POPULAR COMMUNICATIONS

OCTOBER 2009

Shortwave Listening • Scanning • AM & FM • Radio History

DX—Shrinking The World

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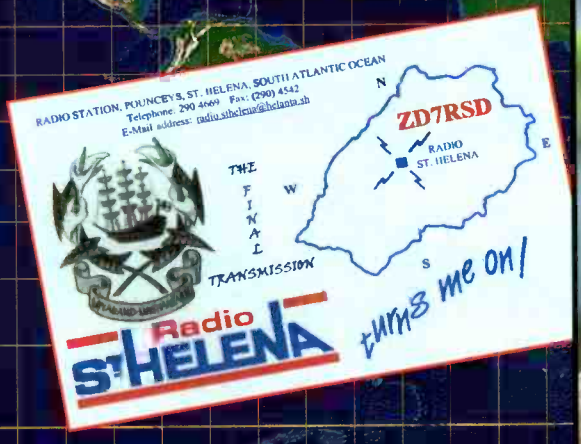
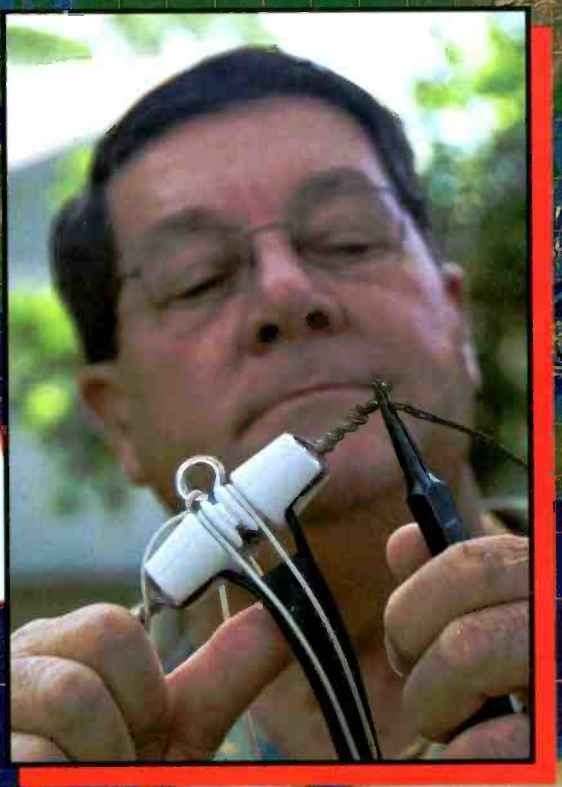
CQWW DX Contest—*THE* Contest For Amateur Radio, p. 22





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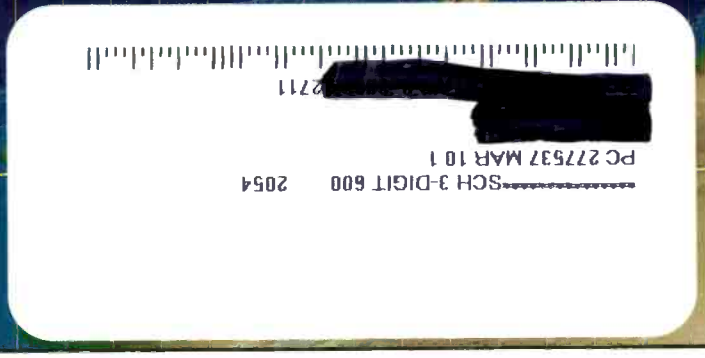
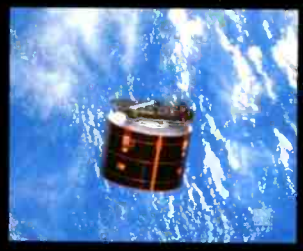
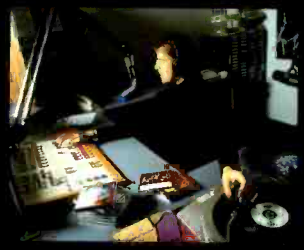


THE PROFESSIONAL STANDARD



- Continuous Frequency Coverage: 100 kHz ~ 2.6 GHz * LSB, USB, CW, AM-Narrow, AM, Wide AM, FM-Narrow, and Wide FM (cellular frequencies are blocked)
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VR-500

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This may be the best shortwave radio offer in our 67 year history! Buy the Grundig G4000A at our special sale price of $99.99 and we will also include both:

- ✔ ***FREE*** **Grundig AN200** AM loop antenna
- ✔ ***FREE*** **Eton FR350** emergency AM-FM-SW radio.

G4000A	**$129.95**
FR350	**59.98**
AN200	**29.95**
Regular Total	**$~~219.88~~**
$99.99 (+$7.95 UPS)	

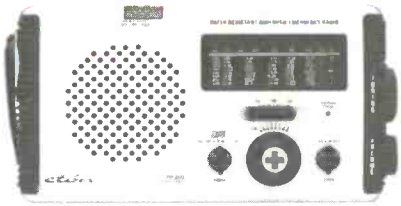
AN200 and FR350 are also sold separately.

GRUNDIG G4000A

The **Grundig G4000A**, historically has been our best selling radio here at Universal. We think the reason is value. Dollar for dollar no other radio offers this much performance and so many features. Coverage is complete, including long wave, AM band and shortwave from 1711 to 30000 kHz. FM stereo is provided to the headphone jack. A thumb wheel knob on the side of the radio provides smooth single sideband (SSB) tuning. The illuminated digital display provides tuning resolution at 1 or 5 kHz on shortwave. Two bandwidths are featured (narrow for maximum selectivity, or wide position for best audio fidelity). The keypad will quickly get you to any frequency or store up to 40 of your favorite stations in the presets. The presets may be accessed directly or you can scan through them by using the radio's second set of Up/Down buttons. The G4000A can also frequency search. The dual digital clock is visible while the radio is playing. Other refinements include: snooze and sleep buttons, lock, High/Low tone sw tch, Local/DX switch, and 9/10 kHz MW scan selection. Jacks for: earphone (3.5 mm), antenna (3.5 mm) and 9 VDC input. The G4000A comes with: AC adapter, stereo earbuds, wind-up antenna, and *Owners Manual*. Requires six AA cells (not supplied). The cabinet has a stunning titanium colored finish. 8"Wx5"Hx1.5"D. 1 Lb. 5 oz. One year limited warranty.

Grundig G4000A *Order #4000* Regular Price $~~129.95~~ **SALE $99.99**

etón FR350



Be prepared and aware with the **etón FR350** emergency radio. This affordable portable receives AM, FM plus 7 shortwave bands: 5800-6350, 6950-7500, 9350-10050, 11550-12200, 13400-14000, 15000-15700, 17400-18050 and 21200-21950 kHz. The FR350 has an analog dial and operates from a wind-up generator, or 4.5 VDC or 3 AA cells (not supplied). The generator charges the supplied, replaceable NiMH battery. Two turns per second for 90 seconds will provide 40 to 60 minutes of operation. There is also a built-in triple LED emergency light source and a siren function. Moisture protected rear panel jacks for: earphone, 4.5 VDC input and phone charger output. The FR350 has the additional capability of recharging certain cell phones with several common cellular power adapters included. With a black canvas carry case, 4.5 VDC 120 VAC adapter, NiMH battery and *Owner's Manual*. Only 8.7 x 4.5 x 2" 1.3 Lbs.

FR350 White	*Order #1350*	**$58.98**
FR350 Blue	*Order #4912*	**$58.98**
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FR350 Orange	*Order #4911*	**$58.98**
FR350 Camo.	*Order #4913*	**$58.98**

GRUNDIG Satellit 750

✔ **Receive a *FREE* etón FR350 with your Satellit 750 purchase.**

The **Grundig Satellit 750** is an exciting portable that brings you the world of long wave, AM and shortwave reception as well as FM and the VHF aeronautical band. Your complete shortwave coverage includes the S.S.B. mode allowing the reception of ham radio operators, maritime and shortwave aeronautical stations. Tune your favorite stations by the conventional tuning knob, quick keypad entry or via the 1000 memories. Enjoy the fidelity you have come to expect from Grundig enhanced by separate bass and treble controls. Other features include: backlit LCD, wide/narrow selectivity, signal strength meter, rotatable AM ferrite antenna, earphone jack, external antenna jack, line output jack plus a 24 hour clock with dual alarm and sleep feature. 14.65 x 7.24 x 5.75".

Grundig Satellit 750 *Order #0750* List Price $400.00 **$299.95**

GRUNDIG AN200

The **Grundig AN200** is a passive, fully adjustable indoor AM band antenna. Inductive coupling makes it easy to use with most portables that have an AM Ferrite bar antenna. Simply placing this antenna near the radio will improve reception! Just adjust the AN200 tuning knob for maximum gain. There is also an output jack for a "wired" connection to radios with AM antenna terminals. The supplied cable has a 3.5mm plug at one end bare wires at the other end.

Grundig AN200 *Order #0912* **$29.95**

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- Prices and specs. are subject to change.
- Special offers are subject to change.
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POPULAR COMMUNICATIONS

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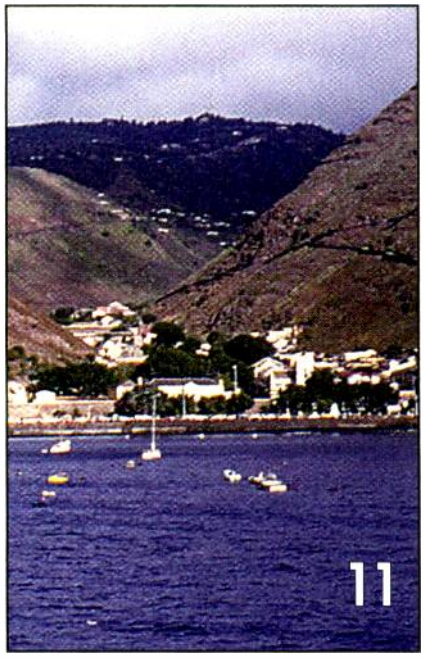
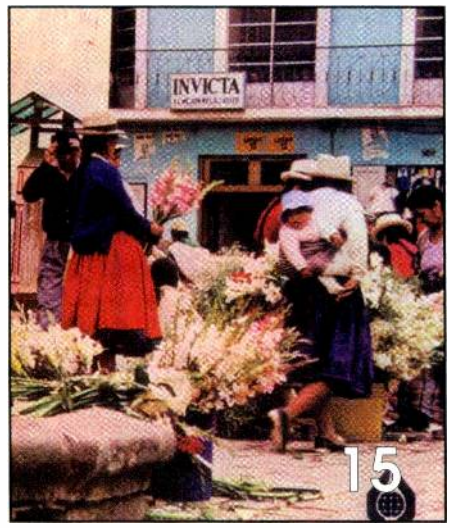
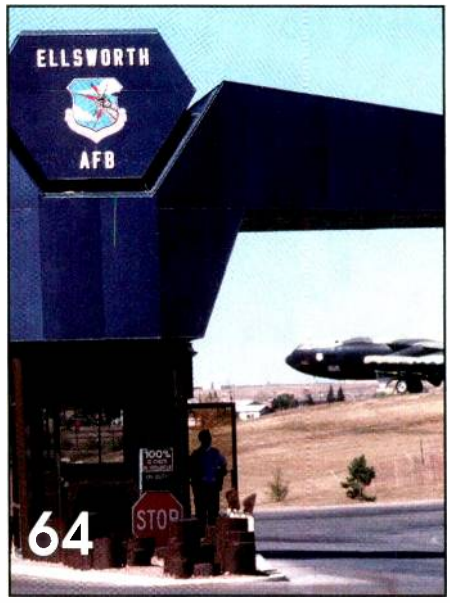






FEATURES

FEATURED COLUMNS

ON THE COVER

Fall is an exciting time for radio hobbyists. With its promise of improved propagation, popular contests, and rare opportunities like Radio St. Helena Day and far-flung ham DXpeditions, this season is a great time to spread wide your radio wings to travel our world. Check out this month's feature articles and featured columns for some DX challenges and tips on how to meet them. (Cover: normal Mercator projection, via Wiki Commons; insets: Radio St. Helena QSL; Bill Anderson, Jr., WB4TJH, constructs an antenna, photo by Larry Mulvehill, WB2ZPI)

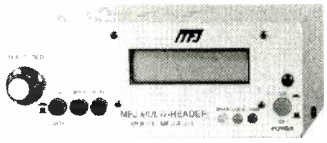
COLUMNS

DEPARTMENTS

Tap into secret Shortwave Signals

Turn mysterious signals into exciting text messages with the MFJ MultiReader™!

MFJ-462B **$199.95**



Plug this self-contained MFJ *Multi-Reader™* into your shortwave receiver's earphone jack.

Then *watch* mysterious chirps, whistles and buzzing sounds of RTTY, ASCII, CW and AMTOR (FEC) turn into exciting text messages as they scroll across an easy-to-read LCD display.

You'll *read* interesting commercial, military, diplomatic, weather, aeronautical, maritime and amateur traffic . . .

Eavesdrop on the World

Eavesdrop on the world's press agencies transmitting *unedited* late breaking news in English -- China News in Taiwan, Tanjug Press in Serbia, Iraqui News in Iraq -- all on RTTY.

Copy RTTY weather stations from Antarctica, Mali, Congo and many others. Listen to military RTTY passing traffic from Panama, Cyprus, Peru, Capetown, London and others. Listen to hams, diplomatic, research, commercial and maritime RTTY.

Listen to maritime users, diplomats and amateurs send and receive *error-free* messages using various forms of TOR (Telex-Over-Radio).

Monitor Morse code from hams, military, commercial, aeronautical, diplomatic, maritime -- all over the world -- Australia, Russia, Japan, etc.

Monitor any station 24 hours a day by printing transmissions. Printer cable, **MFJ-5412, $11.95.**

Save several pages of text in memory for later reading or review.

High Performance Modem

MFJ's high performance *PhaseLockLoop™* modem consistently gives you solid copy -- even with weak signals buried in noise. New threshold control minimizes noise interference -- greatly improves copy on CW and other modes.

Easy to use, tune and read

It's easy to use -- just push a button to select modes and features from a menu.

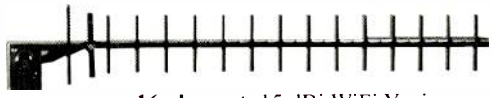
It's easy to tune -- a precision tuning indicator makes tuning your receiver easy for best copy.

It's easy to read -- front-mounted 2 line 16 character LCD display has contrast adjustment.

Copies most standard shifts and speeds. Has MFJ *AutoTrak™* Morse code speed tracking.

Use 12 VDC or use 110 VAC with MFJ-1312D AC adapter, $15.95. 5¼Wx2½Hx5¼D inches.

WiFi Yagi Antenna -- 15 dBi 16-elements extends range



MFJ-1800 **$29.95**

16-element, 15 dBi WiFi Yagi antenna greatly extends range of 802.11b/g, 2.4 GHz WiFi signals. 32 times stronger than isotopic radiator. Turns slow/no connection WiFi into fast, solid connection. Highly directional -- minimizes interference.

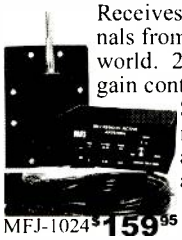
N-female connector. Tripod screw-mount. Wall and desk/shelf mounts. Use vertically/horizontally. 18Wx2¾Hx1¼D inches. 2.9 ounces.

MFJ-5606SR, $24.95. Cable connects MFJ-1800/WiFi antennas to computer. Reverse-SMA male to N-male, 6 ft. RG-174.

MFJ-5606TR, $24.95. Same as MFJ-5606SR but Reverse-TNC male to N-male.

Super Active Antenna

"World Radio TV Handbook" says MFJ-1024 is a *"first-rate easy-to-operate active antenna ...quiet... excellent dynamic range... good gain... low noise... broad frequency coverage."* Mount it outdoors away from electrical noise for maximum signal, minimum noise. Covers 50 KHz-30 MHz.



Receives strong, clear signals from all over the world. 20 dB attenuator, gain control, ON LED. Switch two receivers and auxilary or active antenna. 6x3x5 in. Remote has 54" whip, 50 feet coax. 3x2x4 inches. 12 VDC or 110 VAC with MFJ-1312, $15.95.

MFJ-1024 **$159.95**

Indoor Active Antenna

Rival outside long wires with this *tuned* indoor active antenna. *"World Radio TV Handbook"* says MFJ-1020C is a *"fine value... fair price... best offering to date... performs very well indeed."*

MFJ-1020C **$99.95**

Tuned circuitry minimizes intermod, improves selectivity, reduces noise outside tuned band. Use as a preselector with external antenna. Covers 0.3-30 MHz. Tune, Band, Gain, On/Off/Bypass Controls. Detachable telescoping whip. 5x2x6 in. Use 9 volt battery, 9-18 VDC or 110 VAC with MFJ-1312, $15.95.

Compact Active Antenna

Plug this *compact* MFJ all band active antenna into your receiver and you'll hear strong, clear signals from all over the world, 300 KHz to 200 MHz including low, medium, shortwave and VHF bands. Detachable 20" telescoping antenna. 9V battery or 110 VAC MFJ-1312B, $15.95. 3⅛x1¼x4 in.

MFJ-1022 **$69.95**

Eliminate power line noise!

MFJ-1026 **$199.95**

Completely eliminate power line noise, lightning crashes and interference *before they get into your receiver!* Works on all modes -- SSB, AM, CW, FM, data -- and on all shortwave bands. Plugs between main external antenna and receiver. Built-in active antenna picks up power line noise and cancels undesirable noise from main antenna. Also makes excellent active antenna.

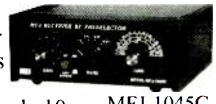
MFJ Antenna Matcher

Matches your antenna to your receiver so you get maximum signal and minimum loss.

MFJ-959C **$119.95**

Preamp with gain control boosts weak stations 10 times. 20 dB attenuator prevents overload. Select 2 antennas and 2 receivers. 1.6-30 MHz. 9x2x6 in. Use 9-18 VDC or 110 VAC with MFJ-1312, $15.95.

High-Gain Preselector



High-gain, high-Q receiver preseletor covers 1.8-54 MHz. Boost weak signals 10 times with low noise dual gate MOSFET. Reject out-of-band signals and images with high-Q tuned circuits. Push buttons let you select 2 antennas and 2 receivers. Dual coax and phono connectors. Use 9-18 VDC or 110 VAC with MFJ-1312, $15.95.

MFJ-1045C **$89.95**

Dual Tunable Audio Filter

Two separately tunable filters let you peak desired signals and notch out interference at the same time. You can peak, notch, low or high pass signals to eliminate heterodynes and interference. Plugs between radio and speaker or phones. 10x2x6 inches.

MFJ-752C **$119.95**

MFJ Shortwave Headphones

MFJ-392B **$24.95**

Perfect for shortwave radio listening for all modes -- SSB, FM, AM, data and CW. Superb padded headband and *ear cushioned* design makes listening extremely comfortable as you listen to stations all over the world! High-performance driver unit reproduces enhanced communication sound. Weighs 8 ounces, 9 ft. cord. Handles 450 mW. Frequency response is 100-24,000 Hz.

High-Q Passive Preselector

High-Q passive LC preselector boosts your favorite stations while rejecting images, intermod and phantom signals. 1.5-30 MHz. Preselector bypass and receiver grounded positions. Tiny 2x3x4 in.

MFJ-956 **$69.95**

Super Passive Preselector

Improves any receiver! Suppresses strong out-of-band signals that cause intermod, blocking, cross modulation and phantom signals. Unique Hi-Q series tuned circuit adds super sharp front-end selectivity with excellent stopband attenuation and very low passband attenuation and very low passband loss. Air variable capacitor with vernier. 1.6-33 MHz.

MFJ-1046 **$119.95**

MFJ Shortwave Speaker

This MFJ *ClearTone™* restores the broadcast quality sound of shortwave listening. Makes copying easier, enhances speech, improves intelligibility, reduces noise, static, hum. 3 in. speaker handles 8 Watts. 8 Ohm impedance. 6 foot cord.

MFJ-281 **$12.95**

MFJ All Band Doublet

102 ft. all band doublet covers .5 to 60 MHz. Super strong custom fiberglass center insulator provides stress relief for ladder line (100 ft.). Authentic *glazed ceramic* end insulators and heavy duty 14 gauge 7-strand copper wire.

MFJ-1777 **$59.95** Ship Code A

MFJ Antenna Switches

MFJ-1704 **$79.95**

MFJ-1702C **$39.95**

MFJ-1704 heavy duty antenna switch lets you select 4 antennas or ground them for static and lightning protection. Unused antennas automatically grounded. Replaceable lightning surge protection. Good to 500 MHz. 60 dB isolation at 30 MHz. **MFJ-1702C** for 2 antennas.

Morse Code Reader

Place this pocket-sized MFJ Morse Code Reader near your receiver's speaker. Then watch CW turn into solid text messages on LCD. Eavesdrop on Morse Code QSOs from hams all over the world!

MFJ-461 **$89.95**

MFJ 24/12 Hour Station Clock

MFJ-108B, $21.95. Dual 24/12 hour clock. Read UTC/local time *at-a-glance*. High-contrast 5/8" LCD, brushed aluminum frame. Batteries included. 4½Wx1Dx2H inches.

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A publication of

CQ Communications, Inc.
25 Newbridge Road
Hicksville, NY 11801-2953 USA

Popular Communications (ISSN-0733-3315), Vol. 28, No. 2, published monthly by CQ Communications, Inc., 25 Newbridge Road, Hicksville, NY 11801. Telephone (516) 681-2922. FAX (516) 681-2926. Web Site:<http://www.popular-communications.com/> Periodicals Postage Paid at Hicksville, NY and at additional mailing offices. Subscription prices (payable in U.S. dollars): Domestic—one year $32.95, two years $58.95, three years $85.95. Canada/Mexico—one year $42.95, two years $78.95, three years $115.95. Foreign Air Post—one year $52.95, two years $98.95, three years $145.95.

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Printed in the United States of America.

POSTMASTER: Send address changes to Popular Communications, 25 Newbridge Road, Hicksville, NY 11801.

EDITORIAL
Tuning In

And That's The Way It Is

by Edith Lennon, N2ZRW
editor@popular-communications.com

Walter Cronkite, a lion of journalism when the pride included Edward R. Murrow, Chet Huntley, and David Brinkley, helped set the standards that once saw his profession held in high esteem. He was called "the most trusted man in America" after a 1973 public opinion poll placed him at the top of a list of public figures. The nickname "Uncle Walter" was bestowed because of his authoritative manner and avuncular voice. To radio amateurs, he was also known as KB2GSD. He passed away on July 17 at age 92, becoming a Silent Key.

Born November 4, 1916, Cronkite dove headfirst into broadcasting early, winning a journalism competition in high school and writing for *The Houston Post* during summer break. He dropped out of college to pursue his goal full time, and embarked on his career, in radio, in 1935 as a news and sports announcer for KCMO Kansas City. A stint as a football announcer at radio station WKY Oklahoma City followed. He moved to print journalism with the United Press, reporting from bombing missions over Germany during World War II. But his path was set in television when Murrow recruited him to join the fledgling news division of CBS. Later named anchor and managing editor of the *CBS Evening News* in 1962, he would end that broadcast each night for 19 years with his trademark signoff, "And that's the way it is."

The list of his benchmarks stretches far and includes many of broadcasting's most significant developments and seminal moments, such as the news shows *You Are There*, *Eyewitness to History*, and *The Twentieth Century*; anchoring coverage of the first televised national conventions and Olympic Games; and the now-iconic reportage of the Kennedy assassination, mankind's first steps on the moon, and the Vietnam War in the aftermath of the Tet offensive.

He officially "retired" from CBS in 1981, but remained active in television production, wrote his memoirs, and founded his own company, which produced more than 60 award-winning documentaries. His own awards, of course, were legion.

Somehow he managed to fit in his interest in hobby radio as well. A ham since the mid-1980s and an ARRL member, Cronkite narrated two League-produced videos, *Amateur Radio Today* and *The ARRL Goes to Washington*. In recognition of his contributions to ham radio, he was inducted into the CQ Amateur Radio Hall of Fame in 2003 (#97) and was presented with the ARRL President's Award in 2005. In 2007 the Radio Club of America gave him its Armstrong Award. I've also heard that he was an SWL, but haven't been able to confirm it (if any readers know, drop me a line). That certainly wouldn't be surprising: the unquenchable curiosity that led Cronkite to journalism is also what lures so many of us to the hobby.

His passing sparked a lot of conversation and reflection on the state of his beloved profession—little of it positive. The years since he stepped away from his anchor's desk have seen a marked deterioration in the quality, credibility, and usefulness of U.S. broadcast journalism. The transformation of news delivery from a public service to a profit center has created a dual-headed beast of homogenization and sensationalism. Fact-based, firsthand news reporting has yielded the floor to shellacked "newsreaders" or shouting heads hurling opinions—all in the mindless march to deliver the most eyes and ears to Corporate.

It's sad to think that despite the power of the mainstream media—a maligned term I've grown to hate for its homogenized and sensationalized overuse, and ironically Cronkite's one-time sphere—to inform and educate, with the shape U.S. broadcast journalism is in today, most hams and shortwave and scanner listeners are probably far savvier about global and local events than the majority of Americans.

And Cronkite knew it, too. In a 1996 Newseum interview he said, "I regret that in our attempt to establish some standards we didn't make them stick, that we couldn't find a way to pass them on to another generation, really."

Well, for the legacy you left behind and the excellent example you set, we say goodbye and thank you, KB2GSD (SK). It's a loud silence indeed. ■

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The Weirder Side Of Wireless

by Staff

When To Communicate Your Communications

A police training exercise went badly awry as it sparked a widespread panic over a possible gunman inside a shopping center near Hobart, the state capital of Tasmania, Australia. The local police and *The Mercury* (Hobart) newspaper switchboards were flooded with phone calls from frantic people stating they'd overheard transmissions on a police radio channel that an armed man was on the loose in the Northgate Shopping Centre in the suburb of Glenorchy, according to a report in the *Mercury*. Glenorchy police stormed the shopping center, apparently not alerted to the fact that a training exercise was being conducted and the gunman did not exist (although some callers even reported that three people had been shot).

The police media department initially said reports of a gunman were a false alarm, but later issued a release stating that a police training exercise was under way and there was no need to panic.

The transmissions that began the confusion were made over a police radio channel as part of a training drill at a nearby Tasmania Police Academy at Rokeby. Inspector Robert Bonde, responding to the incident, said, "Some transmissions were overheard by members of the public who weren't aware they related to a training exercise," It is not known how so many Tasmanians heard about the apparent gunman in such a short time, but the incident raised questions—and apparently concern—about the number of Tasmanians who use police scanners to listen in on police operations, the reported continued.

This *Is* Your Father's (Or Grandfather's) Marconiphone

The BBC has tracked down to a London home a 73-year-old television set that is believed to be the oldest *working* TV in Britain. According to a BBC News report, the discovery came about through a competition run by Digital UK, the body overseeing the switch to digital television. The competition's goal was to inform the public that just about any television, no matter how old, can be used to view digital channels. The Marconiphone 702, built in 1936, still works as a modern television and has been hooked up to a Freeview box to show digital channels, although its owner, Jeffrey Borinsky, an electrical engineer and collector of antique television and radio sets, has had to install a standards converter so that a modern signal can be seen. He's also still working on restoring it to what he calls "its true 1936 magnificence."

Borinsky bought the set, which has a 12-inch screen mounted inside a wooden cabinet, from another collector 10 years ago. The image from the cathode ray tube, mounted vertically inside the cabinet, is reflected onto a mirror. Its only controls are for vertical hold and volume: There is no channel changer, because there was only one channel available—the BBC—at the time the television was built, the report continued.

In Triathlon For Stupid People, Driver Texts, Crashes, Swims

A New York State tow truck driver who was texting on one cell phone and talking on another hit a car, crashed through a fence, and then drove into a swimming pool in Lockport, New York, "making him a poster child for why many people are pushing for a ban on texting while driving," according to an item on the Channel Wire blog. The accident, which injured a woman and her niece, provided the perfect illustration of the results of a recent study by the Virginia Tech Transportation Institute, which found that texting while driving at the same time can increase the risk of a crash by 23 times. As stated on Channel Wire: "The study found that, of all the actions a driver can do with a cell phone while driving, texting was the most dangerous, as a driver's eyes might be on the cell phone for 4.6 seconds out of a 6-second interval, the equivalent of driving the length of a football field at 55 miles per hour without looking at the road, VTTI said."

The driver, who admitted to talking and texting while driving, was charged with reckless driving, talking on a cell phone and following another car too closely. Chief Deputy Steven Preisch of Niagara County said the flatbed truck was towing two vehicles, with two motorcycles on the bed, when it hit the car, went through a yard, sideswiping a house, and then continued through a privacy fence and into the home's in-ground pool. Preisch said the cleanup at the house took more than five hours and that it was hard finding a truck big enough to pull the flatbed out of the pool. ■

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The Bearcat BCT8 scanner, licensed by NASCAR, is a superb preprogrammed 800 MHz trunked highway patrol system scanner. Featuring TrunkTracker III, PC Programming, 250 Channels with unique BearTracker warning system to alert you to activity on highway patrol link frequencies. Preprogrammed service searches makes finding interesting active frequencies even easier and include preprogrammed police, fire and emergency medical, news agency, weather, CB band, air band, railroad, marine band and department of transportation service searches. The BCT8 also has preprogrammed highway patrol alert frequencies by state to help you quickly find frequencies likely to be active when you are driving. The BCT8 includes AC adapter, DC power cable, cigarette lighter adapter plug, telescopic antenna, window mount antenna, owner's manual, one year limited Uniden warranty, frequency guide and free mobile mounting bracket. For maximum scanning enjoyment, also order the following optional accessories: External speaker **ESP20** with mounting bracket & 10 feet of cable with plug attached $19.95. Magnetic Mount mobile antenna **ANTMMBNC** for $29.95.

Bearcat® BCD396T Trunk Tracker IV

Suggested list price $799.95/**CEI price $519.95**

APCO 25 9,600 baud compact digital ready handheld TrunkTracker IV scanner featuring Fire Tone Out Paging, Close Call and Dynamically Allocated Channel Memory (up to 6,000 channels), SAME Weather Alert, CTCSS/DCS, Alpha Tagging. Size: 2.40" Wide x 1.22" Deep x 5.35" High

Frequency Coverage:

25.0000-512.0000 MHz., 764.0000-775.9875 MHz., 794.0000-823.9875 MHz., 849.0125-868.8765 MHz., 894.0125-956.000 MHz., 1240.0000 MHz.-1300.0000 MHz.

The handheld BCD396T scanner was designed for National Security/Emergency Preparedness (NS/EP) and homeland security use with new features such as **Fire Tone Out Decoder**. This feature lets you set the BCD396T to alert if your selected two-tone sequential paging tones are received. Ideal for on-call firefighters, emergency response staff and for activating individual scanners used for incident management and population attack warning. **Close Call Radio Frequency Capture** – Bearcat exclusive technology locks onto nearby radio transmissions, even if you haven't programmed anything into your scanner. Useful for intelligence agencies for use at events where you don't have advance notice or knowledge of the radio communications systems and assets you need to intercept. The BCD396T scanner is designed to track Motorola Type I, Type II, Hybrid, SMARTNET, PRIVACY PLUS, LTR and EDACS* analog trunking systems on any band. Now, follow UHF High Band, UHF 800/900 MHz trunked public safety and public service systems just as if conventional two-way communications were used. **Dynamically Allocated Channel Memory** - The BCD396T scanner's memory is organized so that it more closely matches how radio systems actually work. Organize channels any way you want, using Uniden's exclusive dynamic memory management system. 3,000 channels are typical but **over 6,000 channels are possible** depending on the scanner features used. You can also easily determine how much memory you have used and how much memory you have left. **Preprogrammed Systems** - The BCD396T is preprogrammed with over 400 channels covering police, fire and ambulance operations in the 25 most populated counties in the United States, plus the most popular digital systems. **3 AA NiMH or Alkaline battery operation and Charger** – 3 AA battery operation - The BCD396T includes 3 premium 2,300 mAH Nickel Metal Hydride AA batteries to give you the most economical power option available. You may also operate the BCD396D using 3 AA alkaline batteries. Unique Data Skip - Allows your scanner to skip unwanted data transmissions and reduces unwanted birdies. Memory Backup - If the battery completely discharges or if power is disconnected, the frequencies programmed in the BCD396T scanner are retained in memory. Manual Channel Access - Go directly to any channel. LCD Back Light - A blue LCD light remains on when the back light key is pressed. Autolight - Automatically turns the blue LCD backlight on when your scanner stops on a transmission. Battery Save - In manual mode, the BCD396T automatically reduces its power requirements to extend the battery's charge. Attenuator - Reduces the signal strength to help prevent signal overload. The BCD396T also works as a conventional scanner to continuously monitor many radio conversations even though the message is switching frequencies. The BCD396T comes with AC adapter, 3 AA nickel metal hydride batteries, belt clip, flexible rubber antenna, wrist strap, SMA/BNC adapter, RS232C cable, Trunk Tracker frequency guide, owner's manual and one year limited Uniden warranty. Not compatible with AGEIS, ASTRO or ESAS systems. Order on-line at www.usascan.com or call 1-800-USA-SCAN.

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Bearcat® BC246T Trunk Tracker III

Suggested list price $399.95/**CEI price $214.95**

Compact professional handheld TrunkTracker III scanner featuring Close Call and Dynamically Allocated Channel Memory (up to 2,500 channels), SAME Weather Alert, CTCSS/DCS, Alpha Tagging. Size: 2.72" Wide x 1.26" Deep x 4.6" High

Frequency Coverage:

25.0000-54.0000 MHz., 108.0000-174.0000 MHz., 216.0000-224.9800 MHz., 400.0000-512.0000 MHz., 806.0000-823.9875 MHz., 849.0125-868.9875 MHz., 894.0125-956.000 MHz., 1240.0000 MHz.-1300.0000 MHz.

The handheld BC246T TrunkTracker scanner has so many features, we recommend you visit our web site at www.usascan.com and download the free owner's manual. Popular features include **Close Call Radio Frequency Capture** – Bearcat exclusive technology locks onto nearby radio transmissions, even if you haven't programmed anything into your scanner. **Dynamically Allocated Channel Memory** - Organize channels any way you want, using Uniden's exclusive dynamic memory management system. 1,600 channels are typical but **over 2,500 channels are possible** depending on the scanner features used. You can also easily determine how much memory is used. **Preprogrammed Service Search (10)** - Makes it easy to find interesting frequencies used by public safety, news media TV broadcast audio, Amateur (ham) radio, CB radio, Family Radio Service, special low power, railroad, aircraft, marine, racing and weather frequencies. **Quick Keys** - allow you to select systems and groups by pressing a single key. **Text Tagging** - Name each system, group, channel, talk group ID, custom search range, and S.A.M.E. group using 16 characters per name. **Memory Backup** - When power is lost or disconnected, your BC246T retains the frequencies that were programmed in memory. **Unique Data Skip** - Allows the BC246T to skip over unwanted data transmissions and birdies. **Attenuator** - You can set the BC246T attenuator to reduce the input strength of strong signals by about 18 dB. **Duplicate Frequency Alert** - Alerts you if you try to enter a duplicate name or frequency already stored in the scanner. **22 Bands** - with aircraft and 800 MHz. The BC246T comes with AC adapter, 2 AA 1,800 mAH nickel metal hydride batteries, belt clip, flexible rubber antenna, wrist strap, RS232C cable, Trunk Tracker frequency guide, owner's manual and one year limited Uniden warranty. For more fun, order our optional deluxe racing headset part #**HF24RS** for $29.95. Order now at www.usascan.com or call 1-800-USA-SCAN.

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News, Trends, And Short Takes

by D. Prabakaran

Future Uncertain For *Passport To World Band Radio*

Larry Magne, publisher of *Passport to World Band Radio*, told readers that the future of the seminal SWL guide is in "limbo." According to a statement posted on the publisher's website (www.passband.com):

"As with any good recipe, a range of ingredients has to come together if a reference book is to succeed. Solid content is, of course, essential. But in recent months other considerations have had an increased bearing on the future of *Passport to World Band Radio*. So it is that the 26th Edition of *Passport to World Band Radio* is being held in limbo...

"For *Passport* readers and our small team, alike, this is a seminal moment. After all, *Passport to World Band Radio* goes back a quarter century and has had something like a million readers worldwide. But the future has its own rhythm that confounds prognostication.

"There may yet be more chapters to this story. Stay tuned."

While Magne did not give a specific reason for the decision, the action seems to reflect the decline in popularity of shortwave listening, as well as the availability of shortwave schedules on the Internet.

MFJ Purchases Cushcraft Amateur Radio Antennas Product Line

MFJ Enterprises, Inc., Starkville, Mississippi, has purchased the Cushcraft Amateur Radio Antennas product line from Laird Technologies, St. Louis, Missouri.

"We are excited to have the Cushcraft Amateur Radio Antennas product line alongside our other five companies," said Martin F. Jue, president and founder of MFJ. "This product line increases our ability to offer our customers a wide range of antenna options at different prices. Customers will be able to choose from Cushcraft Amateur Radio Antennas, Hy-gain, and MFJ antennas through one source." MFJ purchased Hy-gain in 2000.

The Cushcraft products, which will still be manufactured in Manchester, New Hampshire, include a wide range of HF/VHF/UHF vertical, beam, and Yagi antennas. MFJ says it will add more new products to the antenna line.

A special customer support number has been set up in Starkville (662-323-5803) to handle Cushcraft Amateur Radio Antenna product technical support, parts requests, and customer services.

MFJ Enterprises, Inc. also owns Ameritron, Mirage, and Vectronics.

FCC Changes FM Translator Rules To Allow Rebroadcast Of AM Stations

The Federal Communications Commission has adopted changes in its FM translator rules to allow AM stations to use certain FM translator stations to retransmit their AM service within their AM stations' current coverage areas. Specifi-cally, AM broadcast stations will be allowed to use currently authorized FM translator stations (i.e. those now licensed or authorized in construction permits that have not expired) to rebroadcast their AM signals, provided that no portion of the 60 dBu contour of the station extends beyond the smaller of: (a) a 25-mile radius from the AM transmitter site; or (b) the 2 mV/m daytime contour of the AM station.

In addition, AM broadcast licensees with Class D facilities will be allowed to originate programming on FM translators during periods when their AM station is not operating. The FCC says this will permit AM broadcasters to better serve their local communities and thus promote the Commission's bedrock goals of localism, competition, and diversity in the broadcast media.

(Source: Radio Netherlands Media Network blog)

Venezuela Steps Up Control Of Television And Radio

Venezuela is taking dozens of radio stations off the air and putting stricter rules on cable and satellite television as part of President Hugo Chávez's battle with private media firms. Disodado Cabello, the public works minister who also oversees Venezuela's broadcasting watchdog, said 154 FM radio stations will be taken off the air and shifted into public hands in what he called "democratizing the airwaves." He recently said 86 AM radio stations will also be hit as the government steps up efforts to turn Venezuela into a socialist society.

"The use of the radio-electric spectrum is one of the few areas where the revolution has not been felt," Mr. Cabello said in a presentation to legislators about the need for reform in the sector. President Chávez and his supporters describe their drive to broadcast a pro-government message as a "media war" with private news companies. Venezuela's media is highly polarized with biased coverage the norm on both government and private networks.

(Source: Reuters) ■

Capitol Hill And FCC Actions Affecting Communications

by Richard Fisher, KI6SN

Former Naval Officer To Head Public Safety And Homeland Security Bureau

Admiral Jamie Barnett (Ret.), former deputy commander of the Navy Expeditionary Combat Command, and director of Naval Education and Training at the Pentagon, has been named by Federal Communications Commission Chairman Julius Genachowski to head the commission's Public Safety and Homeland Security bureau.

The mission of the PSHSB is "to collaborate with the public safety community, industry and other government entities to license, facilitate, restore and recover communications services used by the citizens of the United States, including first responders, before, during and after emergencies by disseminating critical information to the public and by implementing the Commission's policy initiatives," according to FCC guidelines. Barnett retired from the Navy in 2008 and had been a senior research fellow at the Potomac Institute for Policy Studies.

Commission Ordered To Reopen Comment Period On BPL Issue

Following a federal appeals court decision, the FCC has been directed to take additional comments on broadband over power line (BPL) technology. The action was taken after the American Radio Relay League sued, complaining that some of the studies on which the commission had based its decisions had not been revealed to the public. The court directed the FCC to "provide a reasonable opportunity for public comment on its unredacted studies, to make those studies part of the rulemaking record and to better explain its 'extrapolation factor' for use in measurement of emissions from Access BPL systems," according to a report on RadioWorld.com.

The FCC says the unredacted staff technical studies have been placed into the record and the commission has "laid out an explanation for its decisions about the extrapolation factor," according to the report. "Also it says that it is re-examining the extrapolation factor 'in light of the recently issued technical studies addressing the attenuation of BPL emissions with distance and efforts by the IEEE to develop BPL measurement standards.'"

Net-Neutrality, Open Access Bring Thousands Of Comments To FCC

The FCC has received thousands of responses in its call for comments regarding so-called net-neutrality and open access rules, according to published reports. The practice of net-neutrality "generally prohibits broadband providers from blocking or slowing customers' access to any legal Web content.

Supporters of net-neutrality rules say broadband providers have market incentives to slow or block content that competes with their own offerings or that of their business partners," according to a report by Grant Gross of IDG News Service and carried on ComputerWorld.com. About 10,000 comments were submitted regarding the national broadband play by the close of the commission's submission period.

Supporters of net-neutrality charge that broadband providers have "market incentives to slow or block content that competes with their own offerings or that of their business partners," the report said. "Broadband providers have argued that net-neutrality rules are unnecessary and could keep them from managing their networks. The FCC enforces net neutrality on a case-by-case basis, but a more formal rule could stifle the broadband marketplace by discouraging private investment, some free market think tanks argued."

2012 World Radiocommunication Conference Agenda Proposals

The 46-nation administrative oversight body of the International Telecommunication Union has announced it will hold the next World Radiocommunication Conference in 2012, with a wide range of spectrum allocations on the table. The meeting is tentatively scheduled for January 23–February 17. Scheduling conflicts and difficulties in finding facilities forced cancellation of a proposed October–November 2011 session in Geneva, Switzerland.

According to a news release from the ARRL, the WRC-12 agenda, developed by the delegates at the last WRC in Geneva in 2007, "was formally adopted by the ITU Council in 2008. There are 25 agenda items addressing potential new or revised spectrum allocations to existing services, including: consideration of an allocation of about 15 kHz in parts of the 415–526.5 kHz band to the amateur service on a secondary basis; consideration of requirements for and implementation of the radiolocation service (radar) between 30–300 MHz; consideration of possible allocations between 3-50 MHz for oceanographic radar applications; consideration of regulatory measures to enable software-defined and cognitive radio systems; and examination of the effect of emissions from short-range devices. ■

Telepresence

by Rob de Santos
commhorizons@gmail.com

"These 'video rooms' might have floor to ceiling monitors on one or more walls, with cameras and microphones recreating the room at the other end, or 'merging' them together so participants all seem to be in the same place."

When it comes to location, just how "there" do you want to be? Back in my "corporate" days, the primary way we had meetings with staff at other facilities was to either travel to the other site or have a telephone conference with them, aka a "telecon."

The telecon was often necessary for decisions that couldn't wait a day or more for someone to get to the other site, but it was distinctly unsatisfactory. You couldn't see faces or other visual signals to know if the "yes, we'll do that" comment on the other end was sincere or not. To make matters worse, the satellite delay required a half-second or more pause so you wouldn't talk over someone at the other end. Then, just as I was leaving my corporate stint, the videoconference was becoming an option.

The early videoconference was often not much more than a telecon with choppy video added. There were no close-ups, and the quality or frame rate was less than perfect. Often the connection failed or couldn't be set up at all. Things have improved a great deal in more recent years, and with tools like Skype, you can get good results with two laptops and the Internet. However, for larger groups, more is necessary.

Enter the concept of *telepresence*. Advances in communication technology, such as better cameras, HD video, enormous flat panel monitors, and high-speed Internet connections, make it possible to have virtual joint meetings now. A number of companies in the videoconference business are promoting telepresence as the next advance in this technology.

One major selling point of this is that you can simulate the experience of "being there" more realistically than ever. While sitting at a conference table, the "people" across the table from you are actually images on a monitor, life-size and in high definition (you can even see that tomato sauce stain on the VP's tie from his lunchtime cheeseburger). The "conference rooms" are outfitted with special lighting, acoustic tiling, and carefully chosen furniture.

The attractions from a corporate standpoint are obvious. More staff at each end can be involved and travel costs eliminated. The trips I used to make would now cost my former employer thousands per week. It doesn't take many of those to justify the cost of installing telepresence systems, even with installation costs running from a few thousand dollars to upwards of $350,000. The crew of the Starship Enterprise with their view screen never had it this good!

What does this mean for the average *Pop'Comm* reader? Before the turn of the millennium, there were many predictions about the new century that proved unfounded.* Among them was the coming of the video-based telephone. The famous Picturephone, displayed by AT&T at the 1964 World's Fair and featured in the movie *2001: A Space Odyssey*, was an example of such a technology. That device was a market failure and never reached the average consumer. But was the prediction wrong about the technology in general? We've now met and surpassed that with telepresence. *(Note to self: Do not plan to live long enough to be around when incorrect predictions in this column are reviewed in 40 years...)*

Moreover, telepresence may well creep into our home lives. As the costs come down, it's possible that we may one day have a dedicated space in our homes, where we can interact with friends and family in a lifelike manner. They'll appear to be in the same room with us, as we'll appear to be with them. These "video rooms" might have floor-to-ceiling monitors on one or more walls, with cameras and microphones recreating the room at the other end, or "merging" them together so participants all seem to be in the same place.

There's much to commend the idea that we could share our lives in such a way that the grandkids can really see and be seen by grandma. One can imagine a future "virtual" meeting of communications hobbyists allowing those who cannot attend in person to participate.

Naturally, there are also significant privacy concerns associated. It may be extreme, but one can envision an Orwellian scenario with Big Brother watching.

Do you want to be "there" virtually with friends and family? Have you ever used a telepresence system? Drop me a line and let me know.

* See the article at *www.boblucky.com/Papers/green.htm*. An online search will show much discussion of the Picturephone and why it failed.

A Goal For The DX Season: Target Ten For '10

With The A10 Broadcast Year Around The Corner, And The Promise Of Improved Propagation, Here Are Some Suggested Shortwave Prizes

BY GERRY DEXTER

It's that time of the year again, when tradition and the propagation prognosticators begin to tout the arrival of a new DX season, and many of us get newly excited about our hobby as we imagine the prospects which await us down the next DX road. Having gone through one or two of these in the past, experience tells me to temper my emotions somewhat. That long-sought 2-watt Paraguayan on 7777 (point 7) isn't likely to present itself to my antenna system this season, no matter what I do, even if propagation is spectacular. But this rite of fall still spurs us to sharpen both our tools and skills as we try our best in the hunt for the most elusive shortwave prey.

As the new season gets underway, chances are that it may be just a bit better than average, truth be told. But we still look forward (with fingers crossed) to its being better than it's been, to propagation giving us the opportunity to bag a few stations that are now heard just once in awhile by a handful a well-located fortunate few who get to play with top-notch equipment and go crazy with mind boggling antennas.

Maybe the coming new season will favor us poor souls who seek but haven't yet found, and not necessarily with the impossible catch, the once-in-a-lifetime log, but by rewarding our efforts to hear more and farther than we have in a long time. This season, whether the propagation gods wear a smile or a scowl, I suggest taking up the challenge of pulling in those signals that are just past the edge of ease, maybe only ranking a four or five on a scale of 10 (one being I can hear it on my cat's whiskers, and 10 meaning there is no way, I have WYFR as my next door neighbor). The hunt is all.

So, as we approach the A10 listening season, here are 10 targets to try for. I present them in no particular order, not alphabetically, not geographically, not in order of difficulty. It's up to you how to prioritize your 10 for 10 challenge. Let us know how you do.

Radio Nacional, Angola—This one has been a question mark for most of last season. It has a habit of disappearing for months at a time, as it did recently, leaving one to wonder what was going on. When it is active you should be able to hear it on 4950 in our local evenings, say from around 0200 (it's listed for 24-hour operation). If it's coming in really well, you might want to scurry up to its low-power 7217 channel, which is almost never heard (see "An SWL's 'Energy Efficiency Challenge': The All-Continent QRP Award" elsewhere in this issue for another reason to try for low-power broadcasters). Programming will be in Portuguese. Address: C.P. 1329, Luanda. Email: fdiatezwa.rna.ao

Radio St. Helena Day is much anticipated each year, good conditions or not.

Radio Vanuatu—The few remaining shortwave stations in the Pacific Isles are always favorites, and this station certainly scores big in that department. They've been off the air for some time but now they have a fresh lease. 3945 has been reactivated with 10 kW, but you'll have to wade through amateur QRM and be awake and alert at an ungodly hour (around 0900!). The other channel, 7260, isn't heard very often or very well, but it's worth checking for when conditions seem favorable. It runs even lower power (only 8 kW) and it's questionable as to whether it's even in regular use. Address is PMG 049, Port Vila. No email.

Gerry Dexter is *Popular Communications*' "Global Information Guide" columnist.

Why is this Tibetan girl smiling?

The author, hunkered down for the hunt in the comfort of his shack.

Northern Territory Shortwave Service, Australia—Three stations make up this group serving the land of Crocodile Dundee, all with about the same degree of rarity. They consist of VL8K, Katherine, which uses 2485 and 5025; VL8A, at Alice Springs (2310 and 4835); and VL8T, in Tennant Creek (2325 and 4910). Reception of these three "should" improve significantly about now. Try the lower frequencies early in the morning (around local sunrise) and the 60-meter channels well past your local midnight. Generally the lower frequencies are better heard. Address: ABC Northern Territory Shortwave Service, Box 9994, Darwin, NT 0801. No email and no addresses are available for the individual stations. Replies come from the Darwin headquarters.

Radio St. Helena—This is one station everyone tries for, even if they've already logged it. "Radio St. Helena Day" is a yearly event that's eagerly anticipated by DXers around the world. For just one day and with one broadcast per year, who wouldn't try to catch it? The special day is usually on a Saturday in mid-November with the broadcast transmitted on 11092.5 upper sideband. I'm *guessing* the date may be November 21 this year. (You can find out for certain ahead of time by doing a Web search for "Radio St. Helena Day" when we get closer to the event.) For the past couple of years the broadcast has run all afternoon (from 2000), so you have plenty of time to monitor. If you don't hear anything at the 2000 start just stay with it, as they change the beam direction and they don't get around to feeding North America until late in the afternoon. Radio St. Helena, P.O. Box 93, Jamestown. St. Helena, STHL 1ZZ, South Atlantic Ocean. Email: stationmanager@helanta.sh. Note that they do not QSL email reports. And, be prepared to wait for a reply until you've celebrated a birthday or two! Mail to and from the island takes a loooong time!

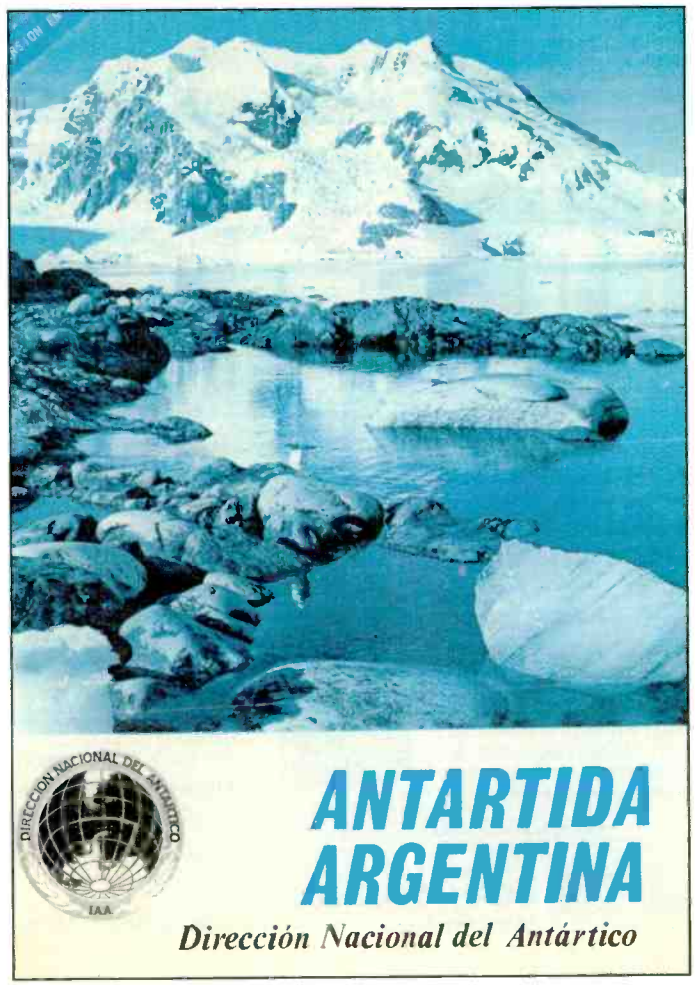
Xizang Peoples Broadcasting Station (China National Radio)—This is one of the many Chinese regional and special broadcast services and is usually considered a "catch" because of the Tibet aspect (Tibet is considered a separate radio country by the North American Shortwave Association, but don't tell the Chinese that!). Xizang PBS broadcasts on several frequencies not in use by other Chinese outlets, which makes it a lot easier to decide what you've got. 4820, 4905, 4920 and 5240 are all in use 24 hours per day as is 5935, except for 1800–2000. So you have reasonably good shots at this one whenever Asian reception is good, or even just a bit better than average. Check the frequencies in the early morning hours, plus or minus sunrise. There's late word of new frequencies in use including 7450 from 0900 and 2000 to 0300. Also 7255 from 1000 and 2100–0200. Reception reports are generally answered from 180 Beijing Zhonglu, Lhasa, Xizang, 850000. Email to: xzzbs2003@yahoo.com.cn or zbs@chinabroadcast.cn.

Armed Forces Radio TV Service, Diego Garcia—After a decade or more of silence, Armed Forces Radio put several stations on the air, one of them from the British Indian Ocean Territory island of Diego Garcia, where the U.S. military has a huge base. Like the others, the station relays strictly AFRTS programming, 24 hours per day. Of the several such outlets, this is the toughest to log. Diego Garcia uses 4319 and 12579, both in USB. 4319 can sometimes be heard during the fall months, around late afternoon. If you doubt what you're hearing, check 5446, 7812, or 12133 for the much more easily heard station at Key West, Florida, which will be in parallel. Address:

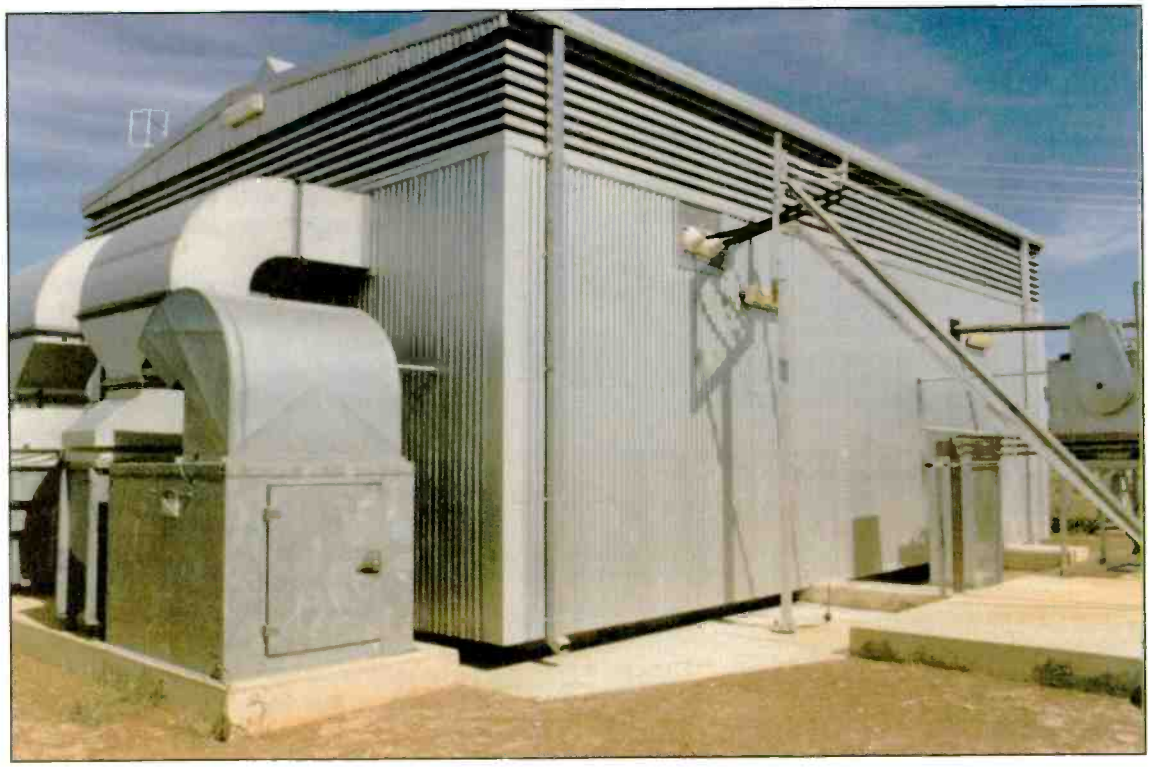
Department of Defense, Naval Media Center Detachment, AFRT-DMC, 23755 Z Street, Building 2730, Riverside, CA 92518-2017, Attn: Officer in Charge. Maybe you should use a large envelope! Email to: qsldodmedia.osd.mil

All India Radio-Port Blair—AIR can be a snap to log, or it can be the very devil to hear. In this case it's the latter. Port Blair in the Andaman Islands (another NASWA shortwave country) is in the Bay of Bengal, almost closer to Burma than it is to India. AIR-Port Blair operates on 4760, scheduled from 2355 to 0300 and 1030 to 1700, but you have to be aware of the AIR outlet from Leh, sharing the frequency at certain hours. Port Blair also uses 7115 from 0315 to 0400 and 0700 to 0930 but to my knowledge no U.S. DXer has ever heard it here, so it's best to focus your attention on 4760 at or within an hour or so into the schedule or around dawn. Reports go to Haddo Post, Dilanpur, Port Blair, 744-102, South Andaman, Andaman and Nicobar Islands, Union Territory, India. Email: airportblair@rediffmail.com. When it comes to QSLing Indian regionals, all I can say is "good luck"!

Radio Nacional Archangel San Gabriel, LRA36, Argentine Antarctica—This one serves scientists and other personnel at Argentina's Base Esperanza and is heard on rare occasions even when propagation isn't the best. We ought to do better with the improved conditions the propagation experts keep promising. The station is not on year-round, just during the Southern Hemisphere's summer months. LRA36 uses 15476 from about 1745 to around 2100 or a few minutes past. They are not active on weekends. And, as you'd expect, the broadcasts are in Spanish. When received it's usually for just a half hour or less, prior to its 2100 sign off. Address: Base Esperanza, V9411XAD, Argentine Antarctica. Email: lra36esperanza@yahoo.com.ar.



Hot target from a cold place: LRA36 on 15476



Transmitter building housing Australia's VL8A and VL8K.

Myanmar Defense Forces Radio—This one has been around for some time as a station run by and for the Burmese (Myanmar) army. It uses 5770 and did so for quite some time before it was identified. Optimum hours are 1330 to 1630 and for those on the west coast 0630 to 0930. The station is located at Taunggyi, which is in Shan state, near Myanmar's west coast, more or less on a line opposite Mandalay. It is Myanmar's fourth largest city, but hard to find on many maps. Email to: syne@mandalay.net.mm.

Nearby, in Laos, is another interesting target in the form of **Lao National Radio**. This station seems to be stumbling a bit these days, down to just a handful of channels in operation: 4413 (variable) carrying a domestic service sometimes heard by west coasters (despite using a mere 1 kW), and 6130 (50 kW) with a so-called "international service" that sometimes makes it farther east. Also apparently active is 7145 with half-hour segments in Thai, Vietnamese, Khmeer, French, and English beginning at 1130. The optimum tuning time for this one would be around dawn (they begin operations at 0900). Address: Pahynam Road. Vientiane, Lao People's Democratic Republic. Email: laonradio@lnr.org.la.

Happy Hunting

That brings us to the end of this mini-survey of prospects for the approaching A10 season. I say "mini" because there are near limitless other opportunities for juicy DX waiting—way too many to cover here. To further whet your appetite consider the low-power, low-frequency Papua New Guinea stations, the many, many outlets still active in Bolivia, Brazil and Peru, as well as all the Indian, Indonesian, Russian, and Chinese regional stations.

The unrestrained optimist could easily envision the bands alive with DX! The more realistic among us would be happy with just a better than average season, promising reasonable chances to log the stations highlighted here. Considering what we've had to put up with during the past few years, "better than average" would be like paradise!

Before you know it the new season will be on us so it's time to get a move on and start your prep work. To quote team leader LeRoy Jethro Gibbs on TV's NCIS when he receives a call sending the group into action: "Gear up!" ■

An SWL's "Energy Efficiency Challenge": The All-Continent QRP Award

Make Fall Listening More Exciting—And Sharpen Your Skills—By Hunting For Low-Power Broadcasters

by Edward J Insinger, WDX2RVO

With DX season approaching, we shortwave listeners have a terrific opportunity to put our well-practiced listening skills to use as we try to pull in more stations (though we'll gladly take a little bit of luck and a heap of help from favorable propagation conditions!). A good way to hone our skills even further is to take up the challenge of one (or more) of the numerous awards available.

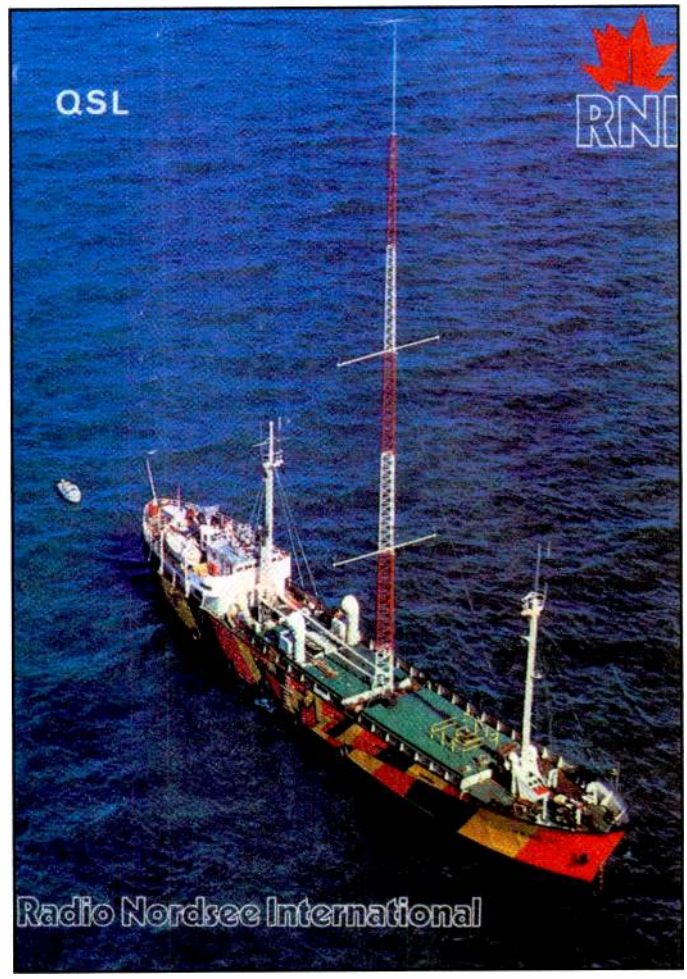
One that I found especially intriguing is the All-Continent QRP Award sponsored by the North American Shortwave Association, or NASWA (see www.dxawards.com/DXAwardDir/naswa.htm). In order to qualify for this award, you have to log and verify a station from each continent, but one whose added total transmitter power equals less than 50 kW. In addition, just to make things a little tougher, NASWA allows the submission of only one time signal station and one pirate station to qualify for this award.

Get Ready To Rise To A Challenge

Sound interesting? You bet it does, so let's look at how you can maximize your chances of success. You can,

a) spend megabucks on a professional receiver;
b) vacation in several remote places, strategically chosen for their ability to pick up low-powered shortwave stations;

Edward Insinger has been a shortwave radio enthusiast since 1968, when he built a Heathkit GR-64 receiver from a kit. He recently received the Adventist World Radio Certificate of Excellence as the 2008 USA Winner of the Wavescan DX Contest. He is also a monitor for Radio Vaticana and an avid QSL collector.



This QSL from Radio Nordsee International shows the 200-foot ship that took to international waters in Europe to send out its shortwave broadcasts.

The attractive QSL of HCJB, Quito, Ecuador (right). This once-powerful missionary broadcaster is on nearly every hobbyist's heard/verified list. As the back of the QSL (below) indicates, on this occasion it was on a high-frequency with low power (100 watts).

Heralding
Christ
Jesus'
Blessings

To: Edward J Insinger

☒ *We wish to thank you for your reception report. We have found it correct and hereby acknowledge with this verification card.*

Date of reception June 1, 1980

Time-GMT 0039-0120

Transmission was heard on 6020 *kHz*
transmitter power - 100 watts

☐ *We feel sure that you have heard one of our transmissions, but the information given was not sufficiently complete or correct to receive full confirmation.*

We appreciate your interest in our programs and invite you to write again.

Sincerely yours,

Robert Barbera

Director of Communications

HCJB Casilla 691 Quito, Ecuador South America

(B) Colonial architecture in CUENCA, Ecuador.
This country flower market is located at one of the numerous sites in Cuenca where colonial flavor can still be enjoyed. Note the turned columns and the old fountain.

c) hunker down at home for some serious armchair traveling to hunt for those difficult DX catches.

If you're like most SWLs, you're limited to option c), but that's not a bad thing. Keeping in mind that we're referring to broadcasters using a mere 1000 watts or so, you'll be pushing your listening skills, antennas, and receivers to their limits, capturing rare, even once-in-a-lifetime, catches, under just the right listening conditions. Here's where we draw the line in the sand between the seasoned DXers searching the shortwaves and the casual listeners spinning the dials on a Sunday afternoon.

Another important part of this undertaking is carefully polishing those reception reports (requiring submission in languages other than English) to ensure that your verifications will follow in due time. By due time, of course, I mean a few months possibly running into several years of follow-up reports, which was the case with my Radio St. Helena QSL. Now, I didn't say it would be easy...

But easy or not, it is fun, challenging, and rewarding, so let's take a look how to get on the fast-track to your own All-Continent QRP Award.

Step #1: What You've Already Logged

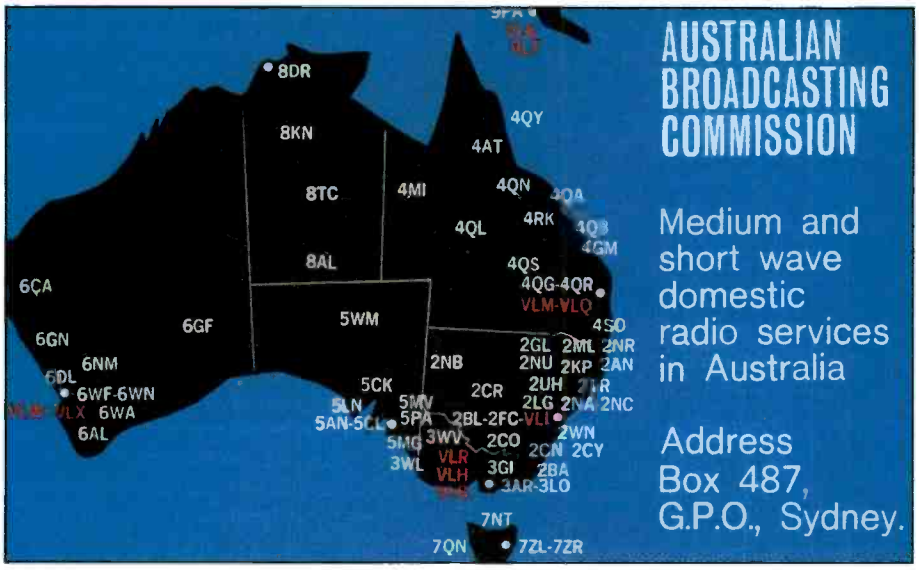
First things first: take a long, hard look at your current All-Continent QRP totals. This lets you determine what continents need improvement and those potential low-power DX catches you should add to your most wanted list.

With the sunspot cycle still favoring the lower bands, there are windows of opportunity in the 60- and 90-meter tropical bands and perhaps some openings on 120 meters, when atmospheric conditions allow readability of signals above the seemingly incessant noise level.

Concentrating on the 41- and 49-meter bands is a viable option if atmospheric noise makes listening on the tropical bands virtually impossible. (We've all experienced listening with headphones to what sounds like a severe thunderstorm taking place in our heads—at that point you have the choice of moving to the higher bands in search of DX, or reaching for the bottle of Advil sitting atop your desk.)

Loggings For The All-Continent QRP Award (under 50 kW level)

Country	Continent	Name of Station	Frequency	Power	Date Heard	Type QSL
Reunion Island	Africa	ORTF – St. Denis	2446 kHz	4000w	8 Jun 73	Letter
Turkey	Asia	Voice of Meteorology	6900 kHz	2500w	21 Feb 73	QSL
Holland (Int. Waters)	Europe	Radio Noordzee Int'l	6205 kHz	10,000w	8 Feb 72	Card
Grenada	N. America	Windward Islands Brdcstg Svc	11970 kHz	5,000w	20 Mar 71	Card
Venezuela	S. America	Observatorio Cagigal YVTO	6100 kHz	1000w	20 Oct 81	Letter
Australia	Oceania	ABC – VLH9 Lyndhurst, Victoria	9680 kHz	10,000w	16 Apr 72	Card



ABC's (Australian Broadcasting Commission's) Sydney, NSW card. Search for its domestic service low-power stations early in the morning.

For my submission, I first reviewed my QSL collection to see if I qualified for the "entry level" requirements, with loggings of broadcasts totaling less than 50 kW. At a time when most international broadcast stations were increasing their power from 100 kW to 250 kW and higher, searching for smaller stations among the giants really tested my verifications. However, my search proved fruitful and I compiled my entries for submission, as outlined in chart "Loggings For The All-Continent QRP Award (under 50 kW level)."

I made these DX catches using Heathkit GR-64, R.L. Drake SW-4A, and Hallicrafters SX-100 Mark II receivers. My antennas included a homebrew 100-foot-long, center-fed dipole (north-south orientation) and a 60-foot-long end-fed longwire (east-west orientation). For an emergency backup, I also built a triangular antenna with two parallel extended legs from the base of the antenna, in my attic. This served as an alternative when wind, snow, or ice storms took down the outdoor aerials.

Make your own list and you, too, may already be eligible for an award. But if not, or if you want to better your own "score," there's still a world of low-power stations waiting to be tuned. Read on.

Step #2: The Hunt Begins

Once I had compiled my list and applied for the "All-Continent QRP Award" at the less than 50-kW level, I decided to continue prowling the shortwave bands for opportunities to improve upon my QRP totals. Add-on stickers are available for your prized certificate, which can be affixed for QRP totals decreasing from 50 kW down to 25 kW, 10 kW, 5 kW, and even a mind-boggling 2 kW.

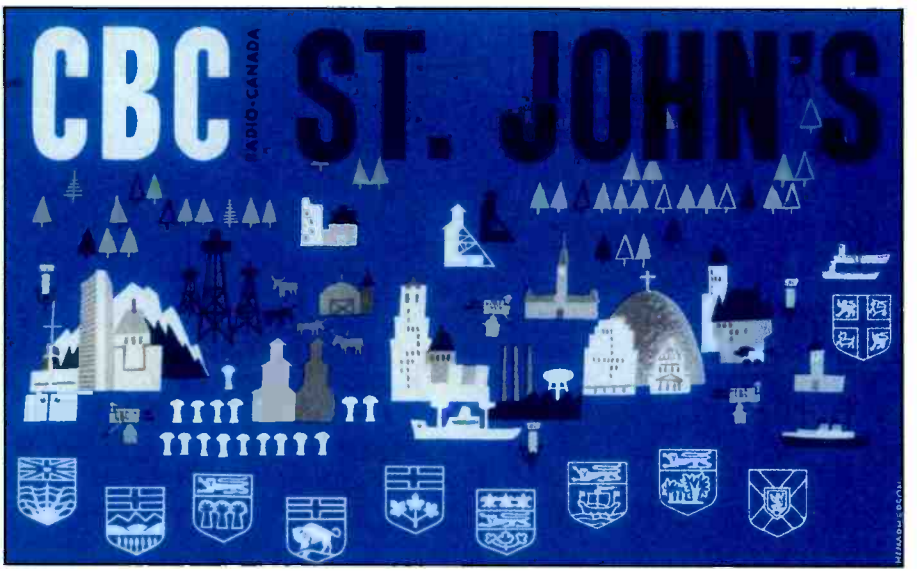
As you get set to zero in on countries and continents that will qualify for your award, remember to use propagation conditions to your advantage. To hone in on stations that are energy misers, consider the following tips to help you accomplish your goal:

- Check for openings after sunrise at your location for stations in the pacific region.
- Monitor WWV for unusual propagation conditions at 18 minutes past each hour, which will alert you to propagation anomalies that can open windows of opportunity.
- Erect your antenna to receive incoming shortwave signals from the desired area broadside, or if possible, run two antennas at 90-degree angles to each other. I've used a pair of PAR Electronics End Fedz, model EF-SWL, in a way that helped me optimize signal strength and readability.
- Raise your antenna as high as possible. The basic tenant that the higher the better applies here and it will lower the noise level on these mini-powered signals.
- Plan a DXpedition to a nearby park or some other undeveloped area where noise levels are at their lowest. You'll be pleasantly surprised at signals that rise from your receiver in quieter environments.
- For backyard use or DXpeditions, consider investing in an easy-to-erect antenna system, such as those available through www.HamRadioFun.com. I use a basic longwire configuration neatly coiled up inside a heavy-duty plastic case that attaches directly to any whip antenna

The result of my continued efforts brought me down to the 10 kW Award level, with the submissions outlined in the second "Loggings" chart.

Loggings For The All-Continent QRP Award (under 50 kW level)

Country	Continent	Name of Station	Frequency	Power	Date Heard	Type QSL
St. Helena	Africa	Radio St. Helena	11092.5 kHz	1000w	15 Nov 08	Card
Turkey	Asia	Voice of Meteorology	6900 kHz	2500w	21 Feb 73	Letter
Ireland	Europe	Radio Dublin International	6910 kHz	800w	24 Jul 84	Letter
USA	N. America	CKZN Newfoundland	6160 kHz	300w	18 Aug 72	Card
Ecuador	S. America	HCJB	26020 kHz	100 w	1 Jun 80	Card
Australia	Oceania	ABC – VL16 Sydney, NSW	6090 kHz	2000 w	7 Apr 72	Card



My QSL card from the CBC (Canadian Broadcasting Corporation), Newfoundland. Several CBC stations relay programs for the Canadian provinces at low power.

I made these DX catches with a Hallicrafters SX-100 Mark II, R.L. Drake R8A, and JRC NRD-535 receiver. My antennas included the homebrew 100-foot-long end-fed longwire (north-south orientation) and a pair of PAR Electronics End-Fedz EF-SWL antennas (north-south and east-west orientation).

Still More Tips For Capturing Low-Powered Stations

You've already got plenty of information to start you on your way to the All-Continent QRP Award, but the following tips will help make your search for low-power stations easier still.

• For those seeking to log and verify Radio St. Helena (a double bonus, since the opportunity exists to add a new country to your totals and it's a low-powered genuine DX catch to boot), the station has announced that it will be on the air in either November or December 2009. Just keep in mind that it broadcasts only one day, so be ready! Check your favorite publication for updates on its schedule and keep in mind that it uses the USB mode of transmission.

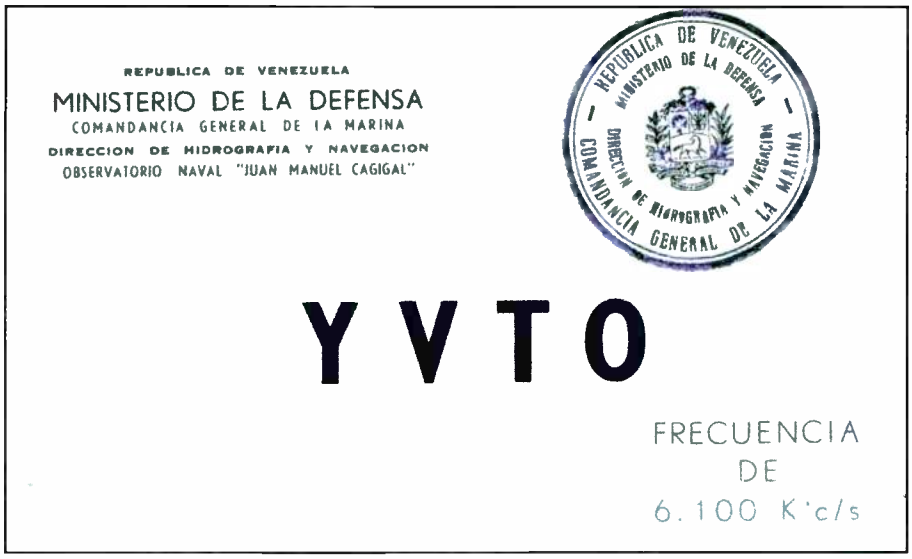
• With favorable transatlantic propagation conditions you have opportunities for logging Europirates, such as Weekend Music Radio or Mystery Radio. These low-powered stations are intermittent, so it's essential to keep track of what other DXers are hearing—and when—to optimize your chances of reception. Reference sources include the monthly *NASWA Journal*, the Free Radio Weekly newsletter, and up-to-the-minute online loggings via www.frn.net/vines. Most of these pirate stations operate using single sideband (SSB), so you'll need a radio that can receive these signals. If you keep your radio tuned to 6925 kHz USB Thursday through Sunday evenings, these stations will appear at any given time.

• South America and Africa offer several opportunities to log lower-power stations operating in the tropical bands. Listening in the 60-, 90-, and 120-meter bands requires patience since the tropics are subject to heavy thunderstorm activity, increasing levels of noise at the source of the stations you're attempting to hear. Also keep in mind that these stations operate for a domestic listening audience and therefore use local languages. This means you'll have to note identifiers carefully for your reception report. If you don't speak the language being heard, you can write your letter in English and translate it (*very roughly*) into the desired language using an online translator such as Babel Fish (www.babelfish.yahoo.com.)

• For those who need a logging from the Middle East, seek out Galei Zahal, the Israel Defence Forces Radio Station, in the evenings on 6973 kHz at 10 kW. It provides a good opportunity for a DX catch from that region.

• Search out and log time and frequency standard stations from outside the United States. I experienced a propagation anomaly on 10,000 kHz that made WWV's time announcements virtually inaudible, but it allowed for the reception of time station LOL, Servicio de Hidrografia Naval, Buenos Aires, Argentina, in Spanish. Excellent sources of information on these stations include *Passport To World Band Radio 2009*, *NASWA Journal* and Glenn Hauser's website at www.worldofradio.com. You can also do a Google search for "Time and Frequency Stations" for additional information.

• Local hams are a valuable resource. Many started out as shortwave listeners and can offer a wealth of useful knowledge for antenna designs, equipment both old and new, and much more. Find out if there are local ham meetings in your area, and if so plan to attend one. You'll meet up with some very friendly and highly



Time signal stations from afar offer a unique opportunity to lower QRP totals. I received this QSL card from YVTO, Venezuela.

experienced radio enthusiasts willing to share their expertise.

Receiving Full Data Verifications From Low-Powered Stations

There are many reasons that SWLs appreciate receiving QSL cards or verification letters from the stations they've logged (see "The Memory Lane Side Benefit"). One bonus of receiving QSL verification cards or letters from stations is that they often list the power output of their transmitters. This is the much sought-after "full data verification," containing the station name, date, time, frequency, and power output.

Of course, for the All-Continent QRP and similar awards, you'll need these for proof of reception. When writing your reception report to request verification, be sure to politely ask that the transmitter power be included on your QSL. Some stations will comply with your request, and occasionally one will even list the make and model of *your* receiver on the QSL. How personalized is that?

The Challenge Never Ends

At this point in my listening experience, I still consider reducing my QRP totals an added bonus for my SWL efforts. As you can see from the tables showing my QRP totals, I'm a "mere" 1700 watts over the qualifications for the most prestigious "All Continent QRP 5kW Award."

Can you guess what I'll be doing this upcoming DX season? ■

The Memory Lane Side Benefit

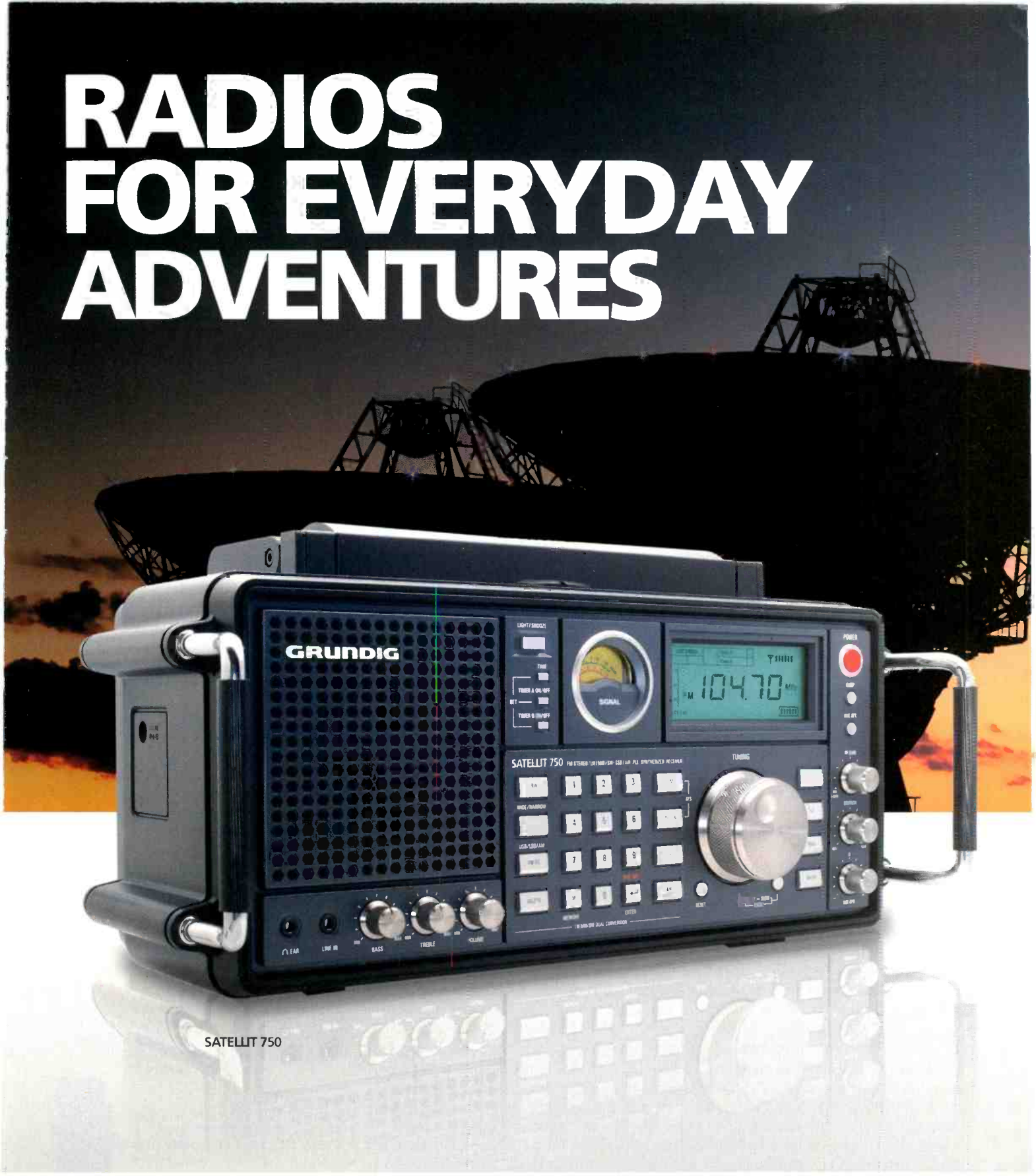
Getting ready to send in your submissions for a contest or award isn't the only reason to go through your QSL card collection. Most of us love to reminisce over our favorite QSLs.

The QSL I received from my catch of the Windward Islands Broadcasting Service (listed in the first chart), became a favorite of mine because it represents an accomplishment that really stands out for me. It was during a time in my hobby when I was using my first-ever shortwave receiver, built from a kit and a modest longwire antenna. Despite the limitations of the receiver, here was a logging of a 5000-watt broadcasting station that was confirmed by a QSL card I received almost one year later.

The QSL I snagged from ORTF – St. Denis, Reunion (also listed in the chart) is another favorite. I heard the station in the 120-meter tropical band and logged it by the dial lamps of my Hallicrafters SX-100 Mark II on a late spring evening. With the use of headphones, it was possible to raise its signal above the noise level and collect enough details to send a reception report in French, which was answered by an exotic QSL card.

While a QSL card or verification letter may contain a wealth of technical data on it, behind it is a treasure chest of memories.

RADIOS FOR EVERYDAY ADVENTURES



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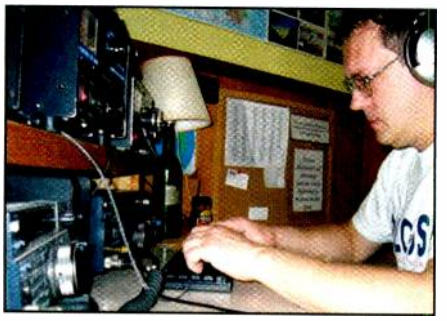
CQ World Wide DX Contest—"THE Contest" For Amateur Radio

When It Comes To Working The World, There's No Better Opportunity (And SWLs Can Join In On The Fun, Too)

by Rich Moseson, W2VU, Editorial Director

In most of the world, ham radio contesting is known as "Radiosport," and for good reason—ham radio contests are indeed sporting competitions for which participants regularly train, work to maintain and improve their equipment and skills, and compete in smaller events to prepare for the major competitions on each year's calendar. The biggest event on the radiosport calendar each year is the CQ World Wide DX Contest, known by many hams as simply "THE Contest."



Last year, the CQ World Wide DX Contest (aka "THE Contest") drew over 50,000 hams from all around the globe together in a shared goal: to work the world. Pictured here are Champ, E21EIC, running low power 7 MHz (left), and Dimitry, UT5UGR, who put V31WA in many logs (right).

In terms of participation, it's one of the largest competitive events in the world, period. Maybe even the biggest. Based on logs received, more than 50,000 hams around the world took part in the 2008 CQWW contest. Few, if any, competitive events of *any* nature draw 50,000 participants together in one place (the HF ham bands) in pursuit of a common goal. Not only that, but what other competition of any nature has competitors participating simultaneously from all over the world?

Here's the best part: you can be one of them. No pre-registration needed; no qualifying runs. All you need is a ham radio license with HF privileges (in the U.S., that would be *any* ham license) and a station from which to operate. Just get on the air during the fourth weekend in October for the single-sideband voice portion of the contest (the Morse code, or CW, competition is on the fourth weekend in November), and start making contacts!

You can log, or keep track, of your contacts on paper or on a computer, and it's your choice after the contest is over whether you want to submit your log. (We encourage everyone to submit a log, even those folks with just a few contacts, as it makes the overall log-checking process more accurate. If you don't want to be listed in the results as a competitor, you may designate your log as a "check log.")

Even if you don't have an HF station of your own, you might still take part as a guest operator at someone else's station. Many hams participate in one of three "multi-operator" categories, meaning that operators are needed since their stations are on the air around the clock for 48 hours. Many groups welcome—and even actively invite—newcomers to contesting to join them.

But What About Sunspots?

Yes, I know we're at the bottom of the sunspot cycle and everyone will tell you that the HF bands are dead. Well, during the CQWW, "everyone" is wrong. Even in this prolonged solar minimum, activity keeps increasing and records keep being broken. It's said that the CQWW makes its own propagation. While

Rich Moseson, W2VU, is the editorial director of *Popular Communications* and the editor of its sister publication, *CQ* magazine.

CQWW For SWLs

The CQWW DX Contest can provide great fun for shortwave listeners as well as hams. As the number of international broadcast stations continues to shrink, hams now offer your best opportunity to monitor and confirm a growing number of countries. Not only are hams all over the world more active during the CQWW, many countries without resident ham populations are put on the air by groups of hams conducting contest "DXpeditions." In fact, many hams who are not "in it to win it" get on during the CQWW because their chances of working new countries are greatly improved. The same applies to SWLs.

Your chances of getting a QSL from hams is excellent, too, despite the growing popularity of online confirmation sources, such as eQSL.cc and the ARRL's Logbook of the World program. Just be sure to include a pre-addressed return envelope and appropriate postage (for DX stations, one or two International Reply Coupons, or IRCs, are best if you can find them). Remember that DX stations, and especially DXpedition stations, will be overwhelmed with QSL requests, so the courtesy of a return envelope and postage will speed things up for you.

I suppose it's possible that all that additional RF energy in the air might actually help charge up the ionosphere a bit, it's much more likely that because there are so many people active on so many frequencies at once, they're able to take advantage of band openings that would have otherwise gone unnoticed because people assume a band is dead and go elsewhere. During the CQWW weekend, whatever band openings there are on 10 meters, for example, will be found and fully utilized.

Even if you just get on for a couple of hours, and maybe work (or monitor, if you're an SWL) a few new countries, or just have fun making DX contacts on a band where "everyone" says you can't, jumping into the CQWW is lots of fun and it's your chance to be part of one of the planet's biggest competitive events!

Read on for some basics to help you out on the air...

2009 CQWW Contest SSB Weekend Basics

Dates: October 24–25, 2009 (UTC)

Times: 0000 UTC Saturday–2359 UTC Sunday (in the U.S., this is Friday evening through Sunday evening)

Frequencies: Voice (phone) portions of the 160-meter (1.8-MHz), 75-meter (3.5-MHz), 40-meter (7-MHz), 20-meter (14-MHz), 15-meter (21-MHz) and 10-meter (28-MHz) amateur bands. You may hear stations outside the U.S. "phone bands." Most of these are legitimate operations from other countries, which may not have the same limitations as we do in the U.S. *Be sure you are transmitting within the band segments allocated for your license class.*

Contest "exchange": This is the information exchanged by stations in contest contacts. In the CQWW, it consists of each station's callsign (use phonetics for accuracy), a signal report (virtually always 5–9) and each station's "CQ zone." There are 40 altogether. In the continental U.S., western states are in Zone 3, central states are in Zone 4, and eastern states are in Zone 5. The official zone list and map are on the CQ website at www.cq-amateur-radio.com/cqwwhome.html.

Competition categories: The CQWW is broken down into various competition categories. The basic divisions are single-operator/multi-operator and high-power/low-power/QRP (really low power), with varying combinations, such as single-op/assisted, multi-single, and multi-multi. You enter the category that best fits your situation. ■

Limitations: There are certain restrictions that may vary by competition category. In no case may you "spot" yourself on the DX Cluster or ask someone to do it for you. Single-ops may not get help from the Cluster (that puts you in the Assisted category) and all antennas have to be within a certain distance of each other (exception: the new Xtreme class, which promotes such innovations as remote sites connected by the Internet). See the rules for complete details.

Loggings: The vast majority of competitors in the CQWW use computer logging (a wide variety of programs is available) and submit their logs via email. It is still OK to use a paper log, though, and to submit an entry by "snail mail."

Where to send logs: Computer logs in Cabrillo format (a standard supported by virtually all logging programs) should be sent to ssb@cqww.com. Paper logs should be sent to *CQ* magazine, 25 Newbridge Rd., Suite 309, Hicksville, NY 11801 USA. Mark SSB or CW on the envelope.

Where to find complete rules: Complete contest rules are in the September issue of *CQ* magazine and are posted on the CQ website at www.cq-amateur-radio.com/cqwwhome.html.

Where to find contest results: Results of the contest are published in *CQ* magazine—SSB results in the August issue, CW results in September—and are posted on the CQ website (see address above). The results are not posted online until the issue in which they appear is no longer on sale.

Understanding VHF Skip

by Ken Reiss
radioken@earthlink.net

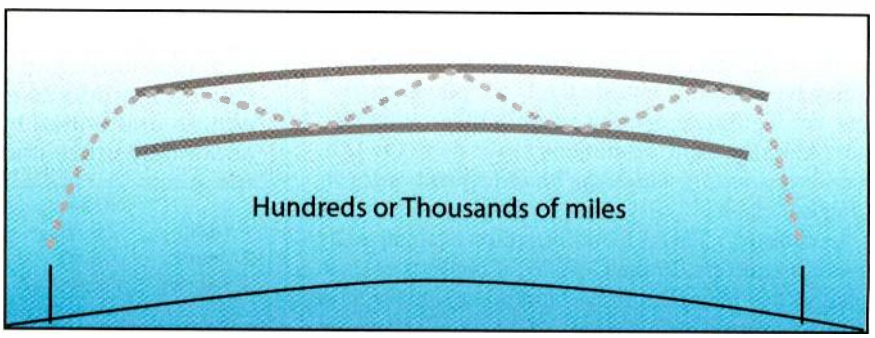
Lower frequencies, and shortwave in particular, commonly bounce off layers of the atmosphere and return hundreds of miles away. This is what makes possible the long-distance, almost world-wide communications that both hams and many commercial two-way services use. The aviation industry still uses HF when planes get over the horizon, although it's beginning to move toward satellite communications. Maritime vessels (large ocean-going ships) are almost all equipped with satellite systems, except in less developed parts of the world. If sat equipment is in place, it's a much more reliable system for two-way communications, which is precisely what these services need.

But for communications closer to home, the VHF/UHF ranges were chosen precisely because of their lack of long-distance capability; after all, you don't really want to have fire engines in Phoenix mistakenly responding to a fire call in Los Angeles. Using frequencies that don't travel beyond the horizon, and then deliberately spacing apart the users of those frequencies, helps minimize one department having to listen to another.

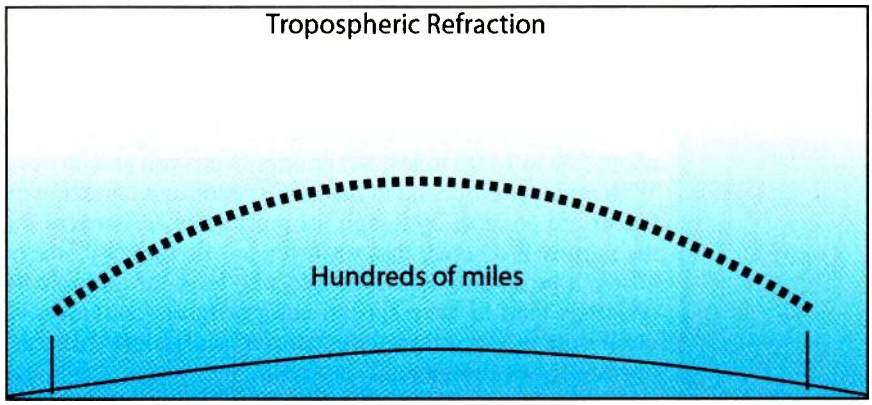
For the most part, the VHF and UHF ranges that we listen to on our scanners are pretty much limited to what's referred to as "line of sight," meaning that a relatively clear path between the transmitting and receiving antennas must exist for communications to take place. In fact, we rely on this limited range to make the VHF/UHF region useful for multiple users all across the country. Many users are licensed on the same frequency all over the country, and under normal circumstances they never know anyone else is there because of the distance separating them. This process of managing frequencies and how closely together they can be recycled is a tough job, even under normal conditions, as more users try to crowd into the spectrum.

"A channel that only a moment ago was dispatching car 2303 will suddenly have a call, usually in a different voice, for 5 David 3 (or the ubiquitous 1 Adam 12)."

When conditions aren't normal, however, all sorts of strange things can begin to happen. They happen with little warning and can disappear almost as quickly and unexpectedly as they appear. For instance, an odd-sounding tone might appear on a fire dispatch channel; or a tone for a fire dispatch might appear somewhere it shouldn't be; or a dispatcher with a strange accent will appear. This last one can actually take a while to figure out because you might just think they hired someone new until you begin to realize the street names are strange too.



Ducting can provide very long-range results at very high frequencies. The downside is that the coverage at each end can be very limited: just a few miles one way or the other and the effect is gone. Some of the longest distance DX on VHF occurs via *E*-layer ducting.



Tropo or more correctly, tropospheric refraction, is much more common for VHF high band long-distance signals. This bending of the signal back to Earth can result in signals (or interference) being heard several hundred miles away.

The one that catches my ear the fastest is strange call letters or unit calls. A channel that only a moment ago was dispatching car 2303 will suddenly have a call, usually in a different voice, for 5 David 3 (or the ubiquitous 1 Adam 12). A closer look at a signal strength meter, if one is available, might reveal that the second dispatcher is slightly weaker (or sometimes stronger). It happens more regularly than you might think, and sometimes it covers amazing distances.

Technically speaking, radio frequency propagation is the correct term. What's known as "skip" is one of the modes of propagation, but there are others, too. The end result—signals traveling much farther than would normally be expected—is the same, regardless of the actual mechanics of how it happens. Of course, sometimes (such as in ham radio applications) this is exactly the effect we're after, but in the public safety world of VHF/UHF communications, it's generally not a good thing, as is perceived as interference.

I recall talking to a Missouri state patrolman years ago who was complaining that sometimes signals from Winnipeg, Manitoba, would come in so strong that the Missouri officers would have to call Winnipeg from their cars and ask them to relay to the Missouri troop that they were in service, or out of service, etc. In an emergency situation, this could get pretty scary in a hurry. Of course, most state patrols in those days operated in the VHF-Lo region, and while Missouri still does Winnipeg has moved to a higher frequency. Even the state patrols are trying to get funding for statewide 800-MHz trunked systems, both for some advantages offered by trunking, and to leave the more common propagation of VHF-Lo behind.

VHF-Lo is the most common place to hear the effects of skip, but it's not limited to just the low band. Lots of signals can be caught from a state or two away on the VHF-Hi band. And while not quite as common, even UHF signals can behave in strange ways. I've never heard any 800-MHz propagation, but that doesn't mean it's not there...I just don't go looking for it.

How Do We Get From Point A To Point C?

There's a variety of methods that can cause a signal to travel beyond its normal range. Keep in mind that not all of these methods occur with the same regularity, and that most are frequency dependent. But first, we need a little refresher course on the atmosphere. Don't worry, there's no test...until the end. For those of you who want to learn more, make sure to follow Tomas Hood's "Propagation Corner" each month right here in *Pop'Comm*.

Under normal circumstances, when everything is working the way it usually does, the atmosphere doesn't reflect or refract (bend) radio frequencies above about 30 MHz. Depending on the sunspot cycle and time of day, the lower limit can be a lot lower than 30 MHz, as shortwave enthusiasts well know. The so called Maximum Usable Frequency (MUF) can be calculated if you have enough atmospheric data, but simple trends will give HF users an idea where to try the communications link they're trying to establish.

For the most part, we can pretty much ignore the atmosphere and its effects above 30 MHz until something weird happens with one of the atmospheric layers. The atmosphere is divided into several layers, the closest to the ground being the troposphere. The troposphere extends to about 20 miles above the surface of the Earth, so very few of us ever get out of the troposphere (even most airlines operate below eight miles, so we're not even getting out of the bottom half!).

It turns out that the troposphere can bend signals a bit all on its own. A bending of the signal means that instead of going straight through to the higher layers of the atmosphere like it normally does, a radio signal is bent, or refracted, in some other direction. It's very similar to the bending of light that makes a magnifying glass work, except that what is bent in this instance is radio energy instead of light. This is called tropos-

Frequency Of The Month

Each month we ask our readers to let us know what they're hearing on our "Frequency Of The Month." Give it a listen and report your findings to me here at "ScanTech." We'll pick a name at random from the entries we receive and give that lucky winner a free one-year subscription, or extension, to *Pop'Comm*. Remember to include your address in case it's your name that's drawn! Good luck!

Our frequency this month is **53.550 MHz**. This is actually a common 6-meter amateur repeater output frequency, so you might hear something local, too. If you have multimode capabilities, try CW or SSB on 50.075 to see what you might hear. You may well not hear anything, and that's fine. Let me know that, too. We invite you to send in questions, information or pictures of your shack to Ken Reiss, 9051 Watson Rd. #309, St. Louis, MO 63126, or via email at radioken@earthlink.net. And don't forget that address!

Our most recent winner is **Richard E. Oakley, W3LDA, of Hallstead, Pennsylvania**. He wrote in, "No Joy on 154.710 Frequency of the Month for July 2009." There may have been No Joy on the frequency, but there was in our drawing—congratulations, Richard!

A radio with an S-meter, such as this AOR AR5000, is a very valuable tool in listening for long-distance signals and then evaluating what you have when you hear something. I prefer the old analog kind, but the digital ones work, too.

pheric refraction, or "tropo" for short, and it's responsible for most of the long-distance signals we see at frequencies above 150 MHz. Again, it's not really a bouncing of a signal, but a bending (or refraction) of it.

The Ionosphere

Starting at about 60 miles up is the beginning of the ionosphere, which is the region that gives us true skip of signals back to Earth. While still technically a refraction, this is sometimes called a reflection and it may be easier to think of it that way. Shortwave operators use this layer all the time, but it does sometimes cause VHF signals to bounce back, too.

The ionosphere is divided up into sub-layers, and the ones of particular interest to us are the *E* and *F* layers.

E refraction, or sporadic-*E* as it's often called, is kind of a mystery. No one is quite sure what causes it, but it can occur at almost any time. It's called sporadic for a reason: it's very unpredictable and spotty when it does happen.

Typically, *E* refraction produces a "first hop" distance of about 500 to 1,000 miles, but multiple hops can and do occur. With multiple hops, and in favorable conditions, amazing distances are possible, although for most scanner listeners with the narrow FM signal that we listen to, the first hop is about all we'll be able to detect. People who look for multiple hop openings tend to have special equipment and antennas and often work in Morse code, or upper sideband modes (ham radio operators, not commercial services).

E refraction is somewhat seasonal (early spring is most likely), but it can occur at any time. It regularly works at frequencies up to 50 MHz, so the VHF Low band and amateur 6-meter band are good places to watch. However, it is possible for *E*-layer skip to happen at frequencies as high as 200 MHz.

There are a couple of different but related propagation modes that also take place in the *E* layer. One is known as ducting, and if you think about a furnace duct, you'll be very close imagining how this works. A duct, or pipe, is formed in the atmosphere under certain weather conditions, but most often just ahead of an approaching cold front. The duct is caused by layers of air at different temperatures treating a radio wave slightly differently.

Sometimes a duct can conduct very high frequency signals over very long distances. There's a fairly common duct that forms between southern California and Hawaii, a distance of about 2,500 miles. Frequencies as high as 2 GHz have been used through ducts.

The downside to ducting is that it is fairly "narrow" geographically. You might have an excellent opening from San Diego to Hawaii, but only a few miles north in Los Angeles or Orange County, there may be nothing. In other words, you have to be located under one end of the duct or nothing happens. The signals with ducting can be very strong, and can last for several hours...or not. Or there can be openings available but no signals being transmitted to take advantage of them.

Another *E* layer phenomenon is called tropospheric enhancement. This is caused by a temperature inversion in the lower

For the serious VHF long-distance enthusiast, wide-band multimode receivers like the AR5000 or this ICOM R-9000 allow reception in CW and SSB modes, which are useful for exploring the ham bands—a good place to find the first signs of something unusual.

atmosphere. Under normal circumstances, as you go higher in altitude, the air temperature gets cooler. A temperature inversion is caused when a layer of warmer air covers a layer of colder air. Only a few degrees difference is necessary, but the effect may be enhanced, resulting in greater differences. This happens frequently in the spring and fall, but it also can occur with warm and cold fronts in the summer. Basically, you may encounter "tropo" at any time other than winter.

The effect of an inversion can vary greatly. A weak inversion might only strengthen signals 50 or 60 miles away, but a strong one can cause signals from hundreds of miles away to blast in. Look for signals in the early evening. It can last almost all night, fading away as the sun warms the upper air in the morning.

Moving up through our atmosphere, we come to the *F* layer. The *F* layer starts about 90 miles above the Earth at night to 120 miles during the day and extends up to 250 miles. Its properties allow for a lot of the long-range communications of shortwave as well as some very high frequencies. The *F* layer is divided into F_1 and F_2. F_1 is not particularly interesting for VHF/UHF, but F_2 propagation is the source of the longest distance signals, and is also the only one of the VHF propagation methods that is caused by sunspots. F_2 is primarily a lower-frequency phenomenon and really only affects the VHF low band. You won't get F_2 signals on the VHF high band, but you can get some very long distances if you're in the right place at the right time, and on the right frequency. Once again, this is a reason to watch the VHF low band and 6-meter ham band.

What Should You Expect To Hear?

When something is opening up, by any of these methods, you'll start to hear signals on your scanner that don't belong there. Usually, they'll be weaker than the signals you're used to listening to on those frequencies. Under extremely good conditions, your radio can pretty much go crazy with all sorts of signals that you don't normally hear. If you're interested in finding the openings, keeping a few ham frequencies in your scanner on several different bands is a big help. Try to find repeater frequencies that are not active in your area if you don't want to listen to the traffic. The presence of a signal may be a sign that you should start looking elsewhere to see what you can find.

Once you notice an opening, it can be a lot of fun to search up and down the band to see if you can identify any other signals from distant stations, and where they're from, of course. Sometimes a callsign will be given, which is the easiest way to identify the location of the station, but more often you're on your own. Once in a while if it's a station not too far away, a road or town location might help pinpoint the area. If it's coming from some distance, good luck.

What if you don't want to listen to the skip? Bummer. Tone squelch helps considerably, if the station you're trying to hear uses it. This is one of the reasons that tone squelch or its digital counterpart is so popular on the VHF bands. If they don't use tone squelch, or your radio is not equipped, about the only other option is turn up the squelch. It can get to the point where you squelch out a lot of the local signals, too, so that might not be acceptable. Take comfort in knowing that this is a temporary situation, and it will bet better in a few hours.

That does it for us for this time around. Until next month, Good Listening! ■

Changing Seasons And The Changing Broadcast Landscape

by Gerry L. Dexter
gdex@wi.rr.com

"Now, your assignment, should you choose to accept it, is to tune in during those new hours and let [Radio Taiwan International] know that you did so and thank them!"

It's about time to say "so long, farewell and amen" to the B09 shortwave broadcast season. As these words go down it's too early to issue a report card on how things turned out. All one can do is look to the future and hope the A10 season achieves straight A's!

For listeners and DXers the days in between the end of one broadcast season and the beginning of another put us in an uncertain state, since there are always a couple of weeks to wait before the updated schedules are sorted out and have appeared in the form of the online EiBi, Aoki or HFCC lists, and thus we can't be as certain about who is occupying a given frequency.

And what's this? A shortwave broadcaster actually *increasing* English to North America? Yes! Radio Taiwan International informs "GIG" contributor Rick Barton of the addition as we're well into the B09 season. They've added an hour for the West Coast from 0500 to 0600 on 5950 and an hour to the Midwest on 9680 from 0200 to 0300, both via Okeechobee. Rick says he thinks this reverts back to the way things were before, but hey, it's still an increase! Now, your assignment, should you choose to accept it, is to tune in during those new hours and let RTI know that you did so and thank them! Email to rti@rti.org.tw.

The much-treasured QSL card from Radio St. Helena received by Rich D'Angelo for last year's November broadcast. (See this month's features.)

And here's another one returning to the air! Radio Vanuatu is said to have installed a new transmitter for its old 3945 frequency. However, 7260 may or may not be active—if it is, it hasn't been noted in quite some time—even by those well positioned. You might be able to dig its new 10-kW unit out on 3945 in the post 0700 period, if luck smiles upon you and the hams are asleep.

Brazil has seen another station name change. The old, almost never heard Radio Caerajas on 4885 has been sold and reactivated as Radio Maria with 1 kW at Aparecida. For what it's worth, the call letters are ZYF692, although no one seems to pay attention to call letters in Latin America any more.

As threatened a month or two ago, the ever-expanding Christian Voice operation has now retreated a bit and has indeed deleted its Portuguese service on 15410, as they had warned might happen.

Somewhere along the way I mentioned the apparent sad state of Angolan shortwave, with all its channels seemingly silent except for the low-powered, never-heard 7217. Now a DXer in Europe has detected activity from Radio Nacional, reactivated on 4950. That's a good spot to keep an ear on, especially if this now semi-rare outlet has escaped you thus far. Back in the heady days of DX eons ago, there were private Angolan stations on 60, 31, and even 25 meters.

Pretty much par for the Gallic course, Radio France International has had to deal with strikes, as employees and unions object to downsizing. RFI's plan would drop half a dozen languages and another four would become available only online. The plan would also cut about 200 positions, reducing staff by about one-fifth. Until things are sorted out with the trade unions, RFI's plan to deal with its increased operating costs and save its international service is on hold. So you might expect some hiccups in RFI's operations for a while.

Help Wanted

We believe the "Global Information Guide" offers more logs than any other monthly SW publication (428* shortwave broadcast station logs were processed this month!). Why not join the fun and add your name to the list of "GIG" reporters? Send your logs to "Global Information Guide," 213 Forest St., Lake Geneva, WI 53147. Or you can email them to gdex@wi.rr.com. Please note that attachment files do not always go through. See the column text for formatting tips.

**Not all logs get used. There are usually a few which are obviously inaccurate, unclear, or lack a time or frequency. Also discounted are unidentifieds, duplicate items (same broadcaster, same frequency, same site), and questionable logs.*

Galei Zahal, the Israeli military broadcast station, is now operating 24 hours per day, on both 6973 and 15785, all in Hebrew.

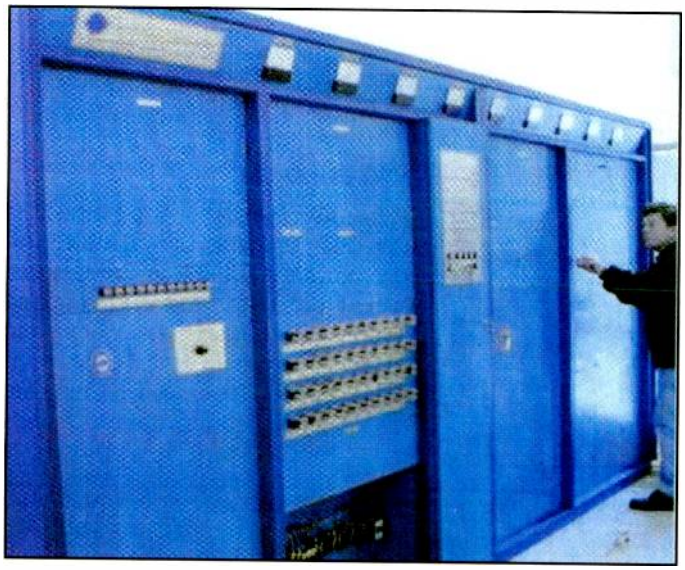
Reader Logs

Remember, your shortwave broadcast station logs are always welcome. But *please* be sure to double or triple space between the items, list each logging according to its home (base) country and include your last name and state abbreviation after each. Also needed are spare QSLs or good copies you don't need

A Guide To "GIG-Speak"

Here's a partial list of abbreviations used in the "Global Information Guide":

(l)	listed
(p)	presumed
(t)	tentative
*	sign on/off time
//	parallel frequency
AA	Arabic
ABC	Australian Broadcasting Commission
AFN	Armed Forces Network
AFRTS	Armed Forces Radio TV Service
AIR	All India Radio
am	amplitude modulation
ancr	announcer
anmt(s)	announcement(s)
AWR	Adventist World Radio
BBCWS	BBC World Service
BSKSA	Broadcasting Service of the Kingdom of Saudi Arabia
CBC	Canadian Broadcasting Corp.
CC	Chinese
CNR	China National Radio
co-chan	co-channel (same) frequency
comml	commercial
CPBS	China People's Broadcasting Station
CRI	China Radio International
DD	Dutch
DJ	disc jockey
DW	Deutsche Welle/Voice of Germany
EE	English
f/by	followed by
FEBA	Far East Broadcasting Association
FEBC	Far East Broadcasting Company
FF	French
GBC	Ghana Broadcasting Corp.
GG	German
HH	Hebrew; Hungarian
HOA	Horn of Africa
ID	identification
II	Italian; Indonesian
Intl	International
IRIB	Islamic Republic of Iran Broadcasting
IRRS	Italian Radio Relay Service
IS	interval signal
JJ	Japanese
KBS	Korean Broadcasting System
KK	Korean
Lang	language
LSB	lower sideband
LV	La Voz; La Voix
M	man
NBC	National Broadcasting Corporation (Papua New Guinea)
nf	new frequency
ORTB	Office de Radiodiffusion et Television du Benin
PBS	People's Broadcasting Station
PP	Portuguese
PSA	public service announcement
QQ	Quechua
RAE	Radiodifusion Argentina al Exterior
RCI	Radio Canada International
Rdf	Radiodifusora, Radiodiffusion
REE	Radio Exterior de Espana
RFA	Radio Free Asia
RFE/RL	Radio Free Europe/Radio Liberty
RFI	Radio France International
RHC	Radio Havana Cuba
RNZI	Radio New Zealand International
RR	Russian
RRI	Radio Republik Indonesia; Radio Romania International
RTBF	RTV Belge de la Communaute Francaise
s/off	sign off
s/on	sign on
SIBS	Solomon Is. Broadcasting Corp.
sked	schedule(d)
SLBC	Sri Lanka Broadcasting Corp.
SS	Spanish
TC	time check
TOH	top of the hour
TT	Turkish; Thai
TWR	Trans World Radio
unid	unidentified
USB	upper sideband
UTC	Coordinated Universal Time (= GMT)
UTE, Ute	utility station
v	variable
vern	vernacular (local language)
VOA	Voice of America
VOIRI	Voice of Islamic Republic of Iran
VOR	Voice of Russia
W	woman
ZBC	Zambian Broadcasting Corp.



One of the transmitters in use at WRNO. (Thanks Charles Maxant)

returned, station schedules, brochures, pennants, station photos, and anything else you think would be of interest. And my mailbox has yet to see that shack photo of yours! I become dispirited!

Here are this month's logs. All times are UTC. Double capital letters are language abbreviations (SS = Spanish, RR = Russian, AA = Arabic, etc.). If no language is mentioned English (EE) is assumed.

ALASKA—KNLS, Anchor Point, 7335 at 0819 to the Far East with EE talks, religious music. (Parker, PA) 9780 with a religious pgm and pop-style music. (Strawman, IA)

ANGUILLA—Caribbean Beacon, 6090 with woman preacher at 0029 and 11775 with Gene Scott at 1840. (MacKenzie, CA)

ALBANIA—Radio Tirana at 0245. (Maxant, WV)

ARGENTINA—Radiodifusion Argentina al Exterior, 11710 at 0225 with music, ID as RAE. (Maxant, WV) 0234 with EE pgm of news items and music. (Strawman, IA) 15345 with comments and vocals. (MacKenzie, CA)

ASCENSION ISLAND—BBC Atlantic Relay, 7255 at 0309 on US-Afghanistan relations. (Brossell, WI) 11810 with world news at 1920. (MacKenzie, CA)

AUSTRALIA—Radio Australia, 5995 and 6020 with news at 0945. (Padazopulos, NJ) 5995-Brandon at 1033 in Tok Pisin with phone interview, 7240-Shepparton at 1431 on women having children past 40, 9580-Shepparton at 1820 on economics in Asia, 9660-Brandon, 11840 at 2310 on Obama's trip to Israel, 13630-Shepparton at 2223 on family benefits, 15240 at 0312 discussing old computers, 15515-Shepparton at 0240 on poems and 15560 at 2257 with comments on news events, sports, ID and headlines. (MacKenzie, CA) 6020 in EE/Pidgin at 1045, 9475 at 1158 on the retail economy, //9580, 9590 and 15240 at 0327, //15515. (Yohnicki, ON) 11660 at 2140 discussing health of Kim Jung Il and 21725 on population figures in Australia. (Maxant, WV) 15515 at 0251 on technical inventions and agriculture there. (Strawman, IA) 17775-Darwin, with news at 0100. (Ng, Malaysia)

Northern Territories SW Service: VL8T, Tennant Creek, 2325 at 0925 with M/W talk but very weak. VL8K, Katherine, 2485 at 0935 with W talk, also very weak. (Parker, PA) 0945 with just threshold audio. (Wilkner, FL)

AUSTRIA—Radio Austria International, 9820 at 0013 with three minutes of news in EE then segments in SS and FF, but mostly in GG. The second half hour is a repeat of the first. (Fraser, ME) 13775 via Canada at 1535 in GG/EE. (Maxant, WV)

Log Jam

Maybe there's something especially weird in the air these days, or perhaps some of you are spending too many hours using WWV as background sound. Whatever the reason, I find that I am continually thrown off track, and thus slowed, by inattentive or incomplete logs. An ill-located station/country means I have to get out of my chair step over to the sorting area (the floor) and reposition that slip, or back track to insert the item elsewhere else in the column. Or it's necessary to look up a location, or even delete a log half way into keyboarding it in because the time or frequency was left out, or it's a repeat (same station, same frequency, same site) of something you've already submitted. So, c'mon, help out an old man and proofread your logs before you submit them.

BELARUS—Radio Belarus, 7210-Minsk with vocals, ID. (Maxant, WV)

BELGIUM—Radio Vlaanderen International, 9590 via England at 1811 in listed Polish. (Brossell, WI)

BOLIVIA—(All in SS) Radio Eco, Reyes, at 0020 with M with upbeat campos and romantic ballads. (Parker, PA) 0030 with no sign of the pulsating problems of past months. Seems very regular as it's on each evening. (Wilkner, FL)

Radio Santa Ana, Santa Ana del Yacuma, 4451.2 at 2317 to 2339 close, seemingly a reactivation, though not heard 1000–1030. Weak, with deep fades. (Wilkner, FL)

Radio Tacana, Tumapasa, 4781.7 monitored at 0135 with W and beautiful W vocal and tribal-sounding song. Would have been a fun catch except they were totally slaughtered by CODAR. Thanks a lot! (Parker, PA)

Radio Lipez, Uyuni, 4796.5 heard at 2339 noted in passing. (Wilkner, FL)

Radio San Jose, San Jose de Chiquita, 5580.2 at 0000 fading in and out. (Wilkner, FL)

Radio Pio Doce, Siglo XX, 5952.5 heard at 0000, irregular sign on at 1100. (Wilkner, FL)

Radio Kawsachun Coca, Lauka, 6075 seems to drift down after variable 1000–1020 sign on. Several short Andean flute numbers. (Wilkner, FL)

Radio Fides, La Paz, 6155.2 at 0150 to 0200 close after ID over light music. (Alexander, PA)

BONAIRE—Radio Nederland Relay, 6165 in SS at 0351. (MacKenzie, CA)

BRAZIL—(All in PP) Radio Imaculada Conceicao, Campo Grande, 4754.9 at 0157, poor, with man talking. (Parker, PA)

Radio Difusora, Londrina, 4815 with M/W talk but poor under CODAR. (Parker, PA)

Radio Cultura Ondas Tropicais, Manaus, 4845.2 at 0007 with preaching and religious vocals. (D'Angelo, PA) 0058 with two men and apparent soccer coverage. (Parker, PA)

Radio Clube do Para, Belem, 0257 with usual reverb and commercials. (Parker, PA)

Radio Anhanguera, Araguania, with W and easy listening music. (Parker, PA) 0940-0950 with rapid talk. (Wilkner, FL)

Radio Difusora, Macapa, 4915 with M and reverb, highlife music, conversation, CODAR QRM. (Parker, PA)

Radio Educacao Rural, Tefe, 4925.2 at 0035 with fast-talking M anor and plenty of reverb. (Parker, PA)

Radio Capixaba, Vitoria, at 0210. Audio taken out by CODAR. (Parker, PA)

Radio Brazil Central, Goiania, 4985 at 0155 with boisterous conversation between two M and a W. (Parker, PA) 0257 with talks. (Brossell, WI)

Radio Aparecida, Aparecida, 6135 at 0930 with Brazilian music. Poor to fair with a threshold signal on 9630. (Alexander, PA)

Radio Inconfidenica, Belo Horizonte, 6009.8 at 0701 heard after RHC sign off. No sign of either Mexico or Colombia. (Alexander, PA)

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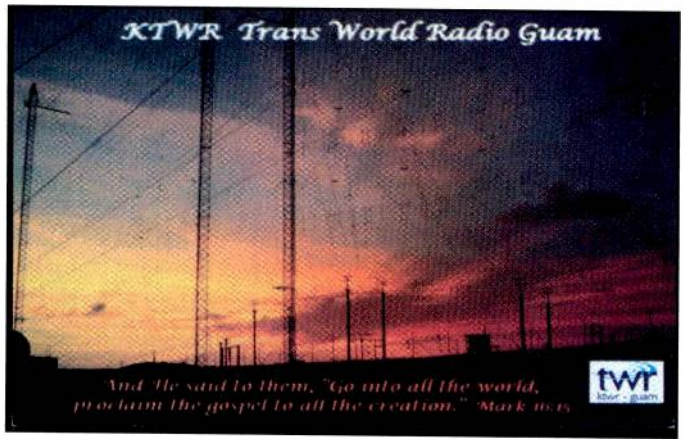


Antennas at Trans World Radio's KTWR, Guam. (Thanks Peter Ng, Malaysia)

Radio Nacional Amazonia, Brasilia, 6185 at 2345 with Brazil-pops, ID at 2359 and news, then back into music. (D'Angelo, PA) 11780 at 2224 with talks and songs. (Brossell, WI)

Radio Novas de Paz, Curitiba, 11724.9 with M anchrs and hymns. (Parker, PA)

Radio Gaucha, Porto Alegre, 11815 with soccer commentary heard at 0047. (Taylor, WI)

BULGARIA—Radio Bulgaria, 6100 at 0554 in BB to Western Europe. (Parker, PA) 0700 at 2334 with *Keyword Bulgaria* and features on Bulgaria. (Fraser, ME)

CANADA—Radio Canada International, 6100 at 2326 about Twitter. (Fraser, ME) 11840 at 2330 with weather and world news. Also 11860 in PP at 2242 with news and comments. (MacKenzie, CA)

CFVP, Calgary, 6030 at 0414 with C/W, local anmts and "AM-1060" ID. Fair at peaks but mainly battling the noise floor with deep fades until unid EE station opened with news at 0500. (D'Angelo, PA)

CFRX, Toronto, 6070 relaying CFRB at 1520 with *Star 52* pgm. (Maxant, WV)

CBC Northern Quebec Service, 9625 with CBC News. (Maxant, WV)

CKZN, St. John's (Newfoundland) heard at 0350 with *Music in the Night*. (Maxant, WV)

CHU, Ottawa, 14670 at 2130 with time signals. (Maxant, WV)

CHAD—Radio Nationale Tchadienne, 6165 at *0429 with balafon IS, anthem at 0432, opening FF anmts at 0433, African tribal music, highlife, FF talk. Weak, with co-channel QRM, possibly from Zambia. Covered by Radio Nederland at their 0459 sign on. (Alexander, PA)

CHILE—CVC-La Voz, 17680 at 2247 in SS with pops. (MacKenzie, CA)

CHINA—China Radio International, 5840 with EE news at 0407. None of the lists show this. (Parker, PA) 9540-Kunming in listed Mandarin at 1314 and 9685-Urumqi in RR at 1231. (Brossell, WI) 5990 in SS at 0000, 9570 in CC at 0328, 9665 via Brazil in SS at 0312, 9790 via Cuba at 0300, 9800 in EE at 1516, 11695 via Albania in FF at 1908, 11895 in CC at 1844, 13700 via Canada in SS at 2220, 13710 via Canada in SS at 0256, off at 0259. (MacKenzie, CA) 9765 with Khmer/EE lesson at 2340. (Ng, Malaysia) 13740 via Cuba with weather, news items at 1428. (Fraser, ME)

China National Radio/CPBS-5-Beijing, 5925 in Mandarin at 1139. (Taylor, WI) 7110-Shijiazhuang in CC at 1210 but now no longer here. Also 9530-Xi'an, 9530 in CC with Firedrake jamming underneath, covering apparent VOA-Philippines. (Brossell, WI) 7130 at 1427 in CC, //7305. (MacKenzie, CA)

Firedrake jammer 9865 on RFA, //11540, 11700 and 12120. Also 13775 at 2215. (MacKenzie, CA) 14420 at 1013 against Sound of Hope. (Parker, PA)

COLOMBIA—La Voz de su Concencia, Puerto Lleras, 6010 at 0347 with SS religious talk and vocals. Distorted ID at 0407 and another SS talk. (D'Angelo, PA)

CROATIA—Voice of Croatia/ Hrvatski Radio, Deanovec, 3985 at 0330 in Croatian. The 75-meter rag chew boys like to zero beat this one, and then complain about it. (Parker, PA) 9925 via Germany in Croatian at 0315. (MacKenzie, CA) 2315 with *Croatia Today*. (Fraser, ME)

CUBA—Radio Havana Cuba, 13790 in SS heard at 2227. (MacKenzie, CA)

Radio Rebelde, 5025 in SS at 0320. (MacKenzie, CA)

CZECH REPUBLIC—Radio Prague, 6080 at 0350 with an interview and 9870 at 0328 with comments and closing. (MacKenzie, CA) 6200 at 0305 with talks in SS. (Brossell, WI) 9440 with *Panorama* pgm at 0018. (Fraser, ME) 11600 at 2100. (Maxant, WV)

DJIBOUTI—Radio Djibouti, 4780, at *0302 with NA, local flutes and vocals, Koran at 0303, AA talk at 0311, rustic vocals at 0322. Strong CODAR QRM. (Alexander, PA) 0326 with HOA vocals to ID and AA news, back to music at 0342. (D'Angelo, PA) 0335 but murdered by CODAR. (Parker, PA)

ECUADOR—HCJB Global, 3220 in Quechua at 0945. (Parker, PA) 9745 in SS at 0305 and 12040 in GG at 2323. (MacKenzie, CA)

La Voz del Napo, Tena, 3279.9 at 0953 with a fairly strong carrier but only faint traces of M in SS through local rain static. (Parker, PA)

EGYPT—Radio Cairo, 7540 at 0250 talking about the countries around Egypt. (Maxant, WV)

ENGLAND—BBC, 6035 Thailand Relay at 1325 with news headlines and closing at 1330. (Ng, Malaysia) 9410 at 0408 on UK government scandals and 9430 via presumed Oman relay in Azeri at 0210 with W talk and interview. Also 9740 Singapore Relay at 1512 with ID, comments on Iranian elections. (MacKenzie, CA) 9605 Thailand Relay at 1229 with website and into world news. (Brossell, WI) 11945 at 0345 with the BBC Africa Service. (Maxant, WV)

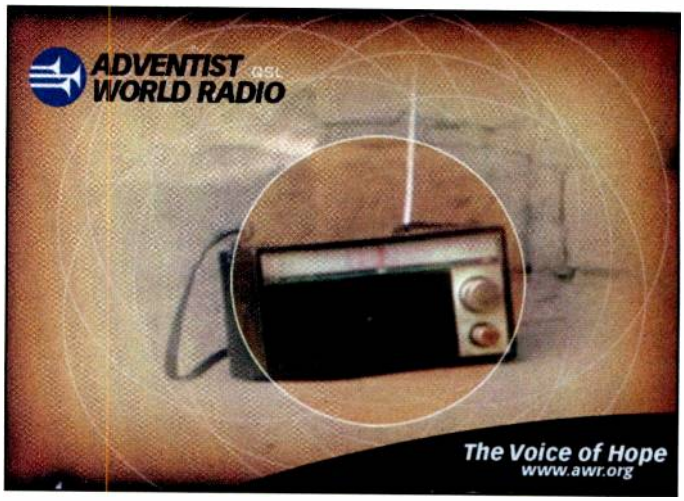
Bible Voice Network, 9490 via (p) Wertachtal at 0034 with W and pgm intro and M with heavy accent with a Bible lesson. (Taylor, WI) 9730 via Germany at 1807 with talks in AA. (Brossell, WI)

EQUATORIAL GUINEA—Radio Nacional, Bata, 5005 at *0501 with NA, Afro-pops, highlife, SS talk, ID, running parallel with 6250, which is unusual. (Alexander, PA)

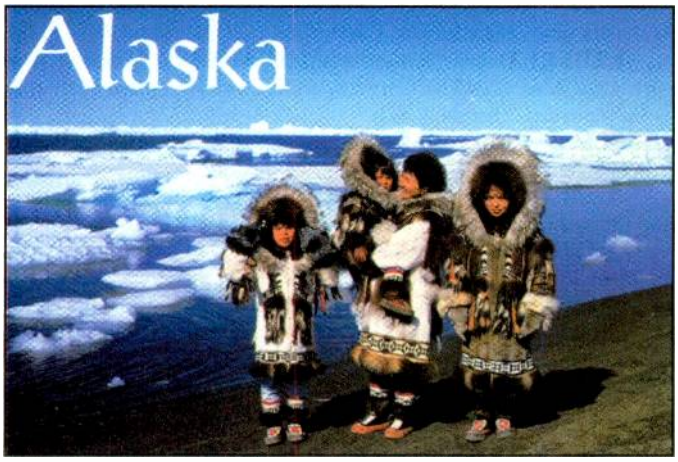
Radio Nacional, Malabo, 6250 at 0520 with M and music pgm, ID at 0531 and long M/W SS talk. (D'Angelo, PA) 0550 with Afro-pops, highlife, SS anmts, possible SS news at 0605. (Alexander, PA)

Radio Africa, 15190 monitored at 1850 with a sermon. (Brossell, WI) 2145 with talk and into vocals. (Maxant, WV) 2251 with closing anmts and contact information: radioafrica@myway.com. (Alexander, PA)

ETHIOPIA—Radio Ethiopia, Gedja, 7110 at 2045-2101* with tribal chants, HOA music, Amharic talk. Off with NA at 2059. Also at 0300–0340 with chimes/gongs at *0300, Amharic talk, HOA music,



AWR Asia confirmed Peter Ng's reception on 15540 from its Guam site.



One of the new KNLS QSL cards, with reception info on a gummed back label. (Thanks Peter Ng)

weak on //9704.2. (Alexander, PA) 0305. (Brossell, WI) 0354 with interesting and distinctive music, sort of a hybrid of western pop and traditional HOA. (Taylor, WI)

Radio Fana, 6110 at *0257 with IS, W in Amharic with ID and anmts, M with news. (D'Angelo, PA)

Voice of the Tigray Revolution, 5980 at 0300 with HOA music, weak in noisy conditions. 5950 fair to good but mixing with Radio Taiwan via Florida. (Alexander, PA)

Voice of Peace and Democracy, 9561 at 0359-0430* with opening ID and anmts, into talk in (l) Tigrinya with short breaks of HOA music. This is scheduled Mon., Wed., Fri. only. (Alexander, PA)

GERMANY—Deutsche Welle, 5915 via Rampisham at 0425 in RR and 6075 via Sines in GG at 0445. (Parker, PA) 6055 Rwanda Relay underneath Spain at 0240. (Maxant, WV) 6160 at 0715 with *Inside Europe* pgm. (Padazopulos, NJ) *0400 with sudden open, EE news. (D'Angelo, PA) 9480 Rwanda Relay in GG at 0412. (MacKenzie, CA) 9825 via Portugal at 0330 with two M in GG. (MacKenzie, CA) 11605 Rwanda Relay in GG at 2050, 11670 Portugal Relay in AA at 1905 and 11725 Rwanda Relay in GG at 1818. (Brossell, WI)

GREECE—Voice of Greece, 7425 in Greek at 0254. Also 9420 in Greek with live sports coverage at 1815. (Brossell, WI) 0331 with two W in conversation. (MacKenzie, CA)

RS Makedonias, 7450 in Greek at 1950. (Brossell, WI)

GUAM—Trans World Radio/KTWR, 13765 with talk in Burmese at 1250 and 15170 with pgm *Running to Win at 0840.* (Ng, Malaysia)

Adventist World Radio/KSDA, 11775 in Mandarin at 1219 with a radio drama. Caribbean Beacon was off this day. (Taylor, WI)

HONDURAS—Radio Misiones International, Comayaguela, 3340 at 0245 with inspirational song in SS. (Parker, PA)

Radio Luz y Vida, San Luis, 3250 at 0217 with ID, slow religious music, and reverb preacher. (Parker, PA) 0247 with soft religious music and M with religious talk, ID at 0312. (D'Angelo, PA)

INDIA—All India Radio, 4800-Hyderabad, 0125 in local language and traces of Indian music. In the clear, but very weak. No sign of the Mexican. Also, 4840-Mumbai at 0107 with M in local Lang, only slightly above the noise floor. (Parker, PA) 7410 at 2145 with a discussion, and, 9445 at 2145 with press review in the general overseas service. (Maxant, WV) 9690-Bangaluru on India's elections at 1340, and 17510-Delhi with II at 0910. (Ng, Malaysia) 9870-Bangaluru (p) 0105 in Hindi with Vividh Bharati pgm of Indian music and a train whistle SFX between selections. (Taylor, WI)

In Times Past...

Here's your blast from the past for this month...

Bolivia—Radiodifusora Tropico, Trinidad, on 4553 in SS at 0018 on September 20, 1966. (Dexter, WI)

Pop'Comm October 2009 Reader Survey Questions

This month we'd like to ask how much you know about and follow propagation conditions. Please use the Reader Survey Card and circle all appropriate numbers. We'll pick one respondent at random for a free one-year subscription, or extension, to *Pop'Comm*, so don't forget your address. Thanks for participating.

Would you say you have a good understanding of the following?

- Sporadic *E* 1
- Tropo 2
- Backscatter 3
- Meteor scatter 4
- Trans-equatorial scatter 5
- F_2 skip 6
- Aurora 7
- None of the above 8

How do you follow propagation conditions?

- "The Propagation Column" in *Pop'Comm* 9
- Other print material 10
- Online sources 11
- Beacons/other devices 12
- Visual observations 13
- Through fellow hobbyists 14
- My own trial and error 15
- I don't follow it; it doesn't concern/affect me 16

How much does better propagation improve your enjoyment of your hobby?

- It makes all the difference in the world 17
- I look forward to it, it's certainly an improvement 18
- It's no big whoop to me 19

June Survey Winner

Unfortunately, we're again out of room for June highlights—our apologies for that. But the winner of the free subscription or extension for answering that survey is **Adam Shirley** of **Meridian, Mississippi**. Congratulations, Adam!

Radio Vlaanderen International, Belgium, QSLed Peter Ng with this partial view of Poelaert Square.

INDONESIA—Voice of Indonesia, 9525 at abrupt *0951 sign on and into (l) Korean and light local music, IS and theme, then opening in EE with ID, news. (Alexander, PA) 1325 something about exports to Australia. (Maxant, WV)

Radio Republik Indonesia, Ternate, (p) 3345 at 0958. Carrier in SSB with an occasional trace of music. (Parker, PA)

IRAN—IRIB, 9495-Kalamabad with Voice of Justice in EE at 0220 with long list of statistics on U.S. involvement in Iran, f/by pgm and frequency schedule, music, IS, anthem, anmt, Koran. (Taylor, WI) 0220 with music, ID, news item. (Maxant, WV) 9895 in AA at 0323 with interview. (MacKenzie, CA)

ISRAEL—Galaei Zahal, 6973-Yavne monitored at 0126 in HH with C/W to Europe. (Parker, PA) 0150 with pops, (p) headlines or other anmts at TOH. (Strawman, IA)

ITALY—Italian Radio Relay Service, 5990 via Slovakia at 0445 with EE religious talk, IRRS anmts and Milano address at 0530 close, somewhat muffled audio. This is Mon.–Thurs. only. (Alexander, PA) *0428 with inspirational instl opening and into religious programming. (D'Angelo, PA) 7290 via Slovakia at 1943 with a pgm on shortwave religious broadcasters. (Brossell, WI)

JAPAN—NHK World Radio Japan, 6110 via Canada at 0500 with news. (Parker, PA) 6190-Yamata in RR with Japanese lesson at 1350. Also 9635-Yamata with *Listening Library* at 0920. (Ng, Malaysia) 9535 in JJ at 1503 and 9835 in JJ at 1823. Also 11935 via Bonaire on JJ at 0303 and 13630 in JJ at 2233. (MacKenzie, CA)

KUWAIT—Radio Kuwait, 9855 in AA at 1802. (Brossell, WI) 11990 at 2050 with hip-hop. (Maxant, WV)

LIBYA—Radio Jamahiriya, 15215 via France in (l) Hausa at 1824. (Brossell, WI)

MADAGASCAR—Radio Madagasikara, 5010 with ID in Malagasy, then a song. (Brossell, WI) 0310 with Afro-pops, local folk songs, Malagasy talk, "Radio Madadgasikara" ID at 0331. (Alexander, PA) 0345 with M/W talks. (Parker, PA)

MALAYSIA—RT Malaysia, 7270-Kuching (Sarawak) with ID as "Wai FM" at 0800 in local dialect and song requests. (Ng, Malaysia)

MEXICO—XEQM, Merida, at 0000 with M in SS and a W at 1214. Generally heard from 1100. (Wilkner, FL)

XERTA-Radio Transcontinental, Mexico City, at 0342 with ballad, M with SS ID then W ancr at 0400, song and ID. (D'Angelo, PA)

XEPPM Radio Education, Mexico City, 6185 at 1304 with SS talks. (Brossell, WI)

MALI—RTV Malienne, 5995 at 2350–0001* with Afro-pops, ID, FF talk, NA and off. (Alexander, PA)

MONGOLIA—Voice of Mongolia, 12085 with CC news by W at 1005. (Ng, Malaysia)

NEW ZEALAND—Radio New Zealand Intl, 6170 at *0700 sign on and into music. Also 11725 at 0435 with a discussion. (Yohnicki, ON) 11725 at 2015 with South Island weather, into music. Also 13730 at 2148 on the New Zealand court system. (Maxant, WV) 0250 in (p) Maori, f/buy rock and EE comments. (Strawman, IA) 2253 on murder mysteries there. (MacKenzie, CA)

NETHERLANDS—Radio Nederland, 11660 via France at 1904 with news. Also, 12045 via Germany at 1822 on how organized churches fight poverty. (Brossell, WI)

The Mighty KBC, 6055 via Lithuania at 2155 with U.S. vocal. (Maxant, WV)

NIGERIA—Voice of Nigeria, 15120 at 2110 discussing the Euro and Europe's influence on money. (Maxant, WV)

NORTH KOREA—Voice of Korea, 11710 at 1325 on raising fish, 13760 in SS at 2135. (Maxant, WV) 1150 asking for letters and "what's most appealing about VOK." (Parker, PA) 1610 with FF and presumed news by M/W. (Strawman, IA) 11735 at 1035 explaining why NK needs "the bomb." 1300 sign on with IS and into EE. Fighting it out with co-channel RHC in SS, and finally losing. (Barton, AZ) CC at 1300. (Ng, Malaysia)

Korean Central Broadcasting Station, 9335 at 1220 with impassioned talks in KK. (Brossell, WI)

NORTHERN MARINAS—KFBS, Saipan, 12090 in VV at 2248, closing a minute later. (MacKenzie, CA)

OPPOSITION—Voice of Peace and Democracy (to Eritrea), 7165 at 0355 in Tigrinya with rock, M ancr, ID at TOH, probable news, and other rock type things. (Taylor, WI)

Radio Voice of the People (to Zimbabwe), at *0358 with O/C, sudden opening at 0400 with instl music, M with ID in local Lang and EE, then news in a local language. (D'Angelo, PA)

PAPUA NEW GUINEA—Radio Madang, Madang, (New Guinea), 3260 at 0946 with M in Tok Pisin. (Parker, PA)

PERU—(All in SS) Ondas del Huallaga, Huanuco, 3330. Seems there on most days around 1000 and again at 0000. (Wilkner, FL)

Radio Tarma, Tarma, 4770 at 0149 with M and reverb. Only traces of it through CODAR. (Parker, PA)

Radio Vision, Chiclayo, 4790 at 0326 with M preacher. (Parker, PA) (p) at 0346 with the usual preacher. (Taylor, WI)

Radio Sicuani, Sicuani, 4826.5 at 0115 with vocal, M/W ancrs and trashed by CODAR. (Parker, PA)

Radio Maranon, Jaen, 4835.5 at 0308 with slow flute, M and abruptly off at 0310. (Parker, PA)

Radio La Hora, Cusco, 6105 at 2320 with a decent signal around 1000–1020. (Wilkner, FL)

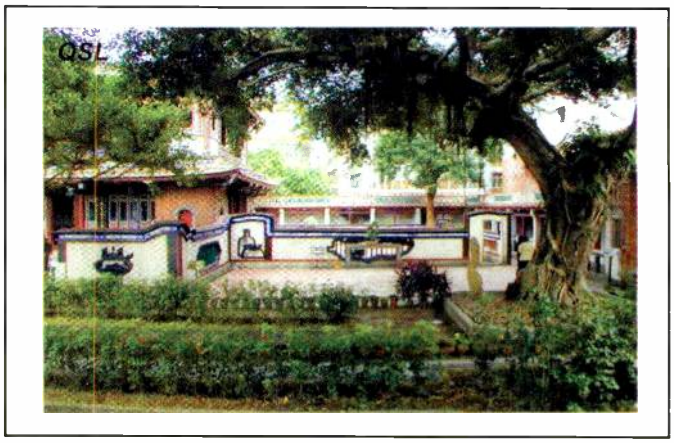
Radio Cultural Amuata, Huanta, 4955 at 0202 with two M talking. (Parker, PA)

La Voz de las Huarinjas, Huancabamba, 5059.2 at 1034. Best heard in LSB. (Wilkner, FL)

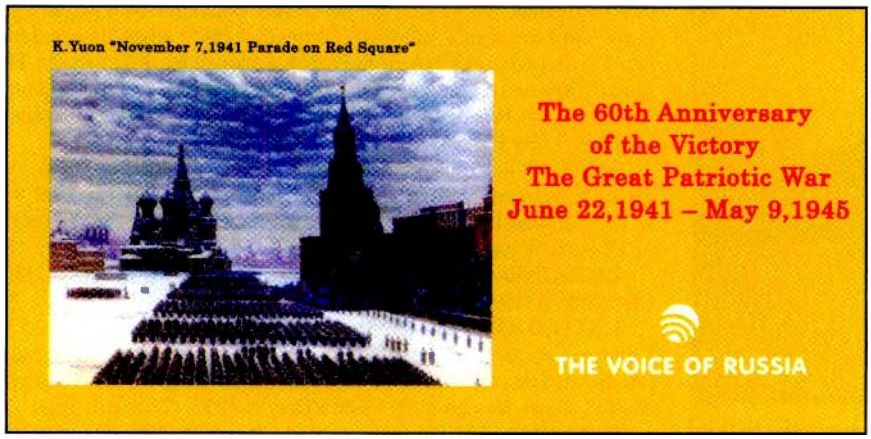
Ondas del Suroriente, Quillabamba, 5120.3 at 0030. (Wilkner, FL)

Radio Bolivar, Ciudad Bolivar, 5460.1 at 0030, but weak and not noted in the 1000 period recently. (Wilkner, FL)

Radio Cusco, Cusco, 6195.8 monitored at 0025 with religious programming and several IDs at 0057, OA music at 0058. Was wiped out



Radio Taiwan sent this artistic card to Peter Ng for a 2003 reception on 15265.



The Voice of Russia commemorated the 60th anniversary of the "great patriotic war" on this QSL sent to Paul Gager, Austria.

by Prague's sign on at 0100. (Alexander, PA) 1100 on with ID, music, mentions of locations in Peru. (Wilkner, FL)

PHILIPPINES—Radio Veritas Asia, 11870 in Hindi at 1350 with W talk and mentions of Philippines. (Ng, Malaysia)

Far East Broadcasting Co., 9430 at 1310 with talks in CC. (Brossell, WI) 9730 in Hmong at 2321. (Taylor, WI)

PIRATES—Oz Radio/WBNY, 6925u at *2332–0000* with a somewhat confused broadcast, starting out with Oz Radio but later went into what was clearly a WBNY pgm with discussion of pirate radio and monkeys. (Zeller, OH)

WPON, 6925u at *0023–0059* with rock, rap and reggae, usual slogan of "The Weapon." (Zeller, OH)

Blue Ridge Radio, 6925u at *0003–0058* with bluegrass banjo, said to be from high atop the bluegrass mountains. Address as blueridgeradio@gmail. com and asked for reports. (Zeller, OH)

Voice of Kaos, at *0045–0112*and *0236–0245 with rock, job losses in Detroit causing chaos. Aned their email as thevoiceofkaos@gmail.com for reports. (Zeller, OH)

Wolverine Radio, 6925u at *0125–0202* with relatively obscure rock, SSTV for 4 minutes at close. (Zeller, OH) 0342-0410. (Wood, TN)

The Crystal Ship, 5285.3am at 0226–0237 with "The Poet" and rock. One military marching skit. Also 6876am at 0153 with rock and criticism of Republicans. Uses the Belfast address. (Zeller, OH)

Captain Morgan, 6924.7u with rock, *Twilight Zone* theme clips here and there. (Zeller, OH)

Northwoods Radio, 6925u at 0135 with ID and address - northwoodsradio@yahoo.com. Signal suffered from overdriven audio and a strong het from Liquid Radio. (Parker, PA) *1342–1401* with flutes, Native American pow-wow and new age. "Broadcasting freedom from the Great Lakes." Short CW clip at close. (Zeller, OH)

XXP, 6925u at 0103 with late '60s things. Said "going off the air, we are" at 0122 close. (Hassig, IL)

Voice of Honor, 6925u at *2346–0012* with military and patriotic music. voiceofhonor@gmail.com. (Zeller, OH)

Dead Cat Radio, (t) 6925u at 0327–0341 with Patsy Cline, Air Supply, The Stray Cats. (Wood, TN)

Liquid Radio, 6925.3am with rock and "club" things, ID. (Parker, PA) (t) At 0146 with dance things, clip from Dilbert TV show. Also 6935 at 2020 with rock, heavy metal, punk, alternate rock and rap. (Hassig, IL)

Radio Marlene, 6925u at 0046–0112* with pop, rock, folk and disco. Said to be coming from the Jersey shore. Gave radiomarline@gmail.com for reports. That address is good. (Zeller, OH)

MAC, 6851am 0000 sign on with IS from some European country, then old TV themes, "Ultraman" and various pop/rock. Gave macshortwave@yahoo. com. At 0120 with tail end of broadcast: national anthem, laughter and then off. Some of these stations need to give more frequent IDs, pronounced clearly and not too fast—spell it out if it's not obvious. Reception far from your transmitter is far from perfect, like it is near your location. (Hassig, IL) (Amen!!—gld)

Red Rhino Radio, 6925u at 0102–0121 with Joe Walsh tune, into this station from the Rhino Radio Network. This time they called themselves "Red" Rhino Radio; gave redrhinoradio@ gmail.com for reports. Other rock numbers also played. (Zeller, OH)

Jack Buck?, 6925u (tent) at 0002–0010 with rock. Others were calling this "Cat Butt," but it sounded to me like they were saying "Jack." (Zeller, OH)

Barnyard Radio, 6930u heard at 0310 with ads for Blaxploitation movies, M talking, lounge act version of a song. Excellent audio for an SSB broadcaster. (Parker, PA)

Radio GaGa, 6925u at 0000–0001 with SSTV digital until 0001 when Radio GaGa ID by M. Also, *2354–0012* with SSTV transmission at open and close, a couple of pop/rock things in between. (Zeller, OH)

Outhouse Radio, 6925u at 0056–0129 with rock and a couple of IDs. (Zeller, OH)

Grey Rhino Radio, 6925u at *0103–0123* saying they were back on the air, playing rock, said to be played "on the cranberry." greyrihinoradio@gmail. com for reports. (Zeller, OH)

Radio First Termer/WEAK, 6925 monitored at *2138–2231 apparently a combined pgm. Considerable rock from the '60s and early '70s. Aned the website for Radio First Termer as www.ibiblio. org/jwsnyderrft/rft.html. Also WEAK *0148–0250 with punk rock, bluegrass and folk. (Zeller, OH)

POLAND—Polish Radio, 9450 via Germany at 1311 on EU safety measures. (Brossell, WI)

PORTUGAL—RDP Intl, 9715 in PP with comments and music at 2334 and 11630 in PP at 2315 with an interview. (MacKenzie, CA) 11735 at *1700 opening EE to Europe, headlines recap at 1704 and another ID. (D'Angelo, PA)

ROMANIA—Radio Romania Intl, 7125 heard at 1940 with talks in GG. Also 9640 at 1808 with pgm on the history of radio dramas in Romania. (Brossell, WI) 9645 at 0323 with music and ID. (Mackenzie, CA)

RUSSIA—Voice of Russia, 7225-St. Petersburg in RR at 0215 with several short features by M/W. Poor. //7285 via Grigoriopol (fair) and 7260-Moscow (very poor). (Taylor, WI) 7330 with RR lesson at 1335. (Ng, Malaysia) 7390 in CC at 1330, 9665 via Moldova with *Russian Hits* at 2335, 12040 via Moscow with news at 1704 and 9735 at 0345 in SS, man with ID at 0400, 15425 at 0315 with an interview on *Russia and the World* pgm. (MacKenzie, CA) 9890 at 0230. (Maxant, WV) 11690 via French Guiana at 2341 in PP, closing at 0357, 15425-Petropavlovsk-Kamchata at 0330 with W and classical music pgm, ID and closedown at 0400. (D'Angelo, PA) 15425 at 0242 but hard to follow muddy audio. Also 15755-Irkutsk in RR at 0247 again with muddy audio. (Strawman, IA)

Magadan Radio, 7320 in RR at 2214. (Brossell, WI)

SAUDI ARABIA—Broadcasting Service of the Kingdom, 9870 with apparent news in AA at 1800. Also 11715 in AA at 1908. (Brossell, WI)

SERBIA—International Radio of Serbia, 9675 with classical piano heard at 0050. (Maxant, WV)

SLOVAKIA—Radio Slovakia International, 7345 at 1949 with a feature on the national orchestra of Slovakia. (Brossell, WI)

SOLOMON ISLANDS—Solomon Islands Broadcasting Corp., 9541.5 (p) heard at 0540 in EE in (p) Pidgin with local island music, covered by a DRM signal. Too weak to pull out more details. Tuned the next morning at 1228 in EE ending a feature, ID for BBC news, then another feature. (Taylor, WI) 1140 (p) weak with slop from CRI-Kunming. Able to tell male from female and talk from music but that was it. Audio gone by 1215. (Strawman, IA)

The Voice of Vietnam got fancy with this photo card sent to Paul Gager for a 2008 reception.

SOUTH AFRICA—Radio Sondergrense, 3320 at 0228 in Afrikaans with W. Louis Armstrong. (Parker, PA) 0249 with soft ballads and instls. (Brossell, WI)

SPAIN—Radio Exterior de Espana, 3350 Costa Rica Relay in SS at 0248. (Parker, PA) 0151. (Brossell, WI) 6055 with music and into mailbox pgm. (Maxant, WV) 0345 in SS, 9630 Costa Rica in SS at 0325, 15110 in SS at 2212 and 17850 Costa Rica in SS at 2245. (MacKenzie, CA)

SUDAN—Sudan Radio TV, 7200 with abrupt *0228 sign on with Koran, AA talk at 0240, "Huna Omdurman" ID, radio drama. (Alexander, PA) 0308 with Koran. (Brossell, WI)

SWAZILAND—Trans World Radio, Manzini, 3240 monitored at 0326 with M in listed Ndau, group choir at 0336, brief instl, ID, instl again and off at 0340. (D'Angelo, PA)

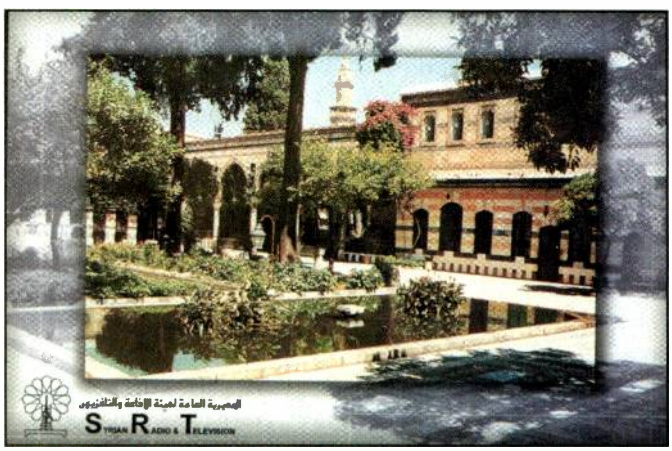
SWEDEN—Radio Sweden, 7395 via Madagascar at 2043 with news items. (Fraser, ME) 2158 with vocal and sudden signal loss, 11520 on Swedish kroner vs. the Euro and 15735 about to start half hour pgm to SE Asia. (Maxant, WV)

SYRIA—Radio Damascus, 12085 at 2113 with EE news, local pops, talk about North Korea, news, features, headlines, anthem at 2157 and into SS at 2159. //9335 was very poor. (Alexander, PA)

TAIWAN—Radio Taiwan International, 7185 in CC at 1219. (Brossell, WI) 1429 in CC and 15440 via WYFR in Hakka at 0245; off by 0259. (MacKenzie, CA) 15320 at 0315 with talk on the health care system there. (Ng, Malaysia)

TANZANIA—Radio Tanzania, 11735 with talks in Swahili at 1910. (Brossell, WI)

THAILAND—Radio Thailand, 9680 on the Thai monarchy at 0020. (Maxant, WV) 15275 at *0000 sign on and into *News Hour* pgm. Good until the signal suddenly dropped at 0029 when their antenna beam switched to WCNA from ECNA. (Alexander, PA) 0155 in Thai until 0200 when chime IS and full ID "This is HSK9, Radio Thailand's world service broadcasting from the public relations department in Bangkok" f/by EE news. (Strawman, IA)



Radio Damascus may have modulation problems but it's especially good with QSLs these days. (Thanks Paul Gager)

TURKEY—Voice of Turkey, 7325 via Canada at 0330 with Turkish music and off at 0332. (MacKenzie, CA) 11730 at 0700 with M in Azeri and 13710 in Urdu at 1235. (Ng, Malaysia) 13635-Emirler in TT with W ancr, Turkish music at 1043. (Parker, PA)

UKRAINE—Radio Ukraine International, 7440 in UU at 0252. (Brossell, WI) 7510 on rivers in Ukraine. (Maxant, WV)

UNITED STATES—Radio Free Europe/Radio Liberty, 9635 via Lithuania at *0458 opening at 0500 in (l) Tartar-Bashir. Some music but mostly talks and interviews from 0505. (D'Angelo, PA) 9990 with Radio Liberty service in (l) Pashto/Dari at 1235. (Brossell, WI)

Radio Farda, 7580 in Farsi at 1954. (Brossell, WI)

Radio Free Asia, 7355 via Taiwan in CC at 1950 and 9335 Northern Marianas in CC at 1816. (Brossell, WI)

Radio Marti, 11930-Greenville in SS to Cuba at 2325. (MacKenzie, CA)

Family Radio/WYFR, 7395 via Madagascar with EE sermon at 1950 and 9310 via Kazakhstan in (l) Burmese at 1306. (Brossell, WI)

WRMI, Miami, 9955 with *Wavescan* DX pgm at 1530. (Maxant, WV)

WEWN, Birmingham, 5810 in SS at 0325. (MacKenzie, CA) 9840 at 0250, 11520 at 0315 saying they were leaving the air due to severe weather and the threat of possible damage to the transmitter and would return after conditions have abated. Also, 11640 at 1030 and 15550 in SS at 1515. (Maxant, WV)

WWCR, Nashville, 5070 at 0324, 5890 at 0327 and 5935 at 0333. (MacKenzie, CA)

WWRB, Manchester, TN, 9385 with a sermon at 1233. (Brossell, WI)

WINB, Red Lion, 13570 at 1748. (MacKenzie, CA)

WBOH, Newport, NC, 5920 at 0330. (MacKenzie, CA)

WTJC, Newport, NC, 9370 at 0405. (MacKenzie, CA)

VATICAN—Vatican Radio, 6020 via Philippines in CC at 1245, QRMing co-channel Australia. (Barton, AZ) 7305 on Lebanon's elections at 0245 and 11625 at 2005. (Maxant, WV) 7360 with two M and a W with comments and IS at 0327. (MacKenzie, CA) 9650 at 0137 in Malay and EE. M/W ancrs, S. Asian vocal, IS, ID and EE schedule to news. (Taylor, WI)

VENEZUELA—Radio Nacional, 11670 via Cuba in SS at 2230 and 13790 via Cuba in EE at 2320. (MacKenzie, CA)

VIETNAM—Voice of Vietnam, 6175 via Canada at 0354 in EE but into SS at 0400. (MacKenzie, CA)

YEMEN—Republic of Yemen Radio, 9780.2 at 0407 with ME music hosted by AA W ancr, ID at 0429 and into M with news, then returned to ME vocals hosted by a man. (D'Angelo, PA)

ZAMBIA—Christian Voice, 13590 at 1020 with EE talks and music colliding with CRI. (Parker, PA)

ZIMBABWE—Zimbabwe Broadcasting Corp., 3396 in vernacular at 0254 with flutes, dums and M vocal. (Parker, PA)

And, once again, order is restored! Sincere and grateful thanks to those who participated this month, namely Richard Parker, Pennsburg, PA; Stewart MacKenzie, Huntington Beach, CA; Mark Taylor, Madison, WI; Jerry Strawman, Des Moines, IA; Charles Maxant, Hinton, WV; George Zeller, Cleveland, OH; Rich D'Angelo, Wyomissing, PA; Brian Alexander, Mechanicsburg, PA; William Hassig, Mt. Prospect, IL; Peter Ng, Johor Bahru, Malaysia; Rick Barton, Phoenix, AZ; Robert Wilkner, Pompano Beach, FL; Fotois Padazopulus, NJ; Robert Fraser, Belfast, ME; Robert Brossell, Pewaukee, WI; Michael Yohnicki, London, ON; and Joe Wood, Greenback, TN. Thanks to each one of you!

Until next month, good listening! ■

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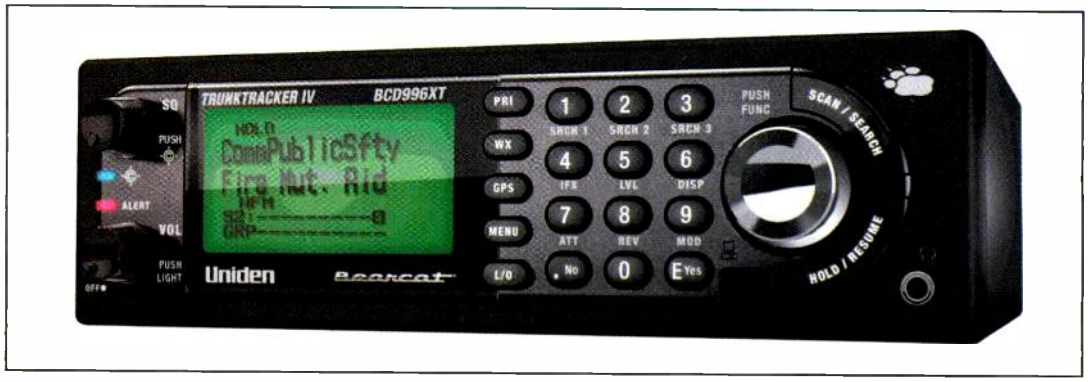


Uniden's new BCD996XT Base/Mobile Scanner is a feature-packed, high-end offering that's sure to create a stir in the scanner market.

New Uniden BCD996XT Base/Mobile Scanner

Uniden's BCD996XT Base/Mobile Scanner is a high-end entry to the marketplace that offers a host of improvements and new features. It gives users access to Trunk Tracker IV, improved APCO-25 digital decoding (plus analog), GPS scanning, and up to 25,000 channels.

Major features and capabilities of the BCD996XT include the following: TrunkTracker IV with control-channel only scanning and I-Call monitoring; tracks voice traffic on P25, Motorola, EDACS, and LTR Trunked systems, supports scanning of rebanded systems, APCO25 Digital Audio decoding plus support for P25 conventional channels; adaptive digital threshold to automatically set the digital decode threshold for APCO 25 systems; EDACS ESK support. Memory is enhanced to 25,000 dynamically allocated channels (systems: 500 maximum; groups per system: 20 maximum). The GPS-enabled feature provides automatic system selection and shows location-based information. Close Call RF Capture instantly tunes to signals from nearby transmitters; Channel Number Tagging lets users quickly select a channel for monitoring; Fire Tone-Out Search helps to identify the tones used on fire paging dispatch channels; Band Scope provides a visual representation of activity within a selected frequency range to help quickly identify active frequencies or sources of interference. The Multi-Color Display backlight lets users set the scanner to alert them to particular channel activity using specific colors.

The BCD996XT also offers 100 Quick Key System Access; Band Scope (graphically finds radio activity); Continuous Band Coverage (25 MHz to 1.3 GHz excluding UHF TV and Cellular); Audio AGC; Automatic Digital Threshold Adjustment; Temporary Lockout; Search with Scan; NAC Decoding for conventional P25 channels; DCS/CTCSS Rapid Decode; S.A.M.E. Weather Alert; PC Programming/Control; System/Channel Number Tagging.

For more information on the Uniden BCD996XT, which has a street price starting at approximately $499, visit www.uniden.com or contact your favorite dealer.

Sonoro Elements W Wi-Fi Internet Radio Works Without A Computer

The Sonoro Elements W Wi-Fi Internet Radio is a clock radio, with some attractive features and a twist: the radio connects to the Internet via Ethernet cable or Wi-Fi (802.11b or g), so you don't need an iPod or computer to listen. The Sonoro Elements radio will tune in over 16,000 Internet radio stations or stream music from the Pandora music service for free (simply choose a song title or artist and Pandora will play music that matches that style) as well as the premium programming on the Sirius Internet radio service (optional, monthly fee required). Other audio

The Sonoro Elements W Wi-Fi Internet Radio connects to the Internet via Wi-Fi or Ethernet cable—no computer necessary!

options include local, over-the-air FM radio (no AM) stations or connecting an iPod with the (optional) iPod dock accessory ($80). The radio will also stream MP3 files stored on a computer. There are 10 channel presets for FM or Internet streams and its search function lets you find specific call letters, genre, and more.

The single, upward-facing speaker produces full sound and you can adjust bass and treble from very low to extreme. There's also a standard 3.5 mm headphone jack so you can connect external speakers and an aux-in port to connect a CD player or other source. It comes in glossy black or white finish with yellow text and dial light; remote control included.

The Sonoro Elements W Wi-Fi Internet Radio lists for $499.99. For additional information, visit www.sonoro-audio.com.

Ten-Tec Microphones

Ten-Tec is offering two new hand microphones. Both are omni-directional with a dynamic element, 500-ohm impedance, and coiled connection cable. The model 702 is wired with an 8-pin connector for the Ten-Tec Omni-VII and Orion-II HF transceivers, plus 8-pin equipped Yaesu transceivers. The model 703 is wired with a 4-pin connector for the Jupiter and older Ten-Tec HF transceivers.

The Ten-Tec model 702 is wired with an 8-pin connector for the Ten-Tec Omni-VII and Orion-II HF transceivers as well as 8-pin equipped Yaesu rigs.

Both the Ten-Tec 702 and 703 sell for $39.95. For additional information, visit http://radio.tentec.com.

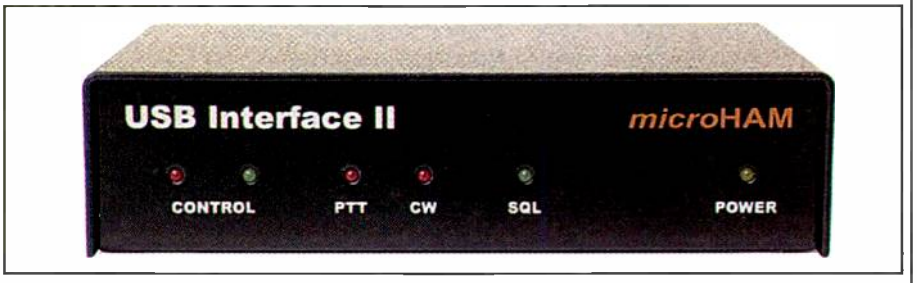
microHAM USB Interface III

microHAM's new USB Interface III solves the problem of connecting to laptops and newer desktops to control your radio when there is no serial (com) port on the computer. The USB Interface III includes full optical isolation of all control signals (radio control, CW, PTT, and squelch) and built-in USB soundcard with front-panel level controls for transmit via your transceiver's accessory audio input and the constant level (pre-volume control) audio output.

microHAM USB interfaces have built-in hardware support for your radio so you don't need additional level converters, such as CT-62, IF-232, FIF-232, and CT-17. The USB Interface III includes support for CW keying (DTR) and PTT (RTS), as well as a detector/driver for pseudo-FSK and QSK CW on the soundcard's right audio channel for use with FLDIGI on any platform. Unlike many common mass-market computer USB to serial adapters, microHAM's USB interfaces are designed for maximum immunity from strong RFI yet are RF quiet. Each data line is low-pass filtered for minimum interference.

The package includes micro USB Interface III, CD ROM with Windows drivers, control software and manual, USB A-B cable, and one radio cable (you specify your radio).

The suggested retail price of the microHAM USB Interface III is $229. For more information or to order, visit www.microhamusa.com.



The microHAM USB Interface III lets you connect your radio to a computer when there is no serial port provided.

World News, Commentary, Music, Sports, And Drama At Your Fingertips

This listing is designed to help you hear more shortwave broadcasting stations. The list covers a variety of stations, including international broadcasters beaming programs to North America, others to different parts of the world, as well as local and regional shortwave stations. Many of the transmissions listed here are not in English. Your ability to receive these stations will depend on time of day, time of year, your geographic location, highly variable propagation conditions, and the receiving equipment used.

AA, FF, SS, GG, etc. are abbreviations for languages (Arabic, French, Spanish, German). Times given are in UTC, which is five hours ahead of EST, i.e. 0000 UTC equals 7 p.m. EST, 6 p.m. CST, 4 p.m. PST.

UTC	Freq.	Station/Country	Notes
0000	5990	China Radio International, via Cuba	SS
0000	6090	Caribbean Beacon, Anguilla	
0000	9820	Radio Austria International	various
0000	9490	Bible Voice, England, via Germany	
0000	6105	XEQM, Mexico	SS
0000	15275	Radio Thailand	
0000	9680	Radio Thailand	
0000	9580	Radio Romania International	
0000	9505	Deutsche Welle, Germany, via Cyprus	
0030	6055	Radio Exterior de Espana, Spain	
0030	9675	International Radio of Serbia	
0100	6973	Galei Zahal, Israel	HH
0100	9870	All India Radio	HH
0100	5910	WBOH, North Carolina	
0100	5035	Radio Aparecida, Brazil	PP
0100	5930	Radio Slovakia Internaitonal	
0100	11915	Radio Gaucha, Brazil	PP
0130	9650	Vatican Radio	EE, others
0130	6155	Radio Fides, Bolivia	SS
0200	9625	CBC Northern Service, Canada	vernacular
0200	5025	Radio Rebelde, Cuba	SS
0200	4915	Radio Difusora, Macapa, Brazil	PP
0200	4410	Radio Eco, Bolivia	SS
0200	15515	Radio Australia	
0200	11710	Radiodifusora Argentina al Exterior	
0200	3280	La Voz del Napo/Radio Maria, Ecuador	SS
0200	9430	BBC, Oman Relay	Azeri
0200	3250	Radio Luz y Vida, Honduras	SS
0200	9495	Islamic Republic of Iran Broadcasting	
0200	4835	Radio Maranon, Peru	SS
0200	3250	Radio Exterior de Espana, Spain, Costa Rica Relay	SS
0200	3320	Radio Sondergrense, South Africa	Afrikaans
0200	7440	Radio Ukraine International	UU
0200	7305	Vatican Radio	
0200	7225	Voice of Russia	RR
0200	4965	CVC-The Voice-Africa, Zambia	
0200	5860	Radio Farda, USA, Kuwait Relay	Farsi
0200	9430	BBC, Oman Relay	
0200	5980	Voice of the Tigray Revolution, Ethiopia	Tigrinya
0230	9925	Voice of Croatia, via Germany	
0230	7425	Radio Tirana, Albania	
0230	7540	Radio Cairo, Egypt	
0230	9890	Voice of Russia	
0230	15440	Radio Taiwan International, via Florida	Hakka
0230	11520	Radio Sweden International	
0230	3396	Zimbabwe Broadcasting Corp.	
0230	4775	Radio Tarma, Peru	SS
0300	9870	Radio Prague, Czech Republic	
0300	4885	Radio Clube do Para, Brazil	PP
0300	4985	Radio Brazil Central	PP
0300	6110	Radio Fana, Ethiopia	Amharic
0300	7110	Radio Ethiopia	Amharic
0300	4780	Radio Djibouti	FF
0300	3240	Radio Misiones International, Honduras	SS
0300	5010	Radio Madigasikara, Malagasy	Malagasy
0300	4800	Radio Transcontinental, Mexico	SS
0300	9645	Radio Romania International	RR
0300	7325	Voice of Turkey, via Canada	
0300	7200	Sudan Radio TV	AA
0300	3240	Trans World Radio, Swaziland	GG, vernacular
0300	7360	Vatican Radio	
0300	4930	Voice of America, Botswana Relay	
0300	4976	Radio Uganda	
0300	5915	Radio Zambia	vernacular
0300	6020	Radio Victoria, Peru	SS
0300	15140	Radio Sultanate of Oman	
0300	11675	Radio Kuwait	AA
0330	6080	Radio Prague, Czech Republic, via Canada	
0330	3985	Croatian Radio	Croatian
0330	6165	Radio Nederland, Bonaire Relay	SS
0330	9420	Voice of Greece	GG
0330	4790	Radio Vision, Peru	SS
0330	9735	Voice of Russia	SS
0330	6175	Voice of Vietnam, via Canada	
0330	3345	Channel Africa, South Africa	
0330	4905	RN Tchadienne, Chad	FF
0400	6030	CFVP, Canada	
0400	6160	CKZN, Canada	
0400	6010	La Voz de su Concencia, Colombia	SS
0400	5915	Deutsche Welle, Germany, via England	
0400	9480	Deutsche Welle, Germany, Rwanda Relay	GG
0400	9895	Radio Voice of the People (Opp. to Zimbabwe)	EE, Vern.
0400	9780	Republic of Yemen Radio	AA
0400	9725	RT Tunisienne, Tunisia	AA

Scan Our Web Site

UTC	Freq.	Station/Country	Notes
0400	4800	Radio Buenas Nuevas, Guatemala	SS
0400	13362	AFN/AFRTS, Guam	USB
0400	5910	Marfil Estereo, Colombia	SS
0400	9805	Radio France International	
0400	11590	Radio Cairo, Egypt	AA
0430	6165	RN Tchadienne, Chad	FF
0430	4960	Voice of America, Sao Tome Relay	
0500	5005	Radio Nacional, Equatorial Guinea	SS
0500	6250	Radio Nacional, Equatorial Guinea	SS
0500	6110	Radio Japan, via Canada	
0500	9635	Radio Free Europe, via Lithuania	Tatar-Bashir
0500	4770	Radio Kaduna, Nigeria	
0500	4775	Trans World Radio, Swaziland	various
0530	6100	Radio Bulgaria	Bulgarian
0600	6185	Radio Educacion, Mexico	SS
0600	5995	RTV Malienne, Mali	FF
0600	4845	Radio Mauritanie, Mauritania	AA
0600	5446.4	AFN/AFRTS, Key West	SB
0700	6170	Radio New Zealand International	
0800	7355	KNLS, Alaska	
0800	9541	Solomon Is. Broadcasting Corp.	
0800	6010	Radio Mil, Mexico	SS
0800	9635	RTV Malienne, Mali	FF
0800	9660	Voice of Nigeria	
0900	2385	VL8K, Australia	
0900	6010	Radio Inconfidencia, Brazil	PP
0900	6020	Radio Australia	
0900	3220	HCJB Global, Ecuador	QQ
0900	3925	Radio Nikkei, Japan	JJ
1000	13590	CVC International, Zambia	
1000	3310	Radio Mosoj Chaski, Bolivia	SS
1000	3360	Ondas del Hualaga, Peru	SS
1030	3260	Radio Madang, Papua New Guinea	Pidgin
1030	4747	Radio Huanta 2000, Peru	SS
1100	9525	Voice of Indonesia	various
1100	9615	Radio Veritas Asia, Philippines	Mandarin
1130	11710	Voice of Korea, North Korea	
1200	11775	KSDA, Guam	
1200	12085	Voice of Mongolia	
1200	7185	Radio Taiwan International	CC
1200	9990	Radio Liberty, USA, via Kuwait	Pashto/Dari
1200	3335	Radio East Sepik, Papua New Guinea	Pidgin
1200	15700	Radio Bulgaria	BB
1230	9685	China Radio International	RR
1230	9605	BBC, Thailand Relay	
1230	13650	Voice of Korea, North Korea	KK
1230	9400	Far East Broadcasting Co., Philippines	CC
1300	9780	KNLS, Alaska	
1300	11735	Voice of Korea, North Korea	CC
1300	9430	Far East Broadcasting Co., Philippines	CC
1300	9450	Radio Polonia, Poland, via Germany	
1300	11870	Radio Veritas Asia, Philippines	Hindi
1300	12000	Radio Havana Cuba	SS
1330	15735	Radio Sweden International	
1330	9935	RS Makedonias, Greece	GG
1400	7120	CPBS/China National Radio	CC
1400	7390	Voice of Russia	CC
1400	5910	Shiokaze,Taiwan via Japan	EE, others
1500	56070	CFRX, Canada	
1500	9740	BBC, Singapore Relay	
1500	9955	WRMI, Florida	
1600	15605	Radio France International	
1700	12040	Voice of Russia	
1700	11735	Radio Romania International	
1730	13570	WINB, PA	
1800	9590	Radio Vlaanderen Intl, Belgium, via England	Welsh
1800	9855	Radio Kuwait	AA
1800	15215	Radio Jamahiriya, Libya,	Hausa
1800	12045	Radio Nederland, via Germany	
1800	9870	Broadcasting Service of the Kingdom, Saudi Arabia	AA
1800	9355	Radio Free Asia, via Northern Marianas	CC
1900	11810	BBC, Ascension Island Relay	
1900	7450	RS Macedonias, Greece	Greek
1900	11660	Radio Nederland, via France	
1900	11735	Radio Tanzania - Zanzibar	Swahili
1900	7355	Radio Free Asia, via Taiwan	CC
1930	7125	Radio Romania International	GG
1930	7345	Radio Slovakia International	
1930	11750	Adventist World Radio, USA via South Africa	Hausa
1930	7580	Radio Farda, USA, via Sri Lanka	Farsi
2000	11625	Vatican Radio	
2000	17735	Radio Canada International	
2030	11990	Radio Kuwait	
2100	15190	Radio Africa, Equatorial Guinea	
2100	15120	Voice of Nigeria	
2100	12085	Radio Damascus, Syria	
2100	7510	Radio Ukraine International	
2100	11660	Radio Australia	
2130	7210	Radio Belarus	
2130	9445	All India Radio	
2130	6055	The Mighty KBC, Netherlands, via Lithuania	
2130	13730	Radio New Zealand International	
2200	17680	Christian Voice,Chile	SS
2200	13790	Radio Havana Cuba	SS
2200	11780	Radio Nacional Amazonas, Brazil	PP
2200	13640	Radio Japan	JJ
2200	11670	Radio Nacional Venezuela via Cuba	SS
2200	7320	Madgadan Radio, Russia	RR
2200	9830	Voice of Turkey	
2200	11665	Christian Voice, Chile	SS
2200	9580	Africa No.One, Gabon	FF
2230	17680	Radio Canada International	PP
2230	12090	KFBS, Saipan, Northern Marianas	VV
2230	7210	China Radio International, via Albania	
2230	9665	Radio PMR, Moldova	
2300	9715	RDP International, Portugal	PP
2300	11630	RDP International, Portugal	PP
2300	11930	Radio Marti, USA	SS
2300	13680	Radio Nacional Venezuela, via Cuba	SS
2330	11840	China Radio International, via Cuba	
2330	6100	Radio Canada International	
2330	9700	Radio Bulgaria	
2330	12040	HCJB Global, Ecuador	GG
2330	9730	Far East Broadcasting Co., Philippines	unid
2330	11690	Voice of Russia, via French Guiana	PP

SuperLoop For Super DX!

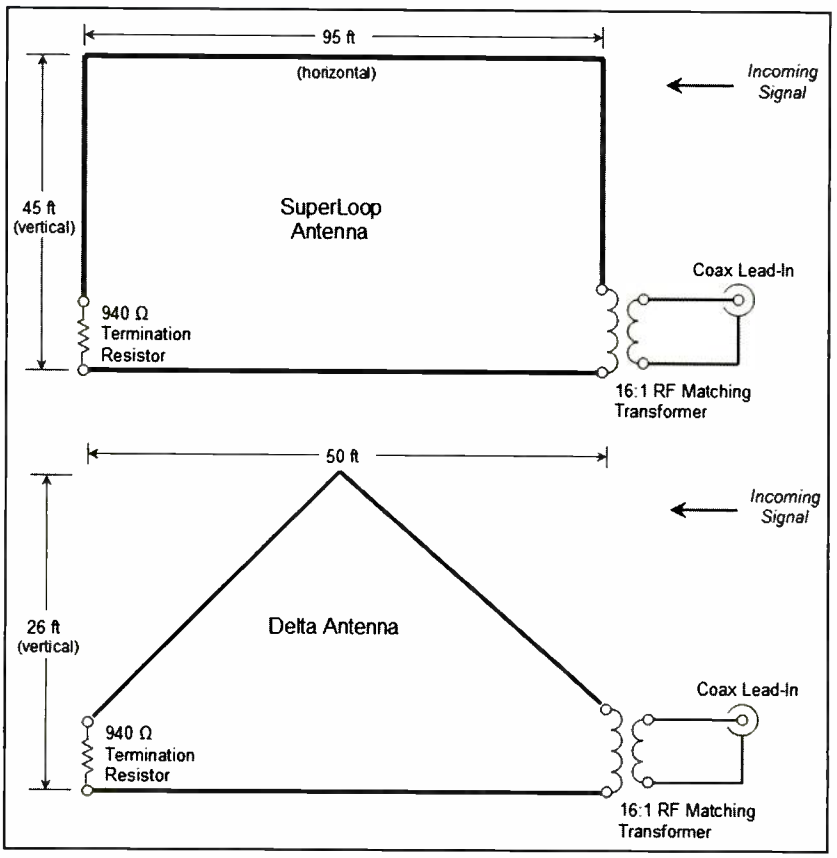
by Bruce A. Conti
BAConti@aol.com

"....there's still plenty of DX to be received. You just need a better antenna; more specifically, the terminated broadband loop antenna."

Necessity is the mother of invention, and that certainly holds true for the development of the terminated broadband loop antenna for AM broadcast DXing. And this invention can really breathe new life into AM DX.

Decades ago a random longwire or a ferrite loopstick antenna was more than adequate for coast-to-coast reception of 640 KFI Los Angeles and 1030 WBZ Boston, plus any number of Pan-American split-frequency stations like 535 Grenada, 834 Belize, and 1555 Cayman Islands. More radio stations used to sign off at night, too, leaving the AM broadcast band wide open for long-distance reception.

Today the AM dial is more congested than ever with most radio stations operating 24/7, digital HD signals interfering with adjacent frequencies, and increased household noise radiating from computers and digital appliances. Plus the split-frequency radio stations have disappeared, all but a couple forced to move on-channel because of the 10-kHz step tuning of digital receivers. Despite all odds, there's still plenty of DX to be received. You just need a better antenna; more specifically, the terminated broadband loop antenna.



SuperLoop and Delta construction diagrams.

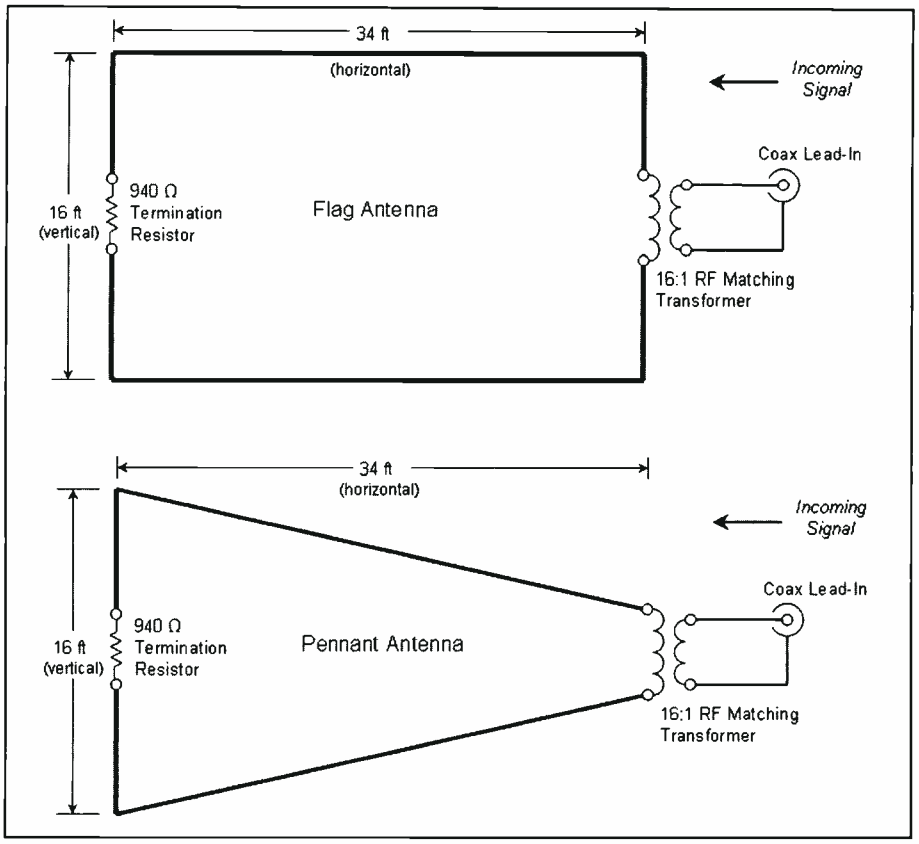
Delta, Flag, Pennant, And SuperLoop

There are four basic types of terminated broadband loop configurations: Delta, Flag, Pennant, and SuperLoop. Each configuration provides a low-noise unidirectional antenna with a wide-angle cardioid (heart-shaped) beam with a back-side null of 30 dB typical. Furthermore, a loop is a balanced antenna with a "floating" ground, which means that no connection to earth ground is required, giving these loop antennas a distinct advantage over unbalanced antennas, such as slopers, random wires, Ewes, and Beverages, that depend on a good earth ground.

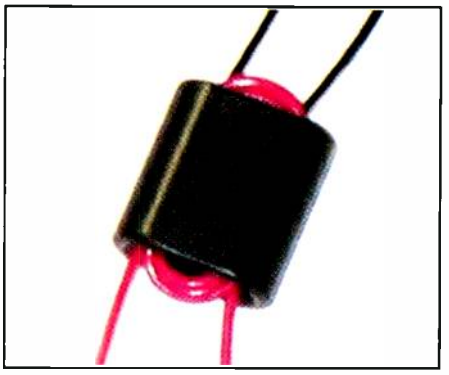
Unlike a standard loop antenna with a bidirectional figure-8 pattern, a terminated loop produces a unidirectional beam simply by the addition of a series termination resistor in the loop of wire. Broadband performance is achieved with a single loop of wire, versus familiar tuned loop antennas constructed of multiple turns of wire around an air-core frame or ferrite loopstick.

The terminated broadband loop is adaptable to almost any situation. Whether on a balcony, on the roof of a car, or supported by trees in the backyard, the antenna design is extremely flexible. The antenna is easy to construct, consisting of a single loop of wire in the vertical plane, a resistor (940 ohms typ.) in series with the loop, and a 16:1 RF matching/isolation transformer connecting the antenna to the lead-in. The resistor is installed on the null-side of the loop, while the transformer is located at the incoming beam-side of the antenna.

The shape of the loop of wire determines the antenna configuration. The Delta is a triangular shape, like the delta of the Greek alphabet, with the base of the triangle parallel to the ground. The Flag is a rectangular shape like a flag on a pole, while the Pennant is shaped like a pennant or triangular flag. The SuperLoop is a rectangle with the bottom resting on the ground. Antenna size can be as small as 6 x 6 feet, or as large as 50 x



Flag and Pennant construction diagrams.



RF transformer wound on a binocular core.

100 feet. A width to height ratio of 2.1 to 1 (width = height x 2.1) is typical but not absolute.

The antenna shape and size can be whatever fits best, though a small antenna in the 6-foot range may require an RF amplifier, such as the DX Engineering RPA-1 (dxengineering.com) or the W7IUV amplifier card (w7iuv.com). A Flag or Pennant might be more suitable for an above ground installation such as a house rooftop or apartment balcony, while a Delta and SuperLoop will perform just as well with the bottom section resting on the ground.

RF Matching Transformer

The 16:1 RF matching/isolation transformer is probably the most crucial component of the antenna. The transformer primary and secondary must be isolated from each other, meaning no physical connection between the two. The typical balun designed for shortwave and amateur radio applications will have primary and secondary windings with a common ground, which can introduce noise. Isolation of the windings is needed to preserve the low-noise balanced antenna configuration. Custom transformer services are offered through the Internet by many amateur radio operators and equipment retailers; however, do-it-yourself transformers are the most cost effective.

Begin with a multi-aperture (binocular) ferrite core, Fair-Rite model 2873000202 in-stock at Newark Electronics (www.newark.com), and light gauge (30 AWG typ.) solid hook-up wire or enamel-coated magnet wire. The winding ratio is the square root of the impedance ratio, so a 16:1 transformer will require a 4:1 winding ratio (the square root of 16 is 4). First wind the high impedance by threading the wire through both the binocular holes 12 times (12 turns), then wind the low impedance 3 turns, for a 4:1 turns ratio (3 x 4 = 12). This is the recommended minimum for AM broadcast band use. Additionally, 16 and 4 turns, or 20 and 5 turns, can be wound depending upon the gauge of wire. More turns will improve coupling at lower frequencies, just remember to maintain the required 4:1 turns ratio.

This type of transformer design is very forgiving, so you don't have to worry too much about the neatness of your windings; crisscrossing and overlapping of wires is not critical. Just try to maintain tight-fitting windings. The aforementioned W7IUV website and the WA1ION site at www.qsl.net/wa1ion offer more examples of binocular transformer winding.

Once the transformer winding is complete, it can be mounted in a water-tight food storage container with appropriate connectors for hook-up to the antenna and lead-in. Binding posts or screw terminals make good antenna connectors. The high-impedance winding (12, 16, or 20 turns) of the completed transformer assembly is connected to the antenna, and the low impedance (3, 4, or 5 turns) to the lead-in.

Use of a Mini-Circuits (www.minicircuits.com) model T16-1 RF transformer is a good substitute for those less inclined to wind their own. The Mini-Circuits transformers are rather tiny though, in a 6-pin dual inline package, thus still requiring some soldering skill to wire into a chassis with connectors. Keep in mind that because of the small size, these transformers are susceptible to lightning and static damage as well as overload. So Mini-Circuits may not be the best choice for Tampa, Florida—the lightning capital of the world—or a location close to a 50-kW AM flamethrower.

Remote Control Termination

For optimum control of the antenna beam, the termination resistor can be replaced by a remote control variable termination. This allows the termination resistance to be fine-tuned while listening "in the shack" to peak the null or signal strength. A remote control termination consists of a 4:1 RF isolation transformer, balanced lead-in, and a 1k-ohm potentiometer. Follow the preceding transformer winding instructions except with a 2:1 turns ratio of 12 turns and 6 turns. The high-impedance winding (12 turns) is connected to the antenna in place of the termination resistor.

A balanced lead-in made of lamp cord, speaker wire, or twisted pair connects the low-impedance winding to a potentiometer conveniently located at your receiver. Though the potentiometer setting will normally be around 240 ohms for a null, a slight adjustment may improve the null of a specific source of interference, such as a co-channel or adjacent station, or it can be adjusted to maximize, rather than null, a signal.

Ultimate Loop Array

For maximum performance, try an array of terminated broadband loops. Two loops can be arranged at 90 degrees of each other for north-south and east-west operation, or parallel loops can be combined to produce a narrower beam. In either case, interesting natural phasing effects can be achieved by combining loops and varying the termination resistance of each antenna, thus making a remote control termination upgrade more desirable. You can easily construct an antenna switch box to switch each antenna on/off or both on.

The Grayland Quad Delta Flag Array designed by Dallas Lankford is an extreme example of an array of loops: four Delta antennas arranged in-line over a distance of 350 feet, phased through precise RF circuitry to produce a 180-degree beam with a full 180-degree backside null. The Grayland Array is so-named for its first successful proof of performance at the Grayland, Washington, DXpedition site. Check it out in the Dallas Files section of the Kongsfjord DXpedition website (www.kongsfjord.no).

FM/TV Broadcast Loggings

"Has anyone reported any digital TV DX yet?" inquired *Pop'Comm* reader Klaus Spies, WB9YBM, adding: "I recently logged DTV Channels 18-1 and 18-2 from Lafayette, Wisconsin. I'm in Streamwood, Illinois, 30 miles straight west of the very northern tip of Chicago."

Roy Barstow, located on Cape Cod, Massachusetts, has been reporting plenty of analog and digital TV DX. "During a big E-skip event over the summer, I did not try for any FM DX but others in the Worldwide TV FM DX Association (WTFDA) were picking up the Dominican Republic on 88.1 MHz. In my TV DX log, I picked up via analog Channel 3 TVES Caracas, Venezuela, two-hop *E*-skip. Later on 3 had Cubavision airing a short movie in English with Spanish subtitles. A little while later noticed Channel 6 Cubavision was parallel to 3. Another huge event was an FM DXer in Europe picking up stations along the east coast. I believe one station was WXTK on Cape Cod. This is unheard of and so far no East Coasters have picked up Europe as far as I know."

Possibly a new transatlantic FM DX record was set over the summer by Paul Logan in Lisnaskea, Ireland, with reception of 90.7 WVAS Alabama, a reported distance of 4,011 miles. Details can be found online at the WTFDA message board. The WTFDA (www.wtfda.org) is America's leading radio club dedicated to FM and TV DXing. Roy Barstow has a direct saltwater path from Old Cape Cod to the Carolinas and Florida, and he's logged several DTV signals from the south. Roy takes full advantage of his

This Month In Broadcast History

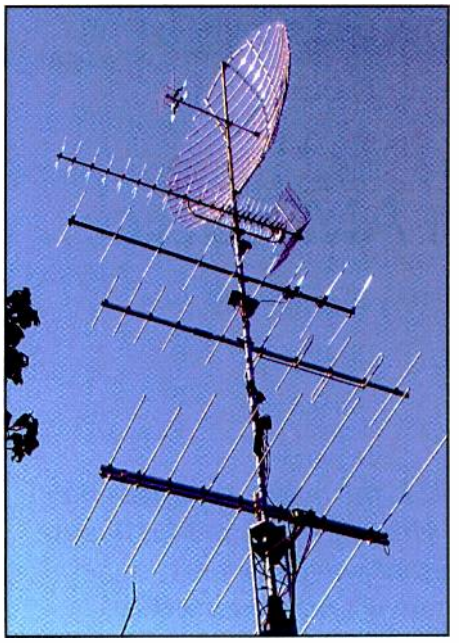
75 Years Ago (1934)—The *Lux Radio Theatre* premiered on the NBC Blue Network featuring dramatic adaptations of Broadway plays.

50 Years Ago (1959)—Rod Serling's *Twilight Zone* debuted on CBS television. "Mac the Knife" by Bobby Darin topped the Fabulous 40 on 560 WQAM Miami.

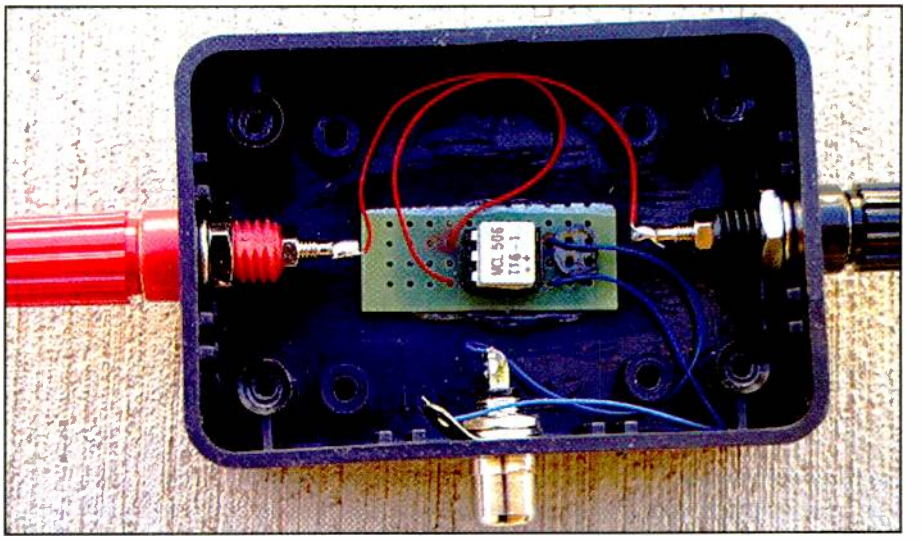
25 Years Ago (1984)—1260 WNRK Delaware conducted a special nighttime DX test to give DXers the rare opportunity to QSL the otherwise difficult to receive "First State." The test was received as far away as Minnesota and Wisconsin.

A transformer is installed in this plastic food storage container with binding posts for antenna and balanced lead-in connections.

David Aichelman, a broadcast DXer in Arizona, used the frame of his outdoor patio roof to support a SuperLoop.



The Barstow array of TV DX antennas mounted on a 52-foot crank-up tower.



Aichelman installed a Mini-Circuits model T16-1 RF transformer in a plastic chassis to connect the SuperLoop to receiver lead-in.

Roy Barstow of Cape Cod, Massachusetts, caught this digital signal from WBTW-DT Channel 56, Florence, South Carolina.

location with an impressive array of FM/TV DX antennas, which he describes below:

"On a crank-up tower at 52-ft a screened 7-ft dish for UHF, below that a European Yagi also for UHF. (This antenna goes to the ICOM R-100 just for audio.) Below that a ChannelMaster cut for Channels 11–13 mainly used for meteor scatter and tropospheric DX. Below that a Blonder Tongue (www.blondertongue.com) high-band 7-13 antenna, and below that a B/T low band 2-6. All have amps. On the south side of the roof without a rotor is a B/T 2-6 antenna end-fired and fixed south for *E*-skip. Also on the roof, another 7-ft dish fixed toward the southwest for tropo. For FM I have an Antenna Performance Specialties (www.antennaperformance.com) APS-13 antenna on an 8-ft Glen Marten tower with Yaesu rotor. This setup netted me two stations on FM from Miami via tropo. Lastly there's an APS-9 antenna also for FM work on the roof."

By the way, Roy also uses Flag and SuperLoop antennas for AM DXing.

Super antennas aren't absolutely necessary to enjoy FM DXing. When conditions are favorable, a portable radio is all that's needed. Bogdan Chiochiu in Montreal received the following FM stations on a barefoot Sangean ACS 818-CST with its telescopic whip antenna during a good atmospheric skip opening. (All times are UTC.)

92.9 KGRC Hannibal, Missouri, at 0020 playing soothing, yet fairly rhythmic R&B and IDing as "Real 92.9." (Chiochiu-QC)

93.7 WFBC Greenville, South Carolina, at 2104 playing up-beat R&B and commercial alt-punk music, IDing with the slogan "B93.7" and mentions of South Carolina. (Chiochiu-QC)

93.9 WSEK Burnside, Kentucky, heard at 2140, a country station heard very strongly during this opening, IDing as "K93 Country" and announcing the website www.k93country.com to vote for the Top 20 songs. This is Kentucky #2 on FM for me, #3 including nighttime mediumwave pest 840 WHAS Louisville! (Chiochiu-QC)

95.5 WIXV Savannah, Georgia, at 2130 with ID as "I-95" and mentions of Savannah after a great R&B number. (Chiochiu-QC)

98.1 WHZT Seneca, South Carolina, heard at 2140 with ID as "The new Hot 98-1." South Carolina #2! (Chiochiu-QC)

102.1 WDRM Huntsville, Alabama, at 2145 mention of the www.wdrm.com website between one light country number and a rhythmic country song. Huge, excellent and local-like at times! Alabama #4, including past logs of 92.9 WTUG and 1700 WEUP. (Chiochiu-QC)

103.3 WMXS Montgomery, Alabama, at 2200 IDing as "Mongtomery's Weekend Music Station" and playing oldies. Excellent local-like signal wiping out weak semi-local 103.3 CHAA in Longueuil, Quebec. New, Alabama #2 on FM! (Chiochiu-QC)

Want further proof that FM DX can happen at any time on any receiver? Here you go:

"Driving home from work thru a thunderstorm, Falmouth to South Yarmouth, Massachusetts, there was an FM opening to South Florida," reports Steve Wood of Cape Cod, undoubtedly taking advantage of the same Atlantic water path as Roy Barstow. "While managing to maintain control amid the rain and traffic I was able to ID a couple of stations. Several other potential stations were noted but I couldn't get anything concrete. All heard on the 2003 Honda Accord-installed radio."

89.3 WSRX Naples, Florida, monitored at 2054 with religious music and a female announcer mentioning Naples. (Wood-MA)

89.5 WRMB Boynton Beach, Florida, monitored at 2055 with SRN news followed by local news and IDs. (Wood-MA)

Now it's your turn to join the fun! TV, FM, and AM DX logs are always welcome here. So raise those antennas and let us know what you're receiving. Until then, 73 and Good DX! ■

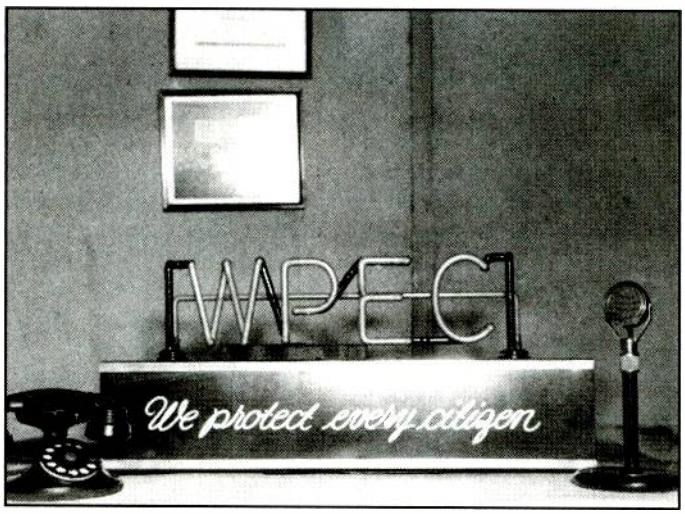
"Calling All Cars!" On AM Radio... The AM *Police* Radio

by Shannon Huniwell
melodyfm@yahoo.com

Sometimes, with eyes tightly closed, Judy Stevenson still hears her brother's voice crackle through the radio. She loves conjuring up this nearly seven decades-old memory in the loneliest wee hours, as that's when her beloved sibling, Raymond, would have been pushing the talk button on his police car's microphone to let headquarters know that he and his senior partner were responding to a call.

"And as a shy high school freshman, I really looked up to my older, newly minted police officer brother," Judy reflected. "Ray sounded so official over the airwaves." What a thrill it was for her monitoring the police band well past midnight to listen for him. If Ray suspected that she'd be awake, and he wasn't involved in anything too serious, he'd tag some quick, innocuous, lingo-laden quip onto the end of a cop-to-HQ transmission. Typically, in just a burst after concluding a radio check, Ray would growl, "All teenagers living in the vicinity of the 300 block of La Habra Avenue should be in the sole custody of their beds," in his best matter-of-fact law enforcement delivery. More than once, this caused the confused dispatcher to request, "Say again."

"In 1921, the police commissioner in the Motor City secured a license to transmit voice from his department's headquarters... It looks like the Detroit cops' KOP originally occupied 1050 kilocycles for about four years before being moved to 1080."

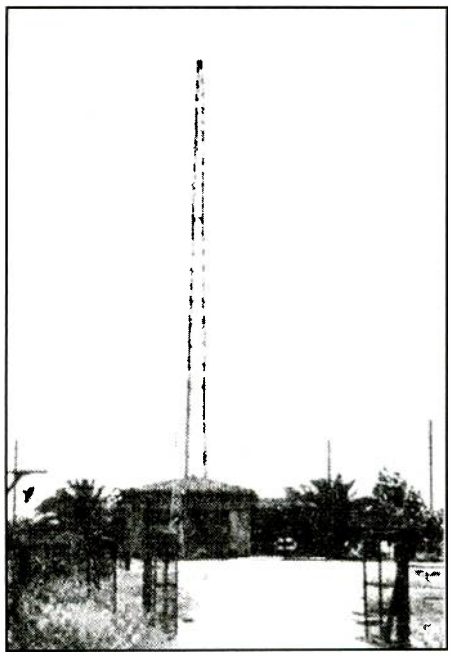


Somebody with the Memphis, Tennessee, police department during its one-way AM radio dispatch days sure knew how to generate good public relations! From the Department's history website, this shot of a window display says what every cop wants to convey: "We Protect Every Citizen." That slogan was neatly coined from the Memphis Police's radio station call letters, WPEC. At the time of this circa-1935 picture, the base-to-car facility operated on 1700 kc, and was no doubt a spot on most Depression-era home radio dials where a bit of the local law enforcement action could be snagged for free. *White's Radio Log* for May/June 1940 has WPEC on 2466 kc with 400 watts of transmitter power output.

"Disregard," Ray would respond, satisfied in knowing that once his good-natured warning signal crackled through the ether, Judy would feel like all was right with the world and could inevitably nod off. "Others apparently picked up on his 'officer friendly' admonition, too," says Judy. "Ray mentioned to me that his department's dispatcher fielded phone calls and an occasional letter saying that it was awful nice to know that cops care about kids keeping a proper bedtime."

Fast-forwarding almost 70 years, Judy woke up one day with the idea that she might find a bit of police radio history via an Internet search. It just so happened that a *Pop'Comm* "Shannon" reference appeared at the top of the Google page, so she emailed me wondering where one might find articles about the era when police broadcasts could be heard on what she termed "regular radio."

Her question took me back in time myself, to a late 1970s estate sale my Dad and I attended. There, we spent a fun afternoon browsing through a well-known local family's past and all of $7 or $8 dollars on a pretty nice Western Auto brand Truetone table radio with "POLICE" labeled right past the broadcast band. Besides that nexus to public service communication, though, I was like



Though admittedly as grainy as a surveillance photo, this LAPD archives picture shows the KGPL transmitter shack and AM vertical radiator used to send out everything from routine stolen car notices to emergency directives for officers to assist women having babies in inconvenient places. Los Angeles cops are especially proud of their department's communications history, which during the AM era featured LAPD's 500-watt KGPL. A 1940 log shows it on 1712, while another source notes it having been at 1730 kc. Either spot was well within the tuning range of most every household's AM radio and provided entertainment even more up-to-the-minute than any of today's pre-recorded TV reality shows.

Tess without Dick Tracey, so I asked my father to do some detective work on the pioneer police radio research case. While Dad put out a dragnet on the topic, he suggested that I issue an all points bulletin via some website sources and a college professor he'd met at a hamfest.

Rounding-Up The Police Radio History Gang

An item I remembered from compiling some trivia for a long-ago column about call letters got me thinking of KOP in Detroit. In 1921, the police commissioner in the Motor City secured a license to transmit voice from his department's headquarters. Some sources note that the U.S. Commerce Department categorized the authorization as "provisional commercial" in the same batch of OKs as fledgling broadcasters like Westinghouse's WBZ Springfield, Massachusetts, and KDKA Pittsburgh. It looks like the Detroit cops' KOP originally occupied 1050 kilocycles for about four years before being moved to 1080.

Besides its wonderfully representative KOP callsign, in only issuing transmissions of intermittent announcements, it was obviously never in the business of providing continuous music, news, or even crime dramas. Consequently, government regulators yanked the license (circa 1926) to free up the spectrum space for a more consistently entertaining station.

Another early police electronic communications adopter sporting mnemonic calls was the short-lived WLAW. New York City's finest used 833 kilocycles to send communiqués to fellow officers on motorcycles equipped with portable receiving sets. It appears that Gotham's WLAW began in 1922 and was a goner by sometime in 1924. Case closed.

When the Federal Radio Commission (FRC) took the radio regulatory reins from the Commerce Department in 1927, it inherited a mish-mash police communication frequency assignment scheme that was attempting to migrate such traffic from the broadcast band (which then ended at 1500 kilocycles) to a precinct above this ever-expanding commercial clan. Reportedly, eight frequencies were allocated with the plan to assign them in checkerboard fashion to every police department in America. Of course, in the electronically cleaner air of the late 1920s, and especially after sunset when criminals typically prefer to do their dirty work, sky wave from the era's rooftop long wire antennas bounced these 50- to 1000-watt signals all over the country, confounding cops trying to catch their headquarters' commands on whom to collar.

FRC (and later Federal Communications Commission) officials heeded their colleagues' call and locked-up a bigger syndicate of sound for police use, reserving 1550 to 1750 and (later adding) 2300 to 2500 kilocycles in 8 kc slices. When 1510–1600 kc was tacked onto the burgeoning Broadcast Band in the 1930s, 1610 kc became police radio's new southern boundary.

It should be noted that until the late 1930s much of the traffic on police channels was one-way voice or dispatcher to car. In fact, several sources indicate that Morse code was the language of a few police departments' choice. Either way, the transmissions were designed to alert patrolling officers who then would pull over to the nearest police call box and ring their sergeant for details. A Wikipedia entry claims that constables in Victoria, Australia, were the first law enforcement types to use two-way radio. The online user-authored encyclopedia says this milestone occurred in 1923 with the sizable receive and transmit gear barely fitting onto the back seat of the Department's "wireless" patrol vehicles. Perhaps.

Internet author Jose Fritz provides a U.S.-based two-way police radio mile marker, reporting on the 1933 accomplishment of Bayonne, New Jersey's police department. He notes they "successfully operated a two-way system between a central fixed station and radio transceivers installed in police cars. The very high frequency system...operated in push-to-talk setup."

I'm not sure how high "very" was in 1933, and doubt it included the VHF one would now associate with frequency modulation, as Edwin H. Armstrong had then only recently unveiled his FM invention. My father recalls an old-time engineer/ham chuckle that anything above 2 MHz was once considered pretty useless for reliable transmission. That was probably a 1920s broadcast band bias, but considering that the FRC assigned experimental television stations (like W2XR owned by Radio Pictures Inc., of Long Island City, NY) to the 2000 kc neighborhood, among what it deemed the pointy attic of frequencies useful to domestic audiences, it's doubtful that Bayonne's boys in blue were FMing at 150 MHz.

Readers who want to delve further into the antique police radio culture should visit www.wb6nvh.com/motorola.htm. Among the fascinating equipment pictures and facts presented at this site is this explanation of frequency assignments during the AM public service communication era:

Police systems of the time broadcast on two ranges. State police, counties and highway patrol (and a few large metro areas) generally broadcast on the 1550–1750 Kilocycle band, while cities and small towns used the other band of 2300–2490 Kilocycles. In many areas, all local agencies other than state police shared the same frequency, which was often the one also used by the Highway Patrol, and thus there were small towns with systems on frequencies technically reserved for state police use. Frequencies were "coordinated" into geographic zones to minimize interference, but nighttime skip conditions had

become a severe problem by 1940. The Fire Radio Service was not created at the same time as the Police Radio Service and appeared some years later. At first, it was not thought necessary to have radios in fire engines! Those fire departments that did install radios did so by licensing them as mobile police radio stations, and shared the police dispatch system.

Motorola's Police Report

Readers who know their radio history will recognize the name Paul V. Galvin. He founded Motorola Corporation (originally Galvin Manufacturing Company) in the 1920s and, by 1930, was busy marketing a radio stable enough to work well in cars bouncing along the day's cement (and sometimes dirt) roads.

Galvin's people noticed that orders for their new Motorola (*motor* because of car *motor* and *ola* as in the old Victor Talking Machine Company's *Victrola* or RCA's *Radiola* trade name) began coming in from police departments that either had their own FRC-authorized transmitter or relied on the good graces of commercial stations to interrupt normal programming for a quick dispatch announcement directed to police officers listening in their cars. In some communities, this simple procedure lasted well into the 1970s.

(By way of a quick aside, my father remembers stopping at a service station in Kingman, Arizona—during summer 1973—when the attendant pumping gas, who was also listening to local KAAA 1230 KHz via a shirt pocket transistor, heard the DJ break into the music to issue a fire department call. The young man immediately abandoned his post in favor of volunteer fire department activity, leaving my dad to finish the fill-up.)

Galvin surveyed public service outfits regarding their radio use and quickly discovered that there could indeed be a market found by following the mobile communications avenue. The same year as his broadcast band Motorola was released, Galvin Manufacturing built its first mobile police radio receivers by adapting its Motorola consumer car radios, according to Motorola's informative website. The site also states that, "A police department would specify what frequency [in the 1610–2500 kc range] its radios should receive [and then assembly] line workers modified tuning coils and locked condensers by hand. They put police radio chassis into the same housing as consumer Motorola car radios."

Galvin's early law enforcement clients were in his firm's native Illinois, but soon came from all across the U.S. While they all sang the product's praises, some of the radio maker's most helpful customers provided feedback about Motorola performance with regard to "rough roads, engine noises, interference, high power consumption, and frequency instability." This prompted Galvin's engineers to develop a new mobile radio it dubbed the Motorola Police Cruiser. Introduced in 1936, this AM radio receiver covered from 1550–2800 kHz, featured a heavy-duty metal case, an improved speaker and circuitry, a stabilized crystal control for better tuning, and lower power consumption.

Motorola's historians like to point out that the company's regular radio business was so robust—even during the Great Depression—that a special shift was used to build police radios on weekends, when the factory was a bit quieter.

Though Dillinger's Tommy Gun could have caused the rugged 1936 Motorola AM Police receiver (squint hard and you'll see it pictured at left) a bit of static, it was much more bullet-proof than the typically home-brew/police department-built radios bouncing around in Depression-era public service vehicles. Our second postage stamp-sized image, on the right, comes from a vintage Motorola brochure and shows the control unit of the firm's new 1941 AM transceiver. The heart of such radios shared trunk space with a spare tire. You can almost hear that cop key his mic and tell the dispatcher back at base, "We got a suspect here who's in a heap of trouble."

"Back At You, Sarge"

While any police vehicle worth its wheels could legally travel up and down a one-way street, most police radio transmissions through the 1930s only went from dispatcher to car. As previously mentioned, patrolling officers' replies were the province of "police only" phone handsets, typically encased in small metal boxes affixed to telephone poles in strategic locations. Galvin's research led him to find a reliable path to add car-to-base communication to the crime fighting equation. Motorola's site says he "assigned his chief engineer, Don Mitchell, to develop a radio transmitter for the [police] car. In August 1939, Galvin Manufacturing introduced the Motorola model T6920 AM mobile transmitter, which broadcast in the 30–40 MHz range. A model P6912 receiver and base station equipment soon followed." The company credits Bowling Green, Kentucky's police department as the first buyer (in 1940) of this two-way AM gear, a line that was in production until FM technology replaced it in the late 1940s.

Some departments had switched to two-way FM as early as 1940. One of them, Connecticut's State Troopers, began using FM in Hartford that year. The IEEE engineering association website identifies University of Connecticut electrical engineering professor Daniel E. Noble as a major force in the development of FM two-way public service communications gear.

In 1939, the Commissioner of Connecticut's State Police sought Noble's help in ridding his force's radios of pesky static, fading fringe signals, and general interference. Nobel had first been directed to cure the Nutmeg State's one-way AM radio format, but Noble promised Connecticut's top cop that he could double the results and do so via static-free FM. My dad believes that Noble probably knew Major Armstrong personally and was likely also a compatriot of Franklin Doolittle, an FM devotee who founded the 1936 experimental "Apex" station that morphed into the original WDRC-FM Hartford, and now WHCN-FM, today considered to be the world's oldest FM broadcast operation.

According to the IEEE information, Noble had already designed two-way AM units and FM broadcast stations and melded this experience into "a circuit design and specifications, from which a practical unit was built by the chief engineer at the Fred M. Link Company. Noble

later said that the success of this system was due to choosing phase modulation, selecting proper station sites, using rooftop antennas on the [patrol] cars, and employing different transmitting frequencies for the base stations and mobile units." Interestingly, a photo (on the *www.ieee.org* page) showing Noble looking at a piece of his chassis-mounted two-way FM brainchild, is captioned with Motorola's courtesy and copyright. That's because Motorola was envious enough of the Noble/Link equipment to quickly hire Noble to help develop radios that would compete against those with the Link brand. In any event, the IEEE concludes that when the Noble/Link system "began operations at Hartford in 1940, [it] signaled the nationwide switch [of public service communications] from AM to FM."

Within a year of the Connecticut success, two-way FM further proved itself on the battlefield (most notably to/from the US Army's VHF walkie-talkies) and solidified FM's stature in the governmental radio two-way genre. By decade's end, FCC officials were sufficiently convinced of FM's adaptability that they mandated police radio's migration from AM and the 1610–2500 kilocycle zone to FM and the 30–50 megacycle VHF band. A second chunk of spectrum space in the 150–174 megacycle area was provided for police use after December 31, 1949.

In addition to the Commission's 1949 spectrum space decree—which grandfathered certain AM police operations until they sought upgrades in facilities—another change was the conversion (by 1950) of the old three and four letter public service callsigns to an alphanumeric system of station identification. Those three and four letter IDs, reasoned FCC regulators, would be needed for all of the new AM, FM, and TV stations sure to sprout up in post-war America.

A Rare Snapshot Of Police Radio's Transition

When my father got back to me with the fruits of his vintage police radio search, he knew one particular source would turn this month's column into a cornucopia of late 1940s/early 1950s cop communication tidbits. At a hamfest, he'd happened to overhear one Robert Knox admiring a nicely preserved Hallicrafters S-38 general coverage receiver (see more on this radio in this month's "Wireless Connection" elsewhere in this issue). Knox, a professor of physics emeritus with the University of Rochester, New York, holds the amateur call, W2IEW. He mentioned to Dad that he once had such a Hallicrafters, which he had used to DX Broadcast and AM Police Band signals from his boyhood home in Northern New Jersey.

My father convinced Professor Knox to email me his DX memoirs complete with a dial scan chart recreated from an old penciled-in dime store notebook that Knox thought might still be around somewhere. His generous promise, fulfilled herein, is a wonderful look at a long-past radio epoch. Of special interest are mentions of the Civil Air Patrol AM stations and some oddball outlets with "V" prefix calls, the letter that traditionally began the ID for many a broadcast station in the British Empire. Professor Knox shares the following musings about the memories that his look into dusty logbooks generated:

Sorting out my 150-meter police calls has been a great experience. It transported me in time. In Newton, New Jersey, from December 1946 through June 1953, I logged 2,955 stations at frequencies above 1600 kHz, most of them before fall 1949 when I left for college. Every type of station except civilian hams appears in the list; municipal and state police numbered 218 of the total.

While logging these stations I was also active in BCB DXing, which made me partial to the lower frequency bands (below 2500 kHz) where police activity was a large presence. The assigned frequencies were 1610, 1618...1730 (every 8 kHz); similarly from 2442 through 2490; and a few others ranging from 2366 to 2430. Numerous other services occupied the region, including Great Lakes ship-to-shore traffic, LORAN, and not the least the Civil Air Patrol, very active on 2374. This frequency is apparently still assigned to the CAP, according to a Web search, but probably seldom used.

From the beginning through winter 1949, police stations had standard alphabetic callsigns with infrequent single-digit numerical suffixes (examples: KFOJ, KFOJ2, the numbers representing subsidiary stations of the main authorization). This luxury even included a few police stations with three-letter calls (examples: WCK Detroit, KVP Dallas) and, in many cases, genuine acronyms (examples: WPDR Rochester, WSSC Spartanburg, South Carolina). Indeed, in these halcyon days ordinary three- and four-letter calls were relatively so plentiful that they were assigned to ships, utilities, commercial, SW broadcast, CAP, INS, and fixed airline stations.

Because of the limited number of such K and W calls (36,504), and the rapidly expanding communications scene, especially AM broadcasting, there was pressure on the supply, and alphanumeric calls were born. The first of these to appear in my log was KEA317 (formerly WAKC), Freehold, NJ, 2366 kHz, on 4/21/49.

It is well known that logging mediumwave broadcast stations during these years was a paradise because of excellent nighttime propagation with very few all-night stations. When I started I probably could have counted those on one hand. Consider, then, that it was even greater in the MW police bands, where brief transmissions made every channel essentially a totally free channel! The finest string of loggings I can find occurred during March 12–14, 1948—remember, this was from New Jersey—this list includes three CAP stations (asterisks):

March 12, 1948 (time is EST)
- 2414 WBSV Dyersburg TN 0432
- 2414 KGZA Fresno CA 0441
- 2414 KGZM El Paso TX 0453
- 2442 KGPX Denver CO 0457
- 2414 KAPH Stockton CA 0510
- 2450 KGHN Hutchinson KS 0511
- 2414 WQFV Augusta GA 0530

March 13, 1948
- 2430 KPAL Alexandria LA 0321
- 2430 WPGI Portsmouth OH 0326
- 2406 KGPW Salt Lake City UT 0329
- 2406 WRJP Brainerd MN 0330
- 2414 KAZF Visalia CA 0333
- 2414 WAKN Herkimer NY 2002
- 2490 WRAY Marion IN 2010
- 1706 VY5O Montreal PQ 2200
- 1626 KOSO Oklahoma City OK 2203
- 2374 WTML* Lansing MI 2245

March 14, 1948
- 2442 WPFX Palm Beach FL 0322
- 2414 KACS Bakersfield CA 0344
- 1682 KNFO Storm Lake IA 0356
- 1714 KHPR Houston TX 0401
- 1714 KVP Dallas TX 0404
- 1682 KGHO Des Moines IA 0412
- 2414 KEWB Hanford CA 0420
- 2414 KACN San Buenaventura CA 0423
- 2374 KONB* Omaha NE 1953
- 2374 KULR* Omaha NE 1954

These were not the only stations heard during these time periods—only the ones that had not been logged earlier.

Some four-letter calls persisted through at least 1949. The last one in my log appears on Dec. 23, 1949 (KHMP, Helena, MT, on 2406). My last new MW police station logging occurred on New Years Day 1951 (KIA809, Knoxville, TN on 2474).

I have no information on the stations beside that which appears in my logs. All sources of information have been lost or discarded except for one issue of a *White's Radio Log*. As I told your dad, Sid Huniwell, I was using a Hallicrafters S-38 for most loggings. Frequency readout was not optimal, so *White's* was an invaluable source for locations and exact frequencies. I sought verifications from very few of the stations because prepared cards were necessary and I was much too busy with schoolwork and the BCB.

While sifting out the police calls, I could not ignore the MW CAP activity in my log. I caught 185 of these, all nominally on 2374 kHz. Their operation was often rather ham radio-like, except that they made fairly brief transmissions. This is clear from the logging times, which are seldom more than a minute or two apart for a given QSO. At first the callsigns were standard four-letter (examples: WIAY, Tampa, and KXNB, Pueblo). When alphanumerics arrived, it appears that the operators tried to assist their colleagues in recognizing them, by appending part of their old four-letter call. I say this partly by inference, but my log occasionally tends to verify the connection. For example, "KCB304ZK," Southington, CT, was probably KCB304 and was noted to be the former WRZK.

Finally, in August 1948 there appeared several CAP stations with "pseudo calls" of the form "VP01" and "VP0AA" (for example, "VP02" Lockhaven, PA, and "VP0AT," Detroit). These stations had exactly the same type of traffic as the others and coexisted with them through the alphanumeric period.

I don't recall having any official list of the CAP stations. Since I have locations for many, they probably announced their city and state or mentioned them prominently in their transmissions. Correspondents helped with a lot of station data but I have no recollection that CAP was included.

If anyone has further details regarding the CAP AM outlets, "V" call stations, or would like to communicate with Professor Knox about vintage public service radio, feel free to email him at w2iew@yahoo.com.

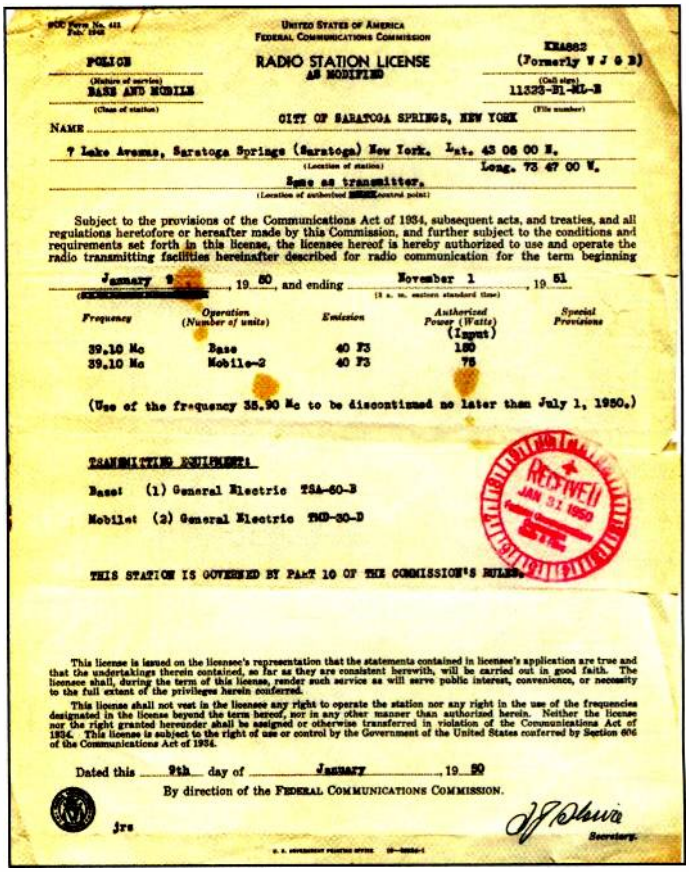
Radio Diehards, Mid-1960s Style

As an arrest that ends in a conviction does for a police officer, a spot-on article about the very last days of AM Police DX made my Dad very happy. His literature eureka was powerful enough to prompt him to convince my Mom that they really needed to take the five-hour drive to "surprise" me. He was hardly inside my door when he handed me a photocopy from the January 1966 edition of *Radio-TV Experimenter*. It held a brief but pertinent exposé by Tom Kneitel (later the founding editor of *Popular Communications*) entitled "DXing The Vanishing Breed."

Kneitel began by noting that circa 1948—when Bob Knox was avidly listening—some 700 American police base stations were licensed to operate just north of the AM Broadcast Band. This legion had dwindled down to about a hundred and he warned procrastinating DXers that this exclusive club would be getting exponentially smaller every year until it was suddenly dark.

"They still make fascinating listening," Kneitel assured his readers. "They can easily be heard throughout all of North America using no more than a fair receiver and a hunk of wire." The accomplished radio writer also noted that "most of them will QSL reception reports" especially if the DXer were to include a stamped/return-addressed card. Kneitel said he wouldn't be surprised if a number of enthusiastic DXers taking his suggestion to heart could log/receive verifications from every remaining AM police radio operation in America, a feat virtually implausible in any other FCC authorized service.

"The best time to listen for these stations," he instructed, "is late at night, especially in the winter months." Kneitel reiterated



UNITED STATES OF AMERICA
FEDERAL COMMUNICATIONS COMMISSION

RADIO STATION LICENSE
AS MODIFIED

KEA882
(Formerly WJGB)

POLICE
(Nature of service)
BASE AND MOBILE
(Class of station)
(Call sign)
11333-B1-ML-B
(File number)

NAME CITY OF SARATOGA SPRINGS, NEW YORK

7 Lake Avenue, Saratoga Springs (Saratoga) New York. Lat. 43 06 00 N.
(Location of station) Long. 73 47 00 W.

Same as transmitter.
(Location of authorized control point)

Subject to the provisions of the Communications Act of 1934, subsequent acts, and treaties, and all regulations heretofore or hereafter made by this Commission, and further subject to the conditions and requirements set forth in this license, the licensee hereof is hereby authorized to use and operate the radio transmitting facilities hereinafter described for radio communication for the term beginning

January 9, 1950 and ending November 1, 1951
(12 o. m. eastern standard time)

Frequency	Operation (Number of units)	Emission	Authorized Power (Watts) (Input)	Special Provisions
39.10 Mc	Base	40 F3	180	
39.10 Mc	Mobile-2	40 F3	75	

(Use of the frequency 35.90 Mc to be discontinued no later than July 1, 1950.)

TRANSMITTING EQUIPMENT:

Base: (1) General Electric TBA-60-B

Mobile: (2) General Electric TMD-30-B

THIS STATION IS GOVERNED BY PART 10 OF THE COMMISSION'S RULES.

RECEIVED JAN 31 1950 FCC

This license is issued on the licensee's representation that the statements contained in licensee's application are true and that the undertakings therein contained, so far as they are consistent herewith, will be carried out in good faith. The licensee shall, during the term of this license, render such service as will serve public interest, convenience, or necessity to the full extent of the privileges herein conferred.

This license shall not vest in the licensee any right to operate the station nor any right in the use of the frequencies designated in the license beyond the term hereof, nor in any other manner than authorized herein. Neither the license nor the right granted hereunder shall be assigned or otherwise transferred in violation of the Communications Act of 1934. This license is subject to the right of use or control by the Government of the United States conferred by Section 606 of the Communications Act of 1934.

Dated this 9th day of January 1950

By direction of the FEDERAL COMMUNICATIONS COMMISSION.

jrs

J. D. Silva
Secretary.

From a law enforcement agency in the stylish horse racing community of Saratoga, New York, comes this wonderful look into police radio's post-war call letters and band transition. Note the FCC's indication that Saratoga's police station calls have been changed from WJGB to KEA882 effective 1/1/50. That's when the Commission took back three- and four-letter IDs so that broadcast stations could use them. The exchange gave public service agencies alphanumerical combination callsigns. Also note that the police station's operating frequency was 39.10 megacycles and via FM, as opposed to the 1610–2500 kc range where most police transmissions had been prior to 1950.

that daytime police AM DX catches were futile. "Nothing happens until sunset," he explained. "The whole band swings right on through the night until dawn." He admonished impatient DXers, saying, "Just let your receiver sit on a single frequency for an hour or two. If you resist the temptation to tune away during a period of extended station inactivity or during some bursts of man made static, you will be able to log most of the stations on the channel in one or two sittings."

Almost half of the remaining AM Police outlets (by 1966) were in California. On 1610 kHz, for example, Golden State authorizations occupied the entire frequency (with no licensed Broadcast Band stations there yet), three in San Rafael (KMA224, KMA862, and KMG688), one in Napa (KMA5180), and another in Crescent City (KMA994). All were directed towards County Sheriff radios. The rest of the aging AM Police lot resided on 1618, 1626, 1634, 1658, 1682, 1690, 1706, 1714, 1722, 1730, 2366, 2382, 2414, 2422, 2442, 2466, and 2490 kHz. Holes in that 8-kHz spacing between each channel revealed the reality that the once-proud AM Police Band community was fast turning into a ghost town.

Kneitel issued a tongue-in-cheek warning that AM Police Band DXers would be subject to developing an affinity for one or two "old reliables on the band and will enjoy tuning them in on evenings when [one isn't] really in the mood to devote intense effort to breaking DX records." He admitted to liking easy catch KCA999 out of Concord, New Hampshire. The Granite State Police radio station (on 1682 KHz) went much further than ever required for statewide law enforcement, "packing a fantastic signal which has been regularly heard in Europe!"

A Radio Policeman's Personal Epilogue

Judy Stevenson hadn't said so in her initial email that got this vintage police radio article going, but her request wasn't mainly related to public service communications history. After thanking me for a manuscript proof copy of this month's column, she admitted it touched her heart for reasons other than kilocycles and ten-fours. Judy said the vivid memories rekindled of Ray's voice just above the old broadcast band are especially precious because they represent some of his last words to her.

Though he had every intention of keying the squad car microphone for years to come, World War II's call to arms intervened. Barely a year after becoming a cop, Ray was drafted by the U.S. Army and sent to the Pacific Theater. In late 1942, he was listed as missing in action. Nothing more was ever heard from him.

Judy still has that original Philco radio in her kitchen. Sometimes, in the wee small hours when she cannot sleep, she'll switch it on in the dark. The soft glow through the yellowed dial prompts her to close her eyes and once more hear the sound of Ray's caring admonition breaking through the fleeting heterodynes of a blank spot in what is now the extended broadcast band. "It's time for my little sis to be safely in the custody of her bed," Judy imagines him announcing...and then she's finally able to drift off to sleep.

And so ends another day of broadcast history at *Pop'Comm*... ■

Making Contact—The Antenna Is The Key, Part 2

by Tomas Hood,
NW7US, nw7us@arrl.net

Last month, we explored a critical component of the radio circuit of which we have direct control: the antenna. This month we continue our discussion of the antenna from the perspective of a ham radio operator, but the principles apply to the shortwave radio listener, too. Since we're talking about transmitting a signal that we hope reaches a targeted receiver, the amateur radio station is a good example in our discussion.

The question posed last month is, "How do we make our HF ham stations work more effectively?" To answer that question, we must understand the radio system in its entirety.

Selecting your antenna is perhaps the most difficult task in constructing a ham station. And yet, antenna type, site, and gain variations can influence station performance more than any other parameter. Let's take a look.

Antennas In System Simulations

One can build an entire hobby around studying different antenna models. It's fun and instructive, and there are a lot of models to look at. Why do we do it? Well, we might want to see how effective our existing antenna is. Or, we might be considering another antenna, and modeling it in software as a "try-before-buy" method that doesn't cost much.

Last month's discussion relied on the ACE-HF PRO software (http://hfradio.org/ace-hf), because we're interested in simulating our HF system to find best frequencies, to determine our coverage areas, and to optimize our operation in general. ACE-HF PRO allows us to easily compare models and arrive at the best model for our needs. Having the correct antenna model is key to all those needs.

For example, **Figure 1** shows the radiation pattern charts for a 10-meter OptiBeam three-stack Yagi Array with a gain of 19.6 dBi at 4 degrees elevation. The Yagis of the stack are set at 150, 100, and 50 feet above ground and rotate together to specified azimuths.

This antenna has a very high directional gain and the main beam is set at a low elevation angle. It also has an exceptional beamwidth (the angular azimuthal width of the pattern at the –3-dB points) of nearly 60 degrees. This antenna is ideally suited for worldwide DX operation.

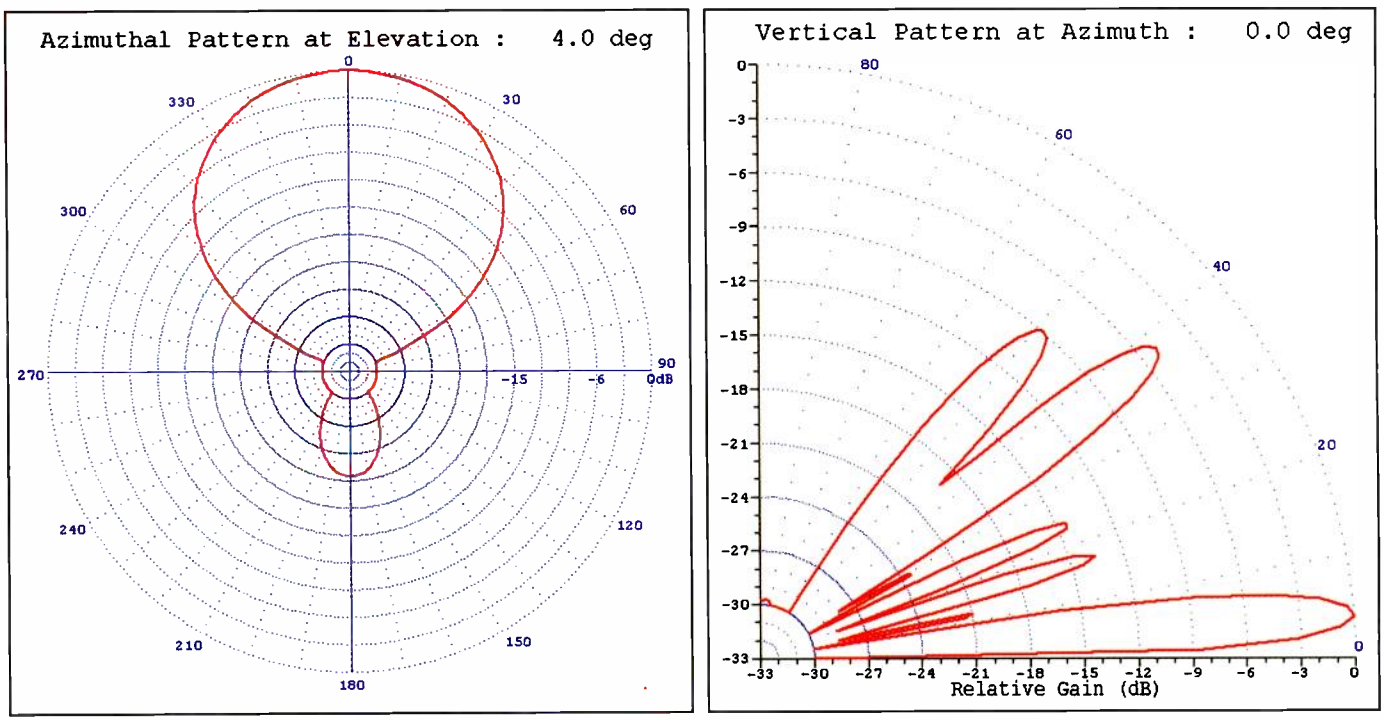


Figure 1. 10-meter OptiBeam Yagi stack antenna at 28.4 MHz.

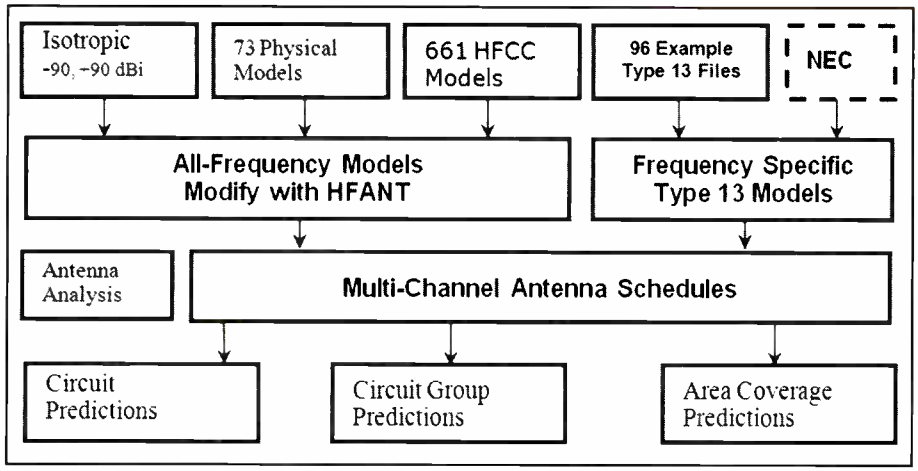


Figure 2. Antenna modeling methods.

ACE-HF PRO comes with more than 800 different antenna models, and many of these may be modified using the HFANT program, which lets you create, manipulate, and save antenna data. **Figure 2** shows how those models are used in the software.

When modeling a circuit between your station and the station at the far end, you need to select the type of antenna being used at the far end. If nothing else is known about a contact's antenna, use an isotropic antenna with an assumed gain. If the antennas are of common types, you can use physical (i.e. mathematical) models that may be modified using HFANT. More accurate models may be made using NEC[1] software such as NEC Win PLUS+, and saved as ACE-HF Type 13 gain-table files. Type 13 files are frequency-specific, and for best accuracy a separate file should be generated for each frequency. ACE-HF automatically runs 10 frequencies for each prediction. When separate Type 13 files are used, they may be individually specified for different bands with user-made multi-channel antenna schedule files.

1. Numerical Electromagnetic Code (NEC) software was created by Laurence Livermore Laboratories to model very complex antenna structures and their surroundings by dimensionally specifying each antenna wire and structure using method-of-moments computations. Each wire within the antenna design is specified by the physical (XYZ) location of each end, and a line is drawn between the two ends to represent an antenna element. The process is repeated until all antenna elements and surrounding surfaces are described and computations then proceed. The resulting NEC model may then be analyzed vs. frequency. Common output parameters include both vertical and elevation patterns, gain values at each vertical and elevation angle, antenna input impedances and VSWRs.

Don't worry about all those complex pattern lobes and nulls when you make a system simulation. ACE-HF will account for them automatically, and will compute the right signal strength at the receiver.

Optimizing Antenna Launch Angles

A special ACE-HF chart may be used to be sure your antenna is appropriate for a particular circuit. For maximum effectiveness, the launch (take-off) angle of your antenna's main beam should coincide with the elevation angle of the Most Reliable Mode (MRM) of the propagation path. An example chart is shown in **Figure 3**, where I analyzed a circuit from my station while living near Seattle to Denver, Colorado.

There is a wealth of information in such analysis charts. The circuit path is shown at the top, along with the antennas that were selected at both ends of the circuit. The antenna azimuth settings are given next, along with the circuit distance. The range of the MRM elevation angles throughout a 24-hour day is also given, together with the directivity gain (G_{max}) and the elevation angle at G_{max}.

This Figure compares the elevation angle range (in green) of the MRM versus the antenna's main beam launch angle (in red) at 7.0 MHz. It's surprising how much insight you can gain when the chart is animated through the 2–30 MHz frequency range.

Type 13 Antenna Model Analysis For Accurate System Simulation

Although mathematical antenna models are easy to modify and use, the most

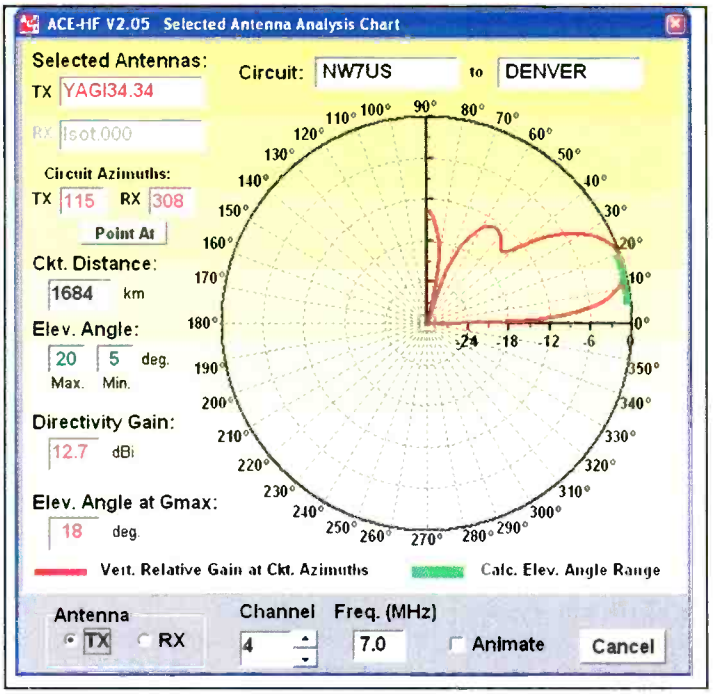


Figure 3. 40-meter Yagi launch vs. MRM elevation angles.

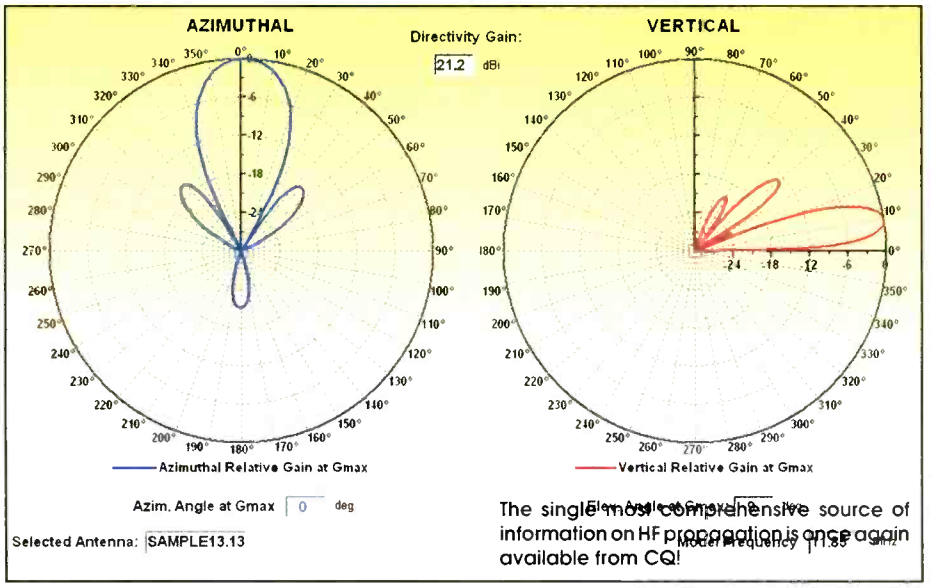


Figure 4. HF curtain array antenna for 11.85 MHz.

accurate system simulations result when NEC Type 13 models are employed. Mathematical models are somewhat generic, and it would be nearly impossible to generate such models for every conceivable case. NEC models, on the other hand, can be tailored by the user for his particular situation. As a simple example, perhaps a ham erects a simple long-wire antenna having a dogleg and sloping down from a treetop to his house. Such an unusual arrangement would be unlikely to be found in the model list; a custom antenna model is needed and a Type 13 file could be produced.

ACE-HF contains a special set of charts to illustrate patterns from Type 13 antenna models. Patterns for a *really good* directional antenna, the Sample 13.13 model included with the software, are shown in **Figure 4**. This model is for a large fixed antenna used in HF broadcasting and is a periodic dipole array with a reflecting curtain, mounted vertically and suspended between towers. The array consists of four rows of elements in four stacks mounted 0.5 wavelength high. Phased feeds to various elements can slew the main beam to different azimuths although the antenna is fixed.

This example is shown to suggest what beautiful and well-controlled patterns you can achieve when the antenna design is complex (compare it with the Yagi Array in Figure 1). It's unlikely that an amateur operator would erect such a huge array, but wouldn't it be fun?[2]

The ACE-HF chart shows a directivity gain of 21.2 dBi at an elevation angle of 9 degrees for this antenna. A set of 1-MHz interval gain-table files is included with the ACE-HF PRO V2.05 installation CD. The selected antenna was a terminated folded-dipole antenna. 50 feet long and elevated 15 meters above ground. **Figure 5** shows a sampling of these Type 13 analysis charts in 4-MHz steps. (In the software, the series can be animated in 1-MHz steps from 2 through 30 MHz.)

While these charts are fascinating, each pair still represents a single slice through our imaginary antenna balloon. Wouldn't it be nice if we could create a three-dimensional figure, as we did in our

2. I have a friend who worked years ago for Continental Electronics, the maker of large HF broadcast transmitters. They had a curtain array for testing purposes, and some of the ham employees made worldwide contacts driving the curtain with a keyed grid-dip meter!

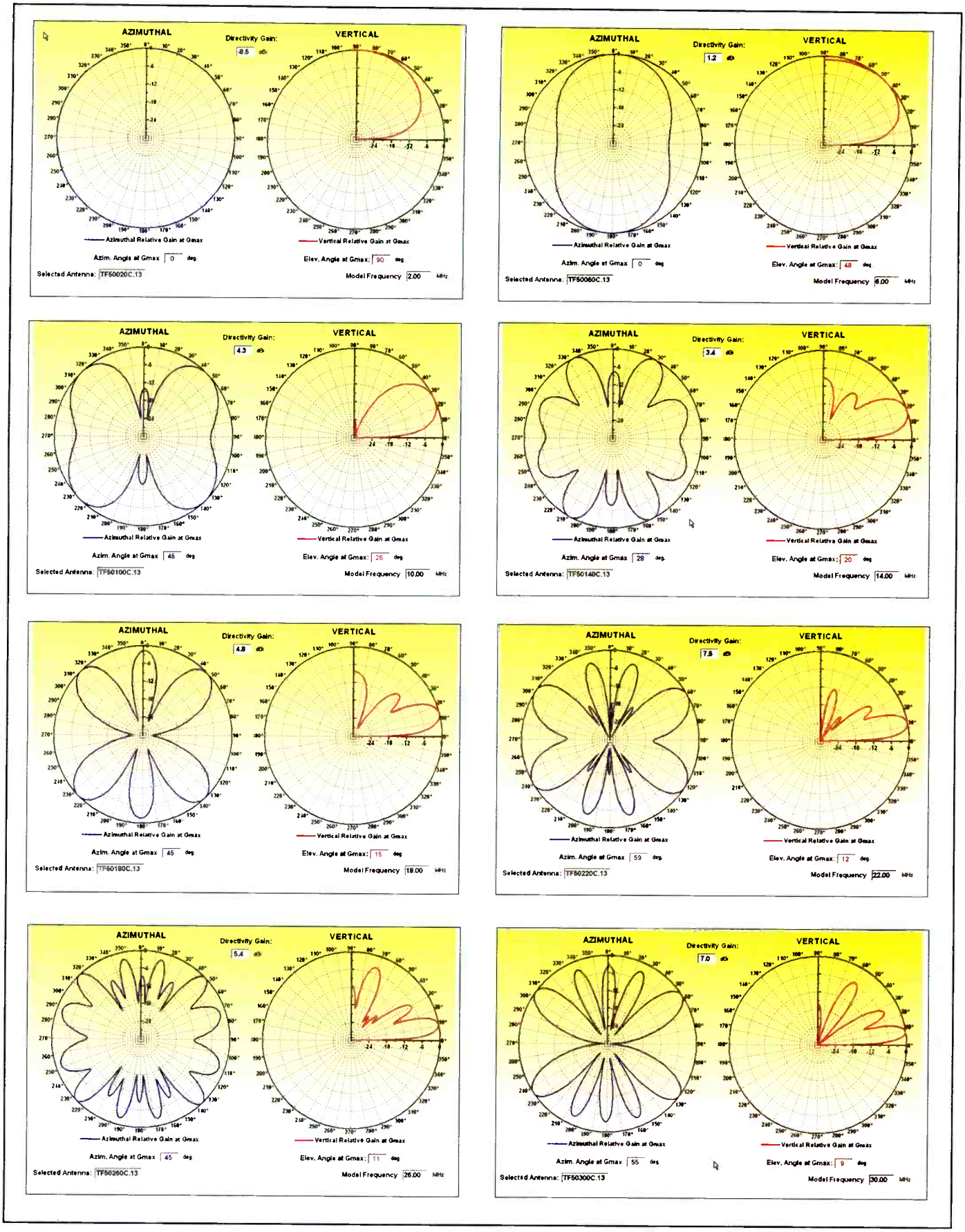


Figure 5. Terminated folded dipole antenna at 2–30 MHz. (See my website at http://podcast.hfradio.org for larger versions of these images.)

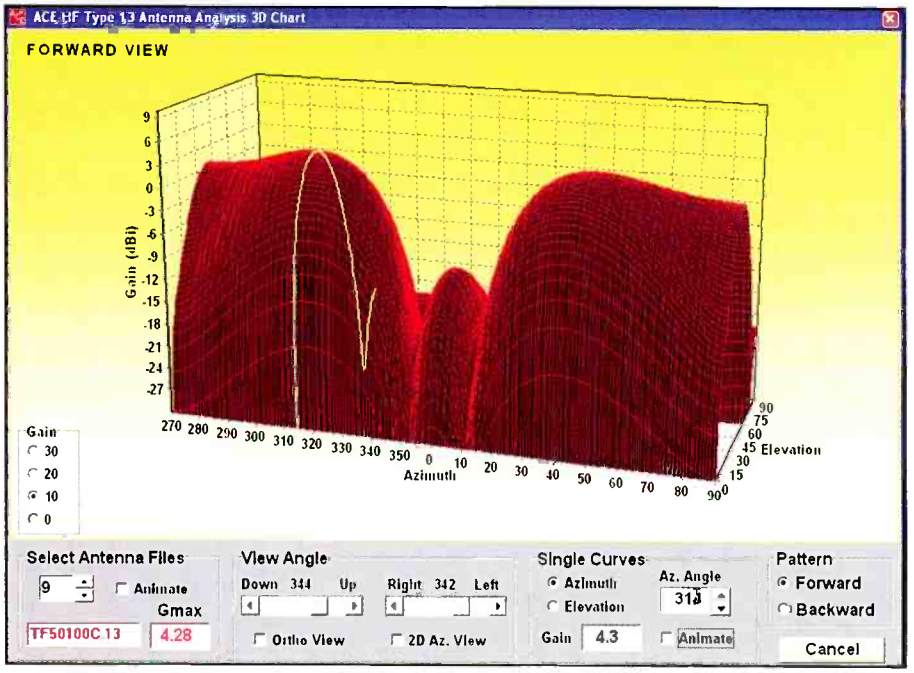


Figure 6. 3D chart of TF dipole antenna at 10 MHz.

gedanken experiment (see last month's column)?

3D Antenna Charts

For centuries, cartographers have sought to illustrate a three-dimensional, spherical globe on two-dimensional paper (see "The Round Earth on Flat Paper," National Geographic Society, 1947). People have struggled with various projections, but it seemed there was always some distortion, some *stretching* of the land, that made the maps look strange.

The ACE-HF folks struggled with the same problem in considering antenna charts, and it would be great if we could have a 3D spherical antenna chart that would visualize our gedanken experiment. On the flat computer screen, as on the paper of this article, a compromise was reached. **Figures 6** and **7** show three-dimensional charts for two of the antennas discussed, from the ACE-HF PRO V2.05 software.

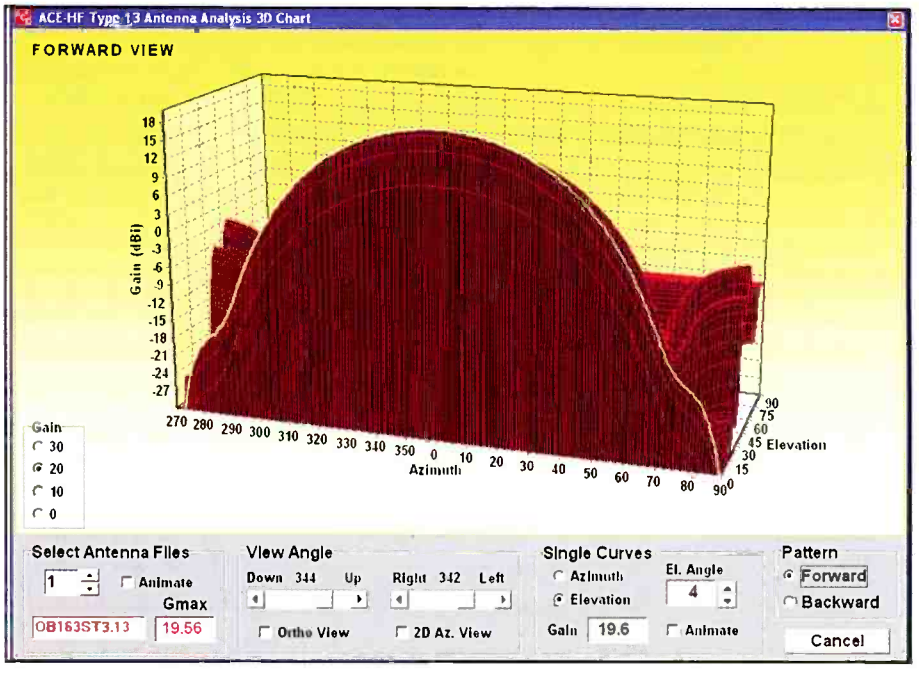


Figure 7. 3D chart of OptiBeam Yagi stack at 28.4 MHz.

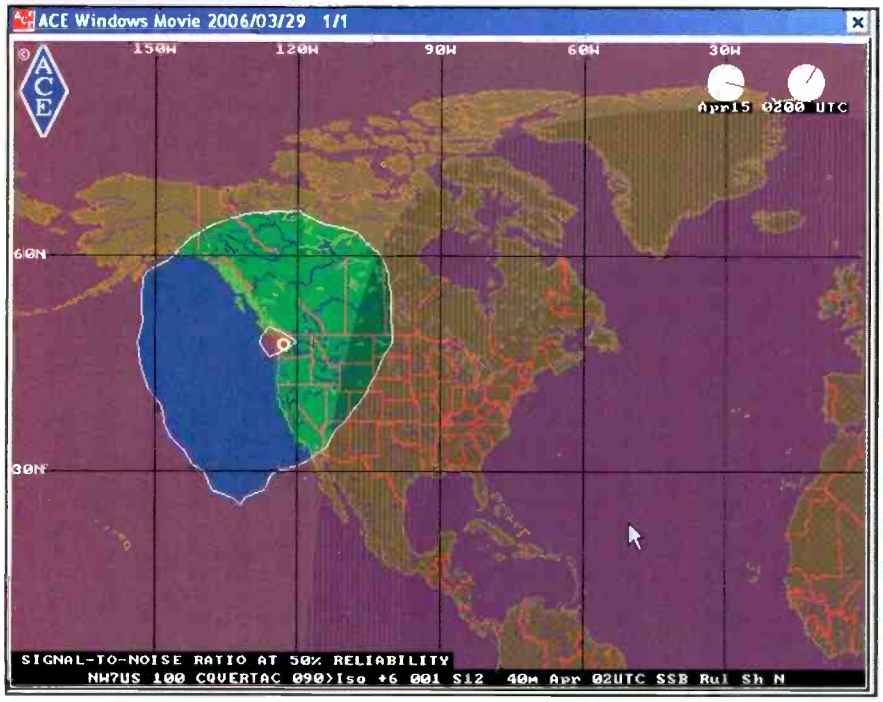


Figure 8. NW7US 40-meter coverage with quarterwave vertical.

The 3D charts are lots of fun to play with. You can change the viewing angle, show different projections, and even shift between forward and backward antenna patterns. And you can animate a single *slice* through the figure as a function of azimuth or elevation angle. In Figure 6, the yellow line shows the slice at 314 degrees azimuth where G_{max} of 4.3 dBi occurs at the top of the diagram. In Figure 7, the yellow line shows the G_{max} slice at an elevation of 4 degrees.

The Bottom Line

I can guarantee that once you play with all these charts, you'll be a lot smarter about antennas. But the bottom line—the question behind these efforts—concerns the effectiveness of our radio stations. To answer that question, I ran ACE-HF area coverage maps for my previous station in Brinnon, Washington, to see how different antennas would affect my communications range. **Figure 8** shows 40-meter coverage at 02 UTC from a quarter-wave vertical monopole, while **Figure 9** shows coverage from a two-stack array of four-element Yagis mounted at 75 and 125 feet above ground, pointed at a 90-degree azimuth angle. The conclusions are obvious, and just wait until you animate these maps through 24 hours with the ACE MOVIE program!

Have I learned anything from my analysis? Yes! Do I want a new antenna? You bet! Once you discover the right antenna by using the modeling features of ACE-HF, you can spend the time to construct the antenna, and then be armed for success.

HF Propagation For October

A change in propagation conditions in the Northern Hemisphere can be observed as we move away from the long sunlit days of summer into the longer hours of winter's darkness. With the shorter period of sunlight each day, the ionosphere has more time during the dark hours to lose the energy created during daylight hours. This affects the propagation of radio signals by lowering the Maximum Usable Frequency (MUF) over many areas of the Earth. However, the change in the length of daily darkness is not the only influence on the propagation of radio waves through the atmosphere. The amount and strength of radiation arriving and passing through our atmosphere varies from season to season, as well as from the solar cycle minimum to the solar cycle maximum.

During the Northern Hemisphere's winter months, the Earth is closer to the sun than during any other time of its orbit. This makes the daytime ionization more intense than that of summer daytimes. In turn, this higher-level energy during the day causes the average MUF to increase slightly as compared to the same time of day during the summer season, over the same radio signal path.

Then, with the longer winter hours of darkness, the ionosphere has more time to lose its electrical charge. This causes the MUF to dip lower at night than during the summer months.

These conditions cause a wide daily variation in the maximum frequency that can be propagated by refraction of the radio waves by the wintertime ionosphere. Many radio enthusiasts celebrate the arrival of the winter shortwave season for these reasons.

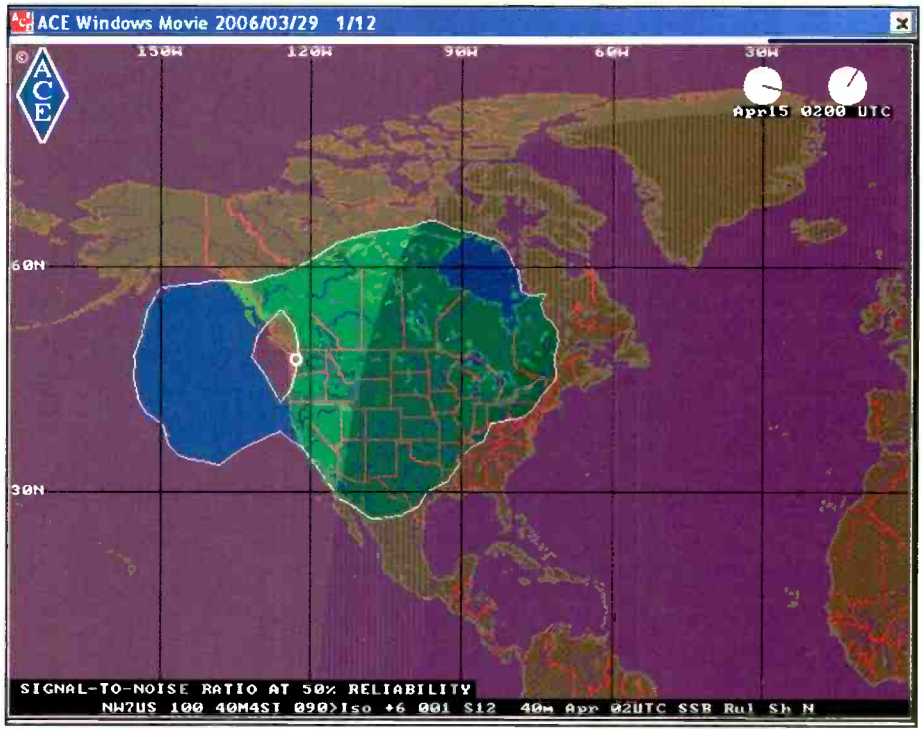


Figure 9. NW7US 40-meter coverage with two-stack Yagi array.

Optimum Working Frequencies (MHz) - For October 2009- Flux = 71, Created by NW7US

UTC TO/FROM US WEST COAST	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CARIBBEAN	19	17	14	12	11	11	10	10	9	9	9	9	9	12	16	18	20	20	21	21	21	21	21	20
NORTHERN SOUTH AMERICA	26	24	21	18	16	15	14	14	13	13	12	12	12	11	20	22	24	25	27	27	28	28	28	27
CENTRAL SOUTH AMERICA	26	24	20	16	15	15	14	13	13	12	12	12	12	14	22	23	25	26	26	27	27	28	27	27
SOUTHERN SOUTH AMERICA	28	26	24	20	19	17	16	15	14	14	13	13	12	12	17	22	25	26	27	28	28	29	29	29
WESTERN EUROPE	9	8	8	8	8	8	8	8	8	8	8	8	8	10	14	15	16	16	15	14	13	11	9	9
EASTERN EUROPE	8	8	8	8	8	9	9	8	8	8	8	8	8	8	12	13	12	12	11	11	9	8	8	8
EASTERN NORTH AMERICA	21	19	14	12	12	11	11	10	10	10	10	10	9	15	19	21	22	23	23	23	23	23	23	22
CENTRAL NORTH AMERICA	12	11	10	7	7	6	6	6	6	5	5	5	5	5	9	11	12	12	13	13	13	13	13	12
WESTERN NORTH AMERICA	6	6	6	5	3	3	3	3	3	3	3	2	2	2	2	5	6	6	6	7	7	7	7	7
SOUTHERN NORTH AMERICA	20	19	17	12	12	11	10	10	10	9	9	9	9	9	15	18	20	21	21	22	22	22	22	21
HAWAII	19	18	18	17	15	12	11	10	10	9	9	8	8	8	8	8	11	14	16	17	18	19	19	19
NORTHERN AFRICA	9	8	8	8	8	8	8	8	8	8	8	8	8	12	14	16	16	17	16	14	10	10	9	9
CENTRAL AFRICA	11	11	11	10	9	9	9	8	8	8	8	8	8	11	14	15	16	17	17	15	14	13	12	12
SOUTH AFRICA	18	17	12	11	11	11	10	10	10	9	9	9	9	15	18	20	21	22	22	22	22	22	21	20
MIDDLE EAST	8	8	8	8	8	9	9	8	8	8	8	8	8	8	13	14	15	14	10	10	9	9	9	8
JAPAN	18	18	17	16	15	13	10	9	9	9	8	8	8	8	8	8	8	8	8	8	13	15	17	18
CENTRAL ASIA	18	18	17	16	15	13	10	9	9	9	8	8	8	8	8	8	9	11	10	10	10	10	17	18
INDIA	12	12	12	12	11	9	9	8	8	8	8	8	8	8	7	8	8	9	10	11	11	11	12	12
THAILAND	18	17	17	16	15	13	10	9	9	9	8	8	8	8	8	8	11	12	12	11	11	11	10	14
AUSTRALIA	24	25	26	25	23	18	16	15	14	13	13	12	12	12	12	11	15	15	14	13	16	18	20	22
CHINA	17	17	17	16	14	12	10	9	9	9	8	8	8	8	8	8	8	8	8	8	8	8	12	15
SOUTH PACIFIC	27	28	27	25	23	19	18	16	15	14	14	13	13	12	12	12	14	14	16	19	21	23	25	26

UTC TO/FROM US MIDWEST	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CARIBBEAN	21	18	16	15	14	13	12	12	11	11	10	10	12	18	20	22	23	24	25	25	25	24	24	23
NORTHERN SOUTH AMERICA	24	22	19	18	16	15	14	13	13	12	12	11	11	16	19	21	23	24	25	26	26	26	26	25
CENTRAL SOUTH AMERICA	25	22	19	18	17	16	15	14	13	13	12	12	15	20	22	24	25	26	26	27	27	28	27	27
SOUTHERN SOUTH AMERICA	27	25	22	21	19	18	16	15	14	14	13	13	12	17	22	24	25	26	27	28	28	29	29	28
WESTERN EUROPE	9	8	8	8	8	8	8	8	8	8	8	8	13	15	16	17	17	17	16	15	14	12	9	9
EASTERN EUROPE	8	8	8	8	8	8	8	8	8	8	8	8	11	14	15	15	14	14	13	12	11	9	9	8
EASTERN NORTH AMERICA	14	12	9	9	8	8	8	7	7	7	7	7	8	13	15	16	17	17	17	17	17	17	16	15
CENTRAL NORTH AMERICA	7	6	5	4	4	3	3	3	3	3	3	3	3	5	6	7	7	8	8	8	8	8	8	7
WESTERN NORTH AMERICA	12	11	10	7	7	6	6	6	6	6	5	5	5	5	9	11	12	12	13	13	13	13	13	13
SOUTHERN NORTH AMERICA	14	13	10	9	8	8	8	7	7	7	6	6	6	9	12	13	14	15	15	16	16	15	15	15
HAWAII	21	20	19	17	13	12	11	11	10	10	10	9	9	9	9	9	13	17	19	21	22	22	22	22
NORTHERN AFRICA	11	10	10	9	9	9	8	8	8	8	8	8	14	16	17	18	18	19	19	19	14	12	12	11
CENTRAL AFRICA	12	10	10	9	9	9	8	8	8	8	8	8	14	16	17	18	18	18	19	17	15	14	13	13
SOUTH AFRICA	18	16	15	14	13	13	12	12	12	12	11	11	21	24	26	27	28	28	28	27	26	24	22	20
MIDDLE EAST	8	8	8	8	8	9	8	8	8	8	8	8	13	15	16	17	17	15	11	10	9	9	9	8
JAPAN	17	17	15	14	10	10	9	9	9	8	8	8	8	8	8	8	8	8	8	8	12	15	17	18
CENTRAL ASIA	17	16	15	13	10	9	9	9	8	8	8	8	8	8	8	11	11	10	10	10	10	10	17	18
INDIA	11	12	12	9	9	9	8	8	8	8	8	8	8	11	13	12	11	10	8	8	8	8	8	8
THAILAND	17	16	14	12	10	9	9	9	8	8	8	8	8	8	11	14	13	12	12	11	11	10	10	13
AUSTRALIA	24	25	24	22	16	15	14	14	13	13	12	12	12	12	11	16	15	15	14	13	16	19	21	22
CHINA	16	16	14	12	10	9	9	9	8	8	8	8	8	8	9	9	8	8	8	8	8	8	11	14
SOUTH PACIFIC	28	27	25	22	19	18	16	15	15	14	13	13	12	12	13	15	14	14	18	20	23	24	26	27

UTC TO/FROM US EAST COAST	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CARIBBEAN	17	15	14	12	12	11	10	10	9	9	9	8	13	16	17	18	19	20	20	20	20	20	19	18
NORTHERN SOUTH AMERICA	21	20	18	17	15	14	13	12	12	11	11	10	13	16	18	20	21	22	23	23	23	23	23	22
CENTRAL SOUTH AMERICA	25	23	21	19	18	16	15	14	14	13	13	15	19	21	22	24	25	26	26	27	27	27	27	27
SOUTHERN SOUTH AMERICA	27	25	22	21	19	18	16	15	14	14	13	13	17	20	22	24	25	26	27	28	28	29	29	28
WESTERN EUROPE	8	8	8	8	8	7	7	7	7	7	10	14	15	16	17	17	17	17	16	15	14	11	9	9
EASTERN EUROPE	8	8	8	8	8	8	8	8	8	8	8	14	15	16	16	16	16	15	14	13	11	9	9	9
EASTERN NORTH AMERICA	6	5	4	4	4	4	3	3	3	3	3	3	6	7	8	8	8	8	8	8	8	8	8	7
CENTRAL NORTH AMERICA	15	12	9	9	9	8	8	8	8	7	7	7	9	14	16	17	17	18	18	18	18	18	17	16
WESTERN NORTH AMERICA	21	19	14	12	12	11	11	10	10	10	10	10	10	15	19	21	22	23	23	24	24	23	23	22
SOUTHERN NORTH AMERICA	16	14	12	11	10	10	9	9	9	8	8	8	9	14	16	18	19	19	19	20	19	19	19	18
HAWAII	21	19	15	13	12	12	11	11	10	10	10	10	10	11	11	10	15	19	21	23	24	24	23	23
NORTHERN AFRICA	11	11	11	10	10	10	10	10	10	10	15	19	21	22	23	24	24	23	21	20	16	13	13	12
CENTRAL AFRICA	12	12	11	11	10	10	10	10	10	10	15	19	21	22	23	24	24	23	21	19	17	16	14	13
SOUTH AFRICA	18	17	16	15	14	14	13	13	13	12	14	21	24	26	27	28	28	28	28	28	26	24	22	20
MIDDLE EAST	10	9	9	9	9	8	8	8	8	8	12	15	17	18	18	19	19	19	16	12	12	11	11	11
JAPAN	15	13	10	9	9	9	9	8	8	8	8	8	8	9	9	8	8	8	8	8	10	14	16	17
CENTRAL ASIA	15	12	10	9	9	9	8	8	8	8	8	8	11	12	11	11	11	10	10	10	10	10	15	16
INDIA	8	8	8	9	9	8	8	8	8	8	8	11	12	12	12	12	12	11	11	11	10	9	8	8
THAILAND	13	10	9	9	9	8	8	8	8	8	8	8	14	15	15	14	13	12	12	11	11	10	10	10
AUSTRALIA	24	23	19	17	16	15	14	13	13	12	12	12	12	17	18	16	15	14	14	14	17	19	21	23
CHINA	14	10	10	9	9	9	8	8	8	8	8	8	10	10	9	9	9	8	8	8	8	8	8	13
SOUTH PACIFIC	27	25	22	20	18	17	16	15	14	14	13	13	12	17	16	15	14	16	19	22	24	26	27	28

Signals below 120 meters are improving, with nighttime paths growing larger in the Northern Hemisphere. Seasonal static, which makes it difficult to hear weak DX signals, is starting to decrease as we move into winter. Expect a few DX openings during the hours of darkness and into the sunrise period. These openings will often be weak due to the relatively high signal absorption during the expected elevated geomagnetic storminess through the rest of this year. Look for openings from Europe and the south if you're listening in the eastern half of the United States, and from the south, the Far East, Australasia, and the South Pacific if you're in the western half of the country. The best propagation aid is a set of sunrise and sunset curves, since DX signals tend to peak when it is local sunrise at the easterly end of the path in question. A good Internet website featuring a grey line map display is found at www.fourmilab.to/earthview/. Follow the link, "map of the Earth" showing the day and night regions.

Seventy-five through 120 meters are coming alive in late October. Expect long-range DX on the low bands, starting close in right after sunset, and extending farther as the night develops. Signals here should peak from Europe and from a generally easterly direction around midnight. DX paths will move farther west through the night. By morning, openings from Asia should be common. For openings in a generally western direction, expect a peak just after sunrise. The band should remain open from the south throughout most of the night. Propagation in this band is quite similar to that expected on 41 meters, except that signals will be somewhat weaker on the average, noise levels will be a bit higher, and the period for band openings in a particular direction will be a bit shorter.

Forty-one meters should be the hottest DX band during the dark hours as the seasonal static levels are lower than they were during the summer. The band should be open first for European DX in the eastern United States during the late afternoon. Signals should increase in intensity as darkness approaches. During the hours of darkness, expect good DX openings from most areas of the world. Signals should peak from an easterly direction about midnight, and from a westerly direction just after sunrise. Excellent openings toward the south should be possible throughout most of the nighttime period.

Paths on 31 through 19 meters are becoming ever more reliable between North America and Europe in the morning and between North America and Asia during the late afternoon hours. The strongest openings occur for a few hours after sunrise and during the sunset hours.

Thirty-one and 25 meters will often remain open into many areas late into the night and will open early in the morning, especially when part of the propagation path moves through sunlit regions. However, these bands are crowded and signals are usually very strong and steady. Twenty-five meters is expected to be an excellent band for medium distance (500 to 1,500 miles) reception during the daylight hours. Longer distance reception (up to 2,000 to 3,000 miles) should be possible for an hour or two after local sunrise, and again during the late afternoon and early evening. Thirty-one meters will provide medium distance daytime reception ranging between 400 and 1,200 miles.

Twenty-two through 19 meters compete with 16 for the best daytime DX band during October. They will open for DX just before sunrise and should remain open from all directions throughout the day, with a peak in the afternoon. Nighttime conditions will favor openings from the south and tropical areas. Since the Southern Hemisphere has long daylight hours, DX paths on these bands from stations in the south will be common.

Sixteen through 13 meters will occasionally open through October when flux levels reach above 100. Paths from Europe and the South Pacific as well as from Asia, at least during days of higher solar flux levels, are common, especially on 16 meters. Look for best conditions from Europe and the northeast before noon and from the rest of the world during the afternoon hours. Reception from the South Pacific, Australia, New Zealand, and the Far East should be possible well into the early evening.

VHF Conditions

Conditions during October should include moderate levels of trans-equatorial propagation (TE) in which stations in the southern states and parts of the Caribbean will be able to work into the northern areas of South America during the late afternoon. During peak years of a solar cycle, October is one of the best months for TE activity, especially later in the month. Since we are in the decline from the current Solar Cycle's peak, these openings will be rarer than previous years, but some exciting openings might occur.

While sporadic-*E* activity is sparse during October in the northern Temperate Zone (where much of the U.S. is located), there is some possibility of extended tropospheric propagation conditions during October because of the changing weather patterns. Higher VHF is the best frequency range to watch for this.

Current Solar Cycle Progress

The Royal Observatory of Belgium reports that the monthly mean observed sunspot number for June 2009 is 2.6. The lowest daily sunspot value recorded was zero (0) on June 6–20, and 25–30. The highest daily sunspot count was 11 on June 1 and June 2. The 12-month running smoothed sunspot number centered on December 2008 is 1.7. A smoothed sunspot count of 11, give or take 9 points, is expected for October 2009.

The Dominion Radio Astrophysical Observatory at Penticton, BC, Canada, reports a 10.7-cm observed monthly mean solar flux of 68.6 for June 2009. The 12-month smoothed 10.7-cm flux centered on December 2008 is 68.5. The predicted smoothed 10.7-cm solar flux for October 2009 is 71, give or take about 8 points.

The observed monthly mean planetary A-Index (A_p) for June 2009 is 5. The 12-month smoothed A_p index centered on December 2008 is 4.9. Expect the overall geomagnetic activity to vary between quiet to minor storm levels during most days in October.

I'd Like To Hear From You

Would you like to hear a weekly podcast about space weather and radio propagation? Check out http://podcast.hfradio.org for the "NW7US Space Weather and Radio Propagation Podcast" produced by this author. Additionally, if you're on Facebook, check out the Radio Propagation and Space Weather Group at http://tinyurl.com/fb-spacewx. As usual, I invite you to visit my online propagation resource at http://propagation.hfradio.org/, where you can get the latest space data, forecasts, and more, all in an organized manner. If you have a cell phone with Internet capabilities, try http://wap.hfradio.org/.

Drop me an email or send me a letter if you have questions or topics you would like to see me explore in this column. And, I'd love to hear any feedback you might have on what I've written. Until next month, 73, de Tomas, NW7US

Ellsworth Air Force Base: Military Might Tucked Into The Black Hills

by Mark Meece, N8ICW
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Not many radio hobbyists would think of western South Dakota as a hot bed of military activity. And perhaps hot bed *is* a bit too strong of a phrase to use, but there's more to see and listen to in the Black Hills than you probably realize.

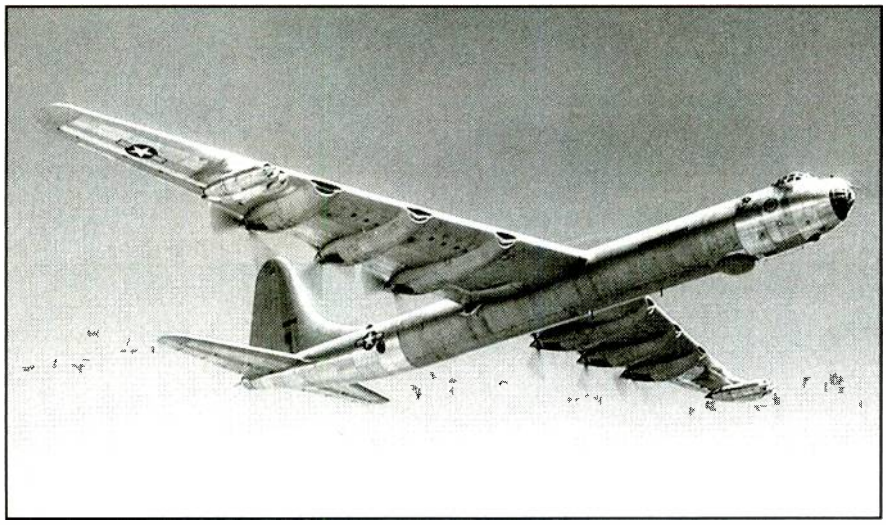
The Lakota Indians named this mountainous area the Black Hills (Pahá Sápa in their language) because of the dark color the abundant trees gave the mountainsides from a distance.

The Black Hills themselves are a bit of a geographical oddity, a small, isolated mountain range suddenly rising from the Great Plains. On the eastern slope of this range, about seven miles from the center of Rapid City, rises a manmade formation: Ellsworth Air Force Base, the focus of this issue's column.

Early History

Less than one month after the bombing of Pearl Harbor, the U.S. War Department laid the ground work for Rapid City Army Air Base. This loca-

Ellsworth AFB Main Gate. (Public domain photo)



B-36 Peacemaker in flight. (Public domain photo)

tion was set up as a training facility for crews flying the B-17 Flying Fortress. In September of 1942 the runways were opened for operation, and thousands of pilots, navigators, radio operators and gunners were taught by the instructors based at Rapid City AAB. This included crews from nine heavy bombardment units and various smaller units. Following the conclusion of operations of World War II, the base went through several mission changes, not to mention identity changes as well.

The base briefly became a training area for weather reconnaissance crews and combat squadrons, using aircraft such as the P-61 Black Widow, P-38 Lightning, P-51 Mustang, and B-25 Mitchell. With aircraft technology rapidly changing during this time, those missions soon came to an end. From September 1946 to March 1947, as Americans embraced peacetime, the base temporarily ceased operations. When activity resumed, the base became an asset under the newly formed United States Air Force and was redubbed Rapid City Air Force Base. The new 28th Bombardment Wing (BMW) flying the B-29 Superfortress was the primary unit assigned to the base.

In January 1948 it was renamed Weaver Air Force Base by Air Force Chief of Staff General Carl A. Spaatz in honor of Brigadier General Walter R. Weaver, a pioneer in the founding of the Air Force. Later that year, Secretary of the Air Force Stuart Symington responded to overwhelming public appeal to return the base to its previous name, and it was once again called Rapid City Air Force Base. It was also at this time that it became a permanent air force installation.

In July 1949 after a flurry of runway improvements, the 29th BMW began converting from the B-29 to the much larger B-36 Peacemaker. The base was transferred from the 15th Air Force to the 8th Air Force in April 1950.

It received its current name from a peacetime tragedy that occurred on March 18, 1953, when the entire 23 member crew was lost in the crash of an American Convair RB-36H in Newfoundland. The flight was on a 25-hour simulated combat mission flying from Lajes, Azores, back to Rapid City. Due to bad weather conditions, the plane was off-course, 90 minutes earlier than anticipated, and flying low altitude. The plane impacted 800 feet up on an 896-foot hill near Trinity Bay, Newfoundland. The mission was co-piloted by Brigadier General Richard Elmer Ellsworth.

As result of the investigation of that crash, new rules were put in place for aircraft to climb to safer altitudes when approaching within 200 miles of a land-water boundary. Then President Dwight D. Eisenhower made a personal visit to the base and dedicated the base in honor of Brigadier General Ellsworth. Unlike the local controversy five years earlier, there were no public objections to the new name.

Ellsworth In The Cold War Era

In 1955 under reorganization from Strategic Air Command HQ (SAC HQ) the 28th BMW was reassigned back to the 15th Air Force. One year later SAC initiated plans to replace the B-36s with the new jet-powered B-52 Stratofortress. On May 29, 1957 Ellsworth's last B-36 took flight to make way for the arrival 16 days later of its first B-52.

The 821st Strategic Aerospace Division, headquartered at Ellsworth took command of all of the base's units in 1958. The activation of the 850th Strategic Missile Squadron ushered in the "Space Age" at Ellsworth as it prepared to accept the installation of Titan I intercontinental ballistic missiles (ICBMs). Not long after the 44th Strategic Missile Wing (44 SMW) was activated, in January 1962, the Titan I's arrived and SAC quickly named the 44th SMW as the host unit at Ellsworth.

Developments of the Cold War changed the military's parameters on an almost daily basis, and the Titan I program was very short lived, having been rendered obsolete by SAC in July of 1962 by the activation of the 66th Strategic Missile Squadron. The 66th was to become the first of three units to operate the Minuteman I ICBMs. The Minuteman I would provide nine years of service at Ellsworth, until June 1971 when SAC inactivated the 821st Strategic Aerospace Division and later, in October of that year, the Minuteman II replaced the outdated Minuteman I.

It was also during the Cold War era that Ellsworth became known as "The Showplace of SAC," by providing a home base to two of a triad of SAC services, namely strategic bombardment and ICBMs. These services continued with very few changes for 15 years. As the 1980s began, the B-52 fleet was showing its age, and new challenges were facing the United States Air Force.

Construction projects were underway to upgrade the facility in preparation for the arrival of the new B-1B Lancer strategic bomber. Early in 1996 the last of the B-52H aircraft left Ellsworth and in January 1987 the 28th BMW received the first of its fleet of 35 B-1Bs. On July 15, 1988, the 12th Air Division arrived at Ellsworth to provide training for the B-1B. On August 10, 1989, SAC activated a third wing at Ellsworth: the 99th Strategic Weapons Wing (SWW), which took primary responsibility of advanced B-1B crew training.

A few months later the shifting tide in eastern Europe brought down the Berlin Wall, marking the beginning of the end of the Cold War. These events had an effect a world away in Rapid City.

The demise of the Soviet Union brought mission changes to the forces of the United States, changes that were rapidly implemented and fluid in design. The first of these saw the 812th Combat Support Group become the 812th Support Wing (SSW), which for a short time functioned as Ellsworth's fourth operational wing. All combat support activities were consolidated into one organization under the 812th SSW.

On order from SAC HQ, the Strategic Warfare Center, replaced the 12th Air Division to provide operational command and administrative control over subordinate units based at Ellsworth. SAC followed with more base level reorganization in 1991, and the 28th BMW was renamed the 28th Wing (WG), the 44th SMW became the 44th Wing, and the 99th SWW became the 99th Tactics and Training Wing (TTW). A mere 10 days later both the SWC and the 812th SSW were made inactive, allowing the 28th Wing to once again become the host unit at Ellsworth. On September 11, 1991 all strategic nuclear alert forces were ordered to stand down, ending the Cold War.

An Air Force B-1B Lancer makes a high-speed pass at the 2003 Pensacola Beach Air Show. (Photo by Gregg Stansbery, public domain)

Ellsworth In The Modern Era

On June 1, 1992, the United States Air Force underwent a major reorganization, the first since its founding in 1948. The Strategic Air Command was inactivated and replaced by the new Air Combat Command (ACC). This move reassigned and renamed the 28th Wing to the 28th Bomb Wing (BW), now under the command of the ACC. This changed the mission of the 28th BW from that of strategic bombardment to worldwide conventional munitions delivery.

Having accomplished its mission of deterrence for many years, the 44th Missile Wing began removing its fleet of Minuteman II missiles from its silos on December 3, 1991. The first Minuteman II launch control center was shut down on April 6, 1992. By April 1994 the entire missile complex was inactivated. In a formal ceremony on July 4, 1994, the 44th Missile Wing was officially inactivated. Sites Delta-01 and Delta-09 were saved from demolition and turned over to the National Park Service. They are now preserved as the Minuteman Missile National Historic Site. The main office is located just south of Interstate 90 at exit 131. The sites can only be toured completely by making advance reservations with the National Park Service at the main office. Tours are approximately two hours long and are limited to six people due to the lack of space at D-01.

In March of 1994, the 34th Bomb Squadron was welcomed to Ellsworth, while the airfield at Mountain Home Air Force Base, Idaho, was undergoing air-

A B-1B from the 37th BS takes off from Ellsorth AFB, the tower can seen in the background. (Photo by A1C Nathaniel G. Bevier, USAF, public domain)

field upgrades. The Thunderbirds of the 34th BS returned to Idaho in 1997. The 99th Wing left Ellsworth in 1995 for its new assignment to Nellis Air Force Base, Nevada. Also that year, one of Ellsworth's oldest units, the 77th Bomb Squadron, was inactivated. That was a short lived move, however, as by April 1, 1996, the 77th BS was once again activated at Ellsworth when the 34th BS returned to its home unit, the 366th Wing in Idaho.

In yet another Air Force reorganization, it was announced in March 1999 that Ellsworth and the 28th BW would become partners in the newly constructed Expeditionary Air Force, later to be named the Air and Space Expeditionary Force. In September 2001, another swap of sorts took place when the 77th BS was once again inactivated and the 34th BS transferred from Mountain Home Air Force Base back to Ellsworth, where it remains active today.

Ellsworth fell under the BRAC 2005 axe wielded by the Pentagon. However, it received a reprieve on August 26, 2005, when an 8 to 1 vote by the nine member BRAC commission spared Ellsworth from the list.

Looking down into a Minuteman II Missile Silo. (Public domain photo)

Tenant Units At Ellsworth AFB And Frequencies Used

UNIT/SUB UNIT	NICKNAME	TAIL CODE	COLOR
28th Bomb Wing			
34th Bomb Squadron	THUNDERBIRDS	EL	yellow/red
37th Bomb Squadron	TIGERS	EL	blue/red

CALLSIGNS: BONE, STRAT, TIGER

ELLSWORTH AIR FORCE BASE (KRCA)

AERONAUTICAL FREQUENCIES

119.500	Ellsworth Approach/Departure
120.625	Ellsworth ATIS
121.800	Ellsworth Ground
126.050	Ellsworth Tower
127.950	Approach/Departure (when KRCA is closed)
259.100	Ellsworth Approach
269.900	Ellsworth ATIS
275.800	Ellsworth Ground
287.700	37th BS Air to Air
289.400	Ellsworth Departure
321.000	28th BW Command Post (RAYMOND 33)
338.200	Approach/Departure (when KRCA is closed)
353.500	Ellsworth Tower
372.200	Pilot to Dispatcher
373.000	Radar
375.775	Metro
377.700	37th BS Air to Air
388.875	34th BS Air to Air
393.000	Radar

Ellsworth utilizes a digital VHF trunked radio system (P-25), a digital scanner is needed in order to monitor it.

SYSTEM:	Ellsworth Air Force Base
TYPE:	Motorola Project 25 Standard
VOICE:	APCO-25 Common Air Interface
SYSID:	17E

FREQUENCIES

138.2375c 138.2625c 138.3375 138.3625 138.4125 138.5625 138.6375 139.1875 139.7625

TALKGROUPS:

1	CE OPS	Civil Engineering General
2	CE MAINT	CE Maintenance Work Centers
3	CE/SNOW	CE Snow Equipment
4	DP CONTROL	Disaster Preparedness
5	EOD	Explosive Ordinance Disposal
6	EMCS	Fire Alarm Maintenance
7	RAMP	Airfield Communications
8	TOWER	Airfield Communications
9	TIGER	37th Bomb Squadron/Maintenance
10	RAIDER	34th Bomb Squadron/Maintenance
11	GENERATION	Exercise
12	MUNS1	Munitions Storage
13	MUNS2	Munitions Flightline
14	MIKE	Aerospace ground equipment (AGE)
15	RANGER	AGE
16	CRASH	Fire Dept Operations
17	TAC2	Fire Dept Backup
18	MEDIC RESP	Ambulance/Emergency Response
19	MEDIC ADMIN	Medical Group Administration
20	SFS 1	Security Forces (Police) Primary
21	SSF 2	Security Forces Backup
22	SF EX	Security Forces Exercise
23	POL	Airfield Refueling Operations
24	TAXI	Transportation Dispatch
25	MOBILITY	Exercise
31	EET (CVI)	Exercise Evaluation Team (EET)
34	CC PRI	Commanders Channel
35	CC SEC	Backup Commanders Channel
38	COMM	Communications
39	MET/NAV	Comm Airfield Equip Maintenance
40	GP NET	Special Events
41	PRI UHF	Land Mobile Radio (LMR)
42	SEC UHF	LMR Backup Ch.2
43	SIREN	Base Public Address

Today Ellsworth operates one 13,503-foot runway (13/31), the base controls all airspace in a 40-mile radius around the area, including all landings at nearby Rapid City Regional Airport (KRAP). The base is also an emergency Shuttle orbiter landing facility.

Check out the accompanying sidebar for information on current active units stationed at Ellsworth along with aeronautical and support frequencies.

If You Visit

As we mentioned earlier in the column there is much to see and do in the area. The South Dakota Air and Space Museum is adjacent to Ellsworth's Main Gate. It's open year round 8:30 a.m. to 4:30 p.m., and admission is free. Bus tours of Ellsworth AFB and the Minuteman II missile silos are available mid-May through mid-September for a small fee. Since the museum is outside the actual base, no special identification is required.

A half hour or so drive from Ellsworth takes you to one of our greatest national monuments, Mount Rushmore. There is also Badlands National Park, Black Hills National Forest, and Wind Cave National Park. That gives you lots of reasons to load up the family and your scanner and venture into the Badlands of western South Dakota.

Reader Logs

From Ontario, Canada, Doug Bell writes in with his military intercepts this month. Doug is using a Sony ICF-2010 and 50-foot long wire. We invite you to send in your own reports, whether on HF, VHF or UHF. You can send them to the email address listed in the column header, but please follow the format you see here. We will include them in a future column.

5616: USB 0024Z REACH 6022 (C-17A/60th AMW, Travis AFB, CA) wkg Gander Radio and receiving ATC clearance to climb to fl 310.

0148Z REACH 5031 (KC-10A/305th AMW, McGuire AFB, NJ) wkg Gander Radio with a SELCAL check.

0212Z REACH 500 (C-17A/437th AW, Charleston AFB, SC) wkg Gander Radio w/a position of 55N 050W and fl 340.

5696: USB 2325Z USCG 2006 (HC-130J/CGAS Elizabeth City) wkg CAMSLANT-Chesapeake w/an "operations normal" and a position of 33.64N 078.57W.

2210Z USCG 2120 (HU-25A/ATC Mobile) wkg CAMSLANT-Chesapeake w/ an "operations normal" and a position of 25.30N 080.21W.

8864: USB 1201Z REACH 1197 (C-17A/437th AW, Charleston AFB, SC) wkg Gander Radio with a position of 55N 050W and fl 320.

8983: USB 1930Z USCG 2003 (HC-130J/CGAS Elizabeth City) wkg CAMSLANT-Chesapeake w/ "operations normal."

11175: USB 0057Z HF-GCS Station ANDREWS repeatedly calling CONVOY 4378 (C-40/ "Sunseekers," VR-58, NAS Jacksonville, FL) with no response.

1327Z DEECEE 51 (KC-135R/459th ARW, Andrews AFB, Maryland) repeatedly calling HF-GCS ANDREWS with no response.

1542Z BOLT 11 (KC-135R/6th AMW, 91st ARS, MacDill AFB, FL) repeatedly calling "mainsail" w/ no response. HF-GCS ANDREWS responded to the call, but BOLT was unable to copy.

1554Z SNOOP 55 (RC-135/55th Wing, Offutt AFB, NB) repeatedly calling an unreadable station/aircraft with no response. HF-GCS ANDREWS responded to the call, but SNOOP was unable to copy.

1906Z REACH 39 (C-17A/62nd AW, McChord AFB, WA) wkg HF-GCS Station ANDREWS with a phone patch and flight data.

1954Z AMC 1466 (C-130J #05-1466/146th AW, CA-ANG, Ventura County, CA) wkg HF-GCS Station LAJES with a HF radio check.

2020Z SPICE 62 (E-4B/55th Wing, Offutt AFB, NE) wkg HF-GCS Station OFFUTT with a phone patch and mission data.

2052Z REACH 3122 (C-17A/437th AW, Charleston AFB, SC) wkg HF-GCS Station OFFUTT with a HF radio check.

11220: USB 2151Z ETHYL 43 (KC-10A or KC-135R) wkg HF-CGS Station ANDREWS with flight data passed. [Signal faded.] Flight requested that an AR message be relayed to RAMA 12 (B-1B/7th BW, Dyess AFB, TX).

11232: USB 0107Z RESCUE 305 (CC-130E/8 WING, 424 SQN, CFB Trenton, Ontario) wkg TRENTON MILITARY with SAR data passed.

1500Z CANFORCE 81 (CC-130H/17 WING, 435 SQN, CFB Winnipeg, Manitoba) wkg TRENTON MILITARY with weather and flight data passed.

2124Z SENTRY 61 (E-3B AWACS/552nd ACW, Tinker AFB, OK) clg TRENTON MILITARY. TRENTON answered the call, but SETNRY was unable to copy.

2130Z CANFORCE 2566 (CC-130E/14 WING, 413 SQN, CFB Greenwood, Nova Scotia) wkg TRENTON MILITARY with flight data passed. ■

Another Look At Small Passenger Vessel Radio Inspection

by Gordon West,
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WB6NOA@arrl.net

"...there's a big demand for local radio operators who hold a General Radio Operator License (GROL); they can come down to a ship in a hurry to perform the VHF inspection and issue a new FCC form 824."

A couple of recent articles on marine radio (the April "Radio Ways" column and the July "Monitoring Marine Transmissions" feature) generated a boatload of reader response. Many readers had additional questions on commercial FCC license preparation, so I thought I'd revisit the topic here for everyone's benefit. Even if the waters near you are already turning chilly, and even if you don't own a boat, if you're an experienced radio operator, read on—it may lead to a marine radio-related career or part-time job (see sidebar).

The U.S. Coast Guard, along with the FCC, requires small passenger vessels to be marine radio equipped and mandates radio inspections every five years for a Communications Act Safety Radiotelephony Certificate. A "small passenger vessel" is defined as any craft less than 100 gross tons that carries more than six passengers for hire. This definition may cover many types of craft, such as:

- Harbor cruise boats
- Party yachts
- Commercial fishing boats
- Sightseeing craft
- Ferries
- Charter fishing yachts
- Dive boats
- Ashes-at-sea boats
- Small educational school trip boats

These small passenger vessels that sail in bays, harbors, rivers, and sounds, adjacent to the open ocean, are required to carry a 25-watt marine VHF transceiver. If one of these vessels sails beyond three miles from shore into the open sea, it must also carry a 406-MHz EPIRB (Emergency Position Indicating Radio Beacon). If such vessels travel to outlying islands, 20 miles to 100 miles from the nearest land, they must also be equipped with a medium frequency/high frequency marine single sideband transceiver. Small passenger vessels that sail only on inland lakes or waterways, or no more than 1,000 feet from shore, may not need to carry marine VHF equipment on board, but are encouraged to do so.

The FCC no longer walks the docks or pulls surprise "party boat" radio check outs, but the U.S. Coast Guard does inspect small passenger vessels for the required marine safety equipment as well as valid radio station certificates. Mandated certificates include the Captain's Marine Radio Operator Permit (a lifetime license), a Ship Station License (a 10-year permit), and an FCC form 824 Ship's Radio Inspection Certificate (a five-year permit). Passenger vessel captains must make sure that their paperwork and licenses are in order and available to a Coast Guard officer for inspection.

Most marine VHF radio station inspections are scheduled for aboard ship about a month before an anticipated Coast Guard inspection. In a surprise Coast Guard inspection, an expired ship radio station inspection certificate (FCC form 824) will result in a return visit by the Coast Guard inspector, usually within two weeks. For this reason, there's a big demand for local radio opera-

Numerous types of vessels, including yachts that charter out to office parties, need a VHF radio inspection certificate.

A Day In The Life Of A Radio Inspector—This Could Be You

The local harbor cruise skipper calls frantically for a radio inspection. The U.S. Coast Guard was aboard and gave him a 30-day grace period to get the marine radiotelephone safety certificate.

As a ship's radio inspector, you answer the call. You first ensure that the vessel has a valid 10-year station license for the marine VHF radio. You'll also verify that the skipper has the required Marine Radio Operator Permit (MP), a lifetime license based on the 24-question FCC Element 1 test. You'll make sure that the vessel complies with Title III, Part III of the Communications Act, Part 80.851, subpart R-vessels limited in operation to 100 miles from shore.

All paperwork in order? Check. Next, show the skipper how to look up FCC Rules and Regulations, Part 80, at the FCC website. The Rule Book does not need to be on board.

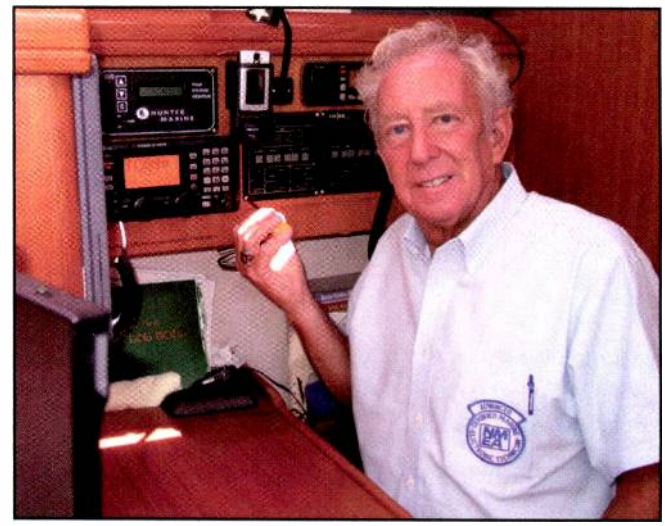
Now, you'll take a look at that onboard 25-watt marine VHF transceiver—a close look. Multiple lives could depend on this VHF radio functioning during a catastrophe. You need to get behind the radio, remove the coax, and insert a quality wattmeter or a well-calibrated power VSWR meter. You need to see a power output of more than 20 watts, but no more than 25 watts, with a push button for 1-watt power reduction.

Next, dial up an unused local marine telephone channel, like Channel 25, and continuously transmit for 10 minutes. Power should not dip below 15 watts, and the voltage must remain higher than 11.5 volts, measured at the radio's red and black terminals, or between the VHF radio's fuse and negative 12 volts, usually radio ground.

Next, conduct a deviation check to ensure that no modulation peaks beyond +/– 5 kHz. You may use your MFJ model 224 FM analyzer, or similar, readjusted up to cover 156 MHz. You may listen to your own signal, with an HT, while tugging on the mic cord to make sure there's no cord cut-out, possibly also verifying frequency tolerance of +/- 10 ppm with a common ham radio frequency counter (most PLL marine VHF radios, you'll find, are well within the 1500 Hz limit).

Your hourly bill will also include testing with a simple $50 field strength meter. The FCC rules require a visual indicator whenever the transmitter is supplying power to the transmitting antenna. Unlike ham sets with an LCD power output indicator, marine VHF transceivers only have a red idiot light, and the red light could falsely illuminate when the final amplifier transistor is completed toasted. The simple field strength meter indicating power output will meet the requirements. Make sure you can see all the readouts at night.

Next, you'll listen to distant weather stations and ship traffic to verify the receiver's sensitivity. Alternately, you can apply a simple VSWR meter, sold by Shakespeare Electronics and others, that contains a tiny sensitivity signal.



Here's Gordo working over a radio installation aboard a sightseeing yacht.

Before moving on, take a last, close look of that mic cable—has it pulled out from the mic plug? Is the cable frayed? If you detect something that might pose a mic problem in the future, insist on a new mic assembly before you sign off on the inspection.

Now on to the marine antenna. Make sure it looks physically intact. Look at the VSWR, which will instantly tell you if there's moisture contamination on the inside of the coax. If the outside of the coax jacket is cracked, it will need to be replaced completely before signing off on the antenna installation. (Hint: More than once I've discovered high SWR, with

Most advanced hams and other serious radio enthusiasts already have the test gear needed to check the marine VHF and SSB installations.

the green braid showing on the outside of the wheelhouse, where the cable disappears into the base of the white fiberglass antenna. If water gets into the coax, the entire antenna system needs to be replaced before inspection approval.)

OK, antenna system standing tall? Check. Next, trace the 12-VDC wiring down to the bank of batteries. Do all connections look clean? While the starting battery may also power the marine VHF, encourage the commercial boat owner to consider a separate battery just for the marine VHF, mounted up high, in case of bilge flooding.

Tug on all the red and black wires to make sure nothing will cut out when the radio is drawing 4 amps on 25 watts transmit. When listening to a transmit signal, it's normal to hear a faint hum in the background, caused by the onboard ship's battery charger. No problem there.

Although not required, you may also want to encourage the skipper to input the ship's MMSI (Maritime Mobile Service Identity) number for Channel 70 DSC (Digital Selective Calling). This number is found on the Ship Station License, and usually begins with 366 or 367 and is a total of nine digits long. The nine-digit number should show up on the screen of the marine VHF when you turn on the equipment. You may choose not to sign off on a ship radio inspection without seeing that MMSI number entered into the marine VHF, and it's a good idea to make sure the VHF is tied into the onboard ship's GPS. This way, in an emergency, pushing the red distress button sends an entire package of DSC information to local U.S. Coast Guard units.

If the vessel goes beyond three miles from shore, you'll also check the 406 MHz EPIRB. Make sure the battery expiration date illustrates compliance with the rules.

Finally, show the skipper some of the added benefits of DSC individual calls, DSC all ship calls, and how to interpret a DSC distress call picked up by this transceiver. Review the explicit requirements to constantly listen to marine VHF Channel 16 when the vessel is in operation. Even if the vessel is just on a simple local harbor cruise Channel 16 needs to be monitored.

Again, it should take you about four hours to complete a thorough marine VHF inspection, and $75 an hour for your time is a reasonable rate. Afterward, you document all your findings, then complete and submit the required FCC certificate, form 824. Leave the list of technical checks for the captain to add to his radio logbook, in case the U.S. Coast Guard wants additional proof of the inspection.

This process must be repeated every five years for every small passenger vessel. Once the word circulates in the boating community that you're a licensed ship radio station inspector, you'll begin to get calls—many of them urgent—after the U.S. Coast Guard discovers incomplete radio paperwork.

The equipment necessary for these checks is common gear that most technically inclined radio enthusiasts already possess. WARNING: If you're *not* technically inclined and don't possess substantial radio experience, you have *no* business certifying radio equipment that passenger lives may depend on in an emergency! However, if you *are* a technical radio enthusiast, ham or not, your commercial GROL is a ticket to "playing radio" down by the seaside.

For fact sheets on conducting inspections of small passenger vessel radio systems visit www.fcc.gov/eb/shipinsp/spv_checklist.pdf.

tors who hold a General Radio Operator License (GROL); they can come down to a ship in a hurry to perform the VHF inspection and issue a new FCC form 824.

Who Performs Radio Inspections?

The marine radio inspector could be you! If you hold a current GROL or higher grade of Global Marine Distress Safety System license, you may instantly become a small passenger vessel radio inspector. Inspections take about four hours of on-board time, are billed at about $75 per hour minimum, and you don't need a $10,000 service monitor to adequately perform the marine radio tests.

The commercial FCC GROL is easy to obtain if you currently hold an amateur radio Extra class ticket, although the ham ticket's not necessary. The current FCC commercial license requires passing a 24-question multiple-choice exam on basic radio rules and regulations and a 76-question multiple-choice exam on electronic theory, which is nearly identical to what's covered in the Extra class amateur radio multiple-choice exam (see **Figure**).

GROL study materials are available at your local ham radio store, or from bookstores like Amazon.com or National Radio Examiners at 1 (800) 669-9594.

Check it out, and if you're interested in pursuing it, take the test before the end of the year. Beginning December 26, 2009, the Element 3 technical test changes from 76 questions to 100 questions, and the subject material is much more complex. ■

Type of License	FCC Acronym	Examination Elements: Written 1 3 5 6 7 8 9 / Telegraphy 1 2 3 4	Term
GROL General Radiotelephone Operator's License	PG	• •	LIFETIME
GMDSS Radio Operator's License	DO	• •	LIFETIME
Restricted GMDSS Radio Operator's License	RG	•	
GMDSS Radio Maintainer's License	DM	• • •	LIFETIME
Restricted Radiotelephone Operator's Permit	RP	No Exam Needed	LIFETIME
Marine Radio Operator's Permit	MP	•	LIFETIME
Third Class Radiotelegraph Operator 's Certificate	T3	• • • •	5 years
Second Class Radiotelegraph Operator's Certificate	T2	• • • • •	5 years
First Class Radiotelegraph Operator 's Certificate	T1	• • • • • •	5 years
Ship Radar Endorsement		•	LIFETIME
Six Month Service Endorsement		No Exam Needed	6 Months

Written Examination Content

All FCC written examinations are multiple-choice format. The question pools for each examination element are public information, and can be obtained from the FCC website. Here is a brief description of the content covered in each FCC written examination:

- **Element 1:** Basic radio law and operating practice with which every maritime radio operator should be familiar. To pass, an examinee must correctly answer at least 18 out of 24 questions. The Element 1 question pool contains a total of 144 questions.
- **Element 3:** General Radiotelephone. Electronic fundamentals and techniques required to adjust, repair, and maintain radio transmitters and receivers. To pass, an examinee must correctly answer 75 out of 100 questions, from the following topics: operating procedures; radio wave propagation; radio practice; electrical principles; circuit components; practical circuits; signals and emissions; and antennas and feed lines. The Element 3 question pool contains a total of 600 questions.
- **Element 5:** Radiotelegraph Operating Procedure. Radio operating procedures and practices generally followed or required in communicating by means of radiotelegraph stations. To pass, an examinee must correctly answer at least 38 out of 50 questions. The Element 5 question pool contains a total of 286 questions.
- **Element 6:** Advanced Radiotelegraph. Technical, legal, and other matters applicable to the operation of all classes of radiotelegraph stations. To pass, an examinee must correctly answer at least 75 out of 100 questions. The Element 6 question pool contains a total of 616 questions.
- **Element 7:** GMDSS Radio Operating Practices. GMDSS radio operating procedures and practices sufficient to show detailed practical knowledge of the operation of all GMDSS subsystems and equipment. The exam consists of questions from the following categories: general information, narrow-band direct-printing, INMARSAT, NAVTEX, digital selective calling, and survival craft. To pass, an examinee must correctly answer at least at least 75 out of 100 questions. The Element 7 question pool contains a total of 600 questions.
- **Element 7R:** Restricted GMDSS Radio Operating Practices. Fifty questions concerning those GMDSS radio operating procedures and practices that are applicable to ship stations on vessels that sail exclusively in sea area A1, as defined in sections 80.1069 and 80.1081 of the Commission s Rules. To pass, an examinee must correctly answer at least 38 out of 50 questions. The Element 7R question pool contains a total of 300 questions.
- **Element 8:** Ship Radar Techniques. Specialized theory and practice applicable to the proper installation, servicing, and maintenance of ship radar equipment in general use for marine navigation purposes. To pass, an examinee must correctly answer at least 38 out of 50 questions. The Element 8 question pool contains a total of 300 questions.
- **Element 9:** GMDSS Radio Maintenance Practices and Procedures. Requirements set forth in IMO Assembly on Training for Radio Personnel (GMDSS), Annex 5 and IMO Assembly on Radio Maintenance Guidelines for the Global Maritime Distress and Safety System related to Sea Areas A3 and A4. The exam consists of questions from the following categories: radio system theory, amplifiers, power sources, troubleshooting, digital theory, and GMDSS equipment and regulations. To pass, an examinee must correctly answer at least 38 out of 50 questions. The Element 9 question pool contains a total of 250 questions.

Figure. GROL Chart and examination content.

Trivia And Toons

by R.B. Sturtevant, AD7IL

Q. I can figure out most of the Morse code abbreviations, but I can't figure out why AR means "finished." What is the origin of this?

A. Don't feel bad about not recognizing this abbreviation, or prosign, if you're used to International Morse. AR doesn't come from the International version, but from another one known as American or Railroad Morse. Some of the same sounds have different letters attached to them for the different versions. AR is represented by the same sounds in American Morse as those in International that represent FN, for "finished."

Q. In the early days of radio, parts must have been harder to come by then they are today. How did people find the parts they needed for experimentation?

A. Well, believe it or not, parts actually weren't as hard to find as they sometimes are today. And it's only fair if we compare apples to apples. In those days, anyone who was into radio was a builder by necessity, and anyone who wanted to start out in the hobby usually either found someone locally to supply him or used mail order. The *Sears, Roebuck and Co. Catalog*, for instance, had several pages of radio and telegraph parts and equipment for amateurs. By late 1923, there were also firms that exclusively dealt with rebuilding burnt-out tubes at half the new tube price. Most of the businesses used mail and advertised that they only worked on 16 different tubes. But how many tube types were there back in 1923?

Trying to find parts today for a building projects using those old schematics, or even newer ones, can be very difficult indeed. There's an old saying that "all movement is not progress." In building authentic homebrew reproductions, this is often true.

Q. You mentioned recently that the Navy wasn't really anxious to let non-military operators back on the airwaves after World War I. Who finally signed the authorization?

A. On April 15, 1919, that authorization was signed by Acting Secretary of the Navy Franklin D. Roosevelt. You may have heard of him. He got into politics later and his "Fireside Chats" were heard by 60 percent of all Americans. He was the first president to really use the radio as an effective tool for communicating government policy to the folks at home.

Q. How fast did the early telegraph operators have to send and receive messages?

A. There were four levels of telegraph operators in the old days of Morse over the wire, and the speed required for each level would differ slightly from one office to another. The first level was the Slow Speed Wire, which took traffic from rural and small town stations. The High Speed Wire dealt with traffic to or from big cities and overseas. More difficult was the Financial Wire because of the accuracy needed, and the fastest wire was the News Wire, which transmitted long stories from reporters to their papers. Speeds for this level ran from 30 to 35 wpm. By the 1880s many operators were using typewriters for receiving, and a highly skilled operator could work speeds of 50 to 60 wpm with this aid (many typed five or six words behind the sounder).

Q. What is a one-time pad and how is it used?

A. Just as its name implies, it's a note pad, each sheet of which has a randomly arranged group of either letters or numbers for use in encryption. A radio operator would have one pad, and another one (his control radio operator) would have its exact duplicate. The operator would use the first page on his pad to encode a message then transmit it to the control who, using the duplicate page, would decode the message. After that message, the first page is destroyed and the second page is used for the next message, resulting in another, unique and random arrangement. If the pages are genuinely random and are used only once, the coded messages are thought to be the only unbreakable "pencil and paper code" method available to field agents. Security of the pads is a primary concern.

Breaking Down The Language Barrier—What's Behind The Jargon

by John Kasupski,
KC2HMZ,
kc2hmz@verizon.net

"The list of Q-signals is quite extensive, with some seen about as often as Halley's Comet and others becoming Radiospeak staples."

Four years ago, when I was still in my rookie year as a *Pop'Comm* columnist, I wrote about a survey conducted in 2003 by a well-known manufacturer of CPU (aka, Central Processing Unit) chips for computers. The survey revealed that only a small percentage of people knew the meaning of 11 common terms of computer jargon. Of more than 1,500 people surveyed, only about 3 percent understood terms such as megahertz, DPI, and MP3. Even among those people surveyed who actually used computers, only about two-thirds understood what the term "megahertz" meant. Worse yet, the survey was in multiple-choice format, which meant that some people probably got correct answers simply by guessing.

Photo A. Heinrich Rudolf Hertz, German physicist after whom the standard unit of measurement for frequency is named. (Photo via Wiki Commons)

It occurred to me then that there are probably also an awful lot of people out there who find radio jargon equally bewildering. I'm guessing that hasn't changed too much, so I thought it might be time to revisit the subject for those getting started in the hobby. We utility monitors move in a world filled with acronyms, callsigns, callwords, and jargon. Even the word "Utility," as in "Utility Communications Digest," is itself a bit of radio jargon—one that, like megahertz and USB, needs explaining for those who haven't long dabbled in the shortwave listening arts.

For the uninitiated, the term "utility" conjures up images of last month's bills from the electric or telephone company. Although I'm aware of at least one such utility that operates a network on the shortwave bands, that isn't what we mean when we talk about utility stations.

The stations we refer to as utility are those stations on the shortwave bands that are not intended to reach the general public (as is the case with shortwave broadcasters) or amateur (ham) stations. If you've ever looked at a list of shortwave bands that shows where the broadcast and ham bands are, you probably noticed that there are some fairly large gaps in between. That's generally where you find utility stations, operating on frequencies that are internationally allocated for use by aircraft, marine, government, military, and commercial communications stations.

The Alphabet Soup Of Radio (Now With More Spice)

Some of the most confusing radio jargon pertains to emission modes, and we tend to abbreviate the names of almost all of them, going all the way back to CW (which stands for Continuous Wave). When you tune through the bands and hear transmissions between two stations using Morse code, that's CW, the oldest form of radio communications.

Once upon a time all radio transmissions used CW, but as technology marched forward it was discovered that it was possible to create a radio signal containing voice information, and AM and FM were born. These two modes use dif-

Table 1. Military/ICAO Phonetic Alphabet

A	Alpha	N	November
B	Bravo	O	Oscar
C	Charlie	P	Papa
D	Delta	Q	Quebec
E	Echo	R	Romeo
F	Foxtrot	S	Sierra
G	Golf	T	Tango
H	Hotel	U	Uniform
I	India	V	Victor
J	Juliet	W	Whiskey
K	Kilo	X	X-Ray
L	Lima	Y	Yankee
M	Mike	Z	Zulu

ferent methods of impressing voice information on a radio signal by modulating (changing) a characteristic of the carrier. In the case of AM, the characteristic changed is the amplitude of the signal, which is why it's called AM, for Amplitude Modulation. With FM, it is the frequency of the signal that is changed, hence Frequency Modulation.

That, of course, was too easy. So, naturally, at some point an enterprising experimenter discovered that an AM signal actually consisted of not only the carrier, but also two sidebands, one just above and one just below the carrier, each of which carried the same voice information that's impressed upon the carrier itself. This also meant that it was possible to greatly increase the efficiency of a transmitted signal by eliminating the carrier and one of the sidebands and concentrating the transmitter's RF (Radio Frequency) power into the one remaining sideband.

This of necessity added some more jargon to the radio arts. The new mode was called Single Sideband Suppressed Carrier, a mouthful that eventually was shortened to just single sideband and abbreviated SSB. When using this method to concentrate the transmitter's power into the lower sideband, it's referred to as lower sideband mode, and abbreviated LSB. When we concentrate the transmitter's power into the upper sideband, it's referred to as upper sideband mode, and abbreviated USB.

That definition is, of course, entirely different from the meaning of USB in computer jargon, where it refers to the Universal Serial Bus. Nonetheless, computers, along with microprocessor-controlled radios, have helped us to develop seemingly countless emission modes that are the result of mating either an actual computer, or some other method of "computerized" control circuit, to a radio. These are generally filed under the term "digital modes" and their abbreviations are also ingredients of the alphabet soup. ALE (Automatic Link Establishment), SITOR (SImplex Teletype Over Radio), RTTY (Radio Teletype), ANDVT (Advanced Narrowband Digital Voice Terminal, a secure voice mode used by the military), and TADIL (TActical DIgital Link) are some of the modes frequently of interest to utility listeners.

Also floating in the radio alphabet soup are the International Q-Signals. These universally agreed-upon three-letter codes beginning with the letter Q were originally conceived as expedient service signals when sending messages in CW, but their use has spilled into other areas of radio. The list of Q-signals is quite extensive, with some seen about as often as Halley's Comet and others becoming Radiospeak staples. Among these codes are QSL (documents confirming reception of a station, often in the form of postcards that are commonly called QSL cards), QRM (interference), QRN (static), QSO (a contact between two or more stations), QTH (the location of a station), QRT (often used when logging stations to indicate a station going off the air), QSB (often used to refer to the effect of HF signals fading), and QSY (which means to change operation to another frequency).

There are other such abbreviations that also descended from commonly accepted Morse abbreviations. CQ, which is a general call to any and all stations, is one of these, and it gives a *Pop'Comm* sister publication its name. The term "Roger" that we sometimes hear as an acknowledgement during voice communications is another. The CW equivalent of this was to send the letter R. At the time, Roger was the radio phonetic for the letter R, and the phonetic "roger" was spoken in place of sending the Morse R for voice operation.

Speaking of the radio phonetics, **Table 1** lists the correct set of phonetics for the letters of the alphabet, as determined by the ICAO (International Civil Aviation Organization) for use by the aviation industry. It is also used by the military forces and government stations of the United States and many other nations, as well as by hams and other frequent users of HF. Because these phonetics differ considerably from the phonetic alphabet and the one often heard in use by various public safety agencies on VHF/UHF, scanner listeners interested in expanding their horizons to include HF would do well to become familiar with the ICAO phonetics.

Other common abbreviations, like HF, VHF, and UHF, refer to frequency ranges. **Table 2** lists the ranges that correspond to the various portions of the radio frequency spectrum to which these abbreviations apply. The designations are based on the frequency of a radio wave, which refers to the time it takes the wave to finish one complete cycle. The higher the frequency of a signal, the shorter its wavelength.

The basic unit of measurement for frequency used to be "cycles per second," but the unit of measure was renamed to honor Heinrich Rudolf Hertz (**Photo A**), the German physicist who was the first to demonstrate the existence of electromagnetic radiation by building an apparatus to produce UHF radio waves. One Hertz is the same as one cycle per second. When we get into higher frequencies, we use kilohertz (a thousand cycles per second) and megahertz (a million cycles per second). And now you know what that term, "megahertz" means, if you didn't already!

Military callwords and callsigns are also part of the recipe. The difference between a callword and a callsign is that

Table 2. Frequency Ranges

ELF	3-300 Hz	Extremely Low Frequency
SLF	300-3000 Hz	Super Low Frequency
VLF	3-30 kHz	Very Low Frequency
LF	30-300 kHz	Low Frequency
MF	300-3000 kHz	Medium Frequency
HF	3-30 MHz	High Frequency
VHF	30-300 MHz	Very High Frequency
UHF	300-3000 MHz	Ultra High Frequency
SHF	3-30 GHz	Super High Frequency
EHF	30-300 GHz	Extremely High Frequency

Photo B. The callsign AIR FORCE ONE is almost universally recognized, but other callsigns may need some explaining. (USAF photo)

the callsign will include a number. Consider a typical callsign such as REACH 1234 or BISON 96. These include both a word and a number. The word may be associated with the mission; REACH, for instance, is a generic callsign for USAF cargo aircraft, and AIR FORCE One (**Photo B**) is a callsign whose mission and meaning are well known. Or it may be associated with a particular military unit; BISON, for example, happens to be used by C-130 flights from a facility near my QTH (**Photo C**).

A callword does not include a number, but again may be associated with a mission or with a particular unit or station. For example, CARBONATE is the ground station at the command post where the BISON C-130s are stationed. Some missions use callwords that change every 24 hours, usually at midnight UTC; the "Nightwatch Net" aircraft are examples of this usage.

To help you sort out these callsigns and callwords, refer to the web page at http://henney.com/chm/callsign.htm. Here you'll find a very helpful military callsign/callword lists, maintained by Ron Perron, an experienced utility listener from Maryland. This URL will fetch you the most recently updated version of Ron's work, which was dated June 2009 at press time. Ron's list is a great starting point, but remember that these callsigns and callwords are always changing. You'll do best to take your own notes and come up with your own list, updated as necessary.

Reader Logs

It is now my privilege to present another oversized batch of readers' logs, provided this month by Al Stern, Satellite Beach, FL (ALS); Mark Cleary, Charleston, South Carolina (MC/SC); Chris Gay, Lexington, KY (CG/KY); and Glenn Valenta, Lakewood, CO (GV/CO).

I'm almost caught up on loggings that were submitted while I was on vacation, and in fact, next month's column should have us completely up-to-date with those loggings. As always, my sincere thanks to those who send in their catches!

3137.0: 266157 (C-17A, 60 AMW) sounding in ALE USB at 0525Z. (MC/SC)

3167.0: JULIET, DELTA, HOTEL, MIKE in UNITAS Exercise Link-11/16 coordination net in USB at 0025Z. (MC/SC); JULIET, DELTA, OSCAR, SIERRA in UNITAS Link-11/16 coordination net in USB at 0106Z. (MC/SC)

3278.0: USA MARS net in progress in LSB at 1137Z. (MC/SC)

3315.0: USAF MARS Region 3 3VAS1 Virginia Net in progress in USB at 0017Z. (MC/SC)

4026.9: USA MARS net in USB at 1216Z. (MC/SC)

4032.9: AAA3VA net control and AAM3RE alternate net control in USA MARS net in LSB at 1106Z. (MC/SC)

4149.0: WBN 3011 (Tug *Pilot*) wkg WPE, Jacksonville in USB at 1235Z. (MC/SC)

4405.0: WLO synth YL w/Caribbean forecast weak but readable under CODAR, in USB at 06:04Z. (GV/CO)

4469.0: Florida CAP net in progress in USB at 1148Z. (MC/SC)

4500.0: AFA4BT in USAF MARS 4S1 Net in USB at 1219Z. (MC/SC)

4700.0: HALIFAX MILITARY radio check with PATHFINDER 31 (CP-140) in USB at 2216Z. (MC/SC)

4721.0: 277183 (C-17A) clg HIK (Hickam HF-GCS) in ALE USB at 0654Z. (MC/SC)

4900.6: SECTOR ST. PETERSBURG clg SHARK 72 in USB at 2317Z. (MC/SC)

5006.0: FLORIDA CAP 48 clg MIDDLE EAST CAP 43 with no joy in USB at 2341Z. (MC/SC)

5135.0: SEMO05 (New York State Emergency Management Office Region 5) sounding in ALE USB at 0522Z. (MC/SC)

5446.5: AFRTS Key West, FL, with short informative messages and commercials, very good levels here, in USB at 0541Z. (GV/CO)

5547.0: San Francisco radio wkg various aircraft for position reports in USB at 0528Z. (GV/CO)

5680.0: KINLOSS RESCUE in QSO with RESCUE 122, 125, 128, and 137 and NAVY 193 for over an hour concerning an accident scene, mention of casualties, in USB at 1315Z. (CG/KY)

5696.0: USCG CAMSLANT wkg CG 2114 (HU-25D, CGAS-Miami); passes position coordinates, incl longitude 77-59 West, in USB at 0202Z. (ALS)

5717.0: JULIET in UNITAS Exercise net in USB at 0035Z. (MC/SC)

5732.0: HAMMER wkg OMAHA 3CC with position of TOI in USB at 0117Z. (MC/SC)

5833.5: T1Z149 (1-149 AVN, TX-ARNG, AASF #4, Houston, TX) sounding in ALE USB at 0927Z. (MC/SC)

6501.0: One of the USCG NMN or NOJ transmitters having problems with heavy over-modulation and splatter, almost unreadable and unable to ID, in USB at 0401Z. (GV/CO)

6604.0: New York VOLMET aero WX bc, finishing, then Gander VOLMET started and locked up after intro, in USB at 0351Z. (GV/CO)

6694.0: TUSKER 313 (CC-130) p/p via HALIFAX MILITARY to GREENWOOD OPS for SAR tasking, in USB at 0140Z. (MC/SC)

6721.0: REACH 143 p/p via Andrews HF-GCS to TACC and Travis CP in USB at 0132Z. (MC/SC)

6739.0: REACH 926 p/p via Puerto Rico HF-GCS to TACC, Scott AFB in USB at 0147Z. (MC/SC)

6742.0: CAMSLANT wkg CG 2131 (HU-

Photo C. A "BISON" C-130 on the ground at the Niagara Falls Air Reserve Base. (USAF photo)

25) for ops and position, in USB at 1451Z. (MC/SC)

6751.0: "DoD Cape" wkg *Freedom Star* (Shuttle SRB retrieval vessel); DoD Cape tells *Freedom Star* they can hear him on the phone and asks him to call again; *Freedom Star* passes message: AirTap 82, AirTap 80, Wind 12, Peak 14, Sea State 2-3 ft, visibility; MSP estimate 1200, in USB at 1430Z. (ALS)

6758.0: Unid 75/850 encrypted station in RTTY at 0344Z. (GV/CO)

6761.0: ETHYL 18 clg REACH 267 in USB at 2245Z. (MC/SC)

6911.5: BROOK (AASF #2, FL-ARNG, Brooksville, FL) sounding in ALE USB at 1343Z. (MC/SC)

6985.0: KYAASF (AASF, KY-ARNG, Frankfort, KY) sounding in ALE USB at 1338Z. (MC/SC)

7361.5: R25485 clg T3Z238 (3-238 AVN (GSAB), MI-ARNG, AASF #1, Grand Ledge, MI) in ALE USB at 2010Z. Also on 8181.5 kHz. (MC/SC)

7480.0: KNNP491WV (American Red Cross) sounding in ALE USB at 1321Z. (MC/SC)

7527.0: USCGC *Kingfisher* in radio check with CAMSLANT in USB at 2155Z; RLT (USCGC *Resolute* WMEC 620) sounding in ALE USB at 1345Z. (MC/SC)

7531.5: RUH955 (UH-60L, 1-228 AVN) clg SKYWAT (Skywatch, Soto Cano AB) in ALE USB at 0142Z. (MC/SC)

7718.5: STPOPS (AASF, MN-ARNG, St. Paul Airport) sounding in ALE USB at 2217Z. (MC/SC)

7833.0: CAPE RADIO wkg "TrackStar" for radio checks; they will monitor both 10780 and 7833 during Mil mission off Cape Canaveral, in USB at 2322Z; CAPe RADIO wkg "TrackStar" for radio checks during Mil mission off Cape Canaveral, in USB at 0305Z. (ALS)

8000.0: H5T and G0C clg A1D, W9A, K6F in UNITAS Exercise net in USB at 1424Z. (MC/SC)

8137.0: Bel Ami Caribbean WX net in progress in USB at 1145Z. (MC/SC)

8156.0: C6LS (Bahamas patrol boat) ops and position report to CORAL HARBOUR BASE in USB at 1129Z. (MC/SC)

8291.0: CAMSLANT making callouts to vessel with MMSI 215533000 that made a DSC distress broadcast, in USB at 2241Z. (MC/SC)

8337.6: SHARK 07 wkg SWORDFISH 05 in USB at 2159Z, SHARK 07 wkg SWORDFISH 05 in USB at 2202Z. (MC/SC)

8776.0: EAM broadcast in USB at 2340Z. (MC/SC)

8912.0: CAMSPAC wkg CG 1716 (HC-130, CGAS Sacramento) for flight ops in USB at 0209Z; MFN (USCGC KNIGHT ISLAND WPB 1348) clg Z13 (USCG Sector Key West) in ALE USB at 0544Z. (MC/SC)

8957.0: SHANNON VOLMET with WX info YL/EE synth voice in USB at 1300Z. (CG/KY)

8968.0: 591486DAT (KC-135R) clg MCCSPR (McClellan HF-GCS) in ALE USB at 1844Z. (MC/SC)

8971.0: WAFER 22 and WAFER 24 (P-3C) wkg GOLDENHAWK in USB at 1921Z. (MC/SC)

8983.0: USCG CAMSLANT wkg CG RESCUE 2135 (HU-25C+, CGAS Corpus Christi) regarding St. Mary's Hospital and victims of overturned vessel off Boynton Beach, FL, in USB at 1950Z; CAMSLANT wkg CG 2005 in USB at 2010Z. (ALS)

8983.0: CAMSLANT wkg CG 2117 (HU-25A, CGAS-Miami) departing CGAS Miami with 7POB, in USB at 2012Z. (ALS)

8983.0: CG 2001 (HC-130J, airborne from St. Johns, Newfoundland) requests guard from CAMSLANT in USB at 1235Z. (MC/SC)

8992.0: CAPE RADIO calling NASA 500 (NP-3D, Point Mugu), working Space Shuttle STS-125 orbiter re-entry photography, in USB at 1607Z. (ALS)

8992.0: YANKY 75 radio check with Offutt HF-GCS in USB at 1117Z. (MC/SC)

9007.0: CANFORCE 2631 (CC-130) wkg TRENTON MILITARY for WX at Montreal and p/p to WING OPS in USB at 2013Z. (MC/SC)

9010.0: PATHFINDER 31 (CP-140) position report to HALIFAX MILITARY in USB at 2210Z; HALIFAX MILITARY wkg RESCUE 908 (CH-149) with traffic from RCC in USB at 1221Z. (MC/SC)

9025.0: 21105 (C-17A) clg 571487 (KC-135R) in ALE USB at 0219Z. (MC/SC)

9106.0: WWLNNN (USN/USMC MARS NNN0WWL) sounding in ALE USB at 2258Z. (MC/SC)

10202.0: OH5 (WGY945, Ohio State EOC) clg 010CDCNHQ in ALE USB in National Public Health Radio Network at 1640Z. (MC/SC)

10538.6: SWORDFISH 13 wkg SECTOR KEY WEST in USB at 0138Z. (MC/SC)

10780.0: CAPE RADIO and "High Therm Control" calling NASA 500 (NP-3D, Point Mugu), working Space Shuttle STS-125 orbiter re-entry photography, in USB at 1600Z. (ALS)

10780.0: CAPE RADIO wkg "TrackStar" for radio checks; rqsts QSY to working freq 7833 during Mil mission off Cape Canaveral, in USB at 2320Z; CAPE RADIO wkg KING 64 (HC-130P 64-14864, Patrick AFB 39RQS) for phone patch in USB at 1705Z. (ALS)

11175.0: HF-GCS Station OFFUTT wkg S4JG for phone patch to "Duty Office"; IDs to Duty Office as TIGER 07; rqsts they pass message to 416-xxxx; also asks if any message for TIGER 02, in USB at 1811Z. (ALS)

11175.0: AIRCRAFT 2AF calling for radio check; no joy, in USB at 2335Z; HF-GCS Station ANDREWS attempting to work REACH 335 but 335 cannot copy, in USB at 2349Z. (ALS)

11175.0: HF-GCS Station "McClellan" wkg REACH 4631 (on ground) for radio check in USB at 0151Z; HF-GCS Station OFFUTT wkg TUFF 01 (B-52H, Barksdale AFB, 2BW) for radio check; wing commander probably aboard, in USB at 1734Z. (ALS)

11175.0: HF-GCS Station ANDREWS wkg EVAC 42 for M&W phone patch in USB at 2000Z; VAGABOND (U.S. MIL) with "standing by for traffic" statement in USB at 2010Z. (ALS)

11175.0: HF-GCS Station "McClellan" wkg RHINO 90 (C-5A, Wright-Patterson AFB) for phone patch to Wright-Patterson AFB Command Post; in blocks at 2200 Local; pressurization write-up and some other write-ups, in USB at 0016Z. (ALS)

11175.0: ANDREWS wkg DAWG 33 for phone patch to Irving Aviation, St. Johns, Newfoundland); rqsts WX; told to contact on VHF when closer and ask for either Irving-St Johns or Irving-Gander, in USB at 0036Z. (ALS)

11175.0: HF-GCS Station ANDREWS wkg DAWG 33 (self-IDed C-130, GA-ANG, Savannah) for two phone patches including one to FBO in Halifax; is diverting to Halifax; ETA 0235Z; 17 POB, in USB at 0134Z. (ALS)

11175.0: HF-GCS Station ANDREWS wkg COBRA 72 (OC-135B #61-2672, Offutt AFB 55W) for phone patch; they QSY to freq 11220, in USB at 1533Z. (ALS)

11175.0: PALMLEAF wkg VAGABOND (both U.S. MIL) for radio check in USB at 1614Z; OMNI 01 calls MAINSAIL, yelling like a P-3C pilot, in USB at 1619Z; AFA5RS wkg REACH 134 (over North Atlantic) for DSN phone patch in USB at 1807Z. (ALS)

11175.0: HF-GCS Station ANDREWS responds to request for radio check from HF-GCS Station PUERTO RICO in USB at 2336Z; ANDREWS wkg REACH 6008 (C-17A #96-0008, Charleston AFB 437AW) for radio check only in USB at 0042Z. (ALS)

11175.0: OFFUTT with a SKYKING "FOXTROT" PXW, time 51 auth code LI, in USB at 2051Z, ANDREWS with a msg "For APOLOGY" ZAWGK6 in USB at 1445Z; ANDREWS with a msg "For BALANCE BEAM" ZAARNC in USB at 1550Z. (CG/KY)

11175.0: HF-GCS station SIGONELLA running p/p for PACEY 65 to Mildenhall Metro, wanted WX for ETIC, but patch interrupted twice by EAMs and never completed, in USB at 1600Z; SIGONELLA with all frequency request for CONVOY 530, in USB at 1630Z. (CG/KY).

11175.0: REACH 283 calling MAINSAIL and raising CROUGHTON for radio check in USB at 1239Z. (CG/KY); BLUE 01 via Croughton, phone patch to HILDA METRO to obtain WX for BIKF and CYYR, in USB at 1243Z. (CG/KY).

11175.0: ANDREWS with a msg "For PIGEON" KOIIG3 in USB at 1505Z. (CG/KY)

11175.0: KING 85 p/p via Offutt HF-GCS to Dyess AFB CP in USB at 1958Z. (MC/SC)

11220.0: HF-GCS Station ANDREWS wkg COBRA 72 (OC-135B #61-2672, Offutt AFB 55W) for DSN phone patch to (Andrews AFB 459AW SAM CP) re ETA 1700Z; rqsts Customs be notified, in USB at 1536Z. (ALS)

11220.0: PUERTO RICO running p/p to COYOTE for Air Force Rescue 84, discussed new search area and nighttime execution plan, in USB at 2100Z. (CG/KY)

11226.0: OFF (Offutt HF-GCS) clg 277183 (C-17A) in ALE USB at 1855Z. (MC/SC)

11232.0: KING 81 p/p via TRENTON MILITARY to KING OPS at Davis Monthan AFB in USB at 2344Z; CANFORCE 4088 (CC-177, 8 Wing) p/p via TRENTON MILITARY to 8 Wing Ops in USB at 0113Z. (MC/SC)

12371.0: Unid Tactical Digital Link (TADIL) station in LINK-11 at 0220Z. (GV/CO)

13152.0: WLO synth YL with WX and holding traffic for sailing vessel *Layla* in USB at 0207Z. (GV/CO)

13257.0: SENTRY 50 p/p via TRENTON MILITARY to FALCON 3 at Tinker AFB in USB at 0021Z. (MC/SC)

13927.0: USAF MARS Operator wkg acft for DSN phone patch to Savannah Combat Training Center CP in USB at 1518Z; USAF MARS Operator AFA7HS (Leawood, KS) wkg REACH 656 for M&W phone patch in USB at 1345Z. (ALS)

13927.0: USAF MARS Operator AFA5QW (Greenwood, IN) wkg TEAM 34 (KC-10, McGuire AFB) for M&W phone patch to SW Florida area in USB at 1447Z. (ALS)

13927.0: USAF MARS Operator wkg REACH 8807 (C-130H #78-0807, PA-ANG 911AW, Pittsburgh, off the coast of Florida) for phone patch to ATOC to see if there is an upload at next destination for them to take to Norfolk, in USB at 1535Z; USAF MARS Operator AFA5RS (Shelbyville, IN) wkg REACH 8807 (15 miles SE of Cuba) for DSN phone patch to Hurlburt AFB Ops in USB at 2134Z. (ALS)

13927.0: AFA5RS wkg REACH 8807 for DSN phone patch to Hilda Dispatch (TACC), Scott AFB; flying from Gitmo to Norfolk; ATCs have issue with acft transponder not working; they tell him to press on as far as he can, and divert to place where they can get maintenance like Charleston; REACH 8807 says he will divert to Eglin, in USB at 2141Z. (ALS)

13927.0: AFA5RS wkg REACH 8807 for DSN phone patch to Eglin AFB CP regarding divert to Eglin; departed from MUGM (Guantanamo Bay NS, Cuba), ETA Eglin at 2351Z; needs Customs; 8 crew members aboard, in USB at 2220Z. (ALS)

13927.0: AFA5RS wkg CG 6042 (MH-60J, CGAS Clearwater, in Bahamas area); just checking to see if they could contact MARS in the event they need later phone patch; asks if any other freq is in use by MARS, is told that 13927 kHz is check-in freq, but 7633.5 is sometimes used due to propagation, in USB at 1420Z. (ALS)

13927.0: AFA5QW wkg CRAB 57 (C-130J #98-1357, MD-ANG 175W, Martin State A/p MD) for M&W phone patch in USB at 1715Z; 13927.0: USAF MARS Operator wkg REACH 558, 80 mi East of Cozumel, for M&W phone patch to a Virginia area code, in USB at 2254Z. (ALS)

13927.0: SMOKE 47 (over the middle Atlantic, aircraft unid, although I once heard a MacDill AFB "Bolt" KC-135 ID his mission callsign as SMOKE) calling any MARS station; no joy, in USB at 0005Z. (ALS)

13927.0: USAF MARS Operator AFA9PF (Los Angeles), then AFA7HS, wkg OPEC 49 near Flat Rock for DSN phone patch to McGuire AFB CP; asks status of receiver EMP 65, in USB at 0033Z. (ALS)

13927.0: AFA5QW wkg SHARK 35 (C-130 on Coronet Oak Mission) for DSN phone patch to San Juan Coronet Oak Ops; ETA 1740Z; Maintenance Status Alpha-3 for #4 engine pressure gauge, in USB at 1539Z. (ALS)

13927.0: USAF MARS Operator wkg REACH 7040 (C-17A #87-0040, Travis AFB 60AMW) for M&W phone patch to a California area code) in USB at 1500Z; AFA5QW wkg KING 77 (over Georgia); sudden sustained noise on freq prevents the phone patch, in USB at 1608Z. (ALS)

13927.0: USAF MARS Operator wkg SABRE 01 for DSN phone patch in USB at 0035Z; USAF MARS Operator AFA4XZ (Salt Springs, FL) wkg KING 21 (C-130, over Northern Florida at 17,000 ft, Southbound) for phone patch to St. Pete-Clearwater, FL, airport FBO; is inbound; wants freq for FBO, in USB at 1523Z. (ALS)

13927.0: AFA5QW wkg SLUFF 61 (KC-135R, Rickenbacker ANGB); relays msg to SLUFF 61 from AFA9PF re: "IDLY 12 is going to 8992" (The operator kept saying "IDLY" but I wonder if it was really "WYLIE") in USB at 1630Z. (ALS)

13927.0: AFA5QW wkg SENTRY 11 (E-3 AWACS, Tinker AFB) for M&W phone patch to a South Dakota area code in USB at 1647Z; AFA5QW wkg REACH 6014 (C-5B #86-0014, Travis AFB 60AMW) for radio check only in USB at 1645Z; AFA4XZ wkg aircraft "51," en route to San Diego, for M&W phone patch to Massachusetts area code in USB at 1506 (ALS)

13927.0: AFA5QW wkg REACH 0216 (probably MC-130P #66-0216, CA-ANG, Moffett Field) for phone patch to Barksdale Metro; requests 1830Z landing WX for KMKE (Gen Mitchell Field, Milwaukee WI), in USB at 1540Z. (ALS)

13927.0: DOOM 32 (B-52H) p/p via MARS to RED OPS at Barksdale AFB in USB at 1249Z. (MC/SC)

14212.6: Unid dasher beacon in CW at 2029Z. (GV/CO)

14300.0: Maritime Mobile Service Net in progress with KF4ZPN net control in USB at 2311Z. (MC/SC)

14405.0: USAF MARS operator AFA9PF (Los Angeles) opening Transcon Space Support Net and broadcasting mission control audio during shuttle launch in USB at 1730Z. (MC/SC)

14435.0: Unid encrypted 75/850 RTTY station, in RTTY at 0115Z. (GV/CO)

14467.0: NAV4 (USN Great Lakes MARS) in QSO with hams on 14328 during annual Armed Forces Day Cross-Band Communications Test in USB at 2054Z. (GV/CO)

15016.0: CONVOY 3982 (C-130T) p/p via Puerto Rico HF-GCS in USB at 2323Z. (MC/SC)

22186.0: Unid ALE (Mil-Std 188-141A) transmission, brief then gone, in ALE at 2212Z. (GV/CO)

22385.0: Unid station sending digital mode marker, suspected OXZ (Lyngby Radio, Denmark), in ARQ at 2215Z. (GV/CO)

27549.0: Unid ALE burst followed by voice comms that were too weak to copy, in ALE and USB at 2248Z. (GV/CO) ■

The Hallicrafters S-38 Receiver Through The Years

by Peter J. Bertini
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"The SR-75 is simply a S-38B receiver with some additional—and very innovative—circuitry included to serve as a modest beginner's 10-watt input CW transmitter inside of what was otherwise an S-38B package."

As a column devoted to vintage radios, "The Wireless Connection" had to get around to paying homage at some point in time to the venerable Hallicrafters S-38 receiver. That time is now.

The production of consumer radios at Hallicrafters had been suspended, as it was at other radio manufacturers, during World War II to help the country meet the needs of the war effort. The S-38 debuted right after the war as the entry-level receiver in the Hallicrafters 1946 product line with an introductory price of $47.50 (a scan of an early S-38 advertisement is shown in **Figure 1**).

While $47.50 might seem a modest sum today, it would now amount to an inflation-adjusted outlay of over $400! Yet the S-38 series enjoyed enormous popularity, which is not too surprising considering the pent up demand for such products in the post-war era. Various S-38 models were in production from 1946 until 1961, so many thousands were produced, and many thousands still exist. Today, the S-38 is the most commonly available vintage receiver.

For its well-heeled clientele, Hallicrafters offered the middle-of-the-road S-40. Priced at $79.00, it was transformer-powered, and an optional S-Meter accessory was also available. This nine-tube set had an RF stage: two IF stages and also included an internal speaker. The 15-tube SX-42 communications receiver ruled at the top of the 1946 line with a $275.00 price tag. Noted industrial designer Raymond Loewy designed the SX-42 cabinet and panel layout (my rack-mounted version is shown in **Photo A**). The SX-42 was the post-war replacement for the SX-28, and both receivers are popular with AM/CW ham operators and SWL boat-anchor enthusiasts. And, yes, the SX-28 and SX-42 will be featured in future "Wireless Connection" columns.

Raymond Loewy also was responsible for the trademark half-moon tuning and logging scale dials featured in the original S-38 and subsequent models. Housed in a compact cabinet with a small footprint, the S-38 initially featured a tunable BFO, ANL, six tubes, and also sported an internal speaker. Later models reduced the tube count from six tubes to five. This was done at the expense of eliminating one tube that served as the dedicated and tunable BFO stage, which was replaced with a poorer-quality fixed BFO that used the single IF stage as a regenerative oscillator. More on this as we discuss the S-38's long lineage.

The Evolution Of The S-38

The S-38, circa 1946: At first, S-38 cabinets featured the smooth black finish shown in **Photo B**; the later runs changed to the black-wrinkle fin-

Figure 1. A scan of a radio handbook ad heralding the newly introduced S-38 Hallicrafters receiver.

Photo A. The machine-age styling of the SX-42 receiver was the work of famed industrial designer, Raymond Loewy. The receiver is rack-mounted in the author's radio shop. The unit mounted below that, and partially visible, is an RCA model AR-88 World War II receiver.

ish shown in **Photo C**. Ed Engelken, who contributed many of the photos shown here, commented that the early S-38 had a metal bottom plate, which was replaced by a cardboard bottom for the rest of the series. Note the "CW Pitch" control to the left of the Bandswitch knob; this is missing in later versions.

The S-38 used a six-tube line, consisting of a 12SA7 converter (mixer and local oscillator in one tube), 12SK7 IF stage, 12SQ7 detector, ANL and first audio, 35L6 audio output, and a 35Z5 half-wave rectifier. The sixth tube was another 12SQ7, serving as a dedicated BFO stage. The BFO was tuned by varying the BFO inductor via the front panel Pitch Control knob. Arguably, the original S-38s are the most collectable of the series, perhaps because of the very short production span and six-tube line up.

The S-38A, circa 1946 to 1947: The S-38A incorporated some minor circuit changes, and one major design change that took place soon after the S-38A production commenced. The dedicated BFO stage was dropped, and the receiver went from six to five tubes. Ed's S-38A is shown in **Photo D**; and the spot on the front panel vacated by the missing Pitch Control is all too painfully evident. This change was most likely made as a cost savings measure, as it eliminated one tube, socket, BFO coil, and knob along with the associated small electrical components. The only change in the tube lineup, besides eliminating one of the 12SQ7 tubes, was to substitute a 50L6 for the original 35L6 to compensate for the total sum of the tubes series-strung AC/DC filament voltages. As an aside, folks with higher line voltages might consider swapping a 50L6 for those radios that use a 35L6; the filament current is the same for both tubes, but the tubes will run a lot cooler and perhaps last longer when running with slightly reduced filament voltages.

The S-38B, circa 1947 to 1953; the S-38C, circa 1953 to 1955: There were not many changes made to the S38-B model. The black wrinkle finish continued, and the tube lineup remained the same. However, Ed Engelken noted that the S-38B design changes were perhaps inspired by stricter UL requirements: The S-38B featured an electrically interlock AC cord on the rear panel, and had asbestos lining on the inside surface of the bottom cover plate. Ed's S-38B is shown in **Photo E**.

The S-38C cabinet style went to a more modern gray hammertone finish. The tube used for the IF stage was changed from a 12SK7 remote cutoff pentode to a 12SG7 semi-remote cutoff pentode. This change may have been made to improve the receiver's AGC action.

The S-38D circa 1955 to 1957: We don't have a photo of this one, I'm afraid,

Photo B. The S-38 receiver was at first produced with a flat black finish. Note the presence of the BFO Pitch control, which is missing on the S-38A and later models. The early S-38 employed a six-tube lineup. (Photo courtesy Ed Engelken)

Photo C. This S-38 has a black-wrinkle finish, indicating that it comes from a later production run. (Photo courtesy Ed Engelken)

Photo D. The S-38A used a five-tube lineup, and the adjustable front-panel CW Pitch control was eliminated. These moves probably saved Hallicrafters a considerable amount of money, but the savings probably weren't passed on to the consumers! (Photo courtesy Ed Engelken)

Photo E. To meet more stringent UL safety requirements, the S-38B introduced needed improvements to reduce shock hazards on these AC/DC powered hot-chassis sets. Many of the control shafts were changed to a non-conducting material to further reduce the chance of exposure to raw AC line voltages if a knob were removed. (Photo courtesy Ed Engelken)

but the major design change was to house it in a radically different cabinet design, featuring a smooth gray finish and large slide rule dial. The old AA5 octal-based tube lineup remained the same.

The S-38E, circa 1957 to 1961: The S-38E came in several flavors, with a second letter designating different cabinet color schemes. The plain vanilla S-38E sported a plain gray finish. Other finishes included the S-38EM in mahogany, the S38-EB in beige. Two contributors were kind enough to supply us with photos: first up is a gray S-38E, owned by Sal Brisindi and shown in **Photo F**; next, we have a beige S-38EB, owned by David Hopper and shown in **Photo G**.

The earlier octal tube was switched to the newer seven-pin miniature tube equivalents. The new tube lineup consisted of a 12BE6 converter, 12BA6 IF stage, 12AV6 detector, ANL (anti

Photo F. The S-38E came in several colors; this is the standard gray model, as denoted by the letter E at the end of the model number. (Photo courtesy Sal Brisindi)

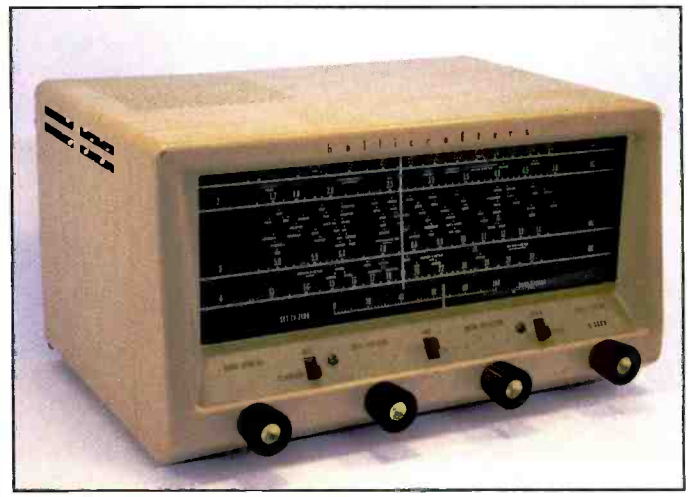

Photo G. David Hopper kindly supplied this photo of his beige S-38EB. Unfortunately, I don't have a photo of the EM mahogany model to share.

noise limiter) and first audio, and 50C5 audio output. A 35W4 was used for the half-wave rectifier. A rear panel control allowed for variable BFO injection. While the series AC/DC filament string survived, the S-38E series deviated from the original hot chassis design by switching to a floating hot ground that was coupled to the metal cabinet via a bypass capacitor. Regardless, any of the receivers in the S-38 lineage should be fully restored using AC safety bypass caps where needed, and even better, should only be operated using an external AC isolation transformer.

Figure 2. These two side-by-side scans are of an early Hallicrafters ad that spanned two pages. The SR-75 was essentially an S38-B that included a 10-watt input CW transmitter. The ill-fated SR-75 faded into obscurity almost as quickly as it was introduced.

The SR-75: The S-38B On Steroids

My research for this column led to me to a fairly rare and obscure Hallicrafters' product: the SR-75 receiver/transmitter combo. Unfortunately, only a few folks I've spoken with have owned or even seen one. Naturally, I'm looking to find one for my collection! The SR-75 is simply a S-38B receiver with some additional—and very innovative—circuitry included to serve as a modest beginner's 10-watt input CW transmitter inside of what was otherwise an S-38B package. This entailed adding a 12BA6 crystal-controlled oscillator stage to the tube lineup and changing the 35Z5 rectifier to a 117Z6 voltage doubler for the higher plate voltages needed for efficient transmitter operation. The 50L6 did double duty as both the audio and RF transmitter output stage.

Adding a CW hand key to a hot-chassis AC/DC radio was another challenge that Hallicrafters' engineers had to overcome. Their solution was to include a battery-powered relay that followed the CW keying of the hand key, thus providing full AC line voltage electrical isolation to the operator. Things were getting a bit crowded on the chassis as you can imagine, and the designers resorted to adding the transmitter controls on the rear chassis apron. Since the 15-meter ham band wasn't assigned until 1952, the SR-75 CW transmitter only covered 80, 40, 15, 11 and 10 meters. Yes, 11 meters was originally a shared band that permitted radio amateur operation in the pre-CB era.

The SR-75 never caught on, and was only briefly offered between 1950 and 1951 before sliding into obscurity. I suspect very few were sold and that fewer still survive to this day. A two-page ad for the SR-75 is shown in **Figure 2**.

Epilogue

In response to a comment about how great life must have been back in the 1950s, a friend replied that "these are the best days." And I suspect is the lesson behind the legacy of the S-38 receiver. Many beginning amateurs were limited by the size of their wallets, and may have been influenced by being able to own a receiver that could do both double duty for both shortwave listening and amateur radio operation.

Alas, while I suspect the S-38 might have had some utility as an SWL's basic band cruiser, it probably left everything to be desired as a CW operator's receiver. They were single conversion and plagued with image problems. They drifted, the IF selectivity was very broad, and even finding the amateur bands was probably a difficult on dials with 30 MHz of coverage crammed on four tiny and poorly marked scales! One wonders how many prospective or new hams were dissuaded from the hobby after such an experience? Regardless, it seems like millions of these receivers were produced, and many are still in active use or displayed by their proud owners. Giving the devil his due, they are fairly sensitive, and fun to operate.

I hope you enjoyed this stroll down Legacy Lane. Until next time, keep those soldering irons warm and those old tubes glowing! ■

The Great Crow Incident

by Bill Price, N3AVY
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"On one particular night, after I made sure it wasn't going to rain, I put my 25-watt Silvertone guitar amplifier (with tremolo!)by the edge of the planted field,connected it to the HP oscillator, and covered it with a plastic sheet."

I was 13, maybe 14. Always studying for my novice ticket, but never getting serious about the code, though that didn't keep me away from gadgets. One of my favorites was an HP audio signal generator. Besides trying to play tunes on it by moving the dial back and forth to get "notes," sometimes I'd attach a key and speaker to it and use it as a code practice oscillator, but not often enough. I hadn't really found a use for it—until the crows came.

It was during the first warm days of spring, when we began to sleep with the windows open. The crows seemed to like whatever was planted in the field about 50 yards from my window. Their cawing began long before my alarm clock could wake me for school, and they were annoying. Fourteen-year-olds are so easily annoyed.

I thought about shooting them, but before I even remembered where the guns were kept, I remembered that audio generator, and how I'd heard that many animals are repelled by certain pitches. And I had all the pitches of the audio rainbow at my fingertips, plus a guitar amplifier to help me along.

On one particular night, after I made sure it wasn't going to rain, I put my 25-watt Silvertone guitar amplifier (*with* tremolo!) by the edge of the planted field, connected it to the HP oscillator, and covered it with a plastic sheet. All our extension cords put end to end reached back to my window. Tone and volume controls were set to max, and the pitch on the oscillator was set somewhere just above where I could hear it. A good guess.

Morning came. The crows came. Caw, caw, caw. I plugged in the cord. I could hear the hum, and I hoped the crows could hear a ferocious squeal. Maybe they did; maybe they didn't. If they did, they must have liked it, because they went on eating and cawing.

That night, I got "the shotgun," a 12 gauge. I knew my father wouldn't want me messing with it, so I did all this after my parents were asleep. I put one shell into the chamber, put the safety on, and set it carefully beneath my younger brother's bed. He was asleep, too, and blissfully unaware of my plans. I leaned across my brother and opened the screen, raising it about two inches until it clicked in position and stayed there. I stuffed a towel into the opening to keep the bugs out.

The next morning, the crows returned. Caw, caw, caw. Well, my little friends, I thought, I'll get at least one of you, and that should be a lesson for the rest. I retrieved the gun and leaned gingerly over my brother and removed the towel, wrapped the barrel of the gun with it so it wouldn't be scratched by the screen, and gently slipped about an inch of the barrel outside the screen—enough, I thought, to keep the sound outside and not bother my brother.

My parents slept soundly in the next room. A large exhaust fan whirred in their window, assuring me they wouldn't hear the gun, either.

Somewhere between the click of the trigger and the earth-shattering KA-BLAM! of the shotgun blast, I realized that I had made some bad assumptions about the sound of the gun and whether it might be heard by other family members.

I turned and saw my father actually hovering in my doorway. He must have levitated from his bed, while my mother's muffled tones from their room demanded, "What in the hell was that? Did the end of the house fall off?"

My father was the king of understatement, and said not a word, but extended his hand, silently demanding that I give him the gun. I turned to comply and he took a step toward me, still making eye contact with me while his big toe made contact with my Craftsman 108 piece tool set with the 18-gauge rustproof steel box with the gray hammertone finish. My mother again demanded, "What was that noise?," while my father muttered what might be construed as a short prayer.

With the gun safely in his hand, and a very pained expression on his face, he quietly asked, "What were you doing?"

Not an unreasonable question, I thought.

"The crows were making noise." I said. "They woke me up."

As my mother asked her question a third time, I noticed that my brother was no longer in his bed, but I could see his feet sticking out from behind his dresser. When I looked closer, I saw he was sitting back there with two pillows over his ears and a terrified look on his face.

My father retreated deliberately from my room. I heard my mother demanding of him "What was he trying to do? WHAT crows? Is he out of his MIND?"

I have always had great respect and love for my dad, but never was I so grateful for his demeanor as I was that morning.

If I'd been him, I'd have killed me. Right there on the spot. They wouldn't have even indicted him if he had done that. They'd have probably awarded him damages from my piggy bank.

Bill seems to be fine, now. But when he speaks about visiting his brother, he tells me that his sibling mainly just holds his ears and stares straight ahead, sometimes calling out, "Caw! Caw! Watch out for that toolbox!"—editor

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