

Amateur Radio

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

COMMUNICATIONS & TECHNOLOGY

DECEMBER 2012

CQ



\$6.99US/CAN



0 74820 08223 2

Season's Greetings

Cushcraft R8 8-Band Vertical

Covers 6, 10, 12, 15, 17, 20, 30, and 40 Meters!

The Cushcraft R8 is recognized as the industry gold standard for multi-band verticals, with thousands in use worldwide. Efficient, rugged, and built to withstand the test of time, the R8's unique ground-independent design has a well-earned reputation for delivering top DX results under tough conditions. Best of all, the R8 is easy to assemble, installs just about anywhere, and blends inconspicuously with urban and country settings alike.

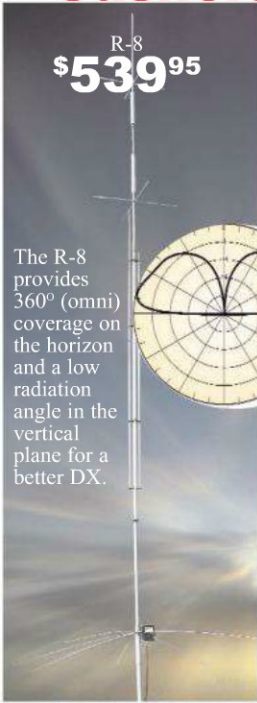
Automatic Band Switching: The R8's famous "black box" matching network combines with traps and parallel resonators to cover 8 bands. You QSY instantly, without a tuner!

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

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

Legal-Limit Power: Heavy-duty components are contest-proven to handle all the power your amplifier can legally deliver and radiating it as RF rather than heat.

The sunspot count is climbing and long-awaited band openings are finally becoming a reality. Now is the perfect time to discover why Cushcraft's R8 multi-band vertical is the premier choice of DX-wise hams everywhere! **R-8GK, \$56.95.** R-8 three-point guy kit for high winds.



R-8
\$539⁹⁵

The R-8 provides 360° (omni) coverage on the horizon and a low radiation angle in the vertical plane for a better DX.

MA-5B 5-Band Beam Small Footprint -- Big Signal

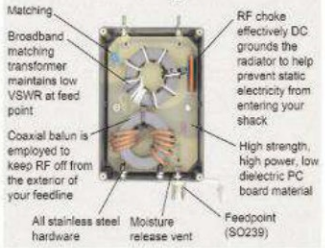


MA-5B
\$499⁹⁵

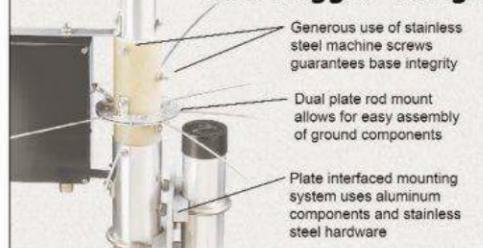
The MA-5B is one of Cushcraft's most popular HF antennas, delivering solid *signal-boosting directivity* in a bantam-weight package. Mounts on roof using standard TV hardware. Perfect for exploring exciting DX without the high cost and heavy lifting of installing a large tower and full-sized array. Its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

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

R8 Matching Network



R8's Rugged Design



Cushcraft 10, 15 & 20 Meter Tribander Beams

Only the best tri-band antennas become DX classics, which is why the Cushcraft World-Ranger A4S, A3S, and A3WS go to the head of the class. For more than 30 years, these pace-setting performers have taken on the world's most demanding operating conditions and proven themselves every time. The key to success comes from attention to basics. For example, element length and spacing has been carefully refined over time, and high-power traps are still hand-made and individually tuned using laboratory-grade instruments. All this



A-4S
\$699⁹⁵



A-3S
\$599⁹⁵

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

stainless-steel hardware, and aircraft-grade 6063 make all the difference.

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

Cushcraft Dual Band Yagis One Yagi for Dual-Band FM Radios



A270-10S
\$169⁹⁵

Dual-bander VHF rigs are the norm these days, so why not compliment your FM base station with a dual-band Yagi? Not only will you eliminate a costly feed

line, you'll realize extra gain for digital modes like high-speed packet and D-Star! Cushcraft's A270-6S provides three elements per band and the A270-10S provides five for solid point-to-point performance. They're both pre-tuned and assembly is a snap using the fully illustrated manual.



A270-6S
\$129⁹⁵

Cushcraft Famous Ringos Compact FM Verticals



AR-2
\$64⁹⁵



AR-6
\$99⁹⁵



AR-10
\$109⁹⁵

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

Free Cushcraft Catalog and Nearest Dealer . . . 662-323-5803
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K5ZD Named New CQWW Contest Director

Randy Thompson, K5ZD, has been appointed Director of the CQ World Wide DX Contest by CQ Publisher Dick Ross, K2MGA. He succeeds Bob Cox, K3EST, who retired from the post in September after 35 years. Thompson is a member of the CQ Contest Hall of Fame and has been Director of the CQ WPX Contest since 2008. More details are available on the CQ Newsroom at <http://www.cqnewsroom.blogspot.com/>. Thompson's move to the CQWW creates a vacancy for directorship of the WPX Contest. See box on page 95 for more details.

Payne, Kummer, Join CQ Advertising Department

Advertising sales for the CQ family of magazines are now being handled by Charlie Payne, ex-WN2AKC, and Jon Kummer, WA2OJK, following the resignation of Chip Margelli, K7JA, to pursue other opportunities in the amateur radio industry. Payne, who is already studying to regain his amateur license, has more than 25 years of experience in magazine ad sales. He is now Advertising Director for CQ, CQ VHF and WorldRadio Online. Kummer, who has been in magazine publishing since 1980, returns for a fourth stint at CQ Communications, where he is now in charge of ad sales for *Popular Communications*.

FCC Proposes No-Retest Licenses for Former Hams

The FCC is proposing to allow former hams to regain their licenses (but not necessarily their old call signs) without retesting, to shorten the grace period for license renewal, to reduce the minimum number of examiners at license test sessions to two, and to permit remote administration of amateur exams in hard-to-reach areas. See additional detail in this month's "Riley's Ramblings" column on page 36. The complete Notice of Proposed Rule Making, WT Docket # 12-283, may be downloaded from <http://fcc.us/UyoPIS>.

GRE Suspends Scanner Manufacturing; Alinco Unaffected

GRE America has announced that its parent company, General Research of Electronics of Japan, has been forced to temporarily suspend the manufacture of scanners for both its own GRECOM brand and for RadioShack. GRE America Sales Director Raj Gounder reported on the company's website that the shutdown is the result of the closure of its factory in China due to a redevelopment project in the area. A new factory was under construction but increased costs made it impossible to finish the building. Gounder says the company is working to establish a contract with a new factory and to resume manufacturing as soon as possible.

Meanwhile, Gounder says GRE America will continue to market, support and service GRECOM scanners already built and will maintain its library database. In addition, he says there will be no impact on GRE America's marketing, service and support for Alinco amateur radio products in the U.S.

German Space Agency Rejects AMSAT-DL Mars Plan

After five years of discussions and negotiations with the German space agency DLR, AMSAT-DL reports that the agency has withdrawn its support for the amateur satellite organization's plan to send a ham radio satellite to Mars, the so-called "P5" satellite. According to the AMSAT News Service, the agency advised the group that P5's mission was financially infeasible and that "the scientific attraction was, compared with the current Mars missions, insufficient."

"Obviously, our P5 mission is now compared with regular missions which cost hundreds of millions of Euro," said the AMSAT-DL board in a statement. The decision also affects plans for a geostationary Earth-orbiting satellite (P3E), which was to be part of the overall P5 program. AMSAT-DL officials are not giving up hope, though, noting that the group "recently had some interesting meetings in China and if we can't do rocket science in (Germany), we have to look for other countries."

Four Amateur Satellites Launched from ISS

Four new amateur radio "cubesats" were deployed on October 4 from the International Space Station. As has been the case for virtually all recent cubesats operating in the amateur bands, they are downlink-only satellites and most have scientific missions not directly related to amateur radio. The ARRL reports that the four satellites deployed in October were TechEdSat, a collaboration between NASA, Japan's and Sweden's space agencies and San Jose State University in California; FITSAT-1, built by university students in Japan, WE-WISH, built by Japan's Meisei Electric Company Radio Club and transmitting CW telemetry and slow-scan TV images; and F-1, built by university students in Hanoi, Vietnam. As of press time, signals had been monitored from all the satellites except F-1.

U.S. Postal Rates to Increase in January

The cost of sending a letter in the United States will increase a penny, to 46 cents, as of January 27, according to the U.S. Postal Service. Postcard stamps will also go up one cent to 33 cents. Rates will also increase for Priority Mail and other services (including the cost of mailing magazines), subject to final approval by the Postal Regulatory Commission. The Postal Service will also be introducing a "forever stamp" for international postage, at a new rate of \$1.10/ounce for all overseas destinations. For more information, see <http://pe.usps.com>.

QRZ.com Suffers Brief Shutdown Due to "Cloud" Outage

Anyone trying to access the popular QRZ.com website on the morning of October 22 most likely received a "server not found" message from their web browser. QRZ.com publisher Fred Lloyd, AA7BQ, reports that the outage was the result of "some kind of big network failure" suffered by Amazon.com, which provides QRZ's "cloud" services. Lloyd said the outage lasted about two-and-a-half hours and knocked hundreds of websites offline. Apparently, the outage began with yet-unspecified problems in northern Virginia and then spread from there. Normal service was restored later in the day.

DHS to Provide EmComm Training at Dayton '13

Representatives of the U.S. Department of Homeland Security's Office of Emergency Communications will be offering the department's Auxiliary Emergency Communications course in conjunction with next year's Dayton Hamvention®. According to *Newsline*, the course will be free and "is intended to supplement and standardize an operator's basic knowledge of emergency amateur radio communications in a public safety context." It is scheduled to be held just prior to the Hamvention, in the Dayton area. Details are available on the Hamvention website at www.hamvention.org.

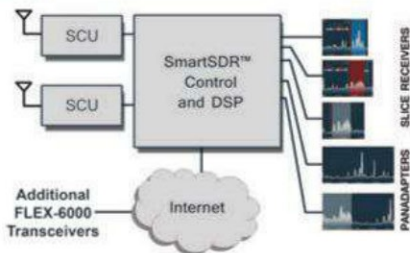
Additional and updated news is available on the Ham Radio News page of the CQ website at <http://www.cq-amateur-radio.com>. For breaking news stories, plus info on additional items of interest, sign up for CQ's free online newsletter service. Just click on "CQ Newsletter" on the home page of our website.



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- Reserve power for future apps

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- Up to 8 Slice Receivers / Panadapters
- Hides complexity

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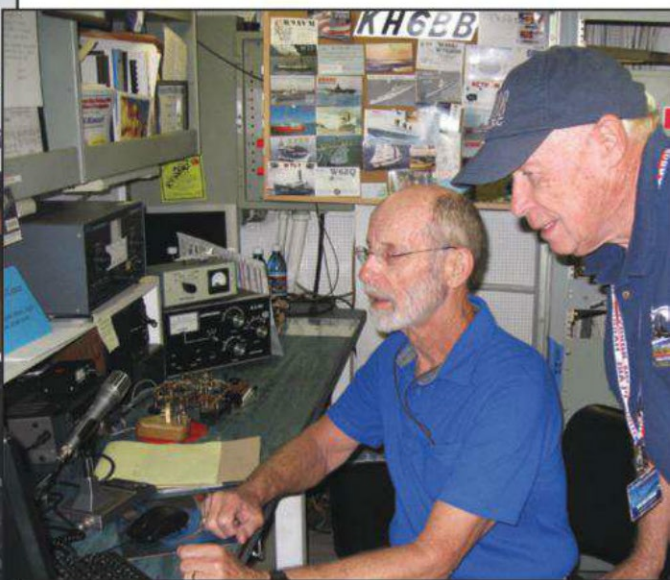
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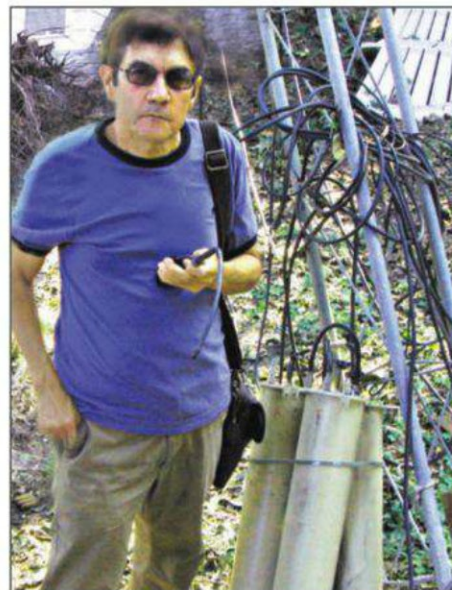
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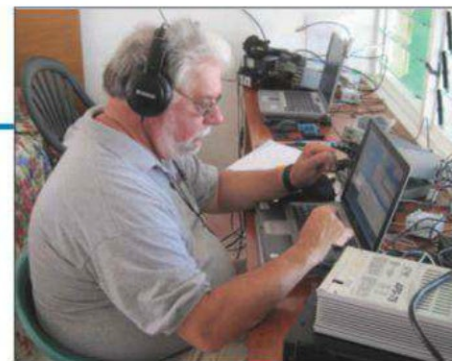
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AMERITRON 600 Watt no tune FET Amp

Four rugged MRF-150 FETs at 50 Volts give high efficiency... No deterioration with use



ALS-600
Suggested
Retail

Ameritron ALS-600 Solid State FET compact desktop station amplifier is only 4 dB below 1500 Watts -- less than an S-unit!

There are no tubes, no tube heat, no tuning, no worry rugged -- just turn on, select band and operate. 600 Watts PEP/500W CW -- lets you talk to anyone you can hear!

Covers 1.5-22 MHz, (10/12 Meters with \$29.95 kit, requires FCC license), instant band-switching, SWR/thermal protected, extremely quiet, lighted peak reading Cross-Needle SWR/Wattmeter, front panel ALC control, operate/standby switch. 12.5 lbs., 9 1/2" W x 7 1/8" H x 12 D in.

Includes ALS-600PS transformer AC power supply for 120/220 VAC, inrush current protected. 32 lbs., 9 1/2" W x 6 H x 12 D inches.

ALS-600 Amp with Switching Power Supply New! ALS-600S, \$1599. ALS-600 amplifier with 10 lb. ALS-600SPS switching power supply combo.



Switching Power Supply

ALS-600SPS
Suggested retail

Works with all ALS-600 amplifiers. Extremely lightweight, just 10 lbs. Superb regulation, very low radiated noise. 9Wx6Hx14 1/2 D in.

From QST Magazine, March, 2005

"... the amplifier faulted only when it was supposed to. It protected itself from our boneheaded, sleep-deprived band changing maneuvers..."

"I found myself not worrying about damaging this amplifier. It seems quite capable of looking out for itself. ... Kudos to Ameritron."

"I couldn't hear any noise at all from the SPS (switching power supply) on the vertical or quad..."

"I came to greatly appreciate the size, weight, reliability and simplicity of this amplifier."

"The ALS-600S makes it possible to pack a transceiver and a 600 Watt amplifier, that together weigh less than 30 pounds."

AMERITRON mobile 500 Watt no tune Solid State Amp

Instant bandswitching, no tuning, no warm-up, SWR protected, 1.5-22 MHz, quiet, compact



ALS-500M
Suggested
Retail

amplifier anywhere and gives you full control. Select desired band, turn On/Off and monitor current draw on its DC Current Meter. Has power, transmit and overload LEDs. RJ-45 cables plug into Amplifier/Remote Head.

Covers 1.5-22 MHz, (10/12 Meters with \$29.95 kit, requires FCC license).

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

Typically 60-70 watts in gives full output. ON/OFF switch bypasses amplifier for "barefoot" operation. Extremely quiet fan comes on as needed. Excellent harmonic suppression, push-pull output, DC current meter. 13.8 VDC/80 Amps. 3 1/2" x 9" x 15 in. 7 lbs.

ALS-500M, \$849, 500 Watt mobile amp.

ALS-500MR, \$879, ALS-500M/Remote Head

ALS-500RC, \$49, Remote head for ALS-500M (for serial # above 13049).

ARF-500K, \$179.95, Remote kit for ALS-500M serial # lower than 13049. Includes AL-500RC Remote Head, filter/relay board for ALS-500M, cables, hardware, instructions.

Ameritron's ALS-500M solid state mobile amp gives you 500 Watts PEP SSB or 400 Watts CW output! Just turn on and operate -- no warm-up, no tuning, instant bandswitching. Fits in very small spaces. New ALS-500RC, \$49 Remote Head lets you mount ALS-500M

Free online manuals! Ameritron brings you the finest high power accessories!

ARB-704 amp-to-rig interface... \$59⁹⁵

Protects rig from damage by keying line transients and makes hook-up to your rig easy!

RCS-4 Remote Coax Switch... \$159⁹⁵

Use 1 coax for 4 antennas. No control cable needed. SWR < 1.25. 1.5 - 60 MHz. Useable to 100 MHz.

RCS-8V Remote Coax Switch... \$169⁹⁵

Replace 5 coax with 1! 1.2 SWR at 250 MHz. Useable to 450 MHz. < 1 dB loss, 1kW@ 150MHz.

RCS-10 Remote Coax Switch... \$179⁹⁵

Replace 8 coax with 1! SWR < 1.3 to 60 MHz. RCS-10L, \$219.95 with lightning arrestors.

New! RCS-12C Fully Automatic Remote Coax Switch Controller... \$239⁹⁵

Band data from transceiver auto selects antennas. Antenna memories. No hotswitching. Rig-to-amp interface. For 3/4 BCD, 1 of 8 relay boxes. RCS-12, \$309.95, auto controller with 8 coax relay box, to 60 MHz. RCS-12L, \$349.95, with lightning arrestors.

AWM-30 Precision SWR Wattmeter... \$149⁹⁵

Active circuit gives true peak/average readings on lighted cross-needle meter. 3000/300 Watt ranges, Remote sensor.

AWM-35 Flat Mobile SWR Wattmeter... \$159⁹⁵

1 5/8 in. thin on dashboard. Remote sensor, 25' cable. True peak, Cross-Needle, 1.5 kW, 1.8-30 MHz. High-SWR LED.

ATP-100 Tuning Pulser... \$69⁹⁵

Safely tune up for full power, best linearity. Prevents overheating, tube damage, power supply stress, component failure.

ADL-1500 Dummy Load with oil... \$74⁹⁵

Oil-cooled. 500 Ohms. 1500 Watts/5 minutes. SWR < 1.2 to 30 MHz. Low SWR to 400 MHz.

ADL-2500 fan-cooled Dry Dummy Load, \$219⁹⁵

Whisper quiet fan, 2.5kW/1 minute on, ten off. 300W continuous. SWR < 1.25 to 30 MHz. < 1.4 to 60 MHz.

SDA-100 Mobile Screwdriver Antenna \$409⁹⁵

80-10M, fiberglass form, Pittman motor, CNC parts, magnetic sensors, #14 wire, 1.2 kW PEP. 6' whip, \$24⁹⁵

800 Watts... \$899 with four 811A tubes



AL-811H, \$949. Plugs into 120 VAC outlet. All HF bands. Hi-silicon transformer, heavy duty tank coils, tuned input, operate/standby switch, Xmit LED, ALC, lighted meters, 32 lbs. 13 3/4" W x 8 H x 16 D in. AL-811, \$799. Like AL-811H, but three 811A, 600 W.

Desktop Kilowatt with Classic 3-500G tube



AL-80B, \$1495. Whisper quiet 3-500G desktop amp gives full kilowatt SSB PEP output. Plugs into 120 VAC. Ameritron's exclusive Dynamic ALC™ doubles average SSB power out and Instantaneous RF Bias™ gives cooler operation. All HF bands. 48 lbs. 14 W x 8 1/2" H x 15 1/2" D in.

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ATR-30, \$599.95 • Super high current edge-wound silver plated roller inductor • 500pf capacitors • 6:1 reduction drives • 3 core current balun • 6 position antenna switch • True peak meter

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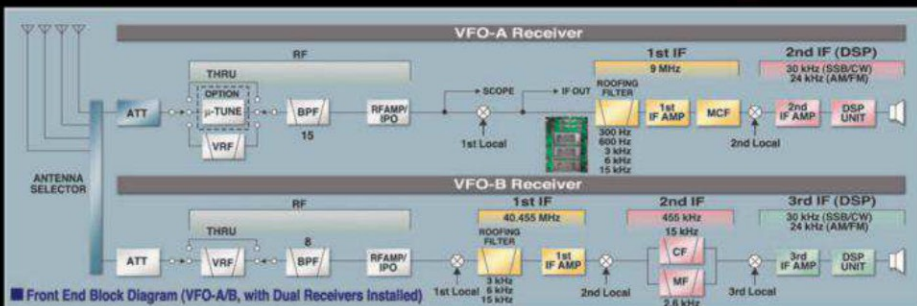
Two Totally Independent Receivers - The VFO-A/Main Receiver utilizes Super Sharp Roofing filters to give you the highest performance and best flexibility

The tight shape factor 6 pole crystal filters and D Quad Double Balanced Mixer design afford incredible improvement in 3rd - Order dynamic range and IP3 performance

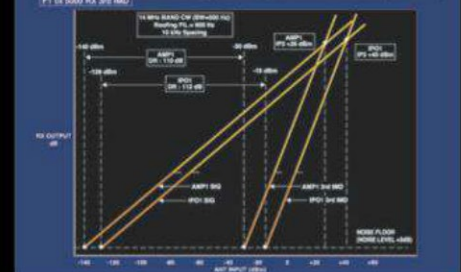


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■ IDR (IMD Dynamic Range) / IP3 (3rd-Order Intercept Point)
(FT dx 5000 RX 3rd MD)



HF/50 MHz 200 W Transceiver **NEW**
FT DX 5000MP

Station Monitor SM-5000 included
± 0.05ppm OCXO included
300 Hz Roofing Filter included

HF/50 MHz 200 W Transceiver **NEW**
FT DX 5000D

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± 0.5ppm TCXO included
300 Hz Roofing Filter optional

HF/50 MHz 200 W Transceiver **NEW**
FT DX 5000

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± 0.5ppm TCXO included
300 Hz Roofing Filter optional

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The World's Smallest HF/VHF/UHF

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- Wide Frequency Coverage
- Optional Remote-Head
- High-Performance Mobile Operation



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HF/50 MHz 100 W Easy to Operate All Mode Transceiver

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- Foot Stand
- Classically Designed Main Dial and Knobs
- Dynamic Microphone MH-31 A8J Included

FT-817ND

The Ultimate Backpack, Multi-Mode Portable Transceiver

- Self-Contained
- Battery-Powered
- Covering the HF, VHF, and UHF Bands
- Provides up to Five Watts of Power Output
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A Century of "Open Source" Electronics

Back in September, I attended the "Open Hardware Summit" in New York City, a gathering of leaders in the open source movement. The idea behind open source hardware (detailed in KB3TAN's October "Makers" column) is that—like the more familiar open source software—designers of tangible products share their design parameters and construction details with "the community," inviting others to build their own versions and to make modifications and improvements, providing those changes are shared with the rest of "the community."

If this sounds familiar to you, it should be. It's what we hams have been doing for more than a hundred years, and that's no exaggeration. As you'll see on page 13, this month marks the centennial of amateur radio licensing and regulation in the United States. Even before the dawn of regulation, though, radio experimenters designed and built new gear, or improved on existing designs, and shared what they'd learned with "the community." The primary means of sharing project designs among radio amateurs has been and still is what you are reading right now—a magazine. While the earliest magazines to carry radio circuits and designs, such as *Electrical World* and Hugo Gernsback's *Modern Electrics*, covered more than just radio, they created that "community" of like-minded people who learned together, taught each other and built on each others' successes; a community of people united by shared interests rather than geographic proximity. The community of electrical experimenters grew and became more specialized, and one branch became the worldwide amateur radio community of which we are a part today.

Today's "makers" and "open source" software and hardware developers are the spiritual (if not actual) great-grandchildren of those early 20th-century experimenters. Some of them may think they've discovered something new, but in reality, they are simply continuing a now century-old tradition of sharing innovations in electricity, electronics and "wireless." The thread of continuity from 1912 to 2012 has been the radio amateur, and in particular, the magazines through which each generation of experimenters and innovators shared with "the community."

This connection was not lost on at least some of the people attending the Open Hardware Summit. Several of the leaders in this community are hams themselves. For example, one of the summit organizers was Bill Ward, KD4ISF, and one of the featured speakers was Bre Pettis, K2BRE, the CEO of MakerBot Industries, one of the biggest players in the open hardware marketplace.

The summit featured more than 20 exhibitors as well as a full program of speakers, and one thing I noticed among them that is not commonly found in non-ham-radio technology gatherings was the near universal respect for they had for hams and ham radio.

"I love my ham friends," said Russian entrepreneur Alexander Chemeris, who has developed a low-cost ultra-wideband SDR transceiver to help provide cell phone coverage via the internet in underserved areas. "They have helped me so much with the RF parts of this project." In fact, he's currently looking for help—perhaps from the ham community—in designing a low-cost, highly-efficient, non-linear GSM amplifier. (*Anyone interested, contact me and I'll put you in touch with him.*)

Shyu Lee, a young man from Shanghai who has developed the Lophilo Project, a computing platform for building your own internet-connected devices, was actually a bit nervous to be meeting someone from a ham radio magazine. One of the projects on his drawing board now is a

general purpose software-defined radio (SDR) that can link to his platform and sell for around \$300 US. He hopes to have it ready to market late next year, and is looking forward to a version specifically for hams.

One of the summit's main goals was to talk about how to handle the beginnings of commercial success in the open-hardware marketplace. As long as most everyone was basically designing and building for each other within "the community," then the complete sharing model made sense. Now, though, companies like MakerBot with its 3D printers are actually starting to make money and find their revenue being undermined by clones which they have encouraged ... until now. It seems that sharing everything may not be that great a business model.

Bre Pettis of MakerBot talked about making only certain segments of a product open-source, while keeping other parts proprietary. David Currier of Parallax, which manufactures the BASIC Stamp, spoke on "The Limits of Open Hardware." And bringing us back to the ham radio connection, one other speaker highlighted the open-hardware licensing model of Tucson Amateur Packet Radio (TAPR) as an example of how to share technology without giving away the store. We have much in common with the folks in the "maker" movement. We need to encourage the integration of amateur radio into the maker world and vice versa. It's a good match with a century of shared heritage.

One other area of congruence between the technological worlds of 1912 and 2012: A century ago, *Electrician and Mechanic* magazine noted that among the hundreds of radio amateurs applying for licenses at one particular federal office, "there have been no women in the line." During a break in the Open Hardware Summit in 2012, while standing in line to visit the men's room, I overheard two women who came out of the ladies' room and looked around. One said to the other, "Someday, there'll be a long line outside this door, too ... and that'll be great." We all need to do more to make that happen, and to encourage young women as well as young men, to pursue their natural curiosity about science and technology.

FCC Licensing Proposal

The FCC has quietly released a Notice of Proposed Rule Making that could bring about significant changes to amateur licensing and renewal procedures. Among other things, it proposes to permit former hams to regain their licenses (but not necessarily their previous call signs) without retesting; to shorten the grace period for renewal after expiration without losing your call; to reduce the minimum number of volunteer examiners at a test session from three to two, and to permit remote exam administration in hard-to-reach areas. This month's "Riley's Ramblings" column (p. 36) has some additional details, and K4ZDH plans to look at the proposal in more depth next month. Meanwhile, we encourage you to read the actual NPRM (WT Docket 12-283) and file comments to let the Commission know your views.

Happy Holidays!

Whether you celebrate Christmas, Chanukah, Kwanzaa, the winter solstice or anything else this holiday season, we at CQ wish you all the best. We hope you get to start the new year with new ham radio toys. And as always, we thank you for being part of our "family" and for inviting us into your home each month (and can we have one of those cookies? Please?).

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

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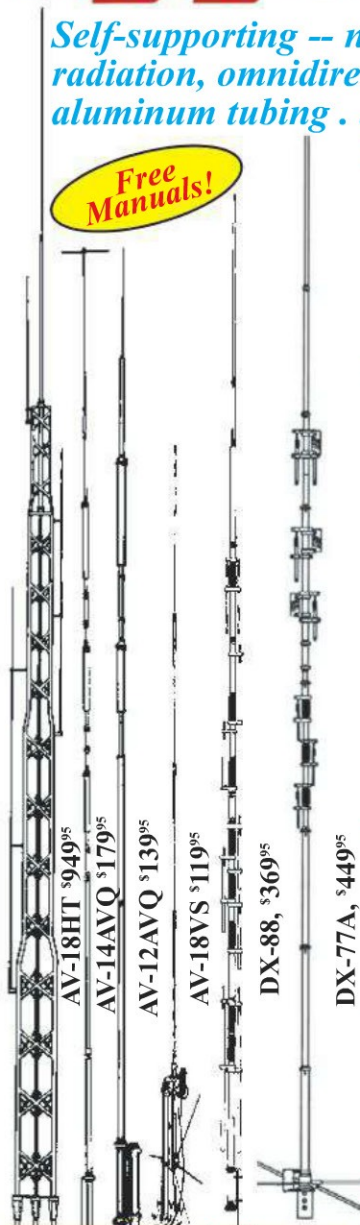
AV-18VS, \$119.95 (10,12,15,17,20,30,40,80 Meters). 18 ft., 4 lbs. High quality construction and low cost make the AV-18VS an exceptional value. Easily tuned to any band by adjusting feed point at the base loading coil. Roof mount with Hy-Gain AV-14RMQ kit, \$89.95.

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AV-14AVQ	\$179.95	10,15,20,40	1500 W PEP	18 feet	9 pounds	80 MPH	1.5-1.625"
AV-12AVQ	\$139.95	10,15,20 M	1500 W PEP	13 feet	9 pounds	80 MPH	1.5-1.625"
AV-18VS	\$119.95	10 - 80 M	1500 W PEP	18 feet	4 pounds	80 MPH	1.5-1.625"
DX-88	\$369.95	10 - 40 M	1500 W PEP	25 feet	18 pounds	75 mph no guy	1.5-1.625"
DX-77A	\$449.95	10 - 80 M	1500 W PEP	29 feet	25 pounds	60 mph no guy	1.5-1.625"

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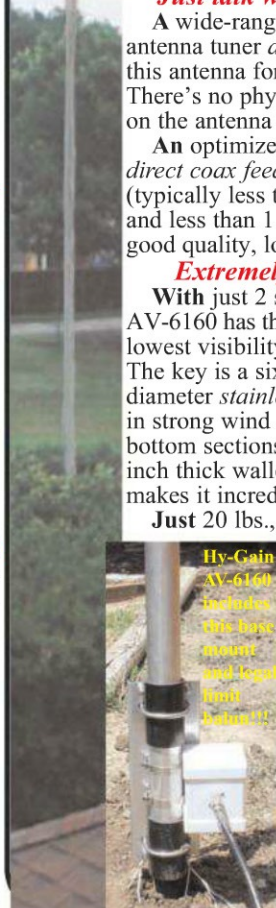
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BERGENFIELD, NEW JERSEY — Boy Scout Troop 139/Venture Crew 7373 Hamfest, Saturday, December 1 at the St. John the Evangelist's Conlon Hall. Activities include an indoor flea market, technical forums. Tickets are \$5. Contact: Diana V., (201) 446-0355; E-mail: <troop139parents@aol.com>. Gordon Beattie, W2TTT, (201) 314-6964; E-mail: <w2ttt@arrl.net>. (Talk-in 146.955- [PL 141.3] or 146.52; exams).

MESA, ARIZONA — Superstition Amateur Radio Club Superstition Hamfest, Saturday, December 1 at the Mesa Community College SW Parking Lot. Activities include a flea market, prizes, concessions, an Amateur Radio Council of Arizona meeting at 11 a.m. For more information visit: <http://wb7tjd.org/wiki/Superstition_Hamfest>. (Talk-in 147.12+ [PL 162.2] or 449.60- [PL 100]; VE exams begin at 8 a.m.)

TAMPA BAY, FLORIDA — Florida Gulf Coast Amateur Radio Council 37th Annual Tampa Bay Hamfest, Saturday, December 1 and Sunday, December 2 at the Manatee Civic Center. Activities include commercial vendors, a swap meet, DXCC/WAS/VUCC/IARU card checking, forums, group meetings. Website: <http://www.fgcarrc.org> or <http://www.tampabayhamfest.org>. Talk-in 145.430- [PL 100]; VE exams, ARECC testing)

HARRISON TOWNSHIP, MICHIGAN — L'Anse Creuse Amateur Radio Club 40th Annual Swap & Shop, Sunday, December 2 at the L'Anse Creuse High School. Flea market, prizes. Contact: LCARC SWAP, 29729 S. River Road, Harrison Township, MI 48045. Greg Crump, e-mail: <n8geo@arrl.net>. Website: <http://bit.ly/Qei6uf>. (Talk-in 147.080+ [PL 100]; VE exams 9 a.m.)

OCALA, FLORIDA — Silver Springs Radio Club Amateur Radio Festival, Saturday, December 8 at the Green Clover Hall. Indoor/outdoor flea market, prizes. Contact: Bill Miller, (352) 873-2017; e-mail: <n6wgm@cfl.rr.com>. Paul Klawunn, (352) 288-2444; e-mail: <kj4amh@gmail.com>. (VE exams)

AITUTAKI ISLAND DXPEDITION — 5B4AIF will be heading a DXpedition to Aitutaki Island, December 10, 2012 to January 5, 2013. They will be operating SSB and RTTY from 6m up to 80m with full legal power and will use a 6m beacon when not on the band, using their sms number ready for when the band opens. Go to: <http://www.aitutaki2012.com/> for details.

MINDEN, LOUISIANA — Minden Amateur Radio Association Christmas Hamfest, Saturday, December 15 at the Minden Civic Center. Flea market, concessions, prizes. Contact: Fran, KD5LKL, <fran@n5rd.org>. Dusty, N5COL, <dusty@n5rd.org>. Website: <http://www.n5rd.org/>. Talk-in 147.300; VE exams 9 a.m. to noon)

WAUKESHA WISCONSIN — West Allis Radio Amateur Club, Inc. 41st Annual Midwinter Waukesha Swapfest, Saturday, January 5, Waukesha County Expo Center. Contact: WARAC Swapfest, P.O. Box 1072, Milwaukee, WI 53201. Phil, W9NAW, (414) 425-3649. Website: <http://www.warac.org>. (VE exams at the AMF Waukesha Lanes 9 to 11:15 a.m.)

SOUTH CAROLINA — Greenwood Amateur Radio Society Greenwood South Carolina Hamfest, Saturday, January 12, Piedmont Technical College Multipurpose Building. ARRL forums, dealers, flea market, prizes, concessions. Contact: GARS, P.O. Box 2404, Greenwood, SC 29646 or Tedd Davison, A14WN, phone: (864) 377-1872; <ai4wn@arrl.net>; <http://www.w4gwd.org>. (Talk-in 147.165+ or 443.900+ (PL 107.2); VE exams 10:30 a.m.)

MARATHON, NEW YORK — Skyline Amateur Radio Club January Winterfest 2013, Saturday, January 12 at the Lovell Field Civic Center. Indoor flea market, prizes. Contact: SARC, P.O. Box 5241, Cortland, NY 13045. E-mail: <k2iwr@arrl.net>. Vendors contact: Patrick Dunn, <kc2bqz@gmail.com>. Website: <http://www.skylineradioclub.org>. Talk-in 147.180 +0.600; VE exams 9 a.m.)

PHOENIX, ARIZONA — Thunderbird Amateur Radio Club & Amateur Radio Council of Arizona Thunderbird Hamfest 2013, Saturday, January 12 at the Northwest Community Church. Activities include hourly prizes. E-mail: <hamfest@w7tbc.org>. Website: <http://www.w7tbc.org/>. (Talk-in 146.700 -600 [PL 162.2] or 446.150 -5 [PL 100]; VE exams 10 to 11:30 a.m.)

Please submit hamfest and special event announcements at least three months in advance by e-mail to <hamfest@cq-amateur-radio.com> or <specialevent@cq-amateur-radio.com>, or by postal mail to: CQ Magazine, Attn: Hamfests (or Special Events), 25 Newbridge Rd., Hicksville, NY 11801. In addition, CQ's sister publication WorldRadioOnline has extensive information on hamfests and special event stations months in advance of the events; go to <www.worldradioonline.com>.

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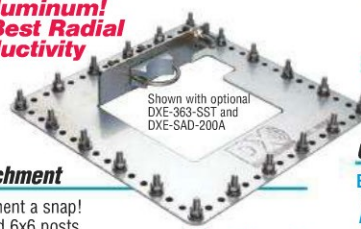
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Was the dawn of radio regulation—a century ago this month—a restriction on freedom for radio amateurs? Or did it provide a foundation on which the Amateur Radio Service could grow and flourish?

The Radio Act of 1912: A Century of Radio Regulation and Licensing

BY RICH MOSESON,* W2VU

December 13, 1912 was a red-letter day in the history of amateur radio in the United States. On that day, 100 years ago this month, the Radio Act of 1912 took effect. For the first time, private radio operators (the word *amateur* was not yet in official use) were required to be licensed, their power was limited to one kilowatt, and their frequencies of operations were restricted to wavelengths below 200 meters (frequencies above 1500 kHz), a part of the spectrum then thought to be worthless.

No doubt, many of the intrepid amateurs of the time chafed at the idea of having their complete freedom of the airwaves restricted. But as we will see, the dawn of regulation was actually a blessing in disguise. A century ago, the radio frequency (RF) spectrum was, to be polite, a mess. Spark-gap transmitters were the state of the art and their broad “wave trains” occupied huge swaths of spectrum around the wavelengths (nobody talked about *frequencies* at the time) thought to be of the greatest use for communications. Commercial, military, and amateur communicators competed for the same spectrum and interference was horrendous. Calls for regulation grew, and were spurred on by the use of wireless to bring help to the foundering *Titanic* after the great ocean liner struck an iceberg.

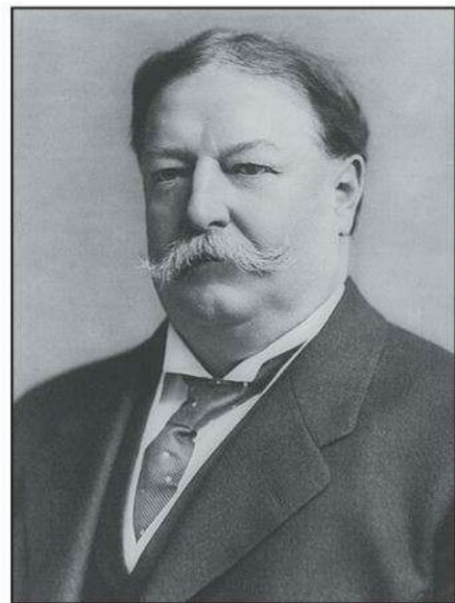
Elimination or Regulation?

Many leaders in government and industry saw amateurs as nothing more than sources of interference to “legitimate”

radio traffic, and hoped that exiling them to wavelengths below 200 meters would spell the beginning of the end for amateur radio. The U.S. Navy, which viewed wireless as a strategic tool, wanted complete control of radio—and almost got it after World War I (but that’s a story for another day). The Navy viewed amateurs as security risks and wanted them off the air. There was also an element of jealousy, as many amateurs of the day had better-equipped stations than the Navy¹.

The nascent commercial wireless industry also viewed hams as pests, and commercial ops likely were responsible for the nickname “ham,” referring to an unskilled actor who stole the spotlight, being applied to amateurs on wireless. In fact, radio pioneer Lee DeForest appeared to have a significant amount of contempt for amateurs. In a 1907 letter to the editor of *Electrical World* magazine², he wrote of “the necessity for early legal protection of legitimate workers from such vandals,” referring to a young amateur in Washington, D.C., who “takes delight in churning up the ether around the Navy Yard.” He continued, “Above all, the ubiquitous amateur with his high-school Ruhmkorf coil, the operator of the ‘brute force and ignorance’ wireless school, must be eliminated.”

Being the visionary that he was, though, DeForest advocated legislating “not the wave-lengths, but the maximum limit of damping of wave-trains which can be permitted...” In other words, regulate the bandwidth occupied by a given signal. “The day of the barbarous spark discharge is numbered,” he wrote, calling for a law to “limit all wireless communications to the sustained oscillation



President William Howard Taft signed the Radio Act of 1912 into law. It took effect 100 years ago this month, on December 13, 1912.

methods”—what we know today as CW—“and there will be ample gamuts of wave-length to ‘go around.’ The bugbear of interference, and much of the discussions in international conventions will be quite unnecessary.” However, it would take more than a decade, and a world war in which wireless began to show its true value, before the federal government followed DeForest’s advice and required that spark transmitters be replaced by those producing *continuous amplitude waves*, or CW.

Enter Hugo Gernsback

Another voice in the radio regulation debate was Hugo Gernsback, the pio-

*Editor, CQ

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



The spark-gap transmitter, such as this one at the American Museum of Radio and Electricity in Bellingham, Washington, was “state of the art” when the new radio act became law. (Photo courtesy Wikimedia Commons)

neering publisher to whom amateur radio owes a great debt for promoting, popularizing and, as we will see, protecting the hobby³. Gernsback understood that even though regulation and licensing would limit the complete freedom of the airwaves to which amateurs were accustomed, this course was the only way to prevent amateur radio from being outlawed altogether. And, according to the excellent *earlyradiohistory.us* website, Gernsback claimed to be the source of the “200 meters and down” restriction on amateur operation. His editorial in the February, 1912 issue of *Modern Electrics* pointed out that the magazine’s owners had always “stood up for the wireless amateurs” and were actively involved in lobbying Congress to protect amateurs’ rights in any bill that might be passed.

“The Government realizes fully the importance of the American amateurs today,” he wrote, “and if any bill should be passed, it will be one that *regulates* wireless, but in no way suppresses it.” Gernsback went on to propose that such a bill should “(restrain) the amateur from using too much power, say, anything above 1 K.W.” and that “(t)he wavelength of the amateur wireless station should be regulated,” suggesting that hams be barred from wavelengths between 200 and 1000 meters (which were the most heavily used commercial and military wavelengths) and allowed to operate anywhere above 1000 meters or below 200 meters. “If this is done,” he wrote, “amateurs will have the same liberty and perhaps greater liberty than today, and complaints against them from Government or Commercial stations will cease automatically.”

Apparently the publishers of *Modern Electrics* had a fair amount of influence on Capitol Hill, as Congress took most (but not all) of Gernsback’s advice. In its final form, the Radio Act explicitly permitted the operation of amateur, or “private,”

stations, subject to licensing and certain restrictions. The new law stipulated that:

- “a person ... within the jurisdiction of the United States shall not use or operate any apparatus for radio communication ... except under and in accordance with a license ... granted by the Secretary of Commerce and Labor...”

- “No private [station] shall use a transmitting wave length exceeding two hundred meters, or a transformer input exceeding one kilowatt, except by special authority of the Secretary of Commerce and Labor...”

The Act also began the process of accepting DeForest’s technical advice, with sections requiring the use of a “pure wave” and a “sharp wave” by all stations.⁴

A New Law

Congress passed the Radio Act in the summer of 1912 and President William Howard Taft signed the bill into law on August 13. Its effective date was four months later, on December 13, setting off a flurry of activity at government offices around the country where exams for the new licenses were being administered. The January, 1913 issue of *Electrician and Mechanic* magazine⁵ reported:

Since the first of the month the office of the electrical school at the Brooklyn Navy Yard has daily been crowded with veteran, neophytic and embryonic wireless operators, all panting to write down what they know about radio communication, its uses and abuses, and so get a license from the Department of Commerce and Labor. All this rush is due to the fact that on December 13 there goes into effect an act for the regulation of radio communication, whereby all wireless operators and all apparatus which work across State lines or can communicate with ships at sea are required to be licensed.

Interestingly, those first license exams did not include a code test, even though at the time Morse code was the only way to communicate over the radio. The magazine reported:

“Anybody who wants a license must first go to the Custom House or to the electrical school at the navy yard and present an application, telling whether he knows anything about the Berlin International Radiotelegraphic Convention and regulations, the Continental and Morse telegraph codes, how much experience he has had and a dozen other things. Then he must let the examiner at the electrical school fire a lot of questions at him. His answers must be written ones, and they are corrected by the examiners under the supervision of the Department of Commerce and Labor.”

And apparently, even then, the mystique of wireless seemed to appeal overwhelmingly to males. “One fact the officers have noticed with surprise during the kaleidoscopic comings and goings of applicants,” *Electrician and Mechanic* concluded, was “that there have been no women in the line.”

Meeting Technical Challenges Then and Now

The only significant part of Hugo Gernsback’s proposal that Congress did not adopt was to permit amateurs on wavelengths above 1000 meters as well as below 200 meters, and in retrospect, that probably was a good thing. Since the common wisdom at the time was that longer wavelengths translated to longer distances, if hams had also been permitted to operate above 1000 meters, most of them probably would have stayed up there and would not have been forced to discover the DXing treasures that awaited them on the short wave bands.

It’s kind of like the microwave bands we have today. The vast majority of hams do the vast majority of their operating



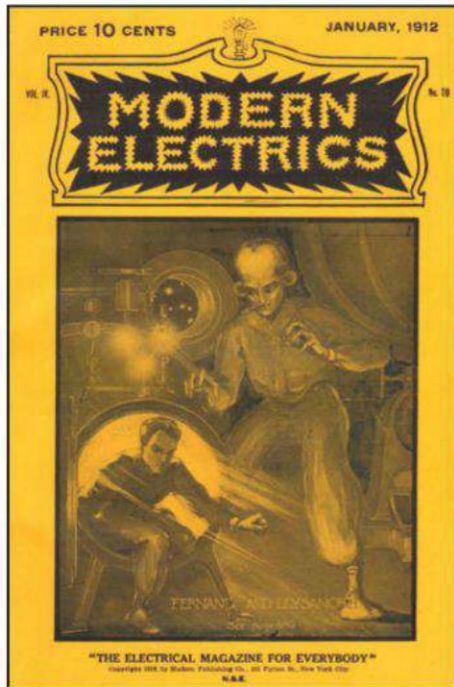
Radio pioneer Lee DeForest—seen here in a 1904 issue of *Electrical Age* magazine—was no friend of amateurs, at least not in the years before regulation and licensing. (Photo courtesy Wikimedia Commons)

on the “safe and familiar” HF and VHF/UHF bands, and only the intrepid few make their way above 450 MHz to discover what those higher bands have to offer. A hundred years ago, we hams, forced to fend for ourselves in the “wasteland” below 200 meters, led the way in discovering long-distance short-wave propagation; today, the commercial folks (many of whom are also hams) took the lead in exploiting the possibilities of the gigahertz bands. It’s not too late for us, though. There’s plentiful and inexpensive equipment available for us to modify and improve, and—great news for hams living with antenna restrictions—the antennas for these bands are really small. Looking back over our first century is a good thing to do. It provides us with perspective. Now, armed with that perspective, we need to look forward to our second century and how we hams—women as well as men—can continue to provide leadership in “the radio art.”

Notes

1. Alessandro Fabbri, a wealthy amateur living in Maine, offered to donate both his 125-foot yacht and his radio station to the U.S. Navy when the United States entered World War I in 1917, since it was far superior to anything the Navy had at the time. See Moseson, “The Most Important ... Station in the World,” *Popular Communications*, July 2006.

2. See <<http://earlyradiohistory.us/1907law2.htm>>. Thomas H. White’s earlyradiohistory.us website is an excellent historical resource and was the source of



An editorial by Hugo Gernsback in *Modern Electrics* magazine included a proposal for limiting amateurs’ power to one kilowatt and wavelengths above 1000 meters and below 200 meters. He may well have saved amateur radio from being outlawed.

many of the documents used in preparing this article.

3. Hugo Gernsback was a prolific publisher in the early and mid-20th century. His *Amazing Stories* magazine is considered the first science fiction magazine and it launched the careers of many great science fiction authors. He was also one of the earliest publishers of magazines devoted to the budding art of wireless communications. Magazine titles in that field included *Modern Electrics*, *Radio Amateur News*, *Short Wave Craft*, and many more. A biography of Gernsback is *Hugo Gernsback, A Man Well Ahead of His Time*, by Larry Steckler, published in 2007 by BookSurge Publishing.

4. Specific language from the Radio Act regarding “pure” and “sharp” waves:

USE OF A “PURE WAVE.” At all stations if the sending apparatus, to be referred to hereinafter as the “transmitter,” is of such a character that the energy is radiated in two or more wave lengths, more or less sharply defined, as indicated by a sensitive wave meter, the energy in no one of the lesser waves shall exceed ten per centum of that in the greatest.

USE OF A “SHARP WAVE.” At all stations the logarithmic decrement per complete oscillation in the wave trains emitted by the transmitter shall not exceed two-tenths, except when sending distress signals or signals and messages relating thereto.

5. See <<http://earlyradiohistory.us/1913rush.htm>>.

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Seventy-one years ago this month, Japanese warplanes launched a surprise attack on the U.S. Naval base at Pearl Harbor, Hawaii, drawing the United States into World War II. Today, the Battleship Missouri stands guard in the harbor as a museum ship, and amateur radio operators keep "Mighty Mo" on the air.

Mighty Mo and the Battleship Missouri Amateur Radio Club

BY WOODY HESTER,* WD9F



Photo A— "Mighty Mo," the Battleship U.S.S. Missouri, saw action from World War II to Operation Desert Storm. It is now a museum ship with a ham radio station aboard. (Photos courtesy the author and/or the Battleship Missouri Amateur Radio Club)

The Battleship USS Missouri (BB63), or "Mighty Mo" as she is called by those who know her, looms large in this nation's history (see photo A). She was born in the midst of World War II, was launched at Brooklyn's New York Navy Yard on January 29, 1944, and was commissioned on June 11, 1944. She is just short of three football fields in length, is 36 yards wide, and her top speed at launch was 33 knots. Armament at commissioning included nine 16-inch guns, twenty 5-inch guns, eighty 40-mm guns, and forty-nine 20-mm guns. Shells fired from her 16-inch guns are often described as being the size of small automobiles. Today, 68 years after her first commissioning, having received a total of 11 battle stars for service in World War II, Korea, and the Persian Gulf, now in the charge of the USS Missouri Memorial Association, Mighty Mo still looms large as a stunning symbol of freedom, serving as a living honor guard to the USS Arizona lying right next to her in Pearl Harbor, Oahu, Hawaii (photo B). For more information about the history of the USS

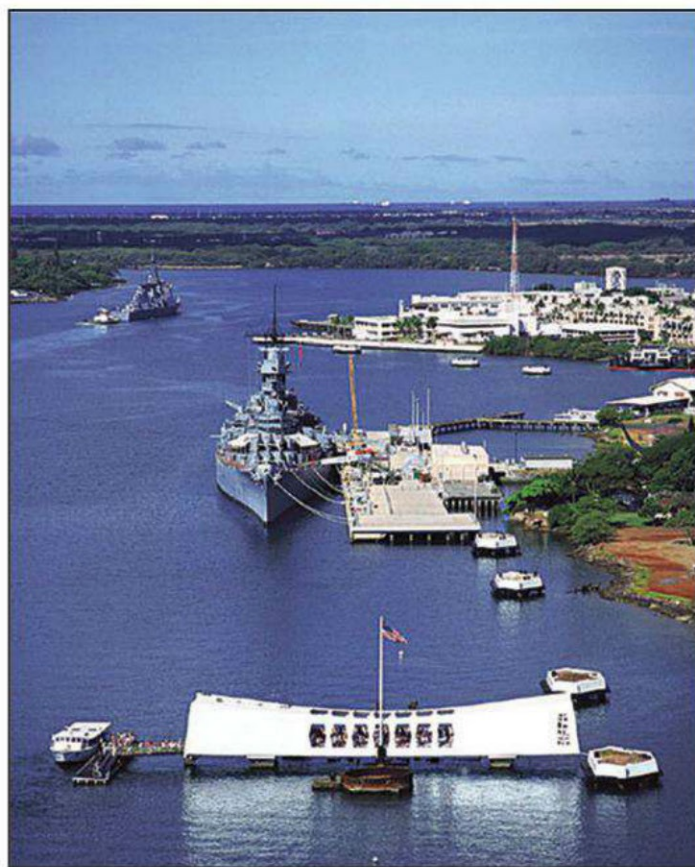


Photo B— The U.S.S. Arizona Memorial in Pearl Harbor, Hawaii (foreground) is "guarded" by the retired battleship U.S.S. Missouri (center).

Missouri, check out the USS Missouri Memorial Association's web page at <www.ussmissouri.com>.

Radio operators and communication technology played a key role throughout the *Missouri's* distinguished service during World War II, the Korean War, the Cold War, and Operation Desert Storm. From the battles of Iwo Jima and Okinawa to communication with the world of the Empire of Japan's unconditional surrender on her deck in Tokyo Bay on September 2, 1945 (photo C), to communication confirming the successful launch of the first Tomahawk Cruise Missile on January 17, 1991 in the opening hours of Operation Desert Storm, radio operators and ever-changing communications technology played key roles.

*e-mail: <fghester@yahoo.com>



Photo C— General of the Army Douglas MacArthur signs Japan's Instrument of Surrender aboard Mighty Mo on September 2, 1945, bringing an end to World War II.

Today, thanks to the dedicated members of the Battleship Missouri Amateur Radio Club – BMARC (photo D), Mighty Mo is still on the air. Radio amateurs can get into her log from anywhere in the world, and even better, if you make prior arrangements via the club's website, you may be able to operate from Mighty Mo's functional radio room if you

visit Pearl Harbor. Through the generosity and hospitality of BMARC, I've had that privilege twice and it's just an awesome experience.

My introduction to Mighty Mo and the BMARC took place in May of 2011. While my wife and I were visiting Pearl Harbor and taking the standard tour of Mighty Mo, one of the volunteers made



Photo D— Members of the Battleship Missouri Amateur Radio Club. Seated left to right: Tets Tenaka, AH7C; John Peters, K1ER; Tom Sato, JA4BTU/AF6NN. Standing left to right: James DeTour, AH6OY; Ray Fabre, WH6ASW; John Vorbau, KH6HAM; Jim Davis, WH6Q; Bill Kendall, KH6OO; and Bill Crawley, KH6FGA.

mention of the amateur radio station on board. Of course, my interest was piqued. Even though the radio room is not on the standard tour, the volunteer was kind enough to take me to it so I could see the setup. There were no BMARC members there that day, so I could only sign the visitor's log and leave them a note.

I knew that I'd be returning to Oahu the following November, so I went to the BMARC web page (www.kh6bb.org), where I read all about the radio station on board and learned how to make arrangements to operate. After exchanging a few e-mails with BMARC President Ned Conklin, KH7JJ, I was contacted by club member Bill Kendall, KH6OO, and a date was set. On the appointed morning, Bill met me at the visitor's center, whisked me around the lines onto a shuttle, and we were headed for Mighty Mo in no time at all. I felt like a V.I.P., and Bill's hospitality was just extraordinary.

Mighty Mo is visible for miles, as she towers over the harbor, but I just wasn't prepared for how big she really is. As we approached, the ship filled the entire skyline. I'm not an engineer of any kind and the fact that something of that size can float seems to defy what little I know about the laws of the universe. Her guns and everything about her are just massive.

In short order Bill walked me around the lines, up the gangway, through several passageways, and we emerged in "Radio Central." The room is about 750 square feet and is filled with vintage equipment from various time periods dating back to the 1940s, some of which BMARC is in the process of restoring. Included among the assemblage is some familiar ham equipment at two principal operating positions. Several BMARC members were already there with other guests. One was participating in a 40-meter phone net serving the Hawaiian Islands, some were waiting for Bill to take other guests and me on a behind-the-scenes tour (photo E), and others were busy swapping war stories.

Over the next hour we got to see most of the ship, including a lot of areas the public doesn't see. One of the most memorable moments was standing in the middle of what is called "Broadway" several decks down, which is the only level where you can actually see the whole length of the ship from the inside (with all watertight doors open). It is simply stunning. If you get to Mighty Mo, try to see Broadway. It's worth the trip. The other memorable moment was when Bill showed us a lever that activated the

Klaxon horn in one of the engine rooms. Its purpose under way was to notify those in the high ambient noise environment to stand by for critical orders. Bill activated it for us, and boy, did it get my attention!

Following the behind-the-scenes tour, we settled back into the radio room, and Bill helped me bring up the station. The rig was a Kenwood TS 450 (photo F) and I had the option to use an AEA amplifier up to 450 watts on some of the bands. The antenna choices were the Discone mounted on the ship's bow or the twin whips mounted amidships. It was about 11 AM in Hawaii and 10 and 12 meters were open. We chose to stick to those two bands and used the Discone without the amplifier. Over the next 90 minutes, in abbreviated CW ragchew-style exchanges, I managed to get 28 stations in the log. One was in Japan and all the rest on the U.S. mainland. I was quickly spotted and picked up by Skimmer stations, so a small pileup assembled. What a great experience. I thoroughly enjoyed handing out KH6BB contacts, and those I worked were thrilled to contact Mighty Mo. In addition to the challenge of managing the small pileup, I was a little challenged sending Mighty Mo's call at my usual operating speed of around 22 words per minute. KH6BB has a *lot* of dits in it! Try sending it yourself several times without sending an extra dit! Fortunately, some kind member of BMARC had set the call into the memory of the electronic keyer.

Because I have family on Oahu, I get there often. In April of this year I was again privileged to operate from Mighty Mo, and this time I accepted Bill Kendall's gracious invitation to join the BMARC members for breakfast before heading over to Mighty Mo. In addition to all of the club members in attendance, I got to meet and talk at length with John

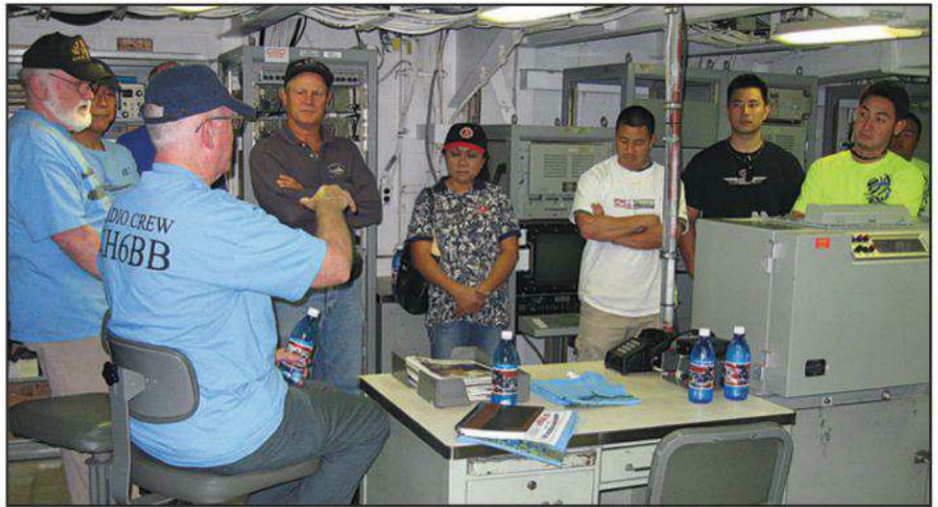


Photo E— KH6BB Trustee John Peters, K1ER, briefs a special tour group of visitors brought aboard the Missouri by BMARC members.



Photo F— Bill Kendall, KH6OO (the author's host), and John Vorbau, KH6HAM, check out the bands from the BMARC club station's TS-450 transceiver.

Peters, K1ER, who is a founding member and the KH6BB Trustee. In fact, John—who is a Navy veteran—was one of several individuals who were instru-

mental in bringing Mighty Mo to her new home at Pearl Harbor. John described the station's history to me and later, aboard Mighty Mo, gave me a tour of the biggest multi-function rig and antenna switch I have ever seen.

One of the things Bill and John had described to me was the 400 feet of 15/8-inch Heliac® feed line that runs from the radio room to the antennas. I was very curious about how they had connected modern-day amateur gear to that, and when I learned how they had done it—with alligator clips! (photo G)—I laughed out loud. In a way, it was refreshing. I could understand it, and it became very clear that this was still "amateur" radio.

Finally, I got to operate the station again. Once again 10 meters was open, but because it was later in the day, all

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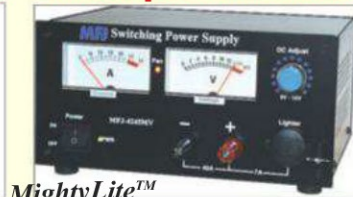


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75 Amps maximum and 70 Amps continuously. Adjustable voltage 4.0-16 VDC. Short circuit, overload and over-temperature protection, 10.5 lbs. 9 3/4"Wx5 1/2"H x9 1/2"D". Great for Ameritron's ALS-500M mobile amplifier!

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MFJ-1116, \$59.95. 8 pairs binding posts, 15A total. Voltmeter, on/off switch.

MFJ-1112, \$44.95. 6 pairs binding posts, 15 Amps total.

MFJ-1117, \$64.95. Powers four transceivers simultaneously (two at 35 Amps each and two at 35 Amps combined). 8x2x3 inches.

All PowerPoles™
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PowerPoles™ AND 5-Way Binding Posts
MFJ-1129, \$114.95. 10 outlets each fused, 40 Amp total. 3 high-current outlets for rigs -- 2 *PowerPoles*® and one 5-way binding post. 7 switched outlets for accessories

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MFJ-1116
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MFJ-1112
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MFJ-1128
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MFJ-1126
\$84.95

MFJ-1129
\$114.95

MFJ-1124
\$64.95

(20A max) -- 5 *PowerPoles*® and 2 binding posts. Fuses include (1- 40A, 2-25A, 3-10A, 3-5A, 2-1A installed). 0-25 VDC Voltmeter. Includes extra *PowerPoles*®(R) and fuses, 12 1/2"Wx1 1/4"Hx2 3/4"D inches.

MFJ-1124, \$64.95. 6 outlets each fused, 40 Amps total. 4 *PowerPoles*®, 2 high-current binding posts. Installed fuses: 1- 40A, 2-25A, 2-10A, 1-5A, 1-1A. Includes extra *PowerPoles*® & fuses -- no extra cost.

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but one of my 27 contacts were on the Pacific Rim. What a thrill for this Midwesterner.

How You Can Participate

By now your interest undoubtedly is piqued, and even if your travels won't be taking you to Hawaii soon, you can still participate. Making contact with KH6BB is fun, too, and I've done that several times. The station is sometimes on the air during special events, and it is on almost every Tuesday. While exact operating times and bands will vary, KH6BB is almost always picked up on any of the several spotting networks, and I have found the Reverse Beacon Network to be especially good for hunting KH6BB. That network includes a feature for looking for a specific call. Using that almost any Tuesday, sometime between 2100 and 0300 UTC, will show you right where KH6BB is active. Instructions for receiving a very nice QSL are included on the BMARC website. One of the times when KH6BB is on the air along with many other museum ships is on the International Museum Ships Weekend. That event usually takes place on the first weekend in June and is sponsored by the Battle Ship New Jersey Amateur Radio Club. For more information about this event check out <www.NJ2BB.org>. KH6BB is also hunting counties, and they are way over 1000. While they want to work everyone, if you happen to be in a rare county they *really* want to work you.

Guest Operations at the *USS Missouri*

If you do plan to be on Oahu, a day on Mighty Mo will be an unforgettable experience. You will need to contact BMARC in advance of your visit so that they can arrange for a club member to meet you, escort you to Mighty Mo's radio room, and assist you with the station. Don't forget to bring your license (or a photocopy). In addition to reading all information on the BMARC website, send a message to <operations@kh6bb.org> at least three weeks in advance (longer is even better), letting them know when you'd like to visit. A club member will reply and set up a meeting time and place and can answer all of your questions.

Operating Times, Frequencies, and Equipment

Pearl Harbor is 2500 miles from California and 5000 miles from the East Coast. The best propagation to the mainland is usually in the mid to late afternoon Hawaii time, from about 0000Z (2 PM Hawaii time) to 0300Z (5 PM Hawaii time), when the ship closes to visitors. The best band is usually 20 meters, with 17 meters as an alternate. Sometimes 15, 12, and even 10 meters are open, allowing contacts with radio amateurs in South America and the entire Pacific Rim, as well as the U.S. mainland. Nominal SSB operating frequencies are 14263, 18163, and 21363 kHz (also 24963 and 28463 if conditions permit). If you're interested in CW, there is a vintage J-38 straight key (photo H), Vibroplex bug, and electronic keyer, all in parallel. You may also bring your own key/keyer if you wish. Equipment varies, but likely will be a Kenwood TS-450 with an AEA linear amplifier for power output of 100 to 450 watts, depending on frequency and antenna. BMARC will take care of QSLs for your contacts, and QSL instructions for ops working KH6BB appear on QRZ.COM.

Getting to the Ship and into Radio Central

The *USS Missouri* is moored on the east side of Ford Island in Pearl Harbor, about 300 yards south of the *USS Arizona*



Photo G— In true ham fashion, the output of the TS-450S transceiver is hooked to the ship's 1.5/8-inch hardline with alligator clips!

Memorial. Ford Island is a naval base and access is restricted, so the base of operations for *Missouri* visitors is at the *USS Arizona* parking lot on the east side of Pearl Harbor (enter via Route 99, Kamehameha Highway). You can drive there, or take a bus, shuttle van, etc.

The *Arizona Memorial*, the *USS Missouri*, and the *USS Bowfin* (a WW II submarine also open to visitors) all use the same parking lots. We assume that you will want to tour the *Missouri* in addition to operating KH6BB. Unlike the *Arizona Memorial*, which is a national park and open for free, the *Missouri* receives no government subsidies of any kind, and lives on donations and admissions fees, so BMARC suggests that you buy regular admission tickets to the ship and take the tour(s).

The ticket office for the *Missouri* is located near the *USS Bowfin*. The *Missouri* is open to visitors from 9:30 AM to 5 PM every day of the week. Once you have a ticket, you will board a trolley for the short trip over the Ford Island Bridge to the *Missouri*. Trolleys run about every 15 minutes in each direction. The last trolley back to the *Arizona* parking lot leaves the *Missouri* at about 5:05 PM, right after the ship closes. The parking lots close at 6 PM.

A thorough tour of the *Missouri* can take several hours or more, depending on your level of interest. Then either before or after you tour the ship, BMARC will arrange to have a club member meet you and escort you to Radio Central, which is not on the regular tour routes. The usual meeting point is on the main deck of the ship, near the boarding brow (gangway) where you get on the ship.

If you are only interested in operating and do not want to visit other parts of the ship, let the club know when you e-mail them and they may be able to make special arrangements.

Thanks to BMARC

In addition to my personal thanks, if I may, on behalf of the worldwide community of radio amateurs and others who celebrate freedom around the globe, I extend congratulations and thanks to all of the dedicated members and officers of the Battleship *Missouri* Amateur Radio Club for keeping Mighty Mo on the air.

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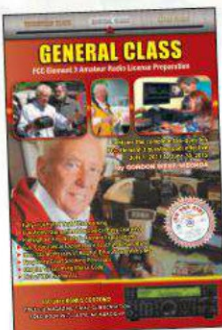
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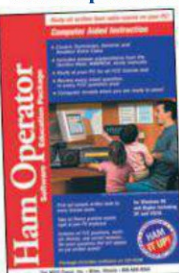
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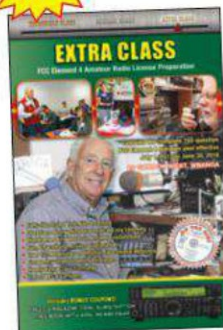
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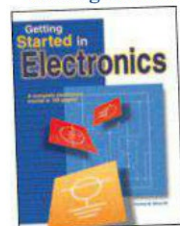
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Results of the 2012 CQ WW DX 160 Meter Contest

BY ANDY BLANK,* N2NT

In 2011 there were a total of 42 scores over 1-million points. In 2012, there were a total of five.

Needless to say, conditions have begun to deteriorate on Topband, but even with less-than-ideal conditions, what better way to spend a cold weekend (depending on where you are, of course) than in the CQ WW 160 Meter Contest (CW last full weekend of January; SSB last full weekend of February)? Very few records were broken in this year's contest, but lots of fun was had by all. Most of the regulars were on, as well as some sought-after DX entities.

When the count was done, 3190 logs were submitted, 2089 on CW and 1101 on SSB. Understandably, this was down from 2011 by almost 400 logs, but then again, conditions were exponentially better in 2011.

What makes Topband interesting is the unpredictability of the conditions. Some years the southern tier dominates, but this year it was the north that had the advantage.

The father-and-son team of Jeff and Patrick Briggs had the highest single operator scores on both modes from the VY2ZM superstation on Prince Edward Island (PEI). Jeff's score was second only to the Assisted world high score made by another Jeff, K8ND, operating from PJ2T. It must be an advantage to be named Jeff! PJ2T now holds the South America record for Single Op and Single Op Assisted, and the highest score of all competitors in the 2012 contest! Harry, RA3AUU, operating from P33W, made a valiant effort but could not equal Jeff's multiplier count, with more state-side/VE multipliers.

On SSB, Patrick, K6AAX, made the highest score of all competitors. Conditions on SSB were way down this year, so sitting in the chair for 40 hours required a lot of perseverance.

In the Multi-Op category there is always a spirited competition stateside among the W8JI, K1LZ, and W2GD crews. This year K1LZ emerged victorious, working more EU stations the second night than the others. On the DX side, only 40K separated E7DX and S52OP. Braco's crew had the edge in QSOs. The S52OP crew was a portable location using a balloon vertical!

On SSB, S52OP took the top spot over EI7M in Multi Op. K1LZ took the USA title again, but with only 332K. The conditions just weren't the best for the SSB contest this time. Another perennial winner from the

Briggs family was Peter, K3ZM, with a score of 322K, just below the K1LZ Multi effort. Peter also took the World Combined Single Op trophy once again! Congratulations.

CW Highlights

In highly competitive Europe, YU1EA operating YT8A took the top spot over OK1RF at CS2C by only 30K. In Low Power, another 30K was the margin of victory between winner LY2IJ and SP3HLM. Low Power USA was taken by John, W2ID, by only 14K over W2TZ. In VE3, John, VE3EJ, won the Ontario honors over fellow CCOers VE3TA and VE3AT.

In the QRP category, VE3MGY and N8VW took the top two spots. QRP on 160 is *hard!* Kudos to all the QRPers who stuck it out. In EU, SP2DNI edged out DJ7WW by only 5K.

This year I thought I would highlight some of the operations from places where you cannot make a world high score, but nonetheless there are spirited competitions.

In USA zone 4, K1LT in Ohio took top honors over Jim, K5RX. If you don't think Jim takes the CQ 160M Contest seriously, read his story (*Note: All QRM, including this story, will be posted on the CQ website (www.cq-amateur-radio.com), CQ WW 160 Meter Contest 2012, "Expanded Results," as well as the list of Guest Ops and full tables—ed.*).

Also check out the picture in this article of the Multi-Op crew in New Mexico, NI5T,



Here is YC0LOW making a big score from rare Oceania in this contest. Thanks, Jo!

with some very-high-tech RX arrays. Some of the stuff the big stations use is wild. W8JI set the standard, with others are trying to keep up. In Low Power K8FH and NA8V were only 3K apart!

In Zone 3, K7NV operating from W7RN took the top spot over AC6DD in the Single Operator category, with N7DD again claiming top West Coast Multi. In Low Power, N7IR and W7RH were also only 3K apart.

In the Assisted categories, while PJ2T and P33W were able to break the elusive 1M-point barrier, LX7I and SN7Q were not far behind.

VE3NE coasted to victory in Canada over VE3RZ, while K3WW and N3UA took #1 and #2 USA.

Riki, K7NJ, took #1 Assisted from the West Coast U.S.A. over N6SS. K9OM had the top zone 4 score.



Congratulations to the team at S52OP who piloted the station to the World Multi-Op Combined Trophy using a balloon vertical!

*e-mail: <director@cq160.com>

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Other scores of note were HK0NA from Malpelo, coming in 9th in the world Multi Op. The team of HK1MW, HK1X, K4UEE, W0GJ, and W6IZT made a lot of DXers happy with a great multiplier.

Many thanks to 5H3EE, 3V8SS, VR2EH, BA4QO, VU2BGS, BV1EK, HS0ZEE, 7Z1SJ, 9M6YBG, YC0LOW, T88TW, VP6T (F6BEE), A61BK, ST2AR, VR2PX, GJ2A (K2WR), A65BP,

4U1WRC (N4QX), DU1/JJ5GMJ, and T32XX for activating some rare countries for the contest.

SSB Highlights

A nice job by Jerry, WB9Z, to hang in there Single Op with K3ZM and N4PN in zone 4. In Canada, VE6BBP cracked the top 5, with

2012 CQ WW 160M CONTEST TROPHY WINNERS AND DONORS

CW

SINGLE OPERATOR

World

Jeffrey T. Briggs, VY2ZM

Donor: Bill Tippet, W4ZV – DJ8WL Memorial

World Low Power

Arunas Vaglys, LY2IJ

Donor: Ed Parish, K1EP

World QRP

Brian Campbell, VE3MGY

Donor: Wayne Mills, N2BG

World Assisted

Jeffrey Maass (K8ND), PJ2T

Donor: Andy Chesnokov, UA3AB

Southern Hemisphere

Al Van Buren, CE1/K7CA

Donor: Robert Kile, W7RH

U.S.A.

Peter H. Briggs, K3ZM

Donor: Ken Byers, K4TEA

U.S.A. Low Power

John Worthington, W2ID

Donor: Rich Kennedy, N4ESS

U.S.A. QRP

Pat Collins, N8VW

Donor: Bob Raymond, WA1Z

U.S.A. Assisted

Charles D Fulp, Jr., K3WW

Donor: Akito Nagi, JA5DQH

U.S.A. Zone 5

Doug Grant, K1DG

Donor: Paul H. Newberry, Jr., N4PN

U.S.A. QRP Zone 4

Charlie Hansen, N0TT

Donor: Dale Putnam, WC7S

U.S.A. Assisted Zone 3

Riki Kline, K7NJ

Donor: Larry Pace, N7DD

North America

Herb Schoenbohm, KV4FZ

Donor: CQ magazine – N4IN Memorial

Canada

John Sluymmer, VE3EJ

Donor: Alabama Contest Group

Canada Low Power

Anthony Ratajczak, VE1ZA

Donor: Contest Club Ontario

Zone 3

Comstock Memorial Station (K7NV) W7RN

Donor: Milt Jensen, N5IA

Zone 4

Ron Vander Kraats, VE3AT

Donor: Steve Schmidt, K4WA

Africa

Mike Stange, 5H3EE

Donor: James "Skip" Riba, WS9V

Asia

Nick Perminov (UN4L), UP2L

Donor: Missouri DX/Contest Club

Asia – Assisted

Igor Booklan (RA3AUU), P33W

Donor: Nodir Tursoon-Zadeh, EY8MM

Japan

Masaki Okano, JH4UYB

Donor: Alabama Contest Group

Europe

Dusan Chea (YU1EA), YT8A

Donor: John Battin, K9DX

Europe Low Power

Czeslaw Dubicki, SP3HLM

Donor: Petr Ourednik, OK1RP – DL1RK Memorial

Europe QRP

Andrzej Michowski, SP2DNI

Donor: Gary Breed, K9AY

Europe Assisted

Philippe Luty, LX7I

Donor: Carsten-Tomas Dauer, DL2OBO

Russia

Sergey Artyomov, R3DX

Donor: UA2 Contest Club

Oceania

Kevin Smith, VK6LW

Donor: John Battin, K9DX

South America

Camilo Fierro, HK3TU

Donor: John Rodgers, WE3C

MULTI-OPERATOR

World

Emir - Braco Memic, E7DX

(9A1TT, 9A9R, E70R, E70T, E74IW, E76C,

E77DX, E77WM ops)

Donor: Hugh Valentine, N4RJ

U.S.A.

Krassimir Petkov, K1LZ

(K1LZ, KB1WKF, K3JO, N8BO ops)

Donor: W8UVZ, W0CD, K8GG

Zone 3

Larry Pace, N7DD

(W8TK N7DD ops)

Donor: Riki Kline, K7NJ/4X4NJ

Europe

Aleksander Spindler, S52OP

(S51V, S52OP, S59A ops)

Donor: Bob Evans, K5WA

SSB

SINGLE OPERATOR

World

Patrick W. Briggs (K6AAX), VY2ZM

Donor: Bill Barr, N4NX

World Low Power

Slavko Celarc, S57DX

Donor: Howard Klein, K2HK

World QRP

James F. S. Eppright, K5RX

Donor: Mike Schwieterman, K7DSL

World Assisted

Luis Ezequiel Pinto Gomes, CT3DL

Donor: Ray Sokola, K9RS

Southern Hemisphere

Al Van Buren, CE1/K7CA

Donor: Riki Kline, K7NJ/4X4NJ

U.S.A.

Peter H. Briggs, K3ZM

Donor: CQ 160 Contest Committee

U.S.A. Low Power

Fred Groner, W2TZ

Donor: Tim Duffy, K3LR

U.S.A. Assisted

Manny Fonseca, Jr., W2MF

Donor: Mississippi Valley DX & Contest Club

U.S.A. Zone 3

Jim Stevenson, W6YI

Donor: Dr. Larry Flegle, N4TMW

U.S.A. Zone 4

Jerry Rosalius, WB9Z

Donor: Alabama Contest Group

U.S.A. Zone 5

Paul H. Newberry, Jr., N4PN

Donor: Jim Monahan, K1PX

North America

John Barcroft (K6AM), ZF2AM

Donor: CQ magazine – K2EEK Memorial

Canada

Paul Hudson, VE3TA

Donor: Alabama Contest Group

Canada Low Power

Don Graziano, VE3VZ

Donor: Rudy Bakalov, N2WQ

Africa

Raffaele Vitrano, IH9YMC

Donor: Carl Henson, WB4ZNH

Asia

Gabriel Mardiros, OD5NJ

Donor: Ed Campbell, NX7TT

Asia Assisted

Norman Banks, 5B4AIF

Donor: Nodir Tursoon-Zadeh, EY8MM

Europe

Rein Kolk, ES5RW

Donor: James "Skip" Riba, WS9V

Europe Low Power

Burkhard Berenbrink, DF8XC

Donor: Contest Club Ontario

Europe Assisted

Massimo Cortesi, IZ4DPV

Donor: Emir-Braco Memic, OE1EMS

Russia

Roman Kruzhallin, R2EAA

Donor: UA2 Contest Club

Oceania

Feri Yusivar, YC1COZ

Donor: Al Teimurazov, 4L5A

South America

Eduardo Araujo, LU2DKT

Donor: John Rodgers, WE3C

MULTI-OPERATOR

World

Aleksander Spindler, S52OP

(S51V, S52OP, S59A ops)

Donor: Southeast DX Club

Zone 3

Patrick G Hess, NK7C

(KF7FQU, N7CQQ, N7NND, NK7C, W7RH ops)

Donor: Paulo Costa Leite, PV8DX

U.S.A.

Krassimir Petkov, K1LZ

(K3JO, KB1RDZ, N8BO ops)

Donor: Jerry Rosalius, WB9Z

Europe

East Cork Radio Group, EI7M

(EI3JE, EI3JZ, EI3KD, EI6BT, EI8IR, G4CLA ops)

Donor: South Jersey DX Association, N2CW

World Single Operator Combined SSB/CW

Peter H. Briggs, K3ZM

Donor: Alex Tkatch, KU1CW

World Multi-Operator Combined SSB/CW

Aleksander Spindler, S52OP

(S51V, S52OP, S59A ops)

Donor: Top Band DX Club

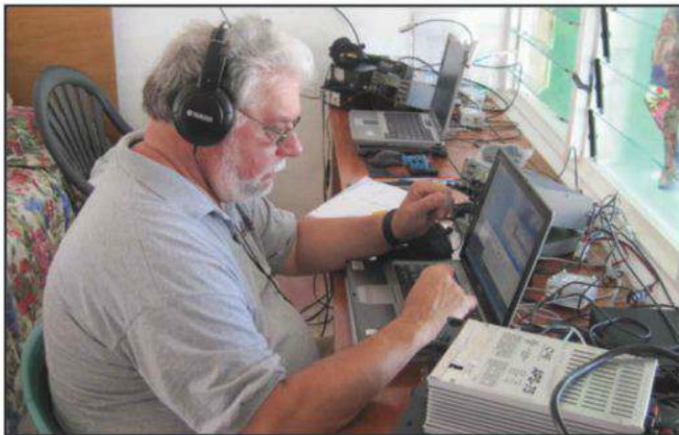
VE3TA and VE3PN ahead. It had to be tough from zone 3, with W6YI's winning score less than 100K! WA7LT was a close second. Also just under 100K was W2TZ winning Low Power honors for the USA. VE3VZ took Low Power for Canada. NT8Z and KB7EEG took Low Power honors in zone 4 and 3, respectively.

K5RX and SP2DNI took top spots in QRP (ouch). With depressed conditions, it's hard to imagine working QRP on SSB. That's dedication.

With just 330K, K6AM piloted ZF2AM to top DX Single Op with ES5RW right behind. In Low Power, S57DX and DF8XC were #1 and #2 DX-side.



This neat station belongs to N5BG and N15T, making big noise from New Mexico. Pictured left to right: K7FA, K7IA, and N3KCJ.



You wanted rare on Topband? Here is Lee, N8LJ, piloting T32XX and making lots of contesters and DXers happy.



Top CW in Minnesota went to Steve, NEØU.

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COMPANY**

Diamond Antenna
Division

2012 CQ WW 160M CONTEST TOP SCORES

<p>CW SINGLE OPERATOR USA</p> <p>K3ZM811,668 K1DG704,667 AA1K585,936 KD4D457,311 NO3M408,740</p> <p>VE</p> <p>VY2ZM1,297,457 VE3EJ843,432 VE3AT661,440 VE3TA650,754 VE3PN334,576</p> <p>Zone 3</p> <p>W7RN236,045 AC6DD182,517 K7NU172,425 KF6T118,925 *N7IR115,640</p> <p>QRP</p> <p>VE3MGY133,458 N8VW109,668 N0TT96,558 SP2DNI91,266 DJ7WW86,526</p> <p>DX</p> <p>YT8A847,484 CS2C816,816 CE1/K7CA773,711 OM2VL754,563 KV4FZ691,252</p>	<p>LOW POWER WORLD</p> <p>LY2J340,480 SP3HLM305,797 YT1VP298,977 S57DX265,930 9A2VR238,144</p> <p>LOW POWER W/VE</p> <p>W2ID191,264 W2TZ177,408 N1UR167,614 K8FH160,240 NA8V157,852</p> <p>QRP W/VE</p> <p>VE3MGY133,458 N8VW109,668 N0TT96,558 WB4MSG71,190 W4UX60,669</p> <p>MULTI-OPERATOR WORLD</p> <p>E7DX1,049,030 S52OP1,008,504 OM7M983,772 ES9C927,476 K1LZ879,780</p> <p>MULTI-OPERATOR W/VE</p> <p>K1LZ879,780 W2GD721,350 W8JI678,900 VE2OJ576,205 NY4A501,381</p>	<p>ASSISTED WORLD</p> <p>PJ2T1,443,260 P33W1,198,567 LX7I955,724 SN7Q743,214 9A2DQ694,148</p> <p>ASSISTED W/VE</p> <p>VE3NE656,880 VE3RZ479,904 K3WW427,017 N3UA405,104 VE3MMQ389,658</p> <p>SSB SINGLE OPERATOR USA</p> <p>K3ZM322,224 N4PN305,074 WB9Z275,688 KK1KW225,990 W3BGN191,970</p> <p>VE</p> <p>VY2ZM886,236 VE3TA442,428 VE3PN202,721 VE6BBP147,126 VE3CR108,870</p> <p>Zone 3</p> <p>W6YI88,941 WA7LT64,172 KE7BT38,760</p>	<p>K7RAT25,016 *KB7EEG17,296</p> <p>QRP</p> <p>K5RX53,298 SP2DNI39,824 VE3MGY39,556 SQ2NNN29,124 DL7UMK25,130</p> <p>DX</p> <p>ZF2AM330,368 ES5RW264,492 9A2DQ251,124 OK1W225,875 9A2VR173,745</p> <p>LOW POWER WORLD</p> <p>S57DX136,864 DF8XC97,584 W2TZ95,700 E77EZ84,042 HA5BSW83,496</p> <p>LOW POWER W/VE</p> <p>W2TZ95,700 NT8Z79,680 W8CO72,688 KG4W65,720 VE3VZ58,752</p> <p>QRP W/VE</p> <p>K5RX53,298 VE3MGY39,556 KP4KE/W419,260</p> <p>KE8UN18,124 W0MRZ16,544</p> <p>MULTI-OPERATOR WORLD</p> <p>S52OP466,722 EI7M446,082 OL7M390,400 K1LZ332,800 9A1P332,652</p> <p>MULTI-OPERATOR W/VE</p> <p>K1LZ332,800 N2CW267,079 ND8DX227,205 K8PO224,688 N2CEI176,300</p> <p>ASSISTED WORLD</p> <p>CT3DL427,968 IZ4DPV388,352 W2MF228,232 5B4AIF222,264 MW0ZZK212,760</p> <p>ASSISTED W/VE</p> <p>W2MF228,232 N3RR158,240 VA3YP149,397 W0AIH142,569 N4RV120,815</p>
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2012 CQ WW160M CONTEST CLUB SCORES

(Minimum of 3 three entries required for listing)

CLUB	#ENTRIES	SCORE	CLUB	ENTRIES	SCORE
BAVARIAN CONTEST CLUB	152	12,056,874	NORTH CAROLINA DX AND CONTEST CLUB	9	365,825
POTOMAC VALLEY RADIO CLUB	127	9,767,068	IOWA DX AND CONTEST CLUB	4	362,050
CONTEST CLUB ONTARIO	47	7,538,287	GIPANIS CONTEST GROUP	4	341,663
YANKEE CLIPPER CONTEST CLUB	64	6,723,746	SOUTHERN CALIFORNIA CONTEST CLUB	15	335,842
FRANKFORD RADIO CLUB	59	6,476,668	BRISTOL (TN/VA) ARC	11	321,214
RHEIN RUHR DX ASSOCIATION	59	5,378,853	AUSTRIAN CONTEST CLUB	4	321,148
BLACK SEA CONTEST CLUB	52	4,934,744	DELARA CONTEST TEAM	6	306,168
KAUNAS UNIVERSITY OF TECHNOLOGY RADIO CLUB	42	3,801,902	WESTERN NEW YORK DX ASSOCIATION	9	432,899
SLOVENIA CONTEST CLUB	20	3,797,649	SPOKANE DX ASSOCIATION	8	282,525
UKRAINIAN CONTEST CLUB	42	3,110,150	CZECH CONTEST CLUB	3	256,170
CROATIAN CONTEST CLUB	17	2,859,145	MEDINA 2 METER GROUP	3	247,107
ARIZONA OUTLAWS CONTEST CLUB	47	2,837,916	KENTUCKY CONTEST GROUP	3	224,089
SP DX CLUB	21	2,724,970	CONTEST GROUP DU QUEBEC	8	223,654
SOCIETY OF MIDWEST CONTESTERS	47	2,566,037	STOR DONBASS	5	219,466
HUNGARIAN DX CLUB	11	2,459,924	KANSAS CITY CONTEST CLUB	3	209,383
MAD RIVER RADIO CLUB	13	2,231,819	UA2 CONTEST CLUB	3	170,798
MARITIME CONTEST CLUB	16	1,956,310	EASTERN IOWA DX ASSOCIATION	3	159,054
RUSSIAN CONTEST CLUB	23	1,866,546	VLADIMIR RADIO CLUB	6	152,455
NORTHERN CALIFORNIA CONTEST CLUB	28	1,866,413	WEST PARK RADIOPS	10	137,284
SOUTH EAST CONTEST CLUB	16	1,762,214	ALEXANDER THE GREAT CONTEST GROUP	6	123,932
FLORIDA CONTEST GROUP	29	1,471,760	SHAKHAN CONTEST CLUB	4	114,788
CTRI CONTEST GROUP	12	1,374,622	WILLAMETTE VALLEY DX CLUB	9	108,224
CONTEST CLUB FINLAND	13	1,366,508	SOUTHERN OSAKA CONTEST CLUB	3	97,210
MINNESOTA WIRELESS ASSN	39	1,354,843	NORTHERN ROCKIES DX ASSOCIATION	3	90,691
TENNESSEE CONTEST GROUP	42	1,311,128	ALLEGHENY VALLEY RADIO ASSOCIATION	4	89,993
URAL CONTEST GROUP	12	1,234,111	SAMARA RADIO CLUB	4	78,146
VYTAUTAS MAGNUS UNIVERSITY RADIO CLUB	6	1,116,704	CLUB DE RADIO EXPERIMENTADORES DE OCCIDENTE	3	77,408
BELARUS CONTEST CLUB	9	1,056,588	LU CONTEST GROUP	4	76,573
ALABAMA CONTEST GROUP	25	980,479	NEW MEXICO BIG RIVER CONTESTERS	4	75,995
CENTRAL TEXAS DX AND CONTEST CLUB	11	922,974	LOW COUNTRY CONTEST CLUB	5	72,538
PERUGIA CONTEST CLUB	4	868,840	SOUTH URAL CONTEST CLUB	3	70,599
ALRS ST PETERSBURG	7	804,186	KIEV CONTEST GROUP	5	68,561
CHILTERN DX CLUB	3	746,118	MOTHER LODGE DX & CONTEST CLUB	3	64,790
ROCHESTER DX ASSOCIATION	11	725,994	ARAUCARIA DX GROUP	3	63,964
BELOKRANJEC CONTEST CLUB	8	684,888	ARCK	3	52,722
HUDSON VALLEY CONTESTERS AND DXERS	12	679,374	DELTA JANDARMI ASSOCIATION TULCEA	3	48,606
YU CONTEST CLUB	4	671,753	SUSSEX COUNTY ARC	3	46,137
NORTH TEXAS CONTEST CLUB	9	636,977	RADIOCLUBUL QSO BANAT TIMISOARA	5	44,882
NORTH COAST CONTESTERS	8	627,592	ARI	3	43,884
LITHUANIAN CONTEST GROUP	4	567,338	DFW CONTEST GROUP	4	41,699
RADIO CLUB HENARES	3	525,827	METRO DX CLUB	3	32,883
GRAND MESA CONTESTERS OF COLORADO	8	435,927	10-70 REPEATER ASSN	3	25,367
DEUTSCH AMATEUR RADIO CLUB	10	430,489	RU-QRP	3	13,074
LONE STAR DX ASSOCIATION	4	430,180	BERGEN AMATEUR RADIOASSOCIATION	3	8,859
VRHNIKA CONTESTERS	6	407,956	WESTERN WASHINGTON DX CLUB	3	6,282
LATVIAN CONTEST CLUB	6	402,431			

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Errata

2011 CQ WW 160M Contest

The following plaque donors and winners were inadvertently omitted from the results of the 2011 CQ 160M Contest. Most of these were new awards for 2011, which caused the errors.

CW

Single Operator Russia
Vadim Ovsyannikov, R9DX
Donor: Dmitri Gorshkov, UA2FB

Single Operator Assisted Zone 3

Preston Smith, N6SS
Donor: Larry Pace, N7DD

Single Operator QRP Zone 4

Charles Hansen, NØTT
Donor: Dale Putnam, WC7S.

SSB

Single Operator Russia
Vladimir G. Falshunov, UA9KAA
Donor: Dmitri Gorshkov, UA2FB

SSB/CW Combined
World Multi-Operator
P33W
(Operators: RA3AUU, 5B4AIE, RW4WR)
Donor: Top Band DX Club

In addition, the **Single Operator Canada** trophy winner should have been listed as **VY2ZM, operated by Mladen Bogdanov, YT6W.**

The name of the **SSB USA Multi-Operator** category winner (**K1LZ**) was incorrect. The correct name of the station owner is **Krassimir Petkov.**

Congratulations to all the winners and thanks to the plaque donors.

In Club Competition, the Society of Midwest Contesters was omitted from the final list accidentally.

In Multi Op, other than the winners mentioned before, OL7M and 9A1P put in great efforts from EU. N2CW and the south Jersey contingent were second to K1LZ, and ND8DX in zone 4 was #3 Multi Op overall, with K8PO right behind in zone 5.

CT3DL was the overall winner in Assisted, with IZ4DPV second overall. W2MF was third and top USA! Congrats, Manny. 5B4AIF and MWØZZK also had big scores Assisted for the world.

Special thanks to OD5NJ, EX8MAT, BV1EK, C31CT, SV9GPV, YC1COZ, LU2DKT, CE1/K7CA, and LU6QI for activating some rarer countries on SSB.

Club Competition

Once again the Bavarian Contest Club and the Potomac Valley Radio Club amassed the biggest scores by far with 277 entries and almost 22-million points!

There were 91 club entries with at least three scores per club. The club scores are the heart of the competition and really help encourage activity. The committee appreciates the efforts from all the radio clubs, no matter how small the entries.

Notes

Special thanks to all those who help make the contest a success, including N6TR, K1EA, K1DG, K5TR, AA5B, W5GN—and especially to K3EST for his 35 years as Director of the CQWW Contest Committee.

If anyone would like a Log Checking Report, send an e-mail to <Director@CQ160.com>. Please specify which mode you are asking for and the callsign used.

Thanks to all for participating and see you in 2013. Remember, starting in 2013 all CQ contests have a 5-day deadline for submitting logs. Check out the rules in the November issue of CQ, on the CQ website (www.cq-amateur-radio.com), and on the 160 Contest website (CQ160.com) for the latest information.

73, Andy, N2NT

(Continued on page 103)

Announcing:

2013 CQ DX Marathon

2012 Logs Due by January 15, 2012

This year's DX Marathon ends December 31, so it's time to go back through your log, see what you have worked, enter it onto the DX Marathon spreadsheet, and then update it with any additional contacts through the end of the year. See the main text or the DX Marathon website for details on how and where to submit your log. Remember, log submission deadline for the 2012 CQ DX Marathon is January 15, 2013.

The 2013 edition of the CQ DX Marathon begins at 0000 UTC on January 1, 2013 and runs through 2359 UTC on December 31, 2013. The goal, as always, is to work as many countries and CQ zones as possible at least once during the calendar year. There are no significant changes to the rules this year, but some clarifications have been added for Formula Class antennas in the Appendix. **Changes are highlighted in bold type.** We will continue to use a downloadable Microsoft Excel® sheet which can be used throughout the year to track your progress and then emailed at the end as your submission—no extra forms required! Many programs are now available to automatically populate the sheet from your logging program. See the DX Marathon website for details. Here are the 2013 rules for the CQ DX Marathon:

Rules, 2013 CQ DX Marathon

Activity period: The CQ DX Marathon is a year-long activity, beginning at 0000 UTC January 1 and ending at 2359 UTC December 31. Each year's event is separate.

Frequencies: Any authorized amateur frequency may be used. Contacts through repeaters or satellites are not allowed for credit, nor are contacts with maritime or aeronautical mobile stations. All contacts must be made entirely over amateur radio frequencies – i.e., Echolink-type contacts do not count.

Modes: Any authorized amateur mode may be used, but three modes will be recognized in the DX Marathon—CW, Phone and Digital. All modes other than CW or voice modes will count as Digital.

Categories: Each entrant in the DX Marathon may submit one log each year per operating location. Participants submitting logs for single mode or single band entries must include only those contacts. Logs submitted with multiple mode or multiple bands will not be considered for mode and band awards. Entries with two or more call signs will only count as a single entry if all contacts were made by the same (single) operator at the same station using the same antennas. Entries that include contacts made with the assistance of remote receivers and/or transmitters in addition to contacts from a primary station are not permitted. There are two entry classes, "Formula" and "Unlimited."

Formula: An entrant may choose one of two options in this class: (1) All contacts must be made with a maximum output power of 10 watts, regardless of band or mode; or (2) the operator may run a maximum of 100 watts output to a simple antenna, such as a vertical or dipole (see the appendix below for further rules on antennas used in either option for Formula class). An operator in Formula class must select

QRP (10 watts or less) or 100 watts and limited antennas at the beginning of the year's DX Marathon, and may not switch between entry modes during the year. All contacts must be made without assistance of any sort, including but not limited to lists, passes, or use of higher power or prohibited antennas to initially secure the contact. Use of spotting nets such as a DX Cluster® is allowed.

Unlimited: Any antenna may be used, along with any power level for which the operator is licensed. Use of spotting nets such as DX Cluster® is allowed.

Scoring: Each country worked is worth one point. Each CQ zone worked is worth one point. The total score is the sum of zones and countries worked, on any mode and any authorized band. There are no multipliers of any kind. Each country and zone count only once. A single QSO may count for both a country and a zone. If in the course of the year you work 238 countries and 37 zones, your score is 275. If you work all 40 zones and 150 countries, your score is 190. The CQ DX Countries List and the CQ Zone List constitute the official lists. The lists are available on the DX Marathon web site. In the case of ties, the operator whose last scoring contact was earlier chronologically will be judged the winner. Decisions of the Marathon Manager are final.

Submissions: Submissions must be made electronically, via e-mail to <scores@dxmarathon.com>. A Microsoft Excel® template into which contacts may be entered is available for download from the CQ DX Marathon website at <<http://www.dxmarathon.com>>. The website also provides other options for those without access to Excel®. **All scores must be received by January 10 following the close of each DX Marathon.**

Verification: QSLs are not required. The operator is expected to claim contacts only from stations the operator has every reason to believe are legitimate, and only to claim contacts in which an accurate two-way exchange was clearly accomplished (see Appendix for further explanation). Scores will be adjusted by the DX Marathon committee for claimed contacts with pirates or any station not considered legitimate. Submissions may be penalized or voided in cases of fraud or poor sportsmanship. Submissions that do not provide detailed descriptions of Formula class antennas (type, height and length, for example) to clearly demonstrate that the antennas meet the rules and the intent of Formula Class may be re-classified to Unlimited class. Decisions of the Marathon Manager are final.

Clubs: Clubs are strongly encouraged to use the framework of this contest for intramural and regional competitions.

Results: The final listing of official scores and winners will be published in CQ Magazine. The scores will also be posted on the DX Marathon website approximately one month after the results are published in CQ magazine.

Awards:

Plaques: The CQ DX Marathon Committee will award plaques as follows: Highest overall score in Unlimited Class; Highest overall score in Formula Class; Highest overall CW, Highest overall SSB and Highest overall Digital only scores; Highest overall score for each of the 6 Continents; Highest overall score for single band entries for the 10, 12, 15, 17,

20, 30, 40 and 80m bands. Plaques for CW, SSB, Continent and Band winners are awarded regardless of Class and will only be awarded if the winning scores in those categories are at least 50% of the score of the overall DX Marathon Unlimited Class winner. Entrants may receive only one plaque per year. In the case of a participant qualifying for more than one plaque, that participant will receive a plaque for the highest level based on the above order.

Certificates: Certificates are awarded to qualified participants in this order: Highest overall score in each CQ Zone; Highest overall score in each Country; Highest overall score in the Formula Class 10 watts or less option. Plaque winners are not eligible for certificates. Only one certificate will be awarded per entrant. In the case of a participant qualifying for more than one certificate, that participant will receive a certificate for the highest level based on the above order.

In all cases, the rulings of the CQ DX Marathon Manager are final.

APPENDIX

Formula Class antennas, option 1:

Operators selecting the 10 watt option are limited to antennas on a single tower and whose height does not exceed 65 feet or 20 meters above ground elevation within 330 feet or 100 meters of the tower base. Wire antennas may also be used but must meet the criteria of the 100 watt option, and may be tower-supported at only one point.

Formula Class antennas, option 2:

Antennas for operators choosing the 100 watt option must be either simple verticals or wire antennas lacking significant gain. No arrays are allowed, whether vertical or horizontal. **Wire antennas, regardless of type, may not exceed 130 feet or 40 meters in length, may not be higher than 65 feet or 20 meters above ground at any point of the antenna and may be tower supported at only one point. The tallest point of vertical antennas used may not be higher than 65 feet or 20 meters above ground.** Yagis, quads and rotatable dipoles may not be used in this category. There is no limit on the number of antennas that can be used as long as each antenna meets the above criteria.

Contacts: Each contact for a claimed country or zone must be a solid contact. The station claiming a contact with another station is expected to have had his or her call sign fully and accurately received and transmitted by the other

station, and to have copied his/her own call being correctly sent by the other station. For example, K2MGA may not claim credit for a QSO with a DX station who had his call as K3MGA, even though in many cases the DX station

would QSL the contact with the correction made (after receiving a card from K2MGA, realizing the error and correcting his/her log). For a contact to count, both stations must correctly copy all of both call signs.

Thanks to our Plaque Sponsors!

Our thanks and appreciation to the plaque sponsors:

Top Unlimited Class score: Northern Illinois DX Association
 Top Formula Class score: Northern Illinois DX Association
 Top CW only score: Bencher, Inc.
 Top SSB only score: Collins Amateur Radio Club in Memory of Art Collins, W0CXX
 Top Digital only score: NN6NN RTTY Team
 Top Single band scores (10, 12, 15, 17, 20, 30, 40, 80): Araucaria DX Group.
 Top Continental scores: Sponsor wishes to remain anonymous.


Additional plaque sponsorships are available. If you or your club would like to sponsor a plaque, please contact the DX Marathon administrator, John Sweeney, K9EL, via <info@dxmarathon.com>.

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AN762 (140W)	EB27A (300W)
EB63 (140W)	EB104 (600W)
AR305 (300W)	AR347 (1000W)



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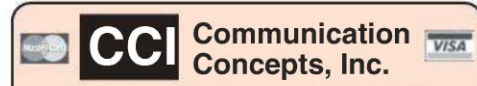
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PSC-4H Set 2000W PEP
PSC-4H5 Set 5000W PEP



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Are We Becoming a Throw-Away Society?

Recently we had a situation at my office that I would like to relate in this column. We have an expensive printer that suddenly failed (with a loud “click” or “snap”). Power was okay, but the unit would not feed paper or print, and the red fault LED kept blinking. The immediate solution from most people at the office was “Well, I guess it’s time to get another one.” Since this is a unit that cost more than \$2000, I was not particularly happy. “I think we should try to fix it,” I said. The result was just short of horror! “Fix it? Who does that anymore? You also have no idea how it works. It’s probably very complex, so why even bother. Parts are most likely not even available, so stop wasting time and just buy another one. A new one will almost certainly be better anyway.” These were the typical comments.

Since I am an experimenter and curious by nature, I ignored all such comments and proceeded to open the unit. After removing many screws and unclipping complex pieces of plastic that snapped together, the problem became obvious. A plastic drive gear had, for some reason, lost some of its teeth and could not engage its neighboring gear. This stopped the print cycle and was the direct cause of the problem. A call to a couple of repair centers resulted in one actually having a spare part (amazing). They would be glad to replace it for us, for a measly \$150 service call, or I could buy it, but with no guarantee, for \$15. Obviously, the latter is exactly what I did, and within an hour after receiving the part we were up and running again (\$135 saved, but if you consider replacing the entire printer, \$1985 saved).

The reason I relate this story to you is it seems that we are becoming a throw-away society. Repair shops are few and far between these days, and the answer to almost every problem is to “throw it away and buy a new and better replacement.” I wonder if this is really true, however.

My amateur radio station consists of a Kenwood TS-830S and all of the various accessories that go with it, circa 1980. It has a bunch of semiconductors, but it also has a 12BY7 driver and two 61416 finals (not fancy MosFETs). You also have to “tune it up” every time you change bands. When something fails, however, you refer to the service manual, locate the defective part, and then replace it. You do not need a microscope to locate the tiny surface-mount part or a micro-tip soldering iron, since you can easily see all components and they all have leads. You also do not need a course in microprocessors or an extensive knowledge of programming. The rig works quite well and has controls that have a “feel” to them that a touch screen cannot equal. The fact that it has lasted for more than 30 years and can still give many of the new “state-of-the art dream rigs” a real run for their money indicates that everything new (and far more expensive) is not necessarily better.

Keep in mind that when you attempt to repair something you run the risk of actually learning something! You also can save a lot of money (\$2000 in my printer example above). Many times you also can actual-

ly improve the “defective” item you are attempting to repair. Remember, in the “old days” almost everything a person owned would be repaired, and this went from electronic devices to clothing. Most drug stores had a tube tester available and a stock of common tubes for sale. Tailors were abundant, as were shoemakers.

Today, when one does require a service call, as much as \$100 is spent just for someone to look at the problem. To then fix it can easily up the cost to labor plus parts plus an additional 15 to 20% markup for parts. If you attempt the repair yourself, you might fix it or at the very least (as my father used to tell me), when all else fails you can still call someone to fix it. If you do try, you most likely will at least learn what the problem is, and when the repair person does show up, you can direct him or her to the problem. From my experience, sometimes the repair person is actually annoyed that the customer is “in the know.” I even had one person refuse to work on a problem we had with our heating system when he heard that I was an engineer. As it turns out, the problem was not even electrical, but a faulty valve. Who knows what the cost would have been if I were not “in the know”?

In a similar vein, the new “modern state-of-the-art” products are often complex and not even easy to adjust when everything is working properly. I have seen amateur transceivers that have so many functions per knob or button that you need a portable user’s chart just to operate them. This to me seems like “technology for technology’s sake.” I believe that somewhere in the design phase for such equipment an engineer is thinking, “Look how clever I am.” This is not just for amateur radio gear, either. Have you tried to program a new TV or DVD player or a complex cell phone? There are even entire companies that exist to just help people install and set up their new device (and these have plenty of customers). This to me seems to indicate where we are going and reminds me of a science fiction story I read many years ago:

It seems that an extra-terrestrial survey team comes upon a planet (Earth?) that has a huge electronics complex of interconnections that cover the entire globe. Every point is covered by video, audio, and data terminals, and the degree of sophistication is amazing. There are no people remaining, however, and the questions are “Where did they all go? Why did this obviously ultra-modern, highly technically advanced society die out?” The answer, when it is finally found, is that in all of the complex electronics and circuitry a single resistor failed, but no one had the basic knowledge to locate and repair it (or for that matter, what a resistor was). Everyone was far too “sophisticated” to even consider such a lowly task and just assumed that it would take care of itself. Let’s hope that we do not evolve in this way.

At this time I would like to wish all of my readers a very happy holiday season, and as I have said for the past 35-plus years in this column, “I sincerely hope all of your dreams and wishes come true in the days ahead.”

*c/o CQ magazine

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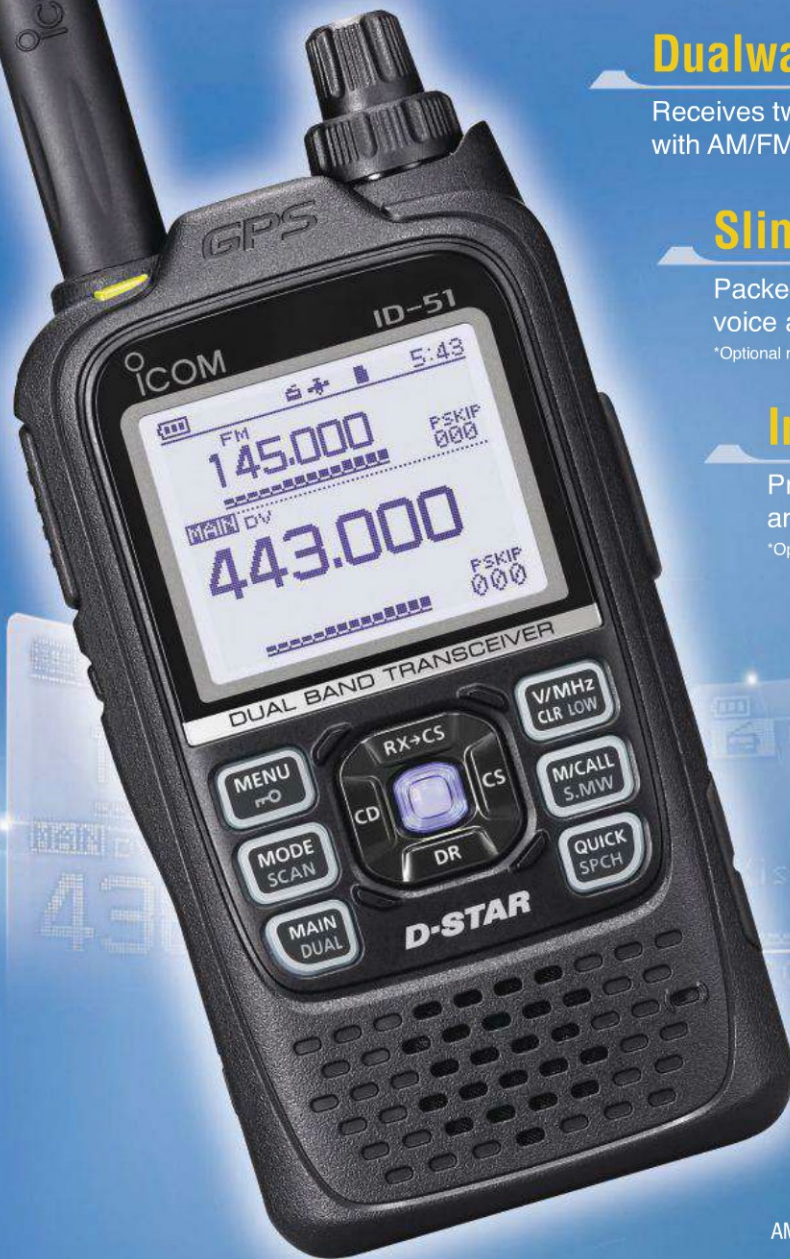
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ICOM

Resilience, Hope, Reorganization, and Preparation

This month we bring you inspiring stories of radio amateurs who have weathered the storm or are preparing to do so—hoping for the best, preparing for the worst, and taking what comes. This is the essence of EmComm.

Katrina and Isaac: Uneasy in “The Big Easy”

By Roberto A. Dabdoub, KB5AVY

Katrina. It was exactly seven years ago to the day that she ravished my home in Metairie, Louisiana. It’s a 1960 ranch-style house that, all this time later, I was still trying to restore.

Then, Isaac. He was a Category 1 hurricane that dealt yet another crippling blow to my already weakened antenna system. It was August 29, 2012.

My 50-foot tower and 440-MHz repeater antenna—reduced to chunks of twisted metal—are found leaning against an oak tree in my back yard (photo A). They’re just like my flood-soaked Cajun accordion, waiting to be repaired so the music can flow again (photo B).

To me, it’s *deja vu*. Here I am, sitting on a wet mattress, soaked beneath a damaged roof, shaking my head in disbelief wondering: *Why us again?* Has God forsaken us? Or have we forsaken the Lord? I’m beginning to believe the sermon of one of our religious leaders: *The cleansing waters of Katrina were needed.*

Just a few days earlier, I was juggling between my three repeaters, the audio feed to Radio Reference, Shoutcast, and all the apps to control them. My grandchildren played with their iPads, walkie-talkies and choo-choo trains.

Then, with the car speedometer clocking a raging five-miles-per-hour, we’re running away from home like headless chickens with alligator legs. Through the swamps, we find safety in some Cajun town along the Atchafalaya Basin, along some forgotten place surrounded by dreadful RF-sapping moss trees.

“The storm is heading your way,” I hear on the car radio speaker, wirelessly connected to Echolink. No one can imagine the anxiety, the fear we experience around here when a hurricane enters the Gulf of Mexico. “A real Montezuma’s revenge,” my mother used to say.

We just don’t know what these storms are going to do anymore. Worst of all, we don’t know with certainty where they are going. I feel like a sheep chased by a guard dog. I’ve been there and done that. One time we ended up right in the eye of the storm and had to turn back.

To the superstitious, it looks as though the storms have some sort of a mission, reminiscent of Randy Newman’s song “Louisiana 1927” . . . “They’re trying to wash us away.” (**LISTEN:** To

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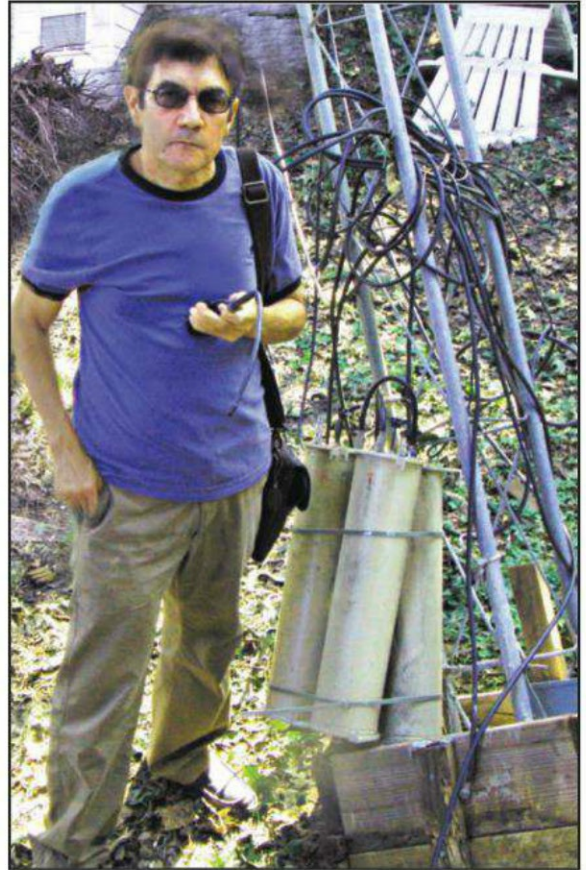


Photo A— Roberto Dabdoub, KB5AVY, stands beside the remains of his 50-foot tower in Metairie, Louisiana, recipient of a one-two punch from Hurricanes Katrina and Isaac on August 29—2005 and 2012, respectively. (Courtesy of KB5AVY)

Randy Newman’s ‘Louisiana 1927,’ <<http://bit.ly/VPhoXL>>.—KB5AVY)

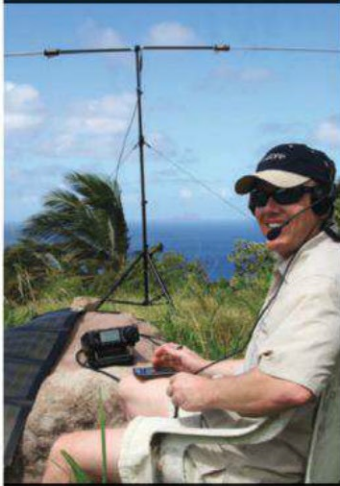
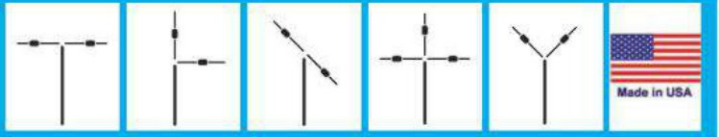
Amateur radio is becoming more *uneasy* in The Big Easy. Yes, we helped with communication during Hurricane Katrina and ham radio proved once again that when everything else fails, our *old fashioned communication* is more effective than the cellular network and police radios.

My UHF repeater did exactly what it was designed for and supposed to do. It stayed on the air and from a high, secure place repeated signals from below. In the aftermath of Katrina, it was used 24/7 with search-and-rescue operations. The signal from 444.150 MHz was heard all the way to Baton Rouge, some 70 miles away. During this critical time, KB5AVY became one of the few links between New Orleans and the outside world. We were lucky, because we never lost power. *Hey, the Lord had not forsaken us! No matter what the reverend said.*

Seven years after Katrina, amateur radio here is alive, but struggling. Sixty percent of the ham



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operators who evacuated the area during Katrina never came back. Repeaters were practically abandoned by clubs and owners and often taken over by scavengers—legally or illegally—with good-hearted intentions. They wanted to bring back ham radio to The Big Easy at any price. Before Katrina, I remember giving out more than 500 access codes to one of my UHF

repeaters. Five minutes wouldn't go by without someone being on there talking.

Today, I find myself *kerchunking* to see if the machine is still alive. Historically, repeaters come and go in this Crescent City of ours. They move as erratically as the mud bugs that crawl in the bottom our bayous.

It takes persistence, you know. Other parts of Louisiana had much better luck

than New Orleans. After Hurricane Katrina we needed even more dedication and courage. There was hardly anyone around to test the repeater. I felt sort of like Don Quixote de la Mancha fighting the windmills of despair.

A few days ago I called a friend on the repeater and later realized he had already passed away. *CQ, CQ, is anybody there?*

"You should have opened your squelch all the way to generate some white noise," my wife said, laughing. I am sure she loved that.

I don't want to give you the wrong impression. We have plenty of people here who still love amateur radio. We just need to get them synchronized.

During Isaac, amateur radio played its role again, providing important information through various links, including to the National Weather Service. Radio Reference played a very important role as well, with those who needed to get back and couldn't access the repeaters. Wind damage and extensive power outages were our main problem. My solar panels? *Nowhere to be found!*

One VHF repeater is now perpetually linked to the Echolink Ireland conference, so there is definitely some QRM. I'm starting to lose my Cajun-French-Spanish accent. *LOL!*

Sporadically you hear some local activity. Some antennas are beginning



Photo B—KB5AVY's tower and 440-MHz repeater antenna are "just like my flood-soaked Cajun accordion, waiting to be repaired so the music can flow again," he writes. (Courtesy of KB5AVY)

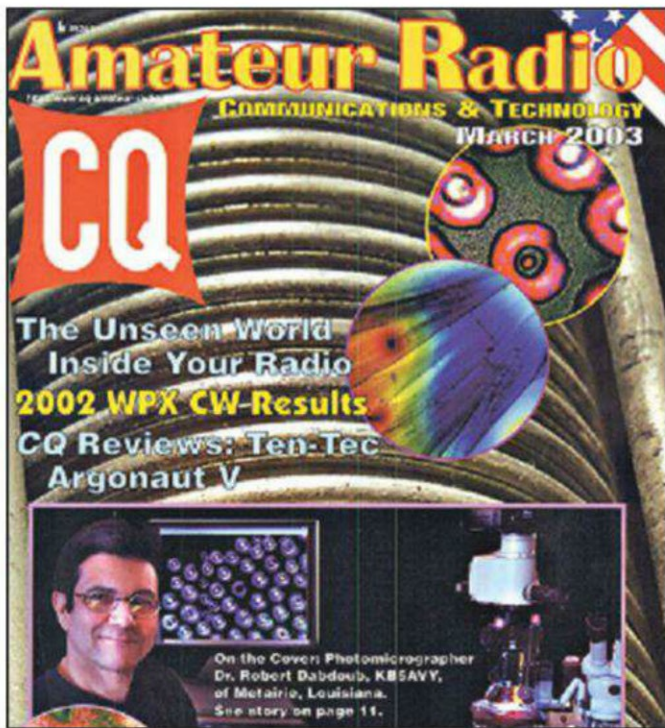


Photo C— KB5AVY-operated repeaters in New Orleans include the 444.150-MHz and 444.975 open auto-patch machines, each linked to 10 meters. Roberto Dabdoub is a genetic scientist, psychologist, and author, featured on the cover of the March 2003 edition of CQ.

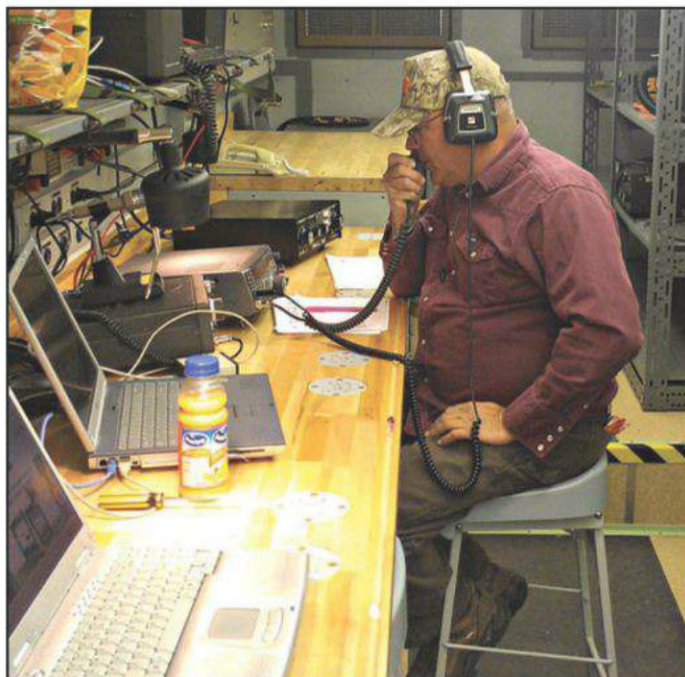


Photo D— Ernie Smith, AAM8CO, is one of the first operators on a new Army Military Auxiliary Radio System (MARS) network under development using military architecture to link the 50 states with the Pentagon. From his strategic position in the Bighorn County, Wyoming emergency management trailer, Smith copies traffic originating anywhere from Florida to Washington state, primarily digital. (Courtesy of N4AHQ)

to dot the skyline—something to look at besides the daunting haze that hangs over Lake Pontchartrain. Lately, VHF has been quite active also, just like in the early days of radio in the French Quarter. New radio clubs are forming and old clubs are regaining their strength.

Hurricanes are not going to *wash us away*—no matter with the song says (photo C).

Realigned: Hams Assume Management Role at Army MARS

By Bill Sexton, N1IN

This is the Army Military Auxiliary Radio System of today, and tomorrow.

MARS Chief Stephen G. Klinefelter announced a major leadership realignment at a conference of the auxiliary's Region Directors three-day conference, September 12–14. Under the terms, radio amateur volunteers assumed day-to-day management responsibility previously exercised from the MARS headquarters at Ft. Huachuca, Arizona.

“You will tell us if you can take on a task and you will tell us the resources you need,” Klinefelter told the leaders at their meeting in Dallas. “Our responsibility at headquarters will be to provide the training and the resources to support you.”

Specifically, each of the auxiliary's 11 regions (10 in the U.S., one overseas) will be under the command of its director. Together the 11 directors will form a policy-making “governance executive board” for the auxiliary as a whole.

It's a striking revision of the military's traditional top-down chain of command, and it was symbolically activated at the first national leadership conference in MARS's 87-year-history.

MARS, a Department of Defense-sponsored program, primarily consists of licensed amateur radio operators who are interested in assisting the military with communications on a local, national, and international basis. It has a long record of providing worldwide auxiliary emergency communications during times of need (photo D).

In Dallas, there was no formal vote of realignment acceptance, but the RDs, as they're known, left little doubt. They immediately set about reviewing and updating policy and

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enlarged the "Chief's Special Staff" of volunteer specialists.

In a closed session they were briefed by a Department of Defense staffer on recent Army MARS mission enhancements. An Executive Order issued by President Obama on July 6 had mobilized the entire federal establishment to tighten up preparations against cyber intrusion.

Like battalion and company commanders in the active-duty Army, the Region and State Directors follow Army-wide policy. Chief Klinefelter's innovative region-centric architecture doesn't just reconfigure administration; it spotlights Army MARS as a survivable last-resort communications tool in any national-level calamity.

A regional command that is accustomed to operating on its own in normal times is unlikely to be sidelined if cut off from headquarters communications in time of crisis. That "self-healing" capability was said to have figured in the auxiliary's updated DoD tasking.

Army MARS reports to the Network Enterprise Technology Command (NETCOM), which manages Army computer networks and communications systems worldwide. Chief Klinefelter, who retired as a full colonel in the Signal Corps after 31 years, returned to

NETCOM as a senior civilian employee and is Deputy Operations Officer G3. He added the MARS post last spring.

"The Dallas conference greatly exceeded my expectations," Chief Klinefelter said. "This one being our first, there were no guarantees that the board would work together. Until you do it, you don't know. Now, we all are looking forward to the future of the program, not just the next meeting."

Looking ahead, Chief Klinefelter had a couple of priority *to-dos* for his board:

- Build "seamless" interoperability with U.S. Air Force and Navy-Marine Corps MARS

- "Recruit younger members." "You're in charge," Chief Klinefelter told the RDs. "You're responsible."

(IN DEPTH: More details of Army MARS's recent realignment appear in "The New 2012 Model Army MARS: Overhauled for Cyber Competition," in the December edition of WorldRadio Online magazine, <<http://www.WorldRadiomagazine.com>>.—K16SN)

Season's Greetings . . .

From everyone on the *CQ Public Service* team, we send you the warmest of holiday greetings and best wishes for the happiest, healthiest of New Years.

73, Richard, K16SN

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"Ham Nation"—You Gotta See This!

In the early '90s I got questions about whether amateur radio could survive the internet. As home computers burst on the scene, more than one "naysayer," even in the FCC, told me that by the end of the decade amateur radio would die off as the internet grew worldwide. Hard to believe, huh?

As Rich, W2VU, has mentioned in this magazine before, amateur radio has been "successfully dying" for quite a while. Now it looks as if we have "successfully died" again, this time in the internet age! We have more licensees than ever. Amateur radio is fully integrated with the internet. In fact, each enhances and serves the other. Thus, I will now add the prediction that "amateur radio will die off as the internet grows worldwide" to a rather long list of my favorite predictions from the past. I collect these things and I could go on for pages, but here are my personal favorites:

- "We don't like their sound, and guitar music is on the way out." Decca Recording Company, explaining why it rejected the Beatles in 1962.
- "Who the hell wants to hear actors talk?" H. M. Warner, Warner Brothers, 1927.
- "I think there is a world market for about five computers." Thomas Watson, IBM Chairman, 1943.

The internet is actually one of the best things that has happened in amateur radio. I say "in" amateur radio and not "to" amateur radio because amateur radio was in a sense the first internet, certainly with CW. From the plethora of logging

programs, to PSK-31 and all the other digital modes, CW skimmers (not that I will ever use it; I'll skim my own radio signals, thank you very much. And I don't have a smart phone and my DVD clock has been blinking for nearly four years, I am proud to say!).

We also have computer remote station control, DX spotting, contesting and logging, D-Star, Logbook of The World, EchoLink—the list could go on and on. Logbook of The World, for example, grows every day and makes QSLing available to the world in spite of postal problems and cost. Of course, too, the integration of amateur radio and the internet into emergency communications is the subject of entire books.

Specifically on the idea of amateur radio and the internet serving each other, please take a look at a program called "Ham Nation." This internet program started in 2011 and has already been responsible for several hundred new licensees coming into the service. You gotta see it! As of this writing there are 67 programs on ham radio covering everything from general explanations and overviews of ham radio to soldering, antennas, and digital communications. You name it. If it's related to amateur radio, it's on there. It is an incredible learning tool available to everyone in the world who has access to a computer.

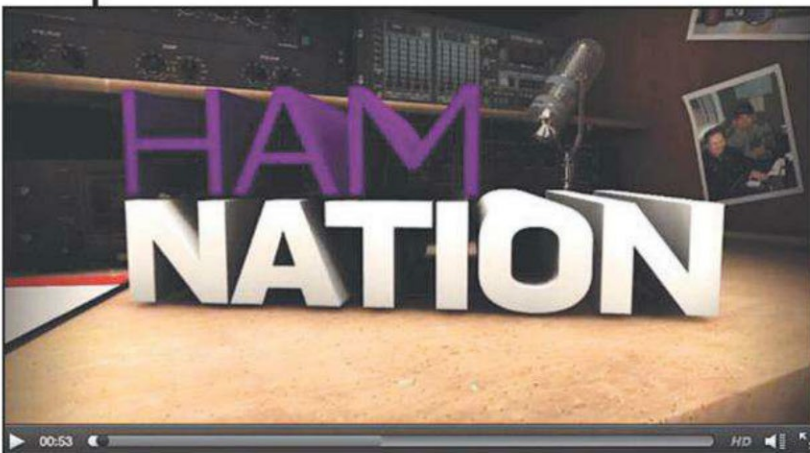
Ham Nation is hosted by Bob Heil, K9EID; Gordon West, WB6NOA; George Thomas, W5JDX, and his "Smoke and Solder" segments; Julian Frost, N3JF; Cheryl Lasek, K9BIK; Amanda Alden, K1DDN; and Don Wilbanks, AE5DW, from *Newsline*. Joe Walsh, WB6ACU, even wrote and plays the theme song for it. The program appears weekly on Leo Laporte's TWIT (This Week in Technology) network, a wonderful resource in itself for those of a technical bent. Leo's "Tech Guy" program is aired each weekend on 160 radio stations throughout America on the Premier Network. Leo invited Bob Heil to host a program on the network and not only was Ham Nation born as a result, but it convinced Leo to get a ham license himself! Ham Nation is broadcast live every Wednesday from 8 to 9 PM Central time, but you can access all the previous programs easily *anytime*.

Ham Nation is easy to access and here's what you do. Put "Ham Nation" into Google or your search engine and that will bring up the program home page. You then can watch each of the archived shows. Clicking the "Watch Live" tab will take you to the live show airing on the TWIT network at the time. On Wednesday nights at 8:00 Central you can watch Ham Nation live.

It's always fun to get in a few minutes early and watch the show being put together. Ham Nation

*C/O CQ magazine

e-mail: <k4zdh@cq-amateur-radio.com>



"Ham Nation," hosted by Bob Heil, K9EID, and Gordon West, WB6NOA, airs weekly on the internet. (Internet screen grab)



Ham Nation is part of Leo LaPorte's "This Week in Technology" (TWiT) network.

is also available as an audio podcast and is available in iTunes. I have not tried the live broadcast, but that's how you can get it real time.

All the programs are archived, and here's how you can go to previous broadcasts of Ham Nation, which is easier for me, because they are always there and can be stopped and started at your convenience. That's just me, I guess. I even tape "Dexter" and "Homeland" on TV to watch later.

Let's review some of the programs. In episode #13 we see Leo, now a newly licensed W6TWT, working his first contact. Episode #14 shows the guys all helping Leo build a 40-meter dipole. Look at Episode #53, "The Night Before Field Day." This program is about stringing an antenna with a potato gun, coiling coax, resistors and Ohm's law, plus other radio topics. This episode is about an hour long and covers many other topics besides Field Day preparation.

At least half-a-dozen hams participated in this single show. As usual, with anything these guys do, the episodes are first class and a lot of fun, in addition to being very, very informative. You have to see this one episode and it will give you a flavor for them all. Just the part with Julian, N3JF, explaining a cool way to coil coax and other cables without disconnecting the ends is worth the whole show. I could have avoided an awful lot of cussing over the years if I had seen that as a Novice back in the '60s!

Get these programs and click on what you want—large or small HD version or just audio as shown under "Download." My favorite so far is the very first show, which is an hour of talking with the Eagles' Joe Walsh, WB6ACU. Anyone who doesn't get a kick out of these shows should be retested by the FCC (just kidding, sorta).

Now let me say this: I haven't seen a verbal description yet of getting on an internet program that worked exactly as had been hoped. I hope this one does. If not, I'll take responsibility, so e-mail me and I'll call you and walk you through it if after you've played with it you just can't access it.

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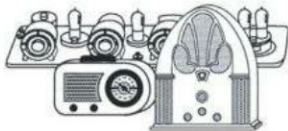
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FCC Proposes Relicensing Former Hams without Retesting, plus Other Changes

On October 2, the FCC released a Notice of Proposed Rulemaking (NPRM). It is WT Docket No. 12-283 and seeks to revise our rules to, among other things, allow former amateurs to be relicensed without needing to be retested, and requires that VECs give permanent credit to licensees for examination elements they passed, rather than the present allowance of 365 days.

The NPRM also proposes to shorten the renewal grace period from two years to 180 days, permit Time Division Multiple Access (TDMA), reduce the time before a callsign becomes available for reassignment to six months instead of two years, and to reduce the number of Volunteer Examiners (VEs) required to give an exam from three to two. It also asks for comments on whether to allow observation by VEs when exams are held at remote locations by audio and video systems to assure proper conduct and necessary supervision, rather than in person. Comments must be filed within 60 days after the NPRM appears in the Federal Register, which can take up to six weeks.

We will explain the proposals in more detail in a future issue, but let me preach a little right now! Please do two things: *Read the NPRM before you file anything*, look at the FCC's reasoning behind the proposals, and *then file* comments, whether you support or object. In other words, don't rely on



summaries, word of mouth, or on-the-air pontifications (especially ignore on-the-air pontifications).

I think the amateur service should still be embarrassed—I know I am—over the fact that in the rulemaking to eliminate the Morse code requirement for a license, *fewer than 1% filed anything*. That was perhaps the most important rulemaking in the history of the service, and 99% of you said *nothing*. I have never yet heard a complaint about the requirement for Morse code being eliminated and gotten a “yes” answer when I asked the person whining if he or she had filed anything in the proceeding.

At least if you aren't going to file anything, please don't complain about the result. There's an old saying (I said it yesterday) that if you don't vote, then you get the government you deserve. Well, folks, the same principle applies to the amateur radio rules.

The web page has an index of all the Ham Nation programs, but keep in mind that each program has a lot more than what is shown in the outline. The little outline is just the highlights. The enthusiasm in each one is as exciting as that of QRPers, and in each program it is contagious.

Some of the most fun in watching Ham Nation is to join the chat room during the show by checking in at irc.twit.tv. The end of each show actually sequences into the live nets—yes, nets!—on 7.268 and 14.268 with WT6H, K5LN, K1LTJ, KØHYD, and K1DDN. There is also a net for D-Star as well as other digital modes. These nets have had over 100 check-ins and are becoming a major part of the Ham Nation movement.

There isn't space here to describe every episode, but just let me say I'm hooked. The first program was broadcast on May 25, 2011. There are programs that cover emergency communications, ham radio basics such as dipoles and soldering, power supplies, satellites, EchoLink, Field Day prepara-

tion, antenna launching guns, ham radio on the *Queen Mary*, which radio to buy, MFJ factory tours, and a great interview with MFJ founder Martin Jue.

There are also programs on how to work a pile-up, DIY projects, the Dayton Hamvention® and other hamfests, equipment reviews, ham radio news, mobile HF antennas, the theory of the phased array (a very interesting tutorial), viewer-submitted videos, remote ham radio operation, and countless other tutorials and summaries, plus a lot of video footage of really cool equipment.

You just gotta see this; scroll through the programs. Ham Nation will be to ham radio what the Khan Academy (www.Khanacademy.org) is to learning in general for the entire world—a wonderful, free resource for all of us.

Well, just my opinion, but I'd say we survived the internet pretty darned well, so go reward yourself by enjoying amateur radio and (you knew this was coming) repeating to yourself my simple and easy-to-remember monthly sermon: Every gift of lasting value comes with responsibility. ... -.- K4ZDH

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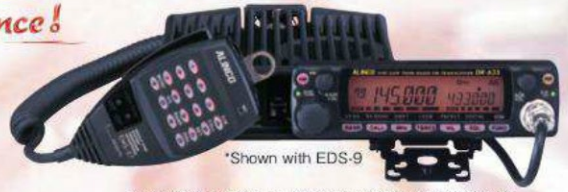
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What You've Told Us...

Our September survey asked about your *CQ* magazine reading habits, and 82% of our respondents were reading the print edition while 17% were reading the digital version. [Note: Among online respondents—about 1/3 of the total—55% were reading the digital edition.]

Just over three-fifths of you (61%) prefer to read *CQ* from cover to cover, followed by 29% who read selected articles first, 5% who read *only* selected articles and 5% who start at the back of the issue.

Asked about reading *any* magazines or newspapers online, 43% of the respondents said they do not, and have no interest. However, 30% said “yes, occasionally” while 24% said “yes, regularly,” and 4% answered “not yet, but plan to.” Among online respondents, 80% answered yes to this question.

On the question of what device(s) you use to read magazines and newspapers online, after factoring out those who don't, 77% use a desktop or laptop computer, 23% use an iPad, 11% each use an Android-based tablet or their smartphones, and 4% use something else. Nearly half of these same readers (44%) prefer their online publications to be formatted just like the print version, while 20% favor a customized format, 19% say content matters more than format, and 10% like a customized table of contents page that links to traditionally-formatted articles.

Asked how their buying decisions are influenced by being able to go to an advertiser's website with a single tap or mouse-click, 60% of respondents say it makes it easier to get more info for making a decision, while 24% say ease of access does not affect their decisions and 7% say that single click makes them more likely to make a purchase.

Finally, we asked readers where they prefer to go when clicking on a link in an ad or typing in a URL they see in a print ad - 63% want to go to a page that is specific for the advertised product while 19% prefer going to a company's general website.

Thank you for your responses. This month's free subscription winner is John Gawronsky, K1JG, of Athol, Massachusetts.

Reader Survey December 2012

We'd like to know more about you—about who you are, where you live, what kind(s) of work you do, and of course, what kinds of amateur radio activities you enjoy. Why? To help us serve you better.

Each time we run one of these surveys, we'll ask a few different questions and ask you to indicate your answers by circling numbers on the Survey Card and returning it to us. As a bit of incentive, we'll pick one respondent each month and give that person a complimentary one-year subscription (or subscription extension) to *CQ*.

The FCC recently proposed some significant changes to amateur licensing rules and examination procedures (see “Riley's Ramblings” in this issue). The full text of the NPRM may be downloaded from <<http://fcc.us/UyoPIS>>. We'd like to get your views on some of the proposed changes.

Please answer by circling the appropriate numbers on the reply card or by going to the following web link <www.surveymonkey.com/s/CQDec12> [From the digital edition, just click on the link].

- 1. The FCC has proposed granting lifetime credit for all exam elements passed, allowing former hams to regain their licenses without retesting. How do you feel about this idea?**
 - Favor strongly29
 - Favor somewhat30
 - Neither favor nor oppose31
 - Oppose somewhat32
 - Oppose strongly33
 - Not sure yet34
- 2. The Advanced Class license is no longer being issued, although current Advanced Class licenses are being renewed. What should the FCC do regarding former Advanced Class licenses? (Select one)**
 - Former holders should be relicensed as Extras35
 - Former holders should be relicensed as Advanced (as if it were a renewal)36
 - Former holders should be relicensed as Generals37
 - Former holders should not be relicensed without retesting38
- 3. The Novice Class license is no longer being issued, although current Novice Class licenses are being renewed. What should the FCC do regarding former Novice Class licenses? (Select one)**
 - Former holders should be relicensed as Technicians39
 - Former holders should be relicensed as Novices (as if it were a renewal)40
 - Former holders should not be relicensed without retesting41
- 4. The FCC has proposed reducing the minimum number of Volunteer Examiners at a test session from three to two. How do you feel about this?**
 - Favor strongly42
 - Favor somewhat43
 - Neither favor nor oppose44
 - Oppose somewhat45
 - Oppose strongly46
 - Not sure yet47
- 5. The FCC has proposed allowing some test sessions in hard-to-reach places to be supervised remotely by VEs using video and audio links (see NPRM at <<http://fcc.us/UyoPIS>> for details). How do you feel about this?**
 - Favor strongly48
 - Favor somewhat49
 - Would want to see a pilot program first50
 - Neither favor nor oppose51
 - Oppose somewhat52
 - Oppose strongly53
 - Not sure yet54
- 6. The FCC has proposed broadening its list of permitted modes to include Time Domain Multiple Access (TDMA) digital transmissions. How do you feel about this?**
 - Favor strongly55
 - Favor somewhat56
 - Neither favor nor oppose57
 - Oppose somewhat58
 - Oppose strongly59
 - Need to know more about it before deciding60

Thank you for your responses. We'll be back with more questions next month.

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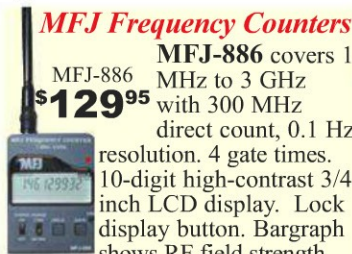
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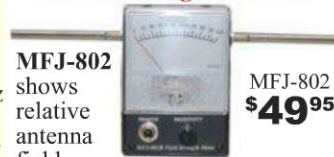
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Of Salt Water and Seriously Fine Little Radios

plus a Brief History of Software Defined Radios

In my last column I presented some little works of art which were, coincidentally, working radio transceivers—not surprising, since amateurs of all varieties take great pride in their gear, especially the pieces they’ve built themselves. One of the rigs in that article was an MTR designed by KD1JV and packaged in a clear plastic box by Steve Russell, K7SL. Steve kindly sent me photos of some of his other creations, one of which you can see in photo A. This is an ATS-2, also by KD1JV. Most of these rigs are packaged in Altoids® tins, but K7SL felt this rig deserved something better. To this end, he rolled his own box out of PC board material but made the top out of Plexiglas® so the artwork within could readily be admired. Included in the box are a keyer paddle and small LiPo battery. The paddle is a Mini-B miniature single-lever paddle by American Morse Equipment (<http://www.americanmorse.com/index.htm>)

This sure makes a pretty and useful little package! If you have a favorite rig that you’re especially proud of, don’t hesitate to send me a picture so I can show it off here on the pages of *CQ*!

Exploring the “Salt Water Amplifier”

If you’re interested in contesting, you’ve no doubt read about a contesting team that calls itself “Team

*1959 Bridgeport Ave., Claremont, CA 91711
e-mail: <qrp@cq-amateur-radio.com>

Vertical.” These guys troop off to a select location somewhere in the Caribbean and set up on a beach with nothing between them and their target audience but a salt-water ground plane. Whereas DXpeditions and traveling contest groups traditionally haul towers and beams with them, more and more they’ve been depending on vertical arrays set up next to the ocean’s edge. Why not? The salt water provides an almost perfectly conducting ground plane in the near field, in the far field, and beyond. With a pair of phased verticals you can get good gain and a very low take-off angle, all with a substantial weight savings over a tower/beam combination.

It turns out you don’t have to be a big-gun tester to take advantage of Mother Nature’s RF mirror. Several QRPers have explored the benefits of operating on salt water, as has been documented in contest soapboxes. A couple come to mind: Paul Stroud, AA4XX, journeyed to Topsail Island off the North Carolina mainland and set up so he could shoot his signal westbound over the water from an east coast QTH. Also, Bill Vanderheide, N7OU, has been known to set up on the western shore of Tillamook Bay in Oregon so he can return the favor, launching his signal eastward.

As luck would have it, this past July my wife and I went to visit relatives at their beach house on the Oregon coast. This house is located on an overgrown sand spit we like to refer to as “Shifting Sands Acres.” The spit forms the outside of Siletz Bay, a large, salty body of water at high tide. It’s pretty much a mud flat at low tide, but no matter, it gave me a chance to try out the “Salt Water Amplifier.”

Photo B is of me, set up and operating in front of the house. At this spot the ocean is about a hundred yards to the west and was of no apparent benefit because I never heard a signal from that direction. At some time in the past my nephew and friends dragged a phone-pole-shaped piece of driftwood up from the beach and planted it front of the house, thinking it would make a nice natural flagpole. I never saw a flag flying from it, but it did make a handy support to which I could lash a Jackite pole. The pole supported an end-fed half wave for 20 meters. I made a few contacts from this location, but nothing to write home about. Later the same day I went to the bay side of the spit and set up the pole with the EFHW right next to the water, hoping to launch my signal eastward. Photo C shows the setup—same antenna, same radio, different results. The band seemed livelier with more background noise, and contacts came more easily.

The next afternoon I was back at the setup next to the house and conditions were just miserable.



Photo A— This ATS-2 was built and packaged by Steve Russell, N7SR. Steve’s homebrew enclosure includes the transceiver board, a keyer paddle, and battery.

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Photo B— A rare sunny day on the Oregon Coast, custom made for portable QRP ops.

W1AW code practice was coming in at a pretty lousy but steady S2. It occurred to me that I could change location to the bayside QTH and make a comparison, so I dropped the antenna, hopped on a bike, pedaled over to the bay, and set the whole thing back up. Elapsed time was about 30 minutes. W1AW was now running S5 to S7, a distinct improvement. I realize that this is not a rigorous scientific experiment, there being too many variables, but it did confirm what I had heard the previous day.

Next day, new experiment. Sometime during the wee hours it occurred to me that the Reverse Beacon Network could be my friend in this investigation, so I set up in front of the house once again, only this time with laptop in hand. I called CQ on 20 meters. A minute later my call popped up, spotted by WA7LNW in Utah. It reported a signal-to-noise ratio of 2 dB, not a big signal by any means. I called a few more times, but the only report I got was from the same Utah station. Did I say the bands were lousy?

I pulled up stakes and performed the relocation drill again. This time I was back on the air in 25 minutes, an improvement over the last time, but still not good enough for rigorous scientific investigation. No matter. After calling CQ, my signal was spotted not only in Utah but also in Ohio, Pennsylvania, and Texas. I was definitely being heard in more places! After several spots from the Utah station from both my locations, I can report an average of a 10-dB improvement.

The time lag between ops at the two different locations might certainly have played a role in the difference in signal strengths. It would certainly make for more accurate results if I could be at both places at once, but seeing the difficulty in that, I imagine that having two stations set up and manned by two operators simultaneously would suffice. Looks like I

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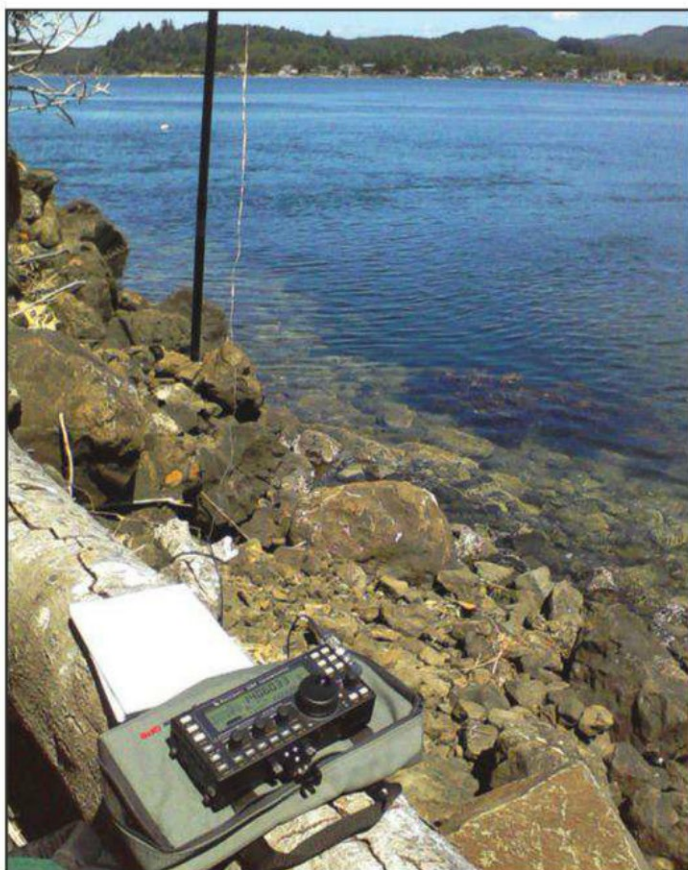
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NEDSP1062-KBD

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*Photo C— A good place to employ the Saltwater Amplifier.*

mated an NE602 oscillator/mixer chip to an LM386 audio amp chip. That's all you needed to make a DC receiver. George Dobbs, G3RJV, of the G-QRP club, so liked the concept that he made a few changes to the design and named it the Sudden Receiver ("The Sudden Receiver," *SPRAT* #58, Autumn, 1989). It lives on today in an improved kit form, still offered by the G-QRP club.

A simple DC receiver has one particularly devilish drawback, however. In a modern superhet receiver, there is an IF in which narrow filters can be used to eliminate one of the incoming signal's sidebands. This is not possible in a simple DC receiver, so both sides of a signal are always present, resulting in the appearance of twice as many signals on the band. From Hayward and Bingham's 1968 article: "One disadvantage of the direct conversion approach is the ever-present audio image. While phasing techniques could be applied, the complexity of such a receiver would make a superhet more practical."

Even as they were introducing this design they were pointing out its biggest fault and suggesting a possible solution.

Fast forward to 1993. Rick Campbell, KK7B, showed us a way to deal with the pesky audio image with his R2, published in the article entitled "High-Performance, Single-Signal Direct-Conversion Receivers," January 1993 *QST*. The technology had finally matured to the point where Hayward and Bingham's original idea could easily be implemented. Campbell used audio phasing techniques to suppress one sideband of the incoming signal. The R2 was tweaked, improved, and quickly became a classic. Single-signal direct-conversion receivers were now easily designed and built. The DC receiver came of age and the real fun is just beginning. Dan Tayloe, N7VE, stepped it up a notch when he designed

his commutating product detector, which then was integrated into the Norcal NC2030 transceiver kit.

Up to this point, the phasing technique—needed to remove the unwanted sideband—was accomplished using analog chips contained within the architecture of the rig itself. The American QRP club started selling its Softrock receiver, which consists of a tiny circuit board connected to a computer. The board contains a mixer which converts the RF to two channels of phase-shifted AF. This is then sent to the computer's sound card. The computer takes over from there, doing the heavy lifting. In recent years, the Softrock receivers have morphed into transceivers and are still available; thousands having been sold. Direct-conversion receivers that depend on computers are now referred to as "Software Defined Receivers," since the computer does the filtering, demodulation, and DSP work. Meanwhile, Flex Radio has come to life, making real-world SDR transceivers that feature phasing DC receivers which rival the current traditional superhets made by the best of the best.

There are now numerous groups involved in the Direct Conversion/ Software Defined Radio world. Many of them are pushing the envelope of what's possible with "phasing techniques" that Hayward and Bingham thought would be complex. Complex they are, but today we have the computing power to take on complex number, crunching problems such as these and make them seem easy.

Technology stands still for no man. Today we have enough compact computing power to be able to shrink the necessary components of the computer so it can reside inside the radio. The new Elecraft KX3 (reviewed in last month's issue of CQ) is an example of a radio that benefits from all of the forego-

ing advances in technology. It is compact, covers all bands from 160 through 6 meters, runs all modes in common usage on the ham bands today, and has a myriad of interference-fighting tools built into its software (firmware, in this case.)

There are lots of bells and whistles built into this little box, but really, how good is its direct-conversion receiver? Most hams depend on two sources for truly critical receiver data, the ARRL lab and Sherwood Engineering. As of the writing of this column, the ARRL has not done a review of the KX3.

Rob Sherwood performs an extensive set of tests on amateur radio gear and posts the results on his website, <www.sherwoodeng.com>. The rigs are tested for commonly recognized receiver performance parameters and then ranked based on close-spaced dynamic range. This little direct-conversion-receiver-based rig landed at the top of the list! Hard to imagine, but it can hold its own against the best offered by Yaesu, Kenwood, Icom, or even its sibling, the K3.

The direct-conversion receiver makes the big time. I doubt Hayward or Bingham are surprised. Kudos to Elecraft!

Sign Off

As the darker days of December descend, I'm reminded of the radio shack I occupied in the basement of our family home in Ohio. It was a small room located behind the furnace, probably the coal bin in an earlier time. In winter it was always toasty, a great place for a teenage ham to go hide from his sisters and chase distant stations on the static-free low bands. Here's hoping you all have plenty of good QRP openings this winter!

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BY JOE EISENBERG, *KØNEB

Kit-building

Holiday Treats

With the holiday season at hand, it is a good time to look at a couple of inexpensive kits that each pack a lot of performance into a small package. Both of these kits are also ideal for a group kit-building experience, as they are low-cost, simple to build, and do not have a huge parts count. Beginning kit builders take note: Here are two great kits for a first-time builder. Both kits are produced by Dale Botkin, NØXAS, creator of HamGadgets, and are available at <http://www.hamgadgets.com>.

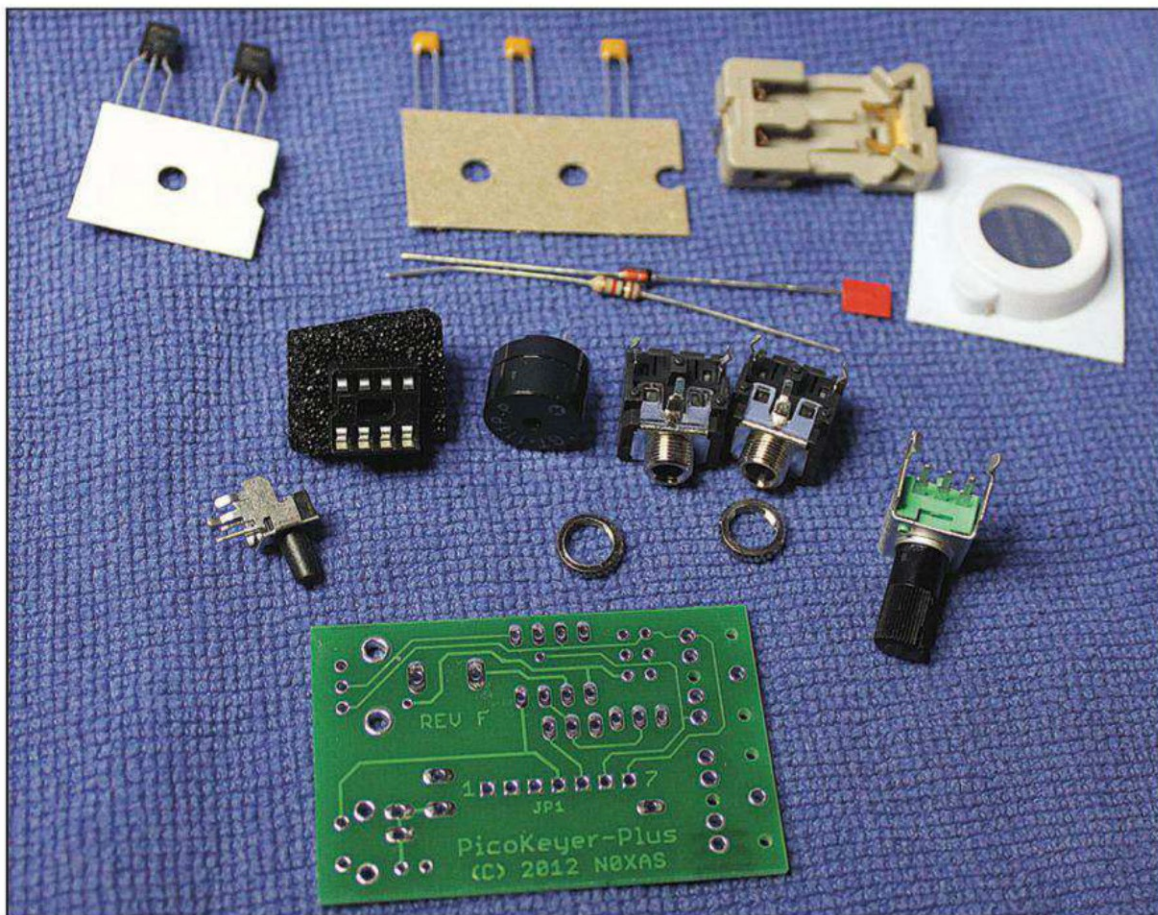
PicoKeyer Plus

The first kit from HamGadgets is the PicoKeyer Plus. This updated version of Dale's ever-popular PicoKeyer kit now also has a custom-case option and a speed-control pot, which the original version did not have. The PicoKeyer Plus has four message memories and numerous other features usually only found in higher end keyers. Consider this kit not only a good beginner's kit, but one that is useful for practicing or teaching Morse code. It can also be used as a beacon ID generator.

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

Construction of the PicoKeyer Plus takes about 20 minutes for an experienced builder and not too much longer for a beginner. This is definitely a kit that can be built easily in less than an hour in a group setting. The manual covers assembly and programming in great detail. There are only three identical capacitors, an 8-pin IC with socket, a pair of MOSFETs, the battery holder and the connectors and controls, as well as a tiny speaker. There are a couple of additional components included that only need be used if you plan on using an external power supply or using power from a radio or other accessory into which you are incorporating this keyer. If you are not building this kit into another device, I recommend getting the matching plastic case to protect it. When building this kit as a group, be sure to have a paddle handy to test it once completed, as well as an external oscillator to be sure it keys the output. Dale has included an interesting feature in the firmware for builders: The keyer will send "73" when it is first powered up to let you know that it is working.

There are a few things to watch out for when building this kit. The kit is supplied with a CR-2032 coin-cell type 3V lithium battery. There is no on/off power



HamGadgets PicoKeyer Plus parts, ready to put together.

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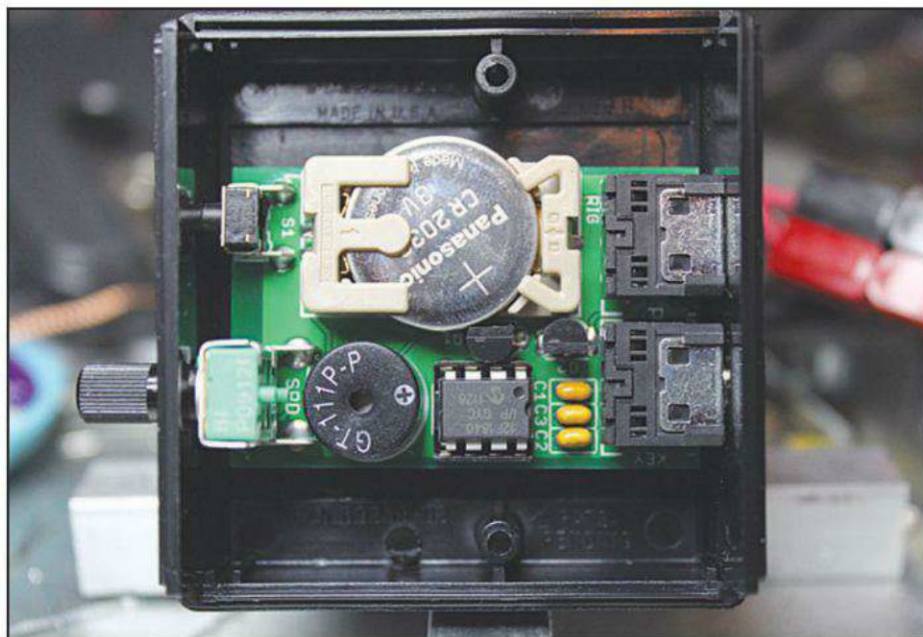
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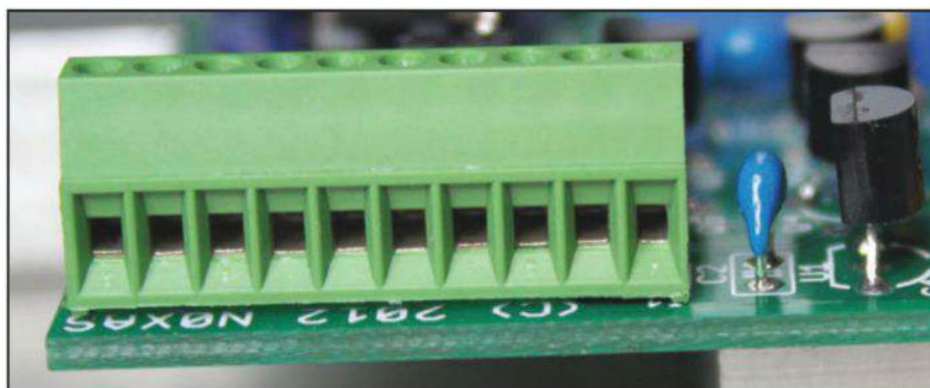
switch supplied with this kit. The reason is because the kit draws so little current when not in use, it does not discharge the battery any more than the battery naturally does sitting on the shelf. I have had one of these kits for about eight years, and the battery still works! If needed, a replacement CR-2032 battery is widely available, as it is commonly used in car-key remote controls and computer motherboards. Make sure you carefully mount the MOSFETs so that your transmitter keys correctly, and pay attention to the correct placement of the 8-pin IC socket and the IC.

Programming the keyer for things such as CQ messages, contest exchanges, beaconing, etc., is performed using the button on the front panel along with the paddles and working through the CW-based menu. Along with the four programmable memories, the keyer can be programmed to insert an incremented QSO number in contest exchanges!

The PicoKeyer Plus sells for \$17.99 and the matching case is \$8.01, making the complete set only \$26.00.

ID-O-Matic 2

The other HamGadgets kit I have put together is the ID-O-Matic 2. This kit can be used as an automatic Morse IDer for use as a station ID reminder or a live over-the-air ID on SSB/FM/AM, for fox hunting, for beacon applications, or for controlling a repeater. In addition, it has a programmable repeater courtesy beep, as well as special messages to indicate conditions at a remote site, such as power failure, etc. This kit has more components than the PicoKeyer Plus, so be sure to set aside about an hour and a half to put it together. Since this kit does not come with a case, be sure to have some sort of enclosure available for mounting it, as well as the appropriate jacks needed to make the



ID-O-Matic board terminal strip for external connections.

connections in your application. The power requirement for this kit is DC from about 7V up to 24VDC.

Assembly is straightforward in the manual, starting with the capacitors and adding the diodes, resistors, and semi-conductors. Be sure to have in mind your primary use for this kit before beginning construction, as there are a few choices to be made, depending on how you are using it. An example is optional de-emphasis for audio response when using it with a repeater receiver. Also be sure to wire the power supply correctly, as there is no polarity protection incorporated in this circuit. All connections to the ID-O-Matic 2 are via a terminal strip which accommodates wires, so no connectors are needed, but tinning the ends of any stranded wires used will help make more secure connections. The DB-9 serial connection is only needed when programming it, so there is a minimum of connections needed when operating.

Programming the ID-O-Matic 2 is done through a serial port, so be sure you have a PC with a serial port available and a simple terminal program. Programming is done via a command-line interface, and all parameters are saved into EEPROM so that all settings are saved if power is removed. A three-color LED provides a visual indication of the status of the ID-O-Matic. Jumpers are provided on the board to accommodate different types of COR (carrier-operated relay) polarities used in repeaters. The ID-O-Matic is available from HamGadgets for \$25 at <<http://www.hamgadgets.com>>.

Stock Up on Tools

With the holidays at hand, keep in mind that a good-quality soldering station, a lighted magnifier, and good-quality flush cutters should be on your shopping list if you don't already have them. I always say that the best chance for success when building kits is when you have the right tools. Lighted magnifiers are widely available at office-supply retailers, and I highly recommend using one with a fluorescent or LED light. Incandescent bulbs can burn your hands when you brush up against the lamp and become uncomfortably warm when using them for a long period. When you can easily read tiny numbers such as those on small capacitors, you can be sure you have placed the parts in the right locations. Also, small tackle boxes are a low-cost and ideal way to keep your parts sorted and safely stored in between building sessions.

Happy Holidays! 73 de Joe, KØNEB

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Jingle Bells, Jingle Bells . . .!!



Well, hi there, gang! 'Tis the season, 'ya know. That's right, Christmas is right around the corner and what better time to leave this edition of *CQ* (and my column) lying around for your significant other to "accidentally" find it and casually peruse some of the more interesting goodies that you might like to have in your Christmas stocking? What follows is a quick overview of several inexpensive radio-related items sure to please the ham in the family.

EmComm Goodies

To be sure, there is a plethora of emergency communications (EmComm) accessories that will make deployed life a lot less stressful. Among them are selections of mil-spec MOLLE gear that are currently used by our armed forces. Classified as load bearing equipment (LBE) these accessories include tactical vests, bug-out-bags, backpacks, assault packs, escape and evasion (E&E) bags, tool bags, and plate carrier vests, to name but a few. I have spent mega bucks trying to find that "perfect" bug-out-bag," with little success. I shopped at REI, Wal-Mart, and Academy Sports in my quest. The results were always lacking. Sure, there were good bags and backpacks, but none that really suited my individual needs. To top that off, I need to buy for my "EmComm Buddy," my wife Patricia, KB3MCT.

In an attempt to put together the ultimate EmComm bag(s), I started quizzing some of my ham radio acquaintances via e-mail. Those folks in the military guided me to the MOLLE gear that has superseded the older ALICE packs of the Vietnam era. The MOLLE gear is modular, has the ability to

add pouches, bags, and hang gear all over the place—and the prices are not outrageous. Availability of this MOLLE equipment is not restricted to the post or base exchanges. The internet has a multitude of MOLLE outlets. My favorite is eBay. My favorite seller is "Tangofighter." I have purchased a lot of gear from it, and it offers brand-new gear at reasonable prices along with shipping so fast you'll get whiplash!

The folks at Tangofighter have provided me with my current E&E bag, complete with additional map case, holster for .45 semi-auto, and additional pouch for a second handheld transceiver (HT). This is the bag that stays in my vehicle and provides basic communications and survival capability. The external radio pouch holds a Yaesu FT-60 dual-band FM HT, while the internal pouch holds an FRS/GRMS HT (more on this later). This bag can be considered my everyday carry (EDC) bag. It provides me the bare essentials to make it home to retrieve my "Go-Kit" (bug-out-bag) and a more substantial radio package.

My official Go-Kit is built around a MOLLE assault pack, again from Tangofighter via eBay (photo A). The pack is relatively small when compared to other MOLLE packs. Like all MOLLE gear, this pack has loops and tie-offs all over the exterior that provide anchor points for all sorts of add-ons. The one thing that makes MOLLE gear rather appealing for the EmComm operator is the ability to reconfigure the basic pack/bag for specific missions.

In this pack I keep several changes of underwear, basic toilet articles, a med kit with prescription meds, spare glasses, some foodstuffs (I prefer power/protein bars and energy drinks, along with a couple of bags of jerky), a selection of zip-closure bags, large trash bags (they make great rain gear), a small survival kit, fishing gear, a spare

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Photo A—eBay is often a great choice for mil-spec MOLLE packs and related gear. I purchased my MOLLE Assault Pack from highly-rated eBay vendor Tangofighter. (Internet screen grab)

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HT, batteries, flashlight, a K-Bar knife, a blow-out bag (medical necessities bag), etc.

The radio suite that Pat and I regularly use is housed in a Stanley mobile work center, repurposed to hold two 17-amp-hour deep-cycle gel-cell batteries, along with HF, VHF/UHF communications equipment, CB gear, and FRS/GMRS radio. The antenna package consists of several sections of fiberglass masts, a dual-band VHF/UHF ground-plane antenna, and coaxial cable carried in a canvas bag.

If you are in need of a good Go-Kit or are planning on

expanding your current kit, give the MOLLE equipment a hard look. The ability to reconfigure and expand your kit not only saves you money in the long run, it allows you to quickly change your Go-Kit to meet mission requirements.

FRS/GMRS . . . Really?

Most of us heavily involved with EmComm are quite familiar with VHF/UHF FM gear that works on our ham bands. After all, that is why we volunteer to support our local served agencies—to use our gear and unique frequencies to provide communications support during times of disaster. However, there is one group of frequencies we need to explore, and that is FRS/GMRS. Without a doubt there are several million Family Radio Service and General Mobile Radio Service HTs out there in the hands of non-technically oriented civilians. These folks are going to use these little HTs for their personal communications needs along with trying to secure help during an emergency. All too often we EmComm volunteers do not address FRS/GMRS users. This needs to be corrected.

Enter the C.Crane XT-511 emergency radio (<<http://bit.ly/WfukpY>>). This little rig (photo B, made by Midland and sold by C. Crane) has AM/FM receive capabilities, along with all the NOAA Weather Radio frequencies. It also incorporates a FRS/GMRS transceiver in the mix! Add to this the ability to run from internal “AA” alkaline cells, an internal Lithium-Ion rechargeable battery pack, and a hand-cranked dynamo charger, plus an external 12VDC supply line, and this little radio set needs to be in every EmComm volunteer’s “Go-Kit.” The radio also features an LED flashlight.

Why is it that I think that this little offering from C. Crane needs to be in my Go-Kit? Simply put, it never hurts to have multiple channels of intel. That’s right; I consider AM and FM



Photo B.— Your “Go-Kit” radios shouldn’t be limited to ham gear. Something such as the C. Crane XT-511 emergency radio (built by Midland) provides reception on the AM and FM broadcast bands and NOAA weather radio, as well as transceiver capability on FRS and GMRS. (K7SZ photo)

broadcast as well as the NOAA weather frequencies along with FRS/GMRS sources of intelligence. The more information to which you have access the better off you are, especially in an emergency scenario. My only regret is that Midland, when designing this little radio, neglected to include the VHF aeronautical frequencies (108–134 MHz AM). It certainly would have been easy to accomplish.

My sample C. Crane XT-511 emergency radio accompanied Patricia and me to our family reunion in September. This was an extended mini-vacation/ speed-run from our home in Georgia to our daughter's new place in Columbia, Maryland, and then northward to the reunion in New Jersey (yes, we had our green cards!!) and back the reverse direction. All in five days! I took that little unit as a precaution, as last year's reunion was cancelled due to the flooding of the Susquehanna River in/around the reunion site in Wilkes-Barre, Pennsylvania. I wish I'd had it then!

Thankfully, its services weren't needed, but it gave me a good chance to try it out just the same. All worked as would be expected, no surprises. The little AM/FM receiver pulled in the various talk radio stations along with the plethora of classic rock outlets along our route. The NOAA weather radio worked flawlessly. I really didn't get a chance to try out the FRS/GMRS transceiver, since basically I was talking to myself unless Pat picked up one of the FRS handhelds and played radio with me! Well, what did you expect? Worldwide DX on UHF with a 6-inch antenna? Of course there were a number of kids on the air using the blister-pack HTs, which is a bit annoying, but just the fact that you could, in an emergency, use this little transceiver to give/get help, coordinate search efforts, locate family members, or just plain comfort some distraught person, whose only contact at the time is via

a little UHF radio set, justifies its inclusion in our kit.

OK, I have to ask this question, seriously: *Who* decides how far these tiny FRS/GMRS handheld radios can actually communicate? Twenty miles? Really? Come on, advertising staff, we in the radio business know that these Lilliputian UHF FM rigs (complete with their horrendous modulation) are unable to communicate over more than a couple of miles under the most ideal conditions! Why do you people insist on the ridiculous claims of up to 20 miles? Is there no shame? OK, I'm off the soapbox . . . for now.

As long as we're on the subject of "Go-Kits" and the things we put in them, what about Class D Citizen's Band gear? That's right, good ole "Got your ears on, good buddy?" type radio gear. Now before you assemble the lynch mob or bring out the burning torches, pitchforks, and hand-operated farm implements, slow down a bit and hang with me.

There are probably more CB radios in existence (and in use) than there are any other radio device except for the ubiquitous cell phone (Yes, Virginia, your cell phone is actually a radio ... deal with it!) Remember what I said about sources of intel? CB certainly qualifies. Including a handheld 40-channel CB HT in your Go-Kit would be prudent, if for nothing more than the ability to contact non-hams during an emergency that just might have some really important information to pass along to disaster mitigators. My point here is no source of radio communications should be cast aside when it comes to emergencies/disasters. A Midland CB HT such as the model 75-822 (\$150) (photo C and <<http://bit.ly/Xg7A7c>>) that works both as a hand-held and a base/mobile unit is just the ticket. I have one in my kit just to keep in touch with others on the roads. It's saved our bacon several times when it came to deciding to reroute



Photo C—A handheld 40-channel CB rig, such as this Midland model 75-822, is also a good addition to any ham's Go-Kit. Your goal in an emergency is to be able to communicate, period. (Photo courtesy Midland USA)



Photo D—The WinKeyer 2 from k1el.com is a great accessory for computerized CW operation. (K7SZ photo)



Photo E—The MasterKeyer Mk1 sees daily use at the Bent Dipole Ranch. (K7SZ photo)

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Hams tend to look down their collective noses at CBers. There seems to be some sense of superiority involved, but the real truth is many hams started their radio careers in CB. That fact tends to be overlooked many times by these very folks who cast a negative word about the "Chicken Band." A CB HT can be a real comm asset in an emergency, so don't overlook that avenue of intel.

And Now a Couple of Things for the Shack

For all you budding and long-time CW ops out there: How's your keyer? Still using the old "manual method" of loading up your memories? Slappin' the paddles, loadin' up the contest exchanges and general messages dit by dot? Does your tired, old four-button memory keyer interface with your logging program, especially for contesting applications? Tired of every time you switch off the gear you find that the old knotted up, ratty power lead you've accidentally nudged has become disconnected and now your beat-up old keyer resets to factory defaults with *no* messages in memory? Sigh! I feel your pain, my brother! I do; I *really* do!

Ta-Da!!

Enter the new, improved memory keyer that interfaces with your radio gear, your logging program, *and* your shack computer! That's right, ladies and gentlemen, right before your very eyes I have not one, but two—that's right, *two*—state-of-the-art, next-generation memory keyers designed and built by two very talented engineers who will forever end your woes affiliated with that old 1980s model CW keyer. Gone

will be the trials and tribulations associated with using a non-computer-controlled keyer. You will be the envy of your ham club as you flaunt your new keyer at the next show-and-tell.

But wait! There's more! Up for your consideration is the K1EL WinKeyer (photo D) and the Ham Gadgets Master Keyer Mk1 (photo E). These two, while seemingly head-to-head competitors, actually are unique pieces of CW gear that have some overlap. Both are focused on the CW operator, whether a newbie or old-hand. Both keyers offer some standard operating features such as multiple computer programmable memories, rig interface, etc. However, each one is uniquely tailored to specific types of ham operator, whether you are an avid contester or a QRP operator who enjoys SOTA/portable ops from the bush.

Today's middle-of-the-road stations are some of the best-equipped ham shacks I've ever seen. The one thing that almost all have in common is the shack computer. Almost as important as the rigs themselves, the shack computer has a reserved place on the ops bench that just cannot be challenged. We have come a long way, baby! With this computer automation comes the basic fact that we can let the computer do a lot of the mundane taskings around the shack. Chief among them is controlling the emissions of our radios. CW is just the beginning. The computer sound card allows us to enjoy a multitude of digital modes, including RTTY, PSK31, JT65, Olivia and Hell, just to name a few. Computers also log for us, both our regular on-the-air contacts and real-time contest logging complete with dupe checking and score keeping. Face it: The shack computer is here to stay, so let's embrace it and put it to work!

These two CW keyers are a real Godsend to anyone wanting to maximize his or her CW experience. It never ceases

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to amaze me how many hams are taking up the CW banner now that the FCC has dispensed with the CW requirement for obtaining a ham license! Great! Come on in; the water's fine! And ... a good state-of-the-art keyer interfaced to your shack computer will definitely help you become a CW virtuoso.

I have used Steve Elliot, K1EL's, (www.k1el.com/) gear for many years, starting with the simple 8-pin PIC keyers in my mono-band QRP rigs of the early 1990s. Steve has moved his business along, keeping pace with the changing trends within the hobby, and he now offers us his WinKeyer 2 (WKUSB), which ushers in a whole new era of computerized CW operation.

I became familiar with Dale Botkin, NØXAS, of Ham Gadgets (www.hamgadgets.com/) a couple of years ago when I needed an extremely compact programmable memory keyer (Pico-Keyer Plus) to include in a homebrew rig (also see this month's "Kit-Building" column elsewhere in this issue—ed.). Dale offers a line of ham radio accessories with the emphasis on CW. He is continually adding to his product line in an attempt to furnish the ham radio community with quality kits.

Both of these folks are great people. Customer service is beyond reproach. Have a problem with a piece of their gear? Call or e-mail them. They are right there to help you, hand-holding if necessary, to get you up to speed with their respective products.

I enjoy both of their top-of-the-line keyers. Both have a place at my Bent Dipole Ranch. I use Steve's WinKeyer 2 (WKUSB) for my portable ops when I need a compact, fully functional, computer-driven keyer that I can program before an outing to get me through a portable/mobile operating event. Dale's little black box, the MasterKeyer, Mk1, I use in the shack daily. Its larger size is better suited to my day-to-day operation. Either would make a great Christmas/holiday gift to the deserving ham.

That's it for this session, gang. I hope I have given some of you some food for thought. See you "next year," provided, of course, that this Mayan Calendar thing isn't for real, OBTW, I have a solution: Predictions are that the world will end on December 21, 2012, because that is the last day recorded on the Mayan Calendar, right? The solution is simple: Run down to the mall, go to the Mayan Calendar Store, and buy a new Mayan Calendar! Happy Holidays!

Vy 73, Rich K7SZ

'Tis The Season for Celebrations



BY JOHN WOOD, *WV5J

what's new

Okay, Thanksgiving is over and Christmas and Chanukah are just around the corner. Celebrations are being planned for many homes and venues, but for just a moment, I'd like to talk about a celebration that was held back in October. To be precise, it was October 6 and the location was Starkville, Mississippi, the home of MFJ Enterprises. The president of this fine company, Martin F. Jue, K5FLU, had published an open invitation months before to anyone who would care to attend and join him in celebrating the 40th anniversary of his company.

MFJ 40th Anniversary Celebration

My wife Marie, WA4WFX, and I drove to Starkville from Germantown, Tennessee to share in this celebration with Martin Jue, his family,

*1870 Alder Branch Lane, Germantown, TN 38139
e-mail: <wv5j@cq-amateur-radio.com>

employees, and many of the friends he has made in the world of amateur radio in the 40 years since his company was started. A large number of people, mostly amateur radio operators, showed up on this cloudy and cool October day to take tours of the MFJ Enterprises headquarters, receive a free MFJ coffee mug and a goody bag, and partake in what had been advertised as a free lunch and a chance to maybe win a door prize or two.

As it turned out, my wife and I enjoyed the tour and free lunch, but missed out when it came to taking home a door prize. Personally, I believe we received something much greater than an antenna or kit project. We were part of the celebration, and as such, we were treated to the opportunity to hear Martin recite the story of MFJ Enterprises—its humble beginnings, its growth days as the number of his employees jumped from 6 to 30 in one month, and how it has become an international company, sending out its products around the world.



MFJ President Martin F. Jue, K5FLU, addresses the crowd that turned out to join him in celebrating MFJ Enterprises' 40th year in business. Visitors were treated to plant tours and a free lunch.

MFJ Enterprises's Richard Stubbs makes a point with a tour group during the October 6 celebration of the company's 40th year. A large number of people, mostly hams, drove to MFJ's Starkville, Mississippi for the event.



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- AIM 4170C is still in production covering 5kHz to 180 MHz.



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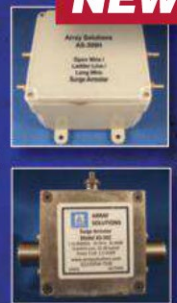


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NEW!

Announcing the New

AS-419 "Bandpasser" Economical Integrated Bandpass Filter System.

The AS-419 bandpass filter unit provides bandpass filters for 160, 80, 40, 20, 15, and 10 meters. Each filter can be selected manually through the use of convenient pushbuttons per band. The Bandpasser can also be controlled automatically via our 4-wire network or through a sourcing band decoder.



NEW!

New Array Solutions 4-square Vertical Array System

Introducing the VNA uhf two-port Vector Network Analyzer

Operates from 5 kHz to 600 MHz. For details on this new product, see the Array Solutions webpage.



NEW!

New pushbutton

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For 8-pak and 4x8-pak systems.



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Right now MFJ Enterprises is the largest amateur radio manufacturer in the U.S., but no matter how much more MFJ Enterprises may grow, I am proud to say I was there when the company turned 40, because in those years Martin has proven that personal motivation, dedication, and imagination can be the mix to create a successful business and something our country now needs so dearly—jobs.

Thus, on behalf of all amateurs, I say to Martin Jue, thank you for creating and building MFJ Enterprises, and for giving the hobby the thousands of products that make it easier for hams around the world to fulfill our mission of providing communication services to the public in times of need, as well as making products that make our hobby one of the greatest, most enjoyable in the world.

We all look forward to seeing the new products that MFJ Enterprises will come up with in its next 40 years.

Look Under the Tree . . .

Now it's time for us to take a look at some new products that just might be the items hams are hoping to find under the tree on Christmas morning.

InnovAntennas Radiating New Products

Are you, or your ham significant other, asking Santa for a new antenna? Well, the design team at UK-based InnovAntennas recently has been working overtime, as the company announced a half-dozen new antennas and antenna lines for HF, VHF/UHF, and EME (Earth-Moon-Earth). Here's a quick look at its new offerings:

Heavy-Duty Verticals for HF. InnovAntenna tells me it's planning to launch a range of heavy-duty verticals which will be rated to handle winds of over 125 mph (201 kph). These HF antennas, covering 10–40 meters, will start with monobanders, which will include four-, six-, and nine-square array bundles, including all control hardware. The monobander antennas will expand into multibanders as InnovAntenna moves through its product year. The bottom sections will have a wall thickness of 3.2 mm, tapering to 1.6 mm at the top, and the antennas will be capable of handling full legal power.

Multiband Rotating Dipoles. InnovAntenna says it has combined open-sleeve technology with an OP-



InnovAntenna plans to launch a line of heavy-duty vertical antennas which can handle winds in excess of 125 mph for bands down to and including 40 meters. The bottom section has a 3.2-mm wall thickness.

DES (OP-DES stands for "Opposing Phase Driven Element System) driven element to produce a shortened rotating dipole with no matching devices, no traps, coils, or loading, which means maximum radiating efficiency. The company says its 21/28/50-MHz version has the same footprint as a 28-MHz rotating dipole, is built from marine-grade stainless steel, handles up to 5 kW, and is rated for winds up to 100 mph (160 kph). A 40/30-meter version is expected to be available as of January.

Log-Periodics. The company is also introducing a line of "dense element" and "band focused" log-periodic array antennas.

The **dense-element LPAs** feature direct 50-ohm feed and SWRs of 1.3:1 or less across their frequency ranges, and the company claims a front-to-back (F/B) ratio of 30 dB and gain of up to 9.5 dBi. It says the performance is a result of tightly packed element cells. The model seen in the photo has 25 elements on a 5.5-meter boom and covers 48–120 MHz. Models for other frequencies will

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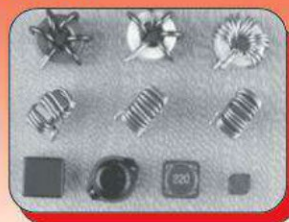
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also be available. InnovAntennas' Justin Johnson, GØKSC, feels that these dense log periodics should provide an excellent complement to the upcoming new range of Flex radios which should give you the capability to track MUF in real time.

"Band focused" Log Periodic Arrays include both monoband and multiband models. The monobanders are three elements and have a very short boom. For example, the 20-meter version has a boom length of just 2 meters (6 feet). The company claims gain of 6.8 dBi and well over 20 dB F/B. The multiband version consists of monoband logs which have been joined together and re-optimized in order that they all complement and enhance one another

EME Arrays. InnovAntennas is also introducing its **X-pol Yagi** for 432 MHz. This cross-polarized Yagi (expected to be

available in January) is ideal for satellite work, and, in a group of four or more, for EME contacts. The 432-MHz version will join lower frequency models already in the company's lineup. Another new entry for moonbounce enthusiasts is the **Super log 432 MHz EME LFA Yagi**. This log-focused array (LFA) will carry up to 40 elements. According to GØKSC, the company has been able to break the G/T (gain-to-noise temperature ratio) barrier at 30 elements and can now create a huge level of suppression in both azimuth and elevation planes. The Super log, says Johnson, provides a super EME and weak-signal antenna base that will not require multi-multi antennas connected with open-wire lines.

Liquid Rubber Sealant for feed points. Finally, Johnson says InnovAntenna is now offering a solution for another ham-related problem, something he calls rubber in liquid form. According to Johnson, it has always been an issue to have to pay a fortune for this stuff due to the volumes in which it has to be purchased. "We are now pleased to announce we can provide liquid rubber with an external life guarantee which exceeds 15 years in 30-ml pots," Johnson said. "These are provided with a brush in the lid for easy application and provide you with enough material to seal and secure many antenna feed points."

For additional information about InnovAntenna products, visit www.InnovAntennas.com, call (888) 998-8541 here in the U.S., or dial +44 (0) 800 0124 205 to reach the United Kingdom office of InnovAntennas.

DX Engineering Maxi-Core® High-Power Multi-Band UNUN

The DXE-UN-43 DX Engineering Multi-Band Vertical UNUN is a matching device specifically designed for use with any

It seems that 43-foot vertical antennas are gaining in popularity, especially when DX Engineering starts creating and selling a matching device, the DXE UN-43 unun, for use with all non-resonant 43-foot vertical multi-band antennas such as the company's own MBVE-1 and MBVE-5.



non-resonant 43-foot-tall vertical multi-band antennas, such as DXE's MBVE-1 and MBVE-5. This UNUN assures the best efficiency from your vertical multi-band antenna and transmission line/tuner installation.

DX Engineering's UN-43 unun minimizes the additional transmission-lines losses caused by SWR and reportedly allows your antenna to perform to its full potential. By allowing your wide-range tuner to easily match the antenna's complex impedance, low-frequency performance is improved over other devices currently available.

Features include full-band tunable coverage on 160–10 meters when used with customer-supplied wide-band tuner, an SWR under 1.5:1, and 2-kW CW/5-kW SSB power-handling capability. Components are enclosed in a high-impact, weather-sealed NEMA spec case. Rugged hardware is used throughout, including a silver-Teflon® SO-239 input, stainless-steel washers, and wing nuts at the feedpoint connection.

Price of this unit is \$104.95. The complete kit with mounting hardware and tinned braid connections is the DXE-UN-43-R, which sells for \$129.95. A customer-supplied, wide-band tuner is required. For more information or to order, visit <www.dxengineering.com>.

Pasternack Enterprises Attenuators

Pasternack Enterprises, Inc., a leading ISO 9001:2008 manufacturer and global supplier of RF and microwave products, introduces its new line of high-frequency attenuators. These

attenuators are perfect for applications requiring reliable and precise frequency levels up to 50 GHz.

The attenuators have frequency ranges from DC to 50 GHz and perform up to the microwave K and Q bands. Power ratings for the SMA, 2.4-mm and 2.92-mm high-frequency attenuators are 1 watt to 2 watts, and they are constructed with stainless-steel bodies and beryllium copper (BeCu) contacts. These broadband, high-frequency attenuators are available with attenuation values from 0 to 30 dB at 1 dB steps in some models.

High-frequency attenuators from Pasternack can be used for many applications, including RF test labs, research facilities, military electronics, telecommunications equipment, security devices, and more. The expansion of Pasternack's millimeter-wave attenuator family provides the market with immediately available, high-quality product solutions. A total of 41 new broadband, high-frequency attenuators have been added to Pasternack's wide range of products to address the growing millimeter-wave market.

"Our new line of high-frequency attenuators is a great addition to the breadth and depth of our millimeter-wave product family," says Gerry Camacho, vice president of technical services at Pasternack Enterprises, Inc. "This new line of attenuators expands Pasternack's reach into higher frequencies to address increasing customer demands in millimeter-wave applications."

The new high-frequency attenuators from Pasternack are available now and can be seen by visiting <<http://www.pasternack.com/t-high-frequency-attenuators.aspx>> directly. Pasternack Enterprises, Inc. can be contacted at +1-949-261-1920.

Sneak Peek from Japanese Ham Fair

My poorly paid spies at the Japanese Ham Fair managed to get this photo to me of a new dual-band antenna from NCG, a magnetic-mount antenna currently called the Comet Fin Antenna. Can you say disguised antenna?



Yes, this is one of InnovAntenna's log-periodic antennas. This particular one covers 48 MHz to 120 MHz and offers a low SWR of 1.3:1 across the entire range.



Car makers have made the fin antenna a popular addition to auto rooftops, so why not create a dual-band ham antenna that has the same appearance. This one has a magnetic mount and it's known as the Comet Fin Antenna from NCG, previewed at the recent Japanese Ham Fair and not yet available in the U.S.

Incredible Software-Defined Antenna Analyzer

COLLINS MECHANICAL FILTERS

The miniVNA PRO is an extraordinary and unique handheld vector network analyzer that makes available a multitude of new features and capabilities which are perfect for checking antennas and RF circuits for hams and commercial users. Together with your PC/Laptop, you can add to your laboratory the further advantages of having this first-class VNA instrument. This is the world's first wireless analyzer capable of scanning and sending the data using an integrated Bluetooth module to a remote PC/Notebook up to 100 meters from the miniVNA PRO's location.



Excellent software for Windows, MAC, and LINUX (32 & 64-bit)
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Also seen at the fair was the CMX-200, a wireless SWR/power meter. Basically it is a wi-fi system that mounts on the wall and transmits an SWR reading plus forward power out and reflected power readings to a nearby display. For additional information, you might want to watch <www.cometantenna.com>.

Software Corner

HamCall on DVD. Published on CD-ROM since 1990, HamCall has outgrown 700-MB CDs and is now published on 4.7-GB DVDs. The HamCall database includes 2,175,000 current callsigns, and now with the extra DVD space includes 590,000 archival callsigns from 1960 to 1983, all integrated into one callsign lookup program. Search by name, city, county, state, country, and more. HamCall is supported by over 53 logging programs and ham-related programs. HamCall is the world's largest callsign database and the only one to include downloadable updates.

HamCall is \$50, including six months of updates and six months access to the HamCall website, HamCall.net, as a HamCall.net gold member. You also can purchase HamCall plus 12 months of updates and HamCall.net access for \$80. Visit <www.hamcall.net>.

Lots That's New at RFinder. Our friends over at RFinder seem to be growing in leaps and bounds with their own website at <www.rfinder.net> and a place on Facebook. In fact, Bob Greenberg, W2CYK, informs me that RFinder (repeater finder)—an app for Android, iPhone and iPad/iPod Touch—provides access to the Worldwide Repeater Directory (contains up to 175 countries) and includes listings for IRLP,

Echolink, AllStar, D-Star, MotoTRBO, and even Winlink information. The app costs \$9.99 per year.

DxSpot New Version 1.0.1. Green Creek Technology has announced the release of DxSpot version 1.0.1 for iPhone, iPad, and iPod Touch. DxSpot is described as your mobile access into the amateur radio DX cluster network. With DxSpot you can connect to the DX cluster of your choice. The internal database supplies the connection parameters to over 300 clusters. Once connected, you can enjoy formatted table views of DX spots and see DXCC information, connected users, cluster announcements, colored WWV propagation data, all while you keep current with the latest DX news. Other features included in DxSpot are the ability to customize connection parameters to access new or private clusters, the ability to enter cluster commands, Telnet access to the cluster console, and more. DxSpot can be downloaded from <http://iTunes.apple.com/us/app/dxspot/id539616666?ls=1&mt=8>.

Well, that does it for our new product views for December. I appreciate all of my readers and I hope you have very Happy Holidays. Merry Christmas and thanks . . .

73, John, WV5J

Note: Listings in "What's New" are not product reviews and do not constitute a product endorsement by CQ or the column editor. Information in this column is primarily provided by manufacturers/vendors and has not necessarily been independently verified. The purpose of this column is to inform readers about new products in the marketplace. We encourage you to do additional research on products of interest to you.

Oops...

Dayton “Safari” Follow-Up

Even with our 2012 Dayton new-product “safari” stretching across three issues, we managed to accidentally leave out the new items introduced at the show by our friends at Array Solutions. Array Solutions manufactures its own gear and acts as the U.S. representative/importer for several overseas manufacturers. Among the new items arrayed at the Array Solutions booth in Dayton were...

ACOM 1500 Amplifier

Put the ACOM 1000 amp on steroids and you have the ACOM 1500 (photo A). It's the same size as the 1000 but has a beefed-up power supply and puts out 1500 watts PEP on 160 through 6 meters (1200 watts for key-down modes such as RTTY and PSK31). It features a larger and easier-to-read LCD display, an LED transmit indicator, and connections for up to three antennas.

OM Power Amplifiers

Array Solutions also displayed OM Power's new line of linear amplifiers, including the 2500A automatic (photo B) and manually tuned 2500HF models for HF, as well as the solid-state Model 1002 1-kW amplifier for 2 meters. These amplifiers currently are in type-acceptance review with the FCC.



Photo A— ACOM's new and more powerful Model 1500 amplifier puts out full legal power on 160-6 meters. (Photos courtesy Array Solutions)



Photo B— The OM-2500A is an automatically tuned kilowatt HF amplifier from OM Power, distributed in the U.S. by Array Solutions.

ProSisTel “Big Boy” Ring Rotator

The model PST-RR55D-Pro lets you rotate beam antennas below the top of your tower (photo C). Made entirely of stainless steel and aluminum and weighing about 75 pounds, it can handle up to five elements on 20 meters. It features 500-degree rotation, programmable limits, programmable soft start/stop, and has a unique auto-calibration feature when in use.

Array Solutions VNAuhf

Array Solutions has introduced the next generation of its popular VNA 2180 vector network analyzer. The two-port VNAuhf (photo D) operates from 5 kHz to 600 MHz. A video demo is available on YouTube at <<http://bit.ly/Py75FZ>>.

RigExperts Impedance Analyzers

RigExperts Ukraine has introduced two new items to its line of antenna analyzers, the AA-1000 and the AA-600. These handheld vector impedance analyzers cover 1 MHz to 1 GHz and 1 MHz to 600 MHz, respectively.

Second-Generation EightPak

The popular EightPak has been repackaged with new features. Manufactured by Array Solutions, the EightPak allows you to switch up to eight antennas between two radios. It uses a single four-wire control cable and may be used with a manual controller or be computer-controlled via a USB or RS-232 interface.

Detailed information on all of these products and the rest of Array Solutions' offerings may be found on the company's website at <<http://www.arrayolutions.com>>.



Photo C— ProSisTel's “Big Boy” PST-RR55D-Pro ring rotator.

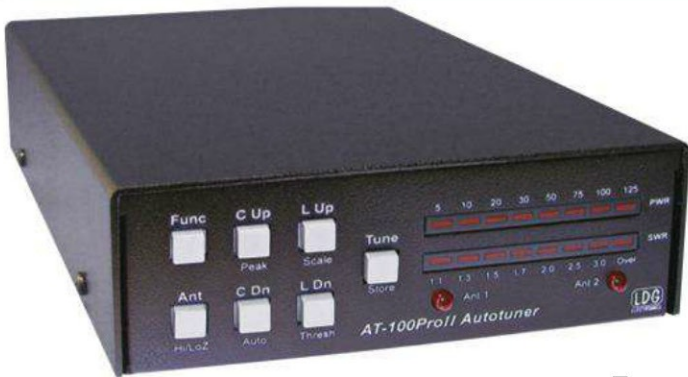


Photo D— Array Solutions' own new vector network analyzer, the two-port VNAuhf, covers 5 kHz to 600 MHz.

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AT-100Proll

This desktop tuner covers all frequencies from 1.8 – 54 MHz (including 6 meters), and will automatically match your antenna in no time. It features a two-position antenna switch with LEDs, allowing you to switch instantly between two antennas. The AT-100Proll requires just 1 watt for operation, but will handle up to 125 watts. Includes six foot DC power cable. **Suggested Price \$229.99**

- RF Sensing
- Tunes Automatically
- No Interface Cables Needed



radio not included

AT-897Plus for the Yaesu FT-897

If you own a Yaesu FT-897 and want a broad range automatic antenna tuner, look no further! The AT-897Plus Autotuner mounts on the side of your FT-897 just like the original equipment and takes power directly from the CAT port of the FT-897 and provides a second CAT port on the back of the tuner so hooking up another CAT device couldn't be easier. **Suggested Price \$199.99**



NEW! AT-600Proll

Building on the success of the AT-600Pro, we refined and expanded the model with an optional external 4.5" analog meter. The new AT-600Proll keeps many of the same features of the previous model, but simplifies the operation. With the two-position antenna switch, there are 2,000 memories that store tuning parameters for almost instantaneous memory recall whenever you transmit on or near a frequency you've used before. Includes six-foot DC power cable. **Suggested Price \$369.99**

Optional M-600 external analog meter \$129.99



Z-100Plus

Small and simple to use, the Z-100Plus sports 2000 memories that store both frequency and tuning parameters. It will run on any voltage source from 7 to 18 volts; six AA batteries will run it for a year of normal use. Current draw while tuning is less than 100ma. The Z-100Plus now includes an internal frequency counter so the operating frequency is stored with tuning parameters to make memory tunes a blazingly fast 0.1 seconds; full tunes take an average of only 6 seconds. Includes six foot DC power cable. **Suggested Price \$159.99**



radio not included

Z-817

The ultimate autotuner for QRP radios including the Yaesu FT-817(D). 2000 memories cover 160 through 6 meters. Also functions as a general purpose antenna tuner with other QRP radios. Powered by four AA internal Alkaline batteries (not included), so there are no additional cables required. **Suggested Price \$129.99**



IT-100

Matched in size to the IC-7000 and IC-706, for either manual or automatic tunes, and status LEDs. Control the IT-100 and its 2000 memories from either its own button or the Tune button on your IC-7000 or other Icom rigs. For your Icom radio that is AH3 or AH-4 compatible. **Suggested Price \$179.99**

Suggested Price \$179.99

AT-200Proll

The AT-200Proll now includes LEDs to show antenna position and if the tuner is in bypass. A two position antenna switch stores 2000 memories per switch. Handles up to 250 watts SSB or CW on 1.8 to 30 MHz and 100 watts on 54 MHz. Rugged and easy to read LED bar graphs simultaneously show RF power and SWR. Includes a six foot DC power cable. **Suggested Price \$259.99**



AT-1000Proll

LDG Electronics' new flagship 1KW tuner features: 5 to 1,000Watts PEP; RF Sensing; Auto and Semi Tuning Modes; 1.8 to 54 MHz range; 6 to 800 ohm range (15 to 150 on 6M); simplified operation; and an optional external 4.5" analog meter. With the two position antenna switch, there are 2,000 memories that store tuning parameters for almost instantaneous memory recall whenever you transmit on or near a frequency you've used before. Includes six foot DC power cable. **Suggested Price \$539.99**

Optional M-1000 external analog meter \$129.99



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Desktop Factories: The 3D Printing Revolution

Picture this: It's a Saturday afternoon and the bands are hopping. Your dipole is racking up new DX contacts left and right and you have nothing booked on your social calendar for the entire weekend. Suddenly, right in the middle of a pileup, your signal dies and you are left wondering what just happened. You look out the window to find the tree limb that had been supporting one end of your antenna has decided today was a good day to come down, and take your insulator to the grave with it.

Assuming you don't live near a good resource or you don't have a good supply of parts on hand, you have few options. You could call it a weekend and watch your DXCC dreams fade further into the future. You could pretend you are MacGyver and put together an improvised insulator out of duct tape and a paperclip, but who really wants to get the ladder out twice to fix a problem, temporarily and then permanently. Or you could always just print a perfect copy right away and finish the job (<http://goo.gl/GDN0w>)!

I know this sounds like science fiction, and although we are not quite at the point of ordering "Earl grey, hot" and having it appear before us, we are at the point where we can have the technology to produce many useful objects in our own homes. To make things even better, their creators share many of the designs needed to make these objects—and you are free to use them whenever and however you want.

What is 3D Printing?

I have run dozens of demos for people showing 3D printing technology, and often, even as I hand them a part created by a 3D printer, they still don't

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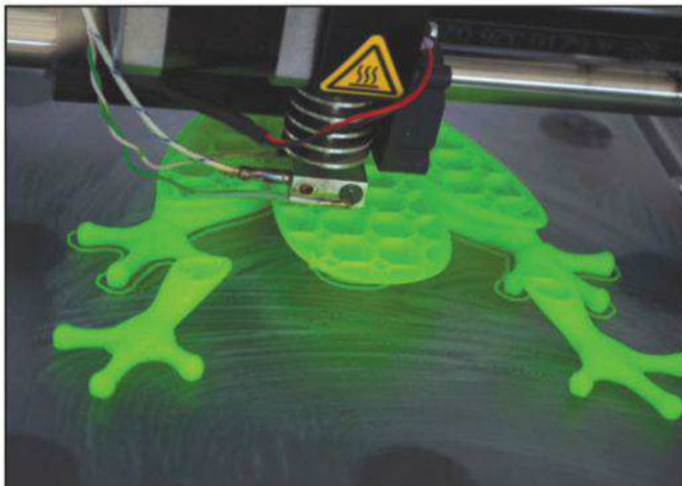


Photo A— The inner layers of a 3D printed frog.
(Photos by Amy Buser, except as noted)

understand how it was made. The most common type of desktop 3D printer that you will find on the market is FDM (Fused Deposition Modeling). FDM printers use spools of plastic filament that are pushed into a heated extruder nozzle while the nozzle is being driven in the shape of the object. After the first layer has been printed, the nozzle is moved up slightly and the next layer is printed on top of it. This continues, layer after layer, until you have a finished item (see photo A).

This works in the same way as a hot-glue gun. As you pull the trigger on a hot-glue gun, it heats up and pushes out a thin bead of glue. You can then draw with that glue, and as it cools you can draw another line of glue on top of that.

The most common type of plastic used is ABS, which is commonly used in toys such as LEGOs®. The layer height, resolution, and quality of prints using this plastic are continuing to improve. The Z (up and down) resolution, which tends to be the factor most commonly tied to quality, averages around .2 mm and is now often as low as .01 mm. The combination of durable plastics used and the resolution of the printers means your final models come out strong and very resilient, making for a really useful end product.

There are other types of 3D printers that use light-curable resins (SLA) or lasers or bonders to fuse powders together (SLS), but these are very uncommon in the hobby market. This is very likely to change over the next few years, though, as more people begin to experiment with these other technologies.

3D Printing Comes Home

3D printing isn't a new technology. Many of the original patents were granted in the 1980s. These devices have been staples for designers and engineers for large companies for years. As these patents have begun to expire, members of the Maker community have begun experimenting with ways to simplify these machines and make them cost-effective for individuals to have in their own homes.

Commercial units created for professional use by businesses have price tags starting around \$10,000 and can quickly go up from there. These models often include high material costs with proprietary materials and non-refillable cartridges (like your home photo printer). The new crop of home printers has taken these prices down to lows that would have been unthinkable just a few years ago. The average home model will cost you just over \$1000, and the recently released Printbot Jr. has broken the sub-\$400 barrier.

A RepRap For Everyone

In 2005, the RepRap project was born. The founders had a goal of making a 3D printer that

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could replicate itself entirely. These "RepRaps" (Replicating Rapid prototypers) would start by printing some of their parts, but hopefully one day would be able not only to print their own bodies, but also their electronics and other parts. This goal is still a long way off, but in 2007 the first design—known as the Darwin—was released. The Darwin still used many extra parts but contained many structural pieces that could

be printed by the Darwin itself. Soon one Darwin could become two Darwins. Although the design wasn't perfect, the point had been proven, and a 3D printer could be used to make other 3D printers.

In 2009, the second generation of the RepRap was born, the "Mendel." The Mendel quickly took off and became the basis of many more "bots" to come. Its simplified construction and sturdy design allowed for better print qualities, making it less of an experiment and more of a useful tool. Soon the ideas created by the Mendel were simplified and transformed by other bot makers producing dozens of derivative bots. 3D printers such as the Prusa Mendel (photo B), Prusa 2, MendelMax, and Huxley all can trace back the basis of their designs to the Mendel.

From the beginning, the RepRap project embraced open-source hardware and software as a way to help spread the project and its improvements throughout the community. Now there are countless variations of printers for sale, being developed by companies as well as individuals who donate their time to further the advancements of the technology. Many of these new designs are still open source, allowing the community to continue to grow and improve on each other's designs.

A Bot to Call My Own

The options for buying a 3D printer have never been better. At this year's Maker Faire New York, dozens of companies showed off their takes on 3D printers. You can now buy a fully assembled bot, ready to take out of the box and start building your dreams. You can also use an open-source design and source each individual part yourself to build a bot

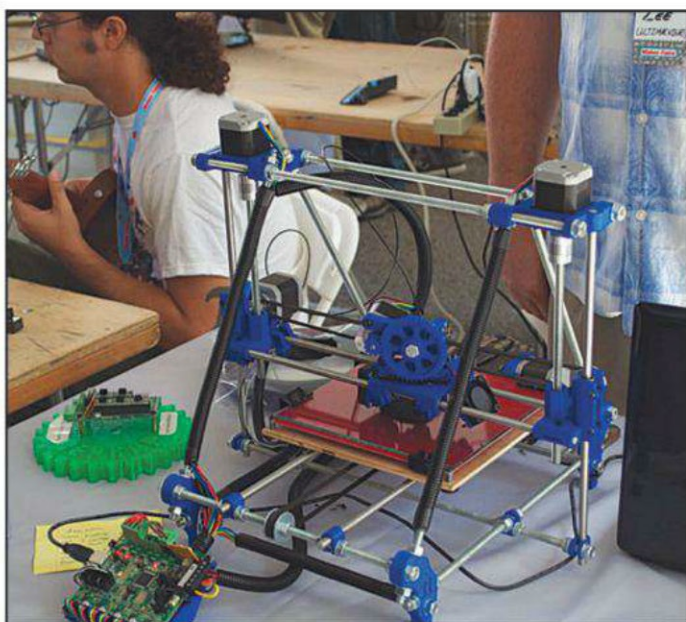


Photo B— The popular Prusa Mendel 3D printer includes many parts that have been printed by another 3D printer.

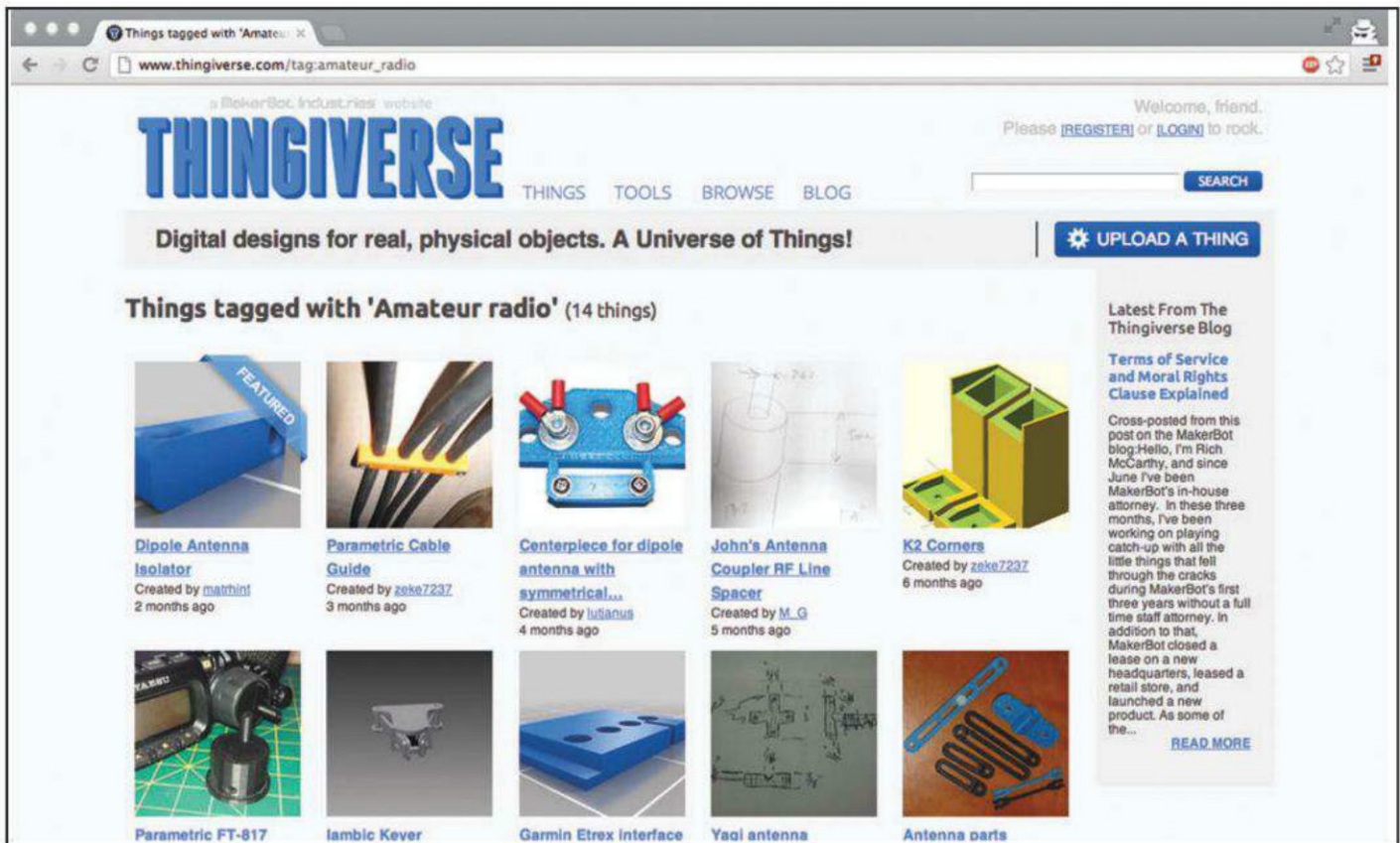


Photo C— Ham radio related items uploaded by members of the 3D printing community to Thingiverse.com. (Internet screen grab)

from scratch—with all design and upgrade decisions being yours. Of course, there are also companies that will provide you a bot in almost every state in between those options.

With the explosion of new models hitting the market, it's difficult for me to give too many recommendations as to what is the best bot to buy, because what may be an amazing machine today may be significantly lacking in an amazing new feature by the time you read this column. At the end of the article, I will provide some links and details on some of the big names that you will probably still be interested in even if you come back to this article in the future.

My best recommendation, though, is that if you have the time and energy to build a 3D printer from a kit, you can save a lot of money over a fully-assembled bot and learn a lot of important lessons on how your machine works along the way. I have thus far built two printers with the process started to build two more, and I love how much each one of them has taught me about the mechanics and principles of building such a machine.

Getting Models

Once you have a 3D printer, you are going to need models to print. For that, there's *Thingiverse*. Thingiverse.com (photo C) is an ever-growing repository of digital files for creating real objects. Largely comprised of objects that are designed to be created with 3D printers, Thingiverse also includes files for use with laser cutters, CNC machines, and other digital fabrication tools.

All of the models on Thingiverse are created by the users of the site and are completely free to use. This open and free model has helped create a site with a wide range of content, from extremely useful things to silly models that will make

you wonder why anyone ever bothered designing them. Many of these models also include source files that can then be used to create new derivative works based on the original. These derivatives are linked back to the original work, creating "family trees" that show the history of parts through many users' works.

There's plenty of stuff for ham radio operators on Thingiverse, as well. Thingiverse allows items to be grouped with tags to help users find collections of useful items for their needs. The tags for Amateur Radio (<http://goo.gl/APo88>) and Ham Radio (<http://goo.gl/OB0rb>) contain a growing list of items that many hams would find useful or fun.

Thingiverse user Matrhint has created and uploaded an iambic keyer (<http://goo.gl/PD2Td>). The body and paddles of the keyer can be printed, and with the addition of two limit switches, this becomes a fully functional item.

One of my early contributions to Thingiverse (that I have since revised) was a replacement knob for the popular Yaesu FT-817 transceiver (<http://goo.gl/nCJ5e>). This was my first HF rig, and although I loved it, I thought the tuning knob could use some improvements. I had seen the spinner knobs that add a post to help you more rapidly tune the radio across the band, and I decided to try to create my own. If you have run into me at Dayton or Maker Faire, I may have given you one of my knobs. Having my own 3D printer means that the cost for me to produce these knobs even in small quantities is maybe 25¢, and likely less than that. This is cheap enough that it's not a big deal for me to print off 10 or 20 before I head to an event and hand them out to fellow 817 owners I meet. Everyone loves an upgrade!

Although Thingiverse contains many files that are already intended to be 3D printed, it's not the only resource for find-

ing 3D models that can be printed. Many popular 3D design tools also create their own repositories of models. *Sketchup*, once owned by Google but recently sold to Trimble, keeps a repository of models created and uploaded by its users (<http://sketchup.google.com/3dwarehouse/>). Because the software is largely targeted at creating architectural models, you will find lots of buildings in the Warehouse, but many of these can be converted to printable models.

Creating Your Own Models

Of course, if you have this amazing tool at your disposal you probably are not just going to want to download other people's designs to print. You will want to create your own. There are many great tools on the market for creating 3D models. There are also great professional tools such as *Solidworks* and *Autocad*, which are the leaders in the industry for engineers and architects. These do tend to be expensive and outside the hobbyist price range for a piece of software. I would love a copy of *Solidworks*, but at nearly \$4000 for a license, I will have to stick to free software for now.

Two of the most popular tools in the hobby 3D printing community for designing printable models are *Sketchup* and *OpenSCAD*. Many users start with *Sketchup*, as its simple pallet of tools and fairly straightforward usage make for a pretty easy learning curve for first-time designers. There are built-in tutorials to help those looking to get started, and third-party blogs such as my friend Matt Donely's *MasterSketchup.com* can turn you into a 3D design guru.

The downside to *Sketchup* is that it's hard to make things with precise measurements and then to later go back and edit those measurements without starting the whole thing over from scratch. This is where a suite of tools comes in that allows for parametric design. The most popular free tool for parametric design is *OpenSCAD*. *OpenSCAD* isn't like a lot of other 3D design tools in that you don't draw your designs; you code them. In *Sketchup*, if you want a cube, you draw a square the size you want your cube to be and then you pull the square up into a cube at the height you want it. In *OpenSCAD* you just declare the cube and set its size. For instance, if I wanted to make a cube that was 10 mm on all sides I could tell *OpenSCAD*: `cube([10,10,10])`.

If I wanted to adjust the size of that cube, I could simply change any of the dimensions and recompile the final

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design. With a few basic pieces of geometry and a few more modifying commands, you can quickly and efficiently create 3D models that are easily revisable and precisely designed.

Getting to Know More

Of course, the best way to learn more about these machines and how they are

changing the world is to actually see them hands-on and talk to other users who have experience with them. Around the world, 3D printing and digital fabrication meetup groups are popping up. These tend to be once-a-month gatherings of 3D printer owners and others who are interested in learning more about the technology. Many of

these events are hosted at hackerspaces and are a great time to check out the space, too. If you can't find a local 3D printing meetup, but you do have a hackerspace in your area, it's more than likely worth reaching out to the folks there to see if they have a 3D printer they could demo for you. Here are a few events and locations that are worth checking out:

- If you are fortunate enough to live in New England, you can join me for my once a month 3D Printing Providence meet up (<http://3DPPVD.org>). I host this meetup on the second Wednesday of each month at AS220 Labs in Providence, RI.
- HackPittsburgh hosts the Open Source Fabrication Group on the second Tuesday of each month (<http://www.opensourcefab.org/>)
- Deezmaker in Los Angeles is a newly opened 3D printer store and hackerspace. It is now selling bots as well as providing space for makers to come in and tinker (<http://deezmaker.com/>).
- Interlock Rochester in Rochester, NY has a 3D printing meetup on the second Thursday of each month (<http://interlockroc.org/>).

There are a few big hitters in the hobby 3D printing world that if you are looking to get into 3D printing you should look into:

- MakerBot (<http://makerbot.com>) has been the big success story for personal 3D printing. It has launched four different models of bots beginning in 2009 and continues to be the biggest name in the industry. With the launch of its newest bot, the Replicator 2 (photo D), Makerbot has unfortunately (in my view) started to shift its business model away from the hobbyist and towards the professional world.
- Josef Prusa (<http://josefprusa.cz/blog/>), creator of the Prusa Mendel, is soon to release his third bot and is an outspoken personality in the community.
- Printrbot (<http://printrbot.com>)—Brook Drumm created a Kickstarter project to make a low-cost 3D printer at the end of 2011. It was a huge success with over \$800,000 of pre-orders coming in. He continues to create new bots, driving down prices.

- Deezmaker (<http://deezmaker.com/>) has opened its own 3D printing store as mentioned above but also has just released its first new bot (photo E) with some new design components that are getting the community talking.
- B9 Creator (<http://b9creator.com/>) is the only non-FDM bot in my list. Another Kickstarter launch, the B9 uses resin and a DLP projector to create its models. The final print quality from these bots is unmatched in the hobby market.

I'm passionate about the home 3D printing community and believe that this is technology that is going to change the world. If you have any questions please feel free to email me at <kb3tan@cq-amateur-radio.com> and I would be happy to share more.
73, Matt, KB3TAN

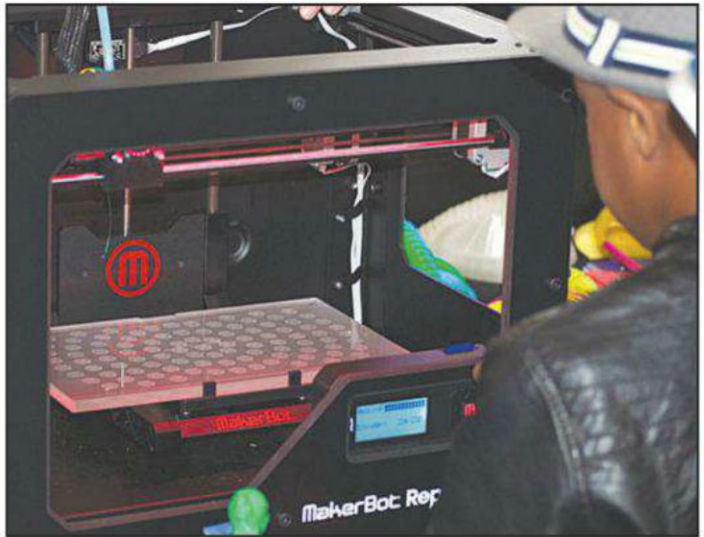


Photo D— Makerbot's new Replicator 2 features a more refined design for the professional market.

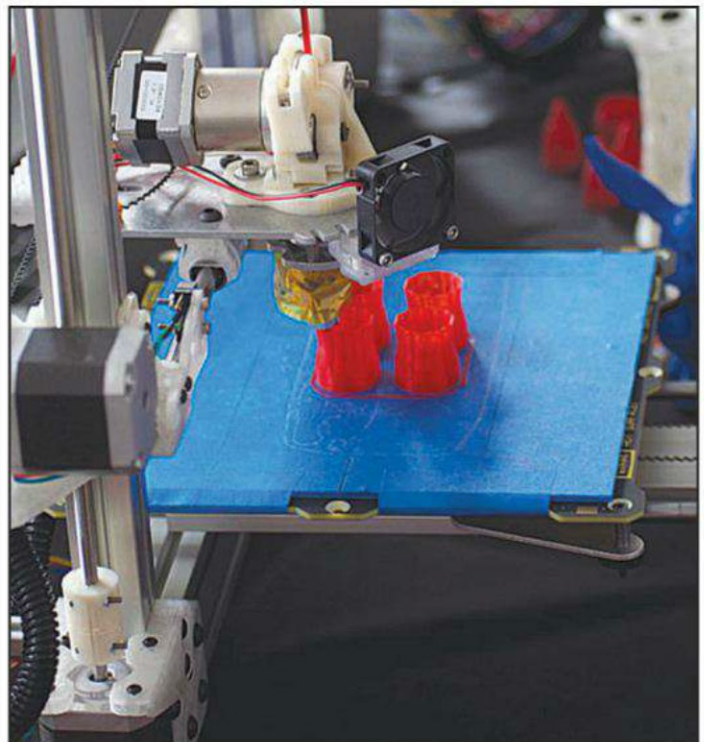


Photo E— The newly released Bukobot printing at Maker Faire New York 2012.

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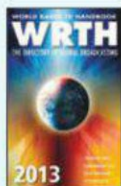
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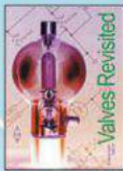
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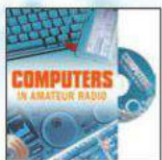
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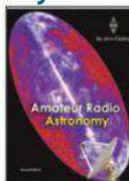
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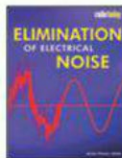
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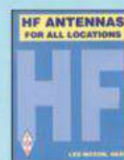


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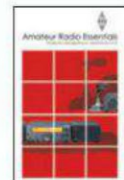


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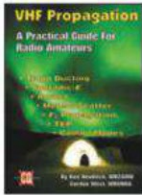


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Making Maps

Man does not live by bread alone, but for really, really good bread I might make an exception. Or maybe a Shrimp Etouffee, Schweinshaxe, or just some good ravioli. You see, for me, food is more than just nourishment, it's one of life's pleasures. Especially good food. And what started this column was a really good Shrimp Etouffee at Papadeux's in Houston, Texas. I think the modern term for my condition is "foodie."

I travel on business often enough, but this has been a banner year, and one I'd rather not repeat. Being away from home isn't my favorite thing, since I can't easily take my radios or lathe with me. However, what makes it bearable is the opportunity to try local food, the kind of food venues that the locals will surely keep in business forever,

while you and I would never know about it—such as that place in Houston, or Rutt's Hut in Clifton, NJ, or Dreamland in Tuscaloosa. (If you want to know more about these places, use Google...).

This is what happened: I was eating that Shrimp Etouffee with my colleague Matt, who is from Florida but had lived in Houston for a few years, and came up with the idea of an annotated map of all the really great places to eat near my workplace, so visitors to northern New Jersey wouldn't have to settle for Olive Garden or Burger King. If you've lived in this area, you know what kind of awesome, one-of-a-kind restaurants we have around here (even ignoring Manhattan). Therefore, I decided to make a list.

The trouble was, not being from the area, most of the visitors also needed maps to find these places. When I think of maps, I think of Google, so there I went. Some of you already know this, but it was news to me that you can build a custom

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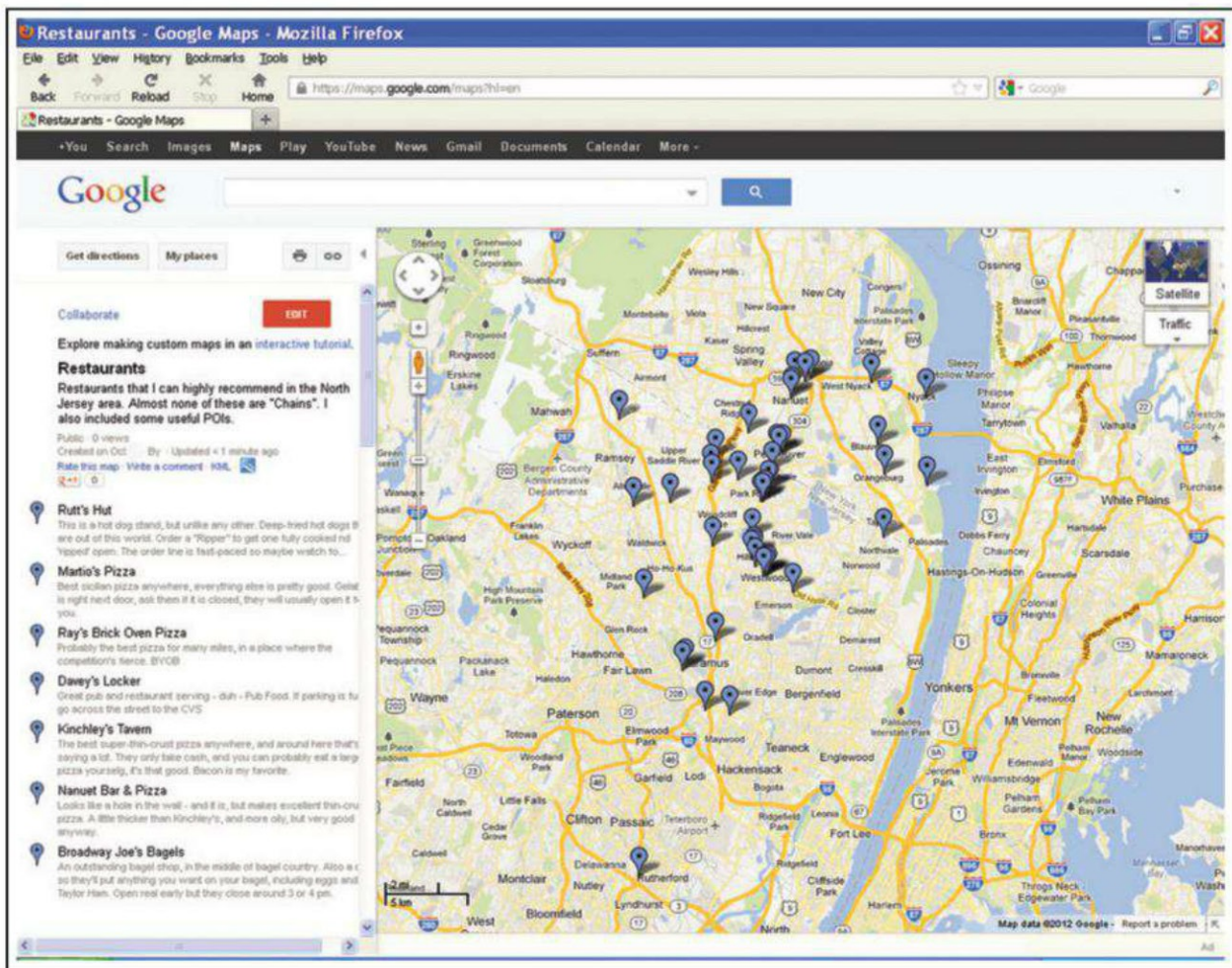


Fig. 1— My Restaurants map after about an hour's effort. As mentioned in the text, I started with all the defaults. See what it looks like today at <<http://google/maps/5xxyn>>.

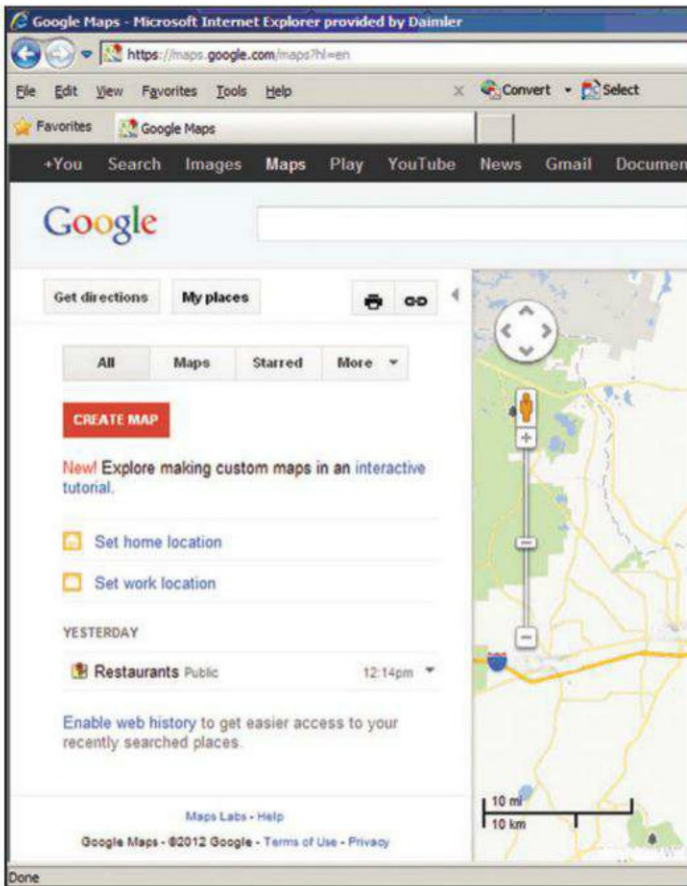


Fig. 2— After logging into Google and selecting Maps and My Places, you can start the process to create a map by clicking the red button. Note the invitation to see an interactive tutorial just below that button, which is a fast and painless way to learn the process.

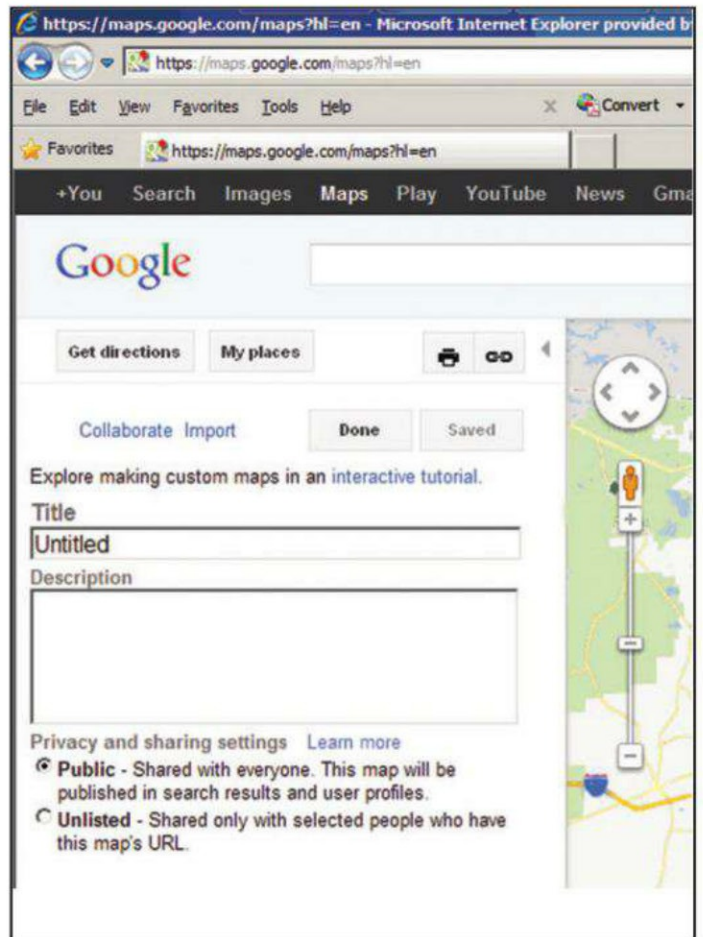


Fig. 3— The first step in creating a custom Google map is to give your map a name and description, and decide if it is to be public or private. See the text for details.

map in Google, dropping little marker pins on locations, adding comments, and sharing it with the world. How cool is that?

I started building a small map (fig. 1), and when things get a little slower at work I add to it. As I was doing that, seeing something about the New York City Marathon led me to think about Steve Mendelsohn, W2ML (SK), and then about the logistics of the amateur radio support team. (Steve was a major factor in ham efforts supporting the Marathon). Thus, I came upon the idea for this month's column: Digital mapping support for amateur radio.

What, if anything, might an amateur radio operator such as you or me do with a custom map? To start with, as a tactical resource it will help anyone associated with an event to get the "big picture," literally. Since it's on the World Wide Web, it can easily be shared. Also, you can grant specific people permission to edit it, so it can be kept current as a collaborative effort, meaning real-time updates.

Let's take an example such as a radio-orienteeing event. You can create a map for the organizers so they know where all the assets for the event are located, including the hidden "fox" transmitters, and then create a similar map for the participants so they know the boundaries and important checkpoints (like first aid). You can easily provide both map views and satellite views, and even terrain where available.

Then there is something more serious, such as the New York City Marathon. Pinpoint every checkpoint, first-aid station, mile marker, and so on. If something changes, it changes for everyone, in real time. You can print the map in varying

levels of detail, and anyone with internet access can see it, or restrict access to a specific group, or create several maps with varying levels of detail and access.

Emergency communicators can make great use of these maps to keep track of assets and incidents as the situation unfolds. Various events can use mapping for everything from directions to the event to a map of the activity for attendees, or even make up a map of local restaurants.

The nicest part is that the map is stored somewhere on the Google servers and is available for users and collaborators to access from anywhere they can get an internet connection. You can even customize the way the map is displayed on your own web page if you like.

Making a custom map actually is quite easy. For a small map, you can place the markers manually, one at a time. For larger maps you can create and use a KML file, which is a type of XML (eXtensible Markup Language) file, and just upload that to Google. We'll get to that in a moment, but first let's talk about the small-map, manual way.

The first step is to sign in to Google. If you don't have a Google account, you'll need to sign up for one. You may have concerns about providing information to Google, but what it requires is quite minimal (although you may need to provide a little more if you want to take advantage of Google's many other services and features). Personally, I value my privacy quite a lot, but having read Google's privacy policy, and considering the information it needs to create the account, I'm not even slightly uncomfortable having a Google account.

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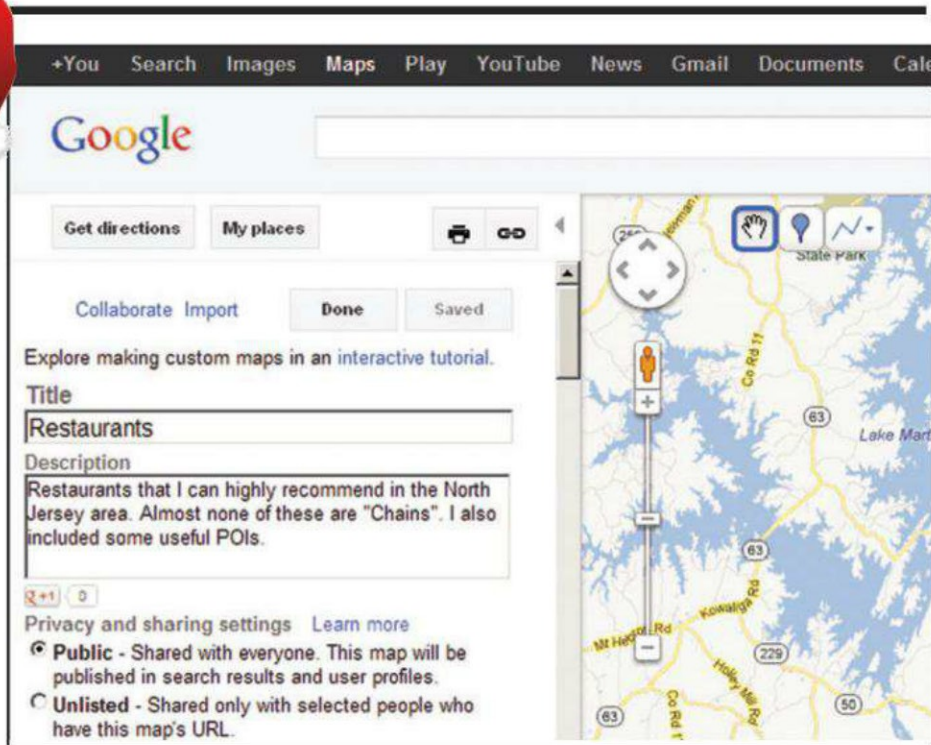


Fig. 4— Note the small toolbar that is shown on the map, at the upper right of this image. With these three tools you can create some very powerful map features.

“Maps” on the top menu. Then, at the upper left, click on the “My Places” button. This opens up a new submenu which has a bright-red button titled “Create Map.” I’ll let you figure out which button to click to create a map, but before you do, there’s a small hyperlink just below that button (see fig. 2) that invites us to explore making maps in an interactive tutorial. That tutorial is how I learned to make maps, so I highly recommend that you take advantage of it

as well. (I admit that I had to restart it several times during my learning phase, so don’t feel bad if this happens to you.)

The next step, after clicking “Create Map,” is to give your new map a descriptive but short name, along with a slightly longer description, so folks accessing it know what it is about (see fig. 3). For my Restaurants map, I chose the not-very-mysterious title of “Restaurants,” and a simple, plain-language description. I also selected the default

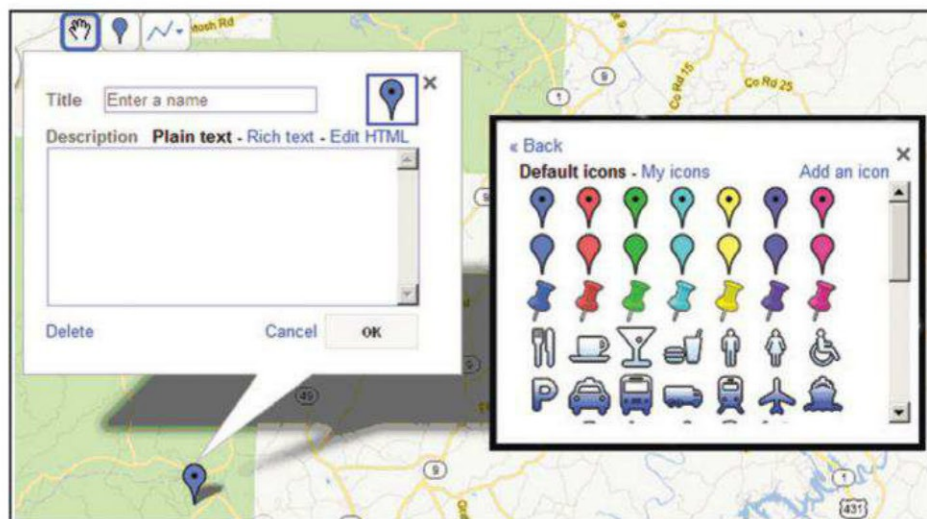


Fig. 5— This is the pop-up window that allows you to provide details about each Placemark you add. To the right are some of the placemark icons available. Note that in fig. 1 only the blue default “pop with dot” icons are used. You can even add your own custom icons.

setting of "Public," meaning that anyone with the URL can access the map. All of these choices can be changed later, or even left blank, but to complete this step and move onward to the next step, you need to click "Done" (Note that the "Saved" button is grayed out at this time. "Done" will save your map title and description, but you are well-advised to get into the habit of clicking the "Save" button after each map entry or edit.)

Now that your map title, description, and status have been developed, it is time to edit your map, adding information. Click the "Edit" button, and a small toolbar appears at the upper left of the map, as you can see in fig. 4.

The first tool is the Hand Tool, which allows you to select and edit map features, as well as being a way of moving the map view around in the window. After selecting this tool, just click and drag to move the map, or click on a feature you created to select and (if desired) edit it.

Next to it is the Placemark tool, which allows you to put placemarks—those blue pin-like objects—onto the map wherever you click. That is, you select the tool, click on a spot on the map, and the placemark is placed. Note that you're not limited to blue and pin-like: After placing a placemark, a name and description window opens up. Click on the blue pin, and several dozen choices for the type of placemark will become visible, as seen in fig. 5. Click one to select it, or you can "Add an Icon" if none of the choices is suitable. Also note that in the description box you're not just limited to plain text: Select one of the options above the text box for either Rich Text (which is text with formatting) or HTML (which can be far more flexibly formatted; just note that you need to have some ability to write or edit HTML). Once you are done, be sure to save the map or your changes will be lost.

For my Restaurants map I used the name of the restaurant as the placemark title, and added a short, plain-text description of the kind of food served, why it was included, and in some cases details on things such as parking or that it does not accept credit cards. At the time I am writing this column, all of my placemarks were the default blue pin (See fig. 1 again). Perhaps I will change them in the future, or perhaps not.

The last tool is the Line tool (see fig. 6). You can draw a line, draw a line along a road (it follows the road automatically), or draw a shape (such as a rectangle or irregular shape). As with a placemark, you can give each line (or line segment) a name, description, and

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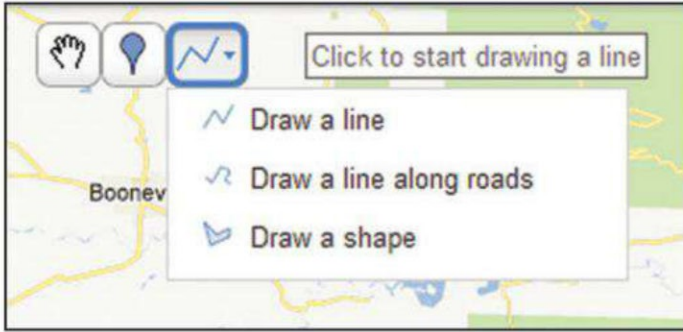


Fig. 6— The three options for the “Draw a Line” custom map tool. See the text for details.

change the line color, thickness, and opacity to any of several offered. I found that this feature was somewhat resource-intensive, meaning your computer might struggle and bog down a little as it works with this feature. Just be patient and it eventually works out. When drawing a line—whether it snaps to roads or not—start the line by clicking on the map. To end the line, click on the last point of the line. To close a shape, you double-click the last point placed, which closes the area. Once again, be sure to save any time you make an addition or change or it will be lost.

Those are the basics of creating a custom map, point by point. In order to really understand and appreciate the amazing possibilities and functions, I recommend that you create a small sample or test map, and play with the options to see what they do. Just remember to save often!

For large and complex maps, you can create a database of sorts in KML (Keyhole Markup Language). If you are familiar with XML, then KML will seem familiar to you. You can imagine KML as a plain text file, with very specific “tags” specifying exactly what each piece of data means. As with any “programming” language, mistakes in spelling or punctuation will cause problems. However, moving from a huge file of location data to a custom Google map becomes very easy if you use a KML file.

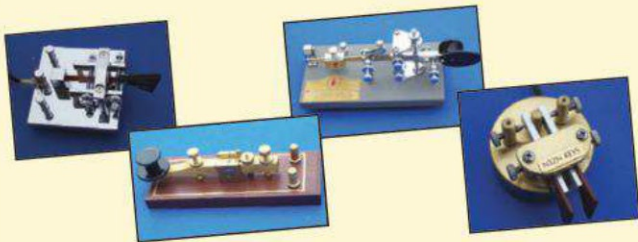
While it is far beyond the capabilities of this column to explain KML in any detail, I can offer you two resources that are sure to help: First, after you’ve created your sample map, you will have the ability to download a KML file with all the data in it. If you save it in .TXT format, you’ll be able to look at the file and align it with what’s shown on your map. Doing this will really help you understand how to use it. Second, visit the Google KML website <<https://developers.google.com/kml/>>, which leads to documentation, tutorials, forums, and more resources that will help you become an expert if you want. It takes some effort, but not as much as earning an amateur radio license.

That’s about all for this month. If you want to see my Restaurants map—especially if you want to find something to eat in the northeastern NJ area—visit <<http://google/maps/5xxyn>>.

As is my custom this time of year, when we’re all feeling good about home, family, and peace, I wish you and yours all the peace of the season, all year round.

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The extraordinary key collection painstakingly assembled over decades by the late Dave Ingram, K4TWJ, is now being offered for sale. Numbering hundreds of pieces, the collection was a labor of love for Dave. Many of the pieces are featured in his “Keys, Keys, Keys” book found on the book shelves of thousands of Hams around the world.

Dave was a writer for CQ for 25 years and loved ham radio. He would want someone to own some of his keys, someone who would display them in their personal collection and enjoy using them. If you would like to purchase one or more of these keys (and more are available), please contact Sandy Ingram, WB4OEE, at wb4oe@att.net.

Now you can own a piece of this fine collection, or even the entire collection! Here are just a few of the many items available:

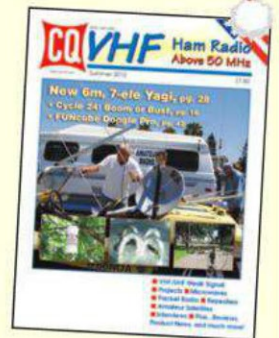
- **Begali HST Single lever \$250; Simplex \$150**
- **ZN QRP Key w/call S/N 006 \$275; 2A N3ZN Key S/N 006 \$200**
- **RMS Titanic TK1 S/N 0001 \$200**
- **GHD GF601MP \$350**
- **Vibroplex Champion \$150**

Contact Sandy Ingram, WB4OEE, at wb4oe@att.net for additional items and information.

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Remembering Maynard Hill, W3FQF (SK)

Last month I focused on Silent Keys of this year. This month I will remember another amateur radio operator, one who made a single headline-grabbing accomplishment in his lifetime. His name is Maynard Hill, amateur radio callsign W3FQF. His major accomplishment: While he had several noteworthy accomplishments in model-airplane flying, he will be forever known for having flown a model airplane across the Atlantic Ocean.

In working on a story idea about amateur radio cubesats and model airplanes, I decided to look into the whereabouts of the man who wrote an article about flying a model airplane across the Atlantic Ocean for the Winter 2004 issue of *CQ VHF* magazine. Unfortunately, I learned that Maynard became a Silent Key on June 7, 2011, at age 85, after a long illness.

Maynard Luther Hill was born on February 21 1926 in Lehighton, Pennsylvania. Early in his life he had a fascination with flying, counting Charles Lindbergh and Amelia Earhart as two of his childhood heroes. Even though he fancied full-size flight, he came to focus his attention on model airplanes.

In order to properly tell the fascinating story about his lifetime hobby, what follows are excerpts from his *CQ VHF* magazine article:

At age seven, after several failures I built my first model airplane that actually flew. That rubber-band-powered creation of balsa and tissue paper smartly climbed to altitudes near 30 feet and sometimes stayed up for as long as 30 seconds! This joyous achievement was the start of a 70-year addiction to a balsa-and-glue habit. I confess that I simply must have the stuff! I built models during high school, during 2 1/2 years in the Navy in WW II, during college, and during 52 years of marriage and family life that occasionally got a little rocky because of my obsession.

After two years of struggles that could rightly be called failures, in 1949 I successfully flew a radio-controlled model airplane. Success was a vague sort of thing in those days. What actually happened is a friend towed my 10-foot-span glider to about a 250-foot altitude. It made several figure-8s as it descended, and was steered to a landing about 200 feet from where it was anchored to the ground by a cable attached to a 20-pound black box that was almost as big as a bread box. This achievement led to a permanent addiction to the fascinating joys of radio-controlled flight.

The radio equipment I used in 1949 was a commercial version of a system that had been developed by the Good brothers. Walt, W3NPS, and Bill, W81FD, were identical twins with an identical zeal for radio-control. Their first RC flights had been made in 1936, and historians credit them with being the first hobbyists and radio amateurs to fly RC in the United States, and perhaps in the whole world.

The Good brothers' post-war RC equipment was made and marketed by Harry Geyer under the logo of Beacon Electronics. The airborne stuff, with its batteries, weighed about 2 lbs. with a 1/2-hour battery supply—gross by today's standards, but remarkably light and small for 1949 vintage radios. The receiver was a super-regenerative type operated on the 6-meter ham band. The heart of the unit was a 3A5 vacuum tube whose plate current

VHF Plus Calendar

December 6	Last quarter Moon
December 12	Moon perigee
December 13	New Moon
December 13	<i>Geminids</i> meteor shower
December 20	First quarter Moon
December 22	<i>Ursids</i> meteor shower
December 25	Moon apogee
December 28	Full Moon

—EME conditions courtesy W5LUU

flowed through a magnetically polarized super-sensitive relay. The filament of the 3A5 needed 100 ma at 1.5 volts. The plate current was 6.0 ma at 45 volts. These two rivers of electrons add up to about 0.42 watts, a Niagara compared to modern pulse code modulation (PCM) receivers.

It would be a blatant misnomer to call an afternoon at the field a "flight session." Most often a couple of hours of relay adjustment, range testing, and battery checking ended with one attempt to fly.

I just cannot resist telling the younger generation of hams about the key technical problem: The 3A5 tube drew 6 ma when the super-regenerative hiss was alive. This current dropped to about 4 ma when the 6-meter carrier wave signal was received. The polarized relay contacts had very fine-pitched threaded screws to set the armature to hair-trigger from the insulated point to the electrical contact point. Sometimes the 45-volt B+ battery would sink out of its useful range before the adjustment was completed. The choice was to go home or stick an expensive spare in there and start over.

In the ensuing decades Maynard set or broke a number of model-airplane records. The following is his summary:

During the 1950s Walt Good became my patient mentor and my very good friend. He helped me build and fly his new dual-proportional control system, which he called TTPW, for two-tone pulse width. Almost everybody called the system "too tough to piddle with," but I succeeded and became a fairly hot aerobatics stunt pilot who came close to being on the American team that went to the first FAI World Championships for RC Models in Zurich, Switzerland in 1960.

In 1962, Walt Good pulled some strings with the British organizers and got me appointed to be the chief judge at the second World Championships in Kenley, England. The Soviet Union sent a team to this event. I was shocked by the crudeness of their models and RC gear. I was very surprised to learn that a lapel pin worn by Pietr Velitchkovski, one of the team members, identified him as a "Hero of the Soviet Union." He had earned this honor by setting seven world records for radio-controlled aeromodels.

On our return from Kenley, Walt and I persuaded fellow members of the D.C.R.C. club to hold some record trials. We figured it ought to be easy to beat Velitchkovski with our superior RC stuff. On July 3 and 4, 1963, with help from the Navy, we assaulted Velitchkovski's altitude record of 7100 feet. We did this in the restricted air space at the Navy base in Dahlgren, Virginia. Four competitors passed Velitchkovski's mark. I went the highest, 13,328 feet, nearly doubling the Soviet record.

This event stimulated a third serious addiction related to aeromodeling. I abandoned aerobatic competition

e-mail: <n6cl@sbcglobal.net>

and started on a campaign to set world RC records. Instead of being at the mercy of human judges who might be biased or inaccurate for many reasons, record setting is a competition controlled by the laws in Mother Nature's arena. Success is rated in terms of rigid numbers, and the judges are tape measures, clocks, and other technical devices. In short, I found it great fun to set up a challenge, to work on the technical problems, and eventually, to achieve the goal. You know when you are successful, and there's no one to blame for failures but yourself.

All of Velitchkovski's records were overtaken by 1970. By 1999 I had gone on to set a total of 23 world records, 21 of them in the major categories of piston-motored altitude, distance and speed in a straight line, distance and speed in closed circuit, and duration. The other two were soaring glider altitude and speed. The first ten or so set during the 1960s were fairly easy. The still-current altitude record of 26,990 feet was moderately difficult, and the last ten were downright tough! Typically, the development and testing took up to two years and a couple of crashes before success was achieved. We chased models using convertibles barreling at 70 mph on Interstates. I flew countless hours on a racetrack path to perfect distance models, ultimately setting a closed-course distance record of 1301 km with a 13-hour flight. Exciting boredom! I survived 33 hours and 39 minutes of solo piloting to set a duration record in 1992.

Back then there was a "Hail Lindbergh" rule that said one man must pilot the model during the entire flight. Amateur radio technology was used to reduce the problems of lack of sleep and changes in metabolism to manageable levels. A 70-cm band Yaesu walkie-talkie was used as a beacon located on the ground near the pilot's position. A homemade direction-finding receiver on board the airplane was mated to the rudder to make the model loiter automatically over the beacon. Also, a 10-milliwatt downlink telemetry transmitter on the 2-meter band sent down data about airplane and engine performance. A loud claxon sounded if something needed the pilot's attention. I was half asleep on a chaise lounge much of the time. Happily, the rule has been changed to allow team efforts.

Further discussion of these past records can't be included here, but if you are interested in learning more about them, a

bibliography of 26 of my publications can be obtained from the librarian at headquarters of the Academy of Model Aeronautics in Muncie, Indiana.

An achievement yet eluded Maynard, that of a transatlantic flight. Here he tells how he researched the possibility of achieving that goal:

I developed two models that convinced me that it might be possible for a "true" model airplane to fly across the Atlantic Ocean from Newfoundland to Ireland. A "true" model airplane for RC records cannot exceed 5 kilograms (11.023 lbs.) gross weight (with fuel), and it cannot use an engine larger than 10 cc (0.6 cu in.) displacement. "Old Faithful IV" had a fuel load of 4.4 lbs. when it was launched on its 33-hour 39-minute record flight. "Marvelous Martha," the smaller model, weighed 5.5 lbs. empty and thus had a 5.5 fuel capacity, within the rules limit. "Martha" and a sister called "Stretcher" established four very difficult distance records between 1994 and 1998. "Martha" holds the current closed-course distance record of 1301 km (808 miles). Two cross-country records (328 miles and 427 miles) were set by chasing the model with a pilot in a convertible that barreled down Interstate routes 81 and 95. A GPS receiver in the convertible recorded the speed of the model to be about 70 mph in level flight (there was little or no wind). This number was verified by clocking lap times over the 1 km closed course during record flights in 1994 and 1998.

During 1996 and 1997, I built and tested Martha-like models with fatter fuselages and longer-span wings. We flew racetrack patterns with a Garmin 75 GPS receiver on board to try to find the optimum wing, propeller, fuselage length, and width. The numbers looked okay, and the 1998 closed-course performance beefed up our optimism. "Let's go for it!" was the vote of the team of helping friends.

We knew we would need money, so the Society for Technical Aeromodel Research was formed and announced at a "Gathering of the Eagles" at the Academy of Model Aeronautics in Muncie, Indiana on September 11, 1998. The goals of the society were two-fold: One was to honor and remember Captain John Alcock and Lt. Arthur Whitten Brown, who flew the first non-stop flight across the



Maynard Hill, W3FQF, prepares to launch TAM-5 at Cape Spear, Newfoundland at 7:45 PM on August 11, 2003.



As a watchful father, Maynard gazes at his creation as the TAM-5 is at last on its way to Ireland.

Atlantic from Newfoundland to Ireland on June 14, 1919. The other was to show young people that model airplanes can be creative, educational, and fun.

If at first you don't succeed, try, try, try, try, and try again. It would take five attempts spread over two years, 2002 and 2003, for Maynard to succeed. Here Maynard tells about his record-breaking flight:

Weather over the Atlantic was predicted to stay mild through the 11th but would go to the dogs soon after. A quick turnaround by a tired crew got TAM-5 unpacked, trim flight tested, fueled, and weighed for a launch at Cape Spear at 7:45 PM Newfoundland time. Ordinarily, it takes me about 4 hours of engine run and fuel-consumption measurements to gain confidence about the needle-valve setting. I had trouble with a fussy filter and had to replace it. I had only about a half-hour of measuring before it was time to proceed to Cape Spear. I was leery and debated scrubbing the launch, but because of the poor three-day forecast I decided to proceed and hope.

The evening fog that plagued us at Cape Spear in 2002 did not happen in 2003. TAM-5 was launched into clear sunset skies. Beautiful! Everyone cheered! I wished I could see the airplane. Alas, I couldn't find it in the sky beyond 200 feet.

There was a little crosswind for the first 500 miles out of St. John, and ground speed was about 43 mph for the first 10 hours. After it passed the Greenland triangle, a mild tailwind put average speed up to about 55 mph. All day on Sunday, the 10th, the satellite data said the engine rpm was fluctuating from 3200 to 4100—very abnormal and scary. Altitude was a porpoising path, up to 320 meters, down to 270. This was also abnormal and scary. It appeared the needle valve was set on the lean side of a proper fuel mixture. Engine power was a bit weaker than was needed to make these TAM models get "up on the step" for a clean cruise. We could worry, but there was nothing to do but hope.

TAM-5 plodded along and reported in all day Sunday. Then from 1:00 AM to 4:00 AM Monday, Newfoundland time, there was no satellite data. It sure looked like another goner.

We were telephoning the Ireland crew to go back to bed, when Cyrus announced there was new satellite data. Call Ireland! Tell them it's still flying! Not only was it still airborne, it was flying better. After 32 hours the rpm was smooth at 3900, the altitude steady at 300 meters, and auto-elevator trim had gone from nearly full "up" to the normal slight "down" trim. It was still dark in Newfoundland, but 4:00 AM Newfoundland time is 7:30 AM Irish time. TAM-5 was now in early morning sunshine over the Gulf Stream. Apparently, it liked flying in the warmer air with a much lighter fuel load. However, the weak tailwind was now mostly a crosswind and ground speed was back down to about 46 mph. It was still 300 miles from the Irish coast and would have to fly for

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another 6¹/₂ hours. We had a fingernail-chewing cliffhanger on our hands! If I had set the needle at its usual slightly rich setting, the model would have run out of fuel in about 36 hours. Now we needed it to fly for 38¹/₂ hours. I kept hoping that the faulty setting would yield the extra time.

Imagine the stress when we passed the 38.5 mark and were still about 20 miles from shore. It would be horrible to have it go that far and then fall short of the designated spot! The Irish crew picked up the short-range telemetry about 8 miles and 10 minutes off the coast. It was coming in right on the 95-degree programmed heading. The entire tech crew had their eyes on the horizon at 275-degree bearing, searching for a glimpse of the plane. They could detect it coming on the instruments, but they couldn't see it. The slender model sneaked in over the coast, and some children in the crowd looked straight overhead and shouted, "There it is! It's up here!"

At 2:08 PM Irish time, Dave Brown, AMA's president, who had agreed to be the landing pilot, brought the plane in a mere 5 feet from the spot. His wife, Sally, was on her cell phone to Cyrus Abdollahi, who quietly stated with a big grin, "It's on the ground." A

cheer went up in the St. John's operations center. I did not jump about or shout with glee as I had done for other records. I did no "high fives," and I am not much into male hugging. I buried my head in Gay's shoulder and quietly wept for joy. We had accomplished what seemed impossible only a few hours ago.

All of the requirements of the Federation Aeronautique Internationale rules for world records were met, and two new records for piston-powered radio-controlled aeromodels have been certified. A distance of 1882 miles exceeded the previous record of 517 miles set by Ron Clem of California in 1998. A duration record of 38 hours 52 minutes 19 seconds exceeds the previous record of 33 hours 39 minutes 22 seconds that I set in October 1992. The holders of these new records are Maynard Hill, builder of the model; Joe Foster, launch pilot; and Dave Brown, landing pilot.

Maynard's obituary on the TAM website (<http://tam.planet21.com>) states the following:

Maynard's reputation as a dedicated and innovative modeler is secure. Even after the



Jim Kennedy, KH6/K6MIO, receives the Chambers award from Kent Britain, WA5VJB, at this year's Central States VHF Society conference.

unparalleled success of the Trans-Atlantic Model project, he continued to work, making several ill-fated attempts to extend the F3 duration record. Finally, as his illness took control, he reluctantly put away the balsa and glue which had been so much a part of his life.

Maynard was much more than a dedicated modeler. He was husband, father of three, and friend to many. He was always willing to share his considerable experience with others. Friends, neighbors, and strangers found they could count on him for useful advice. He read widely and retained information well. In recent years, friends read to him and he devoured talking books. Maynard Hill will be missed.

Chambers and Wilson Awards

The Central States VHF Society presented its two prestigious awards, the Chambers and Wilson awards, at this year's annual conference. The honorees are: Jim Kennedy, KH6/K6MIO, and Jay Liebmann, K5JL. Kennedy received the Chambers award and Liebmann received the Wilson award.

Jim Kennedy, KH6/K6MIO: Kennedy was honored for his many contributions in advancing the studies of propagation. Along with his coauthor, Gene Zimmerman, W3ZZ (SK), he has published several articles on propagation in the Society's *Proceedings*, as well as in *CQ VHF* magazine.

After receiving the award Jim shared with me that he was surprised and honored to be this year's recipient. He added that it is especially humbling to follow in the footsteps of John Chambers, one of his heroes. He stated that he used to hang out with John to learn from him, as John set about to perform his experiments in attempt to make contact with Tommy Thompson, KH6UK/W2UK over the now famous California to Hawaii tropo duct.

Jay Liebmann, K5JL: Liebmann was honored for his many years of service to the society and amateur radio in general. I remember one contribution in which heretofore Jay has received almost no recognition—the K5JL repeater in Oklahoma City.

As the ARRL Oklahoma Section Manager at the time, I was responsible for the amateur radio operators who responded to the Murrah building terrorist bombing disaster. Without a doubt, the backbone of communications for the amateur radio operators was the K5JL repeater. Its reliability, despite more than a week of continuous night and day operation, is a tes-

tament to Jay's commitment to excellence in his station and to serving his community. Furthermore, throughout the years of Jay's activities from Piedmont, Oklahoma, he has been active on the VHF and microwave bands, giving many operators their first DX QSO.

Lunar-Link Acquired

After the untimely passing of K1FO, Lunar-Link has been acquired. More information is on its website: <http://home.cshore.com/lunarlink>?

Current Meteor Showers

Two showers occur this month. The first, the *Geminids*, is predicted to peak around 1330 UTC on December 13. The actual peak can occur 2.5 hours before or after the predicted peak. It has a broad peak and is a good north-south shower, producing an average of 60 meteors per hour at its peak.

The second, the *Ursids*, is predicted to peak around 0800 UTC on December 22. It is an east-west shower, producing an average of no more than 10 meteors per hour, with the very rare possibility of upwards of 90 meteors at its peak.

For more information on the above meteor shower predictions see Tomas Hood, NW7US's "Propagation" column in this issue. Also visit the International Meteor Organization's website: <http://www.imo.net>.

Calls for Papers

Calls for papers are issued in advance of forthcoming conferences either for presenters to be speakers, or for papers to be published in the conferences' *Proceedings*, or both. For more information, questions about format, media, hardcopy, e-mail, etc., please contact the person listed with the announcement. The following organization has announced a call for papers for its forthcoming conference:

The **Society of Amateur Radio Astronomers (SARA)** solicits papers for presentation at its 2013 Western Regional Conference, to be held February 9 through February 10, 2013, at Best Western Socorro Hotel & Suites at Socorro, New Mexico. Papers on radio astronomy hardware, software, education, research strategies, observations, and philosophy are welcome. SARA members or supporters wishing to present a paper should e-mail a letter of intent, including a proposed title and informal abstract or outline, to westernconference@radio-astronomy.org no later than December 1, 2012 (please let them know if you require more time). Be sure to include your full name, affiliation, postal address, and e-mail address, and indicate your willingness to attend the conference to present your paper. Submitters will receive an e-mail response, typically within one week. Formal printed *Proceedings* will be published for this conference and all presentations will be made available on CD.

And Finally . . .

Next month I will discuss RF safety, in particular focusing on protecting one's eyes. Daniel Lewis, DL3IAE, posted a request on the Microwave mailing list pertaining to RF safety and eye protection. More than 25 people responded to his request. I will summarize the responses in next month's column.

With this column, I conclude another year of serving you as your columnist in the wonderful niche of VHF-Plus in the Amateur Radio Service. I wish all of you the best for the holidays and a healthy and prosperous New Year.

Until next month . . . 73 de Joe, N6CL

Awards from Rede dos Emissores Portugueses

This month features the current awards program of the "Rede dos Emissores Portugueses" (REP), the national association of the amateur operators of Portugal. It's nice to see that recent revisions to their program also reduced award fees.

The first award listed, CTDX, is a Portuguese version of the ARRL's DXCC, so if you hold any level of DXCC, you can apply for this one to spice up your awards collection. Additional awards honoring Vasco de Gama and Bartolomeu Dias recall the period of world exploration when Portugal was a leading sea power. The easiest of the REP awards is the Lisbon City Award, which calls for only ten contacts with the capital city of Lisbon.

Rede dos Emissores Portugueses Award Series

General Requirements: SWL OK. Send GCR list including all contact data with at least two signatures of witnesses. Apply to: Rede dos Emissores Portugueses, Award Manager, REP - Rede dos Emissores Portugueses, Rua D. Pedro V, 7-4°, 1250-092 Lisboa, Portugal. Internet: <<http://www.rep.pt/>>

Diploma CTDX100. Rede dos Emissores Portugueses sponsors this award available to all

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



This award, sponsored by the Portuguese National Radio Association, is available to all amateurs and SWLs who submit proof of contact/heard from 100 different countries on the ARRL DXCC list on or after 15 November 1945.

USA-CA Honor Roll

HA1ZH	3592	WM3PEN	3594
RJ3AA	3593		

500

The total number of counties for credit for the United States of America Counties Award is 3077. The basic award fee for subscribers is \$6.00. For nonsubscribers it is \$12.00. To qualify for the special subscriber rate, please send a recent CQ mailing label with your application. Initial application may be submitted in the USA-CA Record Book, which may be obtained from CQ Magazine, 25 Newbridge Road, Hicksville, NY 11801 USA for \$2.50, or by a PC-printed computer listing which is in alphabetical order by state and county within the state. To be eligible for the USA-CA Award, applicants must comply with the rules of the program as set forth in the revised USA-CA Rules and Program dated June 1, 2000. A complete copy of the rules may be obtained by sending an SASE to Ted Melinosky, K1BV, 12 Wells Woods Road, Columbia, CT 06237 USA. DX stations must include extra postage for airmail reply.

amateurs and SWLs who submit proof of contact/heard from 100 different countries on the ARRL DXCC list on or after 15 November 1945.

Separate awards are available for bands/mode as shown below:

Modes: Phone, CW, Mixed, RTTY, SSTV, or Satellite.

Bands: All bands, 10, 12, 15, 17, 20, 30, 40, or 80 meters.

Single band: 6, 10, 40, 80, 160 meters, and satellite.

5 Bands: for working/hearing a minimum of 100 countries on the 5 bands of 10, 15, 20, 40, and 80 meters.

Honor Roll: Contact at least 300 different countries.

Submit log and actual cards (or photocopy of an approved ARRL DXCC award listing proving your country count). Application forms from REP for SAE/IRC. Cost for the award is 6 Euros or \$US8 plus the necessary amount to cover the registered postal charges if cards are sent.

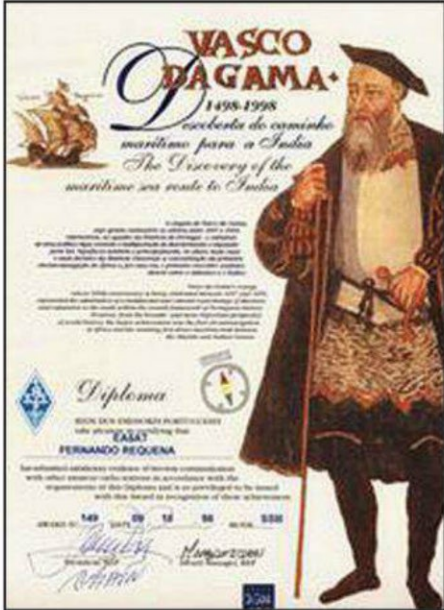
The basic award is for 100 countries. Endorsement stickers for each 25 additional countries until 300. Endorsement thereafter for each 5 additional countries. Cost for endorsements is \$US4 or 3 Euros.

Diploma Vasco da Gama. This award is sponsored by the Portuguese National Radio Association to honor the Portuguese Discoveries during the 15th century and especially the discovery of the sea route to India by the Portuguese navigator Vasco da Gama. Contact different countries along the route of the explorer since 15 November 1945. SWL OK. Earn at least 25 points, which must include one contact with Portugal (CT) and India (VU). Point values shown below. Available SSB, CW, or mixed.

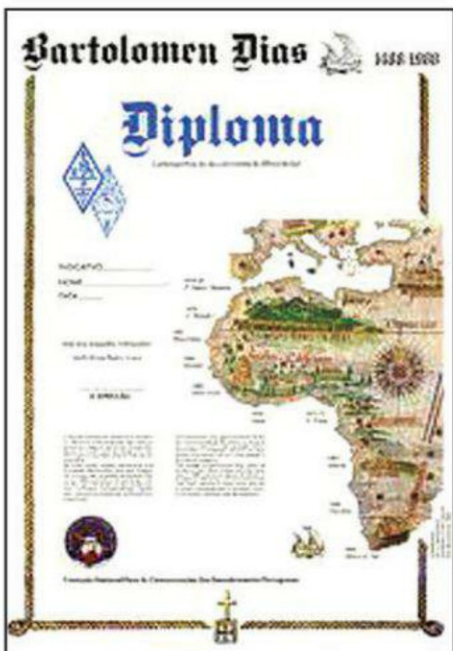
5 different classes as follows (see Table I for point values):
Class I—75 points, Golden Sextant

Class II—100 points, Golden Compass
 Class III—125 points, Golden Anchor
 Class IV—150 points, Golden Astrolabe
 Class V—200 points, Golden Helm Wheel

The highest level of this award is called the “Honor Roll” for those earning 250 or more points. This award



Contact different countries along the route of the explorer Vasco da Gama since 15 November 1945 to earn this award.



Sponsored by REP and the SARL to honor Dias's arrival at the Cape of Good Hope in 1488, this award is given for contacts as specified on or after 1 January 1988.

comes in the form of a small metal statue, a replica of a sailing ship of the golden age of exploration.

Contacts may be submitted in the form of photo copies of cards or GCR list. The diploma is free of charge to members of REP, and will cost 1000

Portuguese escudos for non-members residing in Portugal. For all others, the cost is 6 Euros or \$US8, and cost for endorsements is SASE plus 3 Euros or \$US4.

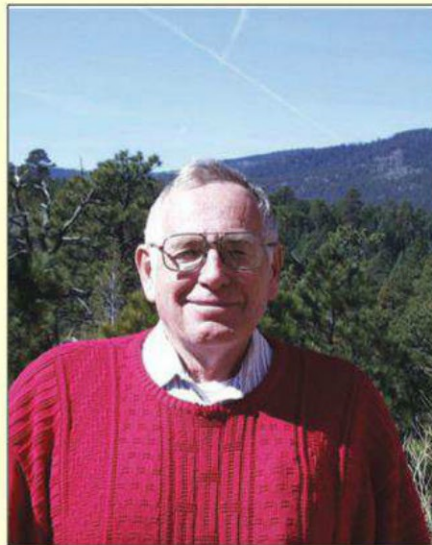
Endorsement stamps are free of charge, requiring a GCR list and SASE

Diploma Vasco da Gama Award

3C Eq. Guinea, 8	C9 Mozambique, 6	T5 Somalia, 8
3C0 Annobon, 10	CN Morocco, 4	TJ Cameroon, 5
3X Guinea, 5]	CT Portugal, 3	TN Congo, 8
5H Tanzania, 5	CT3 Madeira, 4	TR Gabon, 5
5N Nigeria, 4	CU Azores, 4	TU Ivory Coast, 5
5R Madagascar, 8	D2 Angola, 6	TY Benin, 5
5T Mauritania, 5	D4 Cape Verde, 6	V5 Namibia, 5
5V Togo, 5	D6 Comoros, 8	VU India, 5
5Z Kenya, 5	EA8 Canary Isl., 4	VU7 Laccadive, 10
6W Senegal, 5	EL Liberia, 4	ZD7 St. Helena, 5
7O Yemen, 10	EP Iran, 8	ZD8 Ascension, 5
9G Ghana, 5	FH Mayotte, 5	ZS South Africa, 4
9L Sierra Leone, 5	FR/J Juan de Nova, Europa, 10	
9Q Zaire, 8	J5 Guinea-Bissau, 6	Total Available
A4 Oman, 5	SØ West Sahara, 8	Points: 265
AP Pakistan, 5	S9 S. Tome & Principe, 6	
C5 The Gambia, 5		

Table I— Prefix, name of country, and point values.

Richard F. Smale, W5IL USA-CA All Counties #1231, August 14, 2012



Richard, W5IL, USA-CA All Counties #1231.

Hello from Los Alamos, New Mexico. I was first licensed as WA5ROU in the late 1960s and changed my call to W5IL when the 1x2 callsign pool opened up. My amateur career is pretty typical—CW, phone, DX, public service, contests, etc.

It took nearly 30 years before I became interested (then addicted) to County Hunting (CH); then it took nearly 15 years

more before I finally completed the USA-CA-3077 first time around. My County Hunting activity has been a split career. The first thousand or so counties came pretty quickly, followed by several years of inactivity. I came back to the CH arena a few years ago, determined to finish up the task. The next 2000 counties came along at a moderate pace, but the last group, the “rare” group (the “will they ever come on the air?”) seemed to take forever. I had not realized how difficult it is to find that rare county, and I think that the USA-CA award is one of the harder awards to earn. It takes patience (which I sorely lack) and perseverance.

However, it also takes a dedicated group of amateur operators who are, collectively, known as “the mobiles.” Looking at my log, it is obvious that more than half of the 3077 county contacts have been supplied by these wheelmen. Not until the last few years have I tried this type of amateur operation. After several trips around New Mexico with a Hamstick and an ancient Kenwood TS-50, I have a great admiration for the effort and skill that these nomads bring to County Hunting.

I hope that my County Hunting career continues and that I do not lose interest; 3077 CW is my next hope, as well as second time around.

73, Richard, W5IL

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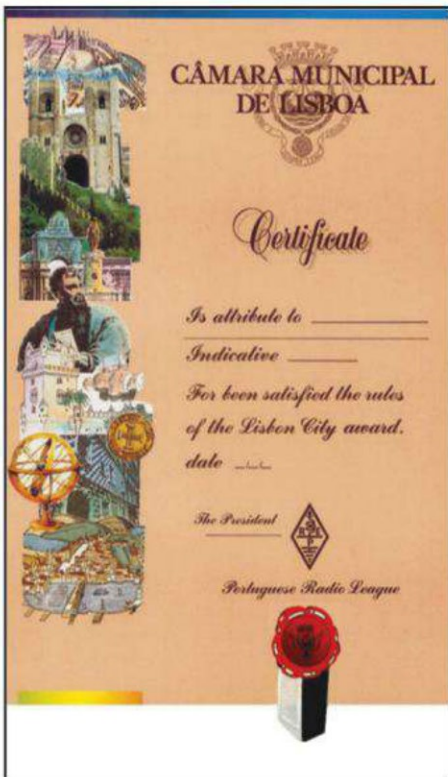


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Contact 10 stations in the capital city of Lisbon after 1 June 1988 to earn this award (see text for details).

or SAE and 2 IRCs. Cost for "Honor Roll" level is 35 Euros or \$US30 for Europeans and 48 Euros or \$US40 for all others.

Bartolomeu Dias Award. This award is sponsored by REP and the SARL to honor Dias's arrival at the Cape of Good Hope in 1488 and given for contacts as specified on or after 1 January 1988:

Portuguese stations need 20 CT and 5 ZS

South Africans need 20 ZS and 5 CT, All others need 5 each of CT and ZS.

SWL OK. Send GCR list and fee of 6 Euros or \$US8; endorsements available for 3 Euros or \$

Lisbon City Award. Contact 10 stations in the capital city of Lisbon after 1 June 1988. SWL OK. Only 7 are needed if CT1REP; the IARU representative station is included. The award can be earned for HF or VHF. Send GCR list and fee of 6 Euros or \$US8; endorsements require an SASE and \$US4 or 3 Euros.

We are always interested in learning of new awards for publication in this column. Please contact me with details and a sample certificate. 73, Ted, K1BV

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WAZ Award Next Up for Logbook of The World Support, plus an Intro to All of CQ's DXing Awards

BY CQ STAFF



CQ and the ARRL have agreed that the Worked All Zones (WAZ) award will be the next CQ award to be supported by the League's Logbook of the World (LoTW) online confirmation system. The target date for "going live" with LoTW support for WAZ is mid-2013.

The first CQ award supported by LoTW is the WPX prefix award. Since Logbook support began in early July, over 200 applications have been processed through the system—including a couple of folks who qualified for the WPX Award of Excellence via LoTW.

WPX Award Manager Steve Bolia, N8BJQ, reports that just about everything seems to be running smoothly after some initial hiccups. One ongoing problem for some people is that the LoTW system has not automatically filled in all of their prefixes. If you encounter this problem, just e-mail Steve at <n8bjq@cq-amateur-radio.com> and he will get it resolved. He is also able, on request, to upload current participants' existing prefix credits to the system as long as he has them in digital form.

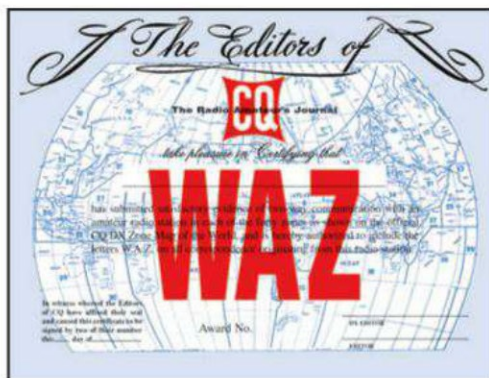
Steve also notes that some people are getting confused about fees. The LoTW credit fee is paid to the ARRL (think of it as postage for QSLs, only a lot less overall) and covers the League's costs. It is separate from the award fee, which is payable to N8BJQ and covers his costs of administering the award program.

Steve has written an excellent step-by-step guide to applying for WPX via LoTW. It is posted on the ARRL's Logbook of the World website at <<http://bit.ly/Qv8gTJ>>. Finally, we are still accepting applications based on traditional QSL cards and credits from eQSL.

A Quick Look at CQ's DX Awards

The WAZ award is CQ's best-known and most popular award program — and it is the second oldest active amateur radio award program, after only the IARU's Worked All Continents (WAC) award. (Yes, folks, it's older than DXCC!) But CQ offers several other awards for DXers as well, so this discussion of CQ awards presents a good opportunity to review them. We'll start, though, with WAZ and WPX for those who may not be familiar with them.

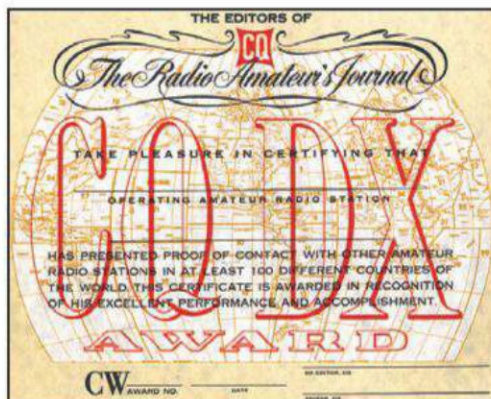
CQ Worked All Zones Award: Way back in the 1930s, the editors of *R/9* magazine (one of CQ's predecessors) divided the world up into 40 zones, based on a combination of geographic boundaries and population concentration. These zone boundaries have remained essentially unchanged over



the past eight decades, despite ongoing changes in political borders, etc. The basic WAZ award is issued for making confirmed contacts with at least one station in each of the 40 CQ Zones of the World. There are sub-awards for separate bands and modes, as well as the highly prestigious 5-band WAZ award. Complete details, including zone boundaries, are on the CQ website at <<http://bit.ly/TC2Ncr>>.

CQ WPX Award: This award is given for confirmed contacts with stations having various numbers of different call sign prefixes, such as W2 or KB6. Basic levels are 300 prefixes for single-mode (CW, Digital and SSB) awards and 400 prefixes for mixed-mode. As of now, WPX is the only CQ award supported by the ARRL's Logbook of the World online confirmation system. Complete rules may be found at <<http://bit.ly/PfjBKB>>.

CQ DX Award: If you qualify for DXCC, then you likely qualify for the CQ DX Award as well. There are, of course, a few differences. First of all, there is no mixed award offered. Each CQ DX Award is single-mode only, either CW, SSB or Digital. As with DXCC, you need 100 confirmed "entities" to qualify. However, the CQ country list is a combination of the DXCC and the WAE (Worked All Europe) lists, so we include some entities that are not on the DXCC list, such as the



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CQ DX Honor Roll

The CQ DX Honor Roll recognizes those DXers who have submitted proof of confirmation with 275 or more ACTIVE countries. With few exceptions, the ARRL DXCC Countries List is used as the country standard. The CQ DX Award currently recognizes 341 countries. Honor Roll listing is automatic when an application is received and approved for 275 or more active countries. Deleted countries do not count and all totals are adjusted as deletions occur. To remain on the CQ DX Honor Roll, annual updates are required. All updates must be accompanied by a SASE if confirmation of total is required. The fee for endorsement stickers is \$1.00 each plus SASE. (Stickers for the 340 level are available.) Please make checks payable to the Award Manager, Keith Gilbertson. Mail all updates to Keith Gilbertson, K0KG, 21688 Sandy Beach Lane, Rochet, MN 56578-99604.

CW

N0FW340	K4IQJ340	N4NX339	K9MM339	K2OWE333	F6HMJ330	WG5G/QRPP325	YO9HP313	K7CU282
K2TQC340	K4MQG340	K4JLD339	W4MPY333	K5RT329	K8ME323	N2LM313	WA2VQV282	
WB4UBD340	W8XD340	K9BWQ339	K7LAY339	K5UO333	JA7XBG329	W9IL323	ON4CAS311	N2VW280
K3UA340	N7RO340	W7CNL339	K8JGJ339	N6AW333	K6YK329	OZ5UR322	WD9DZV309	K4EQ280
N4JF340	N5FG340	N5ZM339	K8LJG338	HB9DDZ333	K8SIX328	KSSKG320	KT2C306	4Z5SG276
K2FL340	K4CN340	K9IW339	KA7T338	W7IIT333	KE3A326	W6YQ319	HB9DAX/QRPP	
WK3N340	OK1MP340	W7OM339	PY2YP334	G3KMQ331	K6CU326	CT1YH317		302
W4OEL340	N4AH340	N4MM339	K9OW334	K6LEB331	KA3S325	EA3ALV316	HA5LQ301	
EA2IA340	F3TH340	WSSJLC339	K1FK334	N7WO331	IK0ADY325	RA1AOB314	K4IE295	
N7FU340	DL3DXX340	YU1AB339	W6OUL334	W1DF331	EA5BY325	WA4DOU313	N3RC291	

SSB

XE1AE341	K4IQJ341	I8KCI340	VE3MRS340	OE2EGL336	K8LJG334	W1DF327	IV3GOW313	K7SAM302
N0FW341	N5FG341	I8KCI341	K7LAY340	W4ABW336	HB9DDZ334	KE4SCY327	W6NW311	4X6DK298
K6YRA341	K4CN341	VE3XN340	W7BJN340	VE1YX336	K8SIX333	K6GFJ327	KU4BP311	WD9DZV298
IK1GPG341	OZ3SK341	K5TVC340	K8LJG339	EA3BMT336	KE3A333	W9GD326	I3ZSX310	K2HJB295
K2TQC341	OK1MP341	W6BCV340	4Z4DX339	IK0AZG336	N2VW333	W6OUL326	KA1LMR309	W9ACE291
K4MZU341	N4CH341	VE2GHZ340	W7FP339	W9IL336	JA7XBG333	VE7SMP326	RA1AOB309	W6MAC289
DJ9ZB341	DL3DXX341	K2FL340	W4UNP339	W8AXI335	N5YY333	N2LM326	G3KMQ309	N3RC289
WB4UBD341	OZ5EV341	K9BWQ340	K9IW339	VK4LC335	K5UO332	VE7EDZ325	XE1MEX309	K7CU287
N4JF341	DU9RG341	W6DPD340	N7WR339	WS9V335	K8ME332	W0ROB324	AD7J309	WD8EOL281
WK3N341	N4MM341	W7OM340	W2FKF339	AA4S335	K5RT331	F6BFI324	I0YKN307	VE6MRT279
K4JLD341	KE5K341	W8ILC340	W3AZD339	PY2YP335	W0YDB331	W4MPY322	XE1MW306	WA2VQV278
N7BK341	IN3DEI341	W9SS340	K1UO339	K9OW335	WA4WTG331	TI8II321	AA1VX305	N3RC295
EA2IA341	EA4DO341	K9HQM340	F6HMJ339	EA5BY335	ZL1BOQ331	YO9HP321	W5GT305	IW0HOU277
K4MQG341	YU3AA341	K0KQ340	W2CC338	XE1J335	SV3AQR331	KW3W321	K4IE305	WA5UA276
K9MM341	K5OVC340	AB4IQ340	K3LC337	OE3WWB334	CT1AHU329	XE1RBV318	K4ZZR305	SQ7B275
K3JGJ341	K3UA340	KZ2P340	VK2HV336	N6AW334	N1ALR329	ON4CAS316	AE9DX304	
N5ZM341	VE2PJ340	YU1AB340	W4WX336	IK8CNT334	K7HG328	HB9DQD314	K7ZM304	
N7RO341	N4NX340	VE3MR340	I0ZV337	CT3BM334	KD5ZD328	N8SHZ313	4Z5FL/M303	

RTTY

WB4UBD339	N14H339	N5FG337	N5ZM335	OK1MP335	K4CN334	K3UA332	WK3N327	K8SIX297
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Shetland Islands (GM/s), Kosovo (YU8) and European Turkey (TA1). In addition, CQ gives credit for the Italian islands of Lampedusa and Pantelleria (IG9/IH9), which are in North African zone 33, as "African Italy." There are a few others as well, so we recommend checking out the complete CQ country

list online at <http://dxmarathon.com/countrieslist/countrieslist.htm> to see what entities you may have that qualify for CQ DX credit but not for DXCC credit. Complete CQ DX Award rules may be found at <http://bit.ly/UeLV0H>.

CQ DX Field Award: This award gives you credit for confirmed contacts

with 50 or more "grid fields," or 10x20-degree blocks of latitude and longitude. "Grid squares" or "grid locators" are commonly used by hams in Europe and by U.S. hams on VHF and UHF. Each "grid square" is a 1x2-degree block of latitude and longitude, identified by two letters, such as FN—this is the "grid

The WPX Program

CW

3320.....HA5GN	3326.....AG3V
3321.....K9IA	3327.....K4HB
3323.....IK2HDF	3328.....DM2DXA
3325.....G5CL	3330.....JF1KML
3325.....IT9XUA	3331.....EY8MM

SSB

3179.....HA5GN	3190.....KJ4QDZ
3180.....W9HBB	3191.....IT9ABN
3182.....OD5ZZ	3192.....KA9JAC
3183.....IW5BT	3193.....YB2TJV
3184.....EA5HRM	3195.....DM2DXA
3185.....IZ4AMS	3196.....EY8MM
3187.....AG3V	3197.....EA5MB
3189.....WC3Q	3198.....8P6NW

Mixed

2300.....HA5GN	2317.....KJ4QDZ
2301.....CT1ELF	2318.....F1VEV
2302.....TF5B	2320.....EI3GAB
2303.....N1TA	2321.....KA9JAC
2304.....N2FF	2322.....YB2TJV
2305.....OD5ZZ	2323.....VA3VF
2306.....K9IA	2324.....9A2GA
2307.....KM4HI	2325.....PY2MC
2308.....IW5BT	2326.....5W1SA
2309.....EA5HRM	2328.....DM2DXA
2310.....IZ4AMS	2330.....EY8MM
2312.....KB2YAN	2331.....EA5MB
2313.....W7SYK	2333.....JP1GVC
2314.....G5CL	2334.....WB\$SLCW
2315.....CE3OPE	2335.....8P6NW
2316.....AG3V	2336.....W1PL

Digital

91.....N3RC	121.....F1VEV
116.....4Z4DX	123.....EA1WW
117.....TF5B	124.....K3CWF
118.....LY3BY	125.....EY8MM
119.....AG3V	126.....W1PL
120.....KJ4QDZ	127.....N3GH

CW: 350 G5CL. 450 K9IA. 500 G0BPK. IT9XUA. AG3V. 550 HA5GN. NF4A. 600 K4HB. 700 IK2HDF. RA0FU. 900 7N2JZT. 950 DM2DXA. 1600 EY8MM. 2000 N3RC. 3450 W8IQ.

SSB: 350 EA5HRM. KA9JAC. YB2TJV. 400 EI9HQ. OD5ZZ. IZ4AMS. 500 G0BPK. 550 EA5MB. 650 8P6NW. 800 RA0FU. DM2DXA. 950 AG3V. 1050 IT9ABN. 1700 EY8MM. 1750 ISREA N3RC.

Mixed: 450 JI2LPV. CE3OPE. TF5B. EI3GAB. W1PL. 500 EI9HQ. IZ4AMS. KB8VVCV. KA9JAC. 550 K9IA. EA5MB. JP1GVC. 600 KJ4QDZ. IW5BT. 650 8P6NW. 700 HA5GN. W4ASE. 750 NF4A. 800 W4ASE. 850 4Z4DX. 9A2GA. 900 KM4HI. K4JC. 950 K3CWF. 1000 5W1SA. 1050 CT1ELF. 1100 RU0FM. 1150 RA0FU. PY2MC. 1200 AG3V. 1300 DM2DXA. N7QJ. 2300 EY8MM. 2350 N3RC. 3000 RA1AOB.

Digital: 400 TF5B. KJ4QDZ. EA1WW. K3CWF. 500 AG3V. 700 W4ASE. 800 EY8MM. 900 N3RC.

160 Meters: HA5GN, N1TA, KJ4QDZ, DM2DXA, EY8MM, AG3V

80 Meters: DM2DXA, EY8MM, AG3V

40 Meters: DM2DXA, EY8MM, IW5BT, AG3V

30 Meters: EY8MM

20 Meters: RU0FM, KJ4QDZ, VA3VF, DM2DXA, EY8MM, AG3V, 8P6NW

17 Meters: EY8MM, 8P6NW

15 Meters: IZ4AMS, DM2DXA, EY8MM, NF4A, AG3V

12 Meters: K4HB, EY8MM

10 Meters: RU0FM, DM2DXA, EY8MM, AG3V

6 Meters: EY8MM

Asia: RU0FM, HA5GN, RA0FU, TF5B, DM2DXA, EY8MM, IW5BT, JF1KML

Africa: HA5GN, DM2DXA, EY8MM, IW5BT

Europe: RU0FM, EI9HQ, HA5GN, TF5B, JI2LPV, OD5ZZ, EA5HRM, IZ4AMS, N1TA, G5CL, N2FF, KJ4QDZ, YB2TJV, VA3VF, DM2DXA, EY8MM, EA5MB, IW5BT, NF4A, W1PL, AG3V, 8P6NW

Oceania: RU0FM, HA5GN, DM2DXA, K3CWF, EY8MM, AG3V

North America: RU0FM, EI9HQ, IZ4AMS, N1TA, CE3OPE, KJ4QDZ, VA3VF, DM2DXA, K3CWF, EY8MM, NF4A, W1PL, AG3V, 8P6NW

South America: LY3BY, RA0FU, DM2DXA, EY8MM

Award of Excellence with 160 Bar: DM2DXA, EY8MM, K4HB

30M Bar: EY8MM, K4HB

17M Bar: EY8MM, K4HB

12M Bar: EY8MM, K4HB

6M Bar: EY8MM

Digital Bar: EY8MM

Award of Excellence Holders: N4MM, W4CRW, K5UR, K2VV, VE3XN, DL1MDD, DJ7CX, DL3RK, WB4SIJ, DL7AA, ON4QX, 9A2AA, OK3EA, OK1MP, N4NO, ZL3GO, W4BQY, I0JX, WA1JMP, K0JN, W4VQ, KF2O, WB8CNL, W1JR, F9RM, W5UR, CT1FL, WA4QM, W8ILC, VE7DP, K9BG, W1CU, G4BUE, N3ED, LU3YL/W4, NN4Q, KA3A, VE7WJ, VE7IG, N2AC, W9NUF, N4NX, SM0DJZ, DK5AD, WD9IIC, W3ARK, LA7JO, VK4SS, I8YRK, SM0AJU, N5TV, W6OUL, WB8ZRL, WA8YTM, SM6DHU, N4KE, I2UIY, I4EAT, VK9NS, DE0DXM, DK4SY, UR2QD, AB9O, FM5WD, I2DMK, SM6CST, VE1NG, I1JQJ, PY2DBU, HI8LC, KA5W, K3UA, HA8UB, HA8XX, K7LJ, SM3EVR, K2SHZ, UP1BZZ, EA7OH, K2POA, N6JV, W2HG, ONL-4003, W5AWT, N3XX, HB9CSA, F6BVB, YU7SF, DF1SD, K7CU, I1POR, K9LJN, YB0TK, K9QFR, 9A2NA, W4UW, NX0I, WB4RUA, I6DQE, I1EEW, I8RFD, I3CRW, VE3MS, NE4F, K88PG, F1HVB, ZP5JCY, KA5RNH, IV3PVD, CT1YH, ZS6EZ, K7EM, YU1AB, IK2ILH, DE0DAQ, I1WYJ, LU1DOW, N1IR, IK4GME, VE9RJ, NN1N, HB9AU, KC6X, N6IBF, W5ODD, I0RIZ, I2MQP, F6HMJ, HB9DDZ, W0ULU, K9XR, JA0SU, ISZJK, I2EOW, IK2MRZ, K5AS, KA1CLV, WZ1R, CT4UW, K0JFL, WT3W, IN3NJB, S5OA, IK1GPG, AA6WJ, W3AP, OE1EMN, W9IL, I7PXX, S53EO, DF7GK, S57J, EA5BM, DL1EY, DJ1YH, KU0A, VE2UW, 9A9R, UA0FZ, DJ3JSW, OE6CLD, HB9BIN, N1KC, SM5DAC, RW9SG, WA3GNW, S51U, W4MS, I2EAY, RA0FU, CT4NH, EA7TV, W9IAL, LY3BA, K1NU, W1TE, UA3AP, EA5AT, OK1DWC, KX1A, IZ5BAM, K4LQ, K0KG, DL6ATM, VE9FX, DL2CHN, W2OO, A16Z, RU3DX, WB9IHH, CT1EEN, G4PWA, OK1FED, EU1TT, S53MJ, DL2KQ, RA1AOB, KT2C, UA9CGL, AE5B, K0DEQ, DK0PM, SV1EOS, UA0FAI, N4GG, UA4RZ, 7K3QPL, EW1CQ, UA4LY, RZ3DX, UA3AIO, UA4RC, N8BJQ, UA3BS, UA9FGR, UT3UY, WA5VGI, UT9FJ, UT4EK, K9UON, UR5FEO, LY2MM, N3RC, OH3MKH, RA3CQ, UT3IZ, S55SL, RU3ZX, Y09HP, RA3DNC, K8ZT, K5K, JH8BOE, TF8GX, S58MU, UX1AA, AB1J, DM3FZ, AG4W, UA3QNS, RX3AGD, WB5JD, LY3W, LY5W, RW4WZ, VO1CV, DK8MCT, HB9DDO, DL4CW, W9RPM, IZ3ENH.

160 Meter Endorsements: N4MM, W4CRW, K5UR, VE3XN, DL3RK, OK1MP, N4NO, W4BQY, W4VQ, KF2O, W8CNL, W1JR, W5UR, W8ILC, K9BG, W1CU, G4BUE, LU3YL/W4, NN4Q, VE7WJ, VE7IG, W9NUF, N4NX, SM0DJZ, DK5AD, W3ARK, LA7JO, SM0AJU, N5TV, W6OUL, N4KE, I2UIY, I4EAT, VK9NS, DE0DXM, UR2QD, AB9O, FM5WD, SM6CST, I1JQJ, PY2DBU, HI8LC, KA5W, K3UA, K7LJ, SM3EVR, UP1BZZ, K2POF, IT9TOH, N6JV, ONL-4003, W5AWT, N3XX, F6BVB, YU7SF, DF1SD, K7CU, I1POR, K9LJN, YB0TK, K9QFR, W4UW, NX0I, WB4RUA, I1EEW, ZP5JCY, KA5RNH, IV3PVD, CT1YH, ZS6EZ, YU1AB, IK4GME, NN1N, W5ODD, I0RIZ, I2MQP, F6HMJ, HB9DDZ, K9XR, JA0SU, ISZJK, I2EOW, K5AS, KA1CLV, K0JFL, WT3W, IN3NJB, S5OA, IK1GPG, AA6WJ, W3AP, S53EO, S57J, DL1EY, DJ1YH, KU0A, VR2UW, UA0FZ, DJ3JSW, OE6CLD, HB9BIN, N1KC, SM5DAC, S51U, RA0FU, CT4NH, EA7TV, LY3BA, K1NU, W1TE, UA3AP, OK1DWC, KX1A, IZ5BAM, DL6ATM, W2OO, RU3DX, WB9IHH, G4PWA, OK1FED, EU1TT, S53MJ, DL2KQ, RA1AOB, UA9CGL, SM6DHU, K0DEQ, DK0PM, SV1EOS, N4GG, UA4RZ, 7K3QPL, EW1CQ, UA4LY, RZ3DX, UA3AIO, UA4RC, N8BJQ, UA3BS, UA9FGR, UT3UY, WA5VGI, UR5FEO, N3RC, UT3IZ, RU3ZX, Y09HP, RA3DNC, K8ZT, K5K, JH8BOE, S58MU, UX1AA, DM3FZ, AG4W, UA3QNS, RX3AGD, LY3W, LY5W, VO1CV, HB9DDO, DL4CW, W9RPM, IZ3ENH.

Complete rules and application forms may be obtained by sending a business-size, self-addressed, stamped envelope (foreign stations send extra postage for airmail) to "CQ WPX Awards," P.O. Box 355, New Carlisle, OH 45344 USA. Note: WPX will now accept prefixes/calls which have been confirmed by eQSL.cc and the ARRL Logbook of The World (LoTW).

*Please Note: The price of the 160, 30, 17, 12, 6, and Digital bars for the Award of Excellence are \$6.50 each.



The WAZ Program

6 Meters

111.....UT5URW (25 zones)

10 Meters SSB

598.....UX0FF

15 Meters SSB

657.....UX0FF

20 Meters SSB

1213.....UX0FF

40 Meters SSB

114.....UX0FF

80 Meters SSB

98.....K2FF

12 Meters CW

69.....UX0FF 70.....W18A

17 Meters CW

89.....UX0FF

20 Meters CW

615.....UX0FF

30 Meters CW

111.....UX0FF 112.....AG9S

40 Meters CW

292.....AG9S

80 Meters CW

95.....UX0FF

160 Meters

410.....VA3EF (40 zones)

411.....R9SG (31 zones)

160 Meter Updates

K5BG.....(39 zones)

All Band WAZ

Mixed

8940.....JA2ZS 8942.....KM4HI

8941.....IZ3ENH

SSB

5226.....IK8SDA 5229.....JA1DEU

5227.....AE5SL 5230.....W2BSN

5228.....IZ0COI 5231.....IZ4NIC

RTTY

232.....JA8DIZ 233.....AG9S

Rules and applications for the WAZ program may be obtained by sending a large SAE with two units of postage or an address label and \$1.00 to: WAZ Award Manager, Floyd Gerald, N5FG, P.O. Box 449, Wiggins, MS 39577-0449. The processing fee for all CQ awards is \$6.00 for subscribers (please include your most recent CQ mailing label or a copy) and \$12.00 for nonsubscribers. Please make all checks payable to Floyd Gerald. Applicants sending QSL cards to a CQ checkpoint or the Award Manager must include return postage. N5FG may also be reached via e-mail: <n5fg@cq-amateur-radio.com>

field"—and two numbers, as each grid field is broken up into 100 smaller rectangles. CQ's offices, for example, are located in grid FN30. For the CQ DX Field Award, we are interested only in the two-letter grid field. Getting confirmed contacts in 50 fields is of roughly the same difficulty as qualifying for basic DXCC or the traditional CQ DX Award. See the complete rules at <<http://bit.ly/OOCK4I>>.

The CQ iDX Award is our best-kept secret. Designed specifically for newer hams, its goal is to introduce Technician Class amateurs to the allure and joys of working DX. For this award *only*, con-

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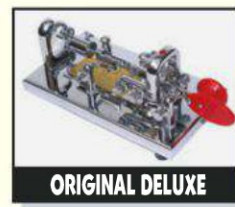
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5 Band WAZ

As of October 1, 2012, 890 stations have attained the 200 zone level and 1792 stations have attained the 150 zone level.

New recipients of 5 Band WAZ with all 200 zones confirmed:
UX0FF

The top contenders for 5 Band WAZ (zones needed, 80 or 40 meters):

K8JRK, 199 (26)	IN3ZNR, 199 (1)
UW0LT, 1999 (2 on 40)	IK4CIE, 199 (1)
N4WW, 199 (26)	JK1BSM, 199 (2)
W4LI, 199 (26)	RW0LY, 199 (2 on 40)
K7UR, 199 (34)	N7XM, 199 (21 on 10)
IK8BQE, 199 (31)	JA1CMD, 199 (2)
JA2IVK, 199 (34 on 40)	EA5RM, 198 (1, 19)
IK1AOD, 199 (1)	N8LJ, (17, 24)
VO1FB, 199 (19)	EA5BCX, 198 (27, 39)
KZ4V, 199 (26)	G3KDB, 198 (1, 12)
W6DN, 199 (17)	JA1DM, 198 (2, 40)
W3NO, 199 (26)	9A5I, 198 (1, 16)
RU3FM, 199 (1)	G3KMQ, 198 (1, 27)
N3UN, 199 (18)	N2QT, 198 (23, 24)
W1FZ, 199 (26)	OK1DWC, 198 (6, 31)
SM7BIP, 199 (31)	W4UM, 198 (18, 23)
N4NX, 199 (26)	US7MM, 198 (2, 6)
EA7GF, 199 (1)	K2TK, 198 (23, 24)
JA5IU, 199 (2)	K3JGJ, 198 (24, 26)
RU3DX, 199 (6)	W4DC, 198 (24, 26)
N4XR, 199 (27)	F5NBU, 198 (19, 31)
HA5AGS, 199 (1)	W9XY, 198 (22, 26)
N5AW, 199 (17)	K22I, 198 (24, 26)
JH7CFX, 199 (2)	W9RN, 198 (26, 19 on 40)
RA6AX, 199 (6 on 10)	W5CWQ, 198 (17, 18)
RX4HZ, 199 (13)	UA4LY, 198 (6&2 on 10)
S58Q, 199 (31)	JA7XBG, 198 (2 on 80&10)
K8PT, 199 (26)	JA3GN, 198 (2 on 80&40)
N8AA, 199 (23)	N4GG, 198 (18, 24)
IZ1ANU, 199 (1)	K4JLD (18, 24)

The following have qualified for the basic 5 Band WAZ Award:

WA2BCK (167 zones)	RA3IS (170 zones)
--------------------	-------------------

5 Band WAZ updates:

G3WW (194 zones)	E74SD (170 zones)
K8YC (191 zones)	NQ7R (188 zones)
VA3AYA (180 zones)	UT2UB (200 zones)

*Please note: Cost of the 5 Band WAZ Plaque is \$100 shipped within the U.S.; \$120 all foreign (sent airmail).

Rules and applications for the WAZ program may be obtained by sending a large SAE with two units of postage or an address label and \$1.00 to: WAZ Award Manager, Floyd Gerald, N5FG, P.O. Box 449, Wiggins, MS 39577-0449. The processing fee for the 5BWAZ award is \$10.00 for subscribers (please include your most recent CQ mailing label or a copy) and \$15.00 for nonsubscribers. An endorsement fee of \$2.00 for subscribers and \$5.00 for nonsubscribers is charged for each additional 10 zones confirmed. Please make all checks payable to Floyd Gerald. Applicants sending QSL cards to a CQ checkpoint or the Award Manager must include return postage. N5FG may also be reached via e-mail: <n5fg@cq-amateur-radio.com>.

tacts made via repeaters and internet-linked repeater networks (such as Echolink or IRLP) qualify for credit. Since many newer hams do not have QSL cards or LoTW accounts, e-mails are considered valid verifications of QSOs. The initial level for the iDX Award is 25 countries worked via internet-linked networks, with a *maximum* level of 100. (And by the way, working 25 or more countries on Echolink or IRLP is *not* an easy thing to do!) Complete rules are at <<http://bit.ly/QwFyl9>>.

Finally, the CQ DX Marathon is a hybrid of an award and a contest. You start from scratch at the beginning of each year, as you would in a contest, but you may collect contacts for the Marathon throughout each year, rather than on one or two specific weekends. Credit is given for countries and zones

worked, and no confirmations are needed. See the rules for the 2013 CQ DX Marathon elsewhere in this issue.

Traditional QSL cards and eQSL credits are accepted for all CQ awards; as of now, Logbook of the World credits are valid only for the CQ WPX Award. You might want to bookmark <http://www.cq-amateur-radio.com/cq_awards/index_cq_awards.html>, from which you can go to rules and other information for all CQ awards.

On the Air in December

The following DX operations are anticipated or continuing in December, courtesy of the ARRL:

- G3RWF will be operating from **Uganda** as 5X1NH through mid-December on several HF bands. QSL to home QTH.

- 9N1FE has been reported active from **Nepal** on 15-meter PSK at around 1100 UTC. Follow the operator's instructions for QSLing.

- A61Q has been active on 10-meter CW from the **United Arab Emirates** between 1300 and 1500 UTC. QSL via EA7FTR.

- H44MS (DL2GAC op.) will be active from **Guadalcanal** in the Solomon Islands through December 10 on 80-10-meter SSB. QSL to home QTH.

- VU3BPZ/3 will be active through the end of December from India's Bharati base in **Antarctica**. QSL via I1HYW.

- Z81D is reported active from **South Sudan** on 40-10-meter SSB at various time. QSL via OM3JW.

We wish you and all of our fellow hams around the world a happy holiday season and good DX in 2013.

CQ DX Awards Program

SSB

2590KU4JZ

The basic award fee for subscribers to CQ is \$6. For non-subscribers, it is \$12. In order to qualify for the reduced subscriber rate, please enclose your latest CQ mailing label with your application. Endorsement stickers are \$1.00 each plus SASE. Updates not involving the issuance of a sticker are free. All updates and correspondence must include an SASE. Rules and application forms for the CQ DX Awards may be found on the <www.cq-amateur-radio.com> website, or may be obtained by sending a business-size, self-addressed, stamped envelope to CQ DX Awards Manager. Please make checks payable to the Award Manager, Keith Gilbertson. Mail all updates to Keith Gilbertson, K0KG, 21688 Sandy Beach Lane, Rochert, MN 56578-9604. We recognize 342 active countries. Please make all checks payable to the award manager. Photocopies of documentation issued by recognized national Amateur Radio associations that sponsor international awards may be acceptable for CQ DX award credit in lieu of having QSL cards checked. Documentation must list (itemize) countries that have been credited to an applicant. Screen printouts from eQSL.cc that list countries confirmed through their system are also acceptable. Screen printouts listing countries credited to an applicant through an electronic logging system offered by a national Amateur Radio organization also may be acceptable. Contact the CQ DX Award Manager for specific details.

How “Being DX” Helps You Be a Better Contester

There are many similarities between being a DXer and a contester. The primary goal of each is to make contacts. DXers want to work the rare ones, rare being defined as those stations in countries (or DX entities) that are new to them. Contesters want to contact as many stations as possible in as many places as possible that yield new multipliers. One of the major differences between the two is that for contesters, their count starts fresh every time, whereas DXers add to their existing totals. Can *being* DX help a dyed-in-the-wool contester improve? I had the chance to find out this past September when I participated in the “Azores Nine Island Hunt.”

From September 28–30, 2012 a group of approximately 30 amateurs activated the Azores Island group. Forming nine country teams with the locals, a total of 20 DXers flew in from Azorean airline SATA destinations to be on the air from all nine Azores islands, a unique concept to bring everyone on board globally to share what the Azores can offer.

The goal was to offer amateurs from all over the world the opportunity to make contact with each island team on three amateur radio bands—17, 20, and 40 meters. The organizing committee consisted of Fernando Tavares, CU2BV, Chairman; Francisco Gil, CU2DX, Azores tourism agency representative; Jose Melo, CU2CE, islands coordinator; and Martti Laine, CU2KG/OH2BH, radio operations coordinator. Martti stated, “It is often said that DXers only work DX. More recently, we have seen a healthy shift toward assisting the society they visit by helping locals become stronger in Amateur Radio. Something totally new is now happening in CU-land—the Azores.”

The amateur radio group also had the goal of helping streamline emergency communications procedures throughout the archipelago. Together with the local amateur population and administrators, they used this activity to test the island-to-island amateur radio network. Prior to the event, operators on all nine islands checked in to a directed net to facilitate logistics, report their setup status, and describe a little something about the island on which they were operating. Net control was performed by Mike Corey, K11U, Emergency Preparedness Manager for the ARRL.

The Azores

The Azores is a beautiful island group. As a Portuguese DX entity, operating can be done using a CEPT reciprocal license. Each of the nine islands has its own unique identity. The highest mountain in all of Portugal is on Pico! There are some very interesting cities such as Ponta Delgada on Sao

*P.O. Box 657, Copiague, NY 11726
e-mail: <n2ga@cq-amateur-radio.com>

Calendar of Events

All year	CQ DX Marathon http://bit.ly/vEKMWD NOTE: 2012 logs due by Jan 15, 2013
Nov. 24-25	CQ WW DX CW Contest http://www.cqww.com/rules.php
Nov. 30-Dec. 2	ARRL 160M Contest http://www.arrl.org/160-meter
Dec. 1-2	ARRL EME Contest http://www.arrl.org/eme-contest
Dec. 1-2	Tops Activity Contest http://bit.ly/T3fQGA
Dec. 2	SARL Digital Contest http://bit.ly/H0lqQf
Dec. 8-9	ARRL 10M Contest http://www.arrl.org/10-meter
Dec. 15	OK DX RTTY Contest http://www.crk.cz/ENG/DXCONTE
Dec. 15-16	Croatian CW Contest http://www.9acw.org/
Dec. 16	ARRL Rookie Roundup, CW http://www.arrl.org/rookie-roundup
Dec. 16	QRP ARCI Holiday Spirits Homebrew Sprint: http://bit.ly/PH1goU
Dec. 21	AGB Party Contest http://ev5agb.com/contest/agb_party.htm
Dec. 23	RAEM Contest http://bit.ly/PGRWMMg
Dec. 26	DARC Christmas Contest http://bit.ly/PGRHAT
Dec. 29	RAC Winter Contest http://www.rac.ca/en/rac/programmes/contests/
Dec. 29	Stew Perry Topband Challenge http://jzap.com/k7rat/stewrules.txt
Jan. 1	SARTG New Year RTTY Contest http://www.sartg.com/contest/nyrules.htm
Jan. 5-6	ARRL RTTY Roundup http://www.arrl.org/rty-roundup
Jan. 25-27	CQ WW 160M CW Contest http://cq160.com/rules.htm
Feb. 22-24	CQ WW 160M SSB Contest http://cq160.com/rules.htm

Miguel and Angra do Heroísmo on Terceira (recognized as a World Heritage site by UNESCO in 1983). The islands have a unique culture, history, range of activities, and biodiversity. Popular activities are hiking, scuba diving, whale watching, swimming, bird watching, geotourism, big-game fishing, bike tours, health and wellness, horseback riding, and canoeing.

While these islands count as a single DXCC entity, they offer three IOTA groupings as follows: EU-003 Eastern Azores Group (CU1, CU2); EU-089 Western Azores Group (CU8, CU9); and EU-175 Central Azores Group (CU3, CU4, CU5, CU6, CU7). Participating amateurs were K2DO, K11U, KE3Q, N2GA, VE3DZ, VE3FWA, DJ9ZB, DF9TF, G3TXF, G7VJR, OH2BH, OH8NC, OH9MDV, LB3HC, ON7LX, ON7TK, ON5NT, OZ7AM, and OZ1IKY, together with locals CU1AAD, CU2BV, CU2CE, CU2DX, CU3CS, CU4AB, CU5AM,

Azores Nine Islands Hunt Summary

Total QSOs: 30,390
Total DXCCs: 119
Distinct calls: 7,918

Table I. Breakdown of contacts.

CU6AB, CU7CA, CU8AAE, and CU9AC. See sidebar for a list of islands, callsigns, operators, radio associations, and hosts.

An interesting aspect of this operating event was that the organizing committee offered an incentive to work at least five different islands—the chance to win a free trip to the Azores, including flights, accommodations, and transfers. Any amateur making contact with five islands was put into one lottery, and the first 25 people to make contact with all nine islands were placed into a second lottery for a total of two free trips. This added to the enthusiasm of the callers and the resulting fierce pileups. By the time the event was over, there were more than 30,000 QSOs made, with 7900 individual callsigns in the log, representing 119 different DXCC countries. The countries with most the QSOs were USA (5458), Germany (4669), and Finland (1917), but even Japan got 875 entries across a difficult path over the North Pole. See Table II for team-by-team breakdowns by band. Additional

Help Wanted: WPX Contest Director

The appointment of Randy Thompson, K5ZD, as director of the CQ World-Wide DX Contest has created a vacancy in the position of director of the CQ WPX Contest. Interested contesters are invited to apply. You must be an experienced contester with particular knowledge of the WPX Contest, must be a proven administrator, must be able to work well with other people, and also must be capable of meeting deadlines for submitting material for publication in CQ. Randy has posted a detailed description of what the position involves on the WPX Contest blog page at <<http://www.cqwp.com/blog/?p=110>>.

If you are interested, we encourage you to read the blog posting and to contact K5ZD to apply or for more information.

—The editors

statistics may be found on the Azores Nine Island Hunt website at <<http://azores-islands-hunt.com/>>.

The Other End of the Pileup

Being on the “other end” of the pileup was an interesting experience. As a contester, I normally don’t work split, but when you are the DX, it is almost mandatory! One CQ was all it took to generate a pileup, and once you were



The city gates in downtown Ponta Delgada on Sao Miguel Island in the Azores. Legend has it that if you walk through the central gate hand-in-hand, you will have a long future together. An international group of amateurs activated all nine islands of the Azores for a special event at the end of September. (N2GA photos)



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QSOs per Band/Mode

CU1ARM 17 SSB: 719 17 CW: 1133 20 SSB: 881 20 CW: 699 40 SSB: 919 40 CW: 784 QSO total: 5135 DXCCs: 97	CU4ARG 17 SSB: 569 17 CW: 556 20 SSB: 887 20 CW: 506 40 SSB: 91 QSO Total: 2609 DXCCs: 73	CU7CRA 17 SSB: 344 17 CW: 254 20 SSB: 627 20 CW: 135 40 SSB: 102 40 CW: 151 QSO Total: 1613 DXCCs: 65
CU2ARA 17 SSB: 641 17 CW: 395 20 SSB: 1321 20 CW: 412 40 SSB: 142 40 CW: 166 QSO Total: 3077 DXCCs: 81	CU5AM 17 SSB: 468 17 CW: 974 20 SSB: 843 20 CW: 1432 40 SSB: 416 40 CW: 866 QSO Total: 4999 DXCCs: 94	CU8ARF 17 SSB: 226 17 CW: 125 20 SSB: 714 20 CW: 277 40 SSB: 117 40 CW: 493 QSO Total: 1952 DXCCs: 72
CU3URA 17 SSB: 690 17 CW: 520 20 SSB: 715 20 CW: 372 40 SSB: 385 40 CW: 316 QSO Total: 2998 DXCCs: 87	CU6GRP 17 SSB: 402 17 CW: 478 20 SSB: 397 20 CW: 425 40 SSB: 261 40 CW: 824 QSO Total: 2787 DXCCs: 74	CU9AC 17 SSB: 1028 17 CW: 1040 20 SSB: 1038 20 CW: 953 40 SSB: 549 40 CW: 612 QSO Total: 5220 DXCCs: 89

Table II. QSOs per band/mode for each station.

spotted on the DX cluster, the pileup grew to sometimes overwhelming proportions. It helped to listen up and try to spread out the callers a bit. While it's fun to have many people calling, it can definitely slow down your rate. As a contester, rate is everything and maximizing rate is the key to higher scores. The so-called perfect pileup would be one person calling in the clear after every QSO. This would lead to accurate call-sign copying, fewer repeats, and maximum speed. Unfortunately, rate suffers as the size of the pileup increases. When five are calling you, the callsigns begin to mix; when ten are calling, getting a prefix becomes difficult; when one hundred are calling, it becomes a cacophony of sound!

The hardest part was completing an exchange. Once a callsign was picked out of the pile and the exchange was sent, incessant calling by other stations slowed down the process. Stations need to standby while the DX completes the exchange so extra fills are not needed. At the worst times, two or even three extra QSOs were lost because of all the extra sending needed.

Other times longer path openings to harder-to-contact places provided the opportunity to work other stations from those regions. When that happens and only that region is asked to call, please try to accommodate the DX station's request. For example, I would ask for "Asia only" and have Europeans call. Even asking Europe to standby, some stations insisted on giving their callsigns! This is poor operating practice and does nothing to improve the DX station's throughput.

The best advice I can give after being DX is to call where the DX is listening. This sounds simple but can be quite challenging. When too many stations were calling, it could become hard to separate them. I would then move my listening frequency to reduce the number of stations. Once that

Azores Nine Island Hunt Callsigns, Operators, and Hosts

Team Findland, Santa Maria
Associação Radiomadores Marienses, CU1ARM
Juha Hulkko, OH8NC
Kimmo Rautio, OH9MDV
Sérgio Oliveira, CU1AAD

Team Norway, Sao Miguel
Associação Radiamadores dos Açores, CU2ARA
Marius Hauki, LB3HC
Ghis Penny, ON5NT
Guilherme Frias, CU2IF

Team USA (1), Terciera
União Radiamadores dos Açores, CU3URA
George Tranos, N2GA
Diane Ortiz, K2DO (YL)
Domingos Cabral, CU3BS

Team Germany, Graciosa
Associação Radiamadores da Graciosa, CU4ARG
Franz Langner, DJ9ZB
Richard Gottlieb, DF9TF
Guilherme Bento Frias, CU4AB

Team Canada, St. Jorge, CU5AM
Yuri Onipko, VE3DZ
Ed Kulchenko, VE3FWA
José Silveira, CU5AM

Team Denmark, Pico
Grupo Radioamadores do Pico, CU6GRP
Alex Hansen, OZ7AM
Kenneth Hemstedt, OZ1IKY
Jorge Dutra, CU6AB

Team USA (2), Faial
Clube Radioamadores do Faial, CU7CRA
Michael Corey, K1IU
Richard Boyd, KE3Q
Manuel Bettencourt, CU7CA

Team Belgium, Flores, CU8AO
Associação Radioamadores das Flores, CU8ARF
Carine Ramon, ON7LX (YL)
Claude van Pottelsberghe de la Potterie, ON7TK
Frederic Fournier, CU8AAE

Team United Kingdom, Corvo, CU9AC
Nigel Cawthorne, G3TXF
Michael Wells, G7VJR
João Camara, CU9AC

Azores 9 Islands Hunt Organizing Committee
Fernando Tavares, CU2BV, Chairman
Francisco Gil, CU2DX, ATA (tourism agency) Representative
Jose Melo, CU2CE, Islands coordination
Martti Laine, CU2KG, Radio operations

spot became too congested, I'd repeat the process and move again. As a calling station, if you can anticipate this process, you could be in the clear so the DX can pick you out. As a contester, this is an important skill when trying to work a needed multiplier with a huge pileup. Timing is also critical; try calling when everyone else isn't so your call is out in the clear.

Events such as the Azores Nine Island Hunt, which are professionally organized and expertly run, add excitement to amateur radio. While not a contest per se, the contest-style



The operators, organizing committee, and hosts of the Azores Nine Island Hunt. The photo was taken at CU2ARA, the club station of the Associação Radiadores dos Açores, on Sao Miguel.

operating activity generates real pile-ups and can help the operator build contesting and DXing skills. The organizers should be commended for creating such an environment, one that shows amateur radio in such a positive light. One of the “bases and purposes” of

amateur radio in the United States is to “enhance international goodwill.” This event greatly succeeded in doing just that—for the participants in the Azores and for those hams worldwide who contacted them.

73, George, N2GA



U.S. team member Diane Ortiz, K2DO, at the controls of CU3URA on Terceira Island as part of the Azores Nine Island Hunt. Diane is running a pileup on 14.253 using an Elecraft K3 transceiver, an Ameritron AL-1200 amplifier, and a Mosley TA-53 Yagi.

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The Chromosphere

A Quick Look at Current Cycle 24 Conditions

(Data rounded to nearest whole number)

Sunspots

Observed Monthly, September 2012: 62
 Twelve-month smoothed, March 2012: 67

10.7 cm Flux

Observed Monthly, September 2012: 123
 Twelve-month smoothed, March 2012: 127

Ap Index

Observed Monthly, September 2012: 8
 Twelve-month smoothed, March 2012: 8

One Year Ago: A Quick Look at Solar Cycle Conditions

(Data rounded to nearest whole number)

Sunspots

Observed Monthly, September 2011: 78
 Twelve-month smoothed, March 2011: 37

10.7 cm Flux

Observed Monthly, September 2011: 135
 Twelve-month smoothed, March 2011: 96

Ap Index

Observed Monthly, September 2011: 13
 Twelve-month smoothed, March 2011: 7

Several editions ago (September 2012), we looked at the Sun's photosphere. Remember, while our Sun seems to be an extremely hot ball in our sky, visible as a sharply-defined disk when we use proper viewing instruments, such as a telescope projected onto a white paper, we know that the Sun is a gaseous sphere with a huge "atmosphere." (**Caution:** Do not look directly at the Sun with either your eyes or an optical aid such as a telescope! Irreparable damage and even blindness can occur without taking adequate safety precautions! An example of a safe method for viewing the solar disc is to project the solar image onto a white paper.) The Sun's atmosphere can be divided into three major sections. We've looked at the photosphere, now we'll look at another of the three.

Sunspots are those darker (cooler) regions on the Sun that develop because of complex magnetic regions causing a slow-down of the solar convection, cooling the region where these magnetic structures punch through. When we view the photosphere and these sunspots, though, we cannot see the complex magnetic structures involved. Much more complex solar structures can be "seen" by viewing the region above the photosphere, known as the *chromosphere* (or "sphere of color"). If we

*PO Box 27654, Omaha, NE 68127
 e-mail: <nw7us@nw7us.us>

LAST-MINUTE FORECAST

Day-to-Day Conditions Expected for December 2012

Propagation Index.....	Expected Signal Quality			
	(4)	(3)	(2)	(1)
Above Normal: 1, 10, 12-16, 18-20, 23-26, 28	A	A	B	C
High Normal: 5, 9, 11, 17, 27	A	B	C	C-D
Low Normal: 4, 21, 31	B	C-B	C-D	D-E
Below Normal: 2-3, 6, 22	C	C-D	D-E	E
Disturbed: 7-8, 29-30	C-D	D	E	E

Where expected signal quality is:

- A—Excellent opening, exceptionally strong, steady signals greater than S9.
- B—Good opening, moderately strong signals varying between S6 and S9, with little fading or noise.
- C—Fair opening, signals between moderately strong and weak, varying between S3 and S6, with some fading and noise.
- D—Poor opening, with weak signals varying between S1 and S3, with considerable fading and noise.
- E—No opening expected.

HOW TO USE THIS FORECAST

1. Find the *propagation index* associated with the particular path opening from the Propagation Charts appearing in *The New Shortwave Propagation Handbook* by George Jacobs, W3ASK; Theodore J. Cohen, N4XX; and Robert B. Rose, K6GKU.

2. With the *propagation index*, use the above table to find the expected signal quality associated with the path opening for any given day of the month. For example, an opening shown in the Propagation Charts with a *propagation index* of 3 will be excellent on December 1st, poor (D) to fair (C) on the 2nd and 3rd, fair (C) to good (B) on the 4th, etc.

3. As an alternative, the Last-Minute Forecast may be used as a general guide to space weather and geomagnetic conditions through the month. When conditions are Above Normal, for example, the geomagnetic field should be quiet and space weather should be mild. On the other hand, days marked as Disturbed will be riddled with geomagnetic storms. Propagation of radio signals in the HF spectrum will be affected by these conditions. In general, when conditions are High Normal to Above Normal, signals will be more reliable on a given path, when the path is ionospherically supported.

CQ WW CW Contest Forecast Looks Challenging

Good Conditions Expected

The 2012 CQ WW CW Contest (<http://www.cqww.com/>) will start at 0000 UTC, Saturday, November 24, and run through 2359 UTC Sunday, November 25. Here's a quick update. Based on the 27-day rotation of the Sun and the recent solar activity, the forecast is for good to excellent conditions both days. Expect conditions to be comparable to those of the CW weekend of 2011.

Daily 10.7-cm solar flux levels are expected to be 130 on the first contest day, possibly falling to 125 by day two. The geomagnetic planetary A-index is expected to be quiet. There is a chance of X-ray flares, though, so there may be short periods of deep fading on the lower to middle HF bands on sunlit radio paths. When paths are open, you should be able to make significant points. Certainly, the upper bands will be major players. Look for significant scoring on the 15- and 10-meter bands. For an up-to-the day "Last-Minute Forecast," visit my propagation resource center, at <<http://sunspotwatch.com/>>.

wish to view the chromosphere, we either have to have special equipment, or we have to observe it during a total eclipse (either natural or man-made).

If we view the chromosphere during an eclipse, it appears as a reddish ring (some say, of fire!) around the solar disc. When all of the light from the solar disc is blocked from our view, the chromosphere finally can be revealed.

Specially equipped telescopes can

also be used to see the chromosphere. If hydrogen-alpha (H-alpha) filters are added to the telescope, their very narrow spectral band-pass can allow us to view the chromospheric region and observe the complex structures it contains. Using these instruments, we can produce the *filtergram*, a powerful tool for observing solar activity.

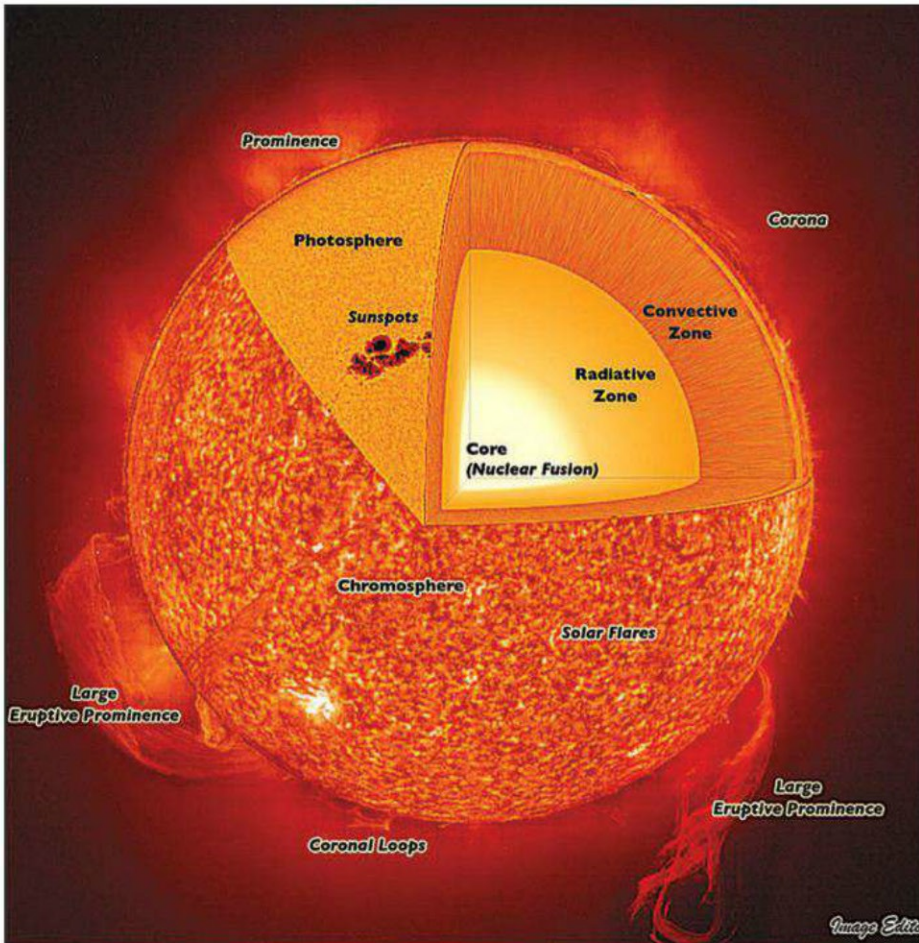
Some amazing sights can be seen in the chromosphere! Often, we can see

“whispy” jets of solar plasma rising out away from the Sun. These jet-like structures are known as *spicules* and span a few hundred kilometers in diameter. These are what give the reddish ring around the eclipsed solar disc the common name of “the solar ring of fire.”

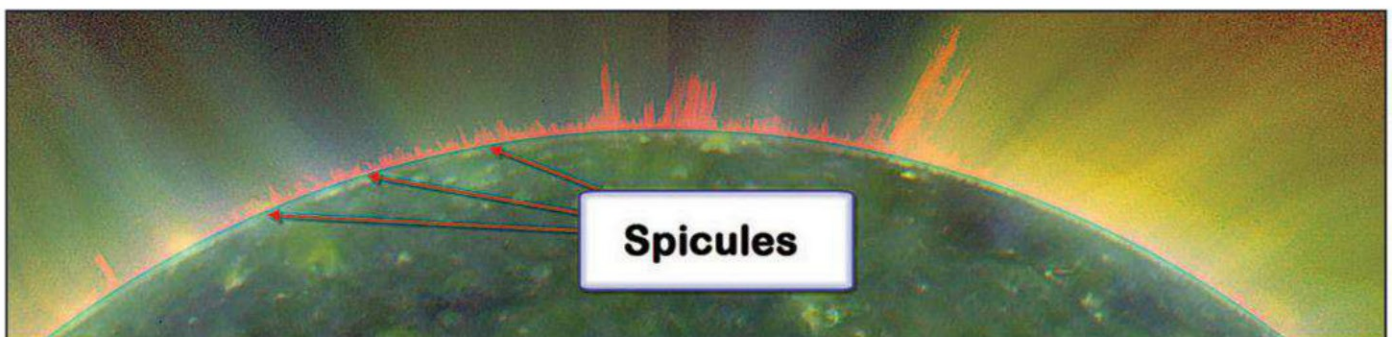
An instrument known as a *spectroheliograph* is used to view the Sun's chromosphere at various wavelengths that are outside of our eyes' vision. Spectroheliograms in the light of H-alpha and calcium show the chromosphere as a highly structured and complex region of the solar atmosphere. By selecting difference wavelengths in our view, we can see different heights of the region. For instance, selecting the H-alpha slice of wavelength allows us to see the mid-chromosphere, down to the photosphere.

Most of the chromospheric features are in motion; structures in our images may appear and disappear as these features are moving about. If we finely tune our wavelength filters, we can even track these movements by compensating for Doppler shifts. Because the filters are so narrow, Doppler-shifting can cause a feature to “disappear” out of view, yet the feature is still there, just moving either toward us or away from us. We now have special instruments that can view the movement in real-time, providing stunning movies of the chromospheric activity. (Recall the past columns in which the Solar Dynamics Observatory spacecraft was discussed).

The temperature of the solar atmosphere from the photosphere to the upper chromosphere changes rapidly with height, particularly near the upper chromospheric region known as the *transition region*. The temperature just above the photosphere is approximately 6500 to 5000 degrees Kelvin (K). beyond the height of about 500 km, the temperature rises until approximately 2200 km, where the temperature jumps



The chromosphere is a layer of gas above the photosphere and below the sun's corona. It's the realm of prominences, spicules and flares. (Credit: NASA/ESA/ Image Editor)



Using special instruments aboard the Solar Dynamics Observatory (SDO) spacecraft, this composite of several images taken at various wavelengths reveals features in the Sun's chromosphere. In this image, we can clearly see the many spicules (see text). (Credit: SDO)

rapidly from about 7000 K up to about 24,000 K!

Within the photosphere (from about 0 to 500 km), the temperature drops due to a decrease in the density of negative hydrogen ions. This reduces the ability of the photospheric gas to absorb energy. Above 500 km, the temperature increases gradually because of non-radiative energy transport. This results in an increase in the ionization of hydrogen atoms and results in a greater number of free protons and electrons. The electrons become available for collisional excitation of specific atoms and ions, which then de-excite by emitting radiation at the specific atomic spectral lines. However, there is a process that hinders the control of temperature, causing the temperature to increase very sharply by nearly 20,000 degrees above 1900 km above the photosphere.

Above the lower chromosphere, the solar magnetic field begins to play an important role. Magnetic field lines in an ionized gas or plasma are susceptible to wave motions known as *magneto-hydrodynamic* (or MHD) waves. An important type of MHD wave is known as the Alfvén wave. These waves are created when a magnetic field line is pulled sideways and then released. Tension in the field line sets up an oscillation. An ionized gas that is perfectly conducting (that is, does not offer any electrical resistance whatsoever) will begin to oscillate together with the field line because the field line is “frozen-in” with the plasma. An Alfvén wave under these circumstances would continue to oscillate forever because there is no resistance to stop it. In reality, however, there is some resistance that causes the wave to lose some of its energy and this energy can be used to set up heating within the gas the wave passes through. This is one of the methods that is probably responsible for heating the regions of the chromosphere above the lowest levels.

Stay tuned, because we’ll next explore the *corona*, the third region in the Sun’s atmosphere.

Winter Opportunities on the Bands

Solar activity has taken a bit of a stall during the latter half of 2012, though there’s enough activity to support good DXing on a number of amateur radio band allocations. It is anyone’s guess as to how this solar cycle, Cycle 24, will progress. Have we already seen the peak of the cycle, only now to see a steady decline in activity? Or hopefully,

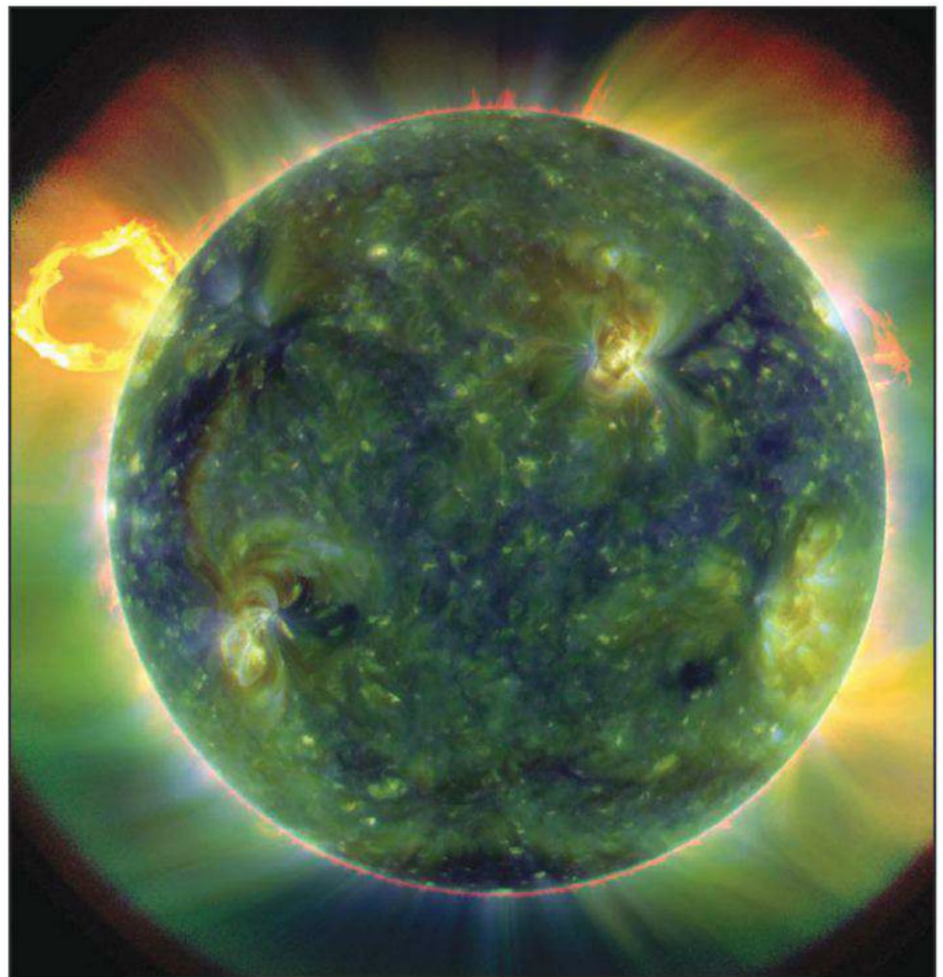
the Sun will resurge with renewed energy? If anything, the Sun is keeping us guessing a bit, and we’re learning incredible facts that we were not able to learn during previous cycles. That’s due to new technology, as well as the nature of how this cycle is so different from recent cycles.

Conditions for December should be fairly stable. The density of ionization in the Northern Hemisphere is expected to increase more rapidly after sunrise than during other seasons. Static and atmospheric noise levels will be at seasonally low values during the month. Reasonably strong signal levels are expected on most of the open bands, and the higher bands are coming ever more active. While improbably, keep a lookout for one or two short 6-meter openings toward the end of December

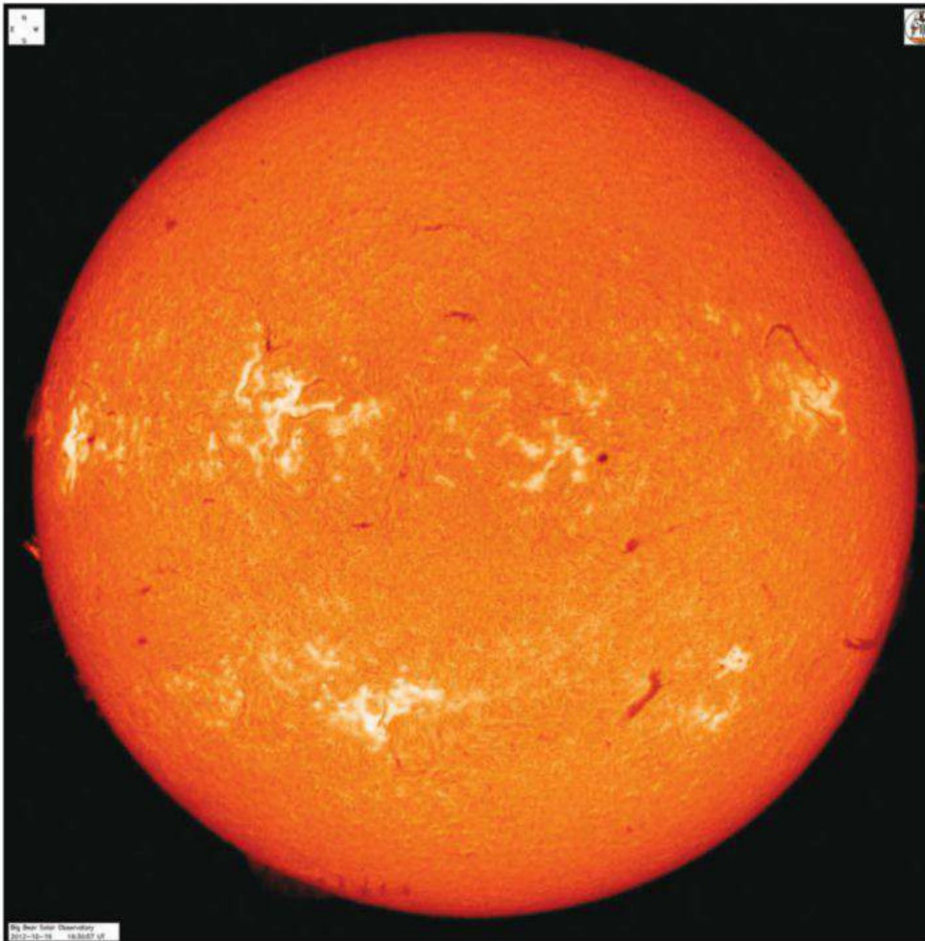
and into the early part of January. Solar activity may bring a surprise.

The daytime openings on 10, 12, and 15 meters will be short but hold a lot of promise for paths into more areas of the world, not just on northerly/southerly paths. Ten meters showed great performance as early as the end of September, but especially during October, with openings into many areas of the world. This continues as we enter into winter. During much of the daylight hours, especially where the propagation paths cross the sunlit regions, expect 10- and 12-meter DX openings. Fairly good DX openings are also expected on 17 and 15 meters, remaining open towards the west during the early evening.

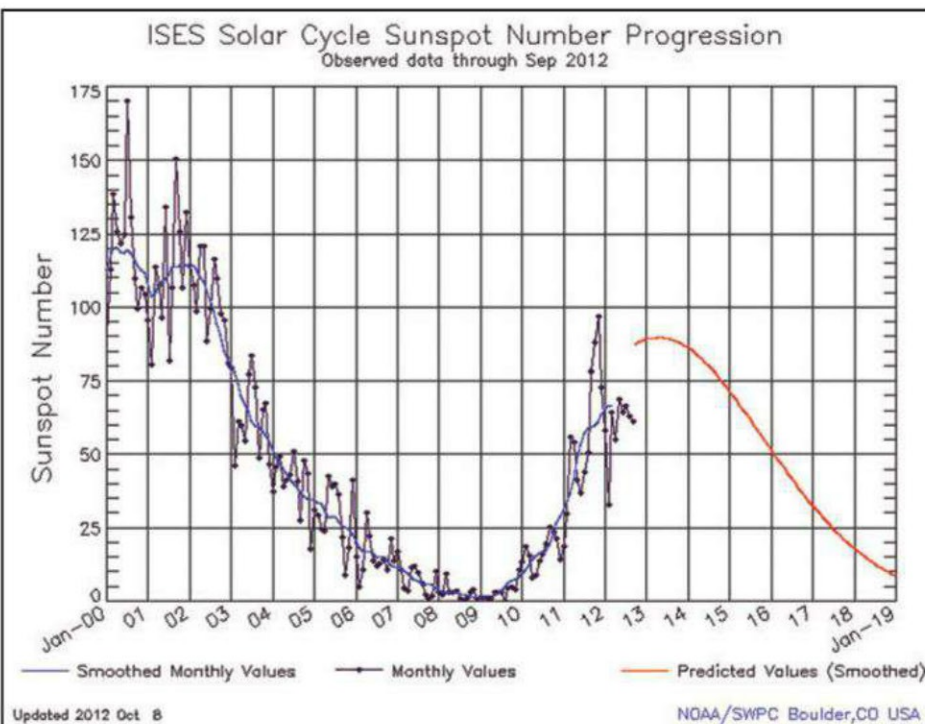
Starting with early morning, expect strong openings on 20 meters in all



This stunning image is a composite made up of various individual images of the Sun, each taken at a different wavelength corresponding to a specific temperature. At these various temperatures, the special instruments aboard the spacecraft can “see” the different heights of the solar atmosphere. This image reveals the chromosphere and the coronal region of our Sun. The massive arching structure rises out of the chromosphere, and is known as a solar prominence (or filament). Such structures may break away from the gravitational pull of the Sun, and become a coronal mass ejection (CME). (Credit: SDO)



This image, taken on 19 October, 2012 at the Big Bear Solar Observatory, was created using an H-alpha wavelength filter. This filter allows us to observe layers of the chromosphere, which is rich in active solar structures created by complex magnetic activity and plasma movement. (Credit: Big Bear Solar Observatory)



Has Solar Cycle 24 reached its peak, now to slowly move toward solar cycle minimum? Or will this cycle re-surge with renewed energy? (Source: NASA/SWPC)

directions until about an hour or two after sunrise, and then into one place or another through the day until early evening. The 30-meter band will not be as strong player for DXing during the daytime, but will come alive closer to the night hours.

Expect both the 30- and 20-meter bands to play most of the night for some paths, especially for stations at low- to mid-latitudes. When conditions are Above Normal, 30, 20, and 17 meters are likely to remain open towards the south and west from early evening until about midnight, especially for DXers in the lower latitudes.

On 40 meters, regional daytime openings will remain strong for most of the day, while great DX will open early in the afternoon. From midnight to sunrise, 40 meters promises some of the hottest nighttime DX during December. The first DX openings should be toward Europe and the east during the late afternoon, then move across the south through the hours of darkness, while remaining open into most parts of the world. Just after sunrise, openings will be more in a westerly direction. Low seasonal noise will make DXing a pleasurable endeavor.

DX openings on 160 and 80 meters during the hours of darkness and into the sunrise period, with considerably decreased static levels, are a sure bet during the longer hours of darkness in the Northern Latitudes. Look for openings toward Europe and the south from the eastern half of the United States and towards the south, the Far East, Australasia, and the South Pacific from the western half of the country. Eighty meters becomes a reliable long-distance band throughout the entire period of darkness during December. Openings on 80 should peak toward Europe and in a generally easterly direction around midnight, then open in a generally western direction with a peak just after sunrise. The band should remain open towards the south throughout most of the night.

For short-skip openings during December, try 80 and 40 meters during the day for paths less than 250 miles, and 80 or 160 meters at night for these distances. For openings between 250 and 750 miles, try 40 meters during the day, and both 80 and 160 at night. For distances between 750 and 1300 miles, 20 and 30 should provide daytime openings, while 40 and 80 will be open for these distances from sunset to midnight. After midnight, 80 meters will remain open out to 1300 miles until sunrise. Try 30 and 40 meters again for

about an hour or so after sunrise. For openings between 1300 and 2300 miles, openings will occur on 20, 17, and 15 meters, with fewer on 12 and 10 meters, during the daylight hours. During sundown to midnight, check 20, 30, and 40 meters for these long-distance openings, and then check 40 and 80 meters after midnight until sunrise. Try 40 meters again for an hour or so after sunrise.

During the WW CW DX Contest, be sure to check my propagation page <<http://sunspotwatch.com/>> for up-to-the-minute conditions. Try out propagation modeling and forecasting software programs to see how those programs model the contest conditions based parameters such as your antenna properties, geographical location, power levels, and operating times. A program that I have reviewed in past columns is ACE-HF Pro (*Note: Recently, I made a confusing statement about the computer operating systems under which ACE-HF Pro can operate. It works perfectly well under the newest of the 32-bit Windows® operating systems, and equally well under the 64-bit versions, using a downloadable tool from Microsoft; refer to the software provider's website for specific details*). Using such a program, you can work out an operational plan using tools such as ACE-HF's Animated Coverage Maps, or the ACE-HF Pro's band opening charts for the various propagation paths you wish to target to get those extra contest points. (See <<http://hfradio.org/ace-hf/>> for these past reviews).

VHF Conditions

Expect occasional geomagnetic storms due to recurring coronal-hole activity. Additionally, expect strong storm conditions if active sunspot regions unleash coronal mass ejections after any powerful x-ray flare, as these CMEs may trigger strong activity leading to auroras. When conditions are Disturbed or Below Normal, there is a possibility for Field Aligned Irregularities (FAI) and auroral-*E* propagation.

At the end of December there is a possibility for a slight increase in sporadic-*E* propagation providing activity on 10, 6, and 2 meters. Check the Last-Minute Forecast at the beginning of this column for those days during December that are expected to be in these categories.

Quite a bit of meteor-shower activity is expected this month, and this should result in improved conditions for meteor-scatter openings on the VHF bands for distances up to about 1000 miles.

Meteor-scatter propagation is a mode where radio signals are refracted off the ionized plasma trails left by dust and small particles that have entered into our atmosphere at thousands of miles per hour. The ionized trail is produced by vaporization of the meteor. Meteors no larger than a pea can produce ionized trails up to twelve miles in length in the *E* layer of the ionosphere. Because of the height of these plasma trails, the range of a meteor scatter contact is between 500 and 1300 miles. The frequencies that are best refracted are between 30 and 100 MHz. However, with the development of new software and techniques, frequencies up to 440 MHz have been used to make successful radio contacts off these meteor trains. On the lower frequencies, such as on 6 meters, contacts may last from mere seconds to well over a minute. The lower the frequency, the longer the specific opening made by a single meteor train. A meteor train that supports a 60-second refraction on 6 meters might only support a 1-second refraction for a 2-meter signal. Special high-speed methods are used on these higher frequencies to take advantage of the limited available time.

Watch for the *Ursids* from December 17 through 26. Most

people miss this, but this could have an hourly rate as high as 50. In 2008, it reportedly had two peaks with an hourly rate of 30 to 35. The *Ursid* radiant is circumpolar from most northern locations, and culminates after daybreak, while it is highest in the sky later in the night. This one could be a good VHF player.

The *Geminids* are possibly the most reliable of the annual showers. While the duration of this meteor shower is shorter than that of others, there's a definite plateau of maximum activity. The *Geminids* begin to peak between December 12 and 15, with a quick climb to its maximum rate of around 140 per hour. Its total window is from December 5 through 20. In North America and Canada, VHF enthusiasts will have the best opportunity to work meteor-scatter propagation from December 12 through the wee hours on the 15th, but as *Geminids* are a "long tail" event, expect continual opportunity, though less often, several days or nights after the peak.

Finally, check out the *Quadrantids* during the last days of December. This meteor shower may peak with around 60 meteors per hour to up to 200. Again, the best time is to start just before midnight, and working through predawn.

Check out <<http://www.imo.net/calendar/>> for a complete calendar of meteor showers. If you are not yet a subscriber to CQ VHF, grab the Winter issue and start your subscription, today. You'll find a wealth of information regarding working meteors, and other VHF activity, in each issue.

Current Solar Cycle Progress

The Dominion Radio Astrophysical Observatory at Penticton, BC, Canada, reports a 10.7-cm observed monthly mean solar flux of 123.2 for September 2012, up from 115.7 in August. The twelve-month smoothed 10.7-cm flux centered on March 2012 is 126.8, about the same as for February. The predicted smoothed 10.7-cm solar flux for December 2012 is about 140, give or take about 9 points.

The Royal Observatory of Belgium reports that the mean monthly observed sunspot number for September 2012 is 61.5. The lowest daily sunspot value during September was 34 on September 14. The highest daily sunspot count for September was 112 on September 3. The 12-month running smoothed sunspot number centered on March 2012 is 66.8, about the same as for February. A smoothed sunspot count of 82 is expected for December 2012, give or take about 8 points.

The observed monthly mean planetary *A*-index (*Ap*) for September 2012 was 8. The 12-month smoothed *Ap*-index centered on March 2012 is 8.1, about the same as February. Expect the overall geomagnetic activity to be quiet to stormy during December. Refer to the Last-Minute Forecast for the outlook on what days that this might occur.

I welcome your thoughts, questions, and experiences regarding this fascinating science of propagation. You may e-mail me, write me a letter, or catch me on the HF amateur bands. Please come and participate in my online propagation discussion forum at <<http://forums.hfradio.org/>>. If you are on Facebook, check out <<http://www.facebook.com/spacewx.hfradio>> and <<http://www.facebook.com/NW7US>>. Speaking of Facebook, check out the CQ Amateur Radio Magazine fan page at <<http://www.facebook.com/CQMAG>>.

Now that the new solar cycle is active, I'll be keeping my ears to the radio, hoping to hear you on the air. Happy DX!

73, Tomas, NW7US

Results of the 2012 CQ WW DX 160 Meter Contest (from page 27)

Number groups after calls denote score, total QSOs, W/E multiplier, countries worked. Total multiplier is the addition of the W/E and countries. Multi-op scores follow single-op listings. An asterisk (*) denotes low power. State, province, and country certificate winners are listed in bold.

2012 CQ WW 160M CONTEST

CW RESULTS

SINGLE OPERATOR

NORTH AMERICA

UNITED STATES

CONNECTICUT

K1KI 154,128 527 52 26
 W1QK 149,468 637 53 26
 WD5T1 26,125 171 43 12
 *K1DM 89,934 409 52 26
 *K2RS/1 78,132 441 48 20
 *W3SM/M 38,164 369 46 1
 *W1JQ 25,648 150 40 16
 *N1XT 11,310 125 36 3
 *AB10D 3,171 65 21 0

MASSACHUSETTS

W1MK 236,562 680 50 39
 W1TO 202,297 765 54 35
 K2DZ/1 69,632 327 45 19
 W5JF 50,240 249 42 22
 A1JE 33,605 232 42 13
 K1TOR 21,216 165 42 9
 W1KO 13,818 153 41 1
 W1JR 6,699 81 31 2
 W1UJ 5,668 88 26 0
 *N81N 60,003 422 46 13
 *W1BYH 55,020 297 52 18
 *N1OY 35,872 243 48 11
 *W1FA 11,104 148 31 1
 *W01N 6,588 111 27 0

MAINE

K1OG 704,667 1,390 58 65
 K1ESE 60,024 409 49 12
 *N1JD 45,845 402 47 6
 *N1CGP 21,736 220 41 3
 *K1OYB 270 11 10 0

NEW HAMPSHIRE

K1TR 59,210 351 44 18
 *N1IX 68,965 402 47 18
 *KU2A/1 39,666 231 49 17
 *W1S 31,959 275 47 6
 *W1END 24,037 243 40 3
 *N7A/1 17,834 220 36 1
 *AE1T 9,450 139 30 0
 *K1BT 7,366 114 27 2
 *W1PD 4,848 88 24 0
 *K1PDY 598 23 0 0

RHODE ISLAND

W1XX 225,704 827 54 35
 K1DFT 44,812 263 49 19
 *W1WBB 62,976 396 48 16
 *N2ULF/1 3,565 72 23 0

VERMONT

W1S 63,070 537 47 6
 N1BCL 44,785 270 51 14
 KB10DD 6,870 104 29 1
 *N1UR 167,614 676 51 35
 *K81NHV 2,838 66 22 0

NEW JERSEY

N2YB 188,627 927 55 26
 N2CC 138,718 512 52 34
 K2WJ 133,510 681 52 27
 K2WV 126,034 539 53 29
 N2ZN 125,048 598 51 26
 N2CU 123,112 435 52 36
 W2GB 114,880 577 54 26
 N2MF 75,744 345 46 26
 WB2ABD 51,255 295 51 16
 W2LK 45,560 200 43 25
 W2GR 40,863 347 46 7
 K2YR 38,200 218 35 20
 *W2TZ 177,408 971 53 31
 *NW2K 77,484 495 54 12
 *K2UF 55,168 327 47 17
 *W2LC 45,045 257 45 18
 *WA2MCR 42,084 273 49 14
 *N2JDQ 41,500 382 47 5
 *N2RI 36,892 347 41 5
 *W2CC 30,690 121 38 28

(OP: (C2S))

*N2JJ 26,235 215 47 6
 *WA2JOK 23,036 224 45 7
 *K2WT 14,508 165 36 3
 *W5M/2 7,380 112 30 0
 *W2TB 5,632 72 30 2
 *KB2KPL 3,483 54 27 0
 *W2BTS 3,423 71 21 0
 *A2ZFA 2,052 59 18 0
 *K2ZR/4 1,065 27 12 3

K2TTT

128,664 650 49 23
 KC2LSD 36,566 419 43 4
 W2LE 34,104 244 45 11
 N2ED 32,793 292 44 7
 N1RK/2 27,783 247 43 6
 K2AX 10,578 93 33 8
 K2GN 8 176 8
 *W2ID 191,264 862 55 31
 *N2UU 15,984 190 34 3
 *K02MX 11,084 135 33 1
 *NE2U 5,300 93 25 0
 *N2GM 1,036 34 14 0

DELAWARE

AA1K/3 585,936 1,352 59 58
 WW30E 100,590 597 52 18
 *WB8MRU/3 3,888 75 24 0

MARYLAND

KD4D/3 457,311 1,255 59 54
 K3ZD 248,920 781 57 41
 N3JUM 128,744 675 53 23
 K3TC 122,342 556 56 27
 K3TN 65,462 344 51 20
 N1SZ/3 50,752 332 50 14
 W2GFS/3 33,350 231 45 13

W2GG/3 28,249 213 44 9
 *N3QE 52,554 401 48 9
 *WA3MCK 43,164 263 48 18
 *N1WVR/3 41,595 263 44 15
 *K3EY 26,864 258 43 3
 *WB3YYY/3 25,730 203 46 8
 *K3TM 26,450 267 42 4
 *K3YDX 17,723 216 37 0
 *K3KU 14,256 184 36 0
 *W6AAN/3 4,470 49 25 5
 *K3BT 2,180 49 19 1
 *KB8NUF/3 1,680 44 24 0
 *K3XZ 1,584 46 18 0

PENNSYLVANIA

N03M 408,740 1,302 59 48
 W3BG 403,012 1,155 59 47
 W3TS 328,300 1,163 58 40
 W3V 98,864 544 52 21
 K3ONW 91,014 459 51 26
 W3SO 86,067 490 53 20
 (OP: W3OZY)
 W3GH 45,384 297 47 15
 KW3A 34,600 321 46 4
 W83FZ 19,646 191 41 6
 W3FVT 18,680 223 37 3
 K4JLD/3 12,288 52 5 27
 N3FA 12,122 142 38 0
 NG3J 11,739 94 36 7
 K3SV 10,368 133 35 1
 *N4XU/3 106,420 560 55 20
 N4D 50,390 493 37 8
 *K3MD 43,000 386 44 6
 *A43L 42,965 270 55 10
 W3WH 41,958 339 46 8
 *W3KB 34,500 298 46 6
 *N3LT 24,624 202 48 6
 *K3N3 20,250 210 42 3
 *N3JNX 3,850 81 22 0
 *K3DC 3,210 67 30 0
 *K3D3H 1,980 57 17 1

ALABAMA

AG4W 121,442 612 56 26
 NN4MM 109,520 620 57 17
 (OP: K9MUG)
 W4RYW 41,064 308 50 8
 KG4CJY 26,784 253 45 3
 K4HAL 21,780 225 43 1
 *N4JF 60,174 541 52 9
 *K4WI 46,854 365 50 7
 *K4ZGB 46,461 429 47 4
 *K4RF 45,103 397 47 6
 *WB4KDI 40,440 299 52 8
 *K4JFDV 25,334 230 50 8
 *N4AU 14,880 171 37 2
 *K5AL 10,374 127 36 2
 *K6AJX/4 10,175 126 36 1
 *WANBS 3,892 65 27 1

GEORGIA

141,252 768 55 24
 K4BAI 114,700 674 56 18
 K8BE/4 79,800 498 56 14
 AA4CF 66,060 498 51 9
 *W4KLY 44,352 307 50 13
 *K4VIG 20,961 193 46 5
 *N3VY/4 23,351 199 42 3
 *N4WD 16,884 185 39 5
 *K4JEX 13,566 155 38 4
 *K4EF 9,120 119 30 8

KENTUCKY

10,879 104 40 3
 *KASPO 2,508 61 19 0

NORTH CAROLINA

276,582 1,025 56 37
 W4G 137,760 749 53 27
 K4SV 67,734 374 53 18
 N4GU 32,084 258 42 10
 K4YKZ 15,660 200 33 3
 AE4E 7,514 120 32 2
 K4JAB 2,132 45 26 0
 *W4KAZ 81,130 586 51 10
 *K4JU 41,595 413 32 2
 *N3CZ/4 24,128 193 45 7
 *A1AGR 16,425 171 41 4
 *N4YDU 15,355 184 36 1
 *K5AS 11,484 171 32 1
 *K4UWH 9,388 108 31 4
 *N4TL 7,710 117 28 2
 *K4TDM 5,096 103 28 0
 *K4JWD 3,900 59 29 0
 *N4WC 100 10 5 0

FLORIDA

198,336 651 57 39
 WA2YV/4 139,600 743 57 23
 K9FY/4 91,845 635 52 13
 AA4HP 52,544 349 47 17
 (OP: W3FC)
 K2E1/4 32,391 189 39 22
 KM4HI 31,536 307 41 7
 K4DD 24,576 226 42 6
 KN4Y 13,062 143 38 4
 K39O/4 3,197 61 20 3
 N4GI 2,675 38 21 4
 K2EUH/4 864 13 3 9
 K4PG 138 10 5 1
 *W4AA 55,572 350 51 15
 *N4UM 55,160 305 50 20
 *NS4U/4 51,360 373 51 9
 *N4OX 45,320 375 49 6
 *N4CJ 21,024 205 43 5
 *K4CC 14,858 126 38 8
 *N4FY 10,716 125 34 4
 *NM1A/4 8,320 81 32 8
 *W4DLZ 5,678 71 32 2
 *N4FP 3,552 64 22 2

SOUTH CAROLINA

19,035 192 42 3
 K7OM/4 14,784 150 38 6
 NJ4F 12,834 112 40 6
 W4TUN 8,058 101 30 4
 AF4OX 3,197 61 20 3
 *W4IT 32,389 306 45 4
 *WA8QR/4 15,440 177 39 1

TENNESSEE

K4RO 192,560 1,050 59 21
 N4WD 129,898 701 55 22
 K0EJ/4 83,266 605 52 10
 AD4EB 70,269 534 51 8

N4ZZ 66,864 542 49 7
 N4AK 63,580 526 50 5
 W04O 40,128 375 44 4
 K1GU/4 35,370 372 45 9
 K4BP 23,532 182 44 9
 W4CXB 19,734 187 42 4
 N4IR 11,625 180 31 0
 KA0TB 11,271 133 37 2
 W4PV 10,980 133 40 5
 AB4GJ 7,141 82 35 2
 K4EJQ 4,531 28 5 18
 NS4X 1,241 35 17 0

KALTA

*N4RO 78,848 474 53 3
 *N2W/4 69,006 686 54 8
 *W4DAN 67,555 345 52 15
 W4AR 47,008 436 47 5
 N4IR 18,032 180 42 4
 *N4AC 16,469 172 39 4
 *K4ZDR 16,341 197 36 3
 *W4BCU 16,211 165 39 4
 *W8RYC/4 12,936 126 42 2
 *W4BK 8,295 111 35 0
 *N4UW 6,630 100 30 0
 *N7YAB 3,640 69 26 0
 *W7T/4 1,862 11 8 0
 *K4EDI 2,000 45 17 0

K3ZM/4

811,668 1,425 58 71
 N4U 283,872 1,076 59 37
 K4FJ 217,587 856 52 35
 N4DJ 103,350 657 49 16
 N4MM 98,901 554 51 18
 NC4S 77,616 596 52 11
 N3JT/4 74,763 428 52 19
 N3UB/4 68,310 457 50 16
 WA4JJK 62,310 444 49 13
 K4RDU 54,498 377 50 12
 N3BM/4 28,356 239 45 6
 N3NK/4 9,205 104 32 3
 *K4ORU 59,964 501 50 7
 *W4GDG 59,964 501 50 7
 *K4RV 55,120 361 52 13
 *W4YE 33,825 268 48 7
 *N4BCC 28,836 235 45 9
 *K4FTO 24,975 251 40 5
 *K3AZR/4 21,956 221 42 2
 *N4VA 15,953 155 38 5
 K4FJ 15,800 186 36 4
 *K4HKQ 14,932 176 34 2
 *N1PC/4 13,630 135 41 6
 *K4YCR 7,316 102 29 2
 *W4APGM 7,230 100 28 2
 *K3MZ/4 4,862 83 26 1
 *K4JFDV 2,622 51 22 0
 *K4EU 1,428 36 16 1
 *K4JJK 1,152 32 18 0
 *AB4SF 1,088 34 16 0

ARKANSAS

207,846 1,050 58 23
 W5R 19,152 165 43 5
 K5J 32 4 4 0
 *N5DRB 37,850 352 46 4
 W5R 18,480 170 45 3
 *K5ACO 11,997 130 41 2

LOUISIANA

W5W 71,825 466 54 11
 *K1DW/5 2,220 54 20 0

MISSISSIPPI

29,478 253 45 6
 W5QL 73,998 522 52 10

NEW MEXICO

193,053 833 57 30
 NSUL 137,897 694 58 15
 K7IA/5 48,120 340 50 10
 *A5E8 40,651 338 47 6
 K4YK 19,135 209 41 3
 *N5FY 18,765 195 42 3
 *K8TE/5 6,771 104 36 1

TEXAS

259,987 1,086 58 33
 K5WA 238,329 1,027 58 33
 NSRZ 207,542 902 57 25
 K5MV 40,068 347 47 8
 W8FM/5 23,267 187 45 8
 AD5VJ 16,900 135 42 8
 AA5VU 15,792 152 41 6
 *W5RYA 84,168 608 54 9
 *NSD 50,211 319 53 10
 *NSKWN 49,842 444 51 3
 K5LSH 32,595 273 48 5
 *WA8ZB/5 23,232 219 45 3
 *W5DYT 19,769 156 46 7
 *K5ME 15,488 145 38 6
 *NSNK 11,703 120 45 2
 *W5JOA 11,600 137 37 3
 10,023 112 35 4
 *K5GJ 8,686 93 39 4
 N5TV 7,848 108 33 3
 *NSZC 7,104 90 36 1
 W8PN 3,906 50 28 3
 *K5M/MM 3,556 52 26 2
 *W5VX/5 1,258 33 15 2

OKLAHOMA

3,406 55 25 1
 W7L 7,449 488 56 10
 NSUM 22,410 224 41 4

CALIFORNIA

182,517 690 56 27
 KF6T 118,925 678 54 17
 N6TV 100,326 524 54 15
 W4FHE 78,912 395 53 19
 N6KI 62,037 431 52 9
 K6TA 28,784 175 43 13
 *W6RKC 27,496 217 49 7
 KN6A 18,473 137 40 9
 N6AA 9,804 100 32 6
 K6EGR 6,739 131 21 2
 K6GDW 3,828 83 21 4
 N6LL 3,042 51 23 3
 2,090 40 21 1
 W6GM 2,070 52 17 1
 N5KQ/6 1,311 30 19 0
 W7B 1,100 1 1 0
 *W6TI 67,201 388 53 14
 *N6IV 6,324 279 52 26

*KT30/6 4,807 100 23 0
 *K6KQV 2,080 61 15 1
 *W6RQV 1,632 42 15 2
 *K6MI 936 39 12 0
 *K6GSL 810 44 9 1
 *N6Q 19,000 12 4 0
 *N6AJR 65 5 5 0

ARIZONA

902 58 17
 (OP: WA2DFI)
 K7XZ 55,945 318 51 16
 (OP: K8BN)
 K2EVB/7 35,048 315 46 6
 A4TA 21,708 119 40 14
 N7RK 15,480 122 38 7
 N1TR 14,564 133 41 3
 W7PP 6,336 77 30 3
 KR2E/7 4,814 71 27 2
 N6V/7 1,470 17 5 10
 *N7IR 115,640 687 55 15
 *W7RH 107,172 579 55 17
 43,752 308 50 8
 *N7MAL 34,024 292 46 7
 *WU9B/7 6,256 82 32 2
 *W9CF/7 2,940 64 20 1
 *AA7V 2,904 57 23 1
 *K6WSC/7 2,125 57 15 2
 *KX6U/7 204 17 6 0
 *N2A/7 54 10 3 0

WASHINGT

80,258 504 53 13
 AD7AF 34,128 227 42 12
 W7WR 18,495 149 37 8
 K7FL 13,301 105 39 8
 KB7N 11,911 122 40 3
 W7GFK 8,496 89 34 2
 N7Q5 4,890 73 29 1
 *A17AA 10,080 119 35 1
 *K7FG 8,480 119 31 1
 *W8TFG 4,960 68 30 1
 *AB7RW 3,591 83 27 1
 3,184 54 29 0
 *W7QN 2,431 76 12 1

IDAHO

30,793 238 47 6
 KG7H 15,615 127 35 10
 *K7JAN 6,030 97 29 1
 *K7QVG 3,066 68 21 0

MONTANA

44,330 289 51 11
 *N7LT 4,620 67 32 1
 *K7B8 4,620 67 32 1
 *N7LT 4,620 67 32 1

NEVADA

236,045 954 58 27
 W6W/7 26,514 210 48 6

OREGON

7,665 99 33 2
 K7Y 2,940 63 19 2
 W7VS 300 6 0 6
 *N7D 27,120 223 42 6
 *W07V 1,326 36 17 0
 *W7YAQ 990 14 1 9

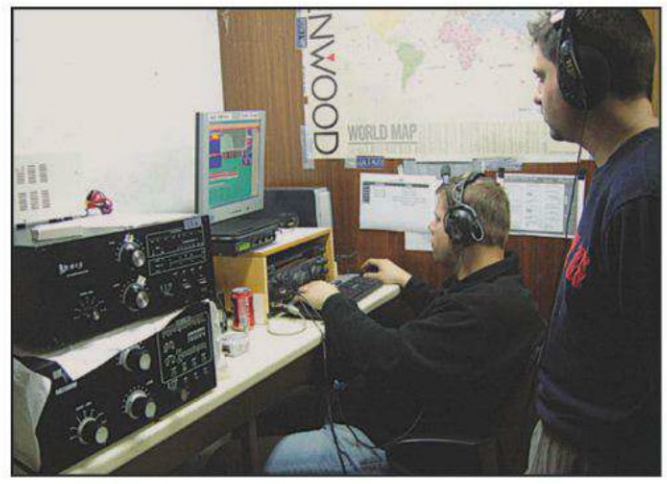
UTAH

84,168 476 55 17
 NSLZ/7 15,933 159 44 3
 AG7JW 10,080 114 39

*LY2U	340.480	944	11	59	YU1CC	40.260	190	1	43	*UZ8I	49.266	311	0	34	SOUTH CAROLINA					RA3XEU	132	14	0	4
*LY3B	188.598	749	2	49	*Y1VAP	298.977	833	14	55	(OP: US7Y)					15.129	162	37	4	UA9FM	26	5	0	2	
*LY4L	181.202	744	2	47	*Y2TAA	93.105	422	1	44	*UX2KA	49.099	267	1	36										
*LY9A	181.152	764	2	46	*Y7YIM	37.000	219	1	36	*UY5AR	48.934	245	0	43	TENNESSEE	23.052	207	48	3	DJ7WW	86.526	330	12	45
*LY3ID	124.550	555	3	44	*YU7D	31.484	188	0	34	*UY5EP	37.625	215	1	37	23.052	207	48	3	DJ7WW	23.680	154	3	34	
*LY2T	97.520	509	0	40	*YU2U	30.336	196	0	32	*UR5KED	36.743	278	0	29	16.880	194	37	3	DL8L	14.644	123	0	28	
*LY2MM	58.786	357	0	34	*YU1M	18.630	140	0	27	(OP: YU1MM)									DL2GAN	2.800	49	0	14	
*LY5Z	51.768	301	0	36						*UT7LU	35.957	176	0	41	VIRGINIA	20.400				DJ3GE	1.441	34	0	11
*LYSR	39.582	324	0	27						*UT80C	30.721	218	0	31	20.400		183	42	6					
*LY2OM	26.651	196	0	29						*UR5EP	29.460	234	0	30	8.308	122	31	0						
*LY2ND	25.730	214	0	31	IT9NO	166.740	535	11	49	*US8UA	28.492	195	0	34	CALIFORNIA	16.892	176	37	4	HG1X	36.399	225	0	33
*LY3ZM	9.366	107	0	21	*T9SFT	12.760	91	0	29	*UR5MM	27.060	164	0	33	16.892	176	37	4	HG6G	32.776	205	1	33	
*LY4Q	216	18	0	4						*UT0UO	25.259	184	0	29	13.112	146	44	0						
										*UX1CW	24.724	194	0	28	1.264	38	15	1						
*ER2RM					OMZVL	754.563	1,349	27	70	*US5ELM	23.112	122	0	36	245	16	6	1	IK5AFJ	51.165	259	1	40	
*ER3MM					OMBWR	449.757	1,092	18	59	*UT1IM	22.167	179	0	37					IV3AOL	9.000	93	0	22	
					OMRFR	424.213	947	19	64	*UT7VR	20.706	146	0	29					IZ50VP	66	3	0	3	
					OM4EX	159.840	403	13	59	*UJ4J0	20.387	151	0	30					IK3JBP	36	3	0	3	
					OM3AG	150.444	455	12	51	*UT5ULX	18.720	156	0	30										
					OM3ZWA	181.995	693	7	48	*UT5CB	18.009	183	0	27	OREGON	10.841	111	32	5	KALININGRAD	21.060	155	0	27
PA5KT	217.600	596	20	48	*OM0T7	154.389	619	1	52	*UT5LA	14.250	105	0	30					LATVIA	23.856	172	0	28	
PA1HR	125.888	447	11	45	*OM5FA	122.056	613	1	42	*US4IPO	10.625	84	0	25	UTAH	22.936	222	44	3	LITHUANIA	48.314	293	0	34
PA5WT	75.555	348	1	44	*OM7AG	105.936	449	6	43	*UR7Z0	10.516	108	0	22	10.841	111	32	5	LY48F	6.517	71	0	19	
PA3AAV	72.144	300	6	42	*OM8LA	103.341	443	3	46	*UX7FB	10.327	107	0	23					LY5G					
PA0CYW	31.086	197	1	32	*OM70M	77.850	306	6	44	*UT8LU	9.734	58	0	31	22.936	222	44	3	MACEDONIA	1.000	20	0	10	
PA3BWK	13.380	96	0	30	*OM4DN	54.230	332	0	34	*US2Y1	9.576	118	0	19					MACEDONIA	1.000	20	0	10	
PA0INA	8.000	51	2	40	*OM5E4	46.812	290	8	39	*UR70M	6.860	86	0	20	13.112	146	44	0	NETHERLANDS	4.356	56	0	18	
PA0JNH	5.210	35	0	30	*OM5EA	44.280	249	1	40	*UR70G	4.284	60	0	17	1.264	38	15	1	NETHERLANDS	4.356	56	0	18	
*PASMW	103.986	406	13	30	*OM5UM	26.910	179	0	30	*US8IB	2.175	28	0	15	245	16	6	1	NORTHERN IRELAND	520	15	0	8	
*PE2JMR	22.720	149	0	32	*OM2OT	22.896	131	0	36	*UY5IG	1.890	52	0	10					POLAND	91.266	451	1	41	
*PAOTCA	20.736	108	8	28	*OM4DU	14.014	119	0	26	*UT5UGQ	1.320	29	0	11	10.841	111	32	5	ROMANIA	24.921	187	0	27	
*PAOSKP	11.861	103	0	29	*OM3BA	12.600	126	0	21	*UT5GDQ	780	18	0	10					SERBIA	11.361	117	0	21	
*PA3ANN	10.580	96	0	23						*UR5EIT	124	17	0	2	WEST VIRGINIA	6.384	105	28	0	SLOVAK REPUBLIC	17.568	156	0	24
*PA3ARM	8.671	75	1	22						*UT5UKA	93	8	0	3										
*PG7V	7.194	69	0	22																				
*PAGQF	4.336	57	0	16	S58Q	163.044	511	11	52															
*PADRA	3.876	61	4	19	S53RM	69.246	347	1	40															
*PAFAW	3.003	49	0	13	S57C	24.676	161	1	30	*MW9M	5.500	51	2	20										
*PASHGF	2.055	28	0	15	S57W	20.250	148	0	30															
*PG2AA	1.309	25	0	11	S51DX	76	5	0	4															
*PADBDS	448	22	0	7	*S57DX	265.930	743	17	53															
*PA0M	125	5	0	5	*S56CW	94.643	484	0	43															
*PC3H	45	6	0	5	*S57NAW	23.008	152	0	32															
					*S55VM	20.068	149	0	29															
					*S58MU	15.824	150	0	23															
*G0RQK	143.262	443	19	44	SPAIN	99.568	403	8	41	EAST MALAYSIA	140	7	0	2	ILLINOIS	49.704	395	51	6	KANSAS	20.335	195	47	2
*G4DOH	24.864	159	0	32	E2ALU	64.531	278	1	46	9M6YBG	140	7	0	2	INDIANA	15.414	173	41	1	MINNESOTA	40.092	350	50	2
					E3A	39.936	141	18	34															
					E44K0	11.200	79	4	24															
					E45EHS	1.536	22	1	15															
					E43ECE	315	7	0	7															
					E43AV	32.723	153	3	40															
					E47RM	29.196	172	5	31															
					E45AKA	21.756	109	9	28															
					E41XT	19.836	105	10	28															
					E47NW	10.920	77	2	26															
					E42NP	9.850	98	3	22															
					E42SW	3.380	40	1	19															
					E45Y1	3.230	45	0	17															
					E43LA	95	7	0	5															
					E41DFP	51	5	0	3															
					E41VT																			
HF3A	593.658	1,261	22	64	SWEDEN	416.990	1,100	14	60	INDONESIA	119.028	257	10	42	MISSOURI	96.558	656	55	11	KANSAS	20.335	195	47	2
					(OP: SP3LPG)																			
SP2LW	278.346	778	13	56	SM5OQ	103.272	394	4	43	BRAZIL	55.276	117	32	20	NOVA SCOTIA	16.576	106	29	3	ONTARIO	133.458	491	51	7
SP9GR	147.840	634	5	43	SM0BSO	73.920	344	1	48															
S06I	143.920	541	8	48	SK2T	48.840	253	0	40	ARGENTINA	3.258	23	9	9	ONTARIO	133.458	491	51	7	UT70F	37.430	215	38	0
SP3SLU	104.791	503	0	43	SM5D	45.904	247	0	40	ARGENTINA	2.76	10	0	6	UT70F	37.430	215	38	0	UT69A	19.228	107	36	2
SP1NY	101.336	381	8	45	SM5CZO	36.075	195	0	37															
SP9LJD	70.047	331	6	37	SM6FUD	32.544	216	0	32															
SP9AKW	48.240	217	4	45	SM7N	11.359	61	0	37															
SP9DWT	33.831	83	10	53	SE2I	6.440	68	0	20															
S07B	22.204	167	0	28	SE6E	2.672	35	0	16															
SP4ETO	15.960	115	0	28	*SM6NET	35.525	208	0	35		</													

Table of call sign allocations for various countries including Lithuania, Netherlands, Norway, Poland, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Ukraine, Oceania, Hawaii, Indonesia, South America, Malpeo Island, Czech Republic, Denmark, England, Estonia, European Russia, Germany, Greece, Hungary, Italy, Lithuania, Netherlands, Norway, Poland, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Ukraine, Oceania, Hawaii, Indonesia, South America, Malpeo Island, Czech Republic, Denmark, England, Estonia, European Russia, Germany, Greece, Hungary, Italy.

This setup belongs to the ED1R Multi-Op from Spain. Here are DH1TW and EC1KR digging out callsigns together.



Continuation of call sign allocations for various countries including South Carolina, Tennessee, Virginia, Maryland, Pennsylvania, Georgia, North Carolina, Florida, Louisiana, Mississippi, New Mexico, Texas, Oklahoma, California, Arizona, Washington, Idaho, Montana, Nevada, Wyoming, Michigan, Ohio, and Wisconsin.

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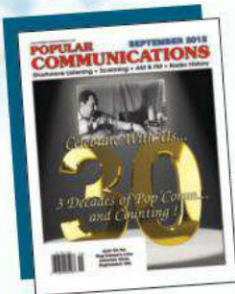
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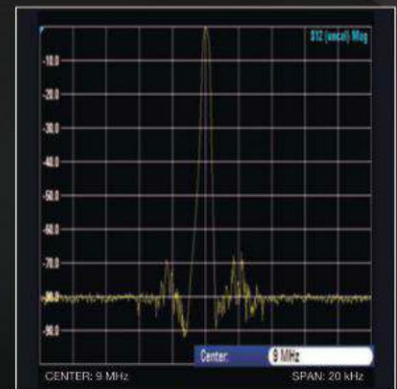
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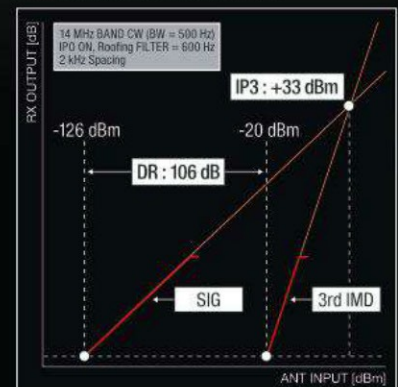
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