Multi-Single
P33W ..... 29,106,540
P3N ..... 28,254,870
CR2X ..... 16,075,794
PJ6A ..... 14,762,832
KP2M ..... 14,634,092
UZ2M ..... 13,770,464
LT1F ..... 12,783,771
ZF1A ..... 12,447,728
9A7A ..... 12,145,652
9A33P ..... 12,025,222

### Multi-Two
CR3L ..... 30,681,288
PS2T ..... 29,460,992
UP2L ..... 26,207,251
RF9C ..... 25,128,630
TM6M ..... 22,126,482
ED1R ..... 15,528,667
HG7T ..... 15,092,255
YT5A ..... 14,923,326
YU5R ..... 14,283,771
ZM1A ..... 14,029,116

### Multi-Multi
9A1A ..... 27,552,348
DR1A ..... 24,903,750
LZ9W ..... 24,589,530
ES9C ..... 23,897,450
IB9T ..... 22,612,632
WW4E ..... 18,325,664
NR4M ..... 17,144,820
RWØA ..... 16,397,552
HA3ØS ..... 15,542,478
LY7A ..... 11,657,754

### ROOKIE
### Single Op All Band High Power
UA5B ..... 4,881,570
AB1OC ..... 397,474

### Single Op All Band Low Power
N1EN ..... 1,419,984
RU27IT (RU4IT) ..... 865,065
HZ1OS ..... 807,270
SQ8KFM ..... 677,040
DL2VV ..... 634,001

W4TTM ..... 231,814
DO6PS ..... 217,674
HS4DDQ ..... 145,544
F5VV ..... 140,530
BH8BJO ..... 127,440

**Single Op 21 MHz Low Power**
HB9EUY ..... 463,250
PY1KR ..... 438,372
YD1CSV ..... 41,875
HS3ANP ..... 32,250

**Single Op 14 MHz Low Power**
HS3LSE ..... 46,224

**Single Op 7 MHz Low Power**
AB9YC ..... 71,214
KK4CIS ..... 54,404

**Tribander/Single Element**
**Single Op All Band High Power**
KV4FZ (N2TTA) ..... 6,829,767
SU9AF ..... 5,271,462
OL5Y ..... 5,049,522
RN9CM ..... 4,765,500
NXØX/4 (N4PN) ..... 4,688,820
RT27WW (RT4RO) ..... 4,615,923
VK6DXI ..... 4,381,335
EU5T (EW2A) ..... 4,320,470
K3EL/2 ..... 4,055,860
OQ5M (ON5ZO) ..... 3,642,376

**Single Op 28 MHz High Power**
A65BD (G4BWP) ..... 2,292,030
R9MC ..... 113,665
4XØA (4X1VF) ..... 36,040
NO6F (K2RD) ..... 18,160
PY1CAS ..... 14,740

**Single Op 21 MHz High Power**
C4Z (5B4AIZ) ..... 3,778,800
OA4SS ..... 2,208,789
WN1GIV/4 (N4BP) ..... 2,046,148
EF1A (EA1XT) ..... 534,650
DL7BY ..... 349,304
G4R (YO4RDW) ..... 332,990
SV9DJO ..... 206,460
IZ8BRI ..... 206,100
OM8LA ..... 117,448
WK7S (K6LL) ..... 78,960

**Single Op 14 MHz High Power**
UN2E ..... 2,334,514
RX6AM ..... 2,187,458
RX9WN ..... 2,047,395
UA3RF ..... 1,697,400
K9OM ..... 1,634,000
Z39A ..... 1,267,473
JA9CWJ ..... 887,046
RA9UN ..... 756,364
VE3CR ..... 734,944
GS4FOC (GM3YTS) ..... 498,309

**Single Op 7 MHz High Power**
9A6C ..... 2,506,680
S58Q ..... 584,730
IK2AOO ..... 528,165
KZ5AA/4 (K4VU) ..... 463,736
K9CC ..... 208,250
EA4ZK ..... 179,557
AB3CV ..... 135,293
JM1NKT ..... 123,492
VE6LB ..... 46,332
W3SFG ..... 42,840

**Single Op 3.5 MHz High Power**
E71A ..... 1,287,230
9A3B (9A1AA) ..... 1,115,000
YT4A (YT1AA) ..... 899,584
HA3LI ..... 771,969
EW8DJ ..... 659,277
S53V ..... 571,032
EA3AKA ..... 143,440

**Single Op 1.8 MHz High Power**
9A2UZ ..... 11,826

**Single Op All Band Low Power**
VP9FOC (VE3DZ) ..... 10,299,040
EE8X (EA8AY) ..... 7,548,556
RT9S ..... 5,325,567
S5ØC (S53CC) ..... 4,626,000
4Z5TK ..... 4,375,740
OR2F ..... 3,051,108

UA9AGX ..... 2,887,746
S56A ..... 2,570,409
KU2M ..... 2,510,118
YL5X ..... 2,008,590

**Single Op 28 MHz Low Power Assisted**
HI3LFE ..... 58,826
UN3Z ..... 28,812
YO2IS ..... 27,963
UA9UX ..... 26,299
OK2QX ..... 17,072
NC6V ..... 15,276

**Single Op 21 MHz Low Power Assisted**
PX4X (PY4XX) ..... 909,632
JA1BPA ..... 551,978
E77R ..... 476,064
RU4SO ..... 299,832
ZM3T (W3SE) ..... 283,464
RWØW ..... 108,741
JJ4ESI ..... 100,200
ON/DL1EFW (DL1EFW) ..... 82,248
Z32ØR (Z35F) ..... 71,392
VE3IAE ..... 71,360

**Single Op 14 MHz Low Power Assisted**
CE3AA (XQ4CW) ..... 2,631,200
S54A ..... 834,548

UA9WOB ..... 781,100
DL9ZP ..... 661,779
SV4FFL ..... 409,734
UR5LAM ..... 309,448
VE6BMX ..... 299,788
DL2SAX ..... 289,548
NJ3K ..... 278,931
DL5GAC ..... 273,036

**Single Op 7 MHz Low Power Assisted**
YU2A ..... 2,137,878
YT2AAA ..... 2,033,752
DK8ZZ ..... 1,869,156
MØC (G3WGN) ..... 1,724,076
F8AEE ..... 396,792
G1N (G3MZV) ..... 313,424
DL6HCC ..... 262,552
NE2C ..... 200,256
AA6XX ..... 199,044
UA1ANA ..... 193,270

**Single Op 3.5 MHz Low Power**
YUØA (YU1RA) ..... 333,270
RA7Y ..... 167,894
DL7URH ..... 132,660
9A2GA ..... 27,830
UR5UBR ..... 27,108
JH7IMX ..... 14,784

# 2013 CQ WW WPX CW USA TOP SCORES

**Single Op All Band High Power**
KM3T/1 (KØDQ) ..... 8,439,667
K1LZ ..... 8,395,912
KC3R (LZ4AX) ..... 8,341,085
AK1W (K5ZD) ..... 7,563,429
AA3B ..... 7,072,897
W5WMU/1 (N5DX) ..... 6,632,190
NQ4I (VE7ZO) ..... 6,323,604
KQ8M ..... 5,920,108
AB1HZ (K5KG) ..... 4,866,015
WXØB/5 (AD5Q) ..... 4,794,559

**Single Op 28 MHz High Power**
K9NW ..... 81,997
K1KI ..... 61,740
K4RDU ..... 24,360

**Single Op 21 MHz High Power**
K3LR (N2NC) ..... 2,497,343
WN1GIV/4 (N4BP) ..... 2,046,148
K4FJ ..... 529,008
WIØWA (NØAC@NØNI) ..... 185,640
NU6S ..... 105,848
K7XZ (K8BN) ..... 89,505

**Single Op 14 MHz High Power**
KJ3X/4 ..... 2,404,831
KGØF (WØUA) ..... 2,386,400
K9OM ..... 1,634,000
W6NV ..... 712,248
NØAT ..... 533,403
K1TN/9 ..... 418,938
KN7T ..... 381,100

**Single Op 7 MHz High Power**
N2MM ..... 1,438,208
N8BJQ ..... 738,108
KZ5AA/4 (K4VU) ..... 463,736
WX9U ..... 295,920
K9CC ..... 208,250
K9UQN/4 ..... 152,712

**Single Op 3.5 MHz High Power**
W3BGN ..... 275,328

**Single Op All Band Low Power**
W3EF ..... 3,822,280
N5AW ..... 2,643,900
KU2M ..... 2,510,118
K3AJ ..... 1,768,184
WJ9B/7 ..... 1,735,428
KQ1F (K1XM) ..... 1,592,640
NA8V ..... 1,314,627
K5KU ..... 1,257,375
WD5K ..... 1,007,830
K1TR ..... 939,948

**Single Op 28 MHz Low Power**
NA4W (K4WI) ..... 58,557
KS9K (N4TZ) ..... 47,730
KN4Y ..... 30,870
NC6V ..... 15,276
AD5MN ..... 14,475

**Single Op 21 MHz Low Power**
WB4TDH ..... 521,170
K5ZCJ ..... 24,530
K7ULS ..... 21,944
W8KNO ..... 13,182
NP4IW/KF6 (NP4IW) ..... 12,727

**Single Op 14 MHz Low Power**
W8IQ ..... 304,328
NJ3K ..... 278,931
K4QPL ..... 269,670
KX9DX ..... 174,900
ADØH ..... 47,232

**Single Op 7 MHz Low Power**
W2EG ..... 1,063,390
WA1FCN/4 ..... 466,829
K9UIY ..... 297,065
AA6XX ..... 199,044
K4JC ..... 133,952
KG1V ..... 108,936
WN4AFP ..... 85,140
K4MX ..... 82,668
AB9YC ..... 71,214
KK4CIS ..... 54,404

**Single Op All Band High Power Assisted**
NY3A ..... 7,353,014
WM3T (K3WI) ..... 4,832,520
N3RR ..... 4,624,760
AD4TR (N4UU) ..... 4,074,470
WK1Q (K1MK@K1TTT) ..... 3,856,773
KW7Y (K7RL) ..... 3,835,386
W3FV ..... 3,060,918
W8MJ ..... 2,940,051
AB3CX/2 ..... 2,784,032
NA3M ..... 2,692,708

**Single Op 28 MHz High Power Assisted**
NO6F (K2RD) ..... 18,160
W2RR (WA2AOG) ..... 16,614

**Single Op 21 MHz High Power Assisted**
KY4F (K4TD) ..... 1,513,332
KE7X ..... 432,666
NQ5K (W5ASP) ..... 373,368
KQ7W (N7BV) ..... 246,957
NG6S (W4UAT) ..... 121,124
WK7S (K6LL) ..... 78,960
NSØM ..... 39,564

**Single Op 14 MHz High Power Assisted**
WS7L ..... 333,900
NC7J (W7CT) ..... 155,999
N2NS/6 ..... 68,034
K6III ..... 55,539
N8AGU ..... 27,451
KZ7X (K6LL) ..... 26,070
WM9Q ..... 13,272

Single Op 7 MHz High Power Assisted
NS1L/4 ..... 2,032,368
NO6T (N6NC) ..... 242,755
AB3CV ..... 135,293
WA2JQK ..... 69,160
W3SFG ..... 42,840
WV6I ..... 18,800

**Single Op 3.5 MHz High Power Assisted**
KØRF ..... 156,306

**Single Op All Band Low Power Assisted**
KZ1M (W1UJ) ..... 2,082,159
KE1J ..... 1,677,744
W3KB ..... 1,607,616
N1EN ..... 1,419,984
KS1J ..... 1,368,684
K7WP ..... 1,089,624
AD1C/Ø ..... 1,026,564
WD4AHZ ..... 992,310
NX1P/7 ..... 990,486
N4NX ..... 966,852

**Single Op 28 MHz Low Power Assisted**
W6AWW ..... 19,440
WB2AA ..... 18,000

**Single Op 21 MHz Low Power Assisted**
W9ILY ..... 155,116
NW2Q ..... 134,068
KFØIQ ..... 12,397

**Single Op 14 MHz Low Power Assisted**
N1QD ..... 32,818
NW4V ..... 26,775

**Single Op 7 MHz Low Power Assisted**
KZ3M (K3STX) ..... 306,544
NE2C ..... 200,256

**Single Op All Band QRP**
N2NT (W2GD) ..... 1,645,175
N4CW ..... 648,462
N7IR ..... 641,322
KCØMO (KØOU) ..... 494,515
KT8K ..... 493,982
W6QU (W8QZA) ..... 404,595
N2WN/4 ..... 267,696
K7HBN ..... 218,075
WQ8RP (N8XX@KD8HNF) ..... 184,728
KM6Z ..... 151,510

**Single Op 21 MHz QRP**
AC5O ..... 66,364
W5NZ/4 ..... 10,011

**Single Op 14 MHz QRP**
WA4JUK ..... 19,680

**Single Op 7 MHz QRP**
N2JNZ ..... 65,075
NN8UU ..... 43,554
WØNV ..... 28,890
NE6M ..... 25,662
N1DZ ..... 13,328

**Single Op All Band QRP Assisted**
W4QO ..... 408,918
N3WD ..... 148,656
W4JDS ..... 39,875
WA2NYY ..... 29,440
N9IXD ..... 19,360
W1CSM ..... 12,444

**Single Op 7 MHz QRP Assisted**
KU7Y ..... 15,768

**Multi-Single**
NY4A ..... 8,743,680
NY6N ..... 6,558,484
WF6C ..... 4,205,100
K5RX ..... 4,104,837
KU7T ..... 3,640,074
KØRC ..... 2,724,040
WBØGAZ ..... 2,544,480
NO7R ..... 2,323,656
NW9X/4 ..... 2,252,850
AE7EG ..... 2,037,320

**Multi-Two**
NR3X/4 ..... 12,537,336
KD4D/3 ..... 11,478,543
K9CT ..... 9,232,265
KC7V ..... 7,571,340
ND2T/6 ..... 5,942,851
K4VV ..... 5,766,516
KU6W ..... 2,614,780
WQ6X ..... 2,199,040
NAØCW ..... 1,790,043
NØMA ..... 1,555,137

**Multi-Multi**
WW4E ..... 18,325,664
NR4M ..... 17,144,820
NR6O ..... 7,733,989

**ROOKIE**
**Single Op All Band High Power**
AB1OC ..... 397,474

**Single Op All Band Low Power**
N1EN ..... 1,419,984
W4TTM ..... 231,814
KK4HEG ..... 62,080

**Single Op 7 MHz Low Power**
AB9YC ..... 71,214
KK4CIS ..... 54,404

**Tribander/Single Element**
**Single Op All Band High Power**
NXØX/4 (N4PN) ..... 4,688,820
K3EL/2 ..... 4,055,860

AB3CX/2 ..... 2,784,032
WN2O (N2GC) ..... 2,614,816
WR9D (KB9UWU) ..... 2,338,362
K3MD ..... 2,204,400
K1AR ..... 1,943,235
N6JV ..... 1,607,418
NW2K ..... 1,415,340
WX6V ..... 1,336,425

**Single Op 28 MHz High Power**
NO6F (K2RD) ..... 18,160

**Single Op 21 MHz High Power**
WN1GIV/4 (N4BP) ..... 2,046,148
WK7S (K6LL) ..... 78,960

**Single Op 14 MHz High Power**
K9OM ..... 1,634,000
K1TN/9 ..... 418,938
KN7T ..... 381,100
NC7J (W7CT) ..... 155,999
N8AGU ..... 27,451
KZ7X (K6LL) ..... 26,070
N5PU ..... 13,962
WM9Q ..... 13,272

**Single Op 7 MHz High Power**
KZ5AA/4 (K4VU) ..... 463,736
K9CC ..... 208,250
AB3CV ..... 135,293
W3SFG ..... 42,840
AB1U/6 (W6RKC) ..... 10,488

**Single Op All Band Low Power**
KU2M ..... 2,510,118
KE1J ..... 1,677,744
AD1C/Ø ..... 1,026,564
WD5K ..... 1,007,830
WD4AHZ ..... 992,310
K1TR ..... 939,948
KN4QD ..... 794,005
AB1J ..... 741,850
W1EQ ..... 714,559
KU8E/4 ..... 673,767

**Single Op 28 MHz Low Power**
NC6V ..... 15,276

**Single Op 21 MHz Low Power**
W5NZ/4 ..... 10,011

**Single Op 14 MHz Low Power**
NJ3K ..... 278,931
K4QPL ..... 269,670
KX9DX ..... 174,900
ADØH ..... 47,232

**Single Op 7 MHz Low Power**
NE2C ..... 200,256
AA6XX ..... 199,044
K4JC ..... 133,952
WN4AFP ..... 85,140
N2JNZ ..... 65,075
WT6P/7 ..... 14,706

operating as VP9FOC. YJØPO traveled to Vanuatu and set a new Oceania low power record while picking up the N6ZZ Memorial DXPedition trophy.

As in 2012, W3EF beat out N5AW for USA bragging rights. This is the third straight runner-up finish for Marv, N5AW. Kazu, M0CFW, traveled to MJ5Z to win Europe.

You can have a lot of high-powered fun running low power on a single band. The single band categories enable competitors to tailor their activity to fit their individual operating time and station capabilities. 7Z1SJ's score would have been fifth place HP 10 meter. D3AA followed up his runner-up finish in the SSB weekend with a commanding win on 15 meters. CN8KD on 20, S51F on 40, OM3ZWA on 80 and UX5NQ on 160 would all have placed in the top ten high power scores.

## Single-Operator Assisted

1276 entries reported using QSO alerting assistance. Worldwide, EA8RM nudged past UPØL (UN9LW, op), while NY3A was tops USA. A lot of action took place in the assisted single band categories as well. PY1NX took 10-meter honors. All other assisted single band champions were located in Europe: EA6URA (EA3AIR) on 15, RM5A on 20, 9A5Y (9A7DX) on 40, DR1D (DL1NX) on 80, and US5WE on 160.

## 2013 CQ WW WPX CW EUROPE TOP SCORES

**Single Op All Band High Power**
4O3A (E73A/9A3A) ..... 6,832,680
LZ6C (LZ3FN) ..... 6,591,184
G5W (G3BJ) ..... 5,566,972
GM9W (MØDXR) ..... 5,219,640
S52OP ..... 5,008,608
OG8X (OH6KZP) ..... 4,895,561
UA4W ..... 4,885,920
UA5B ..... 4,881,570
OHØX (OH2TA) ..... 4,636,010
UW1M ..... 3,846,108

**Single Op 28 MHz High Power**
ED3T (EA3AKY) ..... 120,832
R7AW ..... 101,844
YR6ØA (YO8AXP) ..... 99,910

**Single Op 21 MHz High Power**
UU7J (UUØJM) ..... 2,374,060
S53A ..... 2,365,880
E73W ..... 2,130,905

**Single Op 14 MHz High Power**
CS2C (OK1RF) ..... 4,334,660
YT5W (YU8A) ..... 3,810,390
YT3A (YU7AV) ..... 3,374,230

**Single Op 7 MHz High Power**
YT8A (YU1EA) ..... 5,653,896
TMØR (F6FVY@F6KNB) ..... 4,534,728
S5ØA ..... 3,531,461

**Single Op 3.5 MHz High Power**
E71A ..... 1,287,230
UT5UGR ..... 986,832
YT4A (YT1AA) ..... 899,584

**Single Op 1.8 MHz High Power**
9A2AJ ..... 260,736
OH1RX ..... 103,679
OG9W (OH2BCI) ..... 93,744

**Single Op All Band Low Power**
MJ5Z (JK3GAD) ..... 3,508,252
LY6A ..... 2,843,450
EA3KU ..... 2,007,870
F/W1NN ..... 1,958,089
LY5I ..... 1,857,306
R3QA ..... 1,719,631
OK2MBP ..... 1,634,616
SP1AEN ..... 1,530,912
RU6CS ..... 1,485,324
HB9ARF ..... 1,416,204

**Single Op 28 MHz Low Power**
9A3VM ..... 94,146
UT3LW ..... 57,305
E71W ..... 31,552

**Single Op 21 MHz Low Power**
S57KW ..... 560,622
E77R ..... 476,064
UR6IJ ..... 450,867

**Single Op 14 MHz Low Power**
YT7M (YU7RL) ..... 1,066,000
S54A ..... 834,548
HA6OA ..... 746,824

**Single Op 7 MHz Low Power**
S51F ..... 2,189,484
MØC (G3WGN) ..... 1,724,076
SP6OJE ..... 1,134,958

**Single Op 3.5 MHz Low Power**
OM3ZWA ..... 512,190
LY2T ..... 498,892
LY4T ..... 432,333

**Single Op 1.8 MHz Low Power**
UX5NQ ..... 75,336
SM7MX (SM5MX) ..... 69,552
OK1JOK ..... 41,844

**Single Op All Band High Power Assisted**
LZ8E (LZ2BE) ..... 9,044,828
S53MM ..... 8,579,520
SN7Q (SP7GIQ) ..... 7,650,445
YP9W (YO9WF) ..... 7,528,864
IR2C (IK2PFL) ..... 7,438,956
S59ABC (S51DS) ..... 6,909,504
9A28EU (9A5K) ..... 6,633,437
OE3K (OE1EMS) ..... 6,431,661
S57AL ..... 6,008,643
HA8JV ..... 5,956,020

**Single Op 28 MHz High Power Assisted**
LZ2HM ..... 299,624
EO1I (UT1IA) ..... 186,725
OK1FPS ..... 158,865

**Single Op 21 MHz High Power Assisted**
EA6URA (EA3AIR) ..... 2,742,773
OK5R (OK1RI) ..... 2,495,724
YT7Z (YU7EE) ..... 2,207,439

**Single Op 14 MHz High Power Assisted**
RM5A (RU4W) ..... 2,922,740
HA3DX (HA3UU) ..... 2,806,111
OL6P (OK2PP) ..... 2,678,040

**Single Op 7 MHz High Power Assisted**
9A5Y (9A7DX) ..... 4,006,977
YT4W (YU1DW) ..... 3,505,128
OL4A (OM6NM) ..... 3,461,028

**Single Op 3.5 MHz High Power Assisted**
DR1D (DL1NX) ..... 1,335,168
9A3B (9A1AA) ..... 1,115,000
YQ5C (YO5OHO) ..... 825,360

**Single Op 1.8 MHz High Power Assisted**
US5WE ..... 240,700
DF2UU ..... 205,088

**Single Op All Band Low Power Assisted**
S5ØC (S53CC) ..... 4,626,000
EA5AER ..... 3,252,040
LY3B ..... 3,187,188
LZ9R (LZ3YY) ..... 3,129,987
OR2F ..... 3,051,108
EO7U (UY2UA) ..... 2,903,568
HA6NL ..... 2,826,198
R7MM ..... 2,738,512
S56A ..... 2,570,409
RA1AL ..... 2,221,983

**Single Op 28 MHz Low Power Assisted**
IØUZF ..... 133,278
YT1BX ..... 32,508
ED7C (EA7KJ) ..... 30,381

**Single Op 21 MHz Low Power Assisted**
HB9EUY ..... 463,250
RU5TT (UA3TW) ..... 400,232
YO3ND ..... 299,968

**Single Op 14 MHz Low Power Assisted**
RM5D ..... 1,114,495
LZ5X ..... 1,006,074
SP4JCQ ..... 912,282

Single Op 7 MHz Low Power Assisted
YU2A ..... 2,137,878
YT2AAA ..... 2,033,752
DK8ZZ ..... 1,869,156

**Single Op 3.5 MHz Low Power Assisted**
E74WN ..... 607,338
8SØDX (SMØDSG) ..... 520,899
HGØR (HAØNAR) ..... 196,282

**Single Op 1.8 MHz Low Power Assisted**
9A3R ..... 169,400
E77EZ ..... 96,192
IKØXBX ..... 95,309

**Single Op All Band QRP**
S57DX ..... 1,499,332
UU2CW ..... 1,475,131
RA3AN ..... 1,423,700
TM3T (F5VBT) ..... 1,281,840
UA7G ..... 1,091,948
DF5RF ..... 840,990
YL2CV ..... 688,444
RZ3QS ..... 597,240
UX8IX ..... 558,378
UA1CUR ..... 471,630

**Single Op 21 MHz QRP**
S54AA ..... 126,218
HG3IPA (HA3JB) ..... 104,976
ON/DL1EFW (DL1EFW) ..... 82,248

**Single Op 14 MHz QRP**
YT5T ..... 278,166
HA8MT ..... 254,698
G3LHJ ..... 150,965

**Single Op 7 MHz QRP**
YUØW ..... 861,630
DM2DX ..... 641,489
YO4BEW ..... 456,453

**Single Op 3.5 MHz QRP**
SP4GL ..... 218,736
UT5DJ ..... 33,916

**Single Op 1.8 MHz QRP**
S53AR ..... 34,686

**Single Op All Band QRP Assisted**
OK3C (OK2ZC) ..... 1,700,728
OK6RA ..... 1,437,830
OU2M (DK3WE) ..... 980,316
HG6C (HA6IAM) ..... 725,350
HA6PJ ..... 619,080
E77TA ..... 496,512
UX1UX ..... 460,047
SMØTHU ..... 395,780
UR5FCM ..... 358,832
LA/DK2AB (DK2AB) ..... 165,249

**Single Op 21 MHz QRP Assisted**
YU1LM ..... 218,736
HAØGK ..... 124,830
F/E73CQ ..... 28,783

**Single Op 14 MHz QRP Assisted**
UR5LAM ..... 309,448
RL3DZ ..... 231,868
MMØLGS ..... 212,833

**Single Op 7 MHz QRP Assisted**
UX5UU ..... 577,126

**Single Op 3.5 MHz QRP Assisted**
YU1XX ..... 132,010
S55W (S5ØXX) ..... 84,780

**Single Op 1.8 MHz QRP Assisted**
OL1A (OK1CW) ..... 119,412

**Multi-Single**
CR2X ..... 16,075,794
UZ2M ..... 13,770,464
9A7A ..... 12,145,652
9A33P ..... 12,025,222
OM7M ..... 11,681,856
RL3A ..... 10,589,490
HG6N ..... 10,232,541
E7DX ..... 9,610,255
LX7I ..... 9,130,320
IO1T ..... 9,076,563

**Multi-Two**
TM6M ..... 22,126,482
ED1R ..... 15,528,667
HG7T ..... 15,092,255
YT5A ..... 14,923,326
YU5R ..... 14,283,771
DM6V ..... 13,876,250
DQ4W ..... 13,596,128
LZ5R ..... 13,093,665
DP9A ..... 10,737,472
S52ZW ..... 9,564,750

**Multi-Multi**
9A1A ..... 27,552,348
DR1A ..... 24,903,750
LZ9W ..... 24,589,530
ES9C ..... 23,897,450
IB9T ..... 22,612,632
HA3ØS ..... 15,542,478
LY7A ..... 11,657,754
OH2K ..... 3,591,919
LA1LUA ..... 381,638

**ROOKIE**
**Single Op All Band High Power**
UA5B ..... 4,881,570

**Single Op All Band Low Power**
RU27IT (RU4IT) ..... 865,065
SQ8KFM ..... 677,040
DL2VV ..... 634,001

**Single Op 21 MHz Low Power**
HB9EUY ..... 463,250

**Tribander/Single Element**
**Single Op All Band High Power**
OL5Y ..... 5,049,522
RT27WW (RT4RO) ..... 4,615,923
EU5T (EW2A) ..... 4,320,470
OQ5M (ON5ZO) ..... 3,642,376
UC7A ..... 3,471,900
OM7RU ..... 3,169,692
LA8OM ..... 2,869,344
LY2J ..... 2,713,672
OK7Y (OK1FDY) ..... 2,498,656
F5VKT ..... 2,361,147

**Single Op 21 MHz High Power**
EF1A (EA1XT) ..... 534,650
DL7BY ..... 349,304
G4R (YO4RDW) ..... 332,990

**Single Op 14 MHz High Power**
RX6AM ..... 2,187,458
UA3RF ..... 1,697,400
Z39A ..... 1,267,473

**Single Op 7 MHz High Power**
9A6C ..... 2,506,680
S58Q ..... 584,730
IK2AOO ..... 528,165

**Single Op 3.5 MHz High Power**
E71A ..... 1,287,230
9A3B (9A1AA) ..... 1,115,000
YT4A (YT1AA) ..... 899,584
EA3AKA ..... 143,440

**Single Op 1.8 MHz High Power**
9A2UZ ..... 11,826

**Single Op All Band Low Power**
S5ØC (S53CC) ..... 4,626,000
OR2F ..... 3,051,108
S56A ..... 2,570,409
YL5X ..... 2,008,590
DF1LX ..... 1,992,320
F/W1NN ..... 1,958,089
OK7T (OK1FHI) ..... 1,761,540
R4WDX ..... 1,661,184
EW5W (EW1IP) ..... 1,566,984
OK6RA ..... 1,437,830

**Single Op 28 MHz Low Power**
YO2IS ..... 27,963
OK2QX ..... 17,072

**Single Op 21 MHz Low Power**
E77R ..... 476,064
RU4SO ..... 299,832
ON/DL1EFW (DL1EFW) ..... 82,248

**Single Op 14 MHz Low Power**
S54A ..... 834,548
DL9ZP ..... 661,779
SV4FFL ..... 409,734

**Single Op 7 MHz Low Power**
YU2A ..... 2,137,878
YT2AAA ..... 2,033,752
DK8ZZ ..... 1,869,156

**Single Op 3.5 MHz Low Power**
YUØA (YU1RA) ..... 333,270
RA7Y ..... 167,894
DL7URH ..... 132,660

# 2013 CQ WW WPX SSB & CW COMBINED CLUB SCORES

## UNITED STATES

| Club | Entries | Score |
|---|---|---|
| POTOMAC VALLEY RADIO CLUB | 125 | 179,217,849 |
| NORTHERN CALIFORNIA CONTEST CLUB | 103 | 153,879,440 |
| YANKEE CLIPPER CONTEST CLUB | 82 | 120,450,522 |
| FRANKFORD RADIO CLUB | 62 | 67,052,672 |
| FLORIDA CONTEST GROUP | 60 | 66,210,410 |
| SOCIETY OF MIDWEST CONTESTERS | 80 | 61,624,899 |
| SOUTH EAST CONTEST CLUB | 26 | 51,609,589 |
| SOUTHERN CALIFORNIA CONTEST CLUB | 43 | 32,560,624 |
| ARIZONA OUTLAWS CONTEST CLUB | 55 | 30,042,532 |
| NORTH COAST CONTESTERS | 12 | 27,892,667 |
| MAD RIVER RADIO CLUB | 21 | 27,792,068 |
| DFW CONTEST GROUP | 24 | 22,122,642 |
| WESTERN WASHINGTON DX CLUB | 29 | 18,043,427 |
| NORTH TEXAS CONTEST CLUB | 12 | 17,616,974 |
| CENTRAL TEXAS DX AND CONTEST CLUB | 12 | 17,268,689 |
| WILLAMETTE VALLEY DX CLUB | 31 | 15,302,952 |
| MINNESOTA WIRELESS ASSN | 48 | 12,482,375 |
| GEORGIA CONTEST GROUP | 11 | 12,068,489 |
| ALABAMA CONTEST GROUP | 28 | 11,929,669 |
| TENNESSEE CONTEST GROUP | 31 | 11,177,801 |
| GRAND MESA CONTESTERS OF COLORADO | 14 | 6,592,372 |
| SPOKANE DX ASSOCIATION | 13 | 5,979,261 |
| HUDSON VALLEY CONTESTERS AND DXERS | 12 | 5,818,118 |
| CAROLINA DX ASSOCIATION | 11 | 5,812,771 |
| SAN DIEGO CONTEST CLUB | 5 | 5,562,799 |
| CTRI CONTEST GROUP | 9 | 5,455,344 |
| SOUTHWEST OHIO DX ASSOCIATION | 5 | 3,563,698 |
| ORDER OF BOILED OWLS OF NEW YORK | 9 | 3,417,904 |
| NORTHERN ROCKIES DX ASSOCIATION | 5 | 2,369,541 |
| LOUISIANA CONTEST CLUB | 7 | 2,270,075 |
| KANSAS CITY CONTEST CLUB | 10 | 1,732,893 |
| MISSISSIPPI VALLEY DX/CONTEST CLUB | 7 | 1,706,994 |
| BRISTOL (TN/VA) ARC | 11 | 1,600,866 |
| UTAH DX ASSOCIATION | 6 | 1,306,715 |
| BERGEN ARA | 4 | 1,306,548 |
| 599 DX ASSOCIATION | 4 | 1,177,564 |
| DELARA CONTEST TEAM | 7 | 1,172,560 |
| ALLEGHENY VALLEY RADIO ASSOCIATION | 3 | 719,926 |
| MERIDEN ARC | 4 | 635,440 |
| REDWOOD EMPIRE DX ASSOCIATION | 3 | 629,258 |
| STERLING PARK AMATEUR RADIO CLUB | 6 | 557,311 |
| WESTERN NEW YORK DX ASSOCIATION | 6 | 538,873 |
| ROCHESTER (NY) DX ASSN | 8 | 461,878 |
| QSY SOCIETY | 3 | 439,632 |
| WEST PARK RADIOPS | 7 | 379,049 |
| TEXAS DX SOCIETY | 3 | 370,344 |
| SAN DIEGO DX CLUB | 3 | 368,332 |
| METRO DX CLUB | 9 | 354,922 |
| MADISON DX CLUB | 4 | 331,767 |
| GREAT SOUTH BAY AMATEUR RADIO CLUB | 3 | 247,561 |
| KANSAS CITY DX CLUB | 5 | 220,924 |
| SOUTH TEXAS DX AND CONTEST CLUB | 4 | 161,982 |
| LOW COUNTRY CONTEST CLUB | 3 | 143,676 |
| NORTH CAROLINA DX AND CONTEST CLUB | 3 | 63,912 |
| ALBUQUERQUE DX ASSN | 3 | 60,626 |
| MILFORD OHIO AMATEUR RADIO CLUB | 4 | 49,662 |
| WILLIAMSBURG AREA AMATEUR RADIO CLUB | 3 | 30,829 |

## DX

| | | |
|---|---|---|
| BAVARIAN CONTEST CLUB | 245 | 329,299,265 |
| RHEIN RUHR DX ASSOCIATION | 148 | 304,531,043 |
| ARAUCARIA DX GROUP | 73 | 177,402,179 |
| URAL CONTEST GROUP | 28 | 131,865,897 |
| CROATIAN CONTEST CLUB | 67 | 121,629,912 |
| LU CONTEST GROUP | 43 | 117,618,065 |
| CONTEST CLUB ONTARIO | 70 | 115,159,166 |
| RUSSIAN CONTEST CLUB * | 49 | 103,793,771 |
| SLOVENIA CONTEST CLUB | 37 | 95,915,419 |
| UKRAINIAN CONTEST CLUB | 94 | 89,839,344 |
| HA-DX-CLUB | 15 | 84,886,456 |
| DXARC DX COLOMBIA AMATEUR RADIO CLUB | 4 | 67,691,758 |
| ARAB CONTEST CLUB | 6 | 66,678,303 |
| CONTEST CLUB SERBIA | 71 | 65,941,674 |
| LES NOUVELLES DX | 8 | 65,149,960 |
| CONTEST CLUB FINLAND | 37 | 57,097,412 |
| LZ CONTEST TEAM | 5 | 53,836,708 |
| KAUNAS UNIVERSITY OF TECHNOLOGY RADIO CLUB | 50 | 53,552,625 |
| WEST SERBIA CONTEST CLUB | 11 | 51,771,768 |
| VK CONTEST CLUB | 23 | 43,725,403 |
| BOSNIA AND HERZEGOVINA CONTEST CLUB | 22 | 41,679,081 |
| BELOKRANJEC CONTEST CLUB | 12 | 40,158,941 |
| RADIO CLUB HENARES | 8 | 34,969,321 |
| ORCA DX AND CONTEST CLUB | 24 | 34,490,226 |
| FORTALEZA DX GROUP | 6 | 34,445,782 |
| BLACK SEA CONTEST CLUB | 84 | 34,307,303 |
| BELARUS CONTEST CLUB | 29 | 30,524,758 |
| LATVIAN CONTEST CLUB | 32 | 26,616,682 |
| CONTEST GROUP DU QUEBEC | 16 | 25,650,086 |
| SOUTH URAL CONTEST CLUB | 19 | 20,970,113 |
| RIO DX GROUP | 41 | 20,908,597 |
| WORLD WIDE YOUNG CONTESTERS * | 17 | 20,021,272 |
| SAUDI CONTEST GROUP | 8 | 19,292,408 |
| RUSSIAN CW CLUB * | 45 | 17,712,083 |
| RADIO CLUB VENEZOLANO CARACAS | 14 | 17,553,913 |
| MARITIME CONTEST CLUB | 18 | 16,056,039 |
| SP DX CLUB | 53 | 15,073,213 |
| SKY CONTEST CLUB | 3 | 15,033,067 |
| CHILTERN DX CLUB | 10 | 14,366,812 |
| CLIPPERTON DX CLUB | 7 | 12,416,499 |
| NOVOKUZNETSK RADIO CLUB | 10 | 12,277,664 |
| YB LAND DX CLUB | 21 | 12,095,457 |
| CENTRAL SIBERIA DX CLUB | 5 | 11,190,532 |
| DONBASS CONTEST CLUB | 23 | 11,139,003 |
| LA CONTEST CLUB | 9 | 10,283,928 |
| ARKTIKA | 11 | 10,039,759 |
| ALRS ST PETERSBURG | 15 | 9,684,832 |
| VYTAUTAS MAGNUS UNIVERSITY RADIO CLUB | 16 | 9,422,621 |
| SHAKHAN CONTEST CLUB | 5 | 8,231,452 |
| YO DX CLUB | 18 | 8,071,258 |
| URE | 12 | 7,636,682 |
| DANISH DX GROUP | 17 | 7,634,435 |
| CSTA BUCURESTI | 5 | 7,559,127 |
| YU CONTEST CLUB | 4 | 7,554,987 |
| THRACIAN ROSE CLUB | 21 | 7,521,845 |
| GUARA DX GROUP | 20 | 7,156,418 |
| MEDITERRANEO DX CLUB | 20 | 6,554,009 |
| IVANOVO DX CLUB | 4 | 6,293,544 |
| RADIO AMATEUR ASSOCIATION OF WESTERN GREECE | 3 | 5,060,650 |
| RADIO CLUB PARMA | 5 | 5,011,871 |
| VRHNIKA CONTESTERS | 10 | 5,010,409 |
| CDR GROUP | 8 | 4,549,452 |
| GIPANIS CONTEST GROUP | 11 | 4,495,332 |
| LITHUANIAN CONTEST GROUP | 9 | 4,417,521 |
| CONTEST CLUB CALIFORNIA PENINSULA | 8 | 4,254,324 |
| CHILEAN PACIFIC DX GROUP | 13 | 4,177,559 |
| R4F-DX-G | 6 | 4,145,073 |
| SIAM DX GROUP | 4 | 4,005,042 |
| 599 CONTEST CLUB | 6 | 3,743,023 |
| RU-QRP CLUB | 17 | 3,307,200 |
| RIIHIMAEN KOLMOSET | 4 | 3,143,092 |
| RADIO CLUB URUGUAYO | 5 | 3,114,799 |
| OMSK RADIO CLUB | 8 | 3,105,248 |
| DOMODEDOVO | 5 | 3,051,138 |
| CSTA SUCEAVA | 4 | 3,023,849 |
| ARCK | 13 | 2,946,532 |
| BASHKORTOSTAN DX CLUB | 7 | 2,904,859 |
| VERENIGING VAN RADIO ZEND AMATEURS | 3 | 2,904,320 |
| CS PETROLUL PLOIESTI | 6 | 2,395,848 |
| CZECH CONTEST CLUB | 3 | 2,384,220 |
| SP CONTEST CLUB | 5 | 2,263,051 |
| SAMARA RADIO CLUB | 4 | 1,960,459 |
| SARATOVSKAYA OBLAST RADIO CLUB | 11 | 1,913,056 |
| CSM BAIA MARE | 3 | 1,852,813 |
| STAVROPOL REGION CONTEST CLUB | 4 | 1,840,940 |
| VLADIMIR CONTEST GROUP | 11 | 1,778,423 |
| VERON * | 7 | 1,624,652 |
| KILMARNOCK AND LOUDOUN ARC | 4 | 1,581,151 |
| KKKK CONTEST CLUB KRASNODARSKOGO KRAYA | 3 | 1,565,543 |
| ARGO | 3 | 1,525,534 |
| URVO GRANOLLERS | 4 | 1,470,359 |
| SASKATCHEWAN CONTEST CLUB | 3 | 1,452,549 |
| RCWC | 5 | 1,403,535 |
| UNIVERSITY OF TOKYO CONTEST CLUB | 5 | 1,388,439 |
| FALKOPINGS RADIOCLUB | 7 | 1,365,624 |
| ORENBURG CONTEST CLUB | 3 | 1,350,104 |
| VU CONTEST GROUP | 6 | 1,317,423 |
| URE-CARTAGENA | 3 | 1,308,577 |
| DARC * | 21 | 1,203,852 |
| ARGE BRAUNAU | 5 | 1,194,589 |
| LIPETSK RADIO CLUB | 5 | 1,131,284 |
| UR-QRP-CLUB | 6 | 1,114,718 |
| FIRST CLASS CW OPERATORS CLUB | 3 | 989,973 |
| CSM CLUJ-NAPOCA | 5 | 942,342 |
| RTTY CONTESTERS OF JAPAN | 4 | 937,707 |
| RADIOCLUBUL RADU BRATU | 4 | 915,707 |
| PERUGIA CONTEST CLUB | 6 | 901,547 |
| SK5LW ESKILSTUNA SANDAREAMATORER | 5 | 894,498 |
| GRUPO DXXE | 4 | 831,498 |
| MOSCOW RADIO CLUB | 6 | 827,662 |
| VOLYN CONTEST GROUP | 10 | 681,519 |
| BRACKNELL AMATEUR RADIO CLUB | 3 | 564,741 |
| EPC | 4 | 550,229 |
| GMDX GROUP | 3 | 524,965 |
| SK6AW HISSINGENS RADIOKLUBB | 6 | 486,949 |
| ARI | 3 | 476,253 |
| TDR | 3 | 451,221 |
| OBNINSK QRU CLUB | 4 | 434,424 |
| TEMIRTAU CONTEST CLUB | 4 | 389,153 |
| NOVOSIBIRSK CONTEST CLUB | 3 | 372,377 |
| ARA AMIGOS RADIO ALTOARAGON | 4 | 332,234 |
| VITEBSK CONTEST CLUB | 3 | 314,614 |
| RCC | 4 | 305,536 |
| SRR | 4 | 294,517 |
| PODOLSK | 5 | 284,221 |
| GQRP | 3 | 274,230 |
| ACR MADRONO | 3 | 250,732 |
| DELTA JANDARMI ASOCIATION TULCEA | 3 | 172,086 |
| LYNX DX GROUP | 4 | 167,638 |
| CANTAREIRA DX GROUP | 3 | 145,962 |
| OSORNO CONTEST TEAM | 3 | 140,084 |
| NANAIMO AMATEUR RADIO ASSOCIATION | 3 | 100,305 |
| NOR NIZHEGORODSKOE AMATEUR RADIO COMMUNITY | 3 | 92,395 |
| UDXC | 12 | 90,700 |
| DUBNA DX CLUB | 3 | 35,282 |
| UA2 CONTEST CLUB | 3 | 33,446 |
| CWJF GROUP | 3 | 22,140 |
| LKK LVIV SHORTWAVE CLUB | 3 | 20,671 |
| RADIOCLUBUL QSO BANAT TIMISOARA | 5 | 19,681 |
| ADMIRA ARAD | 3 | 19,039 |
| CS SILVER FOX DEVA | 4 | 17,504 |
| READING AND DISTRICT ARC | 3 | 17,013 |

*Club entry does not meet all rules.

*P40A (KK9A) world-high SOAB(A) LP in the 2013 WPX CW from P49V's station.*


*The M/2 team at PS2T.*

John, KK9A, used his P4ØA call to win first place all band low power assisted in the world. Having a South American QTH seems to be important if you wish to score big on 10; LU3EHR led as South Americans swept the first five places. PR3A (PY3OZ) was king of 15-meter LP assisted, while CE3AA (XQ4CW) (20), YU2A (40), E74WN (80) and 9A3A (160) were the remaining LP assisted winners.

## Single-Operator QRP

321 hardy individuals used 5 watts or less compared with 254 during the recent SSB weekend. Jim, WI9WI, packed his bags for PJ2T in Curacao and ran away with the QRP all band category in 2013. W2GD borrowed N2NT's New Jersey station to capture the USA QRP crown, narrowly missing the USA QRP record set last year by N2WN/4 by 41k points.

Some noteworthy QRP single band scores were posted by LU7HZ on 10, VE6EX on 20, and YUØW on 40.

## Overlay Categories

The Rookie overlay category was established to encourage recently-licensed hams to try the contest experience. This year, 48 entries checked this overlay category. Only nine of the Rookies entered an assisted category with most using low power or QRP. UA5B was world high with 4.8 meg high power while

N1EN teamed up spotting assistance with his low power station to score 1.4 meg and take the North America plaque.

The Tribander/Single-Element overlay category recognizes that many stations face space constraints for antennas. 680 entrants selected this overlay. VP9FOC (VE3DZ) had the top score, and did it with low power. Well done! EE8X was runner-up, both low power and overall. NXØX (N4PN) was the leader among the USA Tribander/Single-Element competitors. KU2M had the highest USA low power score.

### Multi-Operator

P33W set a new high-water mark in the Multi-Operator Single-Transmitter category, while P3N also bettered the previous mark. NY4A led the USA contingent.

There was plenty of competition in the Multi-Operator Two-Transmitter category as well. CR3L beat PS2T for overall bragging rights while UP2L took honors over RF9C in Asia. NR3X/4 had the highest score of any USA multi-two station.

It seems to be hard to staff a full-fledged multi-multi operation as summer approaches and the weather seems so nice. 9A1A won handily while WW4E took stateside honors.

### Club Competition

The same clubs led the list this year as last year, but the point totals were considerably less than last year. The Bavarian Contest Club's impressive total score of nearly 330 million points built up from 245 club logs was nonetheless down more than 25% from their record set last year with a mere 184 logs. The Potomac Valley Radio Club's 125 logs totaled 179 million points, also down substantially.

### Records

Even though radio conditions were down considerably from last year, the high overall level of activity is reflected in several new records: HK1R (World 21 MHz), P33W (World M/S), PJ4A (South America 7 MHz), TM6M (Europe M/2), and UP2L (Asia M/2). Records for all of the various categories and countries can be found at <http://www.cqwpx.com/records.htm>.

### Miscellaneous Statistics

Only 16 stations entered the M/M category, but they made 77,403 QSOs. That's an average of 475 QSOs per operator (163 total M/M ops). The 52 M/2 stations were staffed by 252 operators, who averaged 645 QSOs per person. To put this into perspective, the median sized log for all categories of stations reported making 253 QSOs.

It is interesting to compare the QSO totals for three stations in the same general geographic area, but in different categories. CR3A made 4,336 QSOs as an unassisted single operator (second place

*ED1R ops: EA7KW, EA1FAQ, EA7RM, EC4TA, EA7PP, EA4TX, EA4AOC, EC4DX.*

*The NR4M crew: N3UA-Sejo standing, 7Q7FOC-Jim, KE3X- Ken, KC4D- Bill, Jennifer (contester in training) sitting, K4Z- Ken, and K2KW-Kenny.*

*OL7C ops — OK1FIK, OK1UBO, OK1DUB, OK1DOL (DL7CX not shown).*

worldwide). In that category, the operator can only operate 36 hours, but can interleave QSOs on two or more bands with no restrictions on band changes. CR2X made 5,302 QSOs to place third worldwide in the M/S category, where the three operators used the entire 48-hour contest period, but were limited by the rules in the number of band changes and in general could not work people on more than one band at a time. CR3L, the world-champion M/2, made 6,205 QSOs, again with only three operators. As an M/2 station, CR3L could use two bands at the same time and was also subject to a strict number of band changes during an hour.

Low power entries were submitted by 2,109 single operator stations while 1,322 used higher power and 351 went QRP. Overall, unassisted operation was favored by a nearly two to one margin, 2,447 to 1,305. High power stations narrowly favored unassisted (678 vs. 644) while low power operators overwhelmingly endorsed the "boy and his radio" style of operation (1,513 unassisted vs. 596 unassisted) and the QRP ops voting 256 to 65 for the unassisted style of operation. Even rookies were four times more likely to be operating without than with assistance. The proportion of operators making these various "style" choices was very similar to those in the SSB weekend.

## Final Observations

Most of the pictures submitted came from multi-op stations. While we appreciate that it is easier to get a candid shot when there are extra people around, it's OK to have a picture taken before or after the contest as well, which may be easier for a single-op to arrange.

There are a number of volunteers who make running and reporting the contest possible. The previous contest director, Randy, K5ZD, has continued to provide guidance to the new

director, N4TZ. The software support from K1EA and K5TR is more important than ever with the rapid log adjudication cycle. N8BJQ and WI9WI provided the skilled analysis of the logs that computers alone cannot provide. Doug, K1DG, handles the plaques, while Barry, W5GN, prints and mails your certificates, both in a very timely manner. Paper logs were manually entered by KD9MS, K9MI, K9ZM, W9TC, KC9EOQ, K9QVB, K9WX and N4TZ. K5ZD runs and improves the already outstanding CQ WPX website.

The 2014 CQ WPX CW Contest will be held May 24-25. The log deadline is five days after the conclusion on the contest, May 30 at 2359Z. Updated rules will be published in the February issue of CQ and will be posted on the website: <http://www.cqwpx.com>.

## CQ World-Wide WPX CW Contest
## All-Time Records

The contest is held each year on the last full weekend of March. The All-Time Records will be updated and published annually. Data following the calls: year of operation, total score, and number of prefix multipliers..

### WORLD RECORD HOLDERS
#### Single Operator

| | | | |
|---|---|---|---|
| 1.8 | IH9/OL5Y('98) | 341,068 | 182 |
| 3.5 | TM5Y('08) | 1,983,366 | 567 |
| 7.0 | 3V8CB('10) | 10,758,020 | 805 |
| 14 | UP2L('09) | 7,928,886 | 1043 |
| 21 | HK1R('13) | 8,337,384 | 1044 |
| 28 | ZX5J('02) | 6,787,440 | 857 |
| AB | EF8M('12) | 19,538,250 | 1195 |
| LP | P49Y('11) | 11,008,296 | 936 |
| QRP | P4ØW('97) | 4,018,208 | 632 |
| Assisted | 6Y3W('12) | 12,916,100 | 1060 |

#### Multi-Operator Single Transmitter

| | | | |
|---|---|---|---|
| P33W('13) | | 29,190,427 | 1357 |

#### Multi-Operator Two Transmitter

| | | | |
|---|---|---|---|
| PW7T('12) | | 34,156,451 | 1457 |

#### Multi-Operator Multi-Transmitter

| | | | |
|---|---|---|---|
| HC8N('99) | | 54,697,072 | 1264 |

### U.S.A. RECORD HOLDERS
#### Single Operator

| | | | |
|---|---|---|---|
| 1.8 | WV8JR('07) | 56,760 | 132 |
| 3.5 | W3BGN('08) | 641,092 | 332 |
| 7.0 | KG1D('04) | 3,681,828 | 657 |
| 14 | N2NC('06) | 5,418,630 | 915 |
| 21 | NU5A('99) | 4,411,299 | 789 |
| 28 | WW4M('01) | 2,547,046 | 674 |
| AB | KC3R('12) | 11,264,620 | 1060 |
| LP | W3EF('12) | 5,704,362 | 933 |
| QRP | N2WN/4('12) | 1,686,608 | 592 |
| Assisted | NY3A('12) | 9,923,563 | 1079 |

#### Multi-Operator Single Transmitter

| | | | |
|---|---|---|---|
| KM3T/1('12) | | 15,311,340 | 1254 |

#### Multi-Operator Two Transmitter

| | | | |
|---|---|---|---|
| NN3L('12) | | 21,964,974 | 1362 |

#### Multi-Operator Multi-Transmitter

| | | | |
|---|---|---|---|
| NR4M('12) | | 26,785,984 | 1426 |

### WPX (Prefix) RECORD

| | |
|---|---|
| 9A1A('12) | 1603 |

### CLUB RECORD

Bavarian Contest Club ('12) 441,610,686

### CONTINENTAL RECORD HOLDERS

#### AFRICA

| | | | |
|---|---|---|---|
| 1.8 | IH9/OL5Y('98) | 341,068 | 182 |
| 3.5 | 7X0RY ('08) | 1,701,260 | 407 |
| 7.0 | 3V8CB('10) | 10,758,020 | 805 |
| 14 | 6W1SJ('09) | 6,755,364 | 924 |
| 21 | 5X1Z('01) | 6,362,352 | 782 |
| 28 | ZS4TX('01) | 4,602,028 | 722 |
| AB | EF8M('12) | 19,538,250 | 1195 |

#### ASIA

| | | | |
|---|---|---|---|
| 1.8 | 4X4NJ('96) | 259,420 | 170 |
| 3.5 | TAØ/Z33F('02) | 1,452,552 | 348 |
| 7.0 | ZC4LI('10) | 4,770,336 | 632 |
| 14 | UP2L('09) | 7,928,886 | 1043 |
| 21 | A45XR('99) | 6,557,697 | 843 |
| 28 | HZ1AB('02) | 3,669,994 | 659 |
| AB | 4L0A('09) | 12,560,363 | 967 |

#### EUROPE

| | | | |
|---|---|---|---|
| 1.8 | SN7Q ('08) | 339,542 | 307 |
| 3.5 | TM5Y('08) | 1,983,366 | 567 |
| 7.0 | CT1JLZ('09) | 6,075,936 | 816 |
| 14 | 4O3T ('06) | 5,313,554 | 986 |
| 21 | CR1X('12) | 7,293,280 | 1154 |
| 28 | 9HØA('01) | 3,965,315 | 841 |
| AB | CR2X('11) | 10,498,800 | 1040 |

#### NORTH AMERICA

| | | | |
|---|---|---|---|
| 1.8 | VA1A('99) | 103,680 | 120 |
| 3.5 | FM5BH('97) | 833,490 | 315 |
| 7.0 | V26BA('97) | 6,227,550 | 659 |
| 14 | N2NC('06) | 5,418,630 | 915 |
| 21 | ZF1A('99) | 5,330,129 | 799 |
| 28 | FM5GU('01) | 2,849,769 | 621 |
| AB | VY2TT('12) | 14,249,235 | 1155 |

#### OCEANIA

| | | | |
|---|---|---|---|
| 1.8 | KH6ND('07) | 22,100 | 50 |
| 3.5 | KH6ND('09) | 596,673 | 231 |
| 7.0 | ZM3A('09) | 6,437,695 | 737 |
| 14 | KH6ND('03) | 4,126,690 | 730 |
| 21 | KH6ND('99) | 6,107,256 | 813 |
| 28 | KH6ND('00) | 1,523,008 | 424 |
| AB | NH2T('12) | 11,438,122 | 991 |

#### SOUTH AMERICA

| | | | |
|---|---|---|---|
| 1.8 | HK1MW('11) | 18,300 | 50 |
| 3.5 | YX3A('89) | 1,004,060 | 305 |
| 7.0 | PJ4A('13) | 8,744,862 | 826 |
| 14 | HK1X('11) | 7,254,266 | 1006 |
| 21 | HK1R('13) | 8,337,384 | 1044 |
| 28 | ZX5J('02) | 6,787,440 | 857 |
| AB | PJ4A('11) | 16,272,730 | 1018 |

#### MULTI-OPERATOR SINGLE TRANSMITTER

| | | | |
|---|---|---|---|
| AF | CQ3A('11) | 26,093,210 | 1285 |
| AS | P33W('13) | 29,190,427 | 1357 |
| EU | ES9C('12) | 17,760,738 | 1438 |
| NA | 8P4A('02) | 18,516,960 | 1056 |
| OC | AH2R('01) | 11,541,420 | 957 |
| SA | P49V('01) | 19,760,744 | 1034 |

#### MULTI-OPERATOR TWO TRANSMITTER

| | | | |
|---|---|---|---|
| AF | EF8M('07) | 33,324,192 | 1256 |
| AS | UP2L('13) | 26,207,251 | 1273 |
| EU | TM6M('13) | 22,126,482 | 1407 |
| NA | NN3L('12) | 21,964,974 | 1362 |
| OC | KH6LC('12) | 17,095,460 | 1198 |
| SA | PW7T('12) | 34,156,451 | 1457 |

#### MULTI-OPERATOR MULTI-TRANSMITTER

| | | | |
|---|---|---|---|
| AF | CQ3L('10) | 28,736,154 | 1173 |
| AS | A61AJ('02) | 42,766,232 | 1244 |
| EU | DR1A('12) | 34,790,058 | 1598 |
| NA | 6Y2A('02) | 38,821,328 | 1274 |
| OC | ZL6QH('04) | 16,143,840 | 1010 |
| SA | HC8N('99) | 54,697,072 | 1264 |

#### QRP

| | | | |
|---|---|---|---|
| AF | 5Y4FO('92) | 649,057 | 311 |
| AS | ZC4BS('02) | 2,515,388 | 521 |
| EU | LY5A('01) | 2,331,414 | 646 |
| NA | TI5X('01) | 2,568,470 | 615 |
| OC | FO8JP('86) | 572,131 | 259 |
| SA | P4ØW('97) | 4,018,208 | 632 |

# Buy-Direct

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*Announcing:*

# The 2014 CQ World-Wide 160-Meter Contest

## CW: 2200Z January 24 TO 2200Z January 26
## SSB: 2200Z February 21 TO 2200Z February 23

### 5-Day Deadlines For Log Submissions:
### CW: 2200Z January 31, 2014
### SSB: 2200Z February 28, 2014

**I. OBJECTIVE:** For amateurs around the world to contact other amateurs in as many U.S. states, Canadian provinces, and countries as possible utilizing the 160-meter band.

**II. BAND USE:** 1810-2000 kHz in ITU Region 1; 1800-2000 kHz in ITU Regions 2 and 3. All entrants are encouraged to spread out as much as possible, obeying frequency restrictions and power limits for their own country. **Any violations of the ITU band use may result in disqualification**.

**III. CATEGORIES:**

**For all categories:**

The main site is defined as all transmitters, receivers, and antennas must be located on the same contiguous property. If the property is not contiguous, then all equipment must fall within a 1500-meter radius. All antennas must be connected by wires to the main station. This rule applies to all entrants.

The use of any so-called "Chat Rooms" via the Internet or similar means for communication between stations or operators during the contest period is strictly prohibited. Do not arrange or confirm QSOs by any other means than the use of the 160-meter band and the same mode as used in the contest. Any such use may result in disqualification at the discretion of the committee. The use of self spotting is not allowed in any category.

***Remote operation is permitted under the following conditions:***

- The use of any receiver located away from the main site is strictly prohibited.
- The use of a separate receiver at the remote control location is prohibited.
- Any receiver linked via the Internet or RF not physically located at the main site is strictly prohibited.

If the remote station is located in another DXCC entity, it is required to comply with all local country regulations.

**Operating time: Each contest is 48 hours long and starts at 2200Z**. Single operator stations may only operate 30 out of the 48 hours. Multi-Operator stations may operate 40 hours. Off times must be a minimum of 30 minutes in length for all categories.

**(A) Single Operator:** One person performs all of the operating, logging, and spotting functions. Maximum operating time is 30 hours. ***Passive spotting is NOT allowed.*** (See definition of passive spotting functions below.) Only one transmitted signal is allowed at any moment in time. Maximum power is 1500 watts total output.

**(B) Single Operator/Low Power:** Same as (A) with the exception that the output power shall not exceed 150 watts. Stations in this category compete with other Low Power stations only.

**(C) QRP:** Same as (A) with the exception that the output power shall not exceed 5 watts. Stations in this category compete with other QRP stations only. **Note: There is no Assisted category for QRP entrants**.

**(D) Single Operator Assisted: HIGH POWER ONLY.** Same as (A) with the following exception: The use of passive spotting IS allowed. (See definition of passive spotting functions below.)

**(E) Multi-Operator: HIGH POWER ONLY.** All rules apply as in Single Op Assisted; however, more than one operator (person) is involved in the operation. Maximum operating time is 40 hours. Only one transmitted signal is allowed at any moment in time. Maximum power is 1500 watts total output or the output power allowed by your country, whichever is less. The use of passive spotting is allowed.

**Passive Spotting is defined as (but not limited to):**

DX spotting nets or QSO alerting assistance of any kind. Over-the-air nets or stations that provide frequency and station information.

Any device or person that provides frequency and callsign information of any station during the contest period. This includes band skimmers or similar devices. Passive spotting does NOT include band scopes, SDR receivers, or the like, which provide no information about the signal other than its presence, which is allowed in all categories.

**IV. Exchange:** RS(T) and state for U.S., province for Canada, and CQ Zone for DX. Note: Zones are location indicators only and do not count for multipliers.

**V. Multiplier:**

**U.S. States:** (48 contiguous states); U.S. District of Columbia (DC) (1)

**Canadian Provinces:** (14) VO1, VO2, NB, NS, PEI (VY2), VE2, VE3, VE4, VE5, VE6, VE7, VE8 (NWT), VY1 (YUK), VYØ. Note VO1 and VO2 are separate due to tradition.

**DXCC plus WAE countries:** WAE: IT, GM (Shetland Islands), JW (Bear island), TA1 (European Turkey), 4U1VIC, Z6 Kosova.

**VI. Points:**

Contacts with stations in own country: 2 points.

Contacts with other countries on same continent: 5 points.

Contacts with other continents: 10 points

Maritime mobile contacts count 5 points. There is no multiplier value for a maritime mobile contact.

**VII. SCORING:** All stations—the final score is the result of the total QSO points multiplied by the sum of all multipliers (states, VE provinces, DX countries).

**VIII. Awards:** Certificates will be awarded to the top scorers in each class (see provisions under classes) by state, Canadian area, and DX country. Runners-up with high scores over 100,000 points may also receive certificates. The trophies and donors for all categories can be found on the official contest website <CQ160.com>. If you are interested in sponsoring a plaque, please contact us at: <questions@cq160.com>.

**IX. Club Competition:** Any club that submits at least three logs may enter the Club Competition. The name of the club must be clearly identified under club competition on the summary sheet, or summary portion of the Cabrillo log. Please make sure all entrants from your club use the same club name (spelled the same) in the Cabrillo entry. Non-compliance with this request may result in your score not being credited to your club's entry.

**X. LOG INSTRUCTIONS:**

**The new deadline for log submissions is 5 days from the end of the contest.**

**For CW this is 2200z Jan 31, 2014.**

**For SSB this is 2200z Feb 28, 2014**.

The submission of Cabrillo Logs is highly encouraged. Please submit CQ WW 160 Meter Contest logs via e-mail to <160CW@kkn.net> for CW and <160SSB@kkn.net> for SSB. Logs are requested to be in the Cabrillo file format. You can view the current list of logs received at <CQ160.com>.

**Mailing deadline (postmark) for CW entries is February 1, 2014; for SSB entries March 1, 2014.** Mail all paper/disk logs to: CQ 160 Meter Contest, 25 Newbridge Road, Hicksville, NY 11801 USA. Indicate CW or SSB on the envelope.

For hardship cases that require more time for log submission, send an e-mail to: <Director@cq160.com>. We will make every effort to accommodate you if you have a valid reason for delay.

Cabrillo formatted logs are received by a log processing robot. If your log has been submitted correctly, the robot will reply with an e-mail containing a tracking (confirmation) number. If there is a problem with your log, the robot will send you an error message containing suggestions for how to fix your log. Read this e-mail carefully. Most log submission problems are minor and can be corrected in one pass. Submit your log as many times as needed. The last submitted log will be the version that counts for your official entry. Once you receive a tracking number, your log has been accepted. **Inquiries may be sent to <questions@CQ160.com>**.

Be sure to send in paper and diskette based logs early to ensure receipt by the deadlines. Unreadable paper logs will be classified as check logs.

**XI. Penalties and Disqualification:** Logs will be cross-checked and penalties will be applied at the committee's discretion for contacts determined to be bad or busted. The bad QSO is removed and a penalty of two more equivalent QSOs is applied to the points only. No penalty should be applied for unique QSOs unless they are deemed excessive. A log may be disqualified for violation of amateur radio regulations, unsportsmanlike conduct, or claiming excessive unverified contacts.

Report file outputs showing final score calculations will be available for all entrants after the results are published. The decisions of the CQ WW 160 Contest Committee are final.

*Operating from restricted spaces is becoming a fact of life for more and more hams. Often, it's antennas that are compromised the most. But in VE4KZ's case, it was limited space inside his house that became a challenge to overcome.*

# Lots of Rig in Small Digs

**BY BILL KARLE,* VE4KZ**

Downsizing shudders spines. Whether at work or home, the mood is, at best, "challenging." With more hams facing scalebacks to smaller residences, the station needs to be compressed if one wants to stay active. We moved to a *bigger* property but a *smaller* house. The upside was more room for antennas; the downside was a former roomful of radios that now had to fit into a corner of a room.

VE4KZ usually runs under 100 watts of output on the HF bands using CW, SSB, and digital modes. A host of antennas are used and some need a good antenna-matching unit (AMU). Net control duty on 80 meters calls for adequate effective radiated power helped by a 600-watt out linear amplifier.

The smaller digs obliged that my station's interior equipment be packed into a furniture unit called, by some, a "secretary" and, by others, a "home office." The secretary is in the den that is used for purposes in addition to ham radio so it is good that the secretary can be closed (see Photo A).

## The Shack's Layout

Let's start at the top and work our way downward, noting the features. Photo B is a shot of the opened unit.

One always needs space for pens, pencils, calculators, connectors, adapters, and such. Several plastic drawers are installed for these. The drawers are the stackable sort and often sold at office supply stores. I disassembled them and screwed the single drawers to the top shelf of the cabinet. Another pair is below the keyboard shelf.

The secretary's shelves, as purchased, do not have the strength to carry the equipment, especially the Drake L7 linear amplifier. The amp weighs 27 pounds (12 kilograms) and the power supply tips the scale at 43 pounds (19 kilograms). In addition, the secretary has minimal reinforcement to guard against sway.

The shelf supporting the amplifier and AMU is reinforced with a transverse board that happens to be decorative. Another transverse board at the rear provides further stiffening. The shelf is affixed to wood brackets with screws. The brackets are connected with screws to the secretary's vertical sides. The arrangement transfers the loads to the vertical walls and thus to the floor while eliminating cabinet sway.

The underside of that shelf, shown in Photo C, carries illumination fixtures, similar to those used to light paintings, brightening the working surfaces below. You also can see the brackets supporting the amplifier shelf. The shelf has a slot cut into it. Small fans force added air into the base of the linear amplifier mounted above.

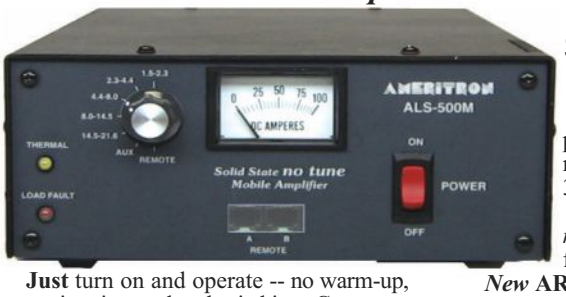
The middle shelf, seen in Photo D, carries the ICOM 756 Pro III, the ICOM 706 Mk IIG, and the RIGblaster Advantage computer-rig interface. To the far right is a Telequipment S-54A oscilloscope, essential to amplifier monitoring. The loads on this shelf are relatively low, so no reinforcement is needed. I show here a MacBook Pro while Photo B portrays the

*Photo A. Closed secretary hiding the shack unless you know the black cable is a transmission line, HI!*

** P. O. Box 4*
*Belair, Manitoba,Canada, R0E 0E0*
*E-mail: <ve4kz@yahoo.ca>*

# AMERITRON mobile *no tune* Solid State Amp

***500 Watts, Instant bandswitching, no tuning, no warm-up, SWR protected, 1.5-22 MHz . . .***
***NEW! ARI-500 Amplifier Radio Interface reads transceiver band data -- automatically bandswitches ALS-500M amp . . . NEW! ALS-500RC Remote Head gives total remote control!***




ALS-500M
**$899**
Suggested Retail

**Just** turn on and operate -- no warm-up, no tuning, instant bandswitching. Compact.

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

**Virtually** indestructible! *Load Fault Protection* eliminates amplifier damage due to operator error, antenna hitting tree branches, 18-wheeler passing by. *Thermal Overload Protection* disables/bypasses amp if temperature is excessively high. Auto resets.

**Typically** 60-70 watts in gives full output. ON/OFF switch bypasses amplifier for "barefoot" operation. Extremely quiet fan comes on as needed. Excellent harmonic suppression, push-pull output, DC current meter. 13.8 VDC/80 Amps. 3½x9x15 inches. 7 lbs.

**Choose** ARI-500 for fully *automatic bandswitching* or ALS-500RC for *manual* remote control.

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

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

**ALS-500M, $899**, 500 Watt mobile amp.

**ALS-500MR, $929**, ALS-500M mobile amp ***plus*** ALS-500RC *Remote Head.*

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

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

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

ARI-500
**$119.95**
Ship Code A

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

# *Programmable* Screwdriver Antenna Controller

***10 Memories . . . Super Accurate . . . AutoPark™ . . . StallProtector™ . . . Super bright LEDs***

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

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

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

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

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

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

SDC-102
**$129.95**
Suggested Retail

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

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

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

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

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


3½Wx3¼Hx1¼D inches.

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

**SRS-1001, $9.95.** Magnetic sensor kit for Hi-Q Antennas to use SDC-102.

## 1.2 kW Screwdriver Antenna

SDA-100
**$409**
Suggested Retail

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

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

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

## *Flat Mobile Wattmeter*


AWM-35
**$159.95**
Suggested Retail

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

## Digital Screwdriver Controller

**4-digit** *super bright* LEDs let you re-tune *exactly* -- fast, no guessing. Digital count range -999 to +999. On/off/reset switch for easy calibration. 4Wx1½H x2D". Use 13.8VDC.

SDC-100B
**$99.95**

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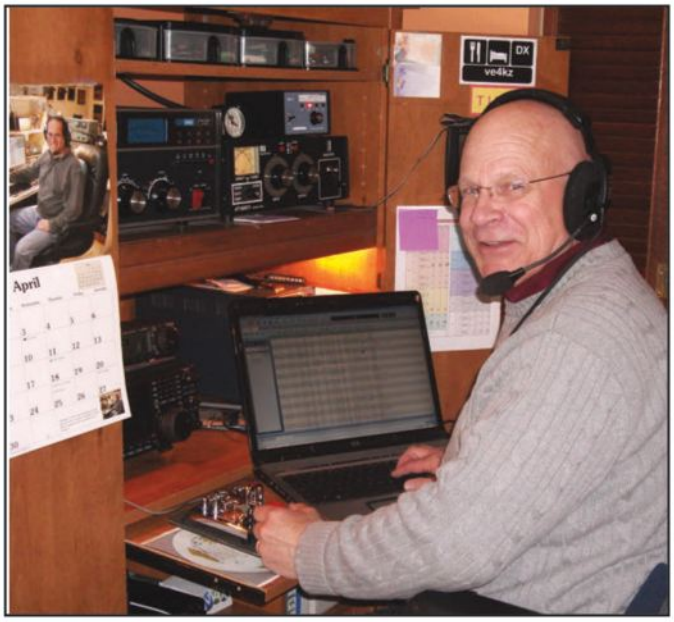


*Photo B. VE4KZ on the air.*

setup when using a WinTel PC. Notice the sight line and cramped space issues that will be discussed later.

Since I am left handed, I place the laptop to the right side of the keyboard shelf so that the paddle may be placed to the left. The transceivers are placed to the left so that I can see their displays. Common advice says that left-handed operators should place the tuning knob to their right (and vice-versa for right-handed operators). The idea is that a "lefty" can tune with the right hand while writing and sending with the left. This advice is modified at VE4KZ since the computer remotely controls the radios while I "copy" Morse via the keyboard into a notepad program or directly into the log. I could send Morse from the keyboard but I like the "feel" and "personality" of my iambic paddle.

The secretary's keyboard shelf, just under the main shelf, turned out to be too low. Rotating the shelf's sliders raised it to a more comfortable height. This shelf carries a MacBook Pro running several operating systems and applications software. This small computer works fine. The rigs on the main shelf are visible and the keyboard shelf still has room for a key and a mouse. A wider laptop does not work as well in this space.

The next shelf down (Photo E) has two low-voltage power supplies. The Alinco DM-330MV switching power supply is small and weighs little. Its output feeds a power distribution panel that has multiple fused circuits. It is a West Mountain Radio Rigrunner 4005. Leads then go to the transceivers on the shelf above. The homebrew supply is an analog one powering 12-volt accessories and the cooling fans.

Metal L-brackets are used to connect the bottom shelf, supporting the Drake amplifier's high voltage supply, to the decorative panel (Photo F). This measure stiffens the shelf and further guards against sway. Not visible is a transverse piece of a 1x3 piece of lumber at the rear of the bottom shelf, further stiffening it.

The linear amplifier power supply operates from 220-volts AC and connects to a suitable wall receptacle on a dedicated 220-VAC circuit immediately behind the cabinet.

Notice the fire extinguisher. Every ham shack should have one. I have had one in each of my shacks over the many years. I never have had to use one but it's better to be ready than not. The extinguisher is the type suitable for electrical fires.

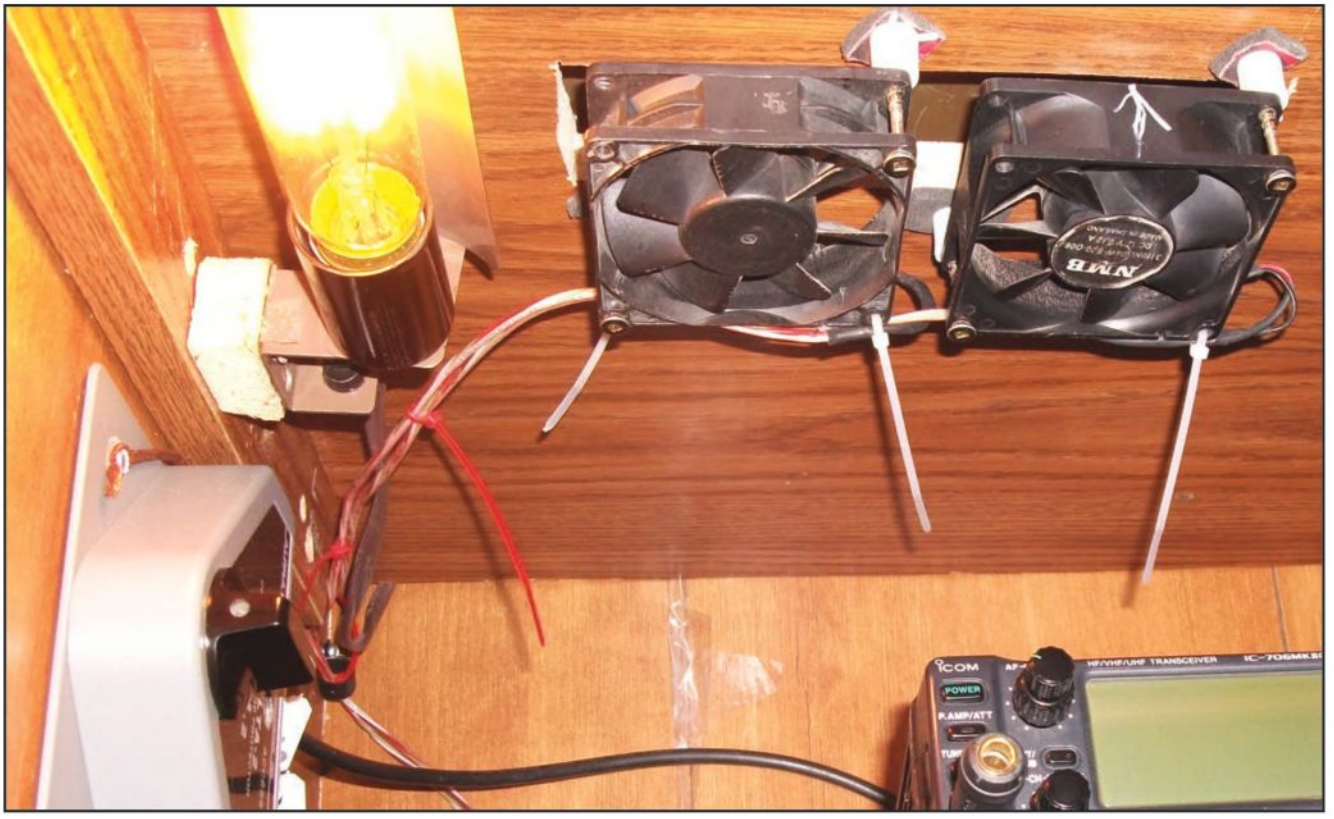


*Photo C. Shot of illumination fixture, amp shelf brackets, cooling fans, and coaxial switch selecting each transceiver.*

*Photo D. The main operating shelf with the two transceivers and the oscilloscope used to monitor transceiver and amplifier output sampled at the input to the AMU.*

A rear view of the upper part of the cabinet (Photo G) reveals some of the wiring. The coaxial cabling at the rear of the AMU and the amplifier are clear. The other wiring is for the lights and for one of two power bars. Various wall warts (powering the amplifier change-over relay, weather station display, and so on) are plugged into the power bar. Another power bar mounted behind the low voltage supplies power to them, the 'scope, and the computer.

## Problems

One problem that I found in this compact station that I did not have when equipment was spread out in the former shack was increased sensitivity to radio frequency interference (RFI). RF was getting into the audio circuits associated with the computer-to-rig interface. RF affected the WinTel computer but not the MacBook. Vice-versa, computer noise was getting into the receivers. Application of split-core RFI filters fixed that problem.

Another problem is heat. The amp dumps a lot of heat out of its rear. So, the back panel of the secretary is cut out to improve ventilation. You can see that in Photo G. The amp needs air so the boost fans described earlier are helpful in that regard.

Problems bring opportunities, it is said. The small keyboard shelf offered such an opportunity. Where might I put operating references? Most essential aids, such as country list, net call-up list, and logs are in the computer. Often-referred charts, such as the AMU and amp Plate/Load settings, are in the computer or taped to the cabinet nearest the relevant unit.


*Photo E. The homebrew power supply to the left, the switching power supply in the center, and the power supply distribution panel mounted at right rear.*

## Later Thoughts

What would I do differently, other than taking over the whole den?

The cabinet itself nearly is immobile. It can be moved but it takes care. The secretary frame, as supplied, does not allow for the addition of casters. A solu-

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littleBits modules each contain a mini-circuit that performs a specific task. They plug together in different sequences to let the builder create a wide variety of projects. They're great for teaching electronics and learning the basics of circuit design. For more information, visit <www.littlebits.com> or contact littleBits Electronics, Inc., 60 E. 11th St., 5th Floor, New York, NY 10003.


*The LittleBits Premium Exploration Kit includes modules and instructions for building 10 different projects. (From littleBits.com website)*

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*Photo F. Amp's high-voltage supply and shack's fire extinguisher.*


*Photo G. Rear upper half of cabinet. Rear of AMU is to the left. Rear of amp is at the right.*

tion would be to mount the cabinet on a wheeled base.

The computer is central to the station since rig control, digital mod and demod, and logging are affected by software running on the machine. I find that the Mac's laptop screen precludes multiple readable images. A bigger monitor, such as on the WinTel laptop, works but it obscures view of the rigs and 'scope. Compare Photos B and D. Maybe moving the transceivers to another shelf would work. They are remoted to the laptop, so why not? One caveat is that I need to see the broadband spectrum 'scope on the Pro III since it is a grand aid, especially in DXing and contesting.

I like to watch the current and voltage being provided by the Alinco supply to the transceivers; these are basic operating parameters. The extant location of the supply prevents easy observation. A remoted DC distribution control would work, showing DC measures on the computer.

While writing this, I was rearranging the power bars so that 110 VAC easily and rapidly can be removed from them. For the same reason, I would like to add a convenient cut-off for the 220-VAC service to the amp's power supply feed. Think safety!

## Conclusion

The article portrayed the layout of a compact station operating multiple modes, in the HF bands, and at power levels between 5 and 600 watts out. Outlined were design pluses and minuses.

All considered, the arrangement is working for me and has done so for some time.

I hope that these thoughts engender ideas that might work for you if you have to pack lots of rig into small digs.

*American hams are lucky in that many of the foreign hams you meet on the air have at least a little knowledge of English. But they also appreciate any effort you may make to recognize their language as well. K6CTW has a guide to basic on-air Russian.*

# Russian CW and Some QSO Phrases

**BY KEN MILLER,* K6CTW**

Ham radio is not only fun, it can be a great learning experience. Once you've learned the rules and a bit of theory to pass the exams to get licensed as a General or an Extra, literally the entire world opens up to you on HF. This gives the opportunity not only to pass standardized messages, but to learn to really *communicate* by sending in the other ham's language. This simple tutorial revolves around Russian CW, and some simple QSO phrases, but would work equally well in any language. Interested? Read on!

| | |
|---|---|
| Thank you for the contact | СПАСИБО ЗА КОНТАКТ |
| Sent as | SPASIBO ZA KONTAKT |

*Figure 1. Getting started … how to send "thank you for the contact" in Russian.*

| | |
|---|---|
| Your signal RST 599 | СИГНАЛ RST 599 |
| Sent as | SIGNAL RST 599 |

*Figure 2. Signal report. Obviously, substitute proper numbers if signal is not 599.*

| | |
|---|---|
| Name | ИМЯ (your name here) |
| Sent as | I M AA (your name) |

*Figure 3. Sending your name.*

## Codes

My enjoyment of Morse code and its CW equivalents has now spanned over four decades.

It was CW that drew me into ham radio in the first place. In the years I've been licensed, most of that running CW, I've discovered other, similar, codes on the air. As it turns out, those that I hear most often are for sending either Japanese or Russian. A little research also shows that there are a number of similar codes used on CW for communicating in a wide variety of languages, but I've either not heard them, or didn't recognize them when I did.

Of the two major variants that I have been able to recognize, the Japanese Katakana code, although quite interesting, seems well beyond my grasp. Not only are there a lot more symbols, 46, but they do not each represent a letter sound, but rather a combination of sounds. Obviously this requires a facility and understanding of Japanese, which unfortunately I don't have. And, since I didn't even know where to start, Japanese is — at least for the present — just not in the cards for me. Maybe in response to this article, one of our Japanese-speaking readers will help us out by providing a similar write-up.

The other code, for sending Russian, seemed a bit more "do-able," at least for me. Part of that is that there are a lot fewer symbols to learn (only 33). Also, through work and traveling, I've been able to pick up some Russian phrases and expressions over the years. Additionally, with a little study, Russian spelling and grammar seemed to be something I could learn (old dog, new tricks, you get the picture).

## Russian Language Basics

The first thing that struck me was finding out that in Russian, if you can spell it, you can say it and vice-versa. How cool is that? No hidden characters/sounds! Looking at the Russian CW characters listed at the end of this article, you will see that their Continental (International Morse) Code equivalent CW characters have sounds that roughly correspond to the Russian letter's sound.

For example the Russian character "de" has the Continental Code equivalent of the letter "D" (dah-dit-dit) and that is similar to its sound when it's pronounced in Russian. There are, however, a few letters that we don't have in the Latin alphabet. For example, Russian has two letters which signify that the following letter's sound should be a "hard" or "soft" sound, respectively, but are not pronounced themselves.

There is a lot more to this, and unfortunately this article is limited. So, to really find out more about the Russian alphabet and its letter sounds, there are a number of sites on the Web that will provide a much more detail and explanation (See notes 1 and 2). We also have a chart of the Russian alphabet and corresponding code characters included here.

The Russian language also has no articles (For the grammatically-challenged in English, there are two kinds of articles in English grammar: One is the *definite* article, "the," which can be

* e-mail: <k6ctw@earthlink.net>

singular or plural; and the others are the *indefinite* articles, "a" or "an," which are always singular). This should help simplify and shorten transmissions a bit.

Before getting into the phrases themselves, and their translation into Continental Code, it's important to recognize that I'm far from being a Russian scholar, and thus some (most?) of the phrases could probably be sent more succinctly, but it is a first effort, and all comments or corrections are most welcome. Besides, with further learning, practice, and the patience of those Russian operators who work me on the air, I hope to do a lot better in the future.

## The QSO Phrases

First, a little word of explanation. The Russian QSO phrases seen below will have their continental code equivalents listed below or alongside them. Thus, if you send the indicated coding, what the Russian operator will hear is Russian, not some gibberish. The full Russian character encoding is included at the end for reference and so you can learn all of the characters and how they sound. A bit of practice with them before you try them on the air is also recommended. We've put the phrases into boxes for easy reference.

A great way to start, and probably a real surprise for the Russian operator at the other end of the QSO, would be by starting your response by saying thanks for the contact (see Figure 1). Of course the next thing to send is a signal report (Figure 2). Interestingly, the Russian word for signal and the Continental Code equivalent look just like the English word.

Commonly, this is followed by sending your name. In Russian that would be as shown in Figure 3. In the word for name, the 3rd letter does not have a Continental Code equivalent. It is pronounced like the "ya" in the word yard, and is sent like two "A" characters run together. This should be done in the same manner as with prosigns like BT (used between sections of your transmission) and SK for end of contact. Have another look at the Russian CW alphabet in the sidebar to see exactly what I mean with respect to the characters. For the purposes of this article, I have coded them in the same way prosigns are to indicate that you send them as those letters run together. This might be a good time to examine the Russian alphabet chart to see all of those letters that have been coded that way.

And now, continuing along in our QSO, you would probably want to describe your QTH. For that, some of the usual directional pointers are listed in Figure 4. Remember that Russians don't use miles, they use kilometers. An easy conversion factor to remember is that 8 kilometers is approxi-

**RUSSIAN CW ALPHABET**

| | | | |
|---|---|---|---|
| А а | .– | Р р | .–. |
| Б б | –... | С с | ... |
| В в | .–– | Т т | – |
| Г г | ––. | У у | ..– |
| Д д | –.. | Ф ф | ..–. |
| Е е | . | Х х | .... |
| Ё ё | . | Ц ц | –.–. |
| Ж ж | ...– | Ч ч | –––. |
| З з | ––.. | Ш ш | –––– |
| И и | .. | Щ щ | ––.– |
| Й й | .––– | Ъ ъ | –..– |
| К к | –.– | Ы ы | –.–– |
| Л л | .–.. | Ь ь | –..– |
| М м | –– | Э э | ..–.. |
| Н н | –. | Ю ю | ..–– |
| О о | ––– | Я я | .–.– |
| П п | .––. | | |

*Here is a complete chart of the Russian (Cyrillic) alphabet and corresponding code characters.*

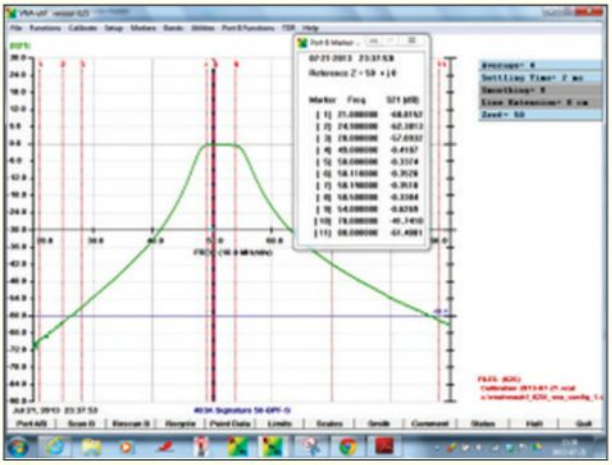
The main compass directions are as follows:

| | |
|---|---|
| North | **СЕВЕР** |
| Sent as | **S E W E R** |
| South | **ЮГ** |
| Sent as | **IM G** |
| East | **ВОСТОК** |
| Sent as | **W O S T O K** |
| West | **ЗАПАД** |
| Sent as | **UI A P A D** |
| Northeast | **СЕВЕРО- ВОСТОК** |
| Sent as | **S E W E R O W O S T O K** |
| Southeast | **ЮГО- ВОСТОК** |
| Sent as | **IM G O W O S T O K** |
| Southwest | **ЮГО - ЗАПАД** |
| Sent as | **IM G O UI A P A D** |
| Northwest | **СЕВЕРО - ЗАПАД** |
| Sent as | **S E W E R O UI A P A D** |

*Figure 4. With Figure 5, how to describe your location in Russian.*

| | |
|---|---|
| QTH 50 Km East of Los Angeles | **QTH 50 KM К ВОСТОК У ОТ Los Angeles** |
| Sent as | **QTH 50 KM K W O S T O K U O T Los Angeles** |

*Figure 5. With Figure 4, how to describe your location in Russian. Remember to use kilometers instead of miles.*



*Frequency response plot of the 4O3A 6-meter bandpass filter from InnovAntennas. (Courtesy InnovAntennas)*

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mately equal to 5 miles. However to use these directional words in a phrase like "southeast of," you will need to precede the direction word with the single letter "ka", add the letter "oo" to the direction, and then put the word OT before the city. For example, to send that your QTH is 50-km east of Los Angeles, you might send the phrase shown in Figure 5. If you happen to be lucky and are near a major city you could

| | |
|---|---|
| Near | **ОКОЛО (city name)** |
| Sent as | **O K O L O (city name)** |

*Figure 6. A simpler approach to sending your QTH.*

| | |
|---|---|
| Weather | **ПОГОДА** (insert condition from below) |
| Sent as | **P O G O D A** (insert condition from below) |
| Sunny | **СОЛНЕЧНО** |
| Sent as | **S O L N E U N O** |
| Rainy | **ДОЖДЛИВО** |
| Sent as | **D O V D L I W O** |
| Cloudy | **ОБЛАЧНО** |
| Sent as | **O B L A U N O** |
| Clear | **ЯСНО** |
| Sent as | **AA S N O** |
| Foggy | **ТУМАННО** |
| Sent as | **T U M A N N O** |
| Snowing | **ИДЕТ СНЕГ** |
| Sent as | **I D E T S N E G** |

*Figure 7. How's the weather? This should help you describe it to your contact in Russia.*

| | |
|---|---|
| Temperature | **ТЕМПЕРАТУРА** (degrees) |
| Sent as | **T E M P E R A T U R A** (degrees) |

*Figure 8. Remember to use Celsius when sending the temperature at your QTH.*

| | |
|---|---|
| I am ____ years old | **МНЕ (yrs) ЛЕТ** |
| Sent as | **M N E (yrs) L E T** |

*Figure 9. How old are you? (If you were Jack Benny, it would always be 29!)*

| | |
|---|---|
| Please QSL | **ПОЖАЛУЙСТА QSL** |
| Sent as | **P O V A L U J S T A QSL** |

*Figure 10. After all this work, you definitely deserve a QSL.*

| | |
|---|---|
| (disclaimer) | ЖАЛЪ, ЗТО - ВЕСЬ РУССКИЙ, ШТО Я ЗНАЮ |
| Sent as | VALX ŪITO WESX RUSSKIJ YTO ĀA ŪI NA ĪM |

*Figure 11. No, please don't reply in Russian at 40 WPM!*

just use the word for "near" which would then be sent as seen in Figure 6.

A short follow-on with the local weather is always a good idea, so you could send the word for weather followed by one of the general weather types seen in Figure 7. And let's not forget to also include the temperature (see Figure 8), remembering to convert Fahrenheit to Celsius. *(I keep an F/C conversion chart on my shack table with 5-degree increments. Another card has mile/km equivalents. - ed.)*

Always informative in any QSO is your age, and for that you could use the coding shown in Figure 9. The coding in Figure 10 then shows how to ask politely for a QSL card.

Then, importantly, to make sure the other station doesn't "snow you" with whole lot of Russian when he/she replies, you might want to also send what is shown in Figure 11, which basically means, "It is a pity, but this is all the Russian I know." (Unless of course, you do know a bit more Russian and are able to copy on your Russian keyboard, or in cursive.) Finally, a nice way to finish the transmission would be with a pleasant goodbye (see Figure 12).

## Conclusion

Once again, I hope that this will not only provide a way for you to try something entirely different, but that it also might promote learning Russian (or any other language for that matter). What better way to get even more enjoyment out of our great hobby, ham radio? So, here's hoping this will encourage you in the use of these Russian CW codes and in learning the Russian language as I'm trying to do [see Note 3].

| | |
|---|---|
| Goodbye | ДО СВИДАННЯ 73 |
| Sent as | DO SWIDANIĀA 73 |

*Figure 12. Th-th-that's all, folks.*

After all, ham radio, particularly with respect to DXing, is about being an ambassador to the world. What better way to show that genuine interest than to send your QSO information to the receiving ham in his or her own language? Why not turn that usual (read boring) TU UR RST 599 QSL VIA BURO 73 into the beginning of a real cultural exchange?

**Notes:**

1 - Russian CW Alphabet: <http://www.wunclub.narod.ru/files/rusmore.html>

2 - Russian for Everyone: <http://www.russianforeveryone.com>

3 - Russian Language Lessons — Learn Russian For Free: <http://www.russianlessons.net>

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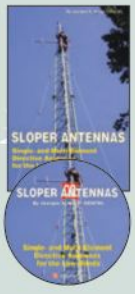


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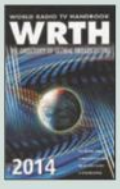


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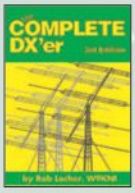


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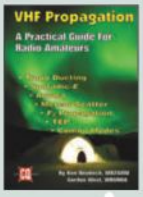


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# Portable AC Power

BY IRWIN MATH,* WA2NDM

When operating in the field, the usual power source is batteries. However, sometimes it is desirable to have an AC supply. While most current transceivers do have 12-V power requirements, many of the older "boat anchors" do not. Since such equipment is usually inexpensive and readily available on "used equipment" websites, a portable AC power source would sometimes be a useful accessory to have. As a result, we thought it would be a good idea to present a relatively inexpensive circuit that could convert your portable DC source to a standard 115 V @ 60 Hz (or 220 V @ 50 Hz), which is this month's offering.

Figure 1 is the overall approach. Before starting, however, I just want to say that there are simpler circuits available (such as direct two-transistor inverters) that will also do this job but if frequency accuracy is required, this approach will be more stable and predictable. Also, the circuit to be described is only rated at about 50 watts. For higher power applications, you will need an approach that is beyond the intention of this column this month.

The best way to convert low-voltage AC to high-voltage AC is—of course—with a transformer. Therefore, the first part of the task is to produce a low-level AC voltage drive signal from our DC source. For this, we will need an oscillator capable of producing a 50% duty cycle signal at either 50 or 60 Hz as required by the power line frequency at your location. Since the final step-up device will be a transformer, it is mandatory for proper operation that the average value of any voltage or current applied to the windings be symmetrical. Figure 2 is a schematic of a 555 astable circuit, modified to produce a very close to 50% square wave output that is suitable. We chose the 555 since it is inexpensive, easily available, and simple in operation. Unlike the common 555 astable circuit, you will note that in this case the RC timing components are driven by pin 3 rather than pin 7 as per the National Semiconductor LM/LMC555 data sheet. This causes the charging and discharging cycles to be the same and the output is therefore

*c/o CQ magazine

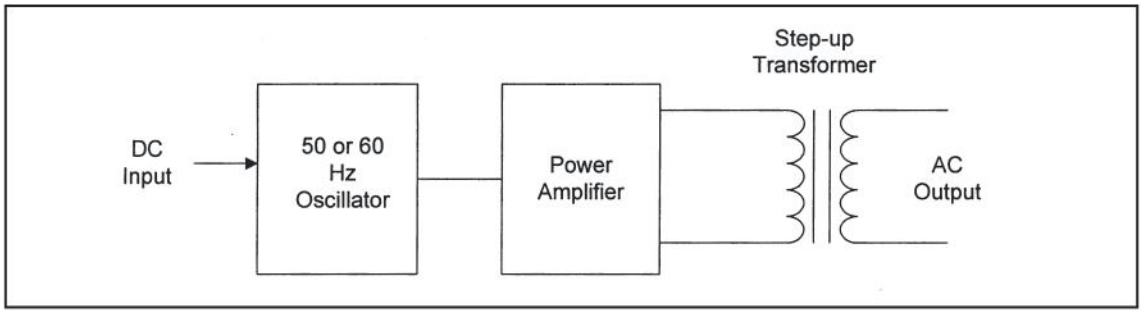


*Fig. 1. Basic DC to AC Inverter Scheme*

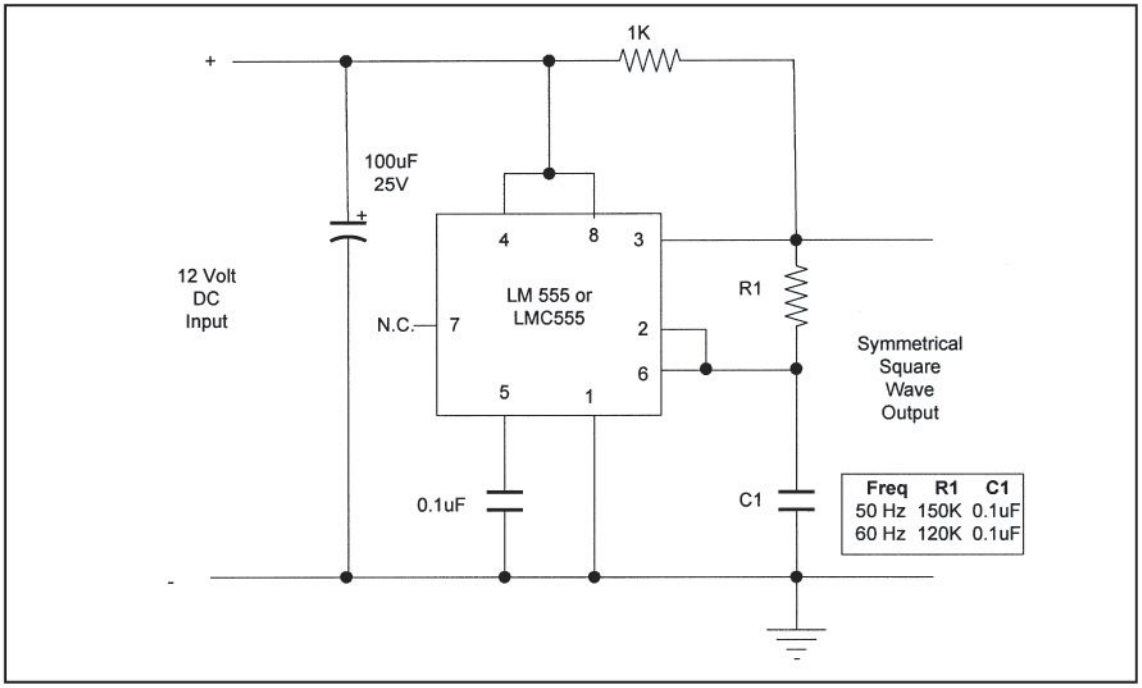


*Fig. 2. 50% Duty Cycle Oscillator using 555*

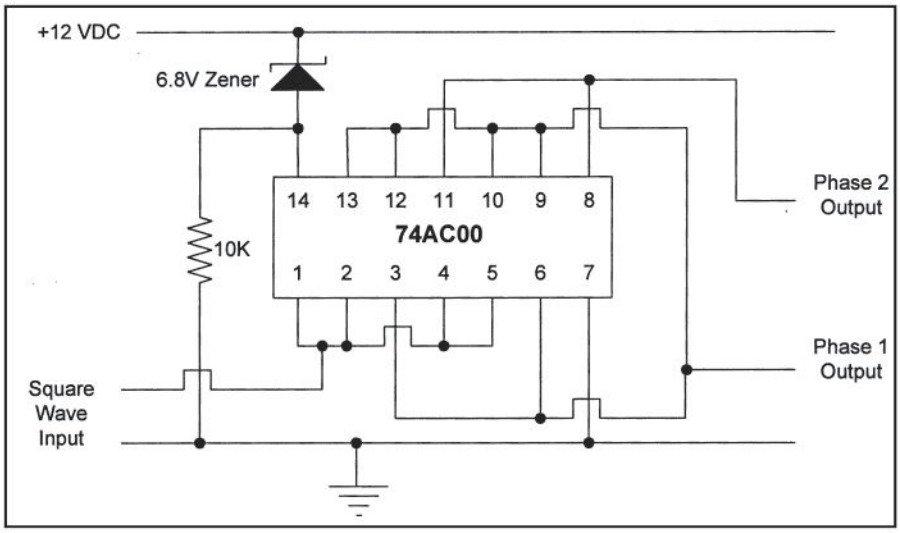


*Fig. 3. Phase splitter circuit*

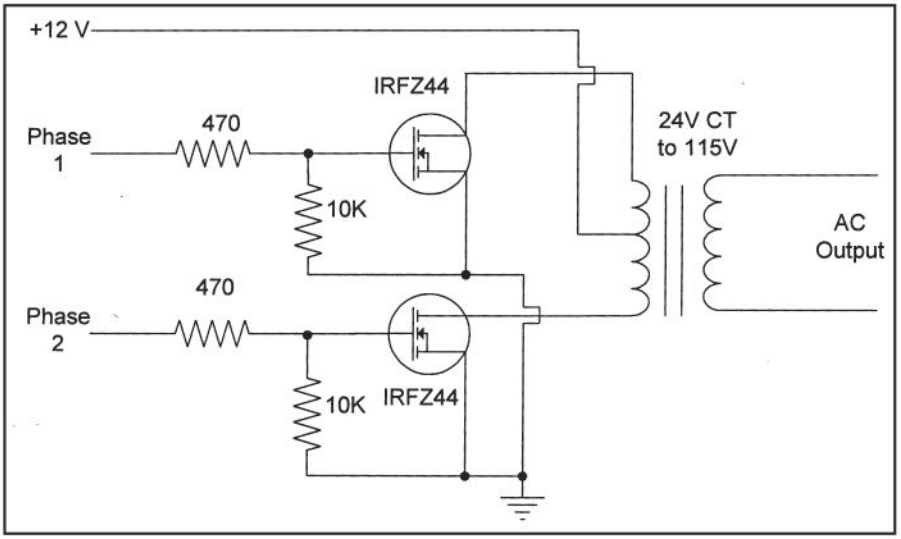


*Fig. 4. MOSFET output amplifier version*

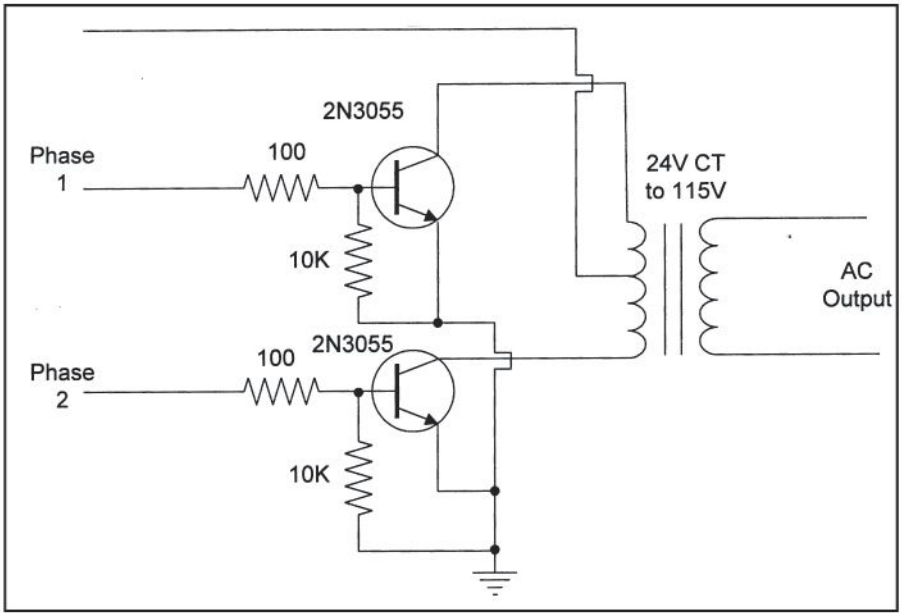


*Fig. 5. Bi-polar output amplifier version*

very nearly symmetrical. The values shown are close to 60 Hz (or 50Hz) and can be trimmed closer if required by adjusting the value of R1. By the way, the 1K resistor from pin 3 to the 12-V line is to assure that the output level is within the standard TTL levels (which is what the 7400 requires).

The output of the oscillator now has to be converted to a signal with two phases. One has to be "normal" and the other 180 degrees out of phase so that the amplifier can properly drive the output transformer. This is the function of Figure 3. Here we use a 7400 NAND gate with two of its gates in parallel and each pair of gates in series. When phase 1 is high, phase 2 will be low, and vice versa. The 7400 needs 5 V to operate and the 6.8-V Zener drops the 12-V input to about 5.2 V, which is within the acceptable range of the chip.

The two phases are then applied to the final amplifier shown in Figures 4 and 5. In Figure 4 we have chosen an International Rectifier IRFZ44 as it is inexpensive, easy to find and will easily handle the current required by the transformer. If you wish, you may use 2N3055 power transistors instead, and the slightly revised connections for these are shown in Figure 5. In both cases, however, the output devices will need to be mounted on a good heat sink and insulated from ground.

It should be noted that the output voltage and current will be a function of the transformer chosen. For moderate outputs, a 115/24 VAC (or 220/24 VAC) center-tapped transformer at 2 amps will provide about 50 W. For higher power, a higher current rating will be needed, along with better heat sinks, transistors etc. Such a design, while similar, is beyond the intention of this column this month as previously mentioned. All components are easy to obtain and not very expensive, so if you need an AC supply for use in the field, don't be afraid to experiment.

In conclusion, as I have already mentioned, there are simpler circuits available that will do this job but if frequency accuracy is required, this approach will be more stable. Also be aware that the output is not quite sinusoidal, so some equipment may not operate properly. You can always experiment with small values of capacitors across the windings (at the correct voltage) to try to shape up the output waveform to some degree if you wish. Again, this is experimental territory, so don't be afraid. Remember that the output is at 115 (or 220) volts, so be extra careful.

73, Irwin, WA2NDM

BY RICHARD FISHER,* KI6SN

# Amateur Radio Flexes Its EmComm Muscle With an 'Aloha!'

## *Hawaiian Hams Step In to Help Stranded Sailors and Assist NWS Meteorologists on Tropical Storm Watch*

Radio amateurs in Hawaii, northern California, and Micronesia became a communications lifeline for the two-man crew of a 53-foot sailboat that had run aground in a remote island group in the Pacific.

The French sailboat *C'est La Vie* was stranded in late July on a reef in western Chuuk Lagoon, near Polle Atoll—about 3,500 miles southwest of the Hawaiian Islands, Figure 1.

According to a report in the *Hawaii Tribune-Herald*, "the excitement began shortly after Big Island Amateur Radio Club member Richard Darling, AH7G, made contact with fellow club member John Bush, KH6DLK," who was in northern California "testing a radio antenna and system he has been working on for the past year and a half to provide emergency and support communications for communities in the Federated States of Micronesia."

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*Photo A. Dennis Lazar, W4DNN, clasps his Kenwood TH-F6A FM transceiver during a recent Summits On The Air adventure. He is often joined on wilderness operations by XYL Ruthie, K4KLQ. Lazar is a proponent of the mantra "keep it simple" when considering changes to the amateur radio Wilderness Protocol. (Courtesy of W4DNN)*

Bush told the paper the Chuuk Islands have "few modern communications options ... with even fewer lines of communication that reach farther than Guam."

Around 10 p.m., Darling and his wife, Barbara, NH7FY, heard a call for help from the *C'est La Vie* as they communicated on the system with friends in Micronesia and with Bush in California.

"(The sailors) said they had a hole and were taking on water and wanted some help," NH7FY told the *Tribune-Herald*. "We ended up calling the Coast Guard in Honolulu, and they relayed the info to Guam."

Bush said the Darlings, from their Hawaii location, heard the stranded sailboat's radio signal clearly and were able to copy the vessel's position, level of danger and other pertinent information, which was relayed to the radio amateurs in California and Micronesia.

Bush, too, passed the information on to the Coast Guard, which alerted local authorities in Chuuk. The hams helped the Coast Guard make direct contact with the *C'est La Vie*, as well.

According to the published report, the Coast Guard subsequently learned through the direct contact that "they were taking on water, but that they were doing well, and the apprehension level was low. They had a life raft and safety equipment." Chief Warrant Officer Gene Maestas said from Honolulu that the crew "also reported that they believed they could walk ashore on the reef, if necessary."

Bush said there are two people "we normally work with and take care of there in Yap (Micronesia) ... and, ironically, the day before (the distress call) they had just put their antenna in place, and that made the difference in everything working." (***IN DEPTH:*** *More about Yap, Micronesia at <http://bit.ly/162Mrj1>. – KI6SN.)*

"As for how the club members view their involvement in the rescue efforts, (Bush) said they were happy to help," the *Tribune-Herald* story reported.

"It's great to see how many people are willing to work very hard when there's a crisis of this sort," Bush said. "It makes you feel good that people will rally to save other people. I don't look at it as any kind of hero situation. It's just stuff that needs to be done and you do your best to make sure that in a situation like this, nobody dies."

Coast Guard authorities recommended that other radio amateurs "who may find themselves in a similar situation should remember to collect a few vital pieces of information, including the distressed vessel's location, including coordinates if

possible, the size and name of the vessel, as well as the status of the vessel, and whether there is any immediate threat to life."

*(**IN DEPTH:** Read the full Hawaii Tribune-Herald story at <http://bit.ly/17UUSBr>. – KI6SN.)*

## Hawaiian Amateurs Help NWS Track Tropical Storm 'Flossie'

As Tropical Storm "Flossie" pounded parts of Hawaii and Maui counties July 29-30 with heavy rain and lightning, amateur radio operators kept National Weather Service (NWS) meteorologists and local EOCs (emergency operations centers) up-to-the-minute on changing conditions and power outages.

According to published reports and the ARRL, radio amateurs organized a joint SKYWARN/ARES/RACES operation using eight VoIP and microwave-linked VHF and UHF repeaters from state and county RACES to serve NWS meteorologists, the Central Pacific Hurricane Center (CPHC), and state and county officials.

"Clem Jung, KH7HO, opened a SKYWARN net from the NWS Honolulu office ham station the evening of July 29 to establish an operational plan," an ARRL Internet posting reported. "The net reconvened the next morning on the AllStar Link repeater system and on 7.088 MHz. ARES and RACES members also participated."

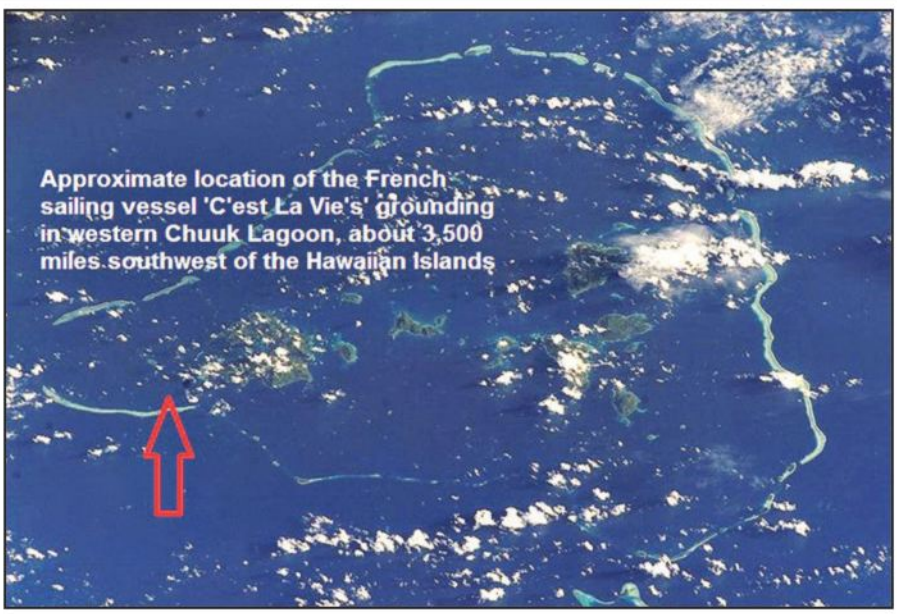


*Figure 1. (Courtesy of NASA via Wikimedia Commons)*

During 12 non-stop hours of operation, the net "recorded 67 check-ins and reports from hams in all four Hawaii counties. Net control stations received reports from throughout the state via amateur radio as well as by cell phones and even social media.

"All reports were shared with CPHC meteorologists. Harvey Monomura, AH6JA, and others on East Hawaii provided ground observations of rain and lightning conditions to supplement what

forecasters were seeing via radar and infrared satellite imaging. The state EOC and all four county EOCs monitored the SKYWARN reports. As the storm moved west, stations on Maui reported considerable lightning and rain, and even small hail, coupled with power outages. As the storm diminished, the CPHC gave the okay to close the SKYWARN net on July 30."

KH7JO said that the cooperation between the SKYWARN net control stations and the NWS was "fantastic ... This success was possible because emergency coordinators had worked previously with the amateur radio community that participated in this net."

## More Food for Thought: Wilderness Protocol 2.0

Dennis Lazar, W4DNN, writes from Port Charlotte, Florida that he has followed with interest *Public Service's* recent stories on ongoing discussions for updating the amateur radio wilderness emergency communications plan—now dubbed Wilderness Protocol 2.0—"as my XYL, Ruthie, K4KLQ, and I are avid hikers and SOTA (Summits On The Air) participants," Photo A.

Noting previous pieces in *Public Service*, Dennis said he especially likes KJ6VU's efforts to "to keep it simple!" ***(SEE:*** *KJ6VU: Electronic Design for an Emergency Signaling System," page 56 in September 2013's CQ. –KI6SN.)*

"The ideas concerning the use of LiTZ or keying in '911,' and so on, present one problem," W4DNN writes. "Some of the little HTs, like the new single-band Yaesus, the Wouxun, and other Chinese HTs have no keypad. I would suggest that a decoder be introduced at repeater sites that would respond to a PTT keyed SOS—*dididit dahdahdah dididit*—instead. Every ham knows this and many non-hams also remember this familiar combination. It is easily keyed by the PTT switch on even the most primitive HT and even by a minimally functioning injured person."

*(**BACKGROUND:** In April's Public Service, Mike Pulley, WB4ZKA, of Chandler, Arizona, suggested a sweeping simplification of the present VHF-UHF calling plan and a retool to include the increasingly popular Family Radio Service. **SEE:** "Time for a Change? Wilderness Protocol 2.0," April 2013 CQ, page 43. –KI6SN.)*

This national forum on possibly changing the Amateur Radio Wilderness Protocol remains very much in session. What are your thoughts?

We welcome all ideas and will continue bringing them to *CQ's* readership in upcoming installments of *Public Service*. Please send your feedback and recommendations to: <ki6sn@cq-amateur-radio.com>. Thank you! – ***KI6SN.***

## Florida Hams Give Kids a Hands-On Radio Demonstration

Florida's North Okaloosa Amateur Radio Club <http://w4aaz.org> gave young people the opportunity to find out more about amateur radio during a hands-on demonstration at the Crestview Public Library.

"My hobby is amateur radio," NOARC member Ron Mahn, KI5FR, told the *Crestview News-Bulletin*. "I love the opportunity to talk to people around the world."

Young people "had the opportunity to use the ham technology, which was one reason Andrew Moore, 12, showed up," the *News-Bulletin* story said. "'I wanted to come out here and listen to and talk into the radio,' he said."

The demonstration included a contact via amateur satellite. *(**WATCH and LISTEN:** To youngsters experiencing amateur*




*Photo B. As reported in the Crestview (Florida) News-Bulletin, Orlan Lasher, 7, gets assistance from North Okaloosa Amateur Radio Club member Ron Mahn, KI5FR, during a hands-on demonstration of ham radio at the Crestview Public Library. (Internet screen grab <http://bit.ly/15qaZqx>)*

*radio for the first time at Crestview Public Library at <http://bit.ly/17V5uQY>, Photo B. –KI6SN)*

## EmComm Training Conducted in Malaysia

Jim Linton, VK3PC, Chairman of IARU Region 3's Disaster Communications Committee, reports via *Southgate ARC News* that "a 'battery-power only' emergency communications exercise—based at Miri in Sarawak, Malaysia—tested message handling and disaster training in mid-September.

According to Johnny Tan, 9M8DB, of the Malaysian Amateur Radio Transmitters Society (MARTS), the event was led by Amateur Radio Club of Sarawak. Communication was conducted between remote sites and a local EOC.

"The suggested IARU Region 3 emergency center-of-activity frequencies on the 40-, 20-, and 15-meter bands (were) used, with appropriate training announcements," Linton reported. "The day-time test (managed) battery power, use of telephony, and PSK31," and measured the Near Vertical Incidence Skywave (NVIS) propagation on 40 meters, "while (trying) out west-east paths across the country on 20 and 15 meters."

9M8DB said evaluations would be made of the remote stations, examining their setups, antennas and "how orderly they operate."

## Amateurs in India Draw Plan to Address Emergencies

*The Hindu* reports members of the Krishna District Amateur Radio Society have prepared a plan to address calamities during India's rainy season.

Society members met in July "to discuss preparedness and other problems they were facing. 'If the government extended support for the voluntary operators, the society could render more service to the public during emergencies,' said Amateur Radio Society district secretary M. Venkateswara Rao," the paper reported.

*(**IN DEPTH:** Read the full "Hindu" news story at <http://bit.ly/1awXoOL>. –KI6SN.)*

## Stand Down . . .

*That's it for November's CQ Public Service. As you can see, there is a lot of EmComm activity in the amateur radio ranks, and we're eager to share your team's activities with CQ's readers. Keep us posted by dropping an email to <ki6sn@cq-amateurradio.com> and we'll take it from there. Until next month, 73 and good EmComm!*

***–Richard Fisher, KI6SN***

learning curve

BY RON OCHU, * KO0Z

# Choosing a Club

Recently, as I was doing some repair work on a friend's power supply sitting on my workbench, there wasn't much activity on the local repeater or on the HF bands, so I put on some background music and the lyrics from "The End" resonated with me.

*"And in the end*
*The love you take*
*Is equal to the love you make."*
*-The Beatles-*

Please forgive me for waxing nostalgic by opening this column with Beatles lyrics, but they are very apropos for this month's topic. These lyrics state that what you will get out of something equates to what you put into it. In my case, however, I've found that what I put into amateur radio equates to me getting even more out of it.

For almost all of us starting off in amateur radio, we can thank someone for assisting us with this wonderful hobby. For me, that helping hand ("Elmer" in ham radio parlance) turned out to be Rod Zerr, KA0MJI, Photo A. I met Rod years ago and he introduced me to the excitement of audio and radio frequencies. Since then, I have learned so much more. That was years ago and we are still close friends today.

Back when I was first licensed in the '70s, though, I was on my own for the most part. I operated CW (Morse code) on the HF bands and I loved every single moment of it. Rod was away at college, so for the most part I operated solo. Somehow, I learned through the world of trial and error, but an Elmer sure would have been nice. Back then, the Internet wasn't around and finding out if there were any nearby ham clubs around was a bit of a challenge. Today there are multiple ways of finding a club and we will look at that a little bit later in this column.

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

## Ham Clubs … Not One Size Fits All

Throughout the years, I've been a member of a number of clubs and I've found that each and every one has its own strengths and weaknesses. I suppose looking for a club is much like looking for a good doctor or dentist. The key is to find one that makes you feel welcome and comfortable. Every club has its own identity, just like you do, and it's important to find one that appeals to you. Keep in mind that each club has its movers and shakers and to a large extent these people will have a strong influence on the makeup of the club, but a club's greatest asset is its membership. Members determine the direction and activity level of any organization. Find a club that appeals to your interests and make sure it has an active membership.

## Where To Look

By far, word-of-mouth is the best way to find out about a ham radio club. Visiting your local library's public bulletin board is another option, or if you're lucky enough to live close to a ham radio store or other electronics emporium, check out their bulletin board or ask a staff member. Another option is to check out the ARRL's website for active, affiliated clubs at: <http://www.arrl.org>.

## What's The Next Step?

Check to see how many clubs there are in your area. Chances are there is more than one. Even here in rural central Illinois, there are three clubs

*Photo A: Ron Zerr, KA0MJI, surrounded by family and friends.*

*Photo B: Macoupin County ARC, K9MCE Field Day. Pictured left to right, seated: Mark Kerhlikar, WD9HBF; and Jeff Naville, KC9WZH. Standing, left to right: Walt Reeves, KB9ENT; and Garry Wnuk, AC9FF, on the air.*

*Photo C: K9MCE club members enjoying pizza before the monthly club meeting.*

all within 30 miles of me. Next, find out the meeting time and location for each, mark your calendar, and make plans to attend each one. Go to a few meetings to see how each club functions. See which club is a better fit for you. You may even find that you'll want to be a member of more than just one.

## What Should I Look For In A Club?

Of course, it is a matter of personal preference as to what you think a club should offer. As for me, I've tried to ascertain what characteristics make up a good club. Here are a few suggestions on what you may want to look for in a club:

**Friendliness** – Foremost among everything else, is the club friendly? Does everyone seem to get along or is it a conglomeration of cliques? Does the club have a committee to welcome visitors and do committee members make it a point to introduce you to other club members? Does the club encourage newbies to visit club functions such as Field Day, Photo B; parties; special event stations; dinners; etc., Photo C. Is there a sense of inclusion among all of the club members?

**Repeaters** – A focal point for many clubs is the repeater (or repeaters) maintained by the club. A repeater serves as a radio version of a "coffee house" for club members to congregate on the air and to just keep in touch while on their daily commutes, chit-chatting with hams passing through the area, or

*Photo D: St. Charles ARC members Gordon Denno, AH6DA, and Dave Collins, KC6YNC, along with other club members enjoying a club picnic.*

*Photo E: National Weather Service meteorologists Ron Przbylinski, KC0WWE; and Jim Kramper, N0LSX, chatting with Dave Kampmann, WS0Z, at Winterfest.*

a resource for getting technical assistance with a problem. More importantly, the club repeater may be a vital link in passing emergency traffic during severe weather events or other types of disasters.

**Club Nets** — Does your prospective club have its own net? A net is a ham radio term for a group of hams meeting on a particular frequency at a particular time for the purpose of sharing club information in an organized fashion. For example, there will be a designated net control operator who will ask for check-ins and then net control will then acknowledge the check-ins and proceed with the club net agenda. Club business may be nothing more than just checking-in and telling everyone on frequency what is new in your life, or it can be something more structured as to how to pass formal message traffic in the event of a local disaster. Is the net on a VHF-UHF repeater? Maybe the club also operates a 10-meter net. Nets are important because they offer an avenue for club members to use their radios and to also be more active in their club.

**Newsletter/Website** — A club newsletter is as important as a local net. It, too, provides an outlet for club exposure in the ham radio community as well as providing club members and the community with timely, topical, relevant club information. It can also allow club members to get, as Andy Warhol put it, their 15 minutes of fame.

A nice way to do so would be to include a brief biography of a club member along with a few pictures each month. Sure it's a bit more work, but the positive side-effects are well worth the effort. A good club newsletter should report on club activities by including pictures, but never at the expense of good reporting. Although a picture may be worth a thousand words, it is still important to include those words. There is no substitute for the words written by someone participating in the club activity. For example, perhaps your club has an annual picnic, Photo D. This is a perfect opportunity for someone to give back to the hobby by writing a few paragraphs on what went on at the picnic, who showed up, etc. All too often, club newsletters contain "borrowed" information from other newsletters, which isn't bad, but there is no substitute for having someone within the club report on what actually happened. That action alone can make the difference in the quality of the club's newsletter. Along with the club newsletter does the club have a website that is organized and updated on a regular basis?

**Skywarn/ARES** — Check to see if the club you are interested in joining is active with the National Weather Service's (NWS) Skywarn program. This is a fantastic opportunity to learn more about weather by attending an NWS storm spotting course and it provides a tremendous public service to not only the local NWS meteorologists, but to the surrounding community as well, Photo E. Along with Skywarn, the club may also be active in the ARRL's Amateur Radio Emergency Service (ARES). Generally, ARES is county-wide organization working in conjunction with the county emergency management director so there may be more than one club involved and that is of tremendous benefit to county residents, Photo F. The training that you'll receive in both of these programs is invaluable and it will generate lifelong friendships while serving your community at the same time.

**License Classes & Testing** – Another big feature to look for is whether the club offers license classes for the Technician, General, and Extra Class licenses? Dynamic and active clubs offer periodic classes throughout the year for the various license classes, as well as VE (Volunteer Examiner) testing on a regular basis, Photo G.

Besides getting new hams licensed, offering classes and exams is a tremendous recruiting tool for new club members and it is another outstanding community outreach service. The thing to keep in mind is that it is not only important to get newcomers licensed, but for

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*Photo F: Assistant Emergency Coordinator Gary Hoffman, KB0H, discussing emergency communications with Linda Liston, NØSQF; and Jon Liston, NØLPC.*

*Photo G: ARRL VE Rick Crockett, WØPC, helping some examinees with their FCC Form 605.*

the club to be there for the newly licensed ham after the exam, which brings us to the next vitally important club function.

**Elmering** – Once the newcomer is licensed, then what? For many folks, getting on the air solo is a difficult proposition. Research indicates that public speaking is one of the highest-ranking fears among people. It is right up there with death itself. Although ham radio offers the security of some privacy in a room or car, it is nonetheless still stressful at first. Besides "mic fright," there is also the concern of what to say and how to say it, and questions about what your first radio and antenna should be. All of these beginner concerns can be greatly alleviated by a club that offers mentoring. The collective experience of a club's membership has to be one of its greatest assets and it needs to be shared.

Once on the air, how can the new ham further increase any communicative and technical skill? The same question applied to more experienced hams starting out in a new activity. In my area, a club that greatly assisted me with getting on 10 GHz is the St. Louis Area Microwave Society, or SLAMS. It is an informal club made up of some highly-skilled hams who do a great job assisting anyone with a genuine interest to learn more about microwave construction and experimentation, Photo H, by providing guidance, equipment and instruction.

**Programs** – Along with a club business meeting, you should check to see if the club you are interested in offers monthly programs. The ham radio hobby has so much to offer that it is impossible not to come up with a monthly topic. It's great to have nearby ham radio celebrities such as big gun contesters and DXers, or other ham radio celebrities. I can't tout the dedication of Bob Heil, K9EID, enough. I don't think Bob can even count the number of programs that he's given throughout the years. I've never seen his interest in ham radio wane. Today, Bob's time is more limited. However, with advance notice and a bit of creative scheduling, he is willing to put on a virtual club program over Skype.

*Photo H: A few of the St. Louis Area Microwave Society (SLAMS) members gathering at the St. Charles County ARC hamfest. Pictured from left to right: Rich Robertson, NØPQU; Jim Richardson, N5MU; John Germanos, WB9PNU; and Herbert Ullmann, AF4JF.*

Of course these celebrities are awesome, but there is also a tremendous amount of talent within any club that is all too often overlooked. Often, all it takes is someone to just ask a club member to make a presentation. Presentations don't have to be commercial quality, and often, a brief show-and-tell combined with a simple question and answer session is all that it takes to have a great program.

Programs can be just about anything, For example, in the Macoupin County Amateur Radio Club, one of our club members, Garry Wnuk, AC9FF, is a

retired electrician. Recently, he gave an outstanding presentation on properly grounding the shack, Photo I. I'm here to tell you that this old ham learned a thing or two from Garry.

Other program possibilities: What modes are club members operating and how does one get on that mode? What's the EmComm community doing? Is a beam better than a vertical? Or you can go outside the club, possibly inviting the town alderman to talk about CC&Rs (antenna restrictions).

In my opinion, not enough can be said about offering programs. Although club business is necessary and it shouldn't be ignored, it needs to be kept in mind that not many hams got into the hobby to discuss business. Instead, they joined to find out more about the technical and operating aspects of this hobby and a club owes it to its membership to nurture along those interests so that both the club and its members grow together.

## Anything Else To Look For?

So far, I've covered what I consider to be the "biggies" in what to look for in a club. Now if the club is extra special and it is really on the ball, then most likely I think that it will be offering these additional membership benefits as well:

**Training And Equipment Loans** – If the club income allows for it, then it would be great if a club could loan various ham radio equipment to members. For example, does the club have any extra dual band and or HF radios that it could loan out to its membership for a limited time? (Perhaps a member upgrading to a new radio could donate his/her old one for this purpose.)

How about some test gear like an antenna analyzer, or a climbing harness, or gin pole? Members are always working on antennas and what better way to increase membership then to loan a piece of test gear out to members (along with the caveat that if you break it, then you're responsible)? Of course, it would also make for a great program to explain how to properly use this gear, such as an antenna analyzer.

**Hamfest/Swapfests** – Another good sign of an active ham radio club is a club's sponsoring of a hamfest/swapfest. It takes a lot of work to put on one of these events and inexpensive venues in which to hold them are becoming increasingly sparse. A hamfest/swapfest is usually a big event in a club's calendar and a variation on an adage of many hams makes for light work comes into play here, Photo J. This is a fabulous opportunity to learn more

## *Looking Ahead in*

Here are some of the articles we're working on for upcoming issues of ***CQ***:

***Technology Special in December:***

* Antenna Modeling Software: A Look Under the Hood
* Inexpensive 4-Wire Measurements for the Radio Amateur
* Updating a Boatanchor: DDS-VFO Version 2.0
* Gearing Up for "The Pulse"

***Upcoming Special Issues***

February: QRP
June: Take it to the Field
October: Emergency Communications

Do you have a ham radio story to tell? Something for one of our specials? See our writers' guidelines on the CQ website at <http://www.cq-amateur-radio. com/guide.html>

*Photo I: Retired electrician Garry Wnuk, AC9FF, presenting on the proper way to ground the shack at a Macoupin County ARC club meeting.*


*Photo J: Just a few of the hams looking at the wares at the Winterfest hamfest, sponsored by the St. Louis and Suburban Amateur Radio Club (SLSRC).*

about organizing and to give back to the ham radio community. In general, hamfests/swapfests, along with membership dues, provide a major source of club income to assist with repeater maintenance, equipment loans, etc.

**School Club Sponsorship** – In my opinion, if the club is really on the ball and looking to make a big difference in the ham radio community, then it will make it a point to reach out to the local schools and offer ways to assist teachers with incorporating ham radio into the school's curriculum. This activity is called STEM—Science, Technology, Engineering and Math—and schools are often looking for fun, innovative ways to get their students involved with meaningful hands-on activities that enhance STEM skills rather than just doing rote exercises. Ham radio is a perfect choice!

Amateur Radio on the International Space Station [(ARISS) <http://www.arrl.org/amateur-radio-on-the-international-space-station>] is a great way to assist a local school with STEM. ARISS is high profile, but there are other interesting ways to involve ham radio in the classroom. Mark Spencer, WA8SME, is highly involved with STEM in the classroom and he has a plethora of ideas on how clubs can become more involved with local school districts. (Use your favorite search engine to look him up, but be sure to include his callsign.)

## In Conclusion

We've covered a lot of aspects of what to look for in a good club. I haven't given an all-inclusive list and by no means is it complete. Likewise, not every club has to incorporate each and every one of the categories that I've listed in order to be considered "good." I suppose looking for a club is somewhat akin to shopping for a good car. There's no substitute for going to the showroom and taking one out one for a spin. It's the same with a club.

Go to a few meetings and check out the club's activities and find the one(s) that are right for you. Just remember that when you do find that club, please do yourself a big favor and don't be afraid to get involved. For the more you get involved, the more you will learn and the more enjoyable ham radio will become. The Beatles are right, for the love you take does equate to the love you make!

73 and GL, Ron, KOØZ

# The Weekend Wonder — A High Performance 10-GHz Transverter System

BY WAYNE YOSHIDA,* KH6WZ

This is a follow-up to my article on adapting rigs for transverter use (July 2013 *CQ*), and is adapted from an article I wrote for the Fall 2007 issue of *CQ VHF*. Once you have a suitable 28-, 144-, or 440-MHz transceiver prepared for IF use, the next step is to get the "business end" unit for higher frequency operation—the transverter.

Here is the story of a microwave radio challenge: To get another X-band transverter built quickly for a fellow club member who's been procrastinating for over a year about getting on the 10-GHz band. The solution: Get in there and help him build it.

This project began as a challenge to see how quickly a 10-GHz transverter could be built using readily-available components and surplus modules. All one needs are the "ingredients" for the system, some free time to build, some knowledge of how the modules connect together, and a good technical friend with test equipment for the microwave bands. This last ingredient is probably the most important, since the ability to test the unit (as well as surplus parts) requires some specialized gear. Fortunately, I have access to such a resource: my fellow San Bernardino Microwave Society (SBMS) club member, Dave Glawson, WA6CGR. Other microwave-specialty clubs have their cadre of experts, and most of them are willing to help others.

The box of parts can be seen in Figure 1. This box includes a 1-W, solid-state power amplifier (SSPA), all tuned up and tested for use at 10.368 GHz. The amateur radio X-band scene is changing rapidly, since parts are becoming easier to acquire, and the challenge is moving from "where do we get parts?" to "where do we find the time to build a system?"

An enhanced, "competition class," 10-GHz rig would include a receiver pre-amplifier (low-noise

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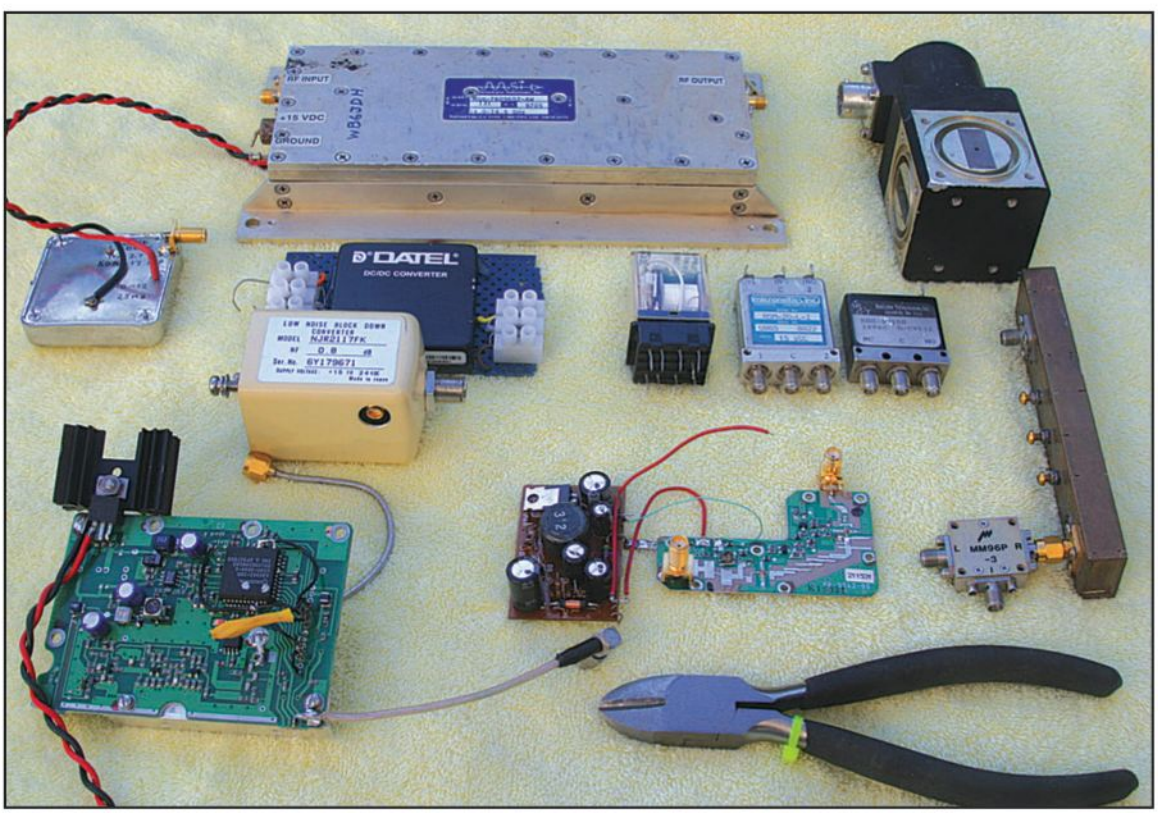


*Figure 1. A box of ingredients needed to form a complete 10-GHz transverter. Available surplus is changing, and the new challenge is moving from "where to get parts" to "where to find the time to build it." See text.*


*Figure 2. Surplus material and previously exotic parts like microwave mixers are easier to obtain these days. This X-Band system has a receiver noise figure of 0.7 dB, with transmit power of 900 mW measured at the antenna port. An 18-inch reflector is attached to the front of the chassis box with machine screws.*

amplifier, or LNA), a 2-foot (or larger) dish antenna and a power amplifier putting out a full 1W (30 dBm) or more.

The rig described in this article is such a unit with a receiver noise figure of less than 1 dB, and about 23-dB conversion gain. Nine hundred milliwatts at 10,368 MHz appears at the antenna port. See Figure 2.

## It's a New X-Band World

Back in 1993, Zack Lau, KH6CP (now W1VT), ran a two-part article in *QST* magazine[1] about building a 10-GHz transverter from "scratch." Zack's project simplified parts procurement by eliminating surplus "brick" oscillators and exotic surplus, and the bill of materials called for off-the-shelf components.

As mentioned, today's surplus availability has changed radically with online auctions and other resources, including fellow club members with access to some fairly complex components, such as waveguide relays and mixers. One of the biggest "boosters" on the 10-GHz ham radio front is the availability of QualComm modules, sub-assemblies, and modification instructions for hams. I have seen surplus QualComm units and systems for sale at local swap meets and online auctions for very good prices. For example, I recently saw a complete QualComm OmniTRACS® system on eBay with a starting bid of $10. Certain modules in this system are extremely useful for the microwave experimenter.

If you are lucky enough to find these useful QualComm units, please remember to heed the warning about *not contacting QualComm with any inquiries*. You must contact the ham community (San Diego Microwave Group in particular[2]) for information on these units.

In addition, commercial microwave companies catering to hams, such as Down East Microwave (DEMI), and the DB6NT units available from Kuhne Electronic and SSB Electronic, provide kits, pre-built transverters and other useful modules such as local oscillators for the microwave bands. These "store-bought" products can greatly simplify the path to getting on the microwave bands successfully, with proven designs and technical support.

## Building Blocks and Component Notes

Figure 3 is a simplified block diagram of the rig, based on the box of ingredients. Since we are dealing with surplus material, it is best to describe the needed circuits in terms of functional "building blocks" rather than referring to specific manufacturers or part numbers. In essence, this rig is made with a local

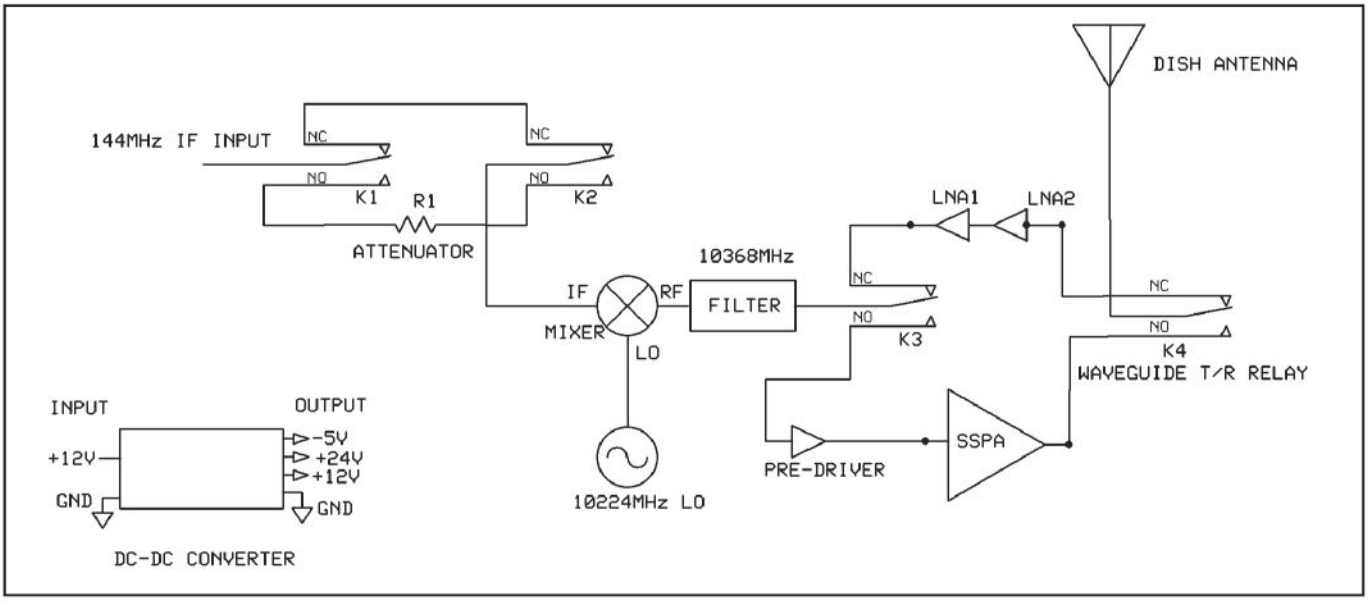


*Figure 3. A simplified block diagram of an X-Band transverter using a 144-MHz IF.*

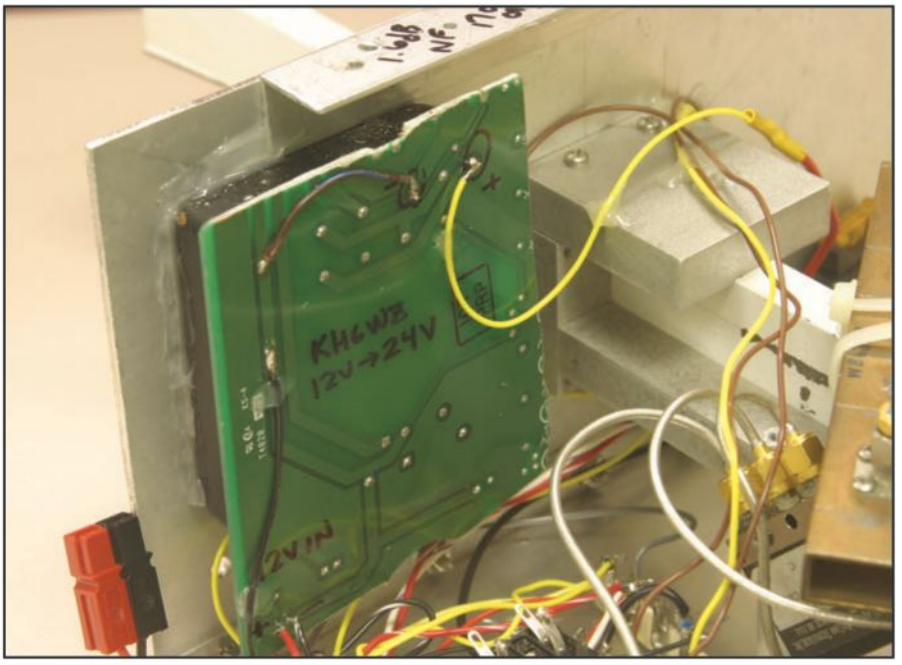


*Figure 4. A surplus DC-DC converter makes minus and plus 12V as well as 5V from a single 12-V DC input. The minus 12V and plus 12V outputs are connected together to make +24V, used to drive the SMA relays.*

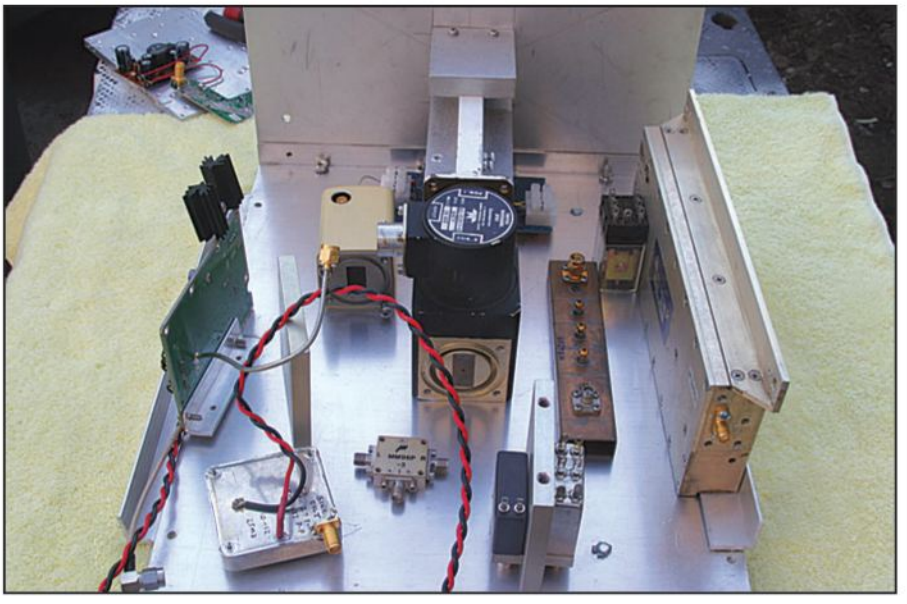

*Figure 5. The chassis layout is driven by keeping the RF paths as short as possible. DC and control circuits are not as critical, so those modules can be mounted wherever they can fit.*

oscillator running at 10,224 MHz, a mixer, a 10,368-MHz waveguide filter, a 144-MHz IF unit (2-meter, all-mode transceiver) and relays.

The local oscillator is the main ingredient, and can be created in several ways. For example, assuming an IF of 144 MHz, the local oscillator frequency is 10,224 MHz (10,224 + 144 = 10,368). The LO frequency can be generated using a modified surplus "brick oscillator"[3] running at 10,224 MHz, or a 2,556-MHz synthesizer and a quadrupler (x4 multiplier) working together to generate the 10,224 MHz. Another LO option is the 10,224-MHz DEMI Microwave Transverter Local Oscillator (MICRO-LO), available in kit or assembled form. Other LO units are available from other suppliers. Take a look at the places listed in the "Sources of Supply" section for more information.

Power supplies for the various modules can be rather cumbersome

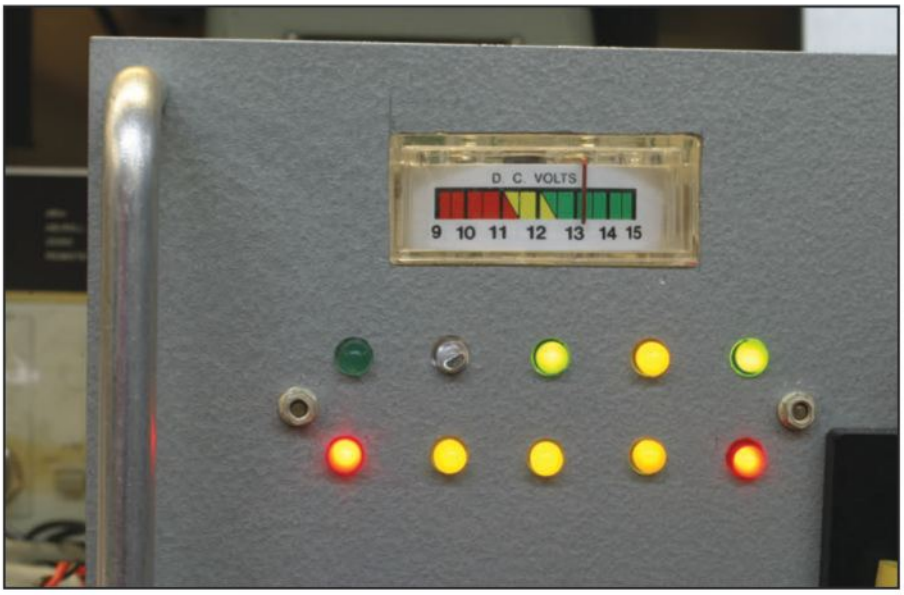


*Figure 6. The "status panel" helps diagnose simple failures, especially useful in the field. The LEDs indicate voltage is present at the various modules. The top row indicators are for receive and "always-on" functions, such as PLL Unlock (a high-brightness red LED, turns on when the PLL is unlocked) and 5V (used for bias power on the amplifier and receiver pre-amp). The bottom row LEDs are the transmit function indicators, such as relay actuation and SSPA-on.*

because the various modules and sub-assemblies require different voltages. For example, the rig shown in this article requires +12V DC, -5V DC and +24V DC, and these voltages must be derived from the automotive 12-V DC (nominal 13.8V DC) system. Scour the surplus suppliers mentioned in the *references* section to find suitable power supply components or assemblies. For example, the -5V DC-DC converter can be found on the surplus market for less than a dollar. The relay voltage converter (12V to 24V) can be bought or built, and there are many circuits documented for this purpose[4]. In this rig, I used a surplus DC-DC converter module scrounged from a computer power supply. The unit takes 9- to 15-V DC in, and puts out +12V, -12V and +5V. Since the voltages are isolated, one can take the two 12-V output voltages and connect the module so that the voltages are placed in series, making +24V DC to drive the relay coils. See Figure 4.

Of course, an AC-operated power supply can simplify the power requirements, but then you may be limited to non-roving operation, unless you have a source of AC power from a generator or other 110-V AC mains electricity.

## Always More than One

When buying surplus material, my practice is to always purchase more than one, since the item may not be available later, if (or when) it comes time to repair the unit. My rule is generally, "One to use, one to lose, and one for spares." Another good reason to buy more than one of the item is its "barter potential." Trading surplus modules from your junk-box for a desired item from another ham is an ancient tradition on which many microwave project builders rely. It is also good practice to test your components as soon as possible, or at least before you install them into your project. Pre-testing parts and modules as you build increases your chance of success at first "power-up," and eliminates the need to guess whether the completed project will work.

## Building Begins

Like any other electronic project, chassis layout and metal-working (Figure 5) are the next steps. Place the various modules on the chassis so that the shortest RF paths are taken between modules. The DC components, such as the 12-V to 24-V converter, can be moved to the farthest areas in the chassis, because lead lengths will not have as much impact on system performance as they will with the local oscillator or the frequency multiplier circuits.

After you figure out where to put the various modules, it is time to work the chassis, drilling and tapping holes as needed. This "mechanical assembly" includes the routing of any waveguide pieces, since this "plumbing" will mostly be determined by the fittings you have on-hand. This is similar to fixing a water heater in your home, but you have only a limited supply of pipes and fittings to use and you have to work with what you've got.

When the modules and sub-assemblies are securely mounted, DC power and control connections are done next. This allows DC and ohmmeter testing to verify that each individual module works before proceeding. When the DC checks are complete, I continue with the RF wiring.

One of the features I like to include in my projects is a set of "status lights" or "reassurance indicators." These are various LEDs that light up (or not) to verify presence of voltage, as a way to help diagnose a problem in the system (see Figure 6). In addition, I have LED indicators on each relay when projects have more than one relay in the system. I first thought that it would be easy to tell if a specific relay has actually actuated, by sound or by feel, but this is not the case. It makes more sense to use some other indicator for a better feeling of "reassurance."

## The 'Ups and Downs'

Be prepared for setbacks and delays while you are building any project using surplus (including "new-old stock") items. For example, it turned out that the mixer I originally had in the box of parts worked … but not work on X-band. Fortunately, my good friend Dave, WA6CGR, had a selection of mixers to try. Although all of the mixers tested

### Sources of Supply

*Down East Microwave*: Kits and factory-assembled transverters and other accessories for the microwave ham: <http://www.downeastmicrowave.com>

*JWM Engineering Group*: Phase-locked oscillators and sequencers: <http://jwmeng.com>

*Kuhne Electronic*: Michael Kuhne, DB6NT, has a variety of kits and assembled units for the microwave experimenter: <http://www.kuhne-electronic.de>

*SSB Electronic* supplies kits and assembled units as well as other accessories and items for the microwave experimenter: <http://www.ssbusa.com>

Tony Long, KC6QHP, of *Reactance Labs*, has some great frequency synthesizers in kit form: <http://reactancelabs.com>

"good" and some of them are in pristine cosmetic condition, only three worked on 10 GHz, and all of them had varying levels of performance. This is another reason to buy more than one item when surplus devices are available.

## The Fun Part

Once the project is complete, it is time to take it out and perform some field-testing. Notice the transverter system has lots of lights, but not many switches or controls. This is done to streamline set-up time and to minimize things to lose or to break. For example, there is no main power switch, because the power cable can control the power, and eliminates a switch that can fail.

I hope these hints inspire more people to get on the microwave bands. A rig for 10 GHz is a good place to start, due to the propagation characteristics, the two-part 10-GHz and Up Contest (each August and September), and the availability of microwave parts, kits and assembled units available to today's experimenters. Experienced microwave hams are generally a helpful lot, since every new station on the air means more points in the next contest!

73, Wayne, KH6WZ

### References/Notes


1- Lau, Zack, KH6CP, "Home-Brewing a 10- GHz SSB/CW Transverter, Part 1, *QST*, May 1993, pages 21-28

Lau, Zack, KH6CP, "Home-Brewing a 10-GHz SSB/CW Transverter, Part 2, *QST*, June 1993, pages 29-31.

2- More information on QualComm surplus is posted on the San Diego Microwave Group projects page, on the San Bernardino Microwave Society (SBMS) website: <http://www.ham-radio.com/sbms>

3- Search eBay for surplus brick oscillators, there are many suppliers for this component. One excellent source is an eBay seller called "PyroJoseph" in Florida.

4- Jim Klitzing, W6PQL, has a very good circuit for converting 12V to 28V for relays using an LM2585. His website is located at: <http://www.w6pql.com>

In the U.K. publication for microwave enthusiasts, two circuits were described to get 24V from 12V. One circuit uses a transistor and a capacitor, and the other circuit uses a 7662 IC and a capacitor. See *Scatterpoint* for September 2004, page 10.

Vicor Corporation, in Andover, MA USA, makes a variety of 12-V in, 24-V out DC-DC converters that appear on the surplus market. Typical part numbers are VI-203-CX and VI-303-CY. They also have a good library of application notes and other power supply data. Go to <http://www.vicr.com>

Dave Glawson, WA6CGR, "A Complete X-Band SSB Portable Communications System," *Proceedings of Microwave Update 1991*, published by ARRL; also online at <http://www.ham-radio.com/wa6cgr/X-Band.pdf>

In Dave's article, a DC-DC converter uses an LM383 audio amplifier chip and three-terminal regulators to convert 12-V DC to various other voltages. With suitable component adjustments, other voltages can be made from Dave's circuit.

Glawson has another DC-DC converter for powering microwave projects from 12-V DC. The circuit is based on an LTC1070 switching regulator and three-terminal regulators to make +28V, -20V, +15V and -5V. Go to <http://www.ham-radio.com/wa6cgr/ps.html>

BY JOE EISENBERG,* KØNEB

# Kit Projects: Not Just For CW Fans

A majority of the kits available to hams lately are designed for receiving and transmitting CW. But, a growing number of great kits are starting to appear that operate in the SSB mode.

## Hendricks Two-Tone Generator Kit

When building an SSB kit, a helpful item to have is a two-tone audio generator. A simple and inexpensive two-tone generator kit is now available from Hendricks Kits. This kit has simple parts and is very straightforward in construction (Photo A). This handy gadget allows you to test the performance of your SSB transmitter and check for distortion. You can even check to be sure the microphone you have selected for your SSB rig works as well. The generator has two different outputs, one for direct connection to the microphone audio input of your transmitter, and another for driving a speaker to test your mic. The two tones have been chosen to test both the lower end and the higher end of the audio spectrum that is carried by your SSB transmitter and not be harmonically related in order to prevent mix products from interfering with the testing process.

Allow an hour or so to put this kit together and once completed, you will be ready to build an SSB kit. Alignment of the Hendricks Two Tone Generator is quite easy, requiring no tuning tools. However, an oscilloscope and a frequency counter are necessary to be sure that the levels of the two tones are identical and they are on the correct frequency needed to perform an accurate two-tone test (Photo B). In this kit, the tones are supposed to be set at 700 Hz and 1900 Hz. (If you don't have these tools, ask around at your local club.)

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

The board supplied with this kit (Photo C) is double-sided and plated through, and is pre-tinned for easy soldering. The board is also silk-screened with the parts layout clearly marked. Construction of this kit begins with the four diodes. Be sure to watch the orientation of the cathode stripes when installing them. The resistors and capacitors follow, along with the IC socket, jacks, and pots. The board comes with rubber feet to support it over any metallic surface, but I recommend finding something to mount it on. The mount can be as simple as a small sheet of Plexiglas so you can be sure it is insulated underneath to prevent shorts from damaging the circuit. Mounting it in a case is a bit difficult as you will need to be able to access the top-mounted controls and switches. A flat piece of plastic with standoffs will work best for a mounting surface.

The Hendricks Two Tone Generator kit is powered by one 9-V battery, so be sure to have one on hand when beginning construction, as well as a speaker to hear its output when finished. The output is a standard 1/8-inch stereo jack, so be sure your speaker has a 1/8-inch stereo plug for it to work properly. You will need to connect to either the ring or the tip, but *do not use a 1/8-inch mono plug* as that will short out the output. Likewise, you will need to make an adapter cable with a 1/8-inch stereo plug on the generator side of the cable with the signal taken from either the ring or the tip of the 1/8-inch plug and the required plug on the radio end to connect the output of the Two Tone Generator to your microphone input. Keep in mind that you will also need some means to close the PTT line on your transmitter when testing it, and be sure to use an adequate dummy load on the output of your transmitter to prevent any unwanted signals from going out on the air or any damage to your transmitter's output stages due to improper SWR. Using a good receiver near-

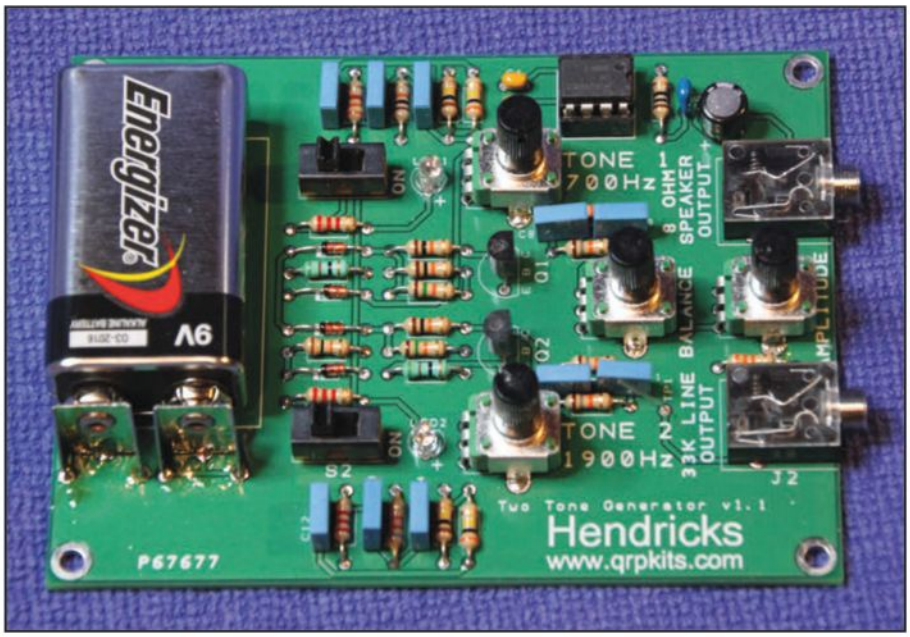
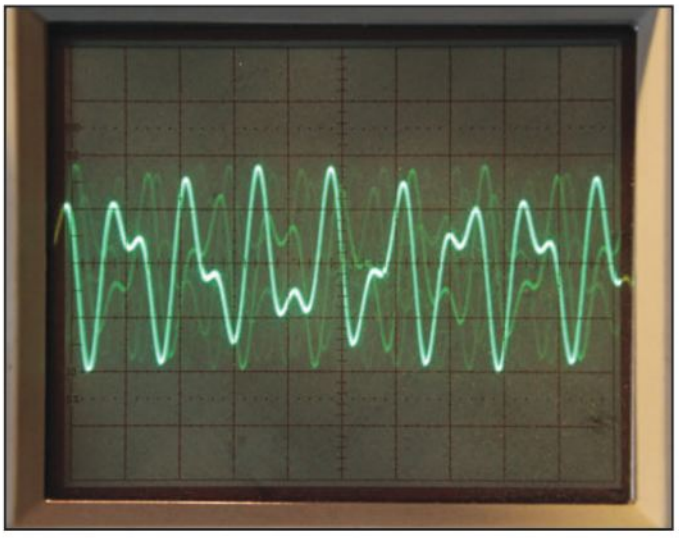



*Photo A. Completed Hendricks Two Tone Generator ready for alignment.*

*Photo B. Oscilloscope view of generator waveforms during alignment.*



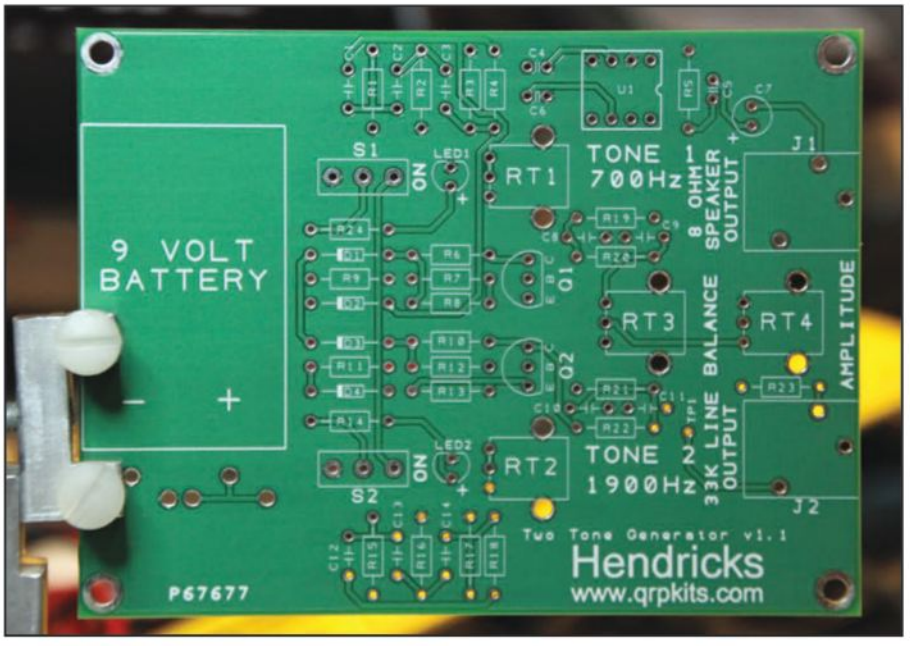



*Photo C. The Hendricks Two Tone Generator board ready to be filled.*

by will let you hear the signal created by your transmitter with the Two Tone Generator. The Two Tone Generator kit is available for $40 from Hendricks kits at <http://www.qrpkits.com>.

## Build Your Own Mic

When you build an SSB transceiver kit, another thing you might need is a microphone. Hendricks Kits also produces a very simple condenser mic kit. This kit lets you construct a hand-held condenser mic with built-in PTT. This kit has a small number of parts (Photo D) and goes together in less than an hour. When you build the condenser mic kit, you will also need a drill to drill the two required 3/16-inch holes as well as some super glue and a single cotton ball.

The board in this kit is very well marked for such a tiny board, and even has etched markings on the underside. The main thing to remember when mounting the parts to the board (Photo E) is to make sure the mic element is polarized correctly. That assures that the correct polarity is supplied to the mic to operate correctly. It is advised to follow the suggestion that a cotton ball be stuffed into the bottom of the mic to create the best possible audio quality and frequency response. I also used super glue to secure the end caps on both sides of the PVC tube that forms the case for the mic (Photo F). Be sure you test your mic before gluing the end caps on. I wired mine with the tip of the 1/8-inch plug being PTT and the mic audio going to the ring to properly interface

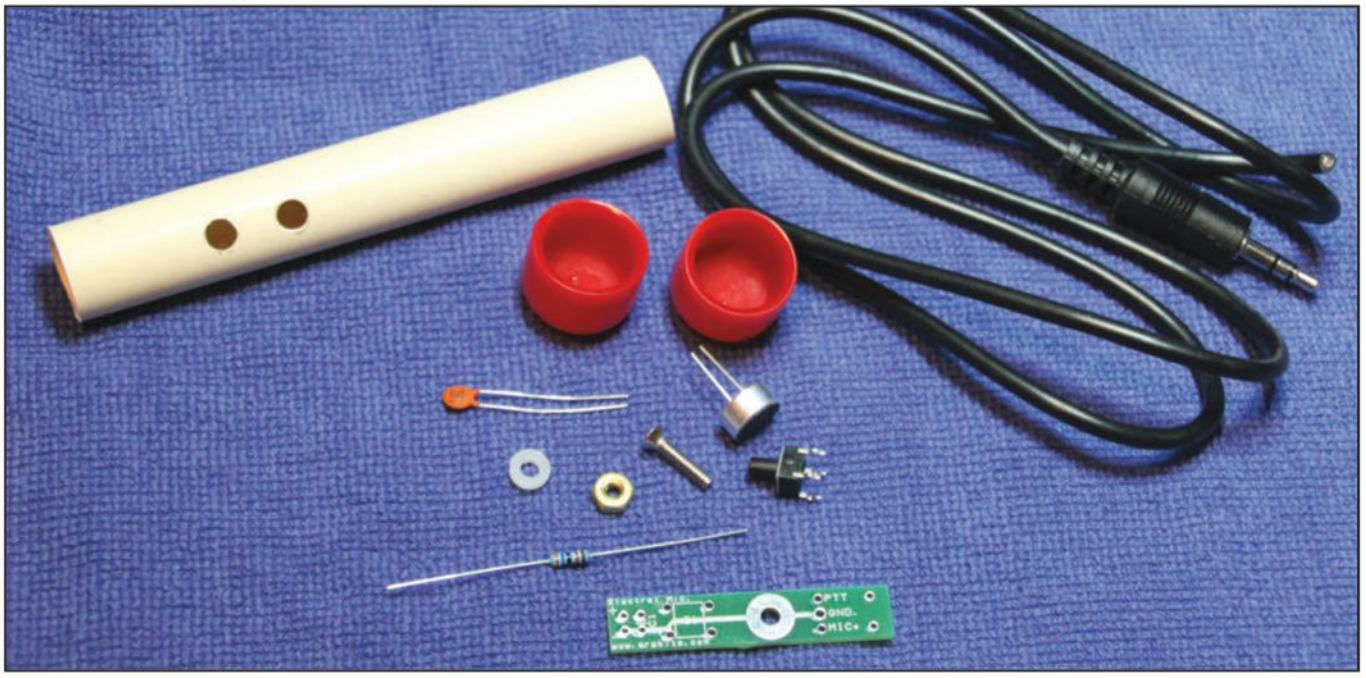



*Photo D. All of the parts for the Condenser Mic Kit ready to be put together.*

with the KD1JV 75-Meter "Survivor" transceiver kit. The Condenser Mic kit sells for $15, again from Hendricks Kits.

## Survivor … 75

The KD1JV 75M Survivor is a 10-watt PEP SSB/5W CW transceiver kit that covers about 350 kHz of the 75-meter band, and a fine tuning control to better tune in signals. Also available from Hendricks Kits, this kit sells for $100 including the case, which is already punched and drilled. You can add the mic kit and the digital dial kit options for another $40 when purchasing the transceiver kit. Next month, we will go into more detail about this fun kit.

## Soldering Together to Stay Warm

Finally, with the cold weather months upon us, it is time to look at the fun of doing a group kit-build. Getting your club together and building kits is a great way to exchange ideas and have lots of help available for less-experienced builders. You can have an event where everyone is building the same kit at the same time, or you can have each member bring along his/her current project and let everybody share ideas from what is being built. Be sure to bring along test equipment and a receiver to test the kits as they are completed and be sure to have plenty of time available so that your builders aren't spending as much time setting up and packing up as they are doing their building.

Until next month, 73 de K0NEB

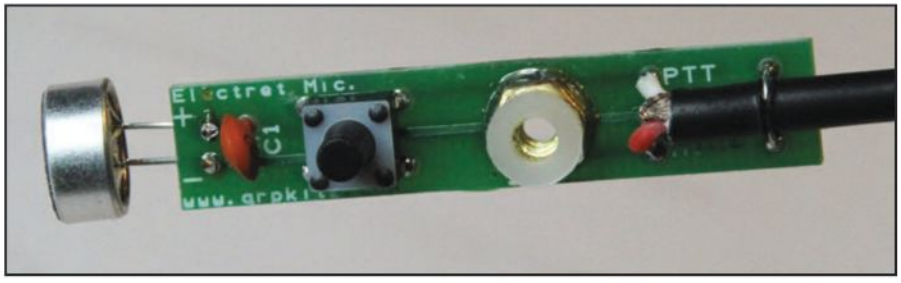



*Photo E. A finished mic kit board.*

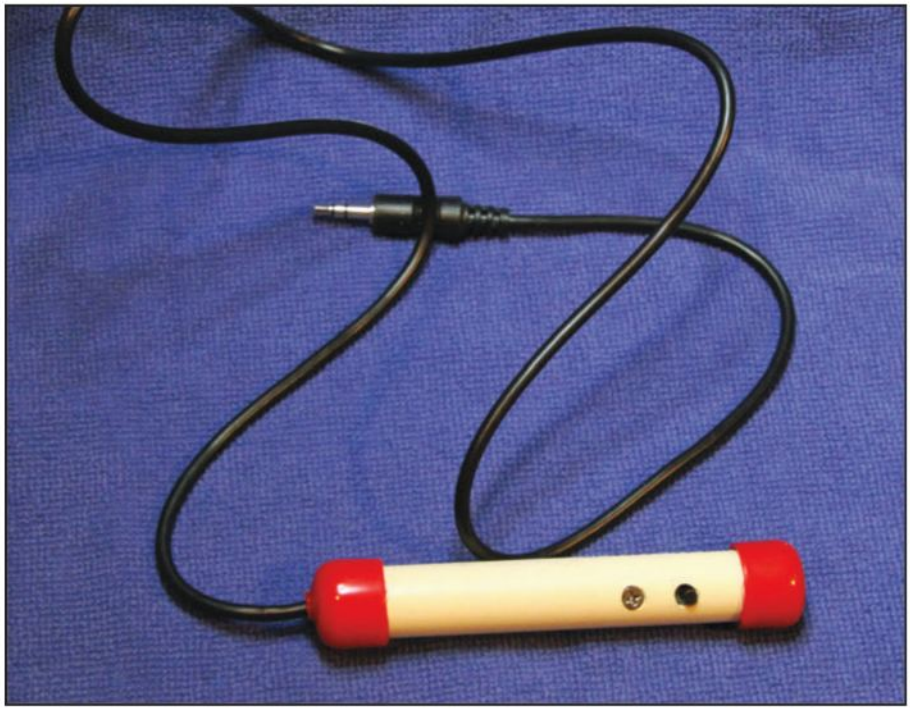


*Photo F. Assembled condenser mic kit ready to plug in.*

# Two Mini-Reviews, Plus Quartzfest and ... Is Ham Radio Going to the Dogs?

BY GORDON WEST,* WB6NOA

This month, "Short Circuits" takes a look at two new pieces of ham gear, a new book, radio dog tags, and a very popular event among hams who are also RV enthusiasts. Rigs first.

## Kenwood TS-990S First Thoughts

I just retired my venerable TS-950 with a companion spectrum display scope and it will soon be placed (really!) in the Kenwood museum, at their main facility in Atlanta, Georgia.

In its place, the new Kenwood TS-990S, a very early serial number, purchased from demo stock from its tour throughout the country last winter. With hardly a scratch on it, my mission was to see the performance difference between the old 950 and this new 990.

The new Kenwood TS-990S is BIG and extremely heavy. The power supply is built in, and you know it's there by the 55 pounds it weighs when you try to move it. This is a 120-VAC rig here in the USA. It comes with a power cord, but *you* supply the mic. If you have a Kenwood MC-60A or MC-90 desktop mic, or the MC-43S hand mic, you are all set. I am staying with my Heil Goldline mic, along with the footswitch.

There are four antenna jacks on the back of this unit. I have my tribander, with 40 meters, on antenna #1; my off-center-fed Windom for 40 and 75 on antenna position #2; a 6-meter InnovAntenna in position #3; and the 4th antenna position is still open.

The instruction manual is over an inch thick. Every single page has photos of the color front panel display, along with pictorials of switch selections. It will take me months to get through the entire manual, and likely years to discover all the features this big league radio can do with my relatively limited (urban necessary) antenna system.

My first mission was to compare everyday operating performance differences between the older rig and this new powerhouse, the TS-990S.

For one, the rig puts out a solid 200 watts, whereas the 950 supplied 100 watts. Everyone on the nets commented that I "sounded stronger" on the new rig. Our 40-meter morning net members tell it like it is, so this is *good*.

Our 40-meter net meets on 7250 kHz, doing battle with foreign broadcasts coming from Asia. We also have periods of "June gloom" overcast, caus-

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*Gordo's desk, where daily on 40 meters, the Kenwood TS-990 gets a workout!*

ing power lines to begin crackling in the receiver. Add to this other nets just a few kilohertz on either side of us, and the new Kenwood TS-990S really shows its receive capability.

I began to hear clearly those stations I've frequently had problems receiving in the past due to elevated local noise levels. The noise limiting and DSP noise-blanking circuits did the trick, and adjacent frequency slop-over was nearly gone, even though I had other operators just a few kHz away.

There are so many individual knob settings that I must learn, this first week just got me on the air with this great new rig. But, one thing for sure, the receiver is smooth in pulling in some of our net stations out of the noisy background on 40 meters.

I have already begun to explore the digital modes, and the color "waterfall" display. The x-y scope in the sub-screen surely makes tuning digital signals a snap. It is fun to see PSK-31 messages scroll across the screen, and I see I can use my USB keyboard to begin transmitting my own messages, too.

Big time DXers and contesters will appreciate the second two-thirds of the instruction book. This rig will literally sing when a 6-over-6 monoband, up 200 feet, gets tied in to all the selectivity this sensitive receiver can offer.

For right now, yes indeed, the TS-990S really lets me hear what a contest transceiver can pull out of a noisy residential environment for a readable signal. Say hi to my trusty 590 when you next tour the Kenwood museum in Atlanta, GA.

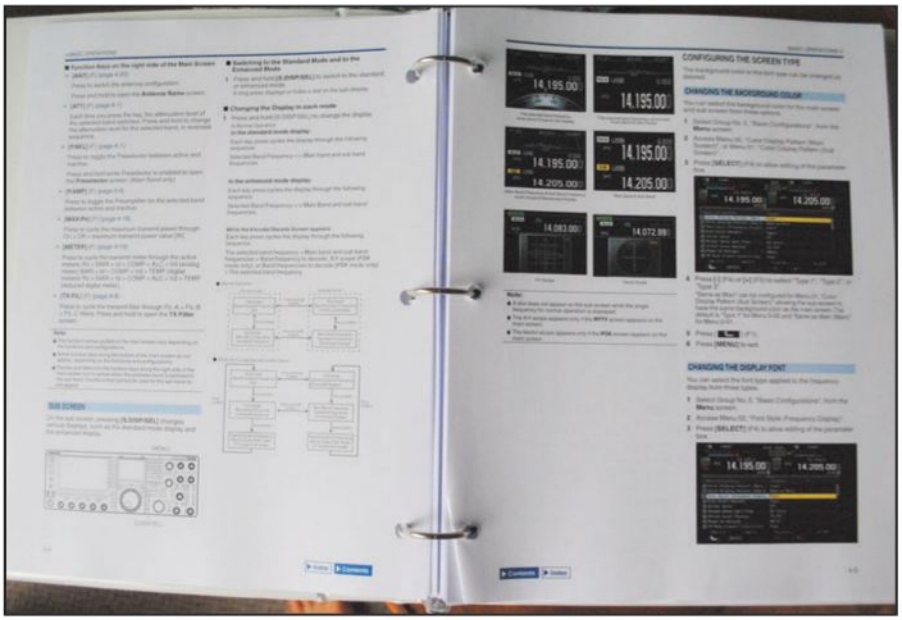
*This* TS-990 is staying *here*, big, heavy time!

## The New PowerWerx $299 Dual-Band Mobile

Last summer, PowerWerx passed up adding the dual-band Wouxun mobile to its extensive line of Wouxun handhelds. Instead, it elected to bring in a dual-band mobile from Qixiang Electronics and Technology, with the proprietary MPU designed to PowerWerx specifications, and carrying the PowerWerx nameplate.

The new PowerWerx DB-750X will likely be a favorite among U.S. Coast Guard Auxiliary, CAP, and MARS operators. It will carry land mobile Part 90 certification. You will need the RT Systems or PowerWerx programming software to initially unlock and program this transceiver for use.

"I have a short article on understanding Chinese radio Part 90 certifications, where I detail an overlooked step necessary to validate the Chinese radio FCC certifications," comments Jason



*Kenwood's TS-990S instruction book is an inch thick and fully illustrated with photos and diagrams on every page.*


*The DB-750X from PowerWerx is a new entry in the amateur marketplace. The dual-band mobile rig, made in China, is FCC Part 90 certified and will operate on public service and commercial frequencies as well as the amateur 2-meter and 70-centimeter bands (with receive on 222 MHz). (Photo courtesy PowerWerx)*


*You will need programming software, either from PowerWerx or RT Systems, to unlock and program the DB-750X. (Photo courtesy PowerWerx)*

*Quartzfest seminars are always very popular. Bring your own chair!*

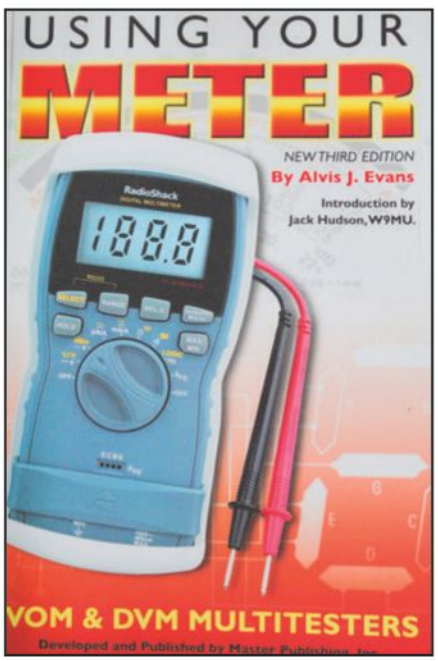
Gant, Division 5 Staff Communications Officer, USCG Aux., District 11 SR.

The PowerWerx DB-750X gives us the standard 50 watts on VHF, and 40 watts on UHF, and is narrowband compliant with selectable narrowband steps. A $20 front-panel remote separation kit allows you to place the transceiver body under a seat, and keep the head at eye level (away from any airbag for driving safety). We saw plenty of color options on the LCD display. Many features may seem familiar to the Yaesu FT-8900 quad-band user.

There are alphanumerics and 750 memory channels, which you can store in up to 10 banks. According to PowerWerx, "We have our unique 2013 band plan, forced in firmware wide and narrow in authorized areas, also wide receive in narrow areas so you can get weather, marine, etc. clearly in receive mode."

The backlit microphone is super-sized and feels good. I heard only a few gripes from our student-testers that the microphone push-to-talk button was so heavy duty that it was tough to keep it depressed for long-winded net operation.

"Since almost all PowerWerx employees are active ham radio operators, they will be first to keep track of incoming comments on this new rig," noted a company spokesman working on the marketing of yet another great product iin the PowerWerx line of commercial radio and ham radio equipment.




*Using Your Meter is full of illustrations on how to get the most out of your VOM or digital multimeter.*

## RV Hams Ready for Quartzfest

The last full week of January draws thousands of RVers to Quartzsite,

Arizona. Here they take in the annual RV show, plus the hundreds and hundreds of independent swap-meet type sellers throughout the heart of town.

Five miles south of Quartzsite is the annual Ham RV gathering called Quartzfest™.

"Nearly one thousand hams and hundreds of ham RVers show up for our week-long event," comments Kris Weed, KR1SS.

"Quartzfest begins Saturday, January 19th, and goes on for a week of ham radio seminars, live-action ham radio training, ham radio energy alternatives, and our popular ham radio nighttime movies," adds Angel, KG7ASN.

This is a free event, including boon-docking on Bureau of Land Management hard packed sand. Campfires happen every evening with marshmallow toasting on the tip end of your favorite antenna stinger. Gordo is there the entire week, so check it out at on the Internet. Hey, you can make a presentation at one of the many seminars. Just check in with one of the Quartzfest™ seminar planners so they can work your presentation and/or ideas into the schedule.

## Using Your Meter

*Using Your Meter*, new third edition, is a 166-page book in which *every* page has drawings to show you how to get the most out of your faithful analog or digital volt/ohm meter.

The authors take you through VOM and DVM concepts, multi-tester measurements, and measurement techniques to test individual components. Whether you're trouble-shooting a typical FET amplifier circuit with your meter, or running continuity tests of the XYL's coffee maker, every page of the book shows you a diagram of how to test multiple circuits to figure out why an appliance goes "snap" when you plug it into the wall.

Written by Alvis Evans, with introduction by Jack Hudson, W9MU, *Using Your Meter* deserves a spot on your ham radio fix-it bench.

## Radio Tag System

Saved by the tag! A ham's four-legged pal was let out for a romp in the front yard, and 20 minutes later, vanished. If you own a pet (or do pets own us?) you know how it feels when they go missing. This story has a happy ending, though, thanks to a ham-customized radio collar.

FOUND! Accidentally and unknowingly locked up in a neighbor's storage unit when the gardeners slammed the door. The next day was going to be a "cooker," and the radio tag made another SAVE.

The 222-MHz, 1-milliwatt, 20-millisecond pulse collars were developed by Spence Porter, WA6TPR, owner and President of Communications Specialists, Inc. in Orange, California.

These small tags run for about a month on a common 2032 lithium battery. Your ham radio callsign gets programmed, too. Each tag has its own individual channel on the 222-MHz band, interstitial to 222-MHz repeater inputs or outputs, as well, while avoiding the weak signal portion of the band.

The once per second pulses are not heard with a common 222-MHz FM radio, but the Comm-Spec CW synthesized receiver with a fold-up Moxon antenna can hear a tag two blocks away. Out in the open, when Fido gets out of the RV at Quartzfest, the receiver can sniff the tag up to half a mile away.

For around $300, you get the complete system. Additional tags, on alternate channels, are only $50 each. The collar has a sewn-in antenna, giving Fido or Fluffy added range.

Great for teaching transmitter hunting, this low-cost system is perfect for the next hamfest.


*T-hunt Fido, Fuzzy, or Friends with the milliwatt tags from Communications Specialists.*

BY JEFF REINHARDT AA6JR

# There's Good News...

...and this is not one of those good news/bad news jokes. As we look back on 2013, the U.S. economy has been making steady—if slow—advances (at least at the time this is being written) and my sources in the ham radio industry tell me things have been picking up there, too. Not stellar, but better than it had been.

Auto sales were also robust through the middle of the year, perhaps reflecting a pent-up demand for new vehicles to replace the tired old wheels that helped so many through the recession. Now I know that *CQ* is not the place you go for financial reports, although in some cases I don't think we could have done much worse than some so-called "experts." Nevertheless, this gradual turnaround bodes well for the ham radio *aficionado* who may be about to purchase a new rig, be it a vehicle, or a radio, or both. And if you're doing one, why not consider the other as well?

If you work it right, you pick out the new ride, and maybe Santa will bring the new rig. Assuming you're on his "good" list, of course. *(Hint: some well-timed flowers, candy, and a dinner out may help Mrs. Santa get in a good mood.)*

## Negotiate What?

I'm fortunate to have some good friends who have been around the block a few times. Some of their wisdom includes the notion that the end of December (week between Christmas and New Year's Day) is a good time to buy a car. I'm told there are several reasons; dealers are happy to unload stock and convert it to cash before the end of the year, some of the previous year's "leftover" models may still be around at greatly reduced prices, if a dealer has outstanding loans on his inventory, getting a unit out the door before the end of the month saves him some interest and quite frankly, December has typically been a slower time at dealerships as holiday shopping usually gets the attention of most families. As a result, manufacturers sometimes provide buyer incentives to boost traffic.

So let's assume you're in the mood to buy and negotiate your deal. There's all the usual stuff, price of the new vehicle, trade-in value, financing, and dealer "extras" like accessories and extended warranties.

Another of my astute friends suggests you negotiate one more thing—some amount of repair shop time to disassemble and reassemble the interior so that you can install your ham radio.

It may be 4, 6, 8, or 10 hours; but shop rates can be costly if you pay for this on your own.

Don't be surprised if the dealer counters with splitting the expense for shop time. That technique basically covers his labor costs. However you approach it, making the deal on your next vehicle contingent on getting the shop time is a smart approach. After the sale is made, it's too late.

Let's face it, computer-aided design has made newer vehicles very difficult to work on. Removing interior panels, or routing wires to a battery locat-

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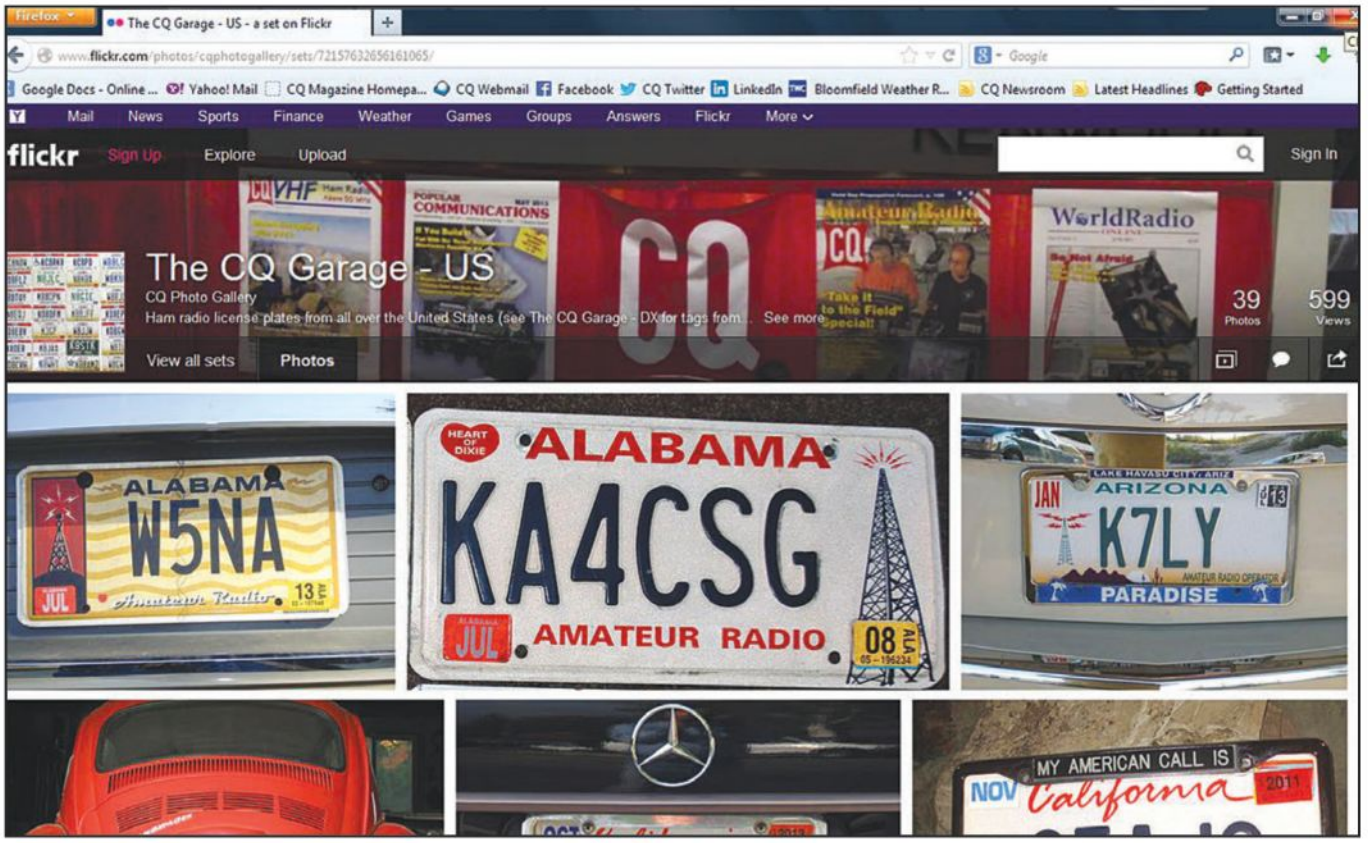
*Many folks are in the market for a new car as the economy slowly recovers. AA6JR suggests negotiating shop time to help with radio installation as you wheel and deal for your new wheels. (Courtesy of Wikimedia Commons)*




*We're still collecting license plate photos for the "CQ Garage" website. Check it out at: <www.flickr.com/photos/cqphotogallery/sets> and if your state isn't represented (we've only got 22 so far), we'd love a photo of your ham radio tags!*

ed in the engine compartment or in the trunk can be a daunting task, to say nothing of routing an antenna cable past a labyrinth of microprocessors. You also don't want to do anything that voids your warranty. By negotiating some shop time, you have factory-trained experts doing the critical work and those folks also have access to special tools that may be needed to remove interior trim items. They also have the proper reference materials to avoid the accidental activation of air bags and other items that may be critical to the complex electronics systems found in today's newest vehicles. With safety systems, intricate entertainment and communications gear, GPS navigation systems, and multiple air bags, the "shade tree mechanic" can quickly find himself over his head and worse, perhaps causing damage that would not be covered by the manufacturer's warranty.

## Get it in Writing

Anyone who's purchased a new vehicle knows that a mountain of paperwork goes with the transaction. Sadly, many of us also know the value of a verbal "promise" in the world of commerce. Quite frankly, if some element of the deal is not on paper, it doesn't exist. So if you do negotiate some shop time, get it in writing and make sure it is signed by someone who's authorized to do so.

## More Good News

The price for some radio equipment is currently very, very attractive. Now I'll sound like a grizzled old geek for a moment here, but when I first became licensed, I purchased a 2-meter mobile rig with 50-watts of output and just 20 memory channels for $360. That's right—$360—plus tax. Take a look at today's prices and you'll see a very different world. At the time this is written, the same manufacturer offers a 65-watt, 2-meter mobile transceiver with 200 memory channels for just under $140 at a given retailer. That new model also has many features not found in my older rig. And that's just one example.

Over the years there has been an evolution that has advanced the radio art and we operators stand to benefit. I can't think of too many things that have decreased in cost, yet increased in the number of features and benefits to the end user over the last 20 years, but certain ham radio offerings currently in the marketplace represent a terrific buying opportunity. If you haven't made a trip to your favorite "candy store" recently, or visited their website, you may be missing an opportunity to upgrade your equipment at a very favorable point in time.

Today's lower prices on full-featured, multi-band transceivers are also tempting. Newer gear that allows the control head to be located away from the transceiver offers the operator flexibility, security, and the ability to use more of the privileges you earned when you obtained your license. It's worth considering spending a few dollars more to upgrade, especially if you average the cost of the rig over a projected life span of 10 years or so.

## The Finishing Touch

Now that I've tempted you with a new vehicle and a new transceiver, why not consider a new antenna system? Your old antenna and its mount have probably faced years of exposure to weather extremes, the coax has aged and may be cracked or prone to moisture intrusion. In my humble opin-

ion, the "skyhook" is the most important component that can determine the overall enjoyment of your mobile installation. There's some truth to that old adage, "A dime spent on antenna is worth a dollar spent on a transmitter."

Like radios, there has been advancement in the field of mobile antenna technology. You still can't transmit on 160 meters through a 6-inch whip but newer designs include nice multi-band combinations, durable mounting bases, and hardware and aesthetics that work with almost any vehicle.

## Wish List

As this is a quarterly column, and as long as we're making references to Santa, I continue to hope that ham radio transceiver manufacturers can come up with some means of incorporating wireless links among mobile radio components. Even better would be a transceiver that interfaces with a car's Bluetooth® link into its audio system for hands-free communications.

But I don't think it would require "moon shot" technology to develop a transceiver where the mic, display and control knobs could be situated at separate locations in the car, truck, or SUV and wirelessly linked to the main transceiver unit. Think of the problems that would solve with installations. An added benefit would be placing those remotable items at locations that are safe, logical, and practical for easy operation.

## An Installation Tip

Many car audio systems now feature an easily accessed "Aux" input, probably to accommodate en external music player such as an iPod® or similar device. The input on one of my vehicles is hidden away in the center console. If you're not using that input for another purpose, you can take the audio from the output jack of your mobile rig to that auxiliary input and enjoy robust audio through your vehicle's speakers. Some multi-band rigs feature stereo jack outputs, which plays into your strategy nicely; output from one band might be heard on the left side speakers; the other band may play through the right side. If your rig isn't wired that way, a few minutes spent building a simple adapter cable will get you to the same place.

## We Need Photos!

As you can see, this quarter's column lacks an important component—photos of your mobile setup. Whether grand in scope or simple for its functions, your mobile installation is of interest to countless *CQ* readers. Send your photos along with a brief description of your installation and any tips you may wish to share to the e-mail address shown on the first page of this column. We're also still collecting photos of ham license plates for the "CQ Garage." We'd love to get our ham license plate WAS and gather one from each Canadian province as well. Be sure to visit the gallery at: <www.flickr.com/photos/cqphotogallery/sets>.

## Happy Holidays

As this is the last *Mobiling* column of 2013, I wish you and yours a most wonderful and relaxing holiday season, with best wishes for a super year in 2014. Be sure to share those thoughts with others as you mobile along the highways.

*–73, Jeff, AA6JR*

BY TOM SMERK,* AA6TS

# Meet-ups Enhance International Goodwill *plus* Ham Radio News and Events from Around the World

This has been a busy month for ham radio. I have some updates from things we presented last month, some interesting training efforts, conferences and festivals, a few disappointments, and a few happy surprises. Our first story caught my eye because in spite of a history of tension and disagreement between these countries, ham radio is bringing the countries together in agreement:

## Amateur Radio Associations in Bulgaria, Greece, and Turkey Sign Memorandum of Understanding

Panayot Danev, LZ1US, reports on the IARU Region 1 website that the national amateur radio organizations of the neighboring Balkan countries of Bulgaria (Bulgarian Federation of Radio-amateurs, or BFRA), Greece (Radio Amateur Association of Greece, or RAAG) and Turkey (Radio Amateur Association of Turkey, or TRAC) signed a Memorandum of Understanding for future cooperation. The three countries have a long history of ordeal by natural disasters like earthquakes, fires, floods, and other dangerous natural phenomena.

The agreement concerns not only support of communication networks when human life and property is at stake, but also coverage of events which promote and strengthen amateur radio, friendship, and cooperation between people, such as Field Day, support of local and worldwide sports events, school contacts with the International Space Station, Scout Jamborees, and other similar events.

The Memorandum of Understanding establishing cooperation between the Bulgarian, Greek, and Turkish amateur radio organizations was signed by their three presidents: Viktor Tzenkov, LZ3NN; Manos Darkadakis, SV1IW; and Aziz Sasa, TA1E. [IARU Region 1]

## "Youngsters On the Air 2013" in Estonia

The third edition of "Youngsters On the Air" took place in Tartu, Estonia, from August 5-12, 2013. About 85 participants attended from Belgium,

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

*Photo A. Youngsters On The Air 2013 group photo. (Courtesy PA2LS, Youth Coordinator IARU-R1 – Used with permission)*

Bulgaria, Croatia, Estonia, Finland, Ireland, Italy, Latvia, Lithuania, The Netherlands, Poland, Romania, Russia, Slovenia, and Sweden. The youngsters (Photo A) followed a program which included such activities as contesting, ARDF (amateur radio direction finding), electronic kit building, robotics, a satellite demonstration, visiting an observatory, intercultural evening, and antenna building.

As an outcome, the youngsters and team leaders are planning new meetings and other youth activities in future. YOTA2014 will take place in Finland. [Lisa Leenders, PA2LS, on the IARU Region 1 website]

Another event involving young hams was the **Polish Ham Radio Training Camp**. From July 20 to August 3, 2013, the sixth amateur radio sports training camp was held at Poronin in the Tatra mountains, in Poland's Matopolska Province, about 80 kilometers from Krakow.

Pawet Zakrzewski, SP7TEV, said the event was organized by the Polish Amateur Radio Union (PZK) and co-financed with a grant awarded by the Ministry of National Defense of the Republic of Poland. The program included classes in radio direction finding, radio-orienteering races, on-air activities from the SPØPZK club radio station, operating in radio networks, a preparation course for the examination for amateur radio certificates, cultural and recreational activities, and various tours.

Zbigniew Madrzynski, SP2JNK, Deputy President for Sport Affairs of the Polish Amateur Radio Union, was the main organizer of the event, and Joanna Karwowska, SQ2LIC, Award Manager of the PZK, was camp director.

The camp was attended by 44 participants, 10-19 years of age, under the care of eight instructors and educational personnel. The youth were divided into groups, having been given classes in various specialties.

During the camp, on 27 July 2013, the examination for amateur radio certificates was also held. PZK organizers believe the camp was a success, and it will enlarge the community of the Polish radio amateurs by bringing new young enthusiasts into the hobby of ham radio.

## Nordic HF Conference Held in Sweden in August

The popular English-language Nordic HF Conference took place in Sweden from August 12-14, 2013. Topics covered included the design of a software-defined radio; an *ionospheric chirpsounder* for HF propagation analysis; creation of applications of advanced VLF/LF/HF-digital signal processing in the amateur radio service, and numerous other offerings.

The conference first took place in 1986 and initially was planned for a limited audience of Nordic countries. It's now held every three years and has grown steadily to a point where it now has international acclaim. [Nordic HF Conference]

## Tokyo Ham Fair Features Ham Radio Satellites

The Japan Amateur Radio League's *Ham Fair 2013* was held in Tokyo on August 24-25. JAMSAT—the Japanese amateur satellite organization—and several amateur radio satellite projects were represented.

The University of Tsukuba CubeSat ITF-1 project was on display. The formal name, ITF-1, comes from the initial letters of the university slogan, "Imagine The Future."

The ARTSAT stand featured the "Invader" CubeSat, which is being developed by students at Tama Art University. The IARU aims to have a camera for Earth imaging and a Digi-Talker, to transmit voice data using FM. Invader will be on the same launch as ITF-1.

Also at the fair was SPROUT, built by students from Nihon University, with launch planned for this December. SPROUT will have a digi-talker and will transmit, using Slow Scan TV (SSTV) and FM packet, pictures of the Earth taken by an on-board camera. It is believed that radio amateurs will be able to make use of the digipeater and possibly even command when pictures are taken. [Source: "Keep America At Work" blog by Virgil Bierschwale]

*The news brought with it a few disappointments in ham radio—a loss of power privileges and a DXpedition that was unexpectedly cancelled. Read on.*

## VK Hams Lose Temporary High-Power Permission and Return to 400-Watt Limits

At the end of an 18-month trial that allowed participating Advanced licensees in Australia to run up to 1 kilowatt on the HF bands, hams in that country learned that their temporary high-power authorization would end on August 31st and would not be renewed.

The Australian Communications and Media Authority (ACMA) pointed out that slightly less than 3 percent of the 10,690 eligible licensees, 297 in all, took advantage of the trial. "Of the 297 that did obtain the authorization, the ACMA was advised by some participants that they had not used higher power," the agency said in its decision.

According to the ACMA, the trial demonstrated a lack of awareness by some Advanced Licensees of their license conditions, saying that hams in that nation are not properly aware of RF exposure requirements.

The Wireless Institute of Australia (WIA) for some time has been pushing for higher power limits for Advanced licensees, who feel the current 400-w power limit puts them at a disadvantage, especially in contests, while other countries permit 1 kW or more. After the New Zealand Amateur Radio Transmitters (NZART) was able to convince regulators in that country to raise the power limit on similar grounds, the WIA was encouraged to again pursue the matter. After the WIA was informed of ACMA's decision to end the trial, and, following talks, it was decided that the ACMA would revisit the issue next year. [WIA News and the ARRL Letter]

## 5C0CE DXpedition From Morocco Canceled by ARRAM President

The Council of Europe Radio Amateur Club (CERAC) announced that a long-planned operation from Morocco, which had been assigned the special callsign "5C0CE," was shut down 16 hours before it was to start due to a last minute blockage of the Royal Association of Radio Amateurs (ARRAM) President. CERAC members had received Moroccan licenses many months prior and radio amateurs from Morocco had prepared for this operation since last year with a lot of enthusiasm.

In an e-mail to ham radio information outlets, Francis Kremer, F6FQK, a founding member of the Council of Europe Radio Amateur Club charged with public relations, said that the notice from the Moroccan national society leader gave no reason for the decision to block the operation from taking place. He noted that each member of the Council's DXpedition team had paid his own expenses and when news came of the forced cancellation, it was too late to recover those expenses. Kremer called the incident very damaging to the ham radio community. [CERAC]

*But not all the news was bad … there were many good things to report as well, such as a return of license exams after a 5-year absence and a grant for equipment for new hams.*

## Amateur Radio Licensing Exam Returns to Bangladesh

The Bangladeshi government will issue new ham licenses for the first time in five years. The Bangladesh Telecommunication Regulatory Authority (BTRC) announced that "Amateur radio licensing exam 2013" will be held on November 9. Previous exam sessions were held in 2008 and 2004.

The Bangladeshi government has only allowed ham radio operations since 1991, though amateurs there have received special permission on a case-by-case basis to set up emergency communications infrastructures during natural disasters such as cyclones, tidal waves, and flooding. The Bangladesh Amateur Radio League (BARL) was formed in 1979 as a way to promote amateur radio, but on-air operations were banned due to the political climate of the region.

A minimum score of 50% will be required to pass an exam consisting of 50 multiple-choice questions regarding fundamentals of radio engineering, basic electronics, amateur radio rules, code, safety etc.

Details of the syllabus can be found in BTRC website <http://www.btrc.gov.bd/>. If you are interested, you can also visit BARL's website at <http://www.barl.org>. [S21SM, Southgate Amateur Radio News]

## YASME Supports Equipment Acquisition for New Ethiopian Amateurs

Ethiopia is a nation where ham radio is re-emerging. Ethiopia came back on the air May 30, 2011, with the re-opening of the Ethiopian Amateur Radio Society station ET3AA. To support the re-establishment of amateur radio in that nation, the YASME Foundation issued a grant to pay the fees associated with license examinations for 25 members of that club. Many were successful, but under Ethiopian regulations, they could not receive licenses without proof of ownership of an amateur radio station.

To further support amateur radio in Ethiopia, the YASME Foundation Board of Directors recently announced that it has made an additional grant to be used to purchase amateur radio transceivers for three club members so that they can satisfy the requirements of the Ethiopian licensing process. The board acknowledges with appreciation the substantial efforts of Ken Claerbout, K4ZW, in facilitating the acquisition of the equipment and mentoring the EARS members.

This latest YASME grant is a step toward getting individual Ethiopian hams back on the air. The YASME Foundation, based in Castro Valley, California, is a not-for-profit corporation organized to conduct scientific and educational projects related to amateur radio. [YASME Foundation]

*On the subject of emergency communications, the word is "déjà vu!" Last month you read about flooding in India and a typhoon in the Philippines. More of the same this month.*

## Philippines on Standby for Typhoon Labuyo

Greg Mossop, GØDUB, IARU Region 1 Emergency Communications Coordinator, reported that on Sunday, August 11, the Philippines Amateur Radio Association

*Photo B. HAM HEROES ... Rahul Ravishankar, VU3HBT (right); Vishwas Krishnamurthy, VU3HVD; and Girish Doss, VU3GDS, were congratulated for their efforts in Uttarkhand relief operations by the Indian Institute of Hams in Mysore. Mr. S. Sathyapal (left), Director, IIH, and R.J. Marcus, IIH Director of Training, were also present." (Photo courtesy The Hindu – used with permission)*

(PARA) had once again activated its Ham Emergency Radio Operators net centered on 7.095 MHz in preparation for the arrival of Typhoon Labuyo. Local clubs also activated nets on 2-meters.

An urgent request was made for the cooperation of neighboring countries in the IARU Region 3 to keep clear of the emergency frequency during and immediately after the storm.

At least one person died and 44 others were declared missing when Typhoon Labuyo hit the northern part of the Philippines early on August 12th. The storm had a big circulation—estimated at 600 kilometers—and gusts from 165 to 200 kilometers per hour (102-124 miles per hour) at its peak. [GØDUB and PARA]

## Hams in India Again Respond to Monsoon Flooding

With the Uttarakhand flooding still fresh in their memories (see October "CQ World Wide"), hams in India once again responded to monsoonal rainfall dangers. Heavy rains on August 4th led to landslides in the high mountain range area of Idukki and the adjoining districts of Kerala.

At the time I am writing this, nine people were reported to have died and several others were reported missing. A district where most people are small and marginal farmers, Idukki also suffered heavy crop and property losses. Several persons were reported missing and rescue work was hampered as roads were blocked by rubble spawned by landslides and flash floods. People in affected areas were relocated to relief camps.

The ham radio response was centered on 7.080 MHz for long-distance communications with VHF being used within the storm devastated region. I will pass on any further developments, if any, in next month's column. [Southgate, IndiaToday.com, Times of India]

## India Recognizes Three Hams as Heroes

During the recent Uttarakhand floods in India, three hams from Bangalore were instrumental in establishing communication with the local district administration in the Himalayan terrain to enable better coordination for civilian relief.

Girish Doss, VU3GDS; Vishwas Krishnamurthy, VU3HVD; and Rahul Ravishankar, VU3HBT (Photo B) were called "Ham Heroes" by the newspaper *The Hindu* for their contribution to Uttarakhand relief operations and were presented Certificate of Excellence awards by the Indian Institute of Hams at a workshop held in Mysore on Saturday, July 27.

All three were among the first hams to reach Uttarakhand and establish a communication link from remote areas. Communicating to the master control center established at Dehra Dun, they relayed messages to the local district administration, which took appropriate measures to reach out to the stranded. According to VU3HBT, the volunteers of Bharat Scouts and Guides would then reach out to the stranded persons in remote places.

Girish Doss, a software engineer, obtained his ham radio license when he was only 12 years old and worked during the Gujarat earthquake, December 2004 tsunami, and now the 2013 Uttarakhand floods. Vishwas, too, is a software professional, and Rahul is a structural engineer with his own consultancy firm.

Shankar Sathyapal, Director of the Indian Institute of Hams, IIH, said though there were nearly 3,000 Hams in Bangalore alone, it was difficult to get volunteers during disasters. [The Hindu]

And finally, I am happy to report that **the International Lighthouse and Lightship Weekend** that you read about here last month set some new records!

Hams around the world embraced the event as an opportunity to set up special event stations. Now that the event has concluded, I learned that a record of 450 registrations from 42 countries has been set in this 16th year for the event.

When the date happened to be scheduled for the same weekend as the famous Central Australian dry river boat race, the Henley on Todd Regatta, the Alice Springs Amateur Radio Club came up with an idea—they would build their own lighthouse and set up a radio station to communicate with all the others from the banks of the Todd River, thousands of kilometers from any coastline.

Greg Mair, VK8GM, explains that with the help of the Henley-On-Todd team, a lighthouse has been built to promote the spirit of amateur radio and lighthouses. The Alice Springs lighthouse joined hundreds of others around the world this year, with hopes that it will attract the attention of local, national and international news media.

This is a good example of how, if you want something bad enough, you can get involved even if you don't qualify. After all, there are not very many lighthouses out in the desert, anywhere on the planet! (*Except, of course, in Australia!*) [Thanks to ABC Rural and VK3PC for this information]

*Thanks to all of you who have expressed an interest in this column. I welcome your comments and stories at—please don't hesitate to drop me an email! I'll look forward to seeing you all here again next month. Until then, 73 de Tom, AA6TS!*

# FUNcube-1 Launch Expected This Month

BY JOE LYNCH,* N6CL

The following is from *Southgate Amateur Radio News* and the AMSAT News Service (ANS):

AMSAT-UK and AMSAT-NL have been advised that the launch date for FUNcube-1 is now expected to be November 21, 2013 at 07:11:29 UTC. This date is still subject to final approval by the authorities.

The FUNcube-1 CubeSat has now completed all its final testing and been placed into its launch pod. FUNcube-1 is actually the middle 1U CubeSat of three sharing a 3U ISIPOD. Also in the pod are ZACUBE-1 from South Africa and HiNCube from Norway, Photo A.

ZACube-1, in addition to carrying VHF and UHF communications equipment, has a 20-meter beacon that will operate on 14.099 MHz. This ISIPOD, with the spacecraft inside, was scheduled to be transported to Russia in October for attachment to the launch vehicle.

FUNcube-1 carries a 435/145-MHz linear transponder for SSB and CW communications and a telemetry beacon using 1k2 BPSK for educational outreach purposes. The FUNcube project started back in 2009, so it is a great relief that we now have a confirmed date for lift off.

FUNcube-1 will lift off from the Yasny launch base located in the Orenburg Region of Russia on a Dnepr launch vehicle that will insert multiple satellites into orbit.

FUNcube-1 is a 1U CubeSat that will provide a signal directly from a satellite in space to the classroom, and can easily be received by schools and colleges. The target audience is students at both primary and secondary levels. The information will be displayed in an attractive format and provide stimulation and encouragement for students to become interested in all STEM (Science, Technology, Engineering & Math) subjects in a unique way. In addition, the spacecraft is also carrying a transponder for radio amateurs to use for

**VHF Plus Calendar**

| | |
|---|---|
| November 3 | New Moon |
| November 3 | Hybrid solar eclipse will be visible in Eastern Americas, Southern Europe, and Africa. |
| November 6 | Moon perigee |
| November 9 | First quarter Moon |
| November 16-17 | ARRL International EME Competition (50-1296 MHz, Round 2). |
| November 17 | Full Moon |
| November 17 | Leonids meteor shower |
| November 22 | Moon apogee |
| November 25 | Last quarter Moon |
| December 2 | New Moon |

*—EME conditions courtesy W5LUU*

*e-mail: <n6cl@sbcglobal.net>*

*Photo A. ZACUBE-1, FUNcube-1 and HiNCube in the pod. (Courtesy of Wouter Weggelaar, PA3WEG.)*

communication.

More information about how to receive the signals from FUNcube-1 will be made available over the forthcoming weeks at <http://www.funcube.org.uk>.

FUNcube-1 communication subsystem:

- 400-mW inverting linear transponder for SSB and CW
- Uplink 435.150 – 435.130 MHz
- Downlink 145.950 – 145.970 MHz
- 400-mW BPSK Telemetry 145.935 MHz

ZACUBE-1: <http://tinyurl.com/ANS-251-ZACUBE-1>

HiNCube: <http://www.hincube.com/>

A recent presentation about the FUNcube project by Graham Shirville, G3VZV, and Wouter Weggelaar, PA3WEG, can be viewed online at: <http://www.batc.tv/streams/amsat1311> or downloaded from <http://www.batc.tv/vod/Funcube1.flv>.

A PDF of the slides from that presentation is here: <http://bit.ly/13XNxjm>

FUNcube information sheets:

- FUNcube Project information Nov 2012: <http://bit.ly/162GnrF>
- FUNcube-1 Educational Outreach information sheet Nov 2012: <http://bit.ly/15qpSc8>

FUNcube-1: <http://amsat-uk.org/funcube/funcube-cubesat/>

FUNcube Yahoo Group: <http://amsat-uk.org/funcube/yahoo-group/>

FUNcube website: <http://www.funcube.org.uk/>

The other satellites that will be on the same Dnepr launch vehicle are listed at: <http://bit.ly/12vPrXG>

AMSAT-UK on Facebook: <https://www.facebook.com/pages/AMSAT-UK/208113275898396>

AMSAT-UK on Twitter: https://twitter.com/AMSAT_UK

Join AMSAT-UK: <http://bit.ly/14YTvPt>

## Cluster Balloonist Makes it as Far as Newfoundland (From Maine)

Jonathan Trappe, KJ4GQV, launched his cluster balloon from Caribou, Maine at 1200 UTC on September 12, 2013. He was tracked on spacenear.us on 14.0956 MHz HF and aprs.fi on 144.390 MHz. Here is a link to *The Telegraph* article that includes a video of the launch: <http://bit.ly/1ba8kVj>

Hovering 150 feet above the water off the coast Jon decided to land once Newfoundland was underneath him. Ironically, he landed close to Newfoundland's Blow Me Down Provincial Park (see: <http://bit.ly/17wCJJn>). As of the writing of this column Jon's plans for another attempt are uncertain.

## Inflatable Antenna could give CubeSats Greater Reach

The following is from *Southgate Amateur Radio News*:

MIT reports researchers have developed a new design of antenna for small satellites known as CubeSats (see Photo B).

Due to their small size, CubeSats have been restricted to

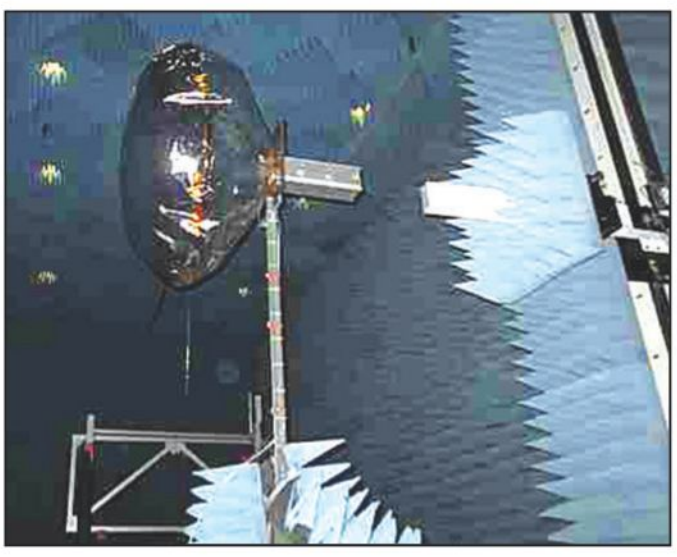


*Photo B. CubeSat equipped with an inflated antenna in a NASA radiation chamber. (Courtesy of Alessandra Babuscia.)*

*Photo C. IW9GDC/B 70-MHz beacon antenna. (Courtesy of IW9GDC.)*

small monopole or dipole antennas.

Such low-gain, omni-directional antennas have restricted CubeSats to Low Earth Orbits (LEO) using lower data rates than would be possible with a large dish antenna.

The MIT team, led by Alessandra Babuscia, is part of the research group of radio amateur Professor Sara Seager, KB1WTW, and also includes graduate students Mary Knapp, KB1WUA; Benjamin Corbin and Mark Van de Loo from MIT; and Rebecca Jensen-Clem from the California Institute of Technology.

The new inflatable antenna may significantly increase the communication range of these small satellites, enabling them to travel much farther in the solar system: The team has built and tested an inflatable antenna that can fold into a compact space and inflate when in orbit.

It is claimed the distance that can be covered by a satellite with an inflatable antenna is seven times farther than that of existing CubeSat communications.

"With this antenna you could transmit from the moon, and even farther than that," says Babuscia, who led the research as a postdoc at MIT. "This antenna is one of the cheapest and most economical solutions to the problem of communications."

Read the full story at: <http://bit.ly/19uZVrs>

MIT press release: <http://bit.ly/1dLXqG8>

## NASA Funds Dual-Mode CubeSat Propulsion

According to Edward Wright, project manager of Citizens in Space, NASA is funding work on a new propulsion system that may enable a 10-kilogram (22-pound) CubeSat mission to Europa. The following is from <http://www.citizensinspace.org>:

Nathan Jarred of the Universities Space Research Association has received a $100,000 Phase I award from the NASA Institute of Advanced Concepts to study a dual-mode propulsion concept that pairs electric and thermal propulsion.

High-efficiency electric propulsion would be used for interplanetary maneuvers, with higher-thrust thermal propulsion reserved for quick Earth orbit escape, drastic orbital maneuvering, and orbital insertion at the destination.

Jarred will use the NIAC money to design and optimize the various components of the overall system. He will also design an experiment to evaluate propellant performance within the thermal mode using existing hardware at the Center for Space Nuclear Research.

More information can be found at the Citizens in Space press release website: <http://bit.ly/1esRdAd>

## First Crowd-Funded Satellites Reach the International Space Station

The cubesats ArduSat-1 and ArduSat-X are aboard the International Space Station, ready to be put into orbit between October 2013 and March 2014. Concerning those cubesats, *The Age* newspaper reported on Jonathan (Jon) Oxer, VK3FADO, who has been developing the ArduSat CubeSats that carry amateur radio payloads

The article, by Ben Grubb, says for the past 10 months Jon has been involved in designing and building the two crowd-funded micro-satellites that will allow anyone to conduct their own space experiments. "There's been so much interest in them that they're basically booked solid," Mr Oxer said.

According to *The Age*: "One proposed experiment is to measure sunspot activ-

ity and radiation levels to see if there is any correlation. Another experiment plans to listen for radio transmissions or radio stations that are over the horizon in order to detect meteors.

The U.S. firm behind the project, NanoSatisfi, crowd-funded the devices using the Kickstarter website last year when it raised $106,330 in one month. See: <http://kck.st/195obyq>.

They are believed to be the first crowd-funded satellites to reach space and will soon be joined by several others, including the ARKYD—"a space telescope for everyone"—which Planetary Resources is behind, and the FUNcube (see details at the beginning of this column).

Read more: <http://bit.ly/18jrMha>

ArduSat Open Source Ham Radio CubeSats: <http://bit.ly/15V4DOC>

## Japanese CubeSat to Test Lithium-Ion Capacitors

The following is from *Southgate Amateur Radio News*:

The OPUSAT CubeSat, built by students at the Osaka Prefecture University Small Spacecraft Systems Research Center (SSSRC), will test Lithium-Ion Capacitors in space.

Lithium-Ion Capacitors have a high energy density (reportedly 14 Wh/kg) and so could potentially be of use in small satellites such as CubeSats where space and mass are at a premium.

OPUSAT will have deployable solar panels and Maximum Power Point Tracking (MPPT). The downlink on 437.150 MHz will be CW, 1200-bps AFSK, or 9900-bps GMSK telemetry.

A launch is planned on the JAXA H-2A-202 rocket in Spring 2014 into a 400-km, circular 65-degree orbit along with the primary payload Global Precipitation Measurement (GPM) Dual-Frequency Precipitation Radar (DPR).

There should be a number of other satellites carrying amateur radio payloads on the launch, including:

- STARS-2 – Kagawa University
- TeikyoSat-3 – Teikyo University
- ShindaiSat – Shinshu University
- INVADER – Tama Art University

  ITF-1 – University of Tsukuba

Here is a link to the OPUSAT website in Google™ English: <http://tinyurl.com/OPUSAT>. See this month's *CQ World Wide* column for more on INVADER and ITF-1.

## NASA Funds CSUN and 12 other CubeSat Projects

I received word from CSUN professor Sharlene Katz, WB6FFE *(SEE: June 2013 VHF Plus column piece: "California State University Northridge Faculty and Students to Develop a CubeSat")*, that NASA has funded CSUN and 12 other university teams for small sat collaborative projects. Here are the NASA announcement and list of teams and projects websites: <http://1.usa.gov/1esSlnx>, <http://1.usa.gov/1esSqaS>, and <http://www.nasa.gov/smallsats>. Please note that the photos pertaining to the CSUN project in the June column were reversed. I apologize for the error.

## Satellite Grid Locator Achievement

The following is from *Southgate Amateur Radio News*:

Congratulations go to John Papay, K8YSE, for working and confirming all 488 USA lower 48 states grids.

John states, "Satellite operators come and go and grids come and go with them. A grid might have a very active operator in it and then it is off the air when that person goes away for whatever reason.

"Interestingly, about half of the 488 grids that were worked were from those operating portable, not in the sense of using a radio with batteries, but in the traditional sense of operating away from their home station location. Once you have experienced being on the other end of a small pileup, you will want to do it again."

He also said, "I started with satellites in June 2006 and only had 47 U.S. grids by August 2008. From August 2008 till Jan 2009, I worked another 109. In 2009, 199 were worked. 2010 was 76 and 2011 was 44. Only four new grids were worked in 2012 and nine were snagged in 2013."

John is possibly the first person to ever work all 488 USA lower 48 States grids on the satellites (at least in the past 10 years). However, while the Fred Fish Memorial Award (FFMA) covers 6-meter operations, the sad part about John's accomplishment is that there is no an award for this wonderful achievement.

## F5ZRB 144.405-MHz Beacon

The following is from *Southgate Amateur Radio News*:

The new generation F5ZRB beacon in grid square IN87kw has been operating since August 25, 2013. Philippe, F6ETI, writes: "The beacon is transmitted in telegraphy and MGM JT65B. Its operation is identical to that of GB3VHF. Its frequency (144.405 MHz) and the sequences of emissions are controlled by GPS. To find and decode JT65B your receiver must show 144.4035-MHz USB."

Read more about the FZ5RB beacon in Google English at: <http://tinyurl.com/F5ZRB-Beacon>.

## New 70-MHz Beacon

Emanuele Di Novo, IW9GDC, reports that he has activated a new 70-MHz beacon. It is operating on 70.092 MHz. Here is the transmit sequence: 24 seconds PI4 (sending IW9GDC/B), 20 seconds FSK CW (sending IW9GDC/B JM78SD), 15 seconds CARRIER, and then the sequence starts over. The antenna is a modified version of Wimo Big Wheel for 50 MHz and tuned for 70 MHz located 150 meters ASL, (Photo C). Grid locator is JM78sd. SWL reports are welcomed. Please email them to <iw9gdc@hotmail.it>.

## Ham Radio EME History Sites

Here are a couple of websites that document the early days of government and amateur radio Earth-Moon-Earth (EME) communications:

The first Amateur lunar tests & contacts 1953-1970: <http://bit.ly/15YcaQs>

First 50-MHz Moon bounce contact 1972: <http://www.rcallen.com/eme50.htm>

## CQ-DATV Issue 5 Now Available

CQ-DATV issue 5 is now available as a free eBook download from <http://www.cq-datv.mobi>

At 20MB, this time it's bigger than ever. There is also a new free eBook reader available for Android platforms at <http://www.aldiko.com/features.html>.

CQ-DATV's Facebook link is: <https://www.facebook.com/cqdatv>.

## CEPT Considers Use of 5830- to 5850-MHz Satellite Band

The following is from *Southgate Amateur Radio News*:

The CEPT SE24 Short-Range Devices meeting M72 took place in Vienna on August 26-27, 2013.

The meeting discussed the use of the frequency bands

5350-5470 MHz and 5725-5925 MHz ('WAS/RLAN extension bands') for wireless access systems including radio local area networks (WAS/RLANs).

Any use of Amateur Satellite Service downlink band of 5830-5850 MHz for this purpose would inevitably raise the noise floor making the weak satellite signals even harder to receive.

Read the CEPT working document at: <http://bit.ly/1bf9ChH>

CEPT SE24 meeting documents can be downloaded from: <http://bit.ly/15qn0w3>

## Communicating via Ambient Backscatter

The following is from *Southgate Amateur Radio News*:

*InfoWorld* reports University of Washington researchers have harnessed omnipresent TV signals to enable battery-free wireless communication.

*Ambient Backscatter* transforms existing wireless signals into both a source of power and a communication medium. It enables two battery-free devices to communicate by backscattering existing wireless signals.

Backscatter communication is orders of magnitude more power-efficient than traditional radio communication. Further, since it leverages the ambient RF signals that are already around us, it does not require a dedicated power infrastructure as in RFID.

Watch Ambient Backscatter: <http://bit.ly/17Vrj2K>

Read the *InfoWorld* article at: <http://bit.ly/16XGaHx>

## Current Contests

The **ARRL International EME Contest (50-1296 MHz, Round 2)** is November 16-17. For ARRL contest rules, see the issue of *QST* prior to the month of the contest or their URL: <http://www.arrl.org>.

## Current Conferences and Conventions

The **AMSAT-NA Space Symposium and Annual Meeting** is to be held November 1-3, in Houston, Texas, at the Marriott Hobby Airport Hotel. Reservations: (713) 943-7979. Ask for the AMSAT Block or use the code AMSAMSA. For more information, please see the AMSAT URL pertaining to the symposium at: <http://ww2.amsat.org/?page_id=551>.

## Current Meteor Showers

The *Leonids*: is predicted to peak on November 17, at either 1000 or 1600 UTC. As with last year's shower, this year's peak may go largely unnoticed.

For more information on the above meteor shower predictions see Tomas Hood, NW7US's *Propagation* column elsewhere in this issue. Also visit the International Meteor Organization's website: <http://bit.ly/1cZrBYL>.

## And Finally

As you can see from my reporting in this column, there is a growing interest in CubeSat development. Most remarkable is the strong interest in crowd-funding of such projects. For example, in addition to the piece about the ArduSats that appears here, the Spring 2013 issue of *CQ VHF* magazine contains Zac Manchester, KD2BHC's, article on his Kickstarter-funded KickSat.

Watch for more interesting pieces on CubeSats and articles on them in the pages of *CQ VHF* magazine.

As always, if you have an item of interest to the VHF and above users, please send me a note about it to: <n6cl@sbcglobal.net>. Thank you.

*Until next month, 73 de Joe, N6CL*

## On the Cover

Nope … Chris Yody, KE7JBF, of Seattle, Washington, is *not* looking up Thanksgiving turkey recipes online. Not even Thanksgiving *ham* recipes! What she *is* doing is setting up her laptop computer with FLdigi and EasyPal digital mode software for ham radio public service activities in and around Seattle.

Chris has been a ham for seven years, inspired by her neighbor, Curt Black, WR5J, whom she says remains her mentor to this day. Chris's main ham radio interests are emergency communications and community service, and she is very active with the West Seattle Amateur Radio Club—which she serves as Treasurer—as well as the Seattle Auxiliary Communications Service (ACS), for which she previously served as Training Coordinator.

FLdigi is soundcard software for digital modes that was designed mostly for HF use, but is being used in Seattle on VHF and UHF for digital nets. The EasyPal software is primarily for sending digital slow-scan TV (SSTV) images, but can also be used for transmitting and receiving most any kind of digital file, including JPG, PDF, DOC, and spreadsheet files, all of which can be very useful in an EmComm setting. It can also be used for e-mail, if connected to a radio with Internet access.

Chris's primary radio is her ICOM ID-80AD handheld, which is connected to her computer via an interface designed and built by the Baton Rouge Amateur Radio Club in Louisiana. The kitchen, by the way, belongs to WSARC Vice President Ken Iverson, AB7X, and his wife, Cora Poletz, W7COR. Chris was there for Ken's help in installing and setting up the FLdigi and EasyPal software. *(Cover photo by Larry Mulvehill, WB2ZPI)*

# Reader Survey November 2013

We'd like to know more about you … and especially what's important to you in ham radio and how we at *CQ* can help serve you better. If you're a regular reader of these surveys, you'll notice that **there is no longer a pull-out card** to fill in and return. Instead, you may:

*** Respond to the survey online** at <www.surveymonkey.com/s/CQNov13> [From the digital edition, just click on the link].

—**OR**—

*** Cut out or photocopy** this page

*** Circle the numbers** that correspond to your answers

*** Mail your completed survey to:** November Reader Survey, CQ magazine, 25 Newbridge Rd., Hicksville, NY 11801.

We will continue to select one respondent to each survey to receive a free one-year subscription (or extension) to *CQ*. This month, with Christmas right around the corner, we'd like to find out what's on your ham radio holiday wish list. (Feel free to leave a copy of this survey where one of Santa's helpers can "accidentally" see it!)

**1. Do you hope/expect to receive at least one ham radio-related gift this year?**

Yes . . . . . 1
No . . . . . 2
Don't know . . . . . 3

**2. Do you plan to give someone else a ham radio-related gift this year?**

Yes . . . . . 4
No . . . . . 5
Don't know . . . . . 6

**3. If you could receive *only one* ham radio-related gift this year, what would it be? (Select only one)**

HF transceiver . . . . . 7
VHF/UHF transceiver . . . . . 8
HF antenna . . . . . 9
VHF/UHF antenna . . . . . 10
Tower . . . . . 11
Station accessory . . . . . 12
Ham-related computer software (including "apps") . . . . . 13
A new or renewed subscription to *CQ* or one of its sister publications . . . . . 14
Other (please tell us what) . . . . . 15
None . . . . . 16

**4. If you could get *two* ham radio-related gifts this holiday season, what would *the second one* be? (Select only one)**

HF transceiver . . . . . 17
VHF/UHF transceiver . . . . . 18
HF antenna . . . . . 19
VHF/UHF antenna . . . . . 20
Tower . . . . . 21
Station accessory . . . . . 22
Ham-related computer software (including "apps") . . . . . 23
A new or renewed subscription to *CQ* or one of its sister publications . . . . . 24
Other (please tell us what) . . . . . 25
None . . . . . 26

**5. What type of equipment would you most like to receive? (Select only one)**

New commercially-built gear . . . . . 27
New kit(s) to build . . . . . 28
Used equipment to operate, modify or repair . . . . . 29
Parts from which to build my own equipment . . . . . 30

**6. Broadly speaking, what would you like to accomplish with any new equipment/accessories you may receive? (Select only one)**

Enhance my station's capabilities for bands/modes I already use . . . . . 31
Enhance my station's capabilities by adding new bands/modes . . . . . 32
Add a new dimension to my station's capabilities
(e.g., adding a mobile or portable station) . . . . . 33
Make operation of my station easier and/or more flexible . . . . . 34
Learn more about a current aspect of my ham activities . . . . . 35
Learn about a new aspect of amateur radio . . . . . 36
Other (please tell us what) . . . . . 37

**Survey Response for Issue:** _____

**Name** _____ **Call Sign** _____

**Address** _____

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

**Country** _____

**E-mail** _____

## What You've Told Us...

Our July survey asked about your summertime operating activities. For most of you who responded, summer doesn't seem to change your habits very much, with 70% reporting no difference in levels of activity during the summer. On the other hand, 26% say the hot weather slows down their hamming, and only 4% say they're more active in summer than at other times of the year.

About two-thirds of you take advantage of summer weather to do antenna and tower work, while about one-quarter of you do more operating away from home during the summer than at other times (27% outdoor; 26% portable; 24% mobile); followed by more public service operating (16%), ragchewing (14%), DXing (11%) and contesting (7%).

We asked the DXers and contesters among you how they compensate for seasonal lows in their favorite activities. Two thirds of them say they work whatever DX is available; 43% focus on off-air ham activities such as antenna work and building, and 38% spend more time doing non ham-radio activities. In addition, 28% keep their competitive skills up by operating in state QSO parties and 16% shift their focus to VHF/UHF contesting, where summer brings better propagation conditions.

Finally, we asked everyone which summertime ham radio social activities were on their calendars. Two-thirds of you go to at least one summer hamfest; 56% attend Field Day, and 50% go to club meetings. Interestingly, only 32% of you attend club picnics, while 16% of avoid ham radio social contact altogether!

This month's free subscription winner is David Cowart, KR4OE, of Fayetteville, North Carolina.

BY TED MELINOSKY,* K1BV

# Awards to Commemorate Famous Roads

A few years ago, after completing the USA-CA award, I dragged my entire QSL collection out of storage, and compiled an alphabetic list of all the different prefixes in preparation for applying for the WPX award. I'm glad I never lost that card collection in the four QTH moves during my working career. After compiling the list of prefixes, I have enthusiastically chased prefix QSOs when not playing contester. It's like a DXCC that never ends.

Recently, I went through the procedure applying for and entering the ARRL LOTW (Logbook of the World) program. Some day, USA-CA will be extended to use this QSL database and it would be good to be familiar with how it works.

Once I got through the "secret password" and installation of the cryptic "TQSL" files, I found the procedure of uploading existing ADIF files to ARRL and converting some paper logs to ADIF files to be pretty easy. Once it was up and running, to my pleasure, I found that about 150 new prefixes could be added to my WPX totals.

LOTW (when it supports USA-CA) will probably have the same benefit for most county hunters, since County is a field which is already collected when you establish your account. LOTW, just like eQSL, does not easily support mobile operations, but every contact that matches your QSO input data will carry a county name with it. And lots of them could be NEW. And that's a good thing.

*12 Wells Woods Rd., Columbia, CT 06237
e-mail: <k1bv@charter.net>


*Germany's Via Regia Award*

### USA-CA Special Honor Roll

Leslie Johnson WA4EEZ
USA-CA All Counties #1236
August 5, 2013

### USA-CA Honor Roll

| 500 | | 2000 | |
|---|---|---|---|
| OD5ZZ | 3612 | WA4EEZ | 1434 |
| **1000** | | **2500** | |
| WA4EEZ | 1844 | WA4EEZ | 1351 |
| **1500** | | **2500** | |
| WA4EEZ | 1550 | WA4EEZ | 1262 |

The total number of counties for credit for the United States of America Counties Award is 3077. The basic award fee for subscribers is $6.00. For nonsubscribers it is $12.00. To qualify for the special subscriber rate, please send a recent CQ mailing label with your application. Initial application may be submitted in the USA-CA Record Book, which may be obtained from CQ Magazine, 25 Newbridge Road, Hicksville, NY 11801 USA for $2.50, or by a PC-printed computer listing which is in alphabetical order by state and county within the state. To be eligible for the USA-CA Award, applicants must comply with the rules of the program as set forth in the revised USA-CA Rules and Program dated June 1, 2000. A complete copy of the rules may be obtained by sending an SASE to Ted Melinosky, K1BV, 12 Wells Woods Road, Columbia, CT 06237 USA. DX stations must include extra postage for airmail reply.

The general theme of the awards featured this month is traveling and the roads we travel on. A number of awards are available that commemorate famous roads for either their importance to early travel or their importance for connecting distant parts of the country together.

## Germany: Via Regia Award

This award is named for the oldest and longest roadway between eastern and western Europe. It has existed for more than 2,000 years and connects eight European countries over its 4,500 km length. To promote amateur radio activities along this historic street, the DARC Ortsverband Schöneck (F75) sponsors the Via Regia award to all licensed radio amateurs and SWLs for proven contacts after 1 January 2010.

The award requires earning a minimum of 100 points.

1. On shortwave, contacts with all eight countries (Spain (EA), France (F), Belgium (ON), Germany (DL), Poland (SP), Ukraine (UR), Belarus (EU), Lithuania (LY)) are required .
2. Each contact with a station in these countries counts 5 points.
3. A contact with a station in the regional association Schöneck (F75) or Nidderau (F31) is worth 10 points, a contact with a club station of the two chapters is worth 20 points.

Send GCR list by regular post or e-mail to viaregiaaward@googlemail.com. There are no band or mode restrictions. Each station can be counted only once per band. Relay or EchoLink contacts are allowed.

The diploma is free of charge and will be sent as a PDF file. If a printed version is desired, the cost is 5 (Bank Wire Transfer Information, please inquire via email). Mailing address of the custodian is: Jurgen Keller DL4YCD, Am Neuberg 8, D-61137 Schoneck, GERMANY.E-mail: Jürgen Keller, DL4YCD, viaregiaaward@googlemail.com.

Internet: <http://www.darc.de/distrikte/f/yls-in-hessen/diplome-hessischer-ortsverbaende/via-regia-award/>


*Germany's Romantic Road Award is almost as pretty as the views along the road itself.*

Also: <http://www.via-regia.org/eng/news/news10/news03_10.php>.

## Germany: Romantic Road Award

The Romantic Road (Romantische Strasse) is one of Germany's most famous tourist routes, a road which travels between the towns of Wurzburg in Franconia and Fussen in the Bavarian Alps. The road will take you past incredibly preserved medieval walled towns (Rothenburg), the "Modern" Neuschwanstein Castle, built in the 1880s by King Ludwig II of Bavaria, and lovely mountain vistas.

The rules require working cities and towns either by name or by the "DOK" number, which is the alpha-numeric reference number given to a club by the German version of ARRL. This reference number (A23, B18, etc.) is almost invariably found on each German QSL card in your collection.

The Romantic Road award may be earned by all amateurs and SWLs by contacting amateurs in cities along the "Romantic Road." For DLs and European stations, 50 points must be earned. For all others and on VHF, 25 points are needed. HF and VHF are separate awards. Phone QSOs = 1 point, CW = 2, other modes = 3 each.

Contacts with stations in DOK T09 count double. The cities along the Romantic Road are Würzburg, Tauberbischofsheim, Bad Mergentheim, Rotenburg o.T., Feuchtwangen, Dinkelsbühl, Nördlingen, Harburg, Donauwörth, Augsburg, Landsberg, Schongau and Fussen. The following DOK's count: A23 A46 B02 B17 B18 B22 C20 C21 C36 P25 T01 T06 T09 T11 T17 T21 Z30 and Z52. GCR list and fee of 5 to: Martin Rudler DG3MR, Sudetenstrasse 12, 86738 Deiningen, Germany.

Internet: http://amateurfunknoerdlingen.de/file00013.html
E-mail: DG3MR@gmx.de


*Diploma Imperium Romanum Award.*

## Italy: Diploma Imperium Romanum

The Roman Empire at the height of its power was enormous and included areas acquired during the leadership of Trajan, Hadrian, Antoninus Pius and Marcus Aurelius. In all of the territories of the empire, the Romans built towns, roads, bridges, aqueducts and fortifications, exporting everywhere a pattern of civilization and the power to assimilate populations and civilizations so thoroughly, that even centuries after the end of the empire, those peoples continued to call themselves Roman.

This award may be earned by making contacts with all of the regions and countries which now exist which, in the past were part of the Roman Empire. Contacts for the award count if made on or after 1-1-1990. SWL OK. All bands and modes OK. Send a log extract to <ik0ike@libero.it> with all QSO information and the signed statement that contacts have been made in full compliance with the amateur radio rules. The manager reserves the right if in doubt to ask for the appropriate cards. The award fee is 15 . For more information about the award and instructions for electronic payment, write to: Manager Gianfranco, IK0IKE, <ik0ike@libero.it> .

List of countries in the territory of the Roman Empire:

1. ZA Albania
2. 7X Algeria
3. C3 Andorra
4. EK Armenia
5. OE Austria
6. 4K Azerbaijan
7. EA6 Balearic Is
8. ON Belgium
9. T9 Bosnia-Herzegovina
10. LZ Bulgaria
11. OK Czech Rep.
12. EA9 Ceuta & Melilla
13. 5B Cyprus Isl
14. ZC4 Cyprus UK Base

## Leslie Johnson WA4EEZ, USA-CA #1236
## August 5, 2013

*Leslie Johnson, WA4EEZ, completed her USA-CA Award 51 years after beginning to collect counties!*

Ameco Code Records—remember those? My OM, K4SHI, was listening to them back in 1961 after he came home from work. While he worked on his code, I would be cooking dinner, so I couldn't help but hear all those dits and dahs. Before long, I knew the code fairly well (at least to copy it!) and shortly afterward, I took the Tech and Novice tests. In December 1961, I became WN4EEZ and WA4EEZ at the ripe old age of 17. I became very active on the VHF bands; made many, many contacts; got my CW speed up with my J-38 on the Novice bands; participated in a Field Day; and even stood by on a local emergency net with Nancy, WA4EDL, during the Cuban Missile Crisis.

Before long, I got some QSL cards returned, and noticed that I had worked different states and counties—the Florida Skip Magazine offered a "Worked all Florida Counties" award, so I kept that in mind as I worked along. (*Note*: The Worked All Florida Counties Award is now administered by The Florida Contest Group) The Clegg 99'er (8 watts) and Globe Hi-Bander 6n2 (50 watts) were two rigs I used in those early days. I built a Heathkit HX-11, which I enjoyed building AND using! I even got into the CQWW VHF contest in 1963 and got a nice certificate for "High Scorer" in the "Florida" section. Somewhere in there, however, a hurricane came along and took down my beloved Finco 6n2 beam. I was off the air until 1977, when I got my General license and put up a vertical for HF. Unfortunately, shortly afterward we got two lightning hits that destroyed most all of our ham gear. I became busy with work and family until 1999, when a couple of our ham friends insisted on helping us get back on the air.

Wow—10m was hopping and I was hooked all over again!! Managed to confirm 500 counties on 10m for the USA-CA-500 award. When the sunspots disappeared, I migrated to HF; began learning about the digital modes—PSK, Hell, RTTY; got into some of the smaller contests and began to see a steady increase in my county total. However, I didn't really believe I could ever get them all—but thought maybe 1000 might be doable. Gosh, maybe even 2000. By this time I was using an Icom 756 Pro II at 100 watts, and all wire antennas for 80-10m.

One fine day in late 2004, I came across the CHN (County Hunters' Net) on 14.336 MHz and began to work on my counties a bit more diligently! I had maybe 1100 counties by then. I learned how to make out the MRCs and use the MARAC QSL Manager service. Hey, this is the way to go!

The final impetus for my county-hunting came when I attended the memorial service for Wendy, KB1AF. She was a member of our local club, and a truly delightful person. She had been very active on the airwaves here locally, despite many health issues. At her service, her USA-CA 3077 Number 952 was displayed, and I determined at that moment to try for all 3077 counties in Wendy's honor.

I continued collecting counties passively, using ragchews and contests and got back onto the CHN's pretty much full time in 2011, when I came across the 40m CH folks on 7.188....Scottie, N4AAT and Joe, N5UZW helped me get started again, and the chase was on! Before too long, using various bands and modes, I had about 1500, then 2500, and then 3000 counties confirmed....

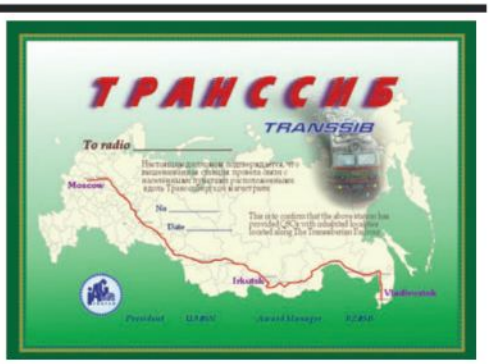
The last three counties seemed to take forever (although it was less than a month, actually). Petroleum, MT—Benton, OR—and Traverse MN. Petroleum County, MT was being run by two mobiles at the same time—WQ7A/m on 20 SSB, and N4CD/m on 20m CW...what to do?...somehow I managed to work them both at 1805z. WQ7A got Benton, OR for me and that left ONE to go! Thanks to Brian, NX0X and his XYL Shari, KB0MHH, Traverse MN—Number 3077 is in the log!

My heartfelt gratitude to all the mobiles, net control stations, contesters, ragchewers, and card checkers who helped me so much along the way! It has taken me 51 years—what a fantastic journey! *73 and good hunting! Leslie, WA4EEZ*

15. HV Vatican City
16. TK Corsica Isl
17. SV9 Crete Isl
18. 9A Croatia
19. SV5 Dodecanese Isl
20. SU Egypt
21. F France
22. 4L Georgia
23. DL Germany
24. ZB2 Gibraltar
25. JY Jordan
26. Great Britain
27. SV Greece
28. OJ Guernsey
29. EP Iran
30. YI Iraq
31. 4Z Israel
32. I Italy
33. GJ Jersey
34. OD Lebanon
35. 5A Libya
36. HB0 Liechtenstein
37. LX Luxembourg
38. Z3 Macedonia
39. 9H Malta Isl
40. GD Man Isl
41. CN Morocco
42. 3A Monaco
43. ER Moldova
44. SV1A Mount Athos
45. 4O Montenegro
46. PA Netherlands
47. E4 Palestine
48. SP Poland
49. CT Portugal
50. YO Romania
51. 1A0 S.M.O.M.
52. T77 S. Marino Rep
53. IS0 Sardinia Isl
54. GM Scotland
55. OM Slovak Rep
56. IT9 Sicily Isl
57. YK Syria
58. S5 Slovenia
59. EA Spain
60. HB Switzerland
61. 3V Tunisia
62. TA Turkey
63. HA Hungary
64. YU Yugoslavia/Serbia
65. GW Wales
66. I0- IK-IZ IW QSO with Rome

## Russia's Irkutsk Awards Group Series: The Transsiberian Award

The Irkutsk Group sponsors several awards, and one of these publicizes the famous Trans-Siberian Railway, which crosses huge distances (5,753 miles), spans seven time zones and takes eight days to complete the journey from Moscow to Vladivostok. Begun in 1891, it took 25 years to complete the initial phase. It was the first reliable "road" to open easier travel and commerce between Moscow and its Far East provinces.




*Transsiberian Award that commemorates the famous route of the Transsiberian Railway.*

Make contact with amateurs in the three cities which form the beginning (Moscow UA3), middle, Irkutsk City (UA0S) and eastern terminus of Vladivostok (UA0L) of this legendary railroad. The three contacts may be made on any band or mode after August 1, 2005. Endorsements are issued for contacts made by one band, all with one mode or with low power. Send GCR list containing usual QSO data plus name of the city and fee of 10 IRC or $US10. Endorsement fee is 4 IRC.

Apply to: Arkady Erbaev, RZ0SB, PO Box 285, Irkutsk 664033, Russia. SWL OK. Fee information is found in each set of rules for different awards.

Internet: http://www.awardgroup.org/ru/iag.html
E-mail: rz0sb@angara.ru

---

We are always interested in learning of new awards for publication in this column. Please contact me with details and a sample of the certificate. 73, Ted, K1BV

BY WAYNE MILLS,* N7NG

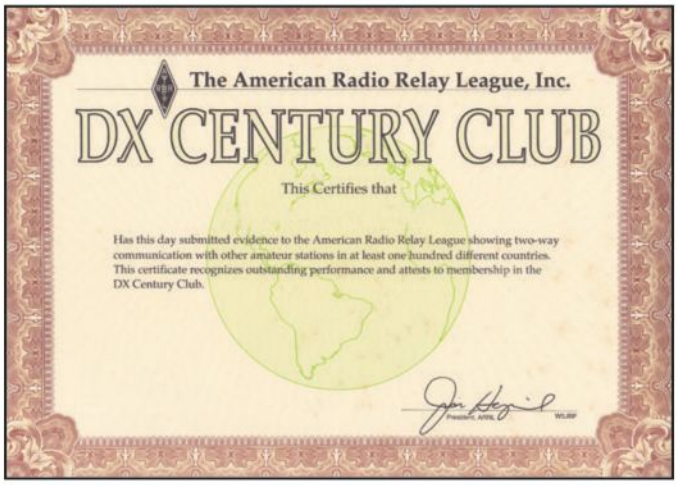
# DXCC and the Law of Unintended Consequences — The DXAC's New Assignment

## COMMENTARY

Many of us know by now that the ARRL DX Advisory Committee has a new task. Just over 15 years ago—in 1998—the ARRL Board of Directors adopted a revised set of rules for the League's DXCC program. One of the most important elements in the new rules was a revised political country criterion, the definition of a sovereign political entity. Almost from the beginning, the country criteria had been contentious, and after the ARRL staff—the Awards Committee—abdicated its role in these matters in the '70s, discussions within the DXAC about new countries usually deteriorated into fitful arguments between those members who wanted "new ones" and those who didn't.

The 1998 political country criteria were designed by the so-called DXCC-2000 Committee to eliminate these arguments. The committee designed criteria consisting of three "bright line" conditions that were intended to leave the arguments to others, non-DXers. The criteria depended on the United Nations (UN), The International Telecommunications Union (ITU), and the International Amateur Radio Union (IARU). This package worked well until it was altered in January 2004. The particular provision that was altered was the so-called IARU Rule, which designated an entity a *political entity* if it had its own separate IARU society. Although the IARU rule worked well initially, it had a potential consequence that led to its removal.

*P.O. Box 1945, Jackson, WY 83001-1945
e-mail: <n7ng@cq-amateur-radio.com>




Because separations (usually islands) need to be only 350 km from parent (political) entities to count as separate countries, the political status of an entity is important. If an entity is not a political one, the required distance is 800 km.

After March 1998, new IARU societies in places such as New Caledonia and Pitcairn led to new

*Kan, JA1BK, making the first QSO at Swains Island in July, 2006 soon after Swains was added to the DXCC country list.*

*Martti Laine, OH2BH, and two old friends, Zorro Miyazawa, JH1AJT, and Kan Mizoguchi, JA1BK, at the Tokyo Ham Fair in August, 2013.*

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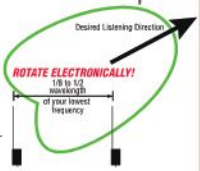


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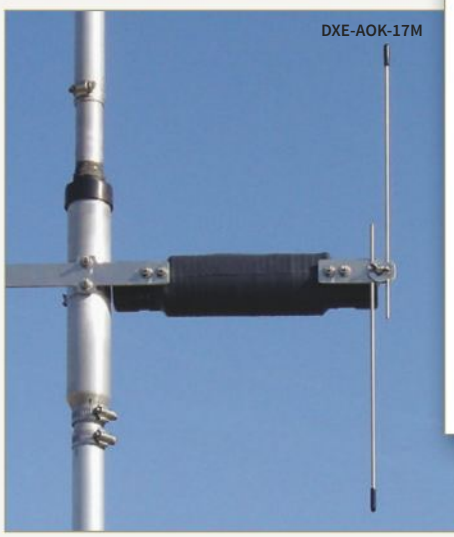



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| DXE-HSR-6BTV-P | 10, 15, 20, 30, 40, 75-80M | $454.00 |

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DXCC entities such as the Chesterfields and Ducie Island. Up to this point, all was well. This is all very complicated, but suffice to say, the IARU rule allowed certain entities to become DXCC "countries" where they hadn't previously counted.

Under the new rules, an initiative was begun by JA1BK to make Swains Island count for DXCC credit. (Why is this important? For an answer, let me suggest that you talk to a Dxpeditioner.) In order to make that happen, American Samoa had to become a point one country. One way to make that happen would be to create a new IARU society for American Samoa as had been previously done with several other entities. So, a petition was submitted to the IARU, Region 3 asking for a separate IARU society for that entity.

During the DXCC-2000 Committee deliberations, the committee considered that a certain amount of pressure might be applied to the IARU in order to change conditions that would create new countries. We were assured, however, that the IARU folks would be able to deal with any pressure. Indeed, the IARU handled its part very well. We assumed that should the creation of a new IARU society be ill-advised or unwarranted, the IARU would reject an application.

Article II, Paragraph 2 of the IARU constitution states that "There shall be only one Member-Society representing a country or separate territory." If American Samoa were to have its own IARU society, the political situation in Region 3 might be altered, and in

## The WPX Program

### CW

| | |
|---|---|
| 3409.....DM5JBN | 3449 .....K1GG |
| 3442 .....G3ZRN | 3452 .....4L1MA |
| 3444.....JR3UIC | 3453 .....G3SEN |
| 3446.....JF2OHQ | 3454.....IV3ARJ |
| 3448 .....N2SO | 3455 .....UR1MA |

### SSB

| | |
|---|---|
| 3346.....S54A | 3365.....4L1MA |
| 3356 .....YV4FJJ | 3366.....WA2VQV |
| 3360 .....IZ2BVN | 3367 .....PP5VB |
| 3361 .....PB2A | 3368.....IZ1JLG |
| 3362 .....K1GG | 3369 .....IV3ARJ |
| 3363 .....PY5VC | 3370.....UR1MA |
| 3364.....FG8OJ | |

### Mixed

| | |
|---|---|
| 2554.....WX7SJ | 2569 .....W7JET |
| 2558.....PY3IT | 2570 .....KX7YT |
| 2561.....IW2FLB | 2571 .....IK2DZN |
| 2560 .....JR3UIC | 2572.....RA1QY |
| 2562.....RU6JL | 2573 .....N1RB |
| 2563 .....K6XN | 2574.....K5WL |
| 2564.....IW4APR | 2575 .....PY5VC |
| 2565.....A61DJ | 2577.....4L1MA |
| 2566.....JI1SAI | 2578.....WA2VQV |
| 2567 .....PB2A | 2579 .....LZ3RN |
| 2568 .....K1GG | 2580.....UR1MA |

### Digital

| | |
|---|---|
| 217.....S54A | 229.....A61DJ |
| 225 .....JR3UIC | 230 .....PB2A |
| 226.....AHØU | 231.....WA2VQV |
| 227 .....RA3LAS | 232 .....IV3ARJ |
| 228.....IW4APR | |

**CW:** 350 WX7SJ, K1GG. 400 DM5JBN. 450 JR3UIC. 600 IZØDBA, UR1MA. 700 K3VAT, N2SO. 750 JJ1BDX. 1500 WA2VQV. 1900 S54A. 2700 IK2DZN. 2950 IØNNY. 3800 W8IQ. 3900 WA5VGI. 4900 N4NO

**SSB:** 350 YV4FJJ. 400 K4HKB, K1GG, PY5VC, PB2A. 500 K7LY. 600 UR1MA. 650 K3CWF. 700 N3JON. 1100 S54A. 1150 IZ1JLG. 3850 N4NO

**Mixed:** 450 PY5VC. 500 AE4WG, DM5JBN. 550 K1GG, PY3IT, FG8OJ. 600 IZØDBA, K7LY, A61DJ, WB4VMH. 650 PB2A. 750 K4JKB, N2SO. 800 WA4WKL. 850 JR3UIC, N2SO. 950 JJ1BDX. 1000 UR1MA. 1050 RA1QY, K3VAT. 1150 KB9OWD. 1200 K3CWF. 1550 WA2VQV. 1700 JJ2LPV. 2300 S54A. 3000 IK2DZN. 5450 N4NO.

**Digital:** 350 K4JKB, IW4APR. 400 RA3LAS, WU9D. 550 JR3UIC, A61DJ. 700 K3CWF. 1100 S54A. 1300 IK2DZN.

**160 Meters:** K4JKB, K1GG, W7JETM UR1MI
**80 Meters:** 4L1MA
**40 Meters:** K4JKB, KB1ODO,JR3UIC, 4L1MA, K3VAT, UR1MI
**20 Meters:** 4L1MA, UR1MI
**15 Meters:** JR3UIC, A61DJ, 4L1MA, UR1MI
**10 Meters:** 4L1MA, UR1MI

**Africa:** 4L1MA, UR1MI
**Asia:** IZØDBA, JH2OHQ, JR3UIC, A61DJ, 4L1MA, UR1MI
**Europe:** IZ2BVN, RU6JL, KB9OWD, JG5UWK, JI1SAI, K1GG, JR3UIC, A61DJ, N2SO, PY3IT, PB2A, DM5JBN, 4L1MA, UR1MI
**Oceania:** JR3UIC, 4L1MA,UR1MI
**North America:** IW2FLB, JJ1BDX, K6XN, K1GG, N2SO, W7JET, AE4WG, FG8OJ, PB2A, 4L1MA, UR1MI
**South America:** 4L1MA, UR1MI, K3CWF

**Award of Excellence:** 4L1MA
**Award of Excellence with 160 Bar:** UR1MI, IV3ARJ

**Award of Excellence Holders:** N4MM, W4CRW, K5UR, K2VV, VE3XN, DL1MDD, DJ7CX, DL3RK, WB4SIJ, DL7AA, ON4QX, 9A2AA, OK3EA, OK1MP, N4NO, ZL3GO, W4BQY, IØJX, WA1JMP, KØJN, W4VQ, KF2O, WB8CNL, W1JR, F9RM, W5UR, CT1FL, WA4QMQ, W8ILC, VE7DP, K9BG, W1CU, G4BUE, N3ED, LU3YL/W4, NN4Q, KA3A, VE7WJ, VE7IG, N2AC, W9NUF, N4NX, SMØDJZ, DK5AD, WD9IIC, W3ARK, LA7JO, VK4SS, I8YRK, SMØAJU, N5TV, W6OUL, WB8ZRL, WA8YTM, SM6DHU, N4KE, I2UIY, I4EAT, VK9NS, DEØDXM, DK4SY, UR2QD, AB9O, FM5WD, I2DMK, SM6CST, VE1NG, I1JQJ, PY2DBU, HI8LC, KA5W, K3UA, HA8UB, HA8XX, K7LJ, SM3EVR, K2SHZ, UP1BZZ, EA7OH, K2POA, N6JV, W2HG, ONL-4003, W5AWT, N3XX, HB9CSA, F6BVB, YU7SF, DF1SD, K7CU, I1POR, K9LJN, YBØTK, K9QFR, 9A2NA, W4UW, NXØI, WB4RUA, I6DQE, I1EEW, I8RFD, I3CRW, VE3MS, NE4F, KC8PG, F1HWB, ZP5JCY, KA5RNH, IV3PVD, CT1YH, ZS6EZ, KC7EM, YU1AB, IK2ILH, DEØDAQ, I1WXY, LU1DOW, N1IR, IK4GME, VE9RJ, NN1N, HB9AUT, KC6X, N6IBF, W5ODD, IØRIZ, I2MQP, F6HMJ, HB9DDZ, WØULU, K9XR, JAØSU, I5ZJK, I2EOW, IK2MRZ, KS4S, KA1CLV, WZ1R, CT4UW, KØIFL, WT3W, IN3NJB, S50A, IK1GPG, AA6WJ, W3AP, OE1EMN, W9IL, I7PXV, S53EO, DF7GK, S57J, EA5BM, DL1EY, DJ1YH, KUØA, VE2UW, 9A9R, UAØFZ, DJ3JSW, OE6CLE, HB9BIN, N1KC, SM5DAC, RW9SG, WA3GNW, S51U, W4MS, I2EAY, RAØFU, CT4NH, EA7TV, W9IAL, LY3BA, K1NU, W1TE, UA3AP, EA5AT, OK1DWC, KX1A, IZ5BAM, K4LQ, KØKG, DL6ATM, VE9FX, DL2CHN, W2OO, AI6Z, RU3DX, WB9IHH, CT1EEN, G4PWA, OK1FED, EU1TT, S53MJ, DL2KQ, RA1AOB, KT2C, UA9CGL, AE5B, KØDEQ, DKØPM, SV1EOS, UAØFAI, N4GG, UA4RZ, 7K3QPL, EW1CQ., UA4LY, RZ3DX, UA3AIO, UA4RC, N8BJQ, UA3BS, UA9FGR, UT3UY, WA5VGI, UT9FJ, UT4EK, K9UQN, UR5FEO, LY2MM, N3RC, OH3MKH, RA3CQ, UT3IZ, S55SL, RU3ZX, YO9HP, RA3DNC, K8ZT, KE5K, JH8BOE, TF8GX, S58MU, UX1AA, AB1J, DM3FZN, AG4W, UA3QNS, RX3AGD, WB5JID, LY3W, LY5W, RW4WZ, VO1CV, VE1YX, DK8MCT, HB9DDO, DL4CW, W9RPM, IZ3ENH, DM2DXA, EY8MM, K4HB, K6ND, TF3Y, K4CN, W1RM, W3LL, 4Z1UF, W3UA, N8VV, HA8QC, LU5OM, US3IZ, RV9CX, K6UM, RWØLT.

**160 Meter Endorsements:** N4MM, W4CRW, K5UR, VE3XN, DL3RK, OK1MP, N4NO, W4BQY, W4VQ, KF2O, W8CNL, W1JR, W5UR, W8ILC, K9BG, W1CU, G4BUE, LU3YL/W4, NN4Q, VE7WJ, VE7IG, W9NUF, N4NX, SMØDJZ, DK5AD, W3ARK, LA7JO, SMØAJU, N5TV, W6OUL, N4KE, I2UIY, I4EAT, VK9NS, DEØDXM, UR2QD, AB9O, FM5WD, SM6CST, I1JQJ, PY2DBU, HI8LC, KA5W, K3UA, K7LJ, SM3EVR, UP1BZZ, K2POF, IT9TQH, N6JV, ONL-4003, W5AWT, N3XX, F6BVB, YU7SF, DF1SD, K7CU, I1POR, K9LJN, YBØTK, K9QFR, W4UW, NXØI, WB4RUA, I1EEW, ZP5JCY, KA5RNH, IV3PVD, CT1YH, ZS6EZ, YU1AB, IK4GME, NN1N, W5ODD, IØRIZ, I2MQP, F6HMJ, HB9DDZ, K9XR, JAØSU, I5ZJK, I2EOW, KS4S, KA1CLV, KØIFL, WT3W, IN3NJB, S50A, IK1GPG, AA6WJ, W3AP, S53EO, S57J, DL1EY, DJ1YH, KUØA, VR2UW, UAØFZ, DJ3JSW, OE6CLD, HB9BIN, N1KC, SM5DAC, S51U, RAØFU, CT4NH, EA7TV, LY3BA, K1NU, W1TE, UA3AP, OK1DWC, KX1A, IZ5BAM, DL6ATM, W2OO, RU3DX, WB9IHH, G4PWA, OK1FED, EU1TT, S53MJ, DL2KQ, RA1AOB, UA9CGL, SM6DHU, KØDEQ, DKØPM, SV1EOS, N4GG, UA4RZ, 7K3QPL, EW1CQ, UA4LY, RZ3DX, UA3AIO, UA4RC, N8BJQ, UA3BS, UA9FGR, UT3UY, WA5VGI, UT9FJ, UR5FEO, N3RC, UT3IZ, RU3ZX, YO9HP, RA3DNC, K8ZT, KE5K, JH8BOE, S58MU, UX1AA, DM3FZN, AG4W, UA3QNS, RX3AGD, LY3W, LY5W, VO1CV, HB9DDO, DL4CW, W9RPM, IZ3ENH, DM2DXA, EY8MM, K4HB, K6ND, W1RM, W3LL, 4Z1UF, W3UA, RV9CX, K6UM.

Complete rules and application forms may be obtained by sending a business-size, self-addressed, stamped envelope (foreign stations send extra postage for airmail) to "CQ WPX Awards," P.O. Box 355, New Carlisle, OH 45344 USA. Note: WPX will now accept prefixes/calls, which have been confirmed by eQSL.cc. and the ARRL Logbook of The World (LoTW).

*Please Note: The price of the 160, 30, 17, 12, 6, and Digital bars for the Award of Excellence are $6.50 each.

## 5 Band WAZ

**As of September 1, 2013 1836 stations have attained at least the 150-zone level, and 908 stations have attained the 200-zone level.**

**The top contenders for 5 Band WAZ (zones needed on 80 or other if indicated): CHANGES shown in BOLD.**

N4NX, 199 (26)
KØQC, 199 (26)
W4DC, 199 (24)
N4WW, 199 (26)
W4LI, 199 (26)
K7UR, 199 (34)
IK8BQE, 199 (31)
JA2IVK, 199 (34 on 40 )
IK1AOD, 199 (1)
VO1FB, 199 (19)
KZ4V, 199 (26)
W6DN, 199 (17)
W3NO, 199 (26)
RU3FM, 199 (1)
N3UN, 199 (18)
W1FZ, 199 (26)
SM7BI, 199 (31)
LU4OM, 199 (34)
EA7GF, 199 (1)
JA5IU, 199 (2)
RU3DX, 199 (6)
N4XR, 199 (27)
HA5AGS, 199 (1)
JH7CFX, 199 (2)
W6OUL, 198 (37,40)
EA5RM, 198 (1,19)
N8LJ, 198 (17,24)
EA5BCX, 198 (27,39)
G3KDB, 198 (1,12)
JA1DM, 198 (2,40)
9A5I, 198 (1,16)
G3KMQ, 198 (1, 27)
N2QT, 198 (23,24)
OK1DWC, 198 (6, 31)
W4UM, 198 (18,23)
US7MM, 198 (2,6)
K2TK, 198 (23, 24)
K3JGJ, 198 (24,26)
F5NBU, 198 (19,31)
W9XY, 198 (22,26)
KZ2I, 198 (24,26)
W9RN, 198 (26,19 on 40)
W5CWQ, 198 (17,18)
UA4LY, 198 (6 and 2 on 10)
JA7XBG, 198 (2 on 80 & 10)
JA3GN, 198 (2 on 80 & 40)
N4GG, 198 (18,24)
K4JLD, 198 (18,24)
RA6AX, 199 (6 on 10)
RX4HZ, 199 (13 )
S58Q, 199 (31)
K8PT, 199 (26)
N8AA, 199 (23)
IZ1ANU, 199 (1)
IN3ZNR, 199 (1)
JK1BSM, 199 (2)
RWØLT, 199 (2 on 40)
JA1CMD, 199 (2)
I5REA, 199 (31)
**RZ3EC, 199 (1 on 40)**
**W1FJ, 199 (24)**

**The following have qualified for the basic 5 Band WAZ Award:**

F4GTB (156 zones)
JR3UIC (170 zones)
K4MWB (195 zones)

**5 Band WAZ updates:**

W7/DL1UF (200 zones)
F8DHE (190 zones)
RZ3EC (199 zones)

***Please note: Cost of the 5 Band WAZ Plaque is $100 shipped within the U.S.; $120 all foreign (sent airmail).**

Rules and applications for the WAZ program may be obtained by sending a large SAE with two units of postage or an address label and $1.00 to: WAZ Award Manager, Floyd Gerald, N5FG, P.O. Box 449, Wiggins, MS 39577-0449. The processing fee for the 5BWAZ award is $10.00 for subscribers (please include your most recent *CQ* mailing label or a copy) and $15.00 for nonsubscribers. An endorsement fee of $2.00 for subscribers and $5.00 for nonsubscribers is charged for each additional 10 zones confirmed. Please make all checks payable to Floyd Gerald. Applicants sending QSL cards to a *CQ* checkpoint or the Award Manager must include return postage. N5FG may also be reached via e-mail: <n5fg@cq-amateur-radio.com>.

fact, because of this provision, ARRL might eventually lose its vote in IARU Region 3.

After much discussion at the January 2004 ARRL Board of Directors meeting, the Board agreed—reluctantly—to eliminate the IARU rule. A highly placed ARRL official later said that "this probably wasn't the best solution to the problem." Indeed, from a DXCC point of view, it was not. (Although the IARU rule was scrapped, American Samoa *was* eventually converted into a point one entity, enabling Swains to gain DXCC country status. What and who drove this, and how it was implemented is a story for another column.)

## The WAZ Program

### 6 Meters

116 .....UT9FJ (25 zones)

### 12 Meters CW

76 .....LZ1XZ

### 17 Meters CW

100 .....LZ1XZ

### 30 Meters CW

121 .....LZ1XZ

### All Band WAZ Mixed

| | | | |
|---|---|---|---|
| 9041 | A61DJ | 9045 | K8LE |
| 9042 | N8DP | 9046 | WB8FLE |
| 9043 | UTØNN | 9047 | JA7KPE |
| 9044 | WR7Q | | |

### SSB

| | | | |
|---|---|---|---|
| 5269 | JA7HYS | 5270 | IZ1JLG |

### CW

| | | | |
|---|---|---|---|
| 722 | E74RG | 726 | YB2LSR |
| 723 | IK2DZN | 727 | JI1VAH |
| 724 | 6K5BXQ | 728 | N2AE |
| 725 | EI8JX | 729 | N7LPA |

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## The CQ DX Field Award Program

### Mixed

136.....K9YC

The basic award fee for subscribers to *CQ* is $6. For nonsubscribers, it is $12. In order to qualify for the reduced subscriber rate, please enclose your latest *CQ* mailing label with your application. Endorsement stickers are $1.00 each plus SASE. Updates not involving the issuance of a sticker are free. All updates and correspondence must include an SASE. Rules and application forms for the CQ DX Awards may be found on the <www.cq-amateur-radio.com> website, or may be obtained by sending a business-size, self-addressed, stamped envelope to CQ DX Awards Manager, Keith Gilbertson, KØKG, 21688 Sandy Beach Lane, Rochert, MN 56578-9604 USA. Please make all checks payable to the award manager.



With the demise of the "IARU" rule, an unfortunate unintended consequence arose. The DXCC political country criteria were then left to rely solely on decisions of the United Nations. If the UN refused to accept a new country as a member state, or if it refused to allow the International Telecommunications Union (a UN agency) to issue the new country a callsign prefix block, by its own rules, the DXCC program could not recognize the new country. As a result, after more than five years, the ARRL still finds itself in a position of not being able to recognize a nation recognized by over half of the member states of the UN—more than five years in *limbo* for Kosovo. *(Note: Significant progress in negotiations between Serbia, Kosovo, and the European Union is being reported as this is being written. Still, insufficient progress has been made in more than five years, and that in itself is not acceptable for the DXCC program.)*

Clearly, the creation of the IARU Rule had undesirable consequences. As such it might not have been the best choice of a bright-line criterion. Yet, simply eliminating it left a gaping hole in the DXCC criteria. The Board discussion and the concessions that led to the decision to eliminate the offending rule contained no solution. They did, however, include recognition by the members that it might be necessary to add a similar rule in the future. *That necessity has come to pass.*

At its July 2013 meeting, in a long-overdue response to this situation, the ARRL Board asked the DXAC to recon-

## CQ DX Awards Program

### CW

1146 .....E74RG

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sider *all* DXCC rules. Most of the rules are fine as they are, and the Board most likely intended that the DXAC emphasize two important areas. One is the rule concerning operator location and remote control. The other—of course—is the country criteria.

The DXAC and the Awards Committee should be able to frame new, updated remote control rules with little difficulty. Despite the desire in some quarters to return to the rules of the previous century, adapting the DXCC rules to current technology should be fairly straightforward.

The country criteria are another matter. Though it seems simple in the abstract, it won't be. Suitable country criteria must provide an alternative to the UN, where one vote among the permanent members of the Security Council can effectively trash the entire DXCC country criteria. Yet, "work-arounds" could have international political consequences that can impede other initiatives.

There are many potential Kosovos out there in the world, and the current scenario may very well repeat itself in the future. I believe we have learned something. The existing criteria have become very political. We must *add* a criterion that is independent of the UN. Perhaps recognition by a majority of UN member states is sufficiently generic. Whatever is chosen, the DXAC now has an opportunity to make a sensible recommendation.

# The DX University

In February 2010, Randy Johnson, W6SJ, wrote an Op-Ed piece in *QST* magazine entitled *DX Etiquette*. Randy opened his piece saying:

"Maybe it was because so little else was going on at the time that the Mellish Reef DXpedition was the only action in town. As I listened to the pileups, it was simply disgusting to hear."

He summed up his article by saying:

"In the final analysis, it's really not a matter of how the DXpedition was run. It's about how the rest of us deported ourselves. Let's show more respect and demonstrate that we appreciate the gifts that others give us."

Having been away from DXing for many years, Randy was appalled by the poor operating he heard upon returning. Many of us have had a similar re-introduction. Some of the reaction is poor memory, but there is some truth to it. (There is no doubt that some Dxers—when they believe they are acting anonymously—can be quite uninhibited.)

After receiving considerable support for his Op-Ed piece, Randy was encouraged to create the "DX Code of Conduct," which he then published on the website. Available in many

## THE WPX HONOR ROLL

The WPX Honor Roll is based on the current confirmed prefixes which are submitted by separate application in strict conformance with the CQ Master Prefix list. Scores are based on the current prefix total, regardless of an operator's all-time count. Honor Roll must be updated annually by addition to, or confirmation of, present total. If no up-date, files will be made inactive.

### MIXED

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 6798 9A2AA | 4344 VE3XN | 3376 K9UQN | 2499 VE6BF | 1667 SQ7B | 1272 KA5EYH | 976 KM6HB | 707 W1/E74OF | 636 ZS2DL |
| 6480 K2VV | 4333 KØDEQ | 3335 JN3SAC | 2476 K5UR | 1655 SV1DPI | 1269 K5WAF | 964 K8ZEE | 706 OE8TLK | 634 UA3LMR |
| 6140 W1CU | 4292 W9OP | 3305 JH8BOE | 2338 I2EAY | 1594 NE6I | 1233 HK3W | 940 K1DX | 684 FG4NO | /QRP |
| 5594 9A2NA | 4290 I2PJA | 3265 OZ1ACB | 2289 N3RC | 1593 S55SL | 1226 K3CWF | 924 IW9HII | 682 AI8P | 629 WB4SON |
| 5250 EA2IA | 4228 N6JV | 3252 W9IL | 2192 N2SS | 1524 K6UXO | 1201 IT9ABN | 908 K4JC | 682 N8HM | 620 PI4DHV |
| 4987 N4NO | 4129 S58MU | 3146 W3LL | 2116 AE5B | 1462 DL4CW | 1148 W9RPM | 825 KD4W | 670 WW3QB | 616 DL5JH |
| 4864 VE1YX | 4022 N9AF | 3151 N6QQ | 2133 KØKG | 1446 DF3JO | 1116 YU7FW | 815 KL7FAP | 662 JA7OXR | 615 KØBAM |
| 4762 KF2O | 3993 N8BJQ | 3007 W2WC | 2040 W2FKF | 1400 NKØS | 1107 PY2MC | 808 W6PN | 662 KJ4BIX | 600 IK1RKN |
| 4722 YU1AB | 3966 IK2ILH | 2956 IK2DZN | 1961 W7CB | 1394 K4CN | 1075 N6OU | 751 YB2TJV | 662 SP8HKT | 600 KB9OWD |
| 4589 S53EO | 3919 WB2YQH | 2946 YO9HP | 1918 NXØI | 1383 IWØHOU | 1071 K6HRT | 726 K5IC | 653 KK3Q | 600 K9OHI |
| 4429 ON4CAS | 3809 SM6DHU | 2905 AB1J | 1906 HA8QC | 1368 LU5OM | 1066 9A3ST | 725 WK3N | 650 N3YZ | 600 VA3VF |
| 4415 I2MQP | 3757 KC9ARR | 2670 WD9DZV | 1862 VE9FX | 1331 YB1AR | 1066 JA1CKE | 723 KØDAN | 649 RA9OO | |
| 4401 I5RFD | 3644 K1BV | 2575 W6OUL | 1818 AK7O | 1329 DK8MCT | 1010 VE3RZ | 712 ISØEBO | 647 PAØQRB | |
| 4384 WA5VGI | 3412 9A4W | 2532 N3XX | 1818 KX1A | 1322 AA4FU | 1002 IK8YFU | 710 WS5J | 644 KWØH | |
| 4363 YU7BCD | 3382 W2OO | 2515 AG4W | 1722 VE6BMX | 1307 K4HB | 978 V51YJ | | | |

### SSB

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 5247 IØZV | 3323 OE2EGL | 2650 IK2DZN | 2315 SV3AQR | 1940 PT7ZT | 1550 IK2RPE | 1187 IZ1JLG | 1012 KU4BP | 758 IV3GOW |
| 4950 K2VV | 3170 KØDEQ | 2595 EA1JG | 2209 IK2QPR | 1935 SV1EOS | 1480 AB5C | 1146 SQ7B | 1007 VE6BMX | 735 K6HRT |
| 4847 OZ5EV | 3108 I4CSP | 2568 SM6DHU | 2201 NQ3A | 1927 AE5B | 1464 VE7SMP | 1145 EA3EQT | 1004 K4HB | 724 W3TZ |
| 4757 VE1YX | 3061 YU7BCD | 2556 N8BJQ | 2156 YO9HP | 1913 K9UQN | 1463 I2EAY | 1098 K4CN | 978 EA7HY | 717 KØDAN |
| 4584 F6DZU | 3022 I8KCI | 2542 W2OO | 2131 N6FX | 1879 K3IXD | 1410 S55SL | 1089 IZ8FFA | 965 VE6BF | 717 N3JON |
| 4442 9A2NA | 2903 IN3QCI | 2497 S58MU | 2098 K5UR | 1861 JN3SAC | 1408 N3XX | 1089 IT9ABN | 931 YB1AR | 714 YB2TJV |
| 4238 I2PJA | 2890 WA5VGI | 2494 KI7AO | 2094 I8LEL | 1825 KQ8D | 1401 K5CX | 1083 KX1A | 919 KA5EYH | 690 W6PN |
| 4112 I2MQP | 2857 4X6DK | 2493 N6QQ | 2093 W2WC | 1800 W6OUL | 1386 IK4HPU | 1045 NE6I | 893 W9RPM | 664 K3CWF |
| 3901 EA2IA | 2846 KF7RU | 2451 EA3GHZ | 2077 AG4W | 1712 N3RC | 1386 NXØI | 1042 IZØBNR | 883 WA5UA | 640 UA9YF |
| 3890 KF2O | 2796 W3LL | 2409 DL8AAV | 2076 K2XF | 1641 AE9DX | 1358 WD9DZV | 1031 IK8OZP | 875 K7SAM | 637 K5WAF |
| 3607 N4NO | 2711 LU8ESU | 2376 W9IL | 2040 W2FKF | 1623 VE9FX | 1258 N1KC | 1031 K4CN | 833 DK8MCT | 606 KJ4BIX |
| 3335 CT1AHU | 2652 I3ZSX | 2326 CX6BZ | 1955 EA3NP | 1611 W2ME | 1189 NKØS | 1022 NW3H | 802 N6OU | 600 WA2BEV |

### CW

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 5930 K9QVB | 3918 VE7DP | 3210 N8BJQ | 2632 W2ME | 2139 N3XX | 1848 I2EAY | 1223 KX1A | 1056 W3LL | 743 JA5NSR |
| 5810 WA2HZR | 3780 WA5VGI | 3161 I7PXV | 2513 W2OO | 2081 N6QQ | 1549 AF5CC | 1220 AA4FU | 1049 K5WAF | 732 SQ7B |
| 5741 K2VV | 3750 VE7CNE | 3003 K9UQN | 2502 JA9CWJ | 2029 W6OUL | 1504 K6UXO | 1210 DL4CW | 891 DK8MCT | 720 K4CN |
| 4648 YU7LS | 3695 KF2O | 2880 JN3SAC | 2478 W9IL | 2010 K5UR | 1488 R3IS | 1205 VE1YX | 821 HB9DAX | 695 S55SL |
| 4520 N4NO | 3686 W8IQ | 2823 IØNNY | 2424 W2WC | 2008 YO9HP | 1480 WO3Z | 1186 NXØI | 813 VE9FX | 665 K6HRT |
| 4228 N6JV | 3676 S58MU | 2788 IK3GER | 2381 N6FX | 1983 EA7AAW | 1447 EA2CIN | 1165 VE6BMX | 794 LA5MDA | 629 IV3GOW |
| 4071 LZ1XL | 3608 KØDEQ | 2773 KA7T | 2373 VE6BF | 1968 N3RC | 1443 WA2VQV | 1125 IØWOK | 783 YB1AR | 615 JH6JMM |
| 3964 9A2NA | 3504 YU7BCD | 2723 EA7AZA | 2311 W9HR | 1957 WD9DZV | 1389 IT9ELD | 1098 LU5OM | 753 F5PBL | 608 W9RPM |
| 3952 EA2IA | 3214 SM6DHU | 2638 OZ5UR | 2267 I2MQP | 1940 AC5K | 1227 NE6I | 1078 AG4W | 749 AE5B | 600 IK2SGV |

### DIGITAL

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2011 W3LL | 1636 WD9DZV | 1330 KF2O | 1047 RW4WZ | 912 KØDEQ | 783 YB1AR | 737 W9IL | 670 IV3GOW | 635 K9UQN |
| 1763 N8BJQ | 1351 AG4W | 1328 IK2DZN | 1009 GUØSUP | 866 SQ7B | 778 JN3SAC | 690 EA2IA | 668 KA5EYH | |
| 1709 N6QQ | 1333 YO9HP | 1160 W2OO | 929 N3RC | 810 HK3W | 774 K3CWF | 672 K9AAN | 672 K9AAN | |

languages, it is a solid set of rules for good operating. Shortly after the publication of the original "code," some of Randy's colleagues developed a parallel code of conduct for DXpeditioners for the same website. The latter code hasn't been widely promulgated.

Operating hasn't improved much in the last few years, and in fact, it hasn't really improved much in the last 75 years. Poor operating has been with us almost forever. Hiram Percy Maxim—the Old Man himself—decried "rotten operating" further back than most of us can remember. My own experience in the '50s and '60s confirms the similarities between then and now. Yet, while there are some malcontents, most DXers are reasonable people. Face-to-face, you would never believe they would act disruptively. On the air, however, can be a very different story. Why is this so? I'd like to know. So, the DX University was created.

The DX University is dedicated to improving DX operating. Its primary methods are two-fold: First, for those of us of sound mind and charitable spirit, The DX University offers techniques and examples of "best practices" that can lead to more successful DXing and better, less obtrusive operating—more fun. A second effort is aimed at analyzing and understanding why people appear to behave the way they do. These observations are sometimes in the media such as this column and the *WeeklyDX*™.

The DX University also helps organize and sponsors or co-sponsors in-person learning sessions. A number of experienced DXers and DXpeditioners have made many excellent presentations. Sessions have been held in several venues including the International DX Convention in Visalia, California; the Utah DX Association in Salt Lake City; two at ARRL Division Conventions; one at "HamRadio," the Friedrichshafen International Exhibition in Germany; and two at the W9DXCC Convention and Banquet in Elk Grove, IL.

Although there are many variables in DXing, few of us have ever even seriously tried to understand what causes poor behavior on our DX bands. The assumption of cause seems to center around belligerence or ignorance. Identify the bad guy and put him down. But this isn't always the answer. Many poor operators aren't even causing a problem. Some time, try observing what is actually happening in a pileup versus what appears to be happening from the point of view of the DXer and the DXpeditioner. When we hear someone calling out of turn, we should ask ourselves if we think he heard and understood the instructions. If he didn't, was the instruction clearly sent at a time when the DXer was able to listen? If not, why not? If there's a reasonable explanation for how he misunderstood, perhaps we should look to educating the DX operator.

On the other hand, if the DXpedition operator seems to be proceeding at an excellent rate, with few errors, but the pileup sounds chaotic—people calling out of turn—is that bad? Maybe not. Perhaps it's only cosmetic. If the pileup sounds well-managed, but occupies an excessive portion of the band, disrupting non-DXers, is that good? Definitely not. If the QSO rate is very low, maybe the operator should understand that it's time to take a break. There are lots of considerations if we *think* about it.

One key consideration in DXing is not only how well the DXers perform, but also *how well the DX operators perform*. A fundamental DX University premise states that a DXpedition operator can and should be responsible for his pileup. *The nature of his pileup is a reflection of his style and capability*. He holds the power and the keys to controlling the pileup. And, quite simply, it is simpler to educate one DXpedition operator than to teach thousands of DXers how to best operate.

The DX University is a hub for the study of DX operating dynamics and behavior. The website, <www.dxuniversity.com>, collects the data and results. There are two sets of "best practices," one each for DXers and

## Light the Night

Larson Electronics <www.magnalight.com> has introduced two new lighting products that may be of interest to hams active in emergency communications or who are also boaters. Its *High Intensity 70-Watt LED Boat Light* produces over 6000 lumens of intense white light, according to the company, with a current draw of only 5.84 amps from a 12 VDC power source. The light is fully sealed and rated waterproof to three meters. A bit pricey for most hams at $730, it is projected to have a 50,000-hour life, so that should be taken into account as well. For more info, see <http://bit.ly/16lFQ97>.

EmComm groups operating from a van at night might want to consider Larson's *Magnetic Mount LED Light Bar.* A relative bargain at $219.95, this light operates from a 9–24 volt DC power source and draws only 0.8 amps at 12 VDC. Its three 3-watt LEDs produce a total of 684 lumens and are also estimated to provide a 50,000-hour service life. The magnetic base has 200 pounds of grip and the light is rated waterproof to three meters. For more info on this light, visit <http://bit.ly/18vGDBM>.

## Palomar Engineers Requests Order Cancellations

Following the passing of company president Jack Althouse, K6NY, in mid-September (see Ham Radio News, p. 2), Palomar Engineers has asked all customers with pending orders to please cancel them while the future of the company is determined, and to be patient regarding refunds.

In an e-mail announcing Jack's passing, the company said, "It will take some time for the family to decide what to do about Palomar (sell, dissolve, or keep it going). We are asking if you have any outstanding orders with Palomar to please cancel them … In the meantime, Palomar is closed for business and will not be taking any further orders at this time." Officials said they would do their best over coming weeks to locate all existing orders and either ship the products or send a refund. Questions and/or copies of invoices may be e-mailed to <palomareng@gmail.com> or mailed to Palomar Engineering, c/o 3312 E. Harmony Ave., Mesa, AZ 85204.

(*CQ* extends its heartfelt condolences to the Althouse family and to the staff of Palomar Engineering.)

***Note:*** *"What's New" is not a product review and does not constitute a product endorsement by CQ. Information is primarily provided by manufacturers/vendors and has not necessarily been independently verified. The purpose of "What's New" is to inform readers about new products in the marketplace. We encourage you to do additional research on products of interest to you.*


*Bob and Kay Schmieder, KK6EK, with OH2BH talking Heard Island at the Tokyo Ham Fair, August 2013.*

DXpeditioners. There's also an updated version of "DXpeditioning Basics," a number of pileup recordings with commentary, and more. Click on the DX University Blog link on the DXU home page. Visit the site and pass on your contributions. Let them know what you think.

## Tips for Beginning … *DXpeditioners*

Perhaps one of the greatest errors made by newer DXpeditioners is a failure to communicate to the pileup just what they expect. Where should DXers call? Split? Up? How far up? If the DX operator has divided the pileup, who is he listening for? North America? Europe? Oceania?

There are many elements to the modern pileup, and it is the responsibility to the DXpeditioner to communicate just what is expected to the DXers in the pileup. This means speaking clearly and slowly on SSB and sending clearly and slowly enough on CW for DXers to understand. How can DXers be expected to call properly if they have no idea what is expected?

By the way, often, it is the SSB pileup that is the most difficult to communicate with. How many DXpeditioners from North America speak to European DXers in a language the DXers can understand? Something to think about.

## Of Interest in November

Later this month, *CQ* magazine hosts the **CQ World Wide CW DX Contest**. The contest starts at 0000Z on Nov. 23 and continues to 2400Z, Nov. 24, 2013. This is a very large DX contest, second only to the CQ WW 'phone contest in October. Newly-minted DXers can easily work 100 countries on this weekend, sometimes many more. Your editor may make it to Southern Sudan for this one, so stop by and give us a few QSOs if you can.

**FR, REUNION ISLAND**. Willi, DJ7RJ, will be active as FR/DJ7RJ from Reunion Island (AF-016) between September 28th and November 2nd. Activity will be on 160-10 meters using CW and SSB. QSLvia DJ7RJ, direct or by the Bureau.

73, Wayne, N7NG

# Remote Control Contest Operating

BY GEORGE TRANOS,* N2GA

One of the fastest-growing trends in contesting is operating from a remote location using local control. With more and more hams living in communities that severely restrict or do not allow antennas and towers, there is a demand for contest operating using radios and antennas located somewhere else. The ham who travels because of work commitments but still wants access to a top-notch contesting station while away from home also can benefit from operating remotely. This column will begin to explore what is involved with this type of operating.

We had the opportunity recently to interview Mike Lonneke, W0YR (Photo A), about the K4VV Remote Contesting Project. Two years ago, Mike and his "TeamK4VV" became the first station to test and use various schemes for multi-operator contesting by remote control (Photo B). Jack Hammett, K4VV (Photo C), has lent his super-station to a group organized by Mike. The station is in northern Virginia and is on 49 acres of property on Catoctin Ridge, once part of the estate of Arthur Godfrey (K4LIB SK), the famous radio and television star of the 1940s to 1970s. Mike is an active member of Potomac Valley Radio Club (PVRC). In addition to Mike and Jack, TeamK4VV consists of Tom Poland, N9NC; Tom Morton, K6CT/CX7TT; Zibi Tyrlik, KU1T; Paul Dluehosh, N4PD; Gary Quinn, NC4S (Photo D); John Westerman, W5ODJ; Adam Forman, W4GOV; and Viktor Kadar, HA5LV.

*Photo A. TeamK4VV organizer and CQ interview subject Mike Lonneke, W0YR.*

Mike says, "Our initial goals for this project were to find a new way to enlarge the operator pool for K4VV and to tap into a great resource: Accomplished contesters who, for various reasons, no longer have access to a full-featured and effective station." In the interview below, Mike describes some of the processes that the team went through to achieve success. Hopefully, some of the questions and answers will provide information for those looking to go down this path of remote control contest operating.

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## Calendar of Events

| | | |
|---|---|---|
| **All year** | **CQ DX Marathon** | **http://bit.ly/vEKMWD** |
| **Oct. 26-27** | **CQ WW DX SSB Contest** | **http://www.cqww.com/rules.htm** |
| Oct. 26-27 | ARRL EME Contest | http://www.arrl.org/eme-contest |
| Nov. 2-3 | Ukrainian DX Contest | http://urdxc.org/rules.php?english |
| Nov. 2-4 | ARRL CW Sweepstakes | http://www.arrl.org/sweepstakes |
| Nov. 3 | High Speed Club CW Contest | http://www.highspeedclub.org/ |
| Nov. 3 | DARC 10-Meter Digital Contest | http://bit.ly/18gGDIM |
| Nov. 9-10 | Kentucky QSO Party | http://bit.ly/Oj3Oa1 |
| Nov. 9-10 | Worked All Europe RTTY Contest | http://bit.ly/JUUR1n |
| Nov. 9-10 | JIDX Phone Contest | http://jidx.org/jidxrule-e.html |
| Nov. 9-10 | OK/OM CW DX Contest | http://bit.ly/19rrRjl |
| Nov. 9-10 | 10-10 Digital Fall Contest | http://bit.ly/yTsaDk |
| **Nov. 9-11** | **CQ-WE Contest** | **http://cqwe.cboh.org/rules.html** |
| Nov. 15 | YO Int'l PSK31 Contest | http://www.yo5crq.ro/Rules2012EN.htm |
| Nov. 16-17 | LZ DX Contest | http://lzdx.bfra.org/rulesen.html |
| Nov. 16-17 | All Austrian 160M Contest | http://bit.ly/NXzWxr |
| Nov. 16-17 | ARRL EME Contest | http://www.arrl.org/eme-contest |
| Nov. 16-18 | ARRL SSB Sweepstakes | http://www.arrl.org/sweepstakes |
| Nov. 16-17 | SARL Field Day Contest | http://bit.ly/H0IqQf |
| Nov. 16-17 | RSGB 2nd 1.8-MHz Contest CW | http://bit.ly/14q3SZz |
| Nov. 17 | EPC PSK63 QSO Party | http://bit.ly/13nKa1g |
| **Nov. 23-24** | **CQ WW DX CW Contest** | **http://www.cqww.com/rules.htm** |
| Dec. 1 | SARL Digital Contest | http://bit.ly/H0IqQf |
| Dec. 6-8 | ARRL 160-Meter Contest | http://www.arrl.org/160-meter |
| Dec. 7-8 | Tops Activity Contest | http://www.procwclub.ro/ |
| Dec. 8 | 10-Meter RTTY Contest | http://bit.ly/16dB5MP |

***Calendar of Events - Also available on the CQ website with live links***

*Photo B. Here are two of the three remote operating positions at K4VV. At least one operator is always on duty to deal with technical hiccups. The station can be configured from single-operator to multi-multi. (Photos courtesy of Mike Lonneke, W0YR)*

*Photo C. K4VV station owner Jack Hammett.*

***CQ:* Why did you and your group get involved in remote contest operation?**

*W0YR:* We wanted to achieve this fascinating dream without spending a lot of money. We knew it would be an excellent way to expand our operator base. There are lots of good contest operators who can no longer travel or who no longer have operational stations. We can tap into their operating prowess and everybody wins.

I want to stress a point. TeamK4VV admires those who can spend $1,000 or more to create a remotable contesting position. *Plug 'N Play* is great, but we've chosen the cheapskate approach and so far it's worked fine. Our total expenditure to develop three remotable contest operating positions has been under $300. There are several ap proaches to remote contesting and I wouldn't say one approach is better than another. However you choose to go about it, it is great fun and it's fascinating, challenging, and effective.

***CQ:* Can you explain the different parameters involved in this type of project?**

*YR:* First, understand the objective of such a project, and that is to sit in one place and make something happen at another place as accurately and easily as possible, without any noticeable delay. Other parameters include money, ease of operation, effectiveness, and robustness. As soon we started working through the various challenges, the whoops, back-slapping, and high-fives at every success made us realize, "Hey! We're having fun."

***CQ:* What were the major decision-making factors you considered?**

*YR:* We first checked FCC regulations and contest rules, then contacted managers of several major contests to make sure we'd be squeaky-clean from a rules standpoint. No one wants to get down the road and learn that what they're doing is illegal. Station owner Jack Hammett, K4VV, totally approved the idea of remote contesting. Thrift *was* a major factor and, as it turns out, it forced us to be inquisitive and inventive. Certainly, the idea that we were breaking new ground helped spur us on. If there are other contest stations with multiple remotable positions, we'd like to know more about them.

***CQ:* What complications does contesting create for remote station operation?**

*YR:* Well, if you're flying a model plane or a CIA drone or operating a 1.5-kW station with Big Berthas and huge Yagi stacks (Photo E), the fear of crashing is right there on your shoulder. The famous "Ready—Fire—Aim!" way of doing things won't work here. We forced ourselves do what is called "destructive testing." This involves trying to ascertain what can go wrong, causing it to go wrong, and then working out a solution to prevent the crash or fault from occurring again. Once a team does this, they *really* learn their systems. Crashes during a major contest are really demoralizing.

Some hams assume you can just cobble up some kind of a remote rig control system and start contesting with it. Disappointment will follow. Contesting by remote control requires extremely fast response times. You must have the same quick response remotely as you would have in the host shack. What's more, mental and physical demands not connected with hearing and calling, working and logging contest stations must be eliminated or minimized. This is why we use *N1MM Logger* for both logging and rig control. Let me ask: What good is it to have every conceivable control on a transceiver available for remote adjustment if you can't achieve an exceptional or even decent QSO rate? *(Look at what N9NC achieves, sitting in New Hampshire, operating K4VV remotely! The rate bars on N1MM - Photo F - show amazing performance with 164 QSOs per hour indicated during his run. – N2GA)*

***CQ:* Can you describe the major obstacles you faced and overcame during the project?**

*YR:* Well, I keep mentioning money so, there's that, of course. Getting remote access to the K4VV station computers was pretty easily solved by using a free version of *LogMeIn*. We use *N1MM Logger* for rig control and *N1MM Rotor Control* to turn the Big Berthas and Yagi stacks. But the other control functions, such as stack selection,

*Photo D. Gary Quinn, NC4S, at the controls at one position during a multi-multi contest. The other two positions were used by remote operators.*

*Photo E. Stacked antennas on a 150-foot tower at K4VV can be used by remote operators.*

amplifier control, and smooth VFO up/down commands were difficult to develop. We ended up using USB relay cards and N-Button-Lite software to control them. Paul, N4PD, and I spent hours unraveling the mysteries of these and we even tried *Visual Basic*. We succeeded eventually, but I sure wish we had known about *hamShack* Switch from UDC-SYS.com. It can be controlled remotely without having software on the client end, so it can remotely control antennas, stacks and audio switching. It also allows the use of keyer paddles at the remote end and looks like it might switch anything to anything from anywhere.

Another obstacle was poor technical writing. It is rampant. We had to decipher arcane descriptions and instructions for applications and hardware, alike. And, I hate to say this, but two of our people couldn't be bothered to read detailed instructions or procedure lists. They tried "this and that" until the host computer locked up.

More obstacles appeared when we

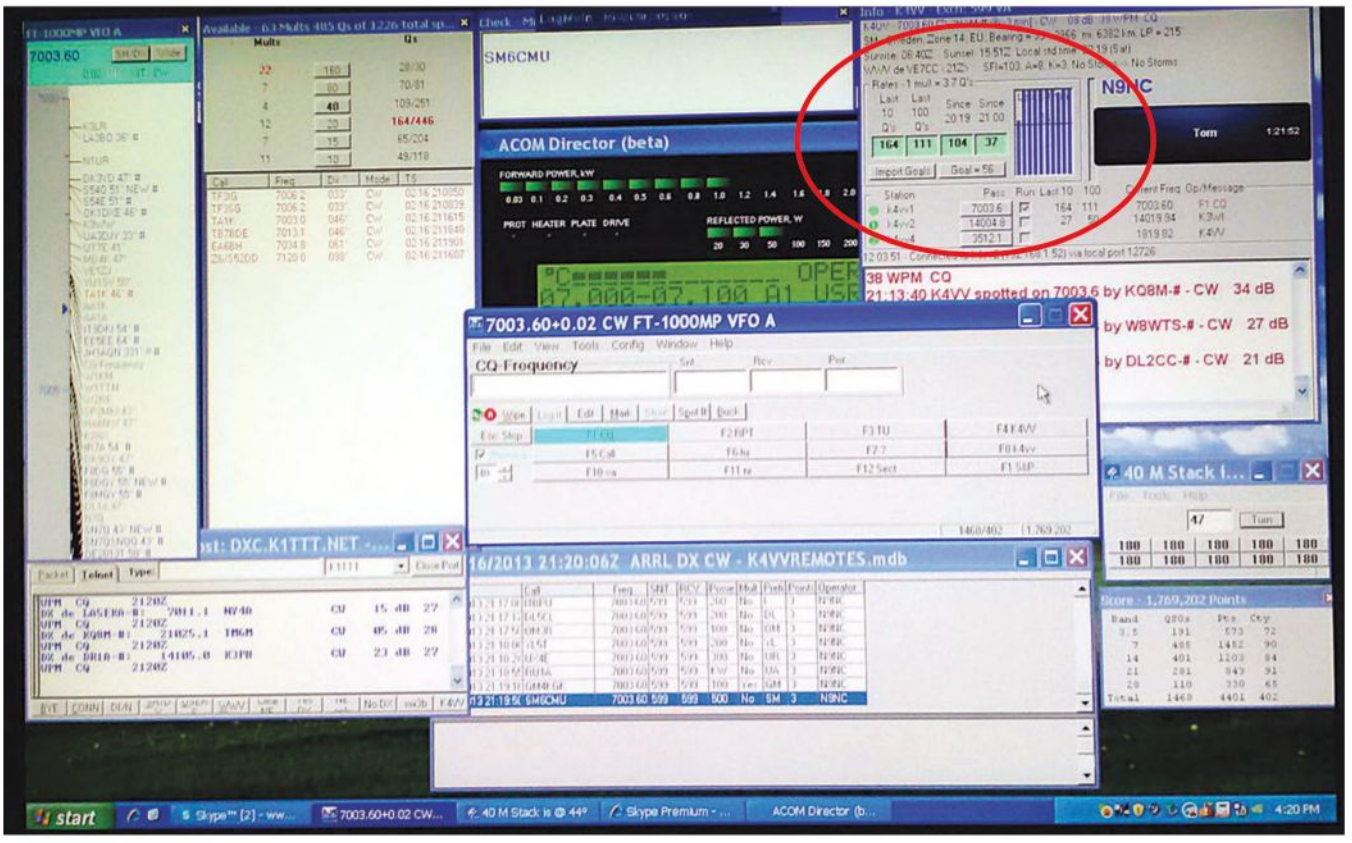


*Photo F. Screen shot from the N1MM logger with N9NC operating remotely. In the box at the upper right, notice the rate bar graphs and last-10 and last-100 rates of over 100 QSOs per hour operating remotely.*





tried to get three remotable positions to work together. Think about this: Any operating position at K4VV can work any band. If Position 2 is on 20 meters, we must make sure that all other positions are locked out of 20 meters. We also must, at that point, furnish all the 20-meter antennas and rotors to Position 2. You see the complexity of the challenge. Further, if 20 meters becomes available and another position uses that band, all those functions need to switch to the new position. All this must be able to happen for ISOs (In-Shack Operators) and ROs (Remote Ops). Zibi, KU1T, figured all this out.

***CQ:* Besides contest logging, what other software applications are important for success at a remote contest operation?**

*YR:* Well, an RO must able to hear the receiver audio perfectly. And if working SSB, he must be able to send high-quality microphone audio to the transceiver. Any number of VoIP applications and gaming audio apps would suffice. We tested several of these and found that for our purposes, *Skype* worked best. For CW we use *N1MM's* keyboard. For remote paddle operation we use *WK-Remote*. ROs need to have to have a *WinKeyer* at their end to "talk" to the *WinKeyer* at the K4VV station position. To control the ACOM 2000 amps I adapted MØYOM's *Acom Director* software.

This is important: ROs need to have a fast and solid Internet connection. Every remote performance problem has been due to a poor Internet connection. All systems may be in top form but a crummy connection will ruin things.

***CQ:* Were any considerations given to contest rules, and do they have an impact on remote contesting?**

*YR:* Of course. We contacted Sean and Ward at the ARRL's Contest Branch and told them exactly what we intended to do and they said, "Go for it!" Same for CQ's WPX Contest Director, Terry Zivney. ARRL, WAE, CQ, and other contest rules make no mention of *where*, physically, the operators have to be. The equipment on the other hand, has to be within a prescribed circle and we easily met that requirement. One Russian contest doesn't allow any remote operations, so we ignored that contest. It's best to check the rules first.

***CQ:* Are there any additional issues that need to be weighed when taking on this type of project?**

*YR:* Yes. Manage your expectations and, if it is a team project, determine the expectations of others. This way, you

can avoid having people drop out due to disappointment. N4PD established a group reflector in order to keep people in the loop. Some very illuminating videos on the K4VV Remote Project are on *YouTube*. These help to show team members what's being accomplished. Quickly give credit to people when they meet a project goal. It's amazing what gets done when you don't care who gets the credit.

***CQ:* Did you receive any outside help on this project?**

*YR:* Only in one instance. We could not figure out how to get the correct rotator "widget" to appear on the screen at the correct operating position. An E-mail to Steve London, N2IC, who is a great *N1MM* "coder," brought back the needed answer within minutes.

***CQ:* What recommendations would you give to someone considering remote contest operation?**

*YR:* Get help and ask a lot of questions. Try everything. Most people are happy to help if you just ask them. But remember to thank them, too. Team K4VV has specialists for almost every field: computers, software, control circuits, transmitters, amplifiers, and even one for DC motors.

Develop just one system at a time. Concentrate on getting *one* position working perfectly. Then worry about any additional positions. Strive to make the RO's experience as much like operating the station in person as possible. It's sort of like flying a drone aircraft. It's all done by remote control. A contesting station is complex, but nowhere near as complex as a drone. You can do it! Think of remote contesting as the biggest video game there is … with *real* consequences; the score.

TeamK4VV is happy to share what we've learned with others. We believe that remote contest operating, whether by a single station operator or by a group, is a big part of the future of contesting. We encourage others to try it. They might just discover something that will help us.

## Summary

I'd like to extend my thanks to Mike Lonneke, W0YR, for his insight into this topic. Remote contesting is here now and there are individuals and groups like "TeamK4VV" who are at the cutting edge of technology. Hams living in antenna-restricted communities, adult care facilities, or who travel away from their contest stations can all benefit from the advantages of remote operating. Maybe you, too, want to give it a try!

propagation

BY TOMAS HOOD,* NW7US

# Good Conditions Predicted for CQ WW DX CW Contest 2013

### A Quick Look at Current Cycle 24 Conditions

*(Data rounded to nearest whole number)*

**Sunspots**
Observed Monthly, August 2013: 66
Twelve-month smoothed, February 2013: 58

**10.7 cm Flux**
Observed Monthly, August 2013: 115
Twelve-month smoothed, February 2013: 118

***Ap* Index**
Observed Monthly, August 2013: 9
Twelve-month smoothed, February 2013: 7

### *One Year Ago:* A Quick Look at Solar Cycle Conditions

*(Data rounded to nearest whole number)*

**Sunspots**
Observed Monthly, August 2012: 63
Twelve-month smoothed, February 2012: 67

**10.7 cm Flux**
Observed Monthly, August 2012: 116
Twelve-month smoothed, February 2012: 127

***Ap* Index**
Observed Monthly, August 2012: 7
Twelve-month smoothed, February 2012: 8

HF radio enthusiasts celebrate the arrival of the winter DX season. November 2013 should hold fair improvement for propagation on most HF bands for stations in the Northern Hemisphere. During the CQ WW DX CW contest this month, we should experience fairly good success, even though the Sun is not nearly as active during this possible sunspot cycle peak as during recent past sunspot cycle peaks.

The 2013 CQ WW DX CW Contest <http://www.cqww.com/> will start at 0000 UTC, Saturday, November 23, and run through 2359 UTC Sunday, November 24. Looking at the 27-day rotation of the Sun, taking into consideration the current solar activity at the time of writing this column, propagation should be good on day one and excellent on day two. Expect conditions to be comparable with conditions from the 2002 contest weekend, as well as similar to last year's contest weekend. Geomagnetic activity should be stable and quiet, making nighttime DX very productive.

Predictions for one 27-day rotational period are far more accurate than for three 27-day rotational periods. Be sure to carefully check conditions on October 27 and 28, since this would be one rotational period before the CW contest weekend. There is better than a 90% chance that conditions observed on those days will recur during the November contest weekend.

See the "Last-Minute Forecast" for expected day-to-day conditions for the entire month of November. An updated day-to-day forecast for the CW contest weekend will appear as a bulletin at the beginning of next month's column. Decem-

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### LAST-MINUTE FORECAST

**Day-to-Day Conditions Expected for October 2013**

| | Expected Signal Quality | | | |
|---|---|---|---|---|
| Propagation Index..... | (4) | (3) | (2) | (1) |
| Above Normal: 1-6, 8-10, 14-16, 19, 24-30 | A | A | B | C |
| High Normal: 3, 7-8, 15-17, 30 | A | B | C | C-D |
| Low Normal: 11, 13, 17 | B | C-B | C-D | D-E |
| Below Normal: N/A | C | C-D | D-E | E |
| Disturbed: N/A | C-D | D | E | E |

***Where expected signal quality is:***
**A—Excellent opening, exceptionally strong, steady signals greater than S9.**
**B—Good opening, moderately strong signals varying between S6 and S9, with little fading or noise.**
**C—Fair opening, signals between moderately strong and weak, varying between S3 and S6, with some fading and noise.**
**D—Poor opening, with weak signals varying between S1 and S3, with considerable fading and noise.**
**E—No opening expected.**

### HOW TO USE THIS FORECAST

**1. Find the *propagation index* associated with the particular path opening from the Propagation Charts appearing in *The New Shortwave Propagation Handbook* by George Jacobs, W3ASK; Theodore J. Cohen, N4XX; and Robert B. Rose, K6GKU.**

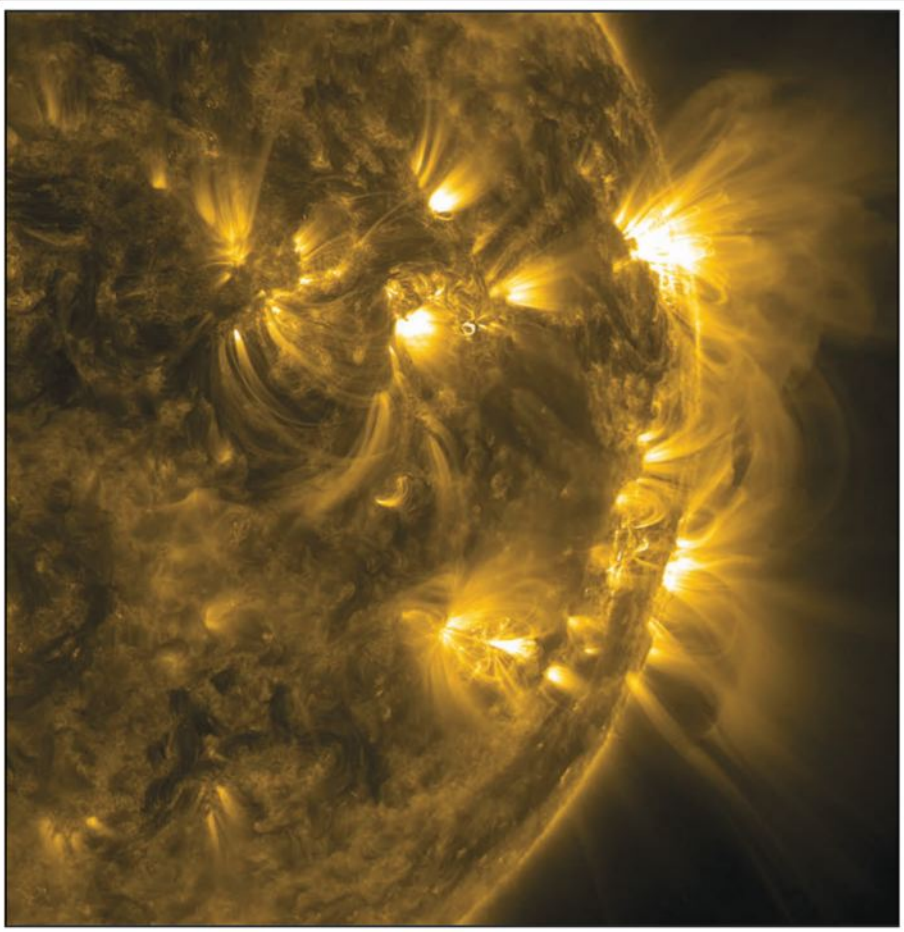
**2. With the *propagation index*, use the above table to find the expected signal quality associated with the path opening for any given day of the month. For example, an opening shown in the Propagation Charts with a *propagation index* of 3 will be will be excellent (A) on Oct 1st and 2nd, good (B) on the 3rd, etc.**

**3. As an alternative, the Last-Minute Forecast may be used as a general guide to space weather and geomagnetic conditions through the month. When conditions are Above Normal, for example, the geomagnetic field should be quiet and space weather should be mild. On the other hand, days marked as Disturbed will be riddled with geomagnetic storms. Propagation of radio signals in the HF spectrum will be affected by these conditions. In general, when conditions are High Normal to Above Normal, signals will be more reliable on a given path, when the path is ionospherically supported.**

| | 2002 | '03 | '04 | '05 | '06 | '07 | '08 | '09 | '10 | '11 | '12 | '13 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| November | 85 | 57 | 35 | 25 | 13 | 6 | 2 | 8 | 27 | 61 | 62 | *79 |

** Predicted values expected during the 2013 contests (revised from the October, 2013 prediction in last month's chart)*

*Table I– Smoothed sunspot numbers recorded during CQ World-Wide DX Contests since 2002 (November CW).*



ber's issue should reach most subscribers before the CW contest begins. You can also see an up-to-the day "Last-Minute Forecast" on my propagation resource center, at <http://sunspotwatch.com/>.

Table 1 tabulates the smoothed sunspot count during previous CQ WW DX CW Contest periods since 2002, and what's predicted for the 2013 contest. Contest conditions may be quite similar to those of last year. Low to middle-latitude propagation paths should be good

*Figure 1. Waving Magnetic Loops—In profile, the magnetic field lines emerging from several active regions were easily observed as they reached across from one magnetic pole to another (Sept. 4-5, 2013). When viewed in extreme ultraviolet light, the tracings of charged particles along the magnetic field lines are revealed. The bright, active regions are areas of intense magnetic forces. This level of detail for the entire Sun has never been available before the SDO (Solar Dynamics Observatory) mission became operational. The video clip at <http://g.nw7us.us/16gZRsw> covers about 18 hours of activity. (Photo courtesy of Solar Dynamics Observatory/NASA)*

on the lower HF bands (160, 80, 40 meters). There is a moderate chance that reasonably long windows of propagation will exist on the higher HF bands above 20 meters for paths spanning lower latitudes over sunlit and gray-line termination regions. However, it is expected that the higher bands will have a lot of fluctuation in performance. The lower frequency bands will be quiet, much like last year.

The DX Propagation Charts and other information in this month's column are designed to help you to make the most of propagation conditions during the contest, if you are participating. Even if you are not a dedicated contestant, you should give it a try. If you are trying for your DXCC or other paper, this is the contest of choice.

Try out propagation modeling and forecasting software programs to optimize your efforts this year. Play around with the contest-specific conditions and station-based parameters such as your antenna properties, geographical location, power levels, and operating times. A program that I have reviewed in past columns is ACE-HF Pro. Using such a program, you can work out an operational plan using tools like ACE-HF's Animated Coverage Maps, or the band opening charts for the various propagation paths you wish to target to get those extra contest points. For more information, see <http://hfradio.org/ace-hf/>, which includes past reviews and articles.

## November Propagation

Last month's column contained a detailed review of conditions expected during October. Let's look at what we can expect this month.

**160 Meters**: Expect productive DX openings on this band during the hours of darkness and into the sunrise period. This year's season is looking to be quiet and stable. With the combined effect of the decreased seasonal static levels and longer hours of darkness in the northern latitudes, 160 is a workable band all through winter. During this month's CQ WW DX CW contest, participants with good DXing antenna systems should experience fair to excellent scores on this band. Look for openings toward Europe and towards the south from the eastern half of the U.S. and toward the south, the Far East, Australasia, and the South Pacific from

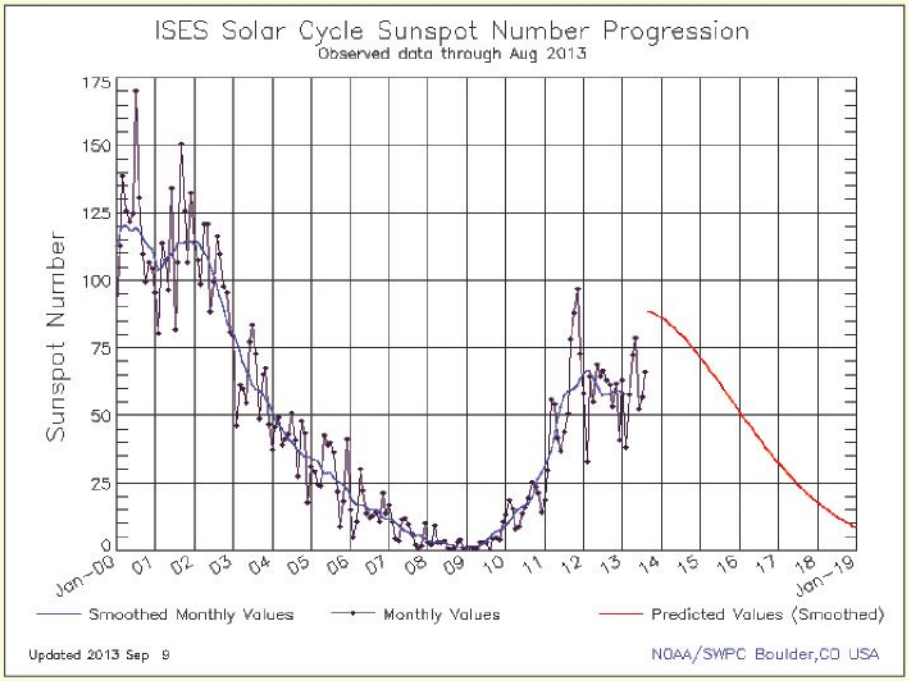
### CQ WW DX SSB Contest Conditions Look Stable

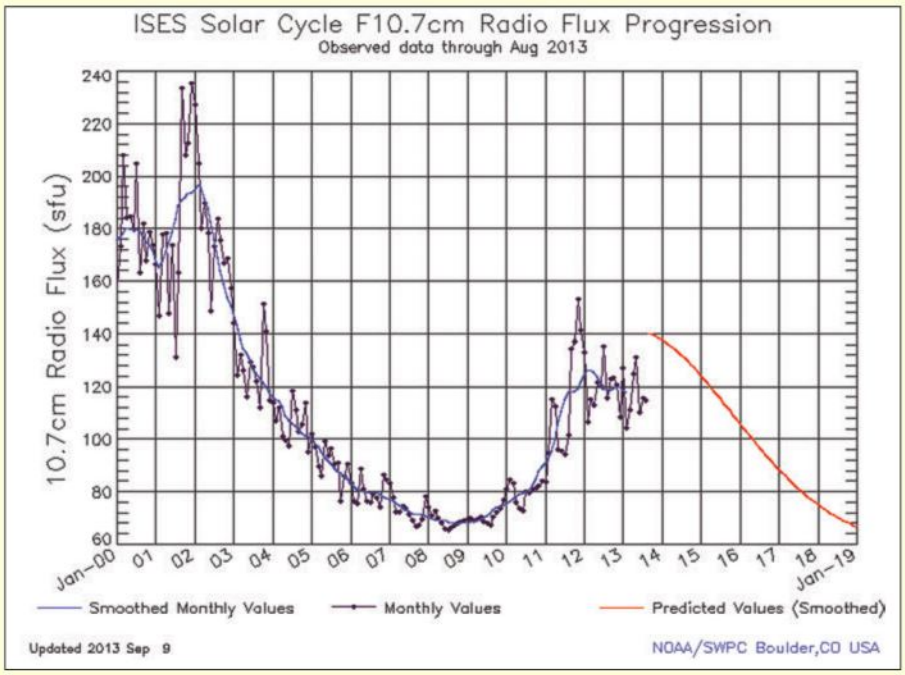
#### Good Conditions Expected

Since this issue of *CQ* should reach most subscribers prior to the start of the 2013 CQ Worldwide DX SSB Contest weekend of October 26-27, here is an updated forecast made at press time for the general propagation conditions expected. Based on the 27-day recurrence tendencies of solar and geomagnetic conditions, it continues to look like conditions will be good on both days.

Daily 10.7-cm solar flux levels are expected to be around 100 during the contest weekend. This is not the greatest news, if it holds true. The geomagnetic planetary A-index is expected to be about 5 on both contest days, which will make the lower frequencies more productive.

Remember that at any time during the contest, if there are sunspots present, a flare may occur. When a flare erupts, it could cause a radio blackout on the Sun-facing side of the Earth. These last between 10 and 60 minutes, depending on the strength and location of the flare. We don't expect any significant geomagnetic activity, however.



the western half of the country. These openings should be strong during the contest period. Remember, the best propagation aid for this band (and for 80 and 40 meters as well) is a set of sunrise and sunset curves, since DX signals tend to peak when it is local sunrise at the easterly end of the path.

**80 Meters**: This should be a great band for DX openings to many areas of the world during the hours of darkness and into the sunrise period. Eighty meters becomes a reliable long-distance band throughout the entire period of darkness. The band should peak toward Europe and in a generally easterly direction around midnight. For openings in a generally western direction, expect a peak just after sunrise. The band should remain open toward the south throughout most of the night. Noise levels will be considerably down from October, and the period for band openings in a particular direction will be a bit longer. Some contest operators may take the challenge of operating exclusively on 80, an adventure in skill and patience. The conditions are expected to be favorable for high scores on this band.

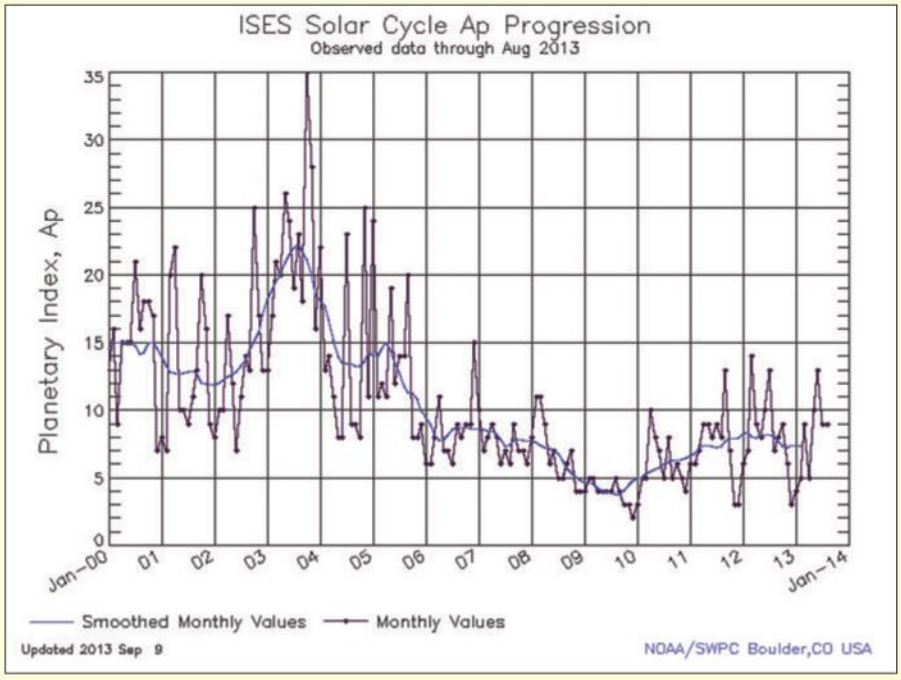



*Figure 2. Is Sunspot Cycle 24 "over the hill?" Solar scientists have observed that the Sun is currently going through the reversal, or flipping, of the Sun's magnetic poles. This happens during each sunspot cycle, right around the time of cycle maximum. Such a reversal historically signals the end of the peak phase of a cycle, after which sunspot activity falls until the sunspot cycle minimum is reached. This cycle has exhibited unpredictable and unusual (from recent history's perspective) behavior, so we're still watching to see if the peak really has occurred. These three charts show sunspot numbers, 10.7-cm radio flux and $A_P$ indices since 2000. (Credit: SWPC/NOAA)*

**40 Meters**: Competing with 80 meters, this should be a hot DX band during the dark hours as the seasonal static levels are lower than they were during the summer. Nighttime MUFs on some paths could fall below 7 MHz this month, losing some steam until morning hours. The band should be open first for DX toward Europe and the east during the late afternoon. Signals should increase in intensity as darkness approaches. Signals should peak from an easterly direction closer to midnight, and from a westerly direction just after sunrise. Remember, just as with 80, signals tend to peak as the sun rises on the eastern end of a propagation path. Working against the CW operator is the interference that increases when the propagation is excellent.

**20 Meters**: DX openings should be possible on this band mostly during the day, and somewhat during the night depending on the path and the path end points (where your station is located, and where your contact's station is). However, because of the shorter daylight hours in the Northern Hemisphere, nighttime path openings will be open for a shorter period this month compared to October, with signal peaks from about an hour or two after sunrise and again during the late afternoon and early evening hours for those paths that may be open. Don't forget to look for long-path openings for about an hour or so after sunrise and again for an hour or so before local sunset.

**15 Meters**: DX propagation conditions in the Northern Hemisphere will be poor to fair on this band, mostly at low-latitudes. A daytime band, fluctuating conditions are expected at these frequencies from shortly after sunrise through the early evening hours. The band could remain open into the evening toward southern and tropical areas.

**10 Meters**: With an expected 10.7-cm flux hovering around 100, 10 meters will be a player this month only on North/South and low-latitude paths. Contest participants in low- and middle-latitude locations can expect daytime contacts during the contest weekend, mainly on North/South paths. If open, the band will peak right after sunrise, and just a bit before sunset, local time. Openings towards Europe and in a generally easterly direction will be sparse, if at all, and should peak an hour or two before noon, while those toward South America and Africa are expected to peak during the early afternoon hours. Optimum conditions toward the Far East, Australia, southern Asia, and the

South Pacific are forecast for the late afternoon and early evening hours, especially from stations in lower latitudes. This band will require a lot of skill and better than average antennas.

### CW Contest Tips

Overall, expect good conditions on 15 and 20 meters during most of the daylight hours. For stations in the lower latitudes, 15 and 20 meters will be usable for most of the contest period, well into the hours of darkness.

From sundown to midnight, 40 meters should be the best band for openings toward the east, north, and south. Twenty meters will close in many locations before midnight, while 80 meters will be a hot band with openings into the same areas as for 40.

Between midnight and sunrise, the best DX band should be 80, with 40 a close second. Openings on both bands should be possible to most areas of the world, with conditions peaking towards the south and west. Some good 20-meter openings are also expected during this period, mainly toward the south and west. The 160-meter band should wake up, offering some good DX openings, similar to 80 meters but with somewhat weaker signals.

### VHF Conditions

The Leonids meteor shower is typically the big event for November. This shower is active from November 6 until November 30. This year, it is expected to peak on November 17 with a maximum count of 15 or more visual meteors per hour. For those readers who are attempting to work off of the plasma trails of these meteors, there may well be enough hourly activity this year to make this a hot event.

Working VHF propagation off of meteor tails (the highly ionized plasma trails left by the meteor) requires some reasonable power and gain, and good operating skill. With the latest digital and high-speed, burst-mode CW software, you can possibly work even the smaller meteors.

Check out <http://www.imo.net/calendar/2013> for a complete calendar of meteor showers in 2013.

Don't forget to check out *CQ VHF* magazine for more details on VHF propagation and conditions. If you use Twitter, you can follow <@hfradiospacewx> for hourly updates that include the K index numbers. You can also check <http://sunspotwatch.com> for the latest numbers.

### Current Solar Cycle Progress

The Royal Observatory of Belgium, the world's official keeper of sunspot records, reports a monthly mean sunspot number of 66.0 for August 2013, up a bit from July's 57.0 and from June's 52.5, yet weaker than 78.7 for May. The low for the month was 31 on August 26. The high of 105 occurred on August 21. The mean value for August results in a 12-month running smoothed sunspot number of 58.4 centered on February 2013. Following the curve of the 13-month running smoothed values, a smoothed sunspot level of 79 is expected for November 2013, plus or minus 14 points. Have we seen the peak of Sunspot Cycle 24?

Canada's Dominion Radio Astrophysical Observatory at Penticton, British Columbia reports a 10.7-cm observed monthly mean solar flux of 114.7 for August 2013, just under July's 115.6 and still lower than 131.3 for May. The 12-month smoothed 10.7-cm flux centered on February 2013 is 118.0. A smoothed 10.7-cm solar flux of about 132 is predicted for November 2013.

The geomagnetic activity as measured by the planetary-A index ($A_p$) for August is 9. The 12-month smoothed $A_p$ index centered on February 2013 is a steady 7.4. Geomagnetic activity should be much the same as we have had during October. Refer to the Last Minute Forecast for the outlook on what days that this might occur (remember that you can get an up-to-the-day Last Minute Forecast at <http://sunspotwatch.com> on the main page).

I welcome your thoughts, questions, and experiences regarding this fascinating science of propagation. You may e-mail me, write me a letter, or catch me on the HF amateur bands. Please come and participate in my online propagation discussion forum at <http://forums.hfradio.org/>. If you are on Facebook, check out <http://www.facebook.com/spacewx.hfradio> and <http://www.facebook.com/NW7US>. Speaking of Facebook—check out the *CQ Amateur Radio* magazine fan page at <http://www.facebook.com/CQMag>.

I'll be keeping my ears to the radio, hoping to hear you on the air. Happy DX!

73, Tomas, NW7US
P.O. Box 27654
Omaha, NE 68127
<@NW7US>
<@hfradiospacewx>

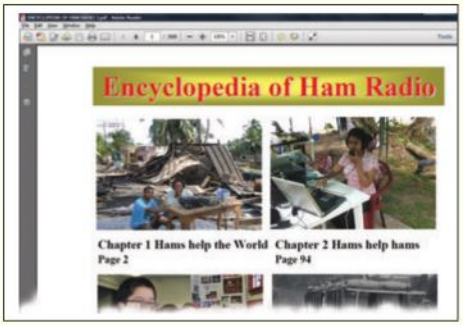
# what's new

### Encyclopedia of Ham Radio

A monumental effort by SM7WT has been completed—his nearly 2,700-page *Encyclopedia of Ham Radio*—written in both English and Swedish (that's 2,700 pages for each version, not combined!). The book, available online only as a large PDF file, is a greatly revised and expanded version of Stan's previous book, *Amateur Radio Gives You 2 Million Friends*, which was profiled in "What's New" back in 2010.

The book is more of a collection of stories than a traditional encyclopedia. Its 7 chapters cover Rescue Operations, Hams Helping Hams (DXpeditions and more), Getting Youngsters Interested in Amateur Radio, History Since 1912, Silent Keys (Friends Gone But Not Forgotten), Contest Operations and Personal Presentations—profiles of 500 active hams, based on the motto that "Behind Every Callsign is an Interesting Person."

The book is available online only, for $8 U.S. For more information, contact SM7WT by e-mail at <SM7WTSTAN@gmail.com>.




***Note:*** *"What's New" is not a product review and does not constitute a product endorsement by CQ. Information is primarily provided by manufacturers/vendors and has not necessarily been independently verified. The purpose of "What's New" is to inform readers about new products in the marketplace. We encourage you to do additional research on products of interest to you.*

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| KJI Electronics | 101 | www.kjielectronics.com |
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| LDG Electronics, Inc. | 105 | www.ldgelectronics.com |
| LightBeam Antenna | 101 | www.LightBeamAntenna.com |
| M² Antenna Systems, Inc. | 33 | www.m2inc.com |
| MFJ Enterprises, Inc. | 11,Cov 3 | www.mfjenterprises.com |
| National RF, Inc. | 109 | www.NationalRF.com |
| PowerPort | 103 | www.powerportstore.com |
| QCWA | 67 | www.qcwa.org |
| R.F. Connection | 71 | www.therfc.com |
| RF Parts | 17 | www.rfparts.com |
| RT Systems | 79 | www.rtsystems.com |
| Radio Club of J.H.S. 22 | 53 | www.wb2jkj.org |
| RemoteHamRadio | 53 | www.remotehamradio.com |
| Rohn Products | 49 | www.rohnnet.com |
| SteppIR Antennas Inc. | 20,21 | www.steppir.com |
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| TG Electronics | 101 | www.tgelectronics.org |
| Tac-Comm | 71 | www.tac-comm.com |
| Telewave, Inc. | 59 | www.telewave.com |
| Ten-Tec, Inc. | 83 | www.tentec.com |
| Ten-Ten International Net, Inc. | 109 | www.ten-ten.org |
| XTAL SET SOCIETY, THE | 109 | www.midnightscience.com |
| Timewave Technology, Inc. | 57 | www.timewave.com |
| Vibroplex | 87 | www.vibroplex.com |
| W&W Mfg | 77 | ww-manufacturing.com |
| W2IHY Technologies | 97 | www.w2ihy.com |
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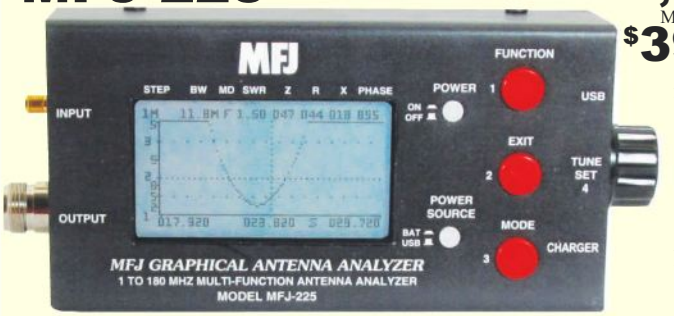


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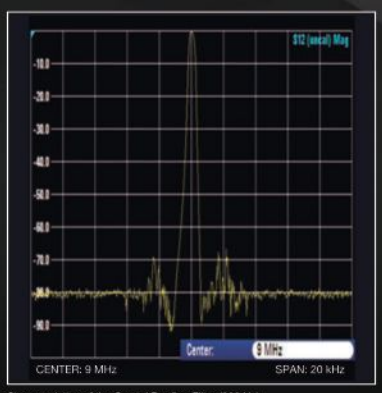
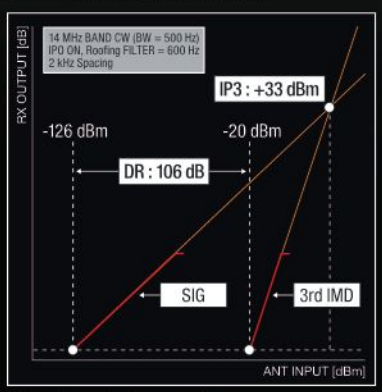



Characteristics of the Crystal Roofing Filter (300 Hz)

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