

# WorldRadio

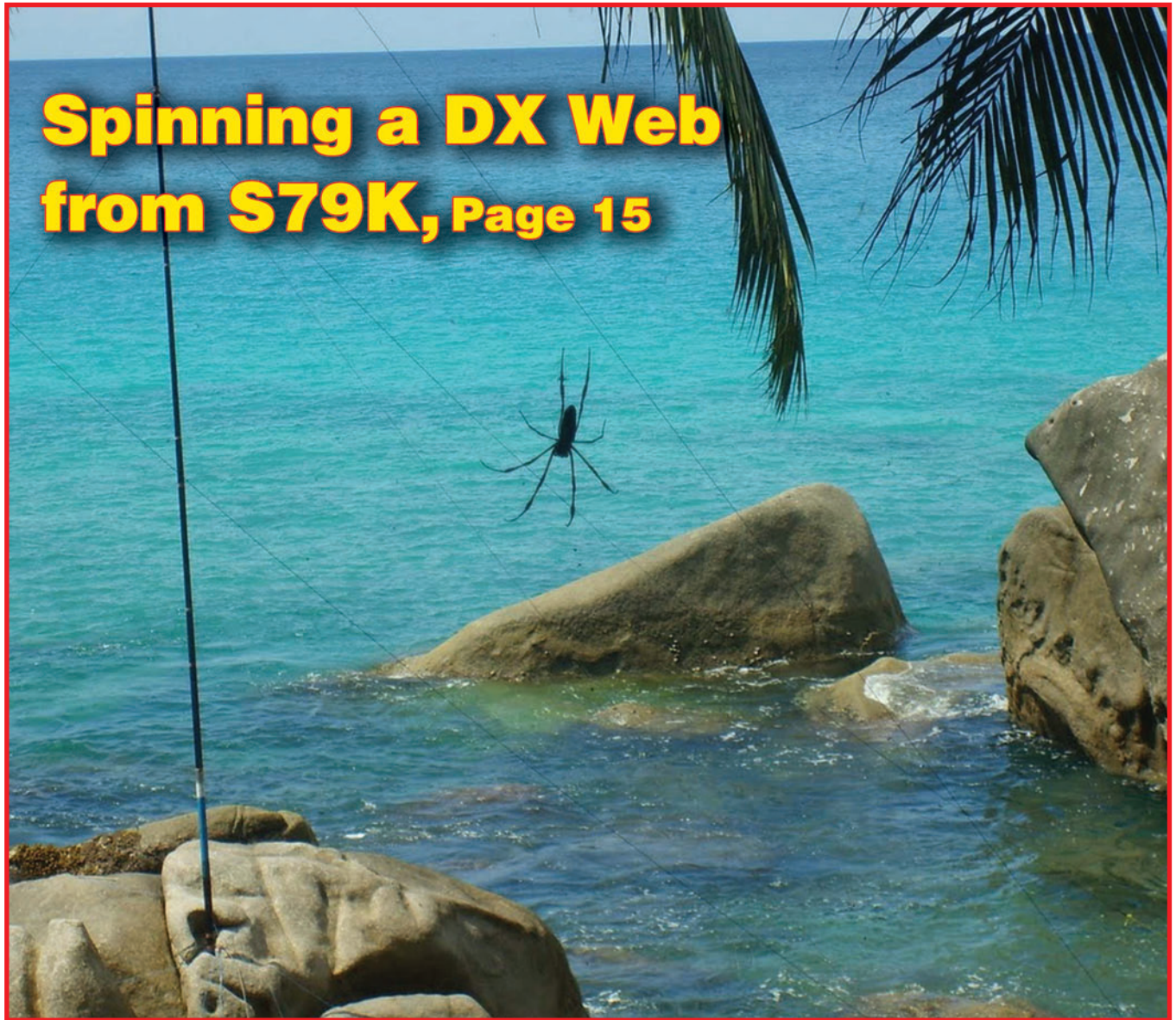
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## ONLINE

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Year 40, Issue 10

APRIL 2011



**Those Crazy Callsign Indicators, Page 13**

**A Coat Hanger Beam for 440 MHz, Page 22**

**Thrills and Chills of Antarctic Propagation, Page 36**

**Kurt's Take On Resonance – Or Not, Page 58**

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



## George Tranos, N2GA, Named CQ Magazine Contesting Editor

George Tranos, N2GA, of Long Island, New York, has been named Contesting Editor of *CQ Amateur Radio* magazine, according to Editor Rich Moseson, W2VU. Tranos succeeds John Dorr, K1AR, who stepped down after writing the magazine's contesting column for nearly 22 years.

Tranos has two decades of contesting experience in a variety of station settings, and has several top scores to his credit, both as a single operator and as part of contesting teams. He has operated extensively from the Caribbean as well as from his home station in New York, and has been a referee at three World Radio Teamsport Championship competitions, in 2000, 2006 and 2010.

George is a member of the Yankee Clipper Contest Club and the New York-based Order of Boiled Owls contest club. He is also a former ARRL Section Manager and past Chairman of Ham Radio University, a day of amateur radio seminars and fellowship on Long Island.

Professionally, Tranos is president of a software and management consulting firm, vice president of a school for professional motorcycle riders, and a freelance journalist. He is married to Diane Ortiz, K2DO, an accomplished tester herself and a former columnist for *CQ Contest* magazine, which was published in the 1990s.

CQ Editor Rich Moseson said, "I am confident that George will uphold the high standards for this column established by K1AR and will bring to it his own perspective. I look forward to working with him over the coming years."

"I am honored to have been asked to contribute to *CQ* magazine," said Tranos. "The contesting column is always the first thing I read. I hope to be able to keep up the great standards and traditions that compel me and many others to look forward to each issue."

George's first column appeared in the March 2011 issue of *CQ*. (*CQ Communications, Inc.*)



## Vintage Radio Shack Catalogs Dating to 1939 Now On the Web

You're in luck if you've been craving a stroll down Radio Shack *Memory Lane*. Check out: < <http://bit.ly/gr0WTB> >.

"The site contains catalogs for the company that date all the way back to 1939," according to an item from Amateur Radio Newline. "Each one is animated in a way that a click of your mouse lets you turn the pages or zoom in to see that special part or item that evokes a memory of days gone by."

There is a history of the company, as well, along with the story of how Charles Tandy purchased Radio Shack Corp. in 1963 for \$300,000, "when it was on the verge of bankruptcy . . . and built it into the mega corporation it is today."

(ARN, K3MSB)

## DX: 9G5LK, P4/W1HEO and 5X1NH Being Activated This Month

**GHANA:** Kees Leenders, PE1KL, and Lisa Leenders, PA2LS, will be operational as 9G5LK near the village of Ampenyi, Ghana from April 28 to May 6. Their activity will be on 80 through 10 meters using SSB, PSK31 and RTTY. QSL via PA2LS.

**ARUBA:** D.E. "Dee" Logan, W1HEO, will be active from Aruba (Islands On The Air SA-036) as P4/W1HEO from April 3-16 from the P49V contest station.

Logan, who is *Promotion and Recruitment* columnist for *WRO*, says operation will be on 160 through 10 meters, CW and SSB, "with emphasis on the higher HF (high frequency) and WARC bands."

"Although this is a semi-holiday outing," he said, "major effort will be devoted to maximizing on-air operating time."

Operation on IOTA frequencies will include 14.260, 14.040, 18.128, 18.098, 21.260, 21.040, 28.460 and 28.040 MHz.

"A special color postcard-QSL will be available," Logan said. "QSL direct only to the W1HEO address on QRZ.com or via the bureau."

**UGANDA:** Nick Henwood, G3RWF, will be active as 5X1NH from Fort Portal in western Uganda through April 14. He prefers to operate CW but plans to be on the digital modes as well, with some SSB on all bands except 160 meters. QSL via his home callsign or electronically using Logbook of the World.

(ARN, W1HEO)

## Radio Amateurs Asked to Track NanoSail-D

When a NASA nanosatellite – NanoSail-D – ejected unexpectedly on January 17 from the Fast Affordable Scientific and Technology Satellite (FASTSAT), the agency called upon amateur radio operators to help track it. NASA asked radio amateurs to listen on 437.270 MHz for the signal and verify that NanoSail-D was operating. NASA received almost 470 telemetry packets from 11 countries.

The NanoSail-D beacon sent an AX.25 packet every 10 seconds; the packet contained data about the spacecraft's systems operation. (To hear a recording of the nanosatellite's beacon made by Hank Hamoen, PA3GUO, visit: < <http://bit.ly/fz45K7> >. – Ed.)

(ARRL Letter)

## Report: 2.4 GHz Distance Record Set Across Tasman Sea

According to published reports, a distance record has been set between Steve Hayman, ZL1TPH, and Adrian Pollock, VK4OX, in the first trans-Tasman Sea contact on 2.4 GHz – 1,439 miles on a band considered line of sight.

ZL1TPH, in Orewa, New Zealand, was running 80 to 100 watts to a 1 meter dish. VK4OX, in Bald Knob, Queensland, Australia, was running about 20 watts to a 24 dBi Gridpack antenna about 29 feet off the ground.

(ARN, ZL4PLM via ZL2BHF)



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HF/50MHz Transceiver



Icom continues to lead in high performance digital technology. The IC-7410 is a familiar-looking yet new HF/50MHz rig for everyday use that takes advantage of our digital know-how. A high grade DSP unit and double conversion super-heterodyne system developed for our higher grade IC-7800/7700/7600 series are used. In addition, the IC-7410 comes with a built-in 15kHz 1st IF Filter and can accept up to two optional filters (3kHz/6kHz). When used with these 1st IF Filters, narrow mode signals such as the CW and SSB modes are protected from adjacent strong signals. Experience the latest tech in your everyday use!

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Even during long hours of heavy duty use, the IC-7410 provides stable output power.



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Max. Performance: 2000MFLOPS



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A standard type B USB connector is located on the back panel. Use it to control your IC-7410 via PC.

# WorldRadio ONLINE TABLE OF CONTENTS

Year 40 Issue 10

APRIL 2011

## FEATURES

- 1** **All Upgrading Took Was a Plan and A Bit of Extra Effort . . .**  
By Kris Merschrod, KM2KM ..... 8
- 1-14** **“So, that’s what you do?” Humor**  
By Dean Lewis, W9WGV ..... 13

## COLUMNS

- 2** **EDITOR’S LOG** ..... 6
- 15-27** **DX WORLD: Seychelles By the Seashore - The S79K DXpedition to Africa** .. 15
- TRAIL-FRIENDLY RADIO:**  
A Coat Hanger Beam to Hang Your 440 MHz FM Signal On..... 22
- RULES & REGS: From All Indications, Lots of Confusion** ..... 28
- STATION APPEARANCE:**  
G4UCJ, Buckingham, England: Sending, Receiving and Editing ..... 31
- AMATEUR SATELLITES:**  
ARISSat-1, Up, Up and Away For ISS Rendezvous ..... 34
- PROPAGATION:**  
The Chills and Thrills of Yet Another F<sub>2</sub> Region Anomaly ..... 36
- 3** **MORSE CODE: Come On in - The CW Water is Just Fine** ..... 40
- WITH THE HANDIHAMS:**  
An Audible Transmitter Output Monitor with a Stealth Antenna ..... 44
- 28-43** **MARS: The Final Report Card: Disaster Preparedness Commentary** ..... 46
- PROMOTION AND RECRUITMENT**  
Tapping Into the Power of Print ..... 52
- 4** **AERIALS: The Power Play: Non-Resonant vs. Resonant Antennas** ..... 58

## DEPARTMENTS

- 44-60** **WorldRadio Online Newsfront** ..... 2
- DX Predictions - April** ..... 39
- Visit Your Local Radio Club** ..... 51
- Hamfests & Special Events** ..... 51
- VE Exams** ..... 56
- Contest Calendar** ..... 54
- WorldRadio Online Mart** ..... 57

**On the Cover:** Was that a Spiderbeam pole that the S79K Team used during its DXpedition to the Seychelle Islands off the east coast of Africa? Here’s the crew’s 40-meter vertical dipole perched on its rock near the water’s edge. See the operators’ story in this month’s *DX World*. (Courtesy of S79K Team)

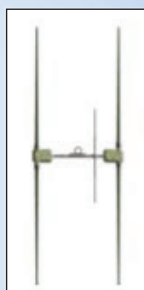




# Which *SteppIR* Product is Best for You?

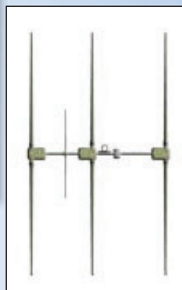
## 2, 3, and 4 Element Yagis

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



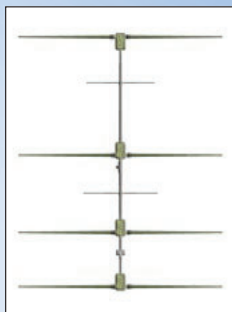
### 2 Element 20m-6m Yagi

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



### 3 Element Yagi 20m-6m

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

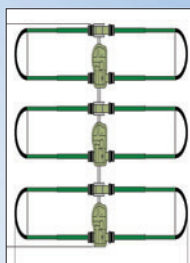


### 4 Element Yagi 20m-6m

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

## Dream Beam Series Yagi's

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

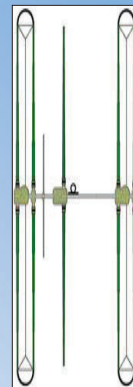


### DB11 Yagi Antenna

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

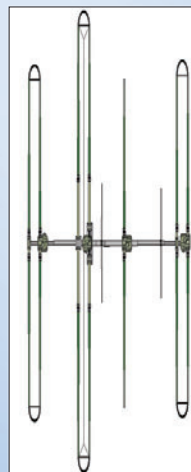
### DB18 YAGI

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



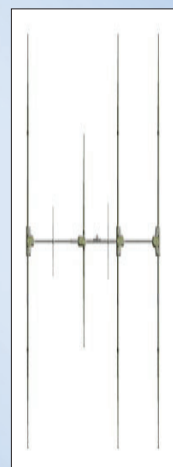
### DB18E YAGI

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



### DB36 DreamBeam Yagi, 40m-6m

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



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

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

## Vertical and Dipoles

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



### BigIR Vertical Antenna, 40m-6m

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



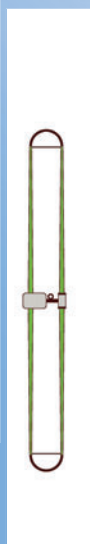
### SmallIR Vertical Antenna 20m-6m

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



### 20m-6m Dipole

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



### 40m-6m Loop Dipole

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

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## 'Try Loading Up the Kids, But Ground 'Em First'

**N**ext time someone *schoos* you on the *Immutable Laws of Antennas*, take note of what helicopter aviation pioneer Igor Sikorsky once said: "According to the laws of aerodynamics, the bumblebee can't fly either, but the bumblebee doesn't know anything about the laws of aerodynamics, so it goes ahead and flies anyway." Oh, did Igor's *choppers* fly.

What brought this to mind was a thread during the **WRO Live Online Chat** session on Super Bowl Sunday.

**Richard Caruth, K3ZEZ**, of Collingdale, Pennsylvania, asked if anyone had "ideas on what I can do for an HF (high frequency) antenna. I live in a townhouse." Sadly, the borough he lives in "won't let me put anything out front. There are electric wires across the back of my house."

Turns out 'ZEZ is retired, on a limited income and "can't buy anything expensive." He doesn't have an attic. "I currently have a half-wave 20-meter center-fed dipole out on my front lawn, about 18-feet high – not even as high as my house – but town fathers say I have to take it down . . . no eaves to run a wire."

"My house is only 16-by-35 feet," he said, lamenting that "if I can (only) get someone to gain access to the roof." He works VHF and UHF through a mag-mount mobile antenna on his room air conditioning unit.

Does this sound familiar? Especially as condo and townhouse living grows in popularity? *What to do?*

First, don't necessarily listen to the *Antenna Gurus* who may tell you, "It'll never work."

Back in the mid-1960s, my friend **Randy Fisher, WA1ECC**, had just gotten a Swan 350 transceiver. Technically, we'd have to wait until the next day to put up an antenna and get on the air. The impatience of teenagers, though, dictated otherwise.

His new rig had been set up in a room with a four-poster bed. *Hummmm*. We circled several turns of hook-up wire around the four posts, used the bed-springs as ground and proceeded to work up and down the east coast from Massachusetts on 75-meter phone. Just goes to show: *You never know . . .*

**WRO** chatters offered even more proof, and a lot of suggestions for K3ZEZ.

**Gene Bartsch, WI7N**, of Banks, Oregon, said he "loaded up the window screen in my dorm room when I was in college in 1967. It didn't work real well, but I did make a few QSOs."

"Try stringing wire around inside the condo and use a tuner against a counterpoise on the floor," suggested **Mike Herr, WA6ARA**, of Ridgecrest, California. "I've used that in hotels with some success . . . I've been chatting with a guy on 60 meters in Tuscon (who) uses a screwdriver antenna on a tripod in his backyard. When he isn't operating he puts it away. Good signal, too."

To which **Ray Lajoie, KB1LRL**, from Fitchburg, Massachusetts added: "You could always set up a screwdriver on your vehicle, then run coax into the shack. The townies can't fight a mobile setup!" (*What's a screwdriver antenna? Check out: < <http://bit.ly/e1H35F> >. – Ed*)

'LRL said he'd "seen an article where this guy modified a vertical and mounted it through PVC," as well, "and put it on the side of his building."

**WRO Looking West** columnist **Bill Pasternak, WA6ITF**, wrote from Saugus, California, that he'd once loaded up "wet spaghetti on 6 meters. Actually it kept drying out and **Larry Levy, WA2INM (SK)** and I had to keep spraying it with a water hose." It was sometime around the summer of 1960. "We were always trying to bust ham radio myths."

**Scott Hernandez, KD5PCK**, from Mandeville, Louisiana, said, "after Katrina, I visited a friend who loaded up his FEMA trailer."

**Ron Erickson, KØIC**, of Essex, Iowa, said "a random wire – 67-foot minimum – will work if you have a counterpoise and/or some ground

(Continued on page 59)

## WorldRadio Online

### EDITORIAL STAFF

**Richard Fisher, K16SN**, Editor

(E-mail: [worldradioonline@gmail.com](mailto:worldradioonline@gmail.com))

**Richard S. Moseson, W2VU**, Editorial Director

(E-mail: [w2vu@cq-amateur-radio.com](mailto:w2vu@cq-amateur-radio.com))

### CONTRIBUTING EDITORS

**Terry Douds, N8KI**, Amateur Satellites

(E-mail: [n8ki@amsat.org](mailto:n8ki@amsat.org))

**Richard Fisher, K16SN**, Trail-Friendly Radio

(E-mail: [ki6sn@aol.com](mailto:ki6sn@aol.com))

**Gerry Gross, WA6POZ**, 10-10

(E-mail: [wa6poz@arrl.net](mailto:wa6poz@arrl.net))

**Dave Hayes, VE3JX**, QCWA

(E-mail: [ve3jx@bell.net](mailto:ve3jx@bell.net))

**John B. Johnston, W3BE**, Rules & Regs

(E-mail: [john@johnston.net](mailto:john@johnston.net))

**Kelly Jones, NØVD**, DX World

(E-mail: [n0vd@dxcentral.com](mailto:n0vd@dxcentral.com))

**Dee Logan, W1HEO**, Promotion/Recruitment

(E-mail: [deverelogan@gmail.com](mailto:deverelogan@gmail.com))

**Carl Luetzelschwab, K9LA**, Propagation

(E-mail: [k9la@arrl.net](mailto:k9la@arrl.net))

**Cheryl Muhr, NØWBV**, YLs

(E-mail: [n0wbv@earthlink.net](mailto:n0wbv@earthlink.net))

**Randall Noon, KCØCCR**, FISTS CW Club

(E-mail: [rnoon@nppd.com](mailto:rnoon@nppd.com))

**Bill Pasternak, WA6ITF**, VHF, FM & Repeaters

(E-mail: [wa6itf@arnesline.org](mailto:wa6itf@arnesline.org))

**Carole Perry, WB2MGP**, Hams With Class

(E-mail: [wb2mgp@ix.netcom.com](mailto:wb2mgp@ix.netcom.com))

**Bill Sexton, N1IN/AAR1FP**, MARS

(E-mail: [sextonw@juno.com](mailto:sextonw@juno.com))

**Kurt N. Sterba**, Aerials

(E-mail via: [worldradioonline@gmail.com](mailto:worldradioonline@gmail.com))

**Patrick Tice, WAØTDA**, With the Handi-Hams

(E-mail: [wa0tda@comcast.net](mailto:wa0tda@comcast.net))

### BUSINESS STAFF

**Richard A. Ross, K2MGA**, Publisher

**Chip Margelli, K7JA**, Director of Advertising

Sales and Marketing

(E-mail: [CQAds@socal.rr.com](mailto:CQAds@socal.rr.com))

**Emily Leary**, Sales Coordinator

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### CIRCULATION STAFF

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### PRODUCTION STAFF

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25 Newbridge Road  
Hicksville, NY 11801-2953 USA

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# All Upgrading Took Was a Plan and A Bit of *Extra* Effort

By Kris Merschrod, KM2KM

At one point, when the Advanced Class still existed, I bought the study manual and thought that I could squeeze in the studies to upgrade my amateur radio license while away on an overseas assignment. For a lot of reasons, that didn't work out.

It wasn't a new theme, though. I'd been thinking about moving up in the amateur radio ranks for more than 27 years. Well, in the last year, just the excuse I needed arrived.

I'd let my subscription to *QST* magazine lapse and the renewal offer included my choice of a book – *free*. The only one on the list I did not have was – you guessed it – *The Extra Class License Manual*.

It arrived about six weeks before the Tompkins Cortland Amateur Radio Club would be offering VE exams. Fellow hams had been encouraging me to upgrade, showering me with the all-essential moral support.

It was perfect timing, except for the two-week trip overseas we'd planned to visit our granddaughters. It was right in the *study period*. On the other hand, it included trans-Atlantic flights plus a couple of four-hour train rides. *Hummmmmmmmm*.

I was going to need a study strategy. I really wanted to pass this exam.

## Getting Started

Socrates once said: *The only true wisdom is in knowing you know nothing*.

Well, I wasn't that bad off, but the first step was to know just where I stood when it came to knowing what needed to be known.

A passing grade is 74 percent. That would mean answering correctly 37 of 50 questions that would be randomly drawn from the VE pool of 700-plus questions.

There is an excellent QRZ.com Internet site to test your basic knowledge and to accompany you as your studies progress: < <http://bit.ly/hOFVR2> >.

It offers 50-question practice exams with an option providing you the opportunity to continue checking answers until you have the correct one. That process includes a reminder, as well as a guide to the areas or sub-elements that need study.

Importantly, the questions are numbered according to the sub-element of the VE question pool. By jotting down that number you can turn to any manual with the question pool numbers and read the material for a better understanding.

I must confess, after so many years of ham activity that included antenna designs, kit building and some actual design work,



**Kris Merschrod, KM2KM (ex KA2OIG), proudly displays his Extra class license and keeps a reminder of his new callsign close by. “Just yesterday I tried a little CW,” he wrote. “It was the first time since upgrading, and out came the KA2OIG. Talk about ingrained patterns!” (Courtesy of KM2KM)**

I was sure that I would have done better than 54 percent on the first practice exam. *Not so*. To be fair, though, that was before opening the manual and starting off on my journey with *reading time galore*.

## Measuring Progress

Most manuals are divided into sub-elements. I carefully read each question and responded while covering the text of the answers. The correct responses were checked off, but the incorrect answers were not checked off in the book. That way I could review the explanatory material in order to grasp the concept and to remember the right answer.

I spent a couple of hours at a time on each sub-element. Then, following the mantra *let it sink in, or be lost*, the next day I used another useful Internet tool at a site called Copasetic Flow: < <http://bit.ly/goQhqT> >.

It allows you to take a test of all of the questions by sub-element. This is not a sample of the pool of questions: It is *all* of the questions. It is a match for the manual and it tracks your progress. Again, it has the question reference numbers so you can jot them down to restudy using the manual.

Daily, I used the QRZ site to measure progress beyond the 54 percent base line. The scores kept creeping up as I completed each sub-element.

So from the 50s, I marched through the 60s and 70s and 80s until the last few days before the exam I'd reached the high 80s and low 90s. The QRZ site offers different samples of random questions, so I started with number 1 and before taking the VE exam I'd completed 17 tests.

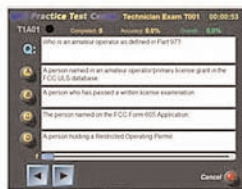


### QRZ's Practice Amateur Radio Exams

This testing system serves as a **training aid** to help amateurs and prospective amateurs in passing the FCC exams necessary to obtain US amateur radio licenses. If you can consistently pass the exams given here, you should almost certainly pass an actual VEC administered exam. Please feel free to visit this site as often as you like as you continue to study to build your knowledge and skills. **Good luck on your exam!**

All of the current test versions from the NCVEC website are presented. These include:

- Technician Class Element 2 Valid 7/01/2010 thru 6/30/2014 **Recently Updated!**
- General Class Element 3 Valid 7/01/2007 thru 6/30/2011
- Extra Class Element 4 Effective 7/01/2008 thru 6/30/2012



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QRZ Practice Test 2.0

QRZ is pleased to announce that our Version 2.0 Practice Tests are now available for general use by all license classes. These new tests give you more feedback, plus, once loaded they will run without a network connection.

**“There is an excellent QRZ.com Internet site to test your basic knowledge and to accompany you as your studies progress,”** KM2KM said. Visit it at: < <http://bit.ly/hOFVR2> >. (Screengrab courtesy of QRZ.com)

I often thought some of the sub-elements were *beyond me*. “I have no business knowing this!” I said. Those were the areas that needed more study. Indeed, they were interesting subjects such as phase angles and the use of polar coordinates.

When that material does not make sense there is always *Google* with more information. The trick is to *understand* and then the answers will make sense.

### Peaking At the Right Moment

As with any athletic event or mental effort, the trick is to reach the peak of ability just before the exam. The day before and the day of the exam, I took one sample exam in the morning and another in the afternoon and touched up the few questions that had escaped me. *I was ready to go*. The examiners cannot tell you your score, but I gather I had missed very, very few.

### The Spoils of Victory

One of the most enjoyable advantages of upgrading to Extra has been access to the 3.6 to 3.8 MHz segment of 75 meters.

The SSB DX-window – the upper part of 3.7 MHz – has been so exciting this winter. I’m working South Africa to the Netherlands. The elbow room from 3.6 MHz on up has been a welcome relief from the congestion on the upper part of 75 meters.

The same can be said for the 7.150 to 7.175 segment of 40 meters on the weekends.

#### In summary the steps were:

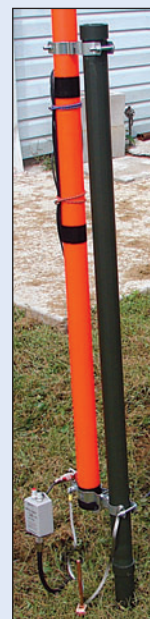
- Order the Extra manual.
- While waiting for the manual, look over the QRZ and Copasetic Flow websites.
- Immediately use the QRZ sample exams to establish your baseline and see what you need to know.
- Make note of the sub-elements where your knowledge is weak.

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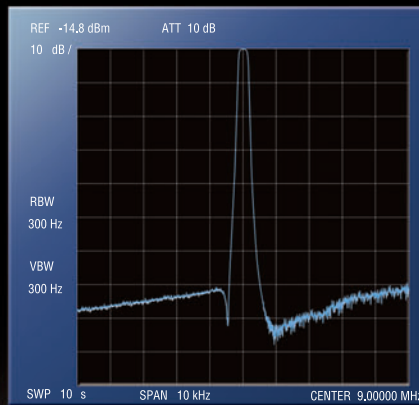
## 112 dB / IP3 +40 dBm



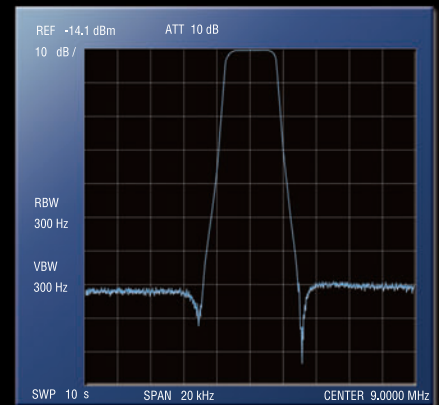
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## Extra Class Amateur Radio Exam Practice

Read the review of the Copasetic Flow Ham Radio Practice Tests at [kb6nu.com](http://kb6nu.com)  
 Practice the FCC Extra Class Ham Radio Exam. Study materials are linked to most questions, or add your own using the form below! For General Class Practice: [General Test](#) and for Technician Class: [Technician Test](#)

**Extra Class Practice Exam (Question pool published 12/20/2008)**

What is a common characteristic of interference caused by a "touch controlled" electrical device?

☐ A. The interfering signal sounds like AC hum on an AM receiver or a carrier modulated by 60 Hz FM on a SSB or CW receiver  
☐ B. The interfering signal may drift slowly across the HF spectrum  
☐ C. The interfering signal can be several kHz in width and usually repeats at regular intervals across a HF band  
☐ D. All of these answers are correct

Question 1 of 50 Accuracy = 0.00% Test Score = 0.00%

**Available Study Material**

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sin	cos	tan	+/-
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sqrt	x^y	1/x	pi
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1	2	3	x
0	.	-	/

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Copasetic Flow “allows you to take a test of all of the questions by sub-element. This is not a sample of the pool of questions: It is *all* of the questions,” KM2KM noted. Visit the site at: < <http://bit.ly/goQhgT> >.  
 (Screengrab courtesy of Blogspot.com)

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- Study the manual – sub-element by sub-element.
- Take the QRZ sample exam once a day to measure progress toward the goal.
- Wait a night and take the Copasetic Flow exam of the sub-element after each sub-element.
- Take note of the sub-element problem areas and study them again.
- Plan to leave a couple of days between covering the sub-elements and taking the VE exam in order to allow time to go back for a review of weak areas.
- A day or two before taking the VE exam, take the QRZ exam a few times to *touch up* your knowledge.
- At the VE exam, just relax and slowly pick off the questions one by one. If you have doubts about a question, use the scrap paper to note the number and come back when you’ve answered the rest. Then, read the exam again objectively. Hand it in, and we will see you on the DX-segment!

### On a Humorous Note:

My wife Stella, KA2OXG, enjoyed shocking family and friends by announcing the latest news: *I now have an extra husband*. One neighbor, obviously warming to the idea, asked: *How do you manage it?*



# ‘So, that’s what you do?’ Humor



By Dean Lewis, W9WGV

A young new engineer, who happens to be a ham, had lunch with me at work the other day. As in the past, he wanted my advice – this time of a personal nature, although once again related to amateur radio.

Matt said he was going to sell his QRP gear and buy every “boat-anchor” he could find. Something with lights, big dials, vacuum tubes, and *size*.

He wanted to know if an HQ-170A < <http://bit.ly/hDDzrF> > was a good receiver. I asked why, since he seemed by all accounts to be doing very well with the K1 < <http://bit.ly/hrcFI> >. And, after all, he doesn’t have much room in his studio apartment for an elaborate station.

Seems he’d met another new employee from Accounting. A girl. They’d dated a few times, and he wanted to really impress her with his technical accomplishments, as she seemed to find that an attractive characteristic in the opposite gender.

I’d met Colleen. She is personable, intelligent, and very attractive. She is also very *traditional*, has *values*, and Matt likes that. In my opinion they would make a good couple.

He thought so, too. She’d mentioned her grandfather had been a ham, although she never knew him well. He had passed away when she was very young. She knew little-to-nothing about amateur radio, except that her grandfather had contacted coun-

**“Matt needed evidence – proof that he was, indeed, a technically competent and accomplished communicator, just like Colleen’s grandfather . . .”** (Courtesy of KI6SN)

tries all over the world and she’d seen photos of his station as it was back in the 1950s.

It was this link that Matt decided to work on to win her affection.

He hadn’t told her he was a ham. It would have seemed trite after hearing about her grandfather: “Oh, I do that, too!” After all, she seemed sophisticated, and they weren’t in high school any more. No, he’d save his *amateur radio* prowess for the right place and time. *And with evidence.*

Having moved into his very first apartment after graduating, Matt had to limit his station not only to what would fit alongside a laptop on a small computer desk, but also to low power so as not to interfere with TV reception, audio equipment, or any of the other electronics in the building.

From Matt’s top-floor apartment, he did manage to sneak a 20-meter half-wave wire into the attic. Quite a change from the station he’d had at home, and from what he’d used at the Engineering Department’s station at the university.



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He'd been licensed since age 14 – starting as a Technician class and quickly working his way through the ranks to Extra. He'd tried all the modes and bands at various times: VHF/UHF FM, 10-meter SSB, high-frequency CW, 6-meter DX'ing, and even EME (earth-moon-earth contacts) while in engineering school.

Matt was a natural – successful in each mode he tried. And he had the certificates to prove his accomplishments. He'd been over to our place a few times. My XYL is a great cook. He had teamed with me during the last contest and I choked when he turned the keyer speed up to 35 wpm.

So the plan was set. Matt needed *evidence* – proof that he was, indeed, a technically competent and accomplished communicator, just like Colleen's grandfather. He had the certificates framed. Although never a big QSL collector, he went back over the QSOs of past years, chose the best and most impressive of them, had his own cards printed, filled them out, and sent them off. There was a lot of DX.

This got to be expensive on a young engineer's salary, what with getting the cards printed, overseas postage at \$.98 a pop, outgoing No. 10 and pre-printed return No. 9 envelopes, and the two, sometimes three *green stamps* < <http://bit.ly/hgFusY> > to cover return postage from the DX stations and their QSL managers.

There would be no waiting for the bureau to handle them. That could take years. It still took time, though – time Matt hadn't wanted to waste.

The dates with Colleen continued, though, and finally the cards started coming in. Work began on the display. One wall

was dedicated to Worked All States – one card from each of the 50 and the WAS Award in the center of the display. Not just *an* award. This one included endorsements for 40-, 20- and 15-meter CW, and QRP. The low power addition was earned since setting up the current station at the apartment.

The opposite wall was all DX, surrounding his DXCC and Worked All Continents certificates, and a special section for 6 meters. In the process he realized he'd also made VUCC, but that certificate would have to wait. Above the world map on the wall in front of his computer desk-station were lined up the cards from EME contacts made at the university. *This kid's really good.*

So, the *big day* came. After dinner and a movie, Matt convinced Colleen to come up to his place for the first time, with a promise of some very good wine and a project he'd put together just for her. He assured her it would explain a lot about him and his background.

Walking into the apartment, she stopped short as Matt asked, "So, what do you think?"

She didn't see the little K1 sitting next to the Dell laptop in the corner.

She didn't notice the small switching power supply or the antenna tuner on top of it, or the small keyer paddle next to it.

She wasn't aware of the 24-hour clock on the wall and the antenna wire running along the baseboard over to the closet where it went through the ceiling to the attic.

She saw the *evidence* that he so carefully prepared, at great expense and with great patience.

"So *that's* what you do?" she wondered. "Collect postcards?"





# Seychelles By the Seashore – The S79K DXpedition to Africa

By Kelly Jones, NØVD

*In 2009 I had the pleasure of meeting and operating with Dave Sharred, G3NKC, and Martin Platt, G4XUM, while visiting PJ2T on the island of Curacao. Since that meeting, we have kept in touch and have had discussion about “where do we go next?”*

*In October 2010, both Dave and Martin embarked on a DXpedition to the Seychelles Islands off the east coast of Africa. In Dave’s own words, here is the story of S79K.*

## As G3NKC Tells It . . .

Between 2002 and 2006, Martin and I participated in various contests as MD4K. However, with the decreasing sunspots, we looked for opportunities to experience the pileups from other

locations. As it turned out we happened to operate from a different continent each year: 2007 from P3F (Cyprus / Asia); 2008 from 6Y1V (Jamaica / North America); and 2009 from PJ2T (Curacao / South America). So in 2010 we looked for an opportunity to operate from Africa.

We had heard about the successful S79GM DXpedition by Robert Ferguson, GM3YTS, and Gavin Taylor, GMØGAV, so we had a number of discussions about the viability of using the same QTH in the Northern part of Mahe – the main island of the Seychelles. Out of those conversations, we concluded that the QTH would be available for our time frame and we would have plenty of time for putting a station together, tearing it down, and, of course, some operating in between!

Due to planning requirements, we needed to establish a team



**The 20-meter vertical dipole array got quite a workout during the S79K DXpedition to the Seychelle Islands off the east coast of Africa.**

very early on and had a short list of operators we could call on. We soon added Michael Wells, G7VJR, and Fred Handscombe, G4BWP, to the team – in addition to Fred's wife, Yei Li.

## Setting Our Antenna Strategy

We knew the QTH was on the water's edge, facing north. This gave us a great take off toward Europe, North America and Asia. But we had to consider the fact that we needed to hand carry all antennas, as well, so they were required to be lightweight, yet effective. In the end we decided on the following:

- **160/80 meters** – Battle Creek Special < <http://bit.ly/fDSG84> > on a 60-foot Spiderbeam pole < <http://bit.ly/fwnfXm> >. Since this antenna is an inverted L with a trap, it was decided that it needed no real preparation ahead of time and we would build it on site, including the radials.

- **40 meters** – A simple quarter wave was planned using a 36-foot fiberglass pole. Again, we decided that these would need no special attention and could be made on site.

- **20 meters** – We decided very early on that we would plan to use a two-element vertical dipole array (VDA), supported on

a 40-foot middle section of a 60-foot Spiderbeam pole. (*To learn about the concepts of the VDA, see a video tutorial featuring David Case, KAINCN, at: < <http://bit.ly/eoAP9k> >. To see the video's accompanying PowerPoint presentation, visit: < <http://scr.bi/eHR6X1> >. – Ed.*)

- **15 and 10 meters** – VDAs were planned here too, using standard 30-foot fiberglass poles.

The VDAs were an unknown quantity to us so by late August we had a planning weekend in Crewe, England in which we successfully made and tested the three of them. They performed fairly close to the design calculations and exhibited some directivity. Due to the difference in location, we expected we would need to resonate the antennas on site in the Seychelles, so we didn't spend much time on tuning them to an exact frequency.

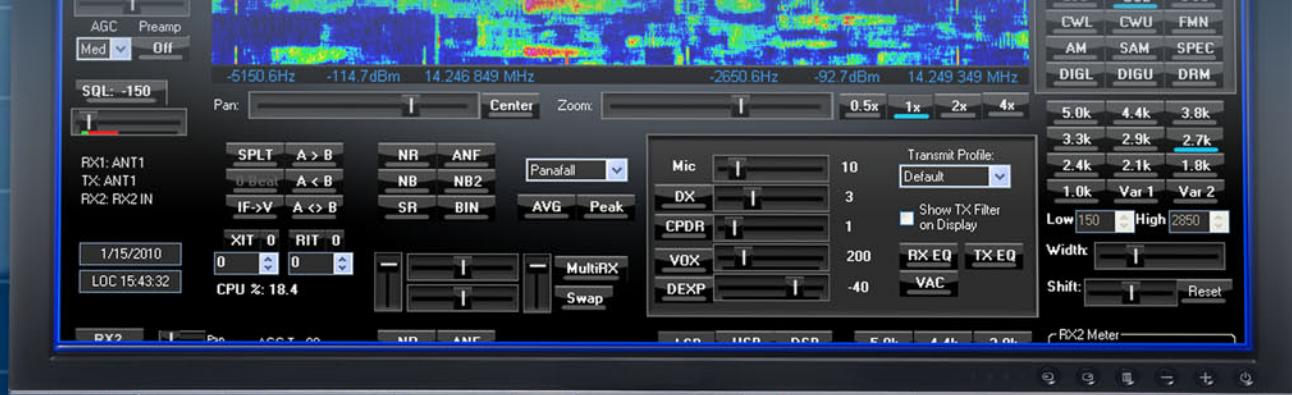


Paradise in the Seychelles, complete with the sun, the sea and antennas. Here, Fred Handscombe, G4BWP, (foreground) and Martin Platt, G4XUM guy the base of S79K's 20-meter vertical dipole array. (Photographs courtesy of S79K Team)



Cables from the S79K shack lead to the 6 Pak below. That's the base of 160/80-meter Battle Creek Special in the foreground with the 40-meter vertical behind it.





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**G4BWP hunkers down as he manages a run of stations on 10 meters.**



**Here's the base of Battle Creek Special. The antenna was resonated for phone portion of 80-meters, but we used a *Sprite Bottle Loading Coil* to drag it down to the CW portion – with good results.**

In addition to our transmit antennas, we had a receiving loop for low band reception. Even though we did erect this in the Seychelles, we rarely had to use it.

### **The Gear We'd Need**

Other equipment we planned to take included:

- **Transceivers** – Two Elecraft K3s. We did consider the need for a back-up radio, but in the end we did not have the capacity to take one.
- **Amplifiers** – Michael already had a Tokyo Hy-Power HL1.2Kfx and Fred had recently acquired an SPE Expert 1K amplifier.
- **6 Pak** – This meant that we planned to run two RG8 coaxes back to the shack, and then RG58 to the *antenna farm*.
- **Filters** – We took individual band pass filters for each radio. These were lighter in weight than our Dunestar filters.
- **Power supplies** – We had various compact switched mode supplies for the rigs and antenna switching.

• **Coax** – We took 75-foot runs of RG8. The VDAs were already coupled to nominal lengths of coax so we had additional runs of RG58 in different lengths in order to extend the coax lengths on site.

• **Tools** – We had a small selection of basic tools including a soldering iron and some spare connectors. Due to weight limits, we only considered items we thought we might need.

- **PCs** – We planned for four laptops. Three were configured in a WiFi network with the fourth to support access to DX Clusters.

### **Welcome to Weight Watchers**

An additional aspect of our planning was weight management – all of the equipment was going with us. Nothing was shipped ahead of time. We created a spreadsheet early on to document our inventory and to monitor the weight so that we could forecast what would be within our weight limit of around 65 lbs – (30Kg).

Because Fred was not able to take either his radio or amplifier with him, we agreed to carry these. This meant that Fred would take the ski bags with the poles in them and all of the coax with him. Seemed like a fair swap at the time, but having all of your antennas and coax with a single person arriving a day later than the rest of the crew could have turned into disaster.

### **S79K, With Strings . . .**

We had applied for the callsign S79K and were quite surprised that our wish was granted! However, we did have a few restrictions in our license that we could not do anything about, even though we asked:

- **160 meters** – The band was only available from 1.81 to 1.85 MHz. We would have liked to have had this extended to either work below 1.810 (maybe split frequency to Europe, EU) or additional slots above 1.850. In the end we spent little time on 160.
- **80 meters** – Standard EU band plan. We knew it would be very hard to find a frequency here although we considered it might be easier for a few hours before EU sunset. Seychelles time is four hours ahead of GMT. We would have liked to have been able to go above 3.8 MHz, as well.

• **40 meters** – The band is only available between 7.05 and 7.100 MHz. This was going to be quite restrictive, but we made the best of it.

Our power limit was restricted to 400 watts so our amps were a good choice.

### **Our Destination**

Michael, Martin and I travelled together from Manchester, England to Dubai on October 25 and then to the Seychelles after a short layover. We did some luggage juggling in Manchester. Both K3s



and the THP amplifier were carried onto the airplane as hand luggage, with everything else going as checked baggage. We knew we were very close to our weight limits, if not over, but were relieved not to incur additional costs!

We arrived to a very dreary and wet Seychelles around at 8 a.m. local time on Tuesday. The Passport Control took an eternity with very thorough checks made on everyone. Martin was unlucky at customs, as well. Agents apparently took an interest in his luggage.

None of the hand-carried radios or amplifiers attracted attention, but Martin's case had the filters and the switching power supplies. In the end our explanation was accepted and Martin was given a piece of paper that was required to be handed in on leaving the Seychelles.

After clearing customs and immigration, the rental car company met us and took us to the villa. We rented two compact Hyundais, and with four adults plus all of our luggage, it made for a tight fit. However, we arrived safely at the rental villa around 10:30 a.m.

### Getting Things Ready

Throughout the rest of the day we opened the cases and set up the stations as much as we could – Fred, who was carrying the antennas and coax, was not due to arrive until early on Wednesday morning.

After Fred's arrival we began setting up the remaining pieces of the station. The waterfront was very rocky so we selected the best sites for all antennas perched on rocks.

First up was the 15-meter VDA. Not surprisingly, we found that the resonant point had changed a little, but we were able to find the resonance point and move it to where we wanted.

### On the Air

By midday, the 15-meter antenna was ready for action and a quick tune across the band netted a few early QSOs with Asian stations, and MØURX with a very good signal, as well. So early on we were hopeful that we would work EU relatively easily.

Next, we set up the Battle Creek Special which was intended for 80/160 meters. Since this was our biggest antenna, we figured it should be put up next. We tuned it for 160 meters and the higher end of 80 meters and we installed about 16 radials with at least half of them tossed into the sea.

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**The guest house we used in the Seychelles was mission control for our S79K radio operation.**

We made a loading coil for the base as well, so we could move the 80-meter resonance point to the CW part of the band. This was a 2-liter Sprite Bottle special! We were on 80-meter CW with a bang from just around EU sunset with the first station in the log being OH3XR. Another 500 QSOs were logged in the next six hours – primarily with Asia and Europe.

### **Tying Together Loose Ends**

Thursday was spent setting up the remaining antennas. Between setups, we did a little band checking and a lunchtime run on 15 and 20 CW. We now had both our stations functional. We even loaded up the 40-meter vertical to give some 30-meter QSOs to the deserving!

Since we had operated 80 meters during the previous evening, we planned to give 160 meters a good go on Thursday evening. We hit Top Band by 1720Z with a QSO with RA1AOB followed by a string of QSOs making many operators very happy.

Since this part of the world was new to us, we wanted to explore the bands just after sunrise. Friday morning we operated mostly on 20 meters and found the band wide open to EU. Since we had planned on an entry in the CQWW SSB DX Contest, we took the opportunity to load up the 40 meter vertical on 17- and 12-meters and hand out a few contacts on

those bands since we knew that we would not be active there during the contest.

In the end, Friday produced around 1,300 QSOs.

### **The CQWW SSB DX Contest**

As I mentioned, one of the reasons for our DXpedition to the Seychelles was to enter the CQWW SSB DX Contest. Martin started the contest at 4 a.m. local time (0000Z) with a nice run on 20 meters. I tried a little on 40, but knew it would be difficult with all of the loud European stations working each other.

We decided not to bother with the low bands on the first night since we know how ferocious those bands can be in Europe. Most of our QSOs were coming on 20 meters and by 0300Z I had moved to 15 meters. It soon opened up with a bang! I was met primarily by a huge wall of JAs (Japan). In fact, it was so difficult to pick out calls, I had to ask for JAs by the numbers – staying on each number for only one QSO. The very disciplined JA ops understood this well and responded accordingly. With the first shift over, we had made more than 600 QSOs.

After a little while behind the radios, we began to realize that only one band was really open at any time. And as the day went on, 20 meters became more difficult – so we moved up to 10 meters. The *money band* at that point became 15

meters – especially when it opened to both Europe and Asia at the same time. After eight hours, we had roughly 1,300 QSOs in the log.

By 1330Z we had moved back to 20 meters. Fifteen meters was beginning to thin out as well, so the 15-meter station became a 40-meter station, and roving low band station. At 1407Z we put both KH7X and KH6MB in the log on 80 meters – KH6 is a *very long way* from S79. All totaled, we finished Saturday with more than 3,750 QSOs in our log.

Sunday was pretty much a repeat of Saturday with 15-meter conditions being perhaps a little better than the previous day. Some “local” Asian stations (A6s, A7s) worked us on all bands, even 160 meters.

On the last evening we managed to find a frequency in our limited 40-meter allocation and were met by a wall of stations calling us. This necessitated split operation since we struggled to make ourselves heard among those callers. Even then, we had to work by the numbers – it was simply amazing how many guys were calling!

### **Crunching Numbers, Heading Home**

We finished the contest with 7,147 QSOs and nearly 9,000 total QSOs for our DXpedition – which we are extremely pleased with, given we were operating from a station with no permanent antennas.

Finally, our DXpedition was coming to an end. Since we had brought all of our equipment with us, it was time to begin tearing it all down and getting it ready for the return trip.

It’s amazing how little time you need to dismantle a station and pack it all away. We disposed of some of our unwanted weight – bits of wire and small things we didn’t want to drag back with us – and went out for a well-deserved meal at a pizzeria on the north coast. In fact, this was about the only place open since it was a public holiday in Seychelles.

On Tuesday we began our return journey. Fred and Yei Li left for Dubai and the rest of us continued to Manchester, England. We again had some negotiations over our excess baggage weight, but in the end were never charged for it.

### **In Retrospect . . .**

We all agreed we had a great time from a great location and were quite pleased



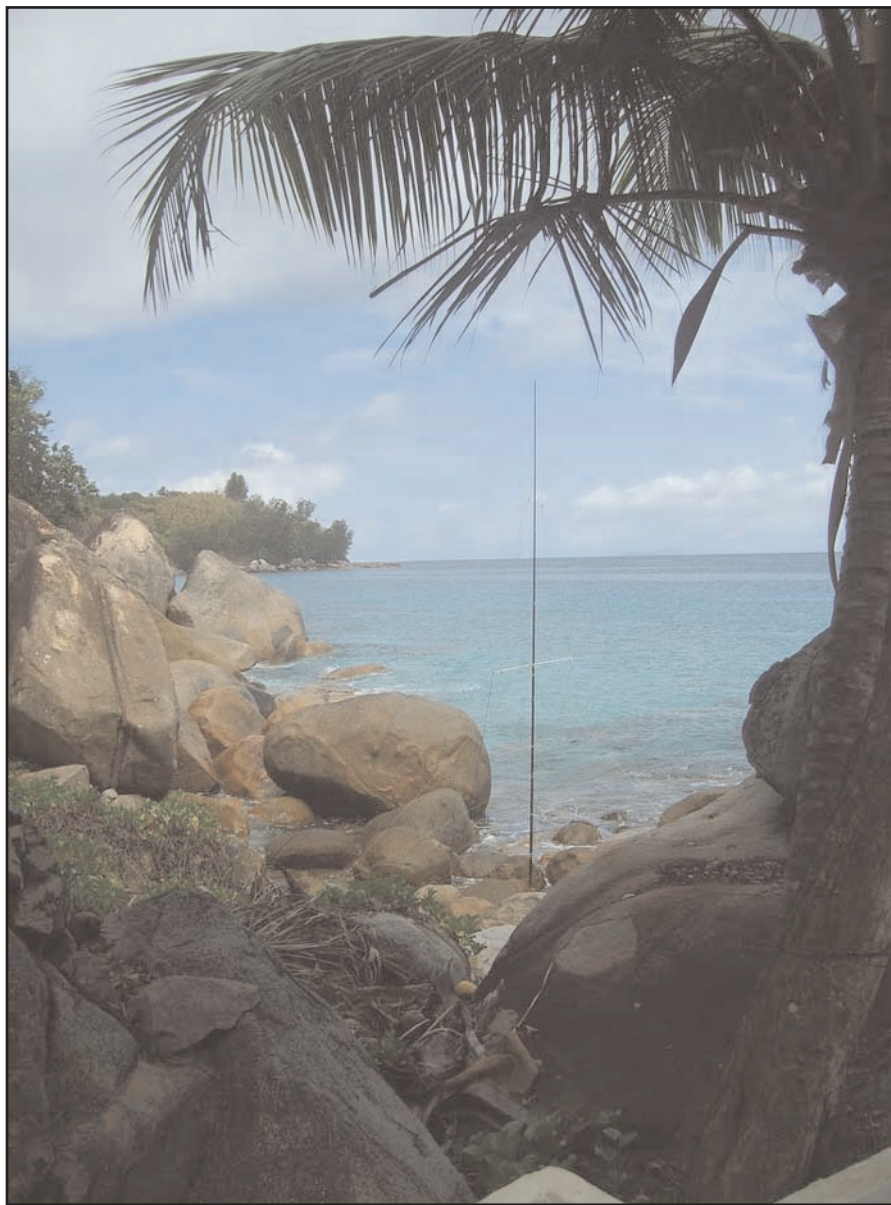
with our efforts. The location of the VDAs really helped – right on the waterfront. This arrangement gave us some advantage over simpler antennas.

All logs have been uploaded to eQSL and LoTW and I have replied to about 500 direct QSLs. Some of the comments were very complimentary and I was humbled by two USA operators. Both were already on the Honor Roll, yet Seychelles was a new one—one guy now needs only one more to be at the top of Honor roll.

This is one easy place to get to and to obtain a license. A great deal of fun can be had from S79 with a relatively simple set up – and there is still plenty of

demand to create pile-ups for as long as you want.

*That's it for this month's column. A very special thanks to Dave Sharred, G3NKC, and his team for sharing their DXpedition experience as S79K. I look forward to hearing your comments, complaints or whatever is on your mind. If you have a story or opinion you would like to share, please send it to me at n0vd@dxcentral.com. I'll do my best to include it in and upcoming column. Look for me on Facebook or Twitter as well, and until next time, see you in pileups!*



The 10-meter vertical dipole array was looking due north – the perfect direction for NA, EU and JA.



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# A Coat Hanger Beam to Hang Your 440 MHz FM Signal On

By Richard Fisher, KI6SN

**T**he arrival of a digital television (DTV) converter here set the wheels in motion to build a little receiving antenna for the relatively new, non-analog, over-the-air signals beamed from stations across Southern California.

Commercially-made DTV antennas can be pretty pricey, but a piece of wood, a handful of metal coat hangers and some hardware yielded a great little beam that picks up as many as 106 non-cable digital stations here – *all free*. Ah, TV DXing. Another story, though, for another time.

The exercise brought back memories of 1960s Novice days in New England when my friend and I built a beam for 2-meter AM using a broomstick and all the metal coat hangers we could scrounge from our parents' closets. The antenna worked great and survived several Massachusetts winters.

Building the DTV beam was so much fun it begged the question: *How about making a coat hanger beam that's trail friendly for VHF or UHF?*

### 'Direct Feed' Is A 'Must'

There are plenty of 2-meter T-FR antennas here, but only a little hand-talkie *rubber duckie* for 440 MHz FM. Element lengths at 70 cm are short and manageable. We'd just need to look around for a nice design.

The only requisite was that the antenna must allow for *direct feed* – meaning the feed line is attached directly to the driven element. Having to fiddle with tuning a gamma, beta, delta or T-match just wouldn't do. Especially with an antenna that would be disassembled, assembled, then disassembled again with each round trip to the field.

A Web search brought up many interesting 70cm beam designs, but a paper titled *Controlled Impedance 'Cheap' Antennas* < <http://bit.ly/dKZZUK> > by Kent Britain, WA5VJB, of Grand Prairie,



**A lightweight 6-element 440 MHz FM beam antenna that's inexpensive and a snap to make performed nicely from the top of Mount Rubidoux in Riverside, California, on ARRL January VHF Sweepstakes weekend.**

(Photographs courtesy of KI6SN)

Texas, emerged the winner. You may recognize 'VJB's name and call sign from his extensive writings in publications including *CQ Amateur Radio* and *Popular Communications*. The *cheap* part the paper's title was particularly attractive.

As you can see in the accompanying illustration and pictures, the 440 MHz beam features a robust six elements: A reflector (REF), four directors (D1-4) and the driven element (DE), shown in red.

### Designing for the Field

With the trail-friendly mantra in mind, a 40-inch length of lightweight half-inch diameter PVC was chosen for the boom. An RCA-style phono jack would be used at the coaxial feed point. You'll need six metal coat hangers.

With these inexpensive materials and

simple hand tools, a portable antenna can be built in practically no time that's perfect for mountain topping on 70cm FM.

Contrary to what many people think, it is possible – *even easy* – to solder to metal coat hangers. The trick is to strip away all of the lacquer coating to expose the bare metal, and to apply enough heat to get a solid solder bond. A 40-watt iron worked beautifully at KI6SN.

### Braving the Elements

To get started, cut one coat hanger to length for the reflector (REF) and others for each director (D1-4). You'll need about a 20-inch length for the driven element (DE), which will take a fancy turn, as you can see in Figure 1 in the illustration. To get the proper length, the *raw* coat hanger will need to be unbent.





**A vintage Radio Shack HTX-404 70cm FM transceiver is connected to the antenna's driven element using a standard RCA plug and jack.**

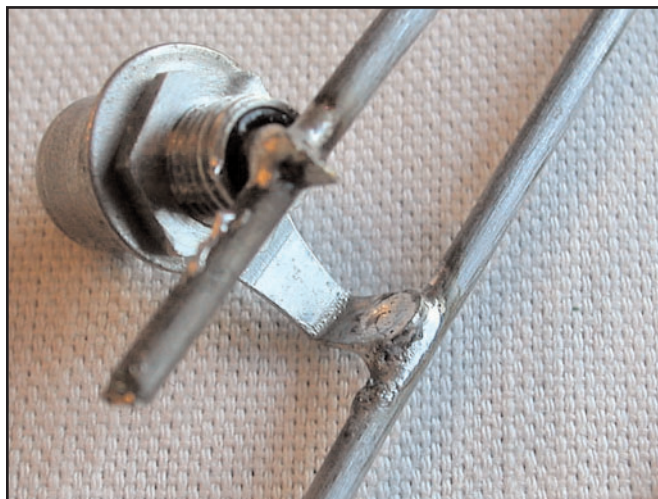
When your coat hanger pieces for REF, D1-4 and DE (now a straight 20-inch length) are in hand, it's time to go to work removing the lacquer coating. Coarse sandpaper and steel wool work just fine. Take special care with every piece. Making the *direct feed* point will require soldering to the driven element, and we'll end up soldering a little bit to all of the other elements as well.

With everything clean and shiny, set REF and D1-4 aside, for the moment. Grab the 20-inch-long piece prepared for DE and refer to Figure 1 in the illustration. It shows a two-sided element with a half-inch bend at the 12-inch point of the top side.

To make the bend, a half-inch diameter wooden dowel or metal rod makes the perfect *former*. Measure, say, 12-and-one-half inches along the coat hanger and place the dowel or rod across it at a right angle. Take the remaining portion of the 20-inch length and bend it to form a U-shape with two parallel sides spaced a half-inch apart. Following specifications in the illustration, trim one side to 12-inches and the other to 6.25 inches. *Voila*.

There's nothing wrong with soldering the inner and outer conductor of your coax cable to the driven element. At KI6SN, since the beam was going to be frequently broken down for toting into the field, an RCA-style phono jack was soldered into position as shown to accept an RCA phono plug at the antenna end of the coax.

The hole in the solder lug of the inner connector on the RCA jack was not quite big enough to allow it to slide one-half inch



**A close-up of the driven element of the 440 MHz beam shows how an RCA-style phono jack bridges the two sides of DE, creating the antenna's direct feed point. The short portion of the two-sided element is slid through the hole in the lug protruding from the jack's inner conductor and soldered. The jack's ground lug is soldered on the opposite side.**

along the driven element's 6.5-inch side. A small file was used to widen its diameter. The solder lug on the outer conductor was then bent to form the bridge to the other side of the driven element. Solder both the inner and outer conductors in place on the driven element, a half-inch in from the end of the short side.

### **Then: 'Boom!'**

With DE now complete and REF and D1-4 now trimmed and pretty, it's on to the boom. The 40-inch length for the PVC was chosen for a few reasons. First, there needed to be 10 inches of PVC behind REF to serve as a *handle* for holding and pointing the beam while operating. Second, 40 inches is a good height for a walking stick, which the boom could certainly be used as on the trail. Just add PVC end caps to protect the pipe. Third, half-inch diameter PVC is inexpensive and widely available. Your local home improvement store has miles of it.

By far the most time consuming part of the beam's construction was lining up holes along the boom for each element to pass through. Ideally, one beam element should line up 90-degrees to the PVC pipe and perfectly parallel to its neighbor element for maximum efficiency. Syncing things up along the PVC's curved surface takes a bit of *doing*. Holes out of alignment – even slightly high or low; too far forward or back – will leave you with six cockeyed elements that may get your signal nowhere.

Having a drill press, of course, would make the alignment process a snap. Unfortunately, *I don't, and it wasn't*.

It seemed the only way to get this right was to hand-draw parallel *chalk lines* the length of the PVC – first on one side and then the other, 180 degrees opposite. After several tries, and sighting down the outside of the boom like a pirate, everything looked good.

Measuring 10-inches from one end of the PVC, a drill point was marked on each chalk line as the position for the reflector (REF). Exactly 2.5-inches from the REF position, the *chalk lines* were marked for holes for the driven element (DE). Again, measuring from REF, marks were made for the first director (D1) at 5.5 inches, and so on for the D 2-4. *Remember, each element*





Snow-covered mountain peaks surround Southern California's Inland Empire valley – some of the summits home to popular VHF and UHF repeaters.

spacing is determined by measuring from the reflector. In the illustration, see the part of the chart labeled *DISTANCE FROM REF.*

Once the boom is marked, it's time to choose a drill bit for making holes that will allow the coat hanger pieces to pass through the PVC. A snug fit would be good. Drilling test holes on another piece of PVC to find the perfect hole size isn't a bad idea.

Carefully drilling at the marked spots for the elements on each side of the PVC is all that is needed to complete boom preparation. Done.

### Putting It All Together

*Now for the fun.* Select the 13-inch-long reflector and slide it through the holes in the boom closest to the antenna *handle* portion of the PVC.



A small dollop of solder added to directors D1-4 and the reflector (REF) prevents the elements from sliding through holes drilled in the boom.

## 6-Element Direct-Feed 440 MHz Beam

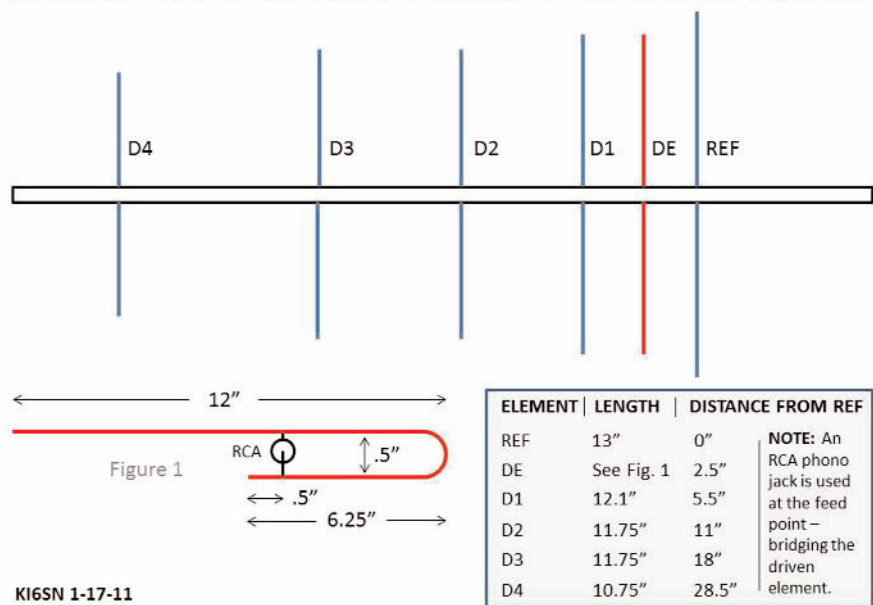


Figure 1.





A half-inch diameter metal rod was used as a “former” at KI6SN to provide the hairpin bend in the driven element, as illustrated in Figure 1.



Remnants of the “chalk line” – drawn by hand using a pencil and straight edge – can be seen along the antenna’s PVC boom, where pass-through holes for the elements were drilled.

In the holes 2.5-inches up the boom, slide the long side of the U-shaped driven element. Next, add directors 1 through 4 in their respective holes along the boom. Match their length to the designation listed in the accompanying illustration. For the most part, they get progressively shorter as you move up the boom. If your through-hole markings are good, everything should line up nicely. They did at KI6SN. *Whew!*

### Testing 1, 2, 3

With everything in place, only the coax from our ancient Radio Shack HTX-404 5-watt handi-talkie needed to be connected to the RCA feed point. Then it was into the back yard for testing. Using a simple field strength meter, we found this little beam’s front-to-back ratio to be excellent.

There are several open 440 MHz repeaters in the Los Angeles area the ’404 could sometimes break with the *rubber duckie*. Holding the beam so its elements were vertically polarized, our signal easily got into all of them with reports of full quieting. *Horray!*

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With the antenna pointed east, other repeaters were accessed that the '404 hadn't been able to access at all. Good things were happening.

## Oops, Back to the Bench

After 15 minutes of jostling, though, the elements were succumbing to gravity, sliding out of alignment through their holes, or falling to the ground. *This would never do.*

A trip back to the workbench resulted in an easy fix. A small dollop of solder on REF and D1-4 at the point where they pass through the hole *on the top side* of the PVC created a stopper or brake to prevent the coat hanger pieces from slipping out. Hardware on the driven element already kept it in place, so no additional solder was needed. It's best to mark the solder point for REF and D1-4 with a felt-tipped pen, removing the element from

the PVC and adding the solder dollop. This will prevent the PVC from being melted by the heat of the soldering iron.

The solder dollop arrangement not only prevents misalignment, but still allows for the beam's complete dismantling when you're ready to hike home.

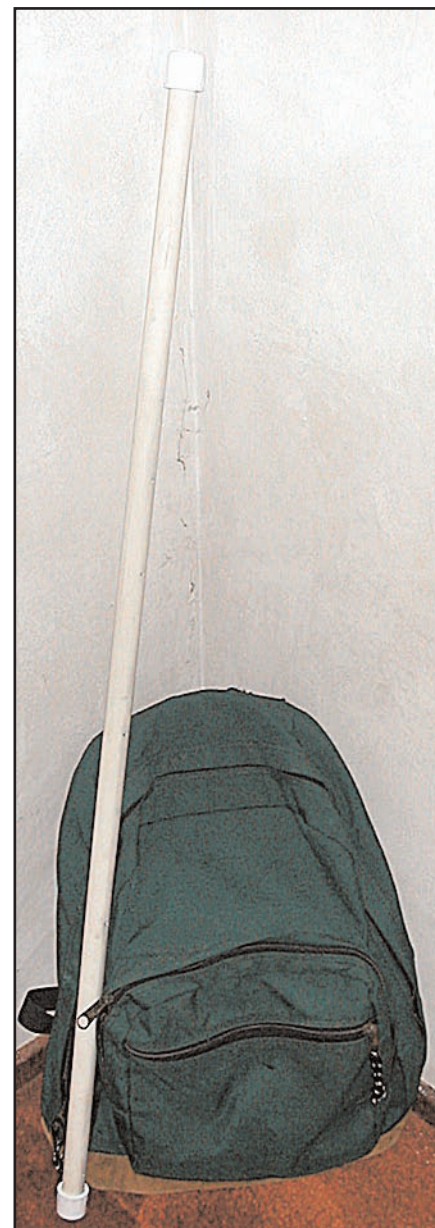
## 'CQ Contest, CQ Contest . . .'

Using half-inch diameter PVC allowed REF and D1-4 to be carried inside the PVC pipe during travel. Be sure the PVC end caps are on good and tight. Unfortunately, the driven element is too wide to fit in the same space. It's carried in the backpack for safe keeping.

A hike up 1,329-foot-high Mount Rubidoux in Riverside, California for the ARRL January VHF Sweepstakes yielded gratifying results for the new antenna and '404. Although there was little simplex activity on 70cm, our signal accessed

even more Southern California repeaters than before. Stations we contacted were asked to listen for us on the machines' input. More often than not, they could hear us simplex loud and clear. *A great day, indeed.*

If 440 MHz FM simplex activity is lagging in your area, why not consider this simple beam for a group or club project? It couldn't be much easier or inexpensive to build, and after hanging your FM signal on this coat hanger antenna you'll likely be pleasantly surprised by the results.



With end caps firmly in place, D1-4 and REF slide easily into the 440 MHz beam's boom for transport. At 40 inches in length, the PVC makes a fine "walking stick" when hiking to a lofty destination for some UHF fun.



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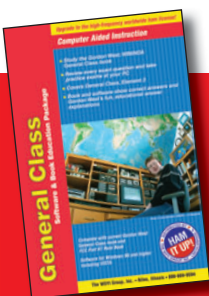
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## The Rules Say...

John B. Johnston, W3BE

### From All Indications, Lots of Confusion

**Q** There is much confusion about appending an indicator to an FCC-assigned amateur station call sign. Please clarify.

**A.** Read BE Informed No. 52, <<http://bit.ly/ep2x96>>.

Appending a self-assigned indicator to a FCC-assigned call sign in the station identification announcement is a long-accepted good amateur practice. It is an expedient way to inform listeners that the station is transmitting under the rules for special operations, from an unanticipated location, or from a vehicle.

Appending one or more words to a call sign is straightforward for phone and image transmissions. For non-voice transmissions, there is a desire to keep the indicator to as few characters as possible. That brings the challenge of listeners understanding just what it is the identifier is intended to convey.

Section 97.119(c) authorizes one or more indicators to be included with the assigned call sign. Each indicator must be separated from the call sign by the slant mark (/) or by any suitable word that denotes the slant mark. If an indicator is self-assigned, it must be included before, after, or both before and after, the call sign. No self-assigned indicator may conflict with any other indicator specified by the FCC rules or with any prefix assigned to another country.

The International Telecommunication Union (ITU) assigns nationality indicators to countries. The combinations of characters and digits in its assignments are, therefore, unavailable for a self-assigned identifier. Read BE Informed No. 14 <<http://bit.ly/fopamO>>.

There are three indicators specified by the FCC rules for recent upgrades, and thus not available for self-assignment: AE, AG and KT. Read Section 97.119(f). Also unavailable are the three letter combinations assigned to our military: AAA-AEZ and ALA-ALZ (Department of the Army); AFA-AKZ (Department of the Air Force); and NAA-NZZ (jointly to the Department of the Navy and the U.S. Coast Guard). Read Section 2.302.

Additionally, the FCC webpage *About Amateur Reciprocal Operating Arrangements* says that when a station is transmitting under the privileges afforded by an amateur service license granted by the Government of Canada or an amateur service license granted by any other country with which the United States has a multilateral or bilateral agreement, an indicator consisting of the appropriate letter-numeral designating the station location must be included in the station identification announcement.

They are: KH0, KH1, KH2, KH4, KH5, KH5K, KH6, KH7, KH9, KL7; KP1, KP2, KP4, KP5, W0, W1, W2, W3, W4, W5, W6, W7, W8 and W9.

**Q. What are your recommendations?**

**W3BE-O-GRAM:** Contemplate just why you want to append an indicator. Here are some recommendations from BE Informed No. 52 <<http://bit.ly/ep2x96>>.

To inform listeners that your FCC-licensed amateur station is transmitting:

- Under the special operations accommodations in Section 97.201 for an auxiliary station, append **AA** to your station's FCC-assigned call sign.

- Under the special operations accommodations in Section 97.203 for a beacon station, append **KB** to your station's FCC-assigned call sign. Do not use the single letter B. It is an I.T.U.-assigned nationality identifier for the People's Republic of China.

- Under the special operations accommodations in Section 97.205 for a repeater station, append **NR** to your station's FCC-assigned call sign. Do not use the single letter R. It is an I.T.U.-assigned nationality identifier for the Russian Federation.

- From a place where the amateur service is regulated by the FCC (Appendix 1, Part 97), but not from the address shown for it on the ULS, append your station's FCC-assigned call sign with the number of the VEC Region (Appendix 2, Part 97). Example: [call sign]/7 or 13/[call sign]. Do not use the single digit 2. It is an ITU-assigned nationality identifier for the United Kingdom of Great Britain and Northern Ireland.

Also appropriate would be the letter prefix and number for the location as assigned under the sequential call sign system less, of course, the above-listed combinations specified for stations transmitting under reciprocal arrangements from places where the amateur service is regulated by the FCC.

- From a vehicle traveling in a place where the amateur service is regulated by the FCC (Appendix 1, Part 97), append to your station's FCC-assigned call sign **WA** for airborne vehicles, **WM** for land vehicles, and **WW** for waterborne vehicles. Do not use the letters M or MM. They are ITU-assigned nationality identifiers for the United Kingdom.

**Q. I monitored two hams talking cross-channel using two repeaters. The first ham was speaking on one repeater and listening to the second ham on the other repeater. The second ham was doing the same in reverse. I thought Section 97.113 prohibited such cross-channeling above 30 MHz. Is that correct?**

**A.** Section 97.113 does not list cross-channeling as a prohibited transmission. The applicable rule, rather, is Section 97.101(b): Each station licensee and each control operator must



cooperate in selecting transmitting channels and in *making the most effective use of the amateur service frequencies*.

**W3BE-O-GRAM:** The issue, therefore, is whether the arrangement – cross-channel or otherwise - is making the most effective use of our amateur service frequencies. There are situations – most notably split-channel HF DXing - where our amateur service community seems to almost universally endorse cross-channeling as a good amateur practice.

If another ham's communication was delayed because of two repeaters being occupied for one conversation, there could be a conflict with Section 97.101(b).

**Q. For our club's VHF net, our club's station location is changed each week to the then-current net control's QTH (location). When acting as net control, should the net control operators identify using their own call signs or should the net control identify using the club's call sign?**

**A.** That's a question to be answered by the license trustee of your club station license and the licensees of the primary stations serving as the net control station. See BE Informed No. 4 < <http://bit.ly/g0H2p0> > for a discussion of the several issues that you should be considering.

**Q. I want to access more reliably our local 2-meter repeater. Can I use a 2-meter/70-centimeter transceiver in my car to relay the signal from my 70cm handheld to access our local repeater?**

**A.** Yes. There are several ways that could be used compli-

antly. The easiest way might be to use one of the several available 2-meter/70cm transceivers that transmit on one band while receiving on the other. You could configure a remotely controlled relay system using such a mobile station operating under the telecommand provisions in Section 97.213. Read Be Informed No. 45 < <http://bit.ly/i9b32l> > REMOTE BASE, REPEATER AND OTHER SYSTEMS. Use your hand-held as an auxiliary station transmitting on the 70cm band under the provisions in Section 97.201. This assumes, of course, that your hand-held receives adequately the 2-meter repeater output channel directly.

**Q. Could I reverse the set up by using my 2-meter hand-held transceiver and my remotely controlled mobile station relay transmitting on 70-cm?**

**A.** Yes. Section 97.201(b) authorizes an auxiliary station to transmit on our 2-meter band, except the 144.0–144.5 MHz and 145.8–146.0 MHz segments.

**Q. Can my ham friends use my relay station?**

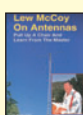
**A.** That would be up to you - as the person having physical control of the station apparatus - to decide. Read Section 97.5(a). Make sure, moreover, that you have a clear understanding with your friends as to whether they are assuming the duties of the station licensee, or the control operator, or both.

**Q. A friend uses a 440 MHz handheld while mobile to reach his home-based cross-band repeater. His home transceiver in turn re-transmits his signal on 2-meters. He also**



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uses this technique at home as he moves about. What do the rules say about this practice?

A. There are at least two compliant possibilities. One is that his UHF handheld transceiver is used as a point-to-point auxiliary station and his home station is his remote base. Another possibility is that his home transceiver is being used as a repeater.

**Q. Does my remotely controlled mobile station have to transmit a station ID?**

A. Yes. Section 97.119(a) says that each amateur station must transmit its assigned call sign on its transmitting channel at specified intervals.

**Q. My mobile station doesn't have an automatic IDer. How can the ID announcement be made?**

A. One *how-to* would be to rely upon the same station identification announcement for both stations. After all, you would be the station licensee and control operator of both stations.

**Q. I want to allow my ham friend W3\*\* to use my mobile station relay K3\*\* as its control operator. How would he ID the two stations?**

A. He would have to find a way to comply with the station identification rules in Section 97.103.

*W3BE-O-GRAM:* One way is for him to identify both the originating and relay auxiliary stations with something such as: ***This is W3\*\* through auxiliary station K3\*\*.***

## HAPPY HAMFESTERS



In Virginia, our R&R Happy Hamfesters are Ben Baddley W4FQT, of Oakton, left, and Ray Johnson, K5RJ, of Vienna, who are all smiles during a visit to the Virginia Beach Hamfest in late 2010.

### Read the rules - Heed the rules

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

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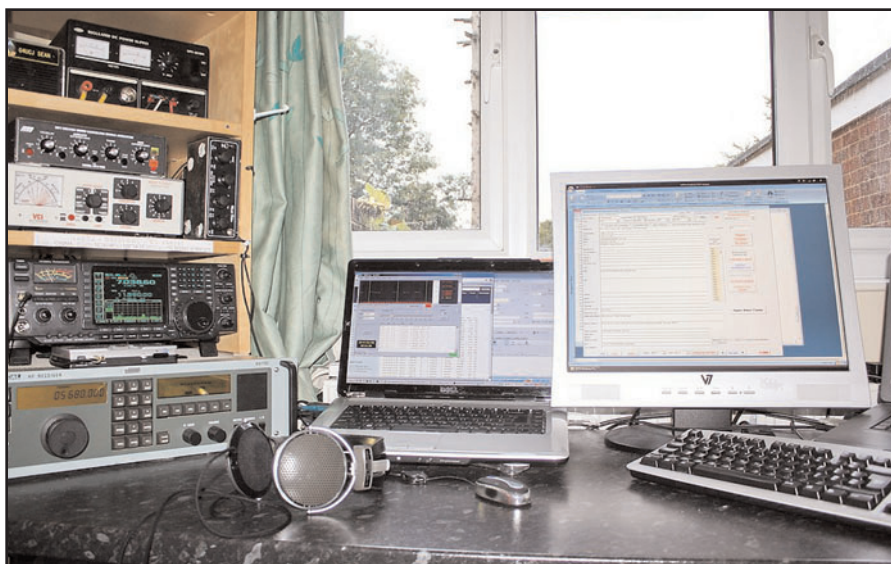
# G4UCJ, Buckingham, England: Sending, Receiving and Editing

Sean Gilbert, G4UCJ, of Buckingham, England, has a wireless set-up that does double duty, satisfying his passions both as a radio amateur and a shortwave listener – a niche in the hobby that has crept into his professional life, as you’ll see.

‘UCJ easily found a harmonic convergence of transmitting and receiving – thrills coming from both. And his beautiful operating position serves as “mission control.”

Are you as proud of your station’s appearance as G4UCJ? Send digital photographs of your station with details to: [WorldRadioOnline@gmail.com](mailto:WorldRadioOnline@gmail.com) and we’ll consider them for publication in *Station Appearance* in an upcoming edition of *WRO*.

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



The listening and transmitting position of Sean Gilbert, G4UCJ, in Buckingham, England is both neat and functional. (Photographs courtesy of G4UCJ)

By Sean Gilbert, G4UCJ

**M**y mum was a very active short-wave listener (SWL) way back when I was a very young child. She heard some very exciting stations.

I think her biggest thrill was hearing King Hussein of Jordan, JY1 – a feat I never managed. My only brush with radio royalty was once hearing King Juan Carlos, EAØJC, of Spain.

She heard a Kon-Tiki raft expedition with Thor Heyerdahl, as it was crossing some ocean, as well. (For more information on the Kon-Tiki expeditions, visit: < <http://bit.ly/evl5eg> > – Ed.)

Mum’s logs were filled with loads of exotic calls, and I wanted to emulate her. I think that is why I am such an enthusiastic SWL these days.

I’ve been an SWL since I was seven years old and a licensed ham since age 14. Next year I celebrate 30 years on the air.

Most of that time has been spent on high frequencies (HF), although I did have a phase in the first couple of years as ham when I was into VHF DX – 2 meters, mainly – and had an impressive set-up to use. It was my stepfather’s.

## Working for WRTH

Today, I still have the capability to transmit, but don’t very often. I prefer to

listen. For 10 years, I have on the staff of *World Radio TV Handbook* where I am International Editor. (WRTH is available from the CQ Online Bookstore: < <http://bit.ly/i9Qpmq> >. – Ed.)

The 2001 edition was my first where I started as Assistant Editor. I was quickly drawn to international broadcasting, as that was what I had cut my teeth on during my earlier SWL career.

When the main editor left, the workload was split between the publisher – who looks after the domestic/national radio side – and me, in charge of the International Broadcasting and Clandestine Radio section. I would guess that was about five or six years ago now, maybe a year longer. It’s a great job, and very challenging.

## On the Ham Bands

As a radio amateur, I am an advocate of using low power, or certainly the lowest possible power to maintain a QSO (contact).

I have worked more than 170 countries with 3 watts or less and simple (often indoor) antennas. Plus, I have 49 states worked on QRP. I need Hawaii and will be trying for that when the higher bands are in better shape over the next few years.



A Wellbrook active receiving loop antenna – one of G4UCJ’s keys to SWLing success – is attached to a tree below an off-center-fed dipole for 40 through 10 meters.





A balun is at the feed point of the Windom antenna used for amateur radio work at G4UCJ.

At my operating position / listening post you'll see an ICOM IC-756PRO transceiver and a Racal RA1792 receiver. My antennas include an off-center-fed dipole for 40 through 10 meters and a Wellbrook ALA1530 active magnetic receiving loop.

### First Contact: 'Over the Garden Wall' On 2 Meters

My first ham radio contact was with someone I had heard on 2 meters regularly and, unusually, he was also in a TV show at the same time. The gentleman was a keen gardener and was presenting a primetime program called *Over the Garden Wall*. Harry Smith was his name, but his callsign eludes me. It was G3 something-or-other.

About a year later I changed my callsign when I upgraded to an HF license – back when Morse Code was a pre-requisite. I was absolutely determined to get a G4 callsign before they ran out, so every night I would practice like mad after doing my homework. (For an explanation of the callsign assignment system in Great Britain, visit: < <http://bit.ly/ev6zyw> >. – Ed.)

At the time over here, Morse code testing was carried out at marine radio stations, by suitably qualified marine radio operators. I took mine at North Foreland Radio in Kent and was one of the last peo-



An S.E.M. Multi Filter and MFJ-1026 Deluxe Noise Canceling Signal Enhancer are "both brilliant at reducing QRM," G4UCJ says.



A Racal RA1792 receiver is a centerpiece of G4UCJ's shortwave listening equipment.

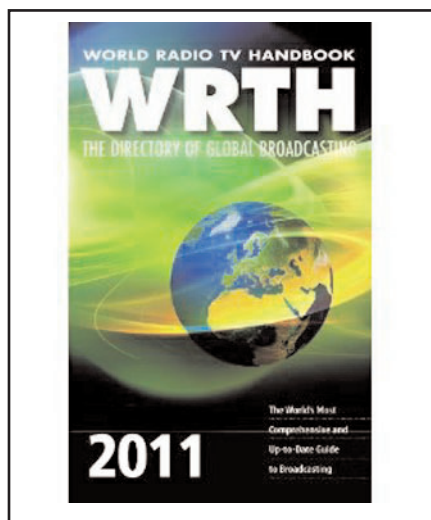


A photograph from G4UCJ's old QTH shows the Wellbrook receiving loop standing tall atop the multi-story building.





Here's how neighbors see G4UCJ's antenna array from their backyard garden.



For 10 years, G4UCJ has been an editor for the World Radio TV Handbook. The 2011 edition is available in the CQ Online Bookstore: <<http://bit.ly/i9Qpmq>>.

ple to take the test there before the testing was transferred to the Radio Society of Great Britain.

I was a very nervous 15-year-old schoolboy at the time, but somehow I passed and Morse has stuck with me ever since. In fact, I became an instructor at the world famous Bletchley Park – home of the Enigma code breakers and Station

X – and then after a while was asked to be a Morse examiner.

One other thing that happened at Bletchley Park was that I was asked to be the manager of the club ham radio station during the Millennium celebrations and I set up links with Camp X in Canada, which was the equivalent of our own Station X, and oversaw the mayors of the two towns exchange greeting messages.

### WRTH Puts Current Focus On Listening

Because of my work with WRTH, the past few months have seen ham radio take a back seat as I have been concentrating on SW broadcast listening. We have just launched a new product – a color bar-graph of international broadcast schedules, similar to the old *Passport to World Band Radio* “blue pages,” but much, much easier to use. This is available as a CD at the moment, but we are hoping to make it available as a direct download later this year.

By the way, I have made my Racal RA1792 receiver available for remote tuning over the Internet. This is really useful as I can check band conditions if I am away from home. Anyone else can connect and tune my radio, as well. Visit <<http://bit.ly/dIPHUb>> and click on the online page.

It is quite strange to be sitting at the radio and suddenly find it has changed frequency or mode. If that happens, I stop tuning and let the person who has connected have a play. If I need to use the radio for research, I don't publish it on the net until I have finished.

### 'Digimodes' Rule My Ham Activity

When I am in ham mode, my main interest these days is digimodes, such as PSK, JT65, MFSK, WSPR and the others.

The way software has developed over the past couple of years means it is so easy to get involved and have fun. Pretty much any available computer/laptop will do the job. My laptop has an external USB soundcard, which cost only a few pounds. It works a treat.

The downside is that if I want to run software defined radio in the future, I am limited by hardware as most SDRs require a fast – 3GHz or better – dual core and lots of storage, plus a very good soundcard.

I worked out that to get a good SDR system I would have to spend roughly the same amount on both radio and PC hardware, so what looks like a cheaper alternative to a standard HF receiver actually turns out to be about the same, or even more.



# ARISSat-1 Up, Up and Away For ISS Rendezvous

By Terry Douds, N8KI

**A**s I'm writing this, we're being blasted by Mother Nature with *one whale of a winter*. I hope everyone weathered the storms and is ready for the birdie chirps heralding the arrival of spring. Fortunately, in the realm of space, our "birds" are chirping all year around.

### ARISSat-1: This Just In . . .

Right at press time exciting news was being announced in regard to the ARISSat-1 amateur satellite. On January 28 at 0132 UTC, a Soyuz rocket lifted off from Kazakhstan carrying the Russian Progress M-09M cargo vehicle to orbit headed for the International Space Station (ISS). (*To see a You Tube video of the launch, visit: < <http://bit.ly/i9UaKr> >. – Ed.*)

The vehicle was carrying the ARISSat-1 in addition to supplies needed for the ISS. It docked with the space station on January 30. (*Watch a You Tube video of docking at: < <http://bit.ly/hYcmQ6> >. – Ed.*)

ARISSat-1 was scheduled to be manually deployed from the ISS by Russian cosmonauts Dmitry Kondratyev and Oleg Skripochka during a spacewalk on February 16. (*Check the WRO Blog for ARISSat-1 mission updates: < <http://bit.ly/enR2D8> >. – Ed.*)

### So, what's in store?

ARISSat-1/RadioSkaf V has simultaneous 2-meter FM, CW, BPSK and transponder transmissions.

These multiple transmissions are created by a new software defined transponder (SDX) board. Features provided by the SDX include:

- FM transmissions cycling between a voice ID, select telemetry values, 24 international greeting messages in 15 languages and live SSTV images.
- CW transmissions including callsign ID, select telemetry, and callsigns of people actively involved with the ARISS program.
- BPSK transmissions featuring a new 1kBPSK protocol developed by Phil Karn, KA9Q, to be readable in low signal level conditions. The BPSK data will alternate between telemetry and Kursk experiment data. Free ground station soundcard demodulator and display software will be available for multiple platforms.
- A 16 kHz-wide amateur radio U/V transponder between the BPSK and FM signals, as well.
- The Kursk experiment, which will be sampling the amount of vacuum each day for 90 minutes and sending data to map the vacuum change as the satellite slowly spirals into the atmosphere.

This is very exciting news, and ARISSat-1 looks to be a new and exciting satellite for us all to use. The redesign of the bird (versus the original *SuitSat*, which is where it all began inside a surplus Russian space suit) has allowed for a new satellite with



This screen capture of a NASA You Tube video shows the shadowy Russian Progress M-09M cargo vehicle carrying ARISSat-1 approaching the International Space Station for docking January 30. (*Courtesy of You Tube*)



***“More than 560 schools or organizations have performed ARISS contacts – inspiring tens of thousands of students and enabling millions and millions, worldwide, to experience the human spaceflight journey and to share in the excitement and camaraderie of the ham radio hobby.”***

leading edge technology aboard and opening the door for amateur satellite operators to again forge new ground in this important area of communications.

At this writing, my fingers are crossed that all will have gone well with deployment, and by the next column we will be learning a great deal about this new bird!

### **Reflecting On a Decade of ARISS**

While discussing the ISS and the ARISS program that allows for students to contact astronauts aboard the station, Frank Bauer, KA3HDO, who served as AMSAT's Vice President of Human Spaceflight for many years, took time recently to reflect on the 10th anniversary of the first amateur radio contacts on the International Space Station (ARISS).

“It is breathtaking to see all that you have done this past decade,” he said. “Ham radio operations on ISS started with the first Moscow/USA checkout contact on November 13, 2000 – just 11 days after Expedition 1 took up residence on ISS.

“That paved the way for the historic first school contact between the students at the Burbank School in Burbank, Illinois and Bill Shepherd, KD5GSL, on December 21, 2000.

“Long-time ARISS volunteer Charlie Sufana, AJ9N, mentored that first contact . . . preparing the Burbank students, teachers and community for an activity that they will remember for the rest of their lives,” Bauer said. “Since then, the ARISS team's volunteer spirit and can-do attitude have kept the ARISS stations on ISS operational the entire decade – through all 26 crew expeditions.”

More than 560 schools or organizations “have performed ARISS contacts – inspiring tens of thousands of students and enabling millions and millions, worldwide, to experience the human spaceflight journey and to share in the excitement and camaraderie of the ham radio hobby,” Bauer continued. “The international team has installed antennas and equipment in several ISS modules, deployed *SuitSat*, delivered ARISSat-1, and a school contact was a prominent *star* in the IMAX ISS 3D movie. Most importantly, you have inspired a legion of students to pursue careers in science, technology, engineering and math.”

Bauer said that on his desk “is a copy of NASA's *Reference Guide to the ISS*. I recently noticed that on the back cover is a beautiful photograph of ISS with the Sun shining prominently on one of the ARISS antennas mounted on the Russian service module.

“That photograph reminds me of a story from the U.S. Constitutional Convention when statesmen Benjamin Franklin, looking toward the president's chair, at the back of which a rising sun happened to be painted, observed to a few members near him, that painters had found it difficult to distinguish in their art a rising sun from a setting sun. Franklin

said ‘I have often . . . looked at that behind the president without being able to tell whether it was rising or setting: But now at length I have the happiness to know that it is a rising and not a setting sun.’

“Indeed . . . the sun that shines over ARISS is a rising sun,” Bauer concluded. “Congratulations to the ARISS international team and their sponsoring organizations.”

### **More Celebration**

Another notable anniversary has occurred since my recent columns.

In late December, AMSAT-China noted the first anniversary of XW-1, known as Hope-Oscar 68 HO-68, with an announcement from Michael Chen, BD5RV/4 at AMSAT-China.

AMSAT President Barry Baines, WD4ASW, said HO-68 was a significant milestone for both amateur radio and AMSAT-China. Barry wrote, “We are very excited to see that HO-68 continues to operate in good health and that a new member of the AMSAT International family has established itself. Again, congratulations on placing HO-68 in service and best wishes for the New Year.”

### **‘Beijing, We’ve Had a Problem’**

Unfortunately, there were some recent problems with HO-68 concerning its telemetry beacon. Project Manager, Alan Kung, BA1DU, sent an update on the satellite's operational status.

He wrote, “after we analyzed the situation of the satellite, we think that the software in the payload management MPU was not running properly. Software crashes stopped communication between the payload management MPU and the satellite management unit. This caused the problem with the beacon and caused an abnormal switch of the transponder mode.”

On January 14, AMSAT-China controllers were able to reset the satellite. It returned to normal operating mode and so far the beacon has continued to operate normally.

If you observe any unusual operation of HO-68, Alan asks that you let him know: < [alankung@public3.bta.net.cn](mailto:alankung@public3.bta.net.cn) >.

### **AMSAT India Update**

AMSAT-India Secretary Nitin Muttin, VU3TYG, announced that the AMSAT-India PDF newsletter is available for download.

The January edition – < <http://bit.ly/gXlfVn> > – includes an announcement by AMSAT-India Technical Director Pop Kumar, VU2POP, regarding the latest developments with the CubeSat transponder. “I have immense pleasure in announcing that the initial design of the transponder has been completed and the components have been procured,” he said.

The full list of specifications and an engineering drawing of the CubeSat transponder PCB can be found via the AMSAT-India January newsletter link.

The newsletter archives are available on-line at: < <http://bit.ly/dO2RVo> >.

### **That's a Wrap for This Month**

Well, once again I'm out of room for another column. Thanks to the AMSAT News Service, the PR arms of the various worldwide AMSAT organizations and to you for taking the time to read the column! I hope to see you all very soon on the birds!



# The Chills and Thrills of Yet Another F<sub>2</sub> Region Anomaly

By Carl Luetzelschwab, K9LA

The May 2009 column discussed the two anomalies in the F<sub>2</sub> region that probably affect our amateur radio operations the most: the seasonal anomaly (also referred to as the winter anomaly) and the equatorial anomaly.

The seasonal anomaly gives us higher daytime MUFs (maximum useable frequencies) in our winter than in summer. Figure 1 in the May 2009 column gave representative winter and summer F<sub>2</sub> region critical frequencies over the Millstone Hill (Massachusetts) ionosonde.

Have you ever wondered why the major contests are centered around our winter months? I suspect one of the reasons was to take advantage of the higher daytime winter MUFs from the seasonal anomaly.

The equatorial anomaly results in two high-density clumps of electrons on either side of the geomagnetic equator during the late afternoon to early evening hours (local times). Figure 2 in the May 2009 column showed a typical electron density profile in 3-D. The equatorial anomaly is responsible for trans-equatorial propagation (commonly abbreviated TEP), and is most noticeable on 10 meters and 6 meters between the Caribbean and South America, between Japan and Australia, and between southern Europe and South Africa.

Another interesting F<sub>2</sub> region anomaly, and the topic of this month's column, is the Weddell Sea Anomaly (WSA).

Figure 1 is Antarctica, and the Weddell Sea is the bay in Zone 13 (that's what the red numbers are – CQ Zones) down and to the right of the peninsula sticking up toward the southern tip of South America.

This anomaly was first observed by ground-based ionosondes in Antarctica (specifically the Halley Bay and Faraday ionosondes) during the International Geophysical Year in 1957. The interesting characteristic of the WSA was a maximum  $f_oF_2$  (F<sub>2</sub> region critical frequency) occurring at night (2200 – 0400 local time) instead of the usual maximum  $f_oF_2$  in the daytime hours (1000 – 1800 local



Propagation in the Antarctic region presents some fascinating anomalies.  
(Courtesy of NOAA)

time). This was observed only in the Antarctic summer.

A good question to ask is, *Does this anomaly show up elsewhere?* Back in 1957 our only measurements of the ionosphere were done with ground-based ionosondes. Since roughly three-quarters of the Earth is water, that leaves a big gap in trying to determine how extensive this anomaly was or if it occurred elsewhere in the world.

Fortunately technology has advanced since 1957. Today we have powerful space-based tools to measure the worldwide ionosphere. For example, the CHAMP (CHALLENGING Minisatellite Payload) satellite uses a Langmuir probe (a device named after Nobel Prize winning physicist Irving Langmuir) to measure the in situ electron density.

Another technique, used by the FORMOSAT-3/COSMIC (Formosa Satellite 3 and Constellation Observing System for Meteorology, Ionosphere, and Climate) satellite is radio occultation to determine

the impact of the ionosphere on the phase delay of a line-of-sight path. This data is then used to calculate the electron density.

Using such space-based data, two scientists in 2003 (Horvath, I., and E. A. Essex, *The Weddell Sea Anomaly observed with the Topex satellite data*, **Journal of Atmospheric and Solar-Terrestrial Physics**, Volume 65, 693-706, 2003) showed that the larger part of the WSA developed in the Bellinghousen Sea, which is just west of the Antarctic Peninsula mentioned in the paragraph about Figure 1. The authors suggested that a more appropriate name for this anomaly might be the Bellinghousen Sea Anomaly.

This paper appears to have rekindled an interest in this anomaly. Many papers have subsequently shown up in the technical literature. In my opinion the best paper (so far!) that depicts this anomaly is by H. Liu, S. V. Thampi, and M. Yamamoto (*Phase reversal of the diurnal cycle in the midlatitude ionosphere*,



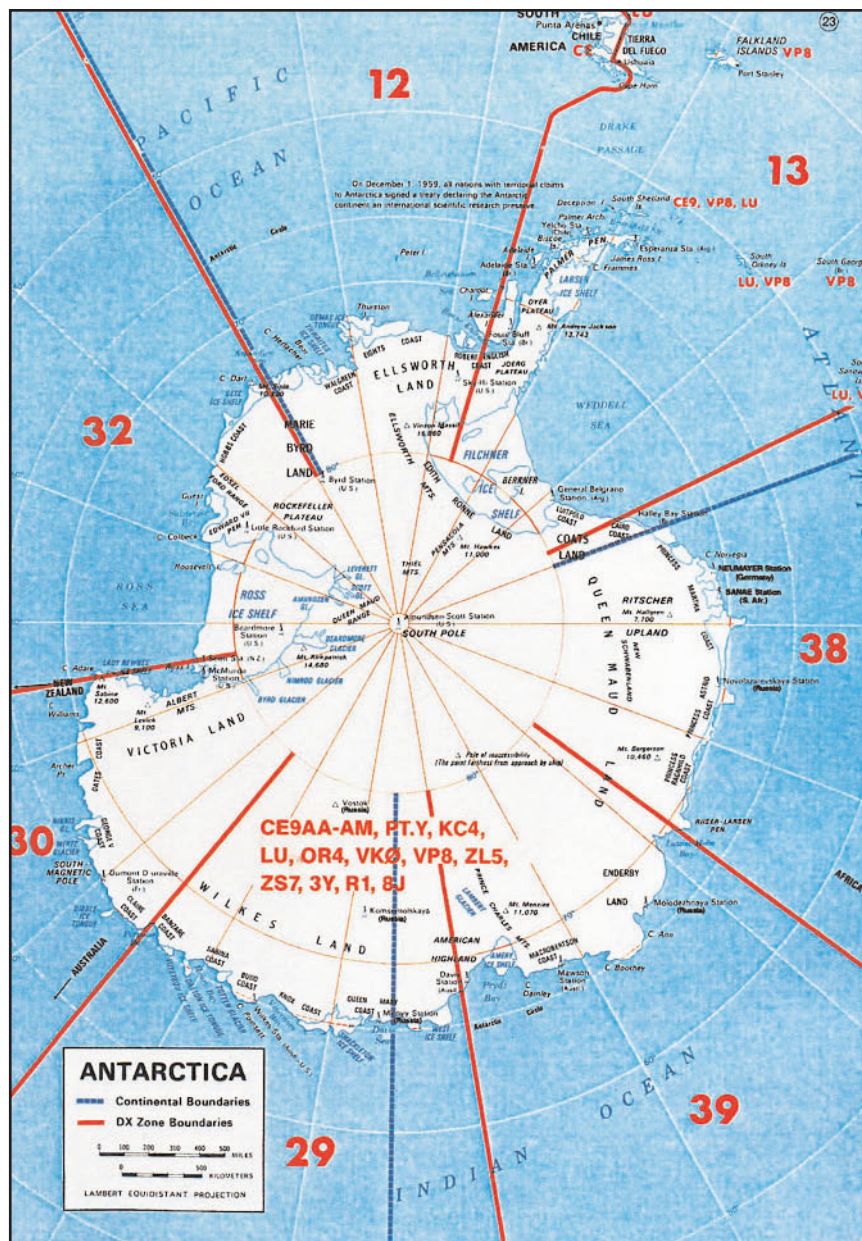


Figure 1 - Antarctica

Journal of Geophysical Research, Volume 115, A01305, 2010). Figure 2 shows the important data from this paper.

Note that the title of the Liu, Thampi, and Yamamoto paper does not refer to the Weddell Sea Anomaly. That's because this reversal of maximum  $F_2$  region electron density to the nighttime hours in summer is not just confined to the Weddell Sea – or even the Bellingshausen Sea. It is a worldwide phenomenon.

The large orange area in the left plot of Figure 2 (this plot is for the December solstice at night, which is summer in the southern hemisphere) shows the extent of what was originally called the Weddell Sea Anomaly. The two orange areas (off

the East Coast of North America and over Japan) in the right plot of Figure 2 (this plot is for the June solstice at night, which is summer in the northern hemisphere) show similar anomalous areas. All three of these areas have their summer electron density maximize at night, not during the day. Going forward, we could call this anomaly the summer evening anomaly. We could even precede it with *mid latitude*, as all three areas are at mid latitudes in terms of geomagnetic coordinates.

The scales on the right of each plot give the difference in electron density between the nighttime value and the daytime value (in terms of electrons per cubic centimeter). This is also stated in the title above

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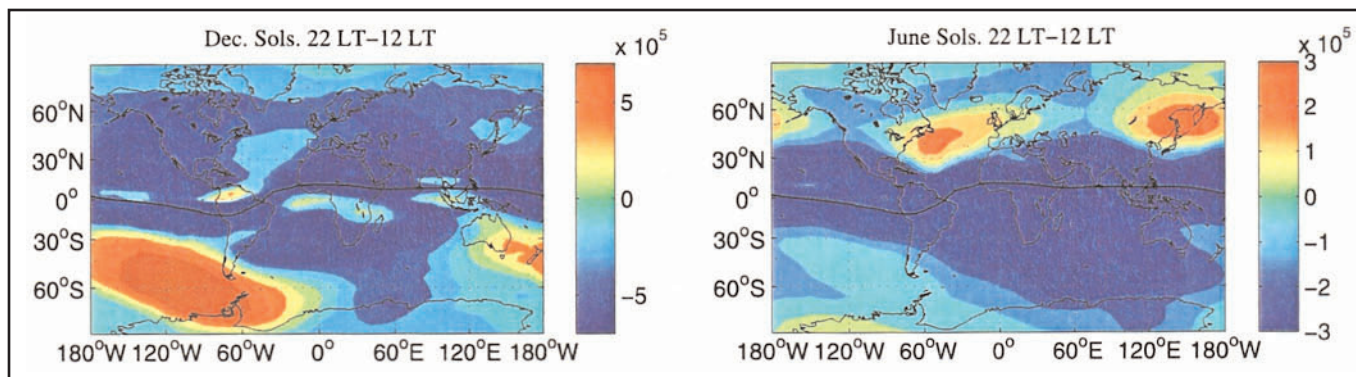
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**Figure 2 – Worldwide Depiction of the Anomaly**

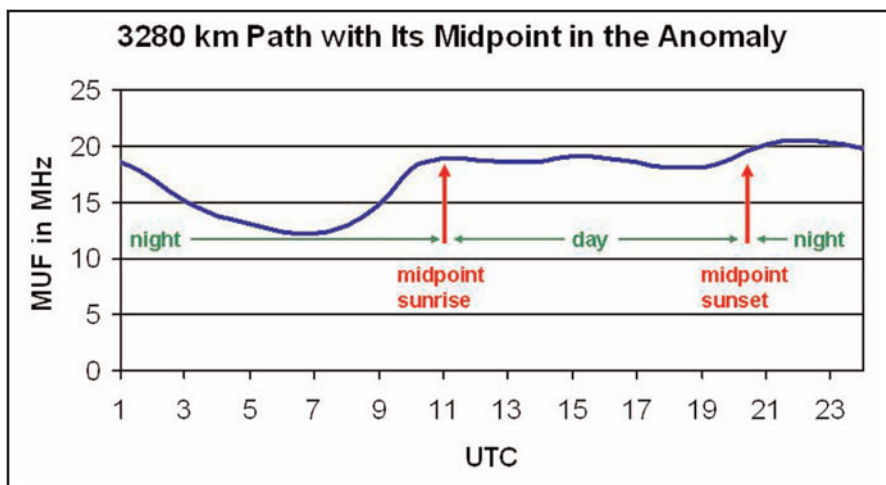
each plot in terms of local time. We see that the greatest difference is in the area to the west of Antarctica, which means this is the most anomalous of the three areas. Unfortunately there are not many radio amateurs in this area, so its effect may go unnoticed.

How about the other two areas? Let's take a look at the area off the East Coast, as this is the one those of us in North America may notice the most.

I set up a single-hop path from the North American East Coast (specifically a W1 station at 42N/71W) to 45N/30W out in the Atlantic, which puts the midpoint of this 3,280 kilometer path in the middle of the anomaly. Using VOACAP at a smoothed sunspot number of 50 in the middle of June gives the MUFs in Figure 3.

Indeed, we see the monthly median MUF maximize in the evening hours (a couple hours after sunset); not during the daytime hours. What this example shows is the 17-meter band might be open throughout the daylight hours during this summer month, and then after sunset there might be a brief opening on 15 meters. Although this is an encouraging example, we have to remember that this is likely just the first hop to an amateur radio population center in Europe or Africa, and there's no reason to believe the rest of the path would cooperate.

Some good news from this VOACAP exercise is that the model of the ionosphere in VOACAP appears to include this anomaly. When you think about it, that makes sense as the North American East Coast ionosondes (Millstone Hill in Massachusetts, for example) and the Japanese ionosondes should see this interesting feature. But the geographical extent to which this occurs in the model may be an extrapolation.



**Figure 3 – June MUF versus UTC for the Atlantic Anomaly**

Before wrapping up this month's column, let's briefly review possible causes of this worldwide anomaly.

Interestingly, the original theories were confined to high latitude processes. After all, Antarctica is at a high latitude, right? Well, that's kind of right. Yes, it's at a high geographic latitude, but it's at a mid-geomagnetic latitude. Since the ionosphere is composed of charged particles, it is affected by a magnetic field – and thus the ionosphere is ordered about geomagnetic coordinates, not geographic coordinates. So it's best to talk about the ionosphere in terms of geomagnetic coordinates.

When it was discovered that this anomaly occurred in three areas of the world, with all of them at mid latitudes, thoughts turned to mid latitude processes such as

temperature changes, neutral composition changes, neutral winds, electric field effects, and downward transport from the magnetosphere. These are probably unfamiliar terms to many people, so there may be a future column discussing these processes.

Unfortunately, none of these processes alone fully explain the anomaly. A recent paper (January 2011) suggested that all three areas are the result of electron drift from the crests of the equatorial ionosphere – from the southern crest for the WSA and from the northern crest for the two northern hemisphere areas.

More research and testing of this hypothesis will certainly occur in the future. For now, though, we'll have to accept the fact that the origin of the anomaly remains a mystery.

*(Figure 1 is from the Radio Amateurs World Atlas by DARC Verlag, Baunatal. Figure 2 is from the article "Phase reversal of the diurnal cycle in the midlatitude ionosphere" by H. Liu, S. V. Thampi, and M. Yamamoto in the Journal of Geophysical Research, Volume 115, A01305, 2010. – Ed.)*



# DX Predictions

April 2011

Maximum usable frequency from West Coast, Central U.S. and East Coast (courtesy of Engineering Systems Inc., Box 1934, Middleburg, VA 20118). The numbers listed in each section are the average maximum usable frequencies (MUF) in MHz for contacting five major areas of the world centered on Africa-Kenya/Nairobi, Asia-Japan/Tokyo, Oceania-Australia/Melbourne, Europe-Germany/Frankfurt, and South America-Brazil/Rio de Janeiro. Smoothed sunspot number = 24.

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

## WEST COAST

UTC	AFRI	ASIA	OCEA	EURO	SA
10	(12)	*12	*20	(10)	*16
12	(18)	11	*17	16	(14)
14	23	*13	*14	19	22
16	25	13	15	19	*27
18	*26	16	(14)	18	*30
20	*25	*22	25	17	*32
22	21	*22	*30	(14)	*31
24	18	*22	*32	(10)	*29
2	*16	*21	*32	*13	*24
4	*16	*19	*31	*15	*20
6	15	*17	*29	12	*17
8	(13)	*14	*23	(11)	*15

## CENTRAL U.S.A.

UTC	AFRI	ASIA	OCEA	EURO	SA
8	(13)	(11)	*21	10	*16
10	(16)	*10	*18	15	*14
12	22	*15	*16	*19	*21
14	25	13	*16	*21	*26
16	26	(11)	(14)	*21	*29
18	*27	(10)	(13)	*20	*31
20	*25	17	25	*18	*32
22	21	20	*30	14	*31
24	*18	21	*33	10	*30
2	*16	18	*32	10	*24
4	*16	15	*32	*13	*20
6	14	13	*26	*11	*18

## EAST COAST

UTC	AFRI	ASIA	OCEA	EURO	SA
7	16	(11)	*20	10	*16
9	18	*10	*17	15	*14
11	*26	*15	*15	*19	*21
13	*30	13	(16)	*21	*26
15	*31	(11)	(15)	*21	*29
17	*30	(10)	(14)	*20	*31
19	*27	(15)	(20)	*19	*32
21	*22	19	29	16	*31
23	*19	20	32	*12	*30
1	*17	18	31	*11	*24
3	*14	14	*28	*10	*20
5	*19	12	23	*11	*18

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# Come On in – The CW Water is Just Fine

By Randall Noon, KC0CCR

**W**hen amateur radio operators are on the air, what do they do? A survey conducted by the ARRL from October 10 through November 10, 2010 and reported in the January 2011 *QST* QuickStats feature found out the following:

Of the people who responded to the survey, 27 percent indicated they don't use CW. This, of course, suggests that the remaining 73 percent of operators who responded do use CW. Of all the operators surveyed who responded, including those who said they don't use CW, they reported they receive CW comfortably as follows:

- 11% at 1 to 5 wpm.
- 15% at 6 to 10 wpm.
- 25% at 11 to 20 wpm.
- 14% at 21 to 25 wpm.
- 5% at 26 to 30 wpm.
- 3% at 31 wpm or higher.

Thus, 51 percent of all operators who responded to the survey say that they comfortably receive CW at speeds of 20 wpm or less, while 27 percent say that they don't use CW at all. Thus, one-quarter of all respondents indicated they comfortably receive CW at 10 wpm or less.

Recall that the preceding percentages concerning CW speed include those who said they don't operate CW. If we readjust the speed numbers, sometimes called normalizing the data, so they exclude those who don't use CW, then the following is obtained. Of those who use CW, they comfortably receive CW at the following speeds:

- 15% at 1 to 5 wpm.
- 21% at 6 to 10 wpm.
- 34% at 11 to 20 wpm.
- 19% at 21 to 25 wpm.
- 7% at 26 to 30 wpm.
- 4% at 31 wpm or higher.

Thus, of the operators in the survey who said they use CW, about 70 percent reported they comfortably receive at 20 wpm or less, and 36 percent said they comfortably receive CW at 10 wpm or less.

Contrary to some perceptions, the survey indicates most CW operators are not cyborgs who decode CW at machinegun speeds. The average operator receives CW at speeds that can readily be understood by ear and likely sends CW at speeds that can be achieved with a hand key, a bug, or hand-operated keyer.

In the same survey, when asked about operating analog voice, 70 percent said their favorite mode is SSB. Only 3 percent said their favorite mode is AM, and 21 percent said their favorite mode is FM. Interestingly, 6 percent said they don't operate at all using an analog voice mode.

With respect to digital modes, 36 percent said they don't operate a digital mode, which leaves 64 percent who apparently do. Thirty-five percent of the total who responded to the survey said they operate PSK-31. The venerable RTTY mode, which was in second place, was claimed by 9 percent. Other modes noted in the survey were packet and APRS - 5 percent; D-Star - 4 percent; MFSK - 2 percent, and Olivia - 2 percent. Again, when normalizing the data to remove those who don't use a digital mode at all, this means 55 percent of operators who use a digital mode use PSK-31.

So, if you, as a potential CW operator, are afraid to get on the CW sub-bands because you think you are too slow, think again. About one-third of the operators who responded to the survey think 10 wpm or less is just fine with them. Further, if you are still shy about using your CW skills because you think you are too slow, despite the results of this survey, try CQ-ing on the FISTS frequencies. FISTS members will work your station no matter how slowly you send and receive, and we don't mind you making mistakes. Just relax and do some code. The FISTS "meeting" frequencies are in Table 1. All licensed amateurs, including Techs and Novices, may use the bands marked in yellow.

Of course, the frequencies in Table 1 are not really FISTS frequencies in the sense that no one else can use them. As with all frequencies, they can be used by anyone and everyone. However, FISTS members do tend to listen to those frequencies, as do many of the 36 percent of CW operators who are comfortable receiving at 10 wpm or less.

Please note one item of band etiquette: When you make contact on a FISTS frequency and the band is busy, please QSY down a little so that others can use the "meeting" frequency. A "down" QSY is preferred so that you don't crowd the QRP meeting frequency just above the FISTS frequency.

## Why Does A1A Mean CW?

Undoubtedly, new CW operators come across the designation A1A, or the older designation A1 to mean CW. Here is why that term is synonymous with Morse Code or CW.

A1A is an emission designator. Emission designators indicate the type of emission or transmission mode an operator is using when transmitting a radio signal. Emission designators are used in various documents such as Part 97, which contains the legal rules for amateur radio, some ARRL publications, and various technical papers and references.

Most operators have seen emission designators used now and then in the literature and know the common ones, such as A1A for sending Morse code the usual way, or J3E for phone transmission using single sideband. Some people still use the older designators, such as A1 for CW, which were replaced some years ago.



Band	Frequency	Notes
2-meters	144.058 MHz	All licenses, including Techs and Novices. If you are in a large city with a 2-Meter Club, this is fun especially during a VHF contest.
6-meters	50.058 MHz	All licenses, including Techs and Novices. This is awfully fun during a 6-meter opening.
10-meters	28.058 MHz	All licenses, including Techs and Novices. When open, this is a worldwide band. 200 watts max. for Techs and Novices.
12-meters	24.918 MHz	Extra, Advanced and General licenses.
15-meters	21.058 MHz 21.158 MHz	All licenses, including Techs and Novices. 200 watts max for Techs and Novices.
17-meters	18.085 MHz	Extra, Advanced and General licenses.
20-meters	14.058 MHz	Extra, Advanced and General licenses.
30-meters	10.118 MHz	Extra, Advanced and General licenses, 200 watts max. This is a great band because it is CW and digital only, and is open most of the time.
40-meters	7.028 MHz 7.058 MHz	All licenses, including Techs and Novices. 200 watts max for Techs and Novices. The 7.028 MHz is a worldwide frequency, while the 7.058 MHz is more for North and South America.
80-meters	3.558 MHz	All licenses, including Techs and Novices. 200 watts max. for Techs and Novices. Both 40 and 80-meters are often open all night long, so keep the coffee pot full.
160-meters	1.808 MHz	Extra, Advanced and General licenses.

**Table 1. FISTS Frequencies**

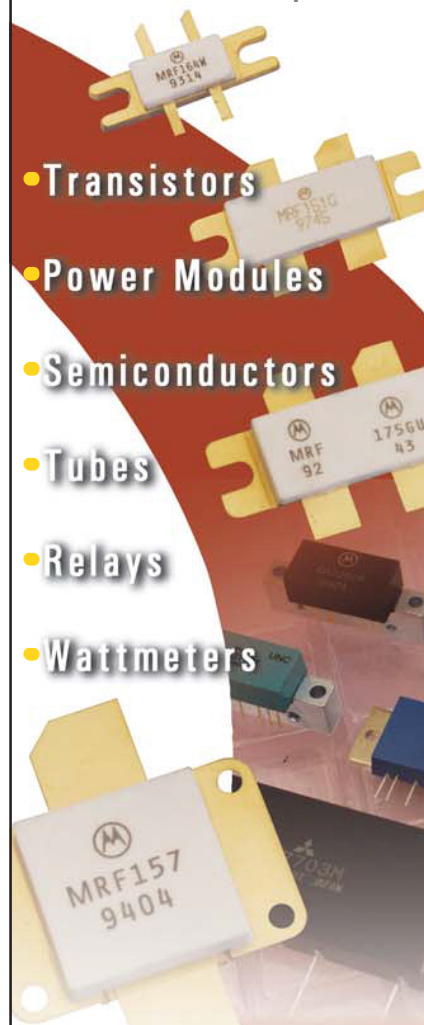
An emission designator is composed of three parts: a letter, a number, and then a letter. The first letter indicates the type of modulation system. The letters used for more familiar modulation systems are as follows.

- A double sideband amplitude modulation
- C vestigial sideband amplitude modulation
- F frequency modulation
- G phase modulation
- H single sideband with full carrier
- J single sideband with suppressed carrier
- R single sideband with reduced or variable level carrier

The second part, a number, designates the nature of the signal that is modulating the carrier. The numbers used for the more common types of modulation are as follows.

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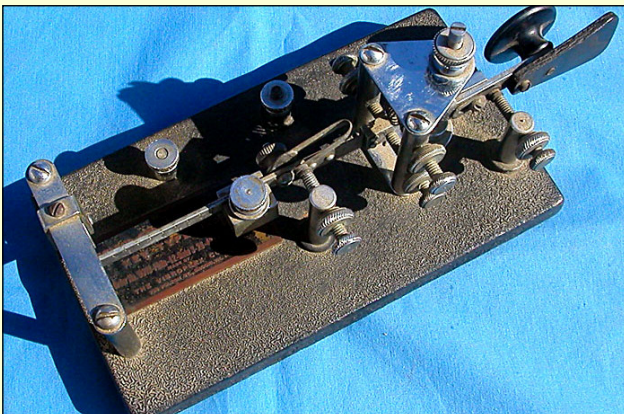


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- 0 no modulation, just raw carrier
- 1 digital data without modulated subcarrier
- 2 digital data on modulated subcarrier
- 3 analog modulated
- 7 two or more channels of digital data
- 8 two or more channels of analog data
- 9 a combination of analog and digital information

The third part of the designator, a letter, indicates the type of information being sent. The common types are as follows.

- A manually received telegraphy
- B automatically received telegraphy
- C facsimile
- D digital information
- E voice telephony
- F video and television
- N no information, perhaps a test signal
- X other

CW that is transmitted by the usual means is A1A. It is a single tone modulating a carrier wave by amplitude modulation. CW using a modulated tone through an FM transmitter, often abbreviated MCW for modulated CW, has the designator A2A. Single sideband voice – upper or lower – is J3E. Narrow band FM from a handi-talkie or repeater is F3E. BPSK-31 is G1B.

## CW Stuff Coming Up

The **2011 EUCW/QRS Party** is April 25 at 0001 UTC through April 29 at 2359 UTC. This is not a contest, but a sort of party or celebration of slow CW activity for a period of five days. No speedsters. The dates selected are intended to avoid weekend contest activity. Work any station but send only in QRS (slow code). Standard QSOs with non-participating stations can even be included in logs. For more information go to: <<http://bit.ly/g8axI7>>.

The **FISTS Spring Sprint** is coming up May 14, from 1700 to 2100 UTC. Please check the FISTS web page for the details: <<http://bit.ly/eQWqdf>>. This is a great activity for a Tech or Novice, since they can operate CW on 4 of the 5 sprint bands. Working a sprint is a lot of fun. It is not a marathon type affair and even a modest rig and antenna can do well. It is especially great for racking up different state QSOs for earning your WAS.

The **2011 Dayton Hamvention** is coming up May 20-22. If you have a chance, go to the Hamvention and visit the FISTS booth (say hello to WZ8C for me), drool on the great keys for sale both new and used, and just indulge yourself. Before you die, go to Dayton at least once.

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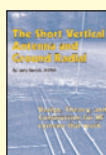


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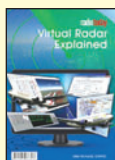


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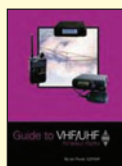
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# An Audible Transmitter Output Monitor with a Stealth Antenna

*This month we step aside for guest columnist Mike Keithley, KJ6CBW, a Handiham member living in Mountain View, California, who has developed an innovative audible RF output monitor that connects between his transmitter and coax feedline. He writes about it here, hoping to perfect the design with more testing and perhaps offer it commercially. KJ6CBW can be contacted at: [mlkeithley@comcast.net](mailto:mlkeithley@comcast.net) – Patrick Tice, WAØTDA.*

I am a Handiham member, totally blind and a user of cochlear implants. After passing my General and Extra exams with the help of the Handiham lectures, I wanted to set up an HF station. I have a Kenwood TS-440SAT transceiver, but erecting an antenna posed a big problem.

I live in a mobile home park where rules forbid antennas of any kind – except for small satellite dish units on the side of the house. I even tried discussing putting up a flagpole with management with no success. So rather than just giving up, I figured if I could get a thin wire up, no one would notice unless they knew what to look for.

I talked this over with Gary Gordon, K6KV, a Handiham volunteer who lives near me in the San Jose area. He proposed a 70-foot number 16 antenna wire, which would be about 20 feet up and strung across some sturdy trees. We'd use the metal



**The “ATOM”, or Audible Transmitter Output Monitor, provides aural feedback that helps a blind user track power and tuning. (Photographs courtesy of K6KV)**



**Mounting the SG autotuner at the feed point provides the most efficient tuning and operation. Even though the tuner is weatherproofed, this mounting location under a soffit provides extra protection from direct exposure.**





**Inside the ATOM monitor:** A tiny sample of the transmitted RF is rectified and used to modulate the pitch of a LM555 multivibrator, which can be heard from its built-in speaker. The audio output rapidly follows any changes in the power level, and provides a qualitative but information-rich confirmation that the transmitter, tuner, and antenna are all working correctly. (K6KV)

frame of the mobile house as a ground plane. The feed point would be at the place where the radiating wire was secured nearest the metal of the mobile home.

Well, we put it up, but its SWR was 7:1 at its intended resonant frequency of 3.6 MHz. We measured a radiation resistance that was too low for the rig's built-in tuner to match. (Gary had a cool antenna analyzer.) That meant we couldn't get power into it from the Kenwood. We felt that the impedance was so low because the antenna ran too close to the metal roof of the house. After Gary and I discussed the matter, I decided to buy an outboard automatic antenna tuner that could match a much wider range of impedances than the Kenwood's internal tuner.

I bought a SGC-234 autotuner. This tuner works from 160 to 6 meters and matches the antenna to any frequency I want to use. The secret is to mount the autotuner right at the antenna feed point rather than at the transmitter. It's waterproof, so it can be exposed to the weath-

er. When the tuner senses RF from the transmitter, it automatically matches the antenna in about five seconds. It remembers its settings so a subsequent match is made almost instantaneously when the frequency is close to the previous one. It requires DC power from the shack, but the power lines are bundled with the coax.

One problem we had was determining when the autotuner completed a match, or if I was even producing output. So we designed an audible RF output monitor that connects between my transmitter and the coax feedline. It has a built-in speaker that can produce a whistle whose pitch rises as the power level increases. It's especially amusing to listen to it warble while the remote tuner is tuning up.

You say, "Just look at the power meter." But I can't. I call the new unit the Automatic Transmitter Output Monitor (ATOM).

Because the wire is only 20 feet above the ground, this is not an ideal DX antenna. It is more like an NVIS (Near Vertical Incidence Skywave) system on the lower

frequency bands and is good for contacts to 500 miles or so. It works quite well, and I find myself doing far more captivated listening than transmitting. But there have been numerous contacts on 80 and 40 meters. We will find out how well it does on 14 MHz and above when the solar cycle improves. There is no RF in the shack and no RFI in the house!

The wire has tarnished from exposure and is now very hard to see. Gary says it's good for 10 years, unless the trees have their way or the kids around here don't cut it down. That really happened, but we had it back up in a jiffy.

So if you live in a condo, apartment or mobile home, and they say you can't put up an HF antenna, do what you must and don't let anyone know.

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# The Final Report Card: Disaster Preparedness

## *Commentary*

By Bill Sexton, N1IN/AAM1RD/AAR1FP

**A** polite if dubious blogger aired his skepticism recently on the Internet's eHam forum. "What does MARS do, realistically?" he asked.

He wondered if the Military Auxiliary Radio System is one of those places "where they always prepare but seldom deploy."

Good questions. Good timing, too.

After 20 years in Army MARS I'm coming up with questions, too. For instance, how long will the welcome last for us plain vanilla volunteers in the increasingly officialized, stratified and alphabetized orbit of emergency response? With all the proliferation of EMACS, ESFs, rev. ICS 213s, IMC, JFO, JISCC, NRP-turned-NRF, etc., maybe there won't be space for a mere

"single resource." That's what I guess my MARS station would be considered in the Federal Emergency Management Agency's arcane terminology.

So, *let's do* talk about the issues raised by a concerned eHam who signed himself "Acmenews" on the eHam MARS forum in January. His queries first. Mine can wait.

Like volunteer firefighters, MARS members do, indeed, drill over and over for events they hope won't ever need their services – *and, thank goodness, usually don't*. In that sense it's true, we seldom deploy. We're not "first responders" in the technical sense. The MARS mission is backup, somewhat comparable to the second-alarm fire companies held ready



**A civilian MARS member explains operations of the Military Auxiliary Radio System to National Guard representatives at the January 2011 Domestic Operations (DOMOPS) Conference. For details, see the sidebar "National Guard, Meet MARS." (Courtesy of N4WWL)**



when a blaze threatens to get out of hand. You still have to be fit and know the job.

## The Things We Do . . .

Did I detect an unspoken “if anything?” Actually, MARS members perform a thousand tasks in a thousand places, mostly quite unspectacular like repairing a repeater or helping an Army Reserve outfit set up radios for a summer exercise.

One of the barely-visible-yet-essential jobs is furnishing net controls and relay operators for the HF (high frequency) network run by the Department of Homeland Security. It links government offices across the country whenever needed, emergency or not.

Another such elite group with low profile operates the Army MARS Winlink system for e-mail-over-HF. Also there's the pioneering air-to-ground phone patch operation of Air Force MARS.

Those ongoing services rely on members of all three MARS branches (Army, Air Force and Navy-Marine Corps). Additionally, Navy-Marine Corps MARS has enhanced and maintains the MARS Automatic Link Establishment (ALE) service. It, too, is assisted by members from the other branches.

Now here's one more upbeat example for Mr. Acmenews, and this one may be *new* news to many in MARS.

The Defense Department's National Guard Bureau (NGB), to which the Air Force and Army National Guard report, is close to completing its fix for the *commo confusion* exposed during Hurricane Katrina. This is a nationwide matrix of Joint Incident Site Communications Capability (JISCC) units, one at least in each state, ready – like a fire crew – for dispatch to any emergency.

The JISCC, which was described in the October 2010 *WorldRadio Online* MARS column, is a trailer-borne, air-transportable communications center – a giant router, actually, capable of plug-and-play switching for multiple inputs of every conceivable mode from CW to Satcom (satellite communications). Now MARS is providing HF connectivity.

“The MARS ability to provide long-range voice and commercial e-mail connectivity over high frequency radio (Winlink) is an important communications capability for the NGB and a valuable asset during domestic operations,” according to a letter from Army Brigadier General David L. Harris, the NGB's director of Domestic Operations and Force Development. “The most recent MARS addition to the NGB Joint Incident Site Communications Capability (JISCC) program of MARS will be very beneficial.” *More on that later.*

## On the Other Hand . . .

Now for *my* observations, admittedly based on familiarity with only one of the three MARS branches, although I've tried to keep abreast of the others. To reiterate, these are one member's personal opinions and do not reflect official policy or anything else.

## The Job Description

Boiled down a bit, the current Defense Department Instruction (DoDI) 4650.02 announces four assignments for MARS. Note the order in which they're listed in this post-Katrina charter because the priority is significant:

(a) “Organized volunteer radio operators” enrolled in MARS will provide “contingency radio communications support to U.S. government operations.”

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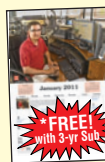
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(b) "DoD Components" come first on the list of customers to be served.

(c) "Civil authorities at all levels," come next, and,

(d) MARS will handle personal messages for our forces "in remote and isolated areas, in contingencies or whenever appropriate."

This sounds reasonable enough on paper. But let's examine with care.

## What is 'Contingency Radio Communications Support?'

Does it mean working from the home station or joining an EOC (Emergency Operations Center) staff? Managing a regional HF net or "shadowing" the incident commander in a disaster zone? Is it refueling a portable generator or constructing a communications center?

And what is meant by a "contingency?" Merriam-Webster's answer isn't very helpful: "an event that may but is not certain to occur." The DoD's Dictionary of Military and Associated Terms (2010 ed.) only gives us "a situation" that is in need of military response.

Basic doctrine like the DoDI should reflect painstaking analysis leading to prioritization of options based on what's achievable and what isn't. It should provide the foundation of fact and principle on which future command decisions must be based.

For me, the clearest conclusion from reading DoDI 4650.02's four-paragraph policy statement is that it wasn't adequately "staffed;" i.e., promulgated only after careful research and thorough consultation.

What's most painfully missing are the Rules of Engagement. Without these, region and state directors can't begin to manage developing emergencies in real-time, much less draft sensible response plans in advance.

Like troop commanders in uniform, MARS leaders in the field need to understand the parameters of support and have in hand specific guidance on what constitutes "contingencies." Those elements are the essential "same pages" on which everybody is supposed to be. In the sort of serious incident where MARS services would be most needed, a presidential directive or Operations Order from MARS headquarters might never get through in time.

## Unbalanced Commitment

Some members of Army MARS (the oldest and biggest of the three branches) may be struck by an oddity in the 4650.02 policy statement. It ranks military support ahead of agency support, but practice has been the reverse – an arguable consequence of vague and indecisive doctrine.

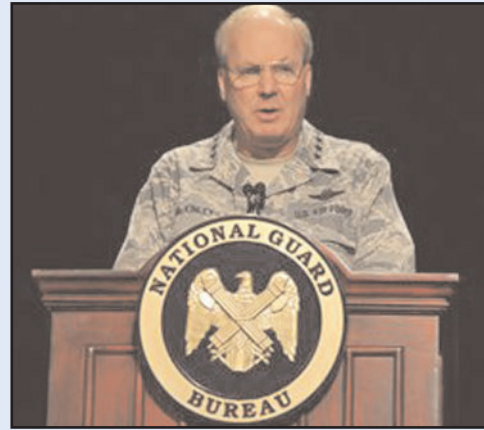
As headquarters focus has lately evolved, even though we're called the Army *Military* Auxiliary Radio System, growth has spurred only in the area of civil support, building alliances with state and local Emergency Management Agencies (EMAs). It's as if there's neither time nor need for expanding military connections. Just call us the *Auxiliary Radio Service, Etc.*

There are hundreds of communities where National Guard or Army Reserve units are locally based but for whatever reason have no contact with MARS operators living nearby. Somewhere along two chains of command, the DoD mandate for interoperability has been lost.

Why an imbalance in the first place?

Certainly one factor is that Army MARS headquarters has marketed Winlink licenses with a level of energy and persis-

## National Guard Chief Tells Troops to Reach Out



**Air Force General Craig McKinley, Chief of the Pentagon's National Guard Bureau (NGB), speaks at the annual Domestic Operations Conference. This year, MARS was invited to participate in the DOMOPS Conference for the first time. (Courtesy of U.S. Air Force Technical Sergeant John Orrell)**

**I**t's a message often heard by MARS members: Get acquainted with the other emergency responders in the neighborhood. Now it's an order to America's National Guard troops from their senior officer.

Air Force General Craig McKinley, Chief of the Pentagon's National Guard Bureau (NGB), made the point at the annual Domestic Operations Conference at which the Military Auxiliary Radio System was an invited participant for the first time.

"You establish these relationships in your hometowns, with the first responder communities, with your neighboring states, territories and the district . . . and with national level agencies," McKinley told the 1,600 military personnel attending the January meeting outside Washington. "It is critical to get to know people before you *need* to know them."

"In any domestic emergency, it will be incumbent upon all the Reserve components to participate in a seamless manner," said McKinley, the National Guard's first four-star general. "I've made it a priority . . . to reach out to the most senior levels within the Department of Defense and our interagency partners, to get the authorities and policy in place that allow all of our forces the operational flexibility to respond effectively."

He added: "Make no mistake; the American public has an expectation of a coordinated and professional response to any and all domestic disasters. It is incumbent of all of us to rise above that challenge. I believe the status quo is not an option. We need to adapt and change the way we're doing business now."

An ROTC graduate at Southern Methodist University and later a fighter pilot, he became chief of the NGB in 2008 after serving as head of the Air National Guard. National Guard units are key candidates for interoperability with MARS. The Army Guard web page reports a Guard presence in 3,000 U.S. communities.

– Bill Sexton, *NIN/AAM1RD/AAR1FP*



## National Guard Meet MARS

A booth introducing the three MARS branches – Army, Air Force and Navy-Marine Corps – was assembled on short notice for the National Guard Bureau's 2011 Domestic Operations Conference outside Washington, DC in January. (Courtesy of N4WWL)



**M**ARS and the National Guard have a lot in common besides answering to the Defense Department. Members of both live and work in the same hometowns. Both are emergency responders who have special roles to play when rivers overflow their banks or hurricanes batter the coasts in the AORs (areas of responsibility) they share.

Yet in many parts of the country and some segments of the Military Auxiliary Radio System, the symbiotic relationship you'd expect simply hasn't developed. The two chains of command just don't connect.

This winter, both sides took a meaningful step toward repairing the gap. It's a grand story of cutting through bureaucracy and seizing opportunity.

A ham in Air Force MARS felt the impulse to speak up about the communication assets that all three MARS components could be providing the military-side of homeland defense. So several months ago he wrote a letter to General Craig McKinley, the U.S. Air Force four-star who is Chief of the Pentagon's National Guard Bureau (NGB). That's the headquarters to which both Army and Air Force National Guard units report when in federal service.

The writer, David Trachtenberg, AFN3PL/N4WWL, of Burke, Virginia, did so knowing a response, if any, could take months. The Pentagon, after all, is busy with a couple of wars, and Guard units are in the thick of them.

*Wrong.* General McKinley's answer came back promptly in the form of a letter from Army Brigadier General. David L. Harris, the NGB's Director for Domestic Operations and Force Development. Would MARS take part in the 2011 National Guard Domestic Operations Conference barely a month later?

"This will serve as an opportunity for you to provide information on your system to all our domestic operations community," Harris wrote, adding: "I look forward to the MARS program and NGB relationship developing in future training exercises and contingency operations." It turned out he was personally familiar with a small communications activity in which a handful from all three MARS services had assisted some years ago.



**Uniforms dominated the conference, to which only military personnel and civilian staff with special clearance were admitted.** (Courtesy of N4WWL)

After a hectic scramble assembling displays plus typical *go kit* equipment, a MARS booth was ready for the January 18-20 conference outside Washington. More than 1,600 Guard representatives from 50 states attended along with ranking Pentagon officials. Sort of like a hamfest except for the camouflage uniforms and so many stars and eagles on attendees' lapels.

Trachtenberg, who serves concurrently as national planning coordinator of Air Force MARS and Virginia state director, was joined in manning the booth by members of the Pentagon Amateur Radio Club and some Air National Guard personnel who possessed on-the-job experience working with MARS.

In recent years, collaboration with MARS has become considerably more prevalent in the Air Force than in the Army, which focused more on civilian agency support. The AFMARS crew had hoped for an official Army presence, but events evidently moved too swiftly for its headquarters to arrange it.

– Bill Sexton, NIIN/AAM1RD/AAR1FP

tence not evident on the military side. Many licenses are issued to paid civilian staff with only minimal training and even less regard for the potential overload on limited bandwidth.

And there's an unintended consequence of history. Up to the first Gulf War (1991), MARS was heavily invested in "morale and welfare" messaging for troops overseas. Army MARS still reports to a headquarters concerned primarily with out-of-the-country communications, even though MARSgrams were made obsolete long ago by e-mail and satellite phones.

As a result, there's no direct chain-of-command link with the Army headquarters that is tasked explicitly with homeland security: U.S. Army North (ARNORTH).

## Re-energizing the Military Commitment

This winter saw an encouraging breakthrough toward restoring the balance implied by 4650.02. National Guard leaders from 50 states were given a look at MARS capabilities during their annual Domestic Operations Conference just outside Washington. (See sidebar "National Guard, Meet MARS"). It was probably the widest exposure for MARS since the ARRL's Amateur Radio Emergency Communications Conference in Huntsville, Alabama in 2007.

MARS got its invitation as the result of a letter from an Air Force MARS member extolling our capabilities.

One of my favorite interoperability stories originated with an Air Force MARS member in upstate New York. He was acquainted with an Army MARS member where both happened to be employed. When the opportunity came along for the two

to join in a weekend support project with the Air National Guard, the workmate from Army MARS mentioned *he too* had a friend – in Navy-Marine Corps MARS. The trio eventually became the Joint MARS Base Support Team at Hancock Field, NY.

And that's only the beginning of this story. Last December, the Army's Brigadier General Harris in his letter inviting MARS to the 2011 Domestic Operations Conference, paid tribute to Hancock's MARS team. It is, he said, "a valuable asset to both military and civilian authorities."

## Taking on Too Much

Earlier in this column I wondered if *any* volunteer ham organization is likely to count for much in the "worst-case" scenarios that disaster experts say lurk ahead. And even if the answer is affirmative, is MARS itself (to cite just one such agency of good intention but untested competence under fire) headed in the right direction?

We're not talking Category 4 hurricanes here, but events on the mind-numbing scale of Port-au-Prince / Chernobyl / Bhopal / the Indonesian tsunami, or of the 1918 global flu pandemic which claimed 600,000 lives in the U.S. alone. Not in the near-century since have Americans experienced such catastrophe in the homeland.

This isn't a great time to raise the subject given all the country's other critical preoccupations, but those of us who volunteer for disaster mitigation can hardly avoid asking the hard questions facing our vocation.

Do amateur radio's volunteer responders, including MARS, possess the individual staying power required of recovery forces in a mega-event? Is training anywhere near sufficient for the likely heavy hitting? Is the overall organization sufficiently resilient in depth? Does leadership acknowledge the challenges? Or in the end will we find ourselves benched for failure on the practice field?

Since the Haiti 'quake, these columns have been mostly devoted to lessons learned that might be useful in a calamity of similar magnitude here in the U.S. A sort of personal wish list has emerged out of that project. Briefly:

- Let's bring unity of command to the three MARS branches (as the National Incident Management System requires).
- Supply MARS with DoD resources appropriate for the mission (if somewhat less than the apparently bottomless Department of Homeland Security cornucopia).
- Put an end to the apparent transformation from military auxiliary to purveyor of software and manpower for civil agencies, which has been the most visible recent activity at Army MARS headquarters. DHS has its own budget.
- And, of course, let's collaborate with the other volunteer entities to eliminate duplication of services and the appearance of competing with each other.
- Above all, let's re-examine the hierarchical top-down model for organizing emergency response. The more destructive the event, the less likely it will function. There may be no "top" left. What meaningful alternative is there?

When I'm asked why MARS members aren't routinely issued a photo ID (there's a cost for checking police records) the old nursery rhyme about pinching pennies comes to mind: *For want of a nail . . .* Especially the final couplet:

*"For want of a battle the kingdom was lost.  
And all for the want of a horseshoe nail."*

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## APRIL

### MARTINEZ, CALIFORNIA – Special Event Station K6M.

Martinez Amateur Radio Club operating April 16 from 1600Z-2300Z. . Operating from the John Muir House National Historic Site in celebration of the 173rd birthday of John Muir, father of the U.S. National Parks System. Frequencies: 14.255 and 21.350 MHz. QSL: Martinez ARC, 230 F St., Martinez, CA 94553.

### RALEIGH, NORTH CAROLINA – Special Event Station N4C,

operating from the 39th Annual Raleigh Hamfest and ARRL North Carolina State Convention. April 23, 8 a.m. to 3:30 p.m. EST, on approximate frequencies: 7.235 or 14.235 SSB, and 7.055 and 14.055 CW. QSL information: < <http://www.rars.org/hamfest> >.

### BELTON, TEXAS – HamEXPO, April 2, 7 a.m. to 2 p.m., Bell

County Expo Center, 301 W. Loop 121. Sponsored by Temple Amateur Radio Club. Onsite concessions, accessible to persons with disabilities. ARRL-sponsored exams. Talk-In frequency: 146.820 / 123.0 Hz. At-door admission fee: \$5. Table fee: \$15-\$25. Details: < <http://www.beltonhamexpo.org/> >. Write: < [expo@tarc.org](mailto:expo@tarc.org) >. Contact: Mike LeFan, WASEQQ, (254) 773-3590 – 10 a.m. to 9 p.m., machine pickup after five rings.

### NEBRASKA – Nebraska QSO Party (NQP), 1700 UTC

April 24 to 1700 April 25. The goal is to promote activity from Nebraska and hopefully give amateurs worldwide a contact from Nebraska. Details: < <http://www.hdx.net/neqso/> >.

### VENICE, FLORIDA – Special Event Station K4S from the

Venice Sharks Tooth Festival, Venice, Florida; Tamiami ARC; 1300Z - 2400Z, April 8-10. Frequencies: 28.383, 21.313, 18.153 and 14.236 MHz. For direct QSL send QSL and SASE to Jack Sproat-W4JS, 1419 E. Manasota Beach Rd., Englewood, FL 34223-6341. DX may QSL via the bureau.

### SPRING GROVE, PENNSYLVANIA – York Hamfest,

Saturday, April 9, from 8 a.m. to 2 p.m. Sponsored by the York Hamfest Foundation. Location: Porters Community Fire Co., 1199 Porters Rd. Spring Grove, PA. 17362. Contact Information: Hamfest Web Site: < <http://www.yorkhamfest.org> >. Inside Tables: Tabitha Zier, < [tazier@embarqmail.com](mailto:tazier@embarqmail.com) >. Phone: (717) 632-6719. Other Information: Duane Sterner < [duane.sterner@yahoo.com](mailto:duane.sterner@yahoo.com) >. Laurel VE Testing starting at noon. Talk-In: 147.330 Mhz (+, PL123hz), Simplex backup: 147.495 Mhz.

## MAY

### DAYTON, OHIO – Dayton Hamvention®, May 20-22, Hara

Arena, 1001 Shiloh Springs Rd. Complete details: < <http://www.hamvention.org/> >.

### DAYTON, OHIO – DX Dinner™ sponsored by the South-

west Ohio DX Association (SWODXA). In conjunction with the Dayton Hamvention®. The dinner will be held on Friday, May 20, at the Dayton Marriott, 1414 S. Patterson Boulevard < <http://www.marriott.com/hotels/travel/dayoh-dayton-marriott> >, (937 223-1000). “DXpedition of the Year”

to be announced. Program details and a list of the prizes available soon at: < <http://www.swodxa.org> > or < <http://www.swodxa.blogspot.com> >. Cash bar starting at 5:30 p.m., with dinner served at 7. Tickets, \$40 each, payable in U.S. funds. Sorry, we do not process Paypal or credit card payments. If a vegetarian meal is desired, it must be indicated when tickets are ordered. Check or money orders, payable to SWODXA, should be sent to Kirk Swallow, W8QID at 3137 Compton Rd, Cincinnati, OH 45251. Be sure to include a SASE for ticket return.

### CADILLAC, MICHIGAN – Wexauke Amateur Radio Club

will sponsor the **49th Annual Cadillac Swap**, Saturday, May 7, at Cadillac Junior High School, 500 Chestnut St. Admission: \$5. Tables: \$10. Talk-in 146.98 MHz (no PL). Commercial vendors and VE session. For information and reservations: Alton McConnmell, (231) 867-3774, < [nu8l@yahoo.com](mailto:nu8l@yahoo.com) >, Wexauke Amateur Radio Club, PO Box 163, Cadillac MI 49601.

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

## Visit Your Local Radio Club



## COLORADO

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

## MICHIGAN

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

*Click here to have your club listed!*



## Tapping Into the Power of Print

By Devere "Dee" Logan, W1HEO

**W**ritten communication provides an important advantage over verbal messages. Spoken words are easily misunderstood and can't be consulted later for clarification. This is why important documents are generally written on paper to assure clear understanding and provide an easily consulted future reference. Yes, the spoken word still has its uses and can be a powerful tool. But print – whether on paper or downloaded from the Internet – provides many advantages.

Promoting ham radio historically has been done by *Elmers*, or mentors, through personal conversations or one-on-one demonstrations. But printed promotional materials allow us to circulate information about amateur radio to a much wider audience.

Printed pieces are ideal for raising awareness of ham radio among target groups. Typical of these are local emergency management, police, fire, town officials, teachers, youth groups, service clubs, potential club members, and similar. Often, a printed piece provides an initial introduction to our radio service that could lead to a later follow-up in-person visit or presentation.

### Types of Printed Pieces

Let's consider the main functions and uses of printed promotional materials. First, they can provide a description of the amateur radio service, since the reader may have only a vague idea of what it is. The text can cover the licensing structure, valuable benefits and fun of amateur radio, examples of how it is used, a bit of history and so on. There are several sources of informational print literature, including *CQ Amateur Radio* magazine's *For Prospective Hams* Web page <[http://www.cq-amateur-radio.com/cq\\_prospective\\_hams.html](http://www.cq-amateur-radio.com/cq_prospective_hams.html)>. The ARRL and, of course, radio clubs, have printed information, as well.

Next, literature can describe the local ham radio scene, such as area emergency preparedness, radio clubs, and Skywarn

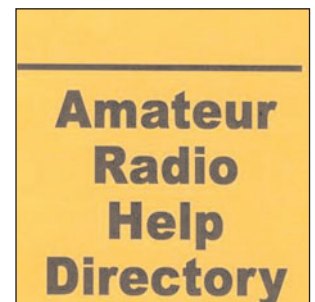
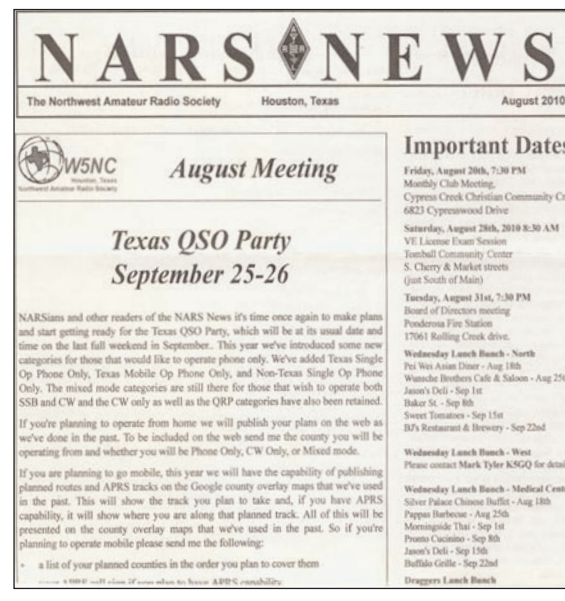
nets. The main advantage of this is to provide a strong local emphasis and contact information that makes it easy for interested persons to connect with the ham radio community.

Every radio club or specialized amateur radio group should have a *backgrounder* that describes details of the organization's purpose, operation, membership, activities and officers. This standard *boil-*

*erplate* can be used in various ways, often attached to a news release or correspondence.

Another valuable application of print is in announcing upcoming events such as ARRL Field Day or public demonstrations of ham radio. News releases and fliers are among the most common forms.

The radio club newsletter is one of the easiest means of communicating radio-



**Samples of printed materials include an ARRL ham radio brochure, a typical club newsletter, and a local help directory listing amateurs who may be contacted for information. (Courtesy of W1HEO)**



related activities. Although generally considered to be an internal publication, it provides a regular channel for documenting club activities and accomplishments. Many club newsletters document public service and community events that would be of interest to groups outside the radio club. Adding local press and emergency management officials to the club newsletter mailing list is a good way to keep amateur radio in the forefront and in the public eye.

## Creating a Good Newsletter

Since most radio clubs publish a newsletter, it's a good idea to make it interesting, newsworthy, and attractive. A strong reason is that the newsletter is the most important tangible benefit that members receive for their dues. Newsletters are ideal promotional tools as well, so consider the external reader when producing yours.

We gave you a few tips in our last column, but here are some additional observations based upon some 40 years of writing, editing, and producing newsletters.

By definition, newsletters contain news. The more newsworthy they are the better. So keep the focus on the journalistic *who, what, where, when, why* and *how* of contents. Be careful not to allow your publication to become a platform for long-winded personal opinions or rants by club members. This can turn off readers.

One of the most important and challenging jobs for an editor is keeping the focus on news and information while confining opinions to a clearly identified column. Sometimes it's better to keep specific topics out of the newsletter altogether.

Keeping text short and to-the-point is a key to better readership. As mentioned in our previous column, the book *Elements of Style* stresses the importance of omitting needless words. This is good advice.

Often the need to fill a certain number of pages will result in dropping in a lot of miscellaneous non-radio *filler* that hardly relates to the club. Jokes that are forwarded via the Internet are often used, even though many readers will have seen them already. Available space can be better used for profiles of club members, new and classic radio reviews, technical articles etc. Keep the focus on ham radio, or readership may suffer as a result.

Before sending a newsletter beyond the club membership, editors should ask themselves: *How would the contents of our newsletter be received by readers out-*

*side our organization?* If the answer is, *not very well*, then some changes need to be made.

If your newsletter contains summaries of public service activity, Field Day, radio classes etc., it will be well worth distributing widely beyond the club membership. Let your club's actions be worthy of words in your newsletter.

How a newsletter looks is another point well worth emphasizing. Following standard newspaper grid layouts, with columns, bold headlines, short paragraphs and photos can make a publication attractive to the reader. Note how newspapers and magazines are designed and laid out and apply some of their approaches to your own printed materials. Several books covering newsletter layout, design and writing are available that can help. Our *Newsletter Editor's Handbook* has been on our shelf for years, and is a good reference.

## Using Printed Pieces

Some of the most common uses of printed materials include publicizing a

Field Day site, public demonstrations of ham radio, listings of club activities such as licensing classes, contact information for reaching *Elmers*, emergency drills and hamfests. Some of these are shown in the accompanying photograph.

Newsletters are easily distributed by standard mail or the Internet. Making a self-mailer will avoid having to stuff the newsletter into an envelope, and keeps postage costs down.

Creating fliers and other materials can be done using a computer program such as Microsoft Word or Publisher. We create documents and then transfer them to a disc, which we take to an office supply store for printing.

Good luck with your print projects. We hope that they become a useful part of your promotional efforts.

Devere "Dee" Logan, WIHEO, is a veteran radio ham who writes a variety of newsletters and has developed a variety of promotional print items over the past 40 years. Contact him at < [devere\\_logan@gmail.com](mailto:devere_logan@gmail.com) >.

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## CONTEST: Missouri QSO Party

**DATE & TIME:** 1800Z 2 Apr - 2400Z 3 Apr

**BANDS/MODE:** 160-10M CW & SSB

**POINTS:** 1 Pt. SSB QSO, 2 Pts. CW QSO (one time only bonus of 100 Pts. for QSO with W0MA)

**MULTIPLIERS:** MO sta's - States/Provinces/Countries; All others - MO Counties

**EXCHANGE:** MO sta's give RST + serial # + County/ All others give RST + Serial # + State/Province/Country

**ENTRY CATEGORIES:** Not given

**ENTRIES:** At time of this column, rules were being updated.

For latest information on rules and submission of logs, see

< <http://www.w0ma.org> >.

## CONTEST: SP DX

**DATE & TIME:** 1500Z 2 Apr - 1500Z 3 Apr

**BANDS/MODE:** 160-10M CW + SSB

**POINTS:** 3 Pts each QSO with Polish sta

**MULTIPLIERS:** Each Polish province (voivodeships) once per band

**EXCHANGE:** Polish sta's give RST + letter of voivodeship (B-Z),

all others give RS(T) + Serial #

**ENTRY CATEGORIES:** Single Op - Single Band, CW; Single Op - Single

Band, SSB; Single Op - All Band, SSB; Single Op - All Band, CW;

Single Op - Single Band, mixed modes; Single Op - All Band, mixed

modes; All single op categories further divided by power level, High,

Low & QRP

**ENTRIES:** SP DX Contest Committee P.O. Box 320 00-950

Warszawa, Poland

Cabrillo to: [spdx-logs@pzk.org.pl](mailto:spdx-logs@pzk.org.pl)

Rules at: < [http://www.spdxcontest.info/reg/reg\\_g.html](http://www.spdxcontest.info/reg/reg_g.html) >.

## CONTEST: QCWA QSO Party

**DATE & TIME:** 1800Z 2 Apr - 1759Z 3 Apr

**BANDS/MODE:** All (except WARC) Bands 160M - 440 MHz CW & SSB

**POINTS:** 1 Pt. Phone 2 Pts CW/Digi

**MULTIPLIERS:** X 1 each QCWA Chapter QSO X1 State/Province/DXCC X3 for QSO with W2MM

**EXCHANGE:** Call + Year first licensed + Chapter (if member) +

State/Province/Country

**ENTRY CATEGORIES:** Single Op, SSB, CW/Digital or Mixed (all modes)

**ENTRIES:** 30 Days Robert Buus, W2OD, 8 Donner St. Holmdel, NJ 07733-2004.

E-mail submissions to: [w2od@aol.com](mailto:w2od@aol.com).

Rules and forms at: < <http://www.qcwa.org/qso-party.htm> >.

## CONTEST: EA RTTY

**DATE & TIME:** 1600Z 2 Apr - 1600Z 3 Apr

**BANDS/MODE:** 80-10M RTTY

**POINTS:** 1 Pt 10/15/20M own continent; 2 Pts. 10/15/20M other continents;

3 Pts. 40/80M same continent; 6 Pts. 40/80M other continents

**MULTIPLIERS:** DXCC, Spanish Provinces, W/VE/JA/VK call areas

**EXCHANGE:** RS(T) + serial #

**ENTRY CATEGORIES:** Single Op - Single Band; Single Op - All Band;

Multi Op (all band only!)

**ENTRIES:** 25 April

Cabrillo logs to: [rttycontest@ure.es](mailto:rttycontest@ure.es)

Rules at: < <http://www.ure.es/contest/430-ea-rtty-contest.html> >.

(NOTE: Rules for 2011 not posted at time of submission)

## CONTEST: Georgia QSO Party

**DATE & TIME:** 1800Z 9 Apr - 0359Z 10 Apr & 1400-2359Z 10 Apr

**BANDS/MODE:** 160-6M CW, SSB, Digital (counts as CW for scoring)

**POINTS:** 1 Pt. SSB, 2 Pts. CW (once per band)

**MULTIPLIERS:** GA sta's - States (including GA)/CA Provinces (DX is not a multiplier!), All others - GA Counties (159) pwr mode (318 possible)

**EXCHANGE:** GA sta's give RST + County, All others give RST + State/Province

**ENTRY CATEGORIES:** Single Op; Multi Op; Multi-Multi;

(Note - all categories subdivided by power output - QRP <5W; Low

<150W, High >150W); GA will have Rovers

**ENTRIES:** 15 May, John Laney, K4BAI P.O. Box 421, Columbus, GA

31902-0421 All formats accepted by e-mail: [gqp@iham.us](mailto:gqp@iham.us)

Rules at: < <http://gqp.contesting.com/Rules.htm> >.

Web page: < <http://gqp.contesting.com/> >.

## CONTEST: Japan International DX

**DATE & TIME:** 0700Z 9 Apr - 1300Z 10 Apr

**BANDS/MODE:** 160-10M CW

**POINTS:** 1 Pt 40/20/15M; 2 Pts 80 or 10M; 4 Pts. 160M

**MULTIPLIERS:** JA Prefectures + JD1 (50 possible), per band

**EXCHANGE:** JA's give RST + Prefecture; all others give RST + CQ Zone

**ENTRY CATEGORIES:** Single Op - Single Band high or low; Single Op -

Multi-Band high or low; Multi Op; Maritime Mobile

**ENTRIES:** 30 days JIDX CW Contest C/O Five-Nine Magazine

P.O. Box 59, Kamata Tokyo 144-8691 Japan

Cabrillo to: [cw@jidx.org](mailto:cw@jidx.org)

Rules at: < <http://jidx.org/jidxrule-e.html> >.

## CONTEST: Mini CWT Test

**DATE & TIME:** 1100-1220Z + 1900-2000Z 13 Apr + 0300-0400Z 14 Apr

**BANDS/MODE:** 20/40/80M CW

**POINTS:** 1 Pt. per band, per QSO

**MULTIPLIERS:** Callsigns

**EXCHANGE:** First name + member # (Nonmembers give first name +

State/Province/Country)

**ENTRY CATEGORIES:** Single op only

**ENTRIES:** 48 hours < <http://www.hornucopia.com/3830score> >.

Web page: < <http://cwops.org> >.

## CONTEST: Holyland DX

**DATE & TIME:** 2100Z 15 Apr - 2100Z 16 Apr

**BANDS/MODE:** 160-10M SSB/CW/Digi

**POINTS:** 1 Pt. 20/15/10M; 2 Pts 160/80/40M

**MULTIPLIERS:** Israeli "Areas" (Note - strongly suggest you see web site for map of "Areas")

**EXCHANGE:** RS(T) + Serial #

**ENTRY CATEGORIES:** Single Op - SSB only; Single Op - CW only;

Single Op - Mixed mode; Single Op, QRP (<10W); Multi Op - (single

XMTR only!)

**ENTRIES:** 31 May Contest Manager 4Z4KX Israel ARC Box 17600

Tel Aviv, 61176 Israel

Cabrillo logs to: [4z4kx@iarc.org](mailto:4z4kx@iarc.org)

Web page: < <http://www.iarc.org> >.

Rules available: IARC Contest Manager, P.O.Box 17600, Tel Aviv 61176, Israel. (SASE required)

## CONTEST: TARA Skirmish Digital Prefix

**DATE & TIME:** 0000-2359Z 16 Apr

**BANDS/MODE:** 160-6M (No WARC!) PSK, RTTY, Hell, MFSK, MT63, Throb, ASCII, SSTV, Domino EX, ALE400 and Packet

**POINTS:** 1 Pt per QSO

**MULTIPLIERS:** >100W X .5; 100-20W X 1; 19-5W X 2; <5W X 3

**EXCHANGE:** Name + Prefix

**ENTRY CATEGORIES:** Single Op, Single XMTR only!

**ENTRIES:** 14 May

Use online form at: < [http://n2ty.org/seasons/tara\\_dp\\_score.html](http://n2ty.org/seasons/tara_dp_score.html) >.

Web page: < [http://www.n2ty.org/seasons/tara\\_dp\\_rules.html](http://www.n2ty.org/seasons/tara_dp_rules.html) >.

## CONTEST: ES Open HF Championship

**DATE & TIME:** 0500-0859Z (Note: Four (4) 1-hour segments) 16 Apr

**BANDS/MODE:** 80/40M SSB/CW

**POINTS:** 1 Pt. SSB; 2 Pts. CW

**MULTIPLIERS:** ES regional prefixes

**EXCHANGE:** RS(T) + serial #

**ENTRY CATEGORIES:** Single Op, CW; Singl Op, SSB; Single Op, Mixed; Multi Op

**ENTRIES:** 20 May Toomas Somets, EX5RY P.O. Box 177

Tartu 50002 Estonia

E-mail logs: [esopen@erau.ee](mailto:esopen@erau.ee)

Rules at: < <http://www.erau.ee/modules.php?op=modload&name=Info&file=index&req=viewarticle&artid=64> >.

## CONTEST: Ontario QSO Party

**DATE & TIME:** 1800Z 16 Apr - 0500Z 17 Apr + 1200-1800Z 17 Apr

**BANDS/MODE:** 160-2M

**POINTS:** 1 Pt. Phone; 2 Pts. CW

**MULTIPLIERS:** Ontario Counties

**EXCHANGE:** Ontario sta's give RS(T) + County; All others give RS(T) + State/Province/Country

**ENTRY CATEGORIES:** Single Op, Mixed QRP (<5W); Low (<150W);

Single Op, Mixed, High; Single Op, Mixed, Single Op, Phone, Low; Single



Op, Phone, High; Single Op, CW, Low; Single Op, CW, High; Multi Op, Single XMTR; Multi-Multi; Rover  
**ENTRIES:** 19 May Contest Club Ontario P.O. Box 93149 Burlington, Ontario L7M 4A3, Canada  
 Log submission: < <http://www.va3cco.com/oqp/submitlog.htm> >.  
 Rules at: < <http://www.va3cco.com/oqp/rules.htm> >.

**CONTEST:** Michigan QSO Party  
**DATE & TIME:** 1600Z 16 Apr - 0400Z 17 Apr  
**BANDS/MODE:** 80-10M CW & SSB  
**POINTS:** 1 Pt. SSB; 2 Pts. CW  
**MULTIPLIERS:** MI sta's count other States/CA Provinces (No DX multiplier); All others count MI counties (83 possible)  
**EXCHANGE:** MI sta's give serial # + county; All others give serial # + State/Province; DX gives serial # + "DX"  
**ENTRY CATEGORIES:** Single Op; Multi Op, single XMTR; Multi Op, Multi XMTR's; Mobile Op, Solo or Multi; EOC  
**ENTRIES:** 30 days Mad River Radio Club c/o Dave Pruett 2727 Harris Road, Ypsilanti, MI 48198  
 Most logging formats accepted, submit entries by e-mail: [logs@miqp.org](mailto:logs@miqp.org).  
 Entry forms and rules at: < <http://www.miqp.org> >.

**CONTEST:** Run for the Bacon  
**DATE & TIME:** 0100-0300Z 18 Apr  
**BANDS/MODE:** 80-10M CW  
**POINTS:** 1 Pt. non-member QSO; 3 Pts. FP member; 5 Pts. FP DX member  
**MULTIPLIERS:** States/Provinces/Countries (X 2 if more than 50 members worked)  
**EXCHANGE:** RST + State/Province/Country + FP #; (non-members give power)  
**ENTRY CATEGORIES:** Single Band; All Band  
**ENTRIES:** Logs submitted by online only:  
 < <http://www.fpqrp.com/autolog.php> >.  
 See web page: < <http://www.fpqrp.com/fpqrpun.php> >.

**CONTEST:** SP RTTY DX  
**DATE & TIME:** 1200Z 23 Apr - 1200Z 24 Apr  
**BANDS/MODE:** 80-10M RTTY  
**POINTS:** 2 Pts own Country; 5 Pts. same continent; 10 Pts. other continents  
**MULTIPLIERS:** SP Provinces (16), once per band; DXCC + Continents (6)  
**EXCHANGE:** RS(T) + Serial # (SP will give RST + Province)  
**ENTRY CATEGORIES:** Single Op - all band; Multi Op - all band; SP single Op  
**ENTRIES:** 25 May Cabrillo to: [sprty@pzk.org.pl](mailto:sprty@pzk.org.pl)  
 (Note: No address given for paper log submission).  
 Rules at: < <http://www.pkrvg.org/zbior.html> >.

**CONTEST:** Florida QSO Party  
**DATE & TIME:** 1600Z 30 Apr - 0159Z 01 May & 1200-2159Z 1 May  
**BANDS/MODE:** 40-10M CW & SSB  
**POINTS:** 1 Pt. SSB, 2 Pts. CW  
**MULTIPLIERS:** FL sta's count States (including FL/Provinces/Countries/Maritime Mobile Regions (once per mode); All others count FL counties (67 possible)  
**EXCHANGE:** FL sta's give RS(T) + County; W/VE sta's five RS(T) + State/Province; DX gives RS(T) + DXCC prefix  
**ENTRY CATEGORIES:** Single Op; Multi Op, Multi Single; Multi-Multi; Mobile; Club; School; (Note: All categories sub-divided by power output - QRP <5W; Low <150W; High >150W)  
**ENTRIES:** 26 May Florida QSO Party c/o Ron Wetjen, WD4AHZ, 5362 Castleman Dr., Sarasota, FL 34232.  
 Cabrillo to: [logs@floridaqsoparty.org](mailto:logs@floridaqsoparty.org).  
 Online entry form at: < [http://www.b4h.net/cabforms/flqp\\_cab.php](http://www.b4h.net/cabforms/flqp_cab.php) >.  
 Rules at: < <http://www.floridaqsoparty.org/rules.html> >.  
 Web page: < <http://www.floridaqsoparty.org/> >.

**CONTEST:** Nebraska QSO Party  
**DATE & TIME:** 1100Z 30 Apr - 1700Z 1 May  
**BANDS/MODE:** 160-2M CW/SSB/Digital  
**POINTS:** 1 Pt. SSB; 2 Pts. CW or Digital  
**MULTIPLIERS:** NE sta's count States/Provinces/DXCC Countries; All others count NE counties (93 possible) (Note: If all QSO's QRP (<5W) X 3; <150W X 2) All QSO's <150W, X 2;  
**EXCHANGE:** NE sta's give RST + county; All others give RST + State/Province/Country  
**ENTRY CATEGORIES:** Single Op; Multi Op, single XMTR; Mobile; Club  
**ENTRIES:** 31 May HDXA NQP, P.O. Box 375, Elkhorn NE 68022-0375.  
 ASCII or Cabrillo to: [nqp@hdxn.net](mailto:nqp@hdxn.net).  
 Rules at: < <http://www.hdxn.net/neqso/neqso.htm> >.

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# VE EXAMS

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

p/r pref. = pre-register preferred but w/i OK

w/i = walk-in only

p/r = pre-registration only-no w/i

w/i pref. = w/i preferred to p/r

CITY	DATE	CONTACT	NOTES	CITY	DATE	CONTACT	NOTES
<b>ARIZONA</b>				<b>NEVADA</b>			
Mesa	3rd Mon	Steve KY7W, 480-804-1469, kj7wk@cox.net	w/i	Stagecoach	2nd Sat	Jack, AC6FU, 775-577-2637 ac6fu@arrl.net	
Phoenix	4th Sat	Gary Hamman, 602-996-8148, K7GH@arrl.net		<b>NEW JERSEY</b>			
<b>ARKANSAS</b>				Roselle	4th Sat	Gerry, AA2ZJ, 732-283-2795, aa2zj@arrl.net	
Vilonia	3rd Sat	James, KE5OVE, 501-796-3910, ke5ove@arrl.net	p/r pref.	Winslow	4th Tues	Mark, K2AX, 609-820-1523, JTRA@comcast.net	
Sherwood	1st Sat	Daryl Stout, AE5WX, 501-291-5058 ae5wx@arrl.net	w/i	<b>NEW YORK</b>			
<b>CALIFORNIA</b>				Bethpage	2nd Tues	Bob, 631-499-2214, w2ilp@optonline.net	p/r
Highland	4/16	Ed, WU6I, 909-864-0155, wu6i@arrl.net	p/r pref.	Canandaigua	1st Wed	Squaw Island ARC, David A. Foster, 585-398-0216, www.siacr.us	w/i
La Verne	Last Sat	Frank, K6FW, 909-628-8661, k6fw@arrl.net	p/r	Valhalla	Call	Stanley, WA2NRV, wa2nrv@weca.org	
Long Beach	3rd Sat	Louise, N6ELK, 562-429-1355	p/r	Yonkers	Call	Paul, AC2T, 914-237-5589, w2yrc@hotmail.com, www.yarc.org	w/i ok
Manteca/Tracy	4th Sat	David, N5FDL, 209-835-6893, n5df@arrl.net	p/r	<b>NORTH CAROLINA</b>			
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<b>IOWA</b>				Charleston	2nd Sat	Riley Stone, 843-832-9105, k4hy@sc.rr.com	w/i
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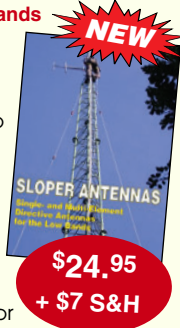
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# The Power Play: Non-Resonant vs. Resonant Antennas

By Kurt N. Sterba

**Tim Factor, KT7F**, of Newport Beach, California, poses this question to Kurt:

*"In your January 2011 Aerials you make the most curious statement, '... a non-resonant antenna radiates just as well as a resonant one. There is no practical difference in the radiation resistance and loss resistance between the two. The reason we tune the antenna to resonance is that it is a lot easier to get power into it.'"*

*"Now it's that last statement that seems to contradict your major premise. If the non-resonant antenna cannot get power to it, how can it radiate as well as a resonant antenna?"*

*"As I understand it, a resonant antenna resonates most of its energy into the ether as useful RF and a non-resonant antenna does not radiate at all, but rejects the energy fed to it, resulting in wasted heat. Isn't useful RF radiation better than wasted heat?"*

*"Kurt, I know you don't make untrue statements just for their shock value, so please help me. What am I missing?"*

Well, Tim, it's a good question. To answer it let's look at a resonant dipole, Figure 1(a), a too-long non-resonant dipole, Figure 1(b) and a too-short non-resonant dipole, Figure 1(c).

The resonant antenna looks just like a resistor. If the dipole is a half-wave above ground the resistor is 70 ohms. But it is not an ordinary resistor that turns the current passing through it into heat. This resistor turns the current into electromagnetic waves that radiate outward to distant places and allow us to communicate with one another.

True, there is a little bit of ordinary resistor in it: the resistance of the wire from which the dipole is made. But we almost always use large enough wire, or even aluminum tubing, to make this resistance very small compared to the radiation resistance. So we can neglect it in our

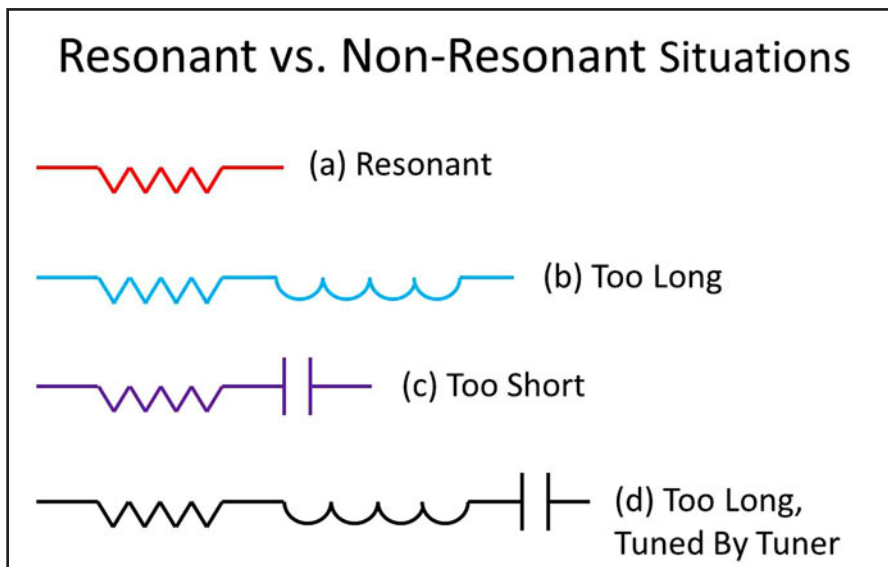


Figure 1.

present discussion. The usual dipole is 99 percent efficient or better.

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

The total series impedance is now higher than 70 ohms. To get the same radiated power – the same current through the resistor as before – we have to apply a higher RF voltage. Our 50 ohm transmitter may not be able to do this but let's suppose we have an RF generator that can do it.

The resistor radiates exactly as before because it carries the same current as before. The inductor produces a magnetic field during one-half of the RF cycle. On the other half-cycle, the field collapses and returns the energy to the circuit. There is no loss. So the efficiency of the too-long antenna is just as good as that of the resonant antenna.

If the antenna is too short then there is a capacitive reactance in series with resis-

tor, Figure 1(c). If we apply enough RF voltage to get the same current through the resistor the result is the same. Only this time the capacitor charges during a half-cycle of the RF and discharges during the other half-cycle.

No power is used and, again, the non-resonant antenna radiates just as well, and with the same efficiency, as a resonant antenna does.

If the inductive or capacitive reactance is too high for our transmitter to drive the antenna, we use a tuner to reduce the reactance to zero. In the case of the too-long antenna of Figure 1(b) the tuner adds an equal capacitive reactance as shown in Figure 1(d). The current in the inductor lags the current in the resistor by 90-degrees. The current in the capacitor leads the resistor current by 90-degrees. So these two currents are 180-degrees apart.

If we make the two reactances equal then the two currents cancel and our transmitter sees just the resistor. It can drive it just as though it was a resonant antenna. The inductor is still there and so is the capacitor that the tuner added. Current



flows through both of them but there is no loss in either.

The non-resonant antenna radiates just as well as a resonant antenna.

### More Questions About the KI6SN End-Fed Dipole

"I have had great success with the KI6SN Trail-Friendly End-Fed Dipole built with RG174 coax cable," a reader writes. "This antenna is a gem when campground portable running QRP."

"I'd like to build one using RG-58 coax using the F240-61 cores for the home QTH (location)."

Here's what the reader would like to know:

**Q:** *How many of the cores would I need for the 500 ohm impedance? I assume 10 turns of RG-58 would do the trick.*

**A:** Well, Kurt's 20 meter end-fed dipole with RG-58 used two F240-61 cores and 10 turns. This gives an impedance of 3,000-ohms on this band. Kurt recommends this as a conservative design.

The drawback to the use of ferrite is that the key-down power is limited to 100 watts. For SSB the limit is a good

deal higher so it will work fine for most transceivers.

The 500 ohms used in KI6SN's antenna is about a minimum and was used to keep the antenna's weight down. Users report good results. But if you are at home, use Kurt's 3,000 ohms.

**Q:** *Regarding RG174, I'm just using the standard stuff, not the MIL-spec Teflon® version. Is that likely to handle 100 watts SSB signal? It's not quite rugged enough for a permanent installation but there are times when camping when I'd like to use it at full power rather than 5 watts.*

**A:** Kurt thinks your RG174 would not survive 100-watts SSB. The problem is that the inner conductor is No. 25-gauge wire. At 10 watts key-down, the wire would get hot enough to melt the insulation. That's why the MIL-spec cable uses Teflon® insulation. Stick to QRP with this antenna.

*Kurt welcomes questions of general interest from readers and will answer them in his column. Write to him at: [WorldRadioOnline@gmail.com](mailto:WorldRadioOnline@gmail.com).*

### Editor's Log (from page 6)

returns . . . I knew of someone who loaded up his outside TV antenna and mast. It seemed to work OK on 80 meters."

"I think I saw an indoor dipole taped against a wall some time ago in an article," chimed in **Angel Santana-Diaz, WP3GW**, of Trujillo Alto, Puerto Rico. "But it depends on what band K3ZEZ wants to operate."

With tongue in cheek, **KD5PCK** said he'd tried tuning up his kids, "but as usual, they were of little help."

"You should try *grounding* them" first, **KB1LRL** shot back. "Might work better. LOL."

### WRO Live Chats: Our First Mid-Week Session This Month

Want to join us on the Web? Here's the latest on the **WRO Live Online Chat** schedule:

Our **first mid-week session** will be **Wednesday, April 13**, at 8 p.m. Eastern Daylight Savings Time (0000 UTC). Hope you can make it.

To better accommodate our friends in the **United Kingdom** and other parts of **Europe**, the **Sunday, May 1** chat will be at 3 p.m. Eastern Daylight Savings Time (1900 UTC). Radio amateurs *everywhere* are welcome.

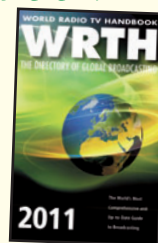
We're soliciting more feedback on best days and times, so we'll let you know how **June** and subsequent months look in an upcoming **Editor's Log**.

Regardless of the day or start time, the sessions are always casual and friendly. Visit: < <http://www.WorldRadioOnline.blogspot.com> > to **sign-up for an e-mail reminder** that a chat is coming up. You can see **REPLAYS** of all previous chats on the site, as well.

— **Richard Fisher, KI6SN**

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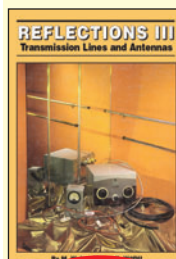
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by Walter Maxwell, W2DU

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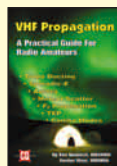


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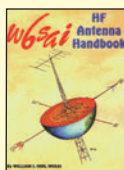


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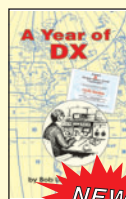
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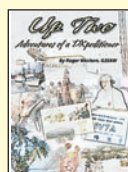


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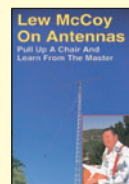


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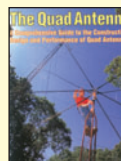
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