

# POPULAR COMMUNICATIONS

MAY 2012

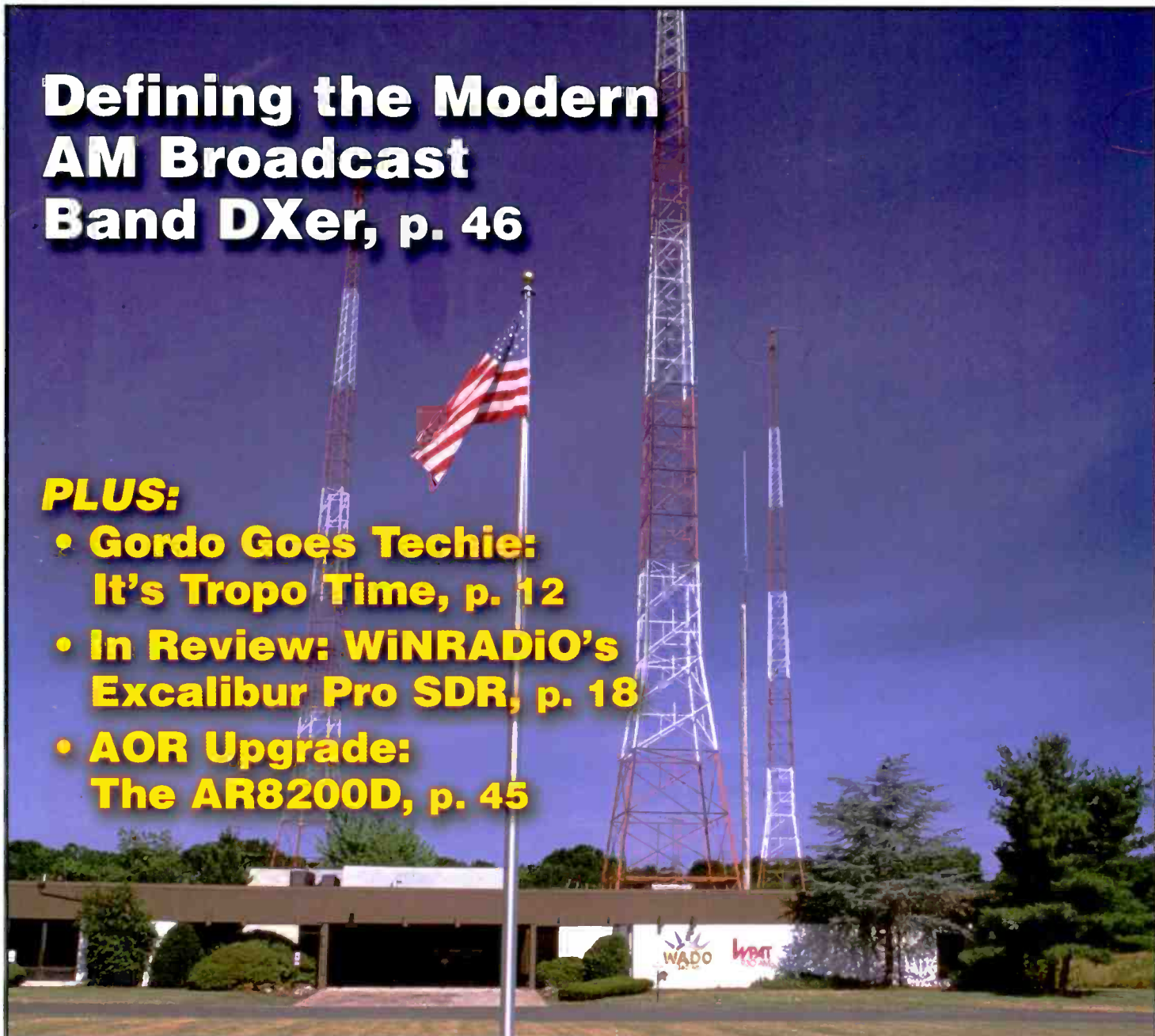
Shortwave Listening • Scanning • AM & FM • Radio History

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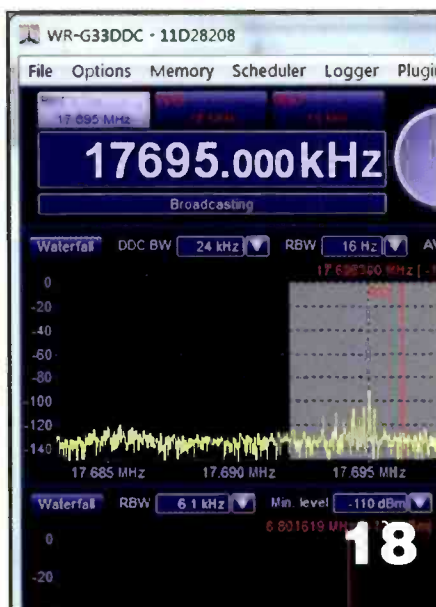
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## ON THE COVER

This month, *Broadcast Technology's* Bruce A. Conti, WPC1CAT, focuses on receiving antennas in the first in a series of articles defining the modern AM broadcast band DXer, page 46. From a transmitting antenna perspective, photographer Larry Mulvehill, WB2ZPI, captured this blue-sky backdropped view of WADO-WPAT antennas at their facilities south of Paterson, New Jersey. At 1280 AM, WADO is a Spanish news-talk station, while WPAT, 930 AM, bills itself "Multicultural Radio."

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A publication of



CQ Communications, Inc.  
25 Newbridge Road  
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Popular Communications (ISSN-0733-3315), Vol. 30, No. 9 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 \$34.95, two years \$62.95, three years \$91.95. Canada/Mexico—one year \$44.95, two years \$82.95, three years \$121.95. Foreign Air Post—one year \$54.95, two years \$102.95, three years \$151.95.

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Printed in U.S.A.

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## EDITORIAL

### Tuning In

by Richard Fisher, KPC6PC/K16SN  
<[editor@popular-communications.com](mailto:editor@popular-communications.com)>

# Dayton 2012: 'Oh, the Ham Op and the Listener Should Be Friends!'

As its name infers, the Dayton Hamvention® is foremost a block party for the amateur radio community. But each year — this will be my third — I'm impressed by how many non-ham shortwave and scanner enthusiasts join in on the fun and stop by the CQ Communications booth to say hello. *How fantastic.*

I shouldn't be surprised. After all, Dayton is very much a COMMvention, with something for anyone with an interest in wireless communication. Lots of listeners have the good sense to recognize this and make the pilgrimage every year.

There are the radio amateurs, as well, who first got into the game as a shortwave or scanner listener. With the feedback we're getting from the *Pop'Comm Monitoring Station* program, it's fair to say there are many thousands of active hams who remain SWLers and scanner buffs in addition to their amateur radio interests.

"Oh, the farmer and the cowman should be friends," sings the cast of *Oklahoma!*

"Oh, the ham op and the listener should be friends," sing the 20,000+ Hamvention attendees. And they are!

It's a harmonic convergence of everything wireless, and if you've never attended, I strongly encourage you to do so. Dayton Hamvention® is a showcase for introducing new gear, including the latest receivers, antennas, software, and so on — a candy store for ham ops and listeners alike.

There are forums touching a broad swath of communications interests and technologies, delivered by experts in their field. There are dinners and hospitality suites. Around-the-clock action.

What's really special is the camaraderie among people who simply get a thrill out of listening for, or talking to people in distant places. It's a three-day adrenaline rush that you'll not want to end.

This year's show is May 18-20 at Hara Arena in Dayton, Ohio. The CQ booth will be on the main floor of the convention hall. Look for the classic red-and-white CQ logo. We'd be so happy to meet you.

(IN DEPTH: For complete details on the 2012 Dayton Hamvention®, visit: <<http://www.hamvention.org/>>. — KPC6PC)

## Update: The Pop'Comm Monitoring Station Program

You'll see in this month's *Monitoring*, page 26, as of the end of February, the *Pop'Comm Monitoring Station* (PCMS) community has grown to more than 800 listeners. We find that number pretty gratifying. The program launched New Year's Day.

Hundreds of Certificates of Registration have been downloaded from the *Pop'Comm Monitors on the Web* Internet page: <<http://www.PopCommMonitors.blogspot.com>>. And we're trying to keep pace with the written requests. Thanks for your patience.

If you are new to *Pop'Comm*, full details about the PCMS program appeared in the January 2012 edition, and an easy four-step registration process at the *Monitors on the Web* website will walk you through how to join.

If you're not yet a member, please take a look. We're building a wonderful listening community and would very happy to have you as part of it.

## Combined Pop'Comm-WRO Live Internet Chat, May 6

Every month you're invited to a casual Internet chat session for *Pop'Comm* and *WorldRadio Online* readers. After all: "*The ham op and the listener should be friends!*"

This month's session begins at 8 p.m. Eastern time Sunday, May 6, (Sunday midnight, 0000 UTC) on the *WorldRadio Online Blog*. Get ready for conversation about *everything communication*.

To take part, at chat time visit <<http://www.WorldRadioOnline.blogspot.com>> and click on the *Cover It Live* box appearing on the page. You'll be linked right to the gab-a-thon.

If you'd like to see texts of previous sessions, you're welcome to do so by pressing *REPLAY* in the chat boxes on the blog for previous months. You can sign up for an email reminder of the May 6 chat, as well, so you won't miss the fun.

We sure hope to see you there.

— Richard Fisher, KPC6PC/K16SN

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\*Frequency specs may vary. Refer to owner's manual for exact frequency specs <sup>1</sup>Optional CI-17 required. <sup>2</sup>Optional CS-RX7 required.  
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**ICOM**

# The Weirder Side of Wireless, and Beyond

Compiled by  
Richard Fisher,  
KPC6PC

## From Beeps to Tweets in One Easy Interface

“Urgent messages sent using Morse Code via radio waves or by electrical telegraphy are, by necessity, quite short,” notes Paul Ridden on the *Gizmag* website, “after all, you don’t want to spend all day dotting and dashing your way through *War and Peace*.”

He suggests that if you “are looking for a novel way to merge the old with the new, Martin Kaltenbrunner’s open source *Tworsekey Morse Code* interface can deliver messages” to Twitter. This is a do-it-yourself project. Everything you need to know is on Kaltenbrunner’s projects page: <http://bit.ly/xO77vx>. There are demonstration videos there, as well: <http://bit.ly/zsuXqz>, **Photo A**.

According to Kaltenbrunner, who is with the Interface Culture Lab at Kunstuniversität Linz, Austria, the project is “an open design exercise in interface archaeology, that decodes the input from a classic Morse telegraph to send Twitter messages. The source code and hardware schematics are available online: <http://bit.ly/xwSmrA>.”

The *Tworse Key* is a standalone device that connects through a standard LAN cable, he says. “The Morse signals are decoded by a built-in Arduino Ethernet board, which delivers the final message through the Twitter API. Please follow [@tworsekey](https://twitter.com/tworsekey) on Twitter to read some example Tweets sent from the actual device,” he suggests. (Source: *Gizmag*, <http://bit.ly/xtD119>)

## ‘We’ll Try’ = ‘No Freakin’ Way’

From Corey Deitz’s *Wacky World of Radio* regarding the radio station song request line:

**The Perception:** You call a station and request a song. The deejay says, “Okay, we’ll try to get it on for you.”

**The Truth:** As *Yoda* said: *There is no try*. What he really means is *no freakin’ way*.

**Why:** Because most radio stations have computer software that rotate the station’s library of music in a methodical way that is more protected than the Jonas Brothers’ virginity. (Source: *About.com*, <http://bit.ly/zhw31h>)



**Photo A.** A demonstration video shows Martin Kaltenbrunner’s open-source *Tworsekey Morse Code* interface translating and delivering a short message to Twitter. Beeps to Tweets, as it were: <http://bit.ly/zsuXqz>. (Internet screen grab)



**Photo B.** Westinghouse and Glenn L. Martin employees pose in front of B-29 Superfortress used in Stratovision tests, circa 1948-1949. And then it was gone . . . (Courtesy of Wikimedia Commons)

## Stratovision: In 1948 You’ve Got It, in 1950, You Don’t

This, from *Air & Space Smithsonian*: On June 23, 1948, a B-29, orbiting 25,000 feet above Pittsburgh, rebroadcast the Republican convention directly from WMAR-TV in Baltimore, 9 to 10 p.m. EDT.

The bomber was outfitted with an eight-foot mast on its vertical stabilizer to receive programs; the signal was sent from the antenna to the cabin, and on to the broadcast antenna. The antenna, stored horizontally in the bomb bay, projected 28 feet down when operating.

After the convention transmission, Martin USA and Westinghouse representatives, **Photo B**, trumpeted Stratovision’s future. They foresaw a nationwide Stratovision network, with programs beamed from one airplane to the next.

Fourteen airplanes could bring TV and FM radio to 78 percent of the population. A comparable ground installation network would require more than 100 relay points, Westinghouse estimated. A fleet of 60 Martin 202 airliners would suffice . . .

In 1949, AT&T set up a coaxial cable network to connect the East Coast with the Midwest, largely through underground wiring. *Oops*.

Westinghouse dropped Stratovision in 1950. (Source: *David Pescovitz, BoingBoing and Air & Space Smithsonian*, <http://bit.ly/w0Cuq5>)

## Wacky DJs and Slow-Cooked Cows

Have you ever wondered why most radio station offices and studios are in one place and the actual transmitter and radio tower are in another?

“We do that because radio waves have been proven to destroy brain cells,” writes Corey Dietz, *About.com* radio industry expert. “How else can you explain some of the wack-jobs, screw ups, and weirdos that get hired to be on the air?”

In addition, Deitz reveals, “many ranchers pay radio stations to place transmitters and towers on their farmland because few people know that AM and FM signals slow-cook the inside of cows and that permits ranchers to sell the cow directly to steak houses for a higher profit.” (NOTE: This is a joke. No cows were harmed during the writing of this item.—Ed) (Source: *Corey Deitz, About.com* <http://radio.about.com/>)



## News, Trends, And Short Takes

By D.Prabakaran

### APCO International Appoints Executive Director

A 30-year veteran of law enforcement and federal telecommunications policy in leadership roles has been named executive director of the Association of Public-Safety Communications Officials (APCO) International.

Derek K. Poarch, **Photo A**, who was appointed in late 2011, recently served as the Public Safety and Homeland Security Bureau Chief at the Federal Communications Commission where he led a team “responsible for the licensing of all public safety communications networks in the United States and ensuring its reliability in responding to man-made and natural disasters and other homeland security matters for the FCC,” APCO said.

“With the breadth and depth of his background, Derek is well positioned to propel APCO International to greater heights,” said APCO President Gregg Riddle.

“Having worked with Derek when he was at the FCC, while I was serving on the APCO Board, I found him to be the consummate professional and well respected in public safety circles,” said APCO Search Committee Chair and Past President Chris Fischer. “I am thrilled to have the opportunity to work with him again.”

Poarch served eight years as the director of public safety/chief of police for the University of North Carolina at Chapel Hill where he led a CALEA (Commission on Accreditation for Law Enforcement) accredited department of approximately 300, “providing police, security, E-911, parking and transportation services to a university community of approximately 45,000.”

“As Executive Director, Poarch will be responsible for managing all aspects of the association including its employees, its advocacy agenda, the attainment of its strategic plan, its financial well-being and the growth of its activities for the benefit of its members and the public safety communications sector,” APCO said.

“I started out in public safety communications as a telecommunicator and the appointment as Executive Director of APCO provides a unique opportunity to take my career full circle and apply the knowledge, skills and experience from my career to continue to move APCO International’s mission forward,” Poarch said. “I look forward to partnering with the officers, board, executive council and staff of APCO to assist the women and men who daily serve the citizens of our country by providing first-class public safety communications.”



Photo A. Derek K. Poarch, executive director of APCO International.

*(BACKGROUND: APCO International is the world’s largest organization of public safety communications professionals. “It serves the needs of public safety communications practitioners worldwide,” the organization says, “and the welfare of the general public as a whole — by providing complete expertise, professional development, technical assistance, advocacy and outreach.” Visit: <<http://www.APCOintl.org>>. — Ed.) (Source: APCO International)*

### Radio Pakistan Hit by Financial Woes

The Pakistan Broadcasting Corporation — popularly known in the subcontinent as Radio Pakistan — is facing a severe financial crunch, plunging more than 3,000 employees and artists into a future of uncertainty.

Permanent employees of the corporation have not been paid the 15 percent increase in salary announced in the federal budget 2011-12, while contractual and daily-wage workers are waiting for their salaries for the last two months, officials said. Some employees said the management has told them the Ministry of Finance was yet to release the funds needed to pay them the raise. A daily-wage employee said that in the Urdu unit there were 35 employees out of which three were regular and the remaining were daily earners. The same was the case in the units of different languages like Punjabi, Seraiki, Balochi, Sindhi, Kashmiri, Balti and Hindi, he said. (Source: *TwoCircles.net*, <<http://www.twocircles.net>>)

### German TV Broadcasters to Harmonize Audio Levels

Germany’s public and commercial TV broadcasters have unanimously agreed to use European Broadcasting Union (EBU) Recommendation 128 to underpin a national move to harmonize the audio levels of their television output.

The broadcasters, including EBU Members ARD and ZDF, plan to begin broadcasting with newly harmonized volume beginning August 31. Thereafter, German viewers will no longer have to grab the remote to manage sudden lurches in volume between programs, advertisements, and so on — as well as discrepancies between channels. (Various sources)

### Trans World Radio Malawi, Becomes ‘Your Friendly Voice’

Trans World Radio (TWR) Malawi is now known as “Your Friendly Voice,” dropping the phrase “in Africa” as it has been known all these years.

In a statement sourced by *Nyasa Times*, “in November 2009, the International Leadership for Trans World Radio directed that all TWR ministries and partners move to using the tag name TWR and the tagline “Speaking Hope to the World.”

TWR Malawi had since the 1980s been using “Your Friendly Voice in Africa,” for its Africa-wide radio outreach. TWR Malawi continued to use this even when it started the FM network in 2001.

In 2011, Trans World Radio celebrated 25 years of work in Malawi — 10, of which, has been broadcasting using the FM signal countrywide. (Source: *Nyasa Times*)

# Capitol Hill And FCC Actions Affecting Communications

by Richard Fisher,  
KPC6PC/KI6SN

## FCC Chairman: ISPs Need to Amp-Up Cybersecurity Role

Federal Communications Commission Chairman Julius Genachowski called on Internet service providers (ISPs) to take a greater role in cybersecurity, while appearing to defend the principles of an open Internet, according to a report on *TomsGuide.com*.

The Chairman's remarks came in a speech given at the Bipartisan Policy Center, <<http://bit.ly/xlrnrA>>, in February. "Singling out domain name fraud, IP hijacking and botnets, (Genachowski) urged what he termed 'Internet stakeholders' to deal with these threats more aggressively," the report noted.

"Today, I'm calling on all ISPs, working with other stakeholders, to develop and adopt an industry-wide Code of Conduct to combat the botnet threat and protect the public," Genachowski said. "This Code of Conduct would be a major step forward and a significant complement to the Obama Administration's broader efforts."

"Consumer education is a key piece of the solution," to these threats, Genachowski suggested. "ISPs can play a significant role in the battle against botnets. They can increase customer awareness so that users can look for signs that their computers are being used as bots, detect infections in customers' computers, notifying customers when their computers have become infected, and offer remediation support." (Source: *Tom's Guide*)

## 200 Radio and 75 TV Stations to Undergo EEO Audit

An Equal Employment Opportunity (EEO) audit was announced by the FCC in February, to assess approximately 200 radio stations and 75 TV stations, authorities said.

An annual audit of 5 percent of all broadcast stations and cable systems in the U.S. had been pledged by the Commission, "to assure their compliance with the Commission's EEO rules — requiring wide dissemination of information about job openings and supplemental efforts to educate their communities about job opportunities in the media industry," the broadcast law blog *JD Supra™* reported, <<http://bit.ly/w99JXi>>.

A deadline of March 27 was set for responses to the FCC from the audited stations. (Source: *JD Supra™*)

## GPS Users Breathe Easier Following Decision on Cell Network

The FCC's revocation of conditional approval of a proposed cellular telephone network that could interfere with GPS signals had outdoors enthusiasts — and especially recreational boaters — breathing a sigh of relief, according to *BYM Product and Industry News*, <<http://bit.ly/wGUMoH>>.

The announcement came February 14, "after the U.S. Commerce Department advised the Commission that 'At this time there are no mitigation strategies' that could prevent interference with GPS signals if the cell phone network planned by a private company, LightSquared, were to be built as proposed," the report said.

"This is a significant development for all GPS users," said BoatUS President Margaret Podlich. "The FCC, as

America's guardian of our airwaves, needs to protect the integrity of the GPS system. It is one of the most important, reliable and critical elements in navigation today — on boats, in the air, and on land." (Source: *BYM Product and Industry News*)

## 800 MHz Licensing Requirements Under Review

An FCC proposal would modify the Commission's licensing requirements for the 800-MHz band by dumping its site-based model with more modern geographic guidelines, reports *Engadget*. <<http://engt.co/ztwLtk>>.

"Commissioners argue the change is needed, as site-based rules were originally established to consider the propagation of analog signals — now obsolete by anyone's standards," the Web posting said. The change would align 800 MHz licensing requirements with those of the 700 MHz, Advanced Wireless Services (AWS) and Personal Communications Service (PCS) bands "and reduce a boatload of paperwork along the way by eliminating current data collection requirements. The proposal would also create a new, two-stage auction process for the unlicensed areas, based on the new geographic approach." (Source: *Engadget*)

## Arizona Legislator Wants FCC Rules Adopted in Classrooms

An Arizona state legislator has introduced legislation that would require classroom teachers to follow FCC guidelines for speech.

The *Associated Press* reported State Sen. Lori Klein introduced the measure "because a parent in her district complained about a high school teacher using foul language."

Klein described the words as "totally inappropriate," and teachers who don't keep their language clean "aren't setting a good example for students," she told the AP.

"You're there to be educated," Klein said. "You're not there to talk smack." (Source: *The Associated Press*, <<http://bit.ly/yEZVoc>>)

## Commission Steps in When Radio Station License Appears on eBay

A Benton Harbor, Michigan-owned community radio station license that was listed for sale on eBay in February cannot be sold in that way, the FCC ruled.

A report by local ABC 57 News said it received an email from an FCC spokeswoman explaining:

"The Commission approves the assignment or transfer of all broadcast stations. A low-power station can only be assigned or transferred to a local not-for-profit entity."

(WATCH: *The ABC 57 news report*, <<http://bit.ly/zQScYl>>. — Ed.)

WBHC's equipment and license were posted on eBay for a minimum bid of \$5,000 by Benton Harbor Emergency Manager Joseph Harris.

Harris closed WBHC in January as a cost-cutting move for the city, whose "city commissioners would host regular talk programs on the station, until it closed," ABC 57 reported. The listing was subsequently removed from eBay. (Source: *ABC 57*)

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## Recent and Future Developments

by Rob de Santos, K8RKD  
<commhorizons  
>@gmail.com>  
Twitter: @shuttleman58

*“It remains my sense that analog cable will largely disappear, with or without a mandatory FCC order.”*

Occasionally, even in a column about future trends in communications, it is worthwhile to ask where we are and if that affects where we thought we were going.

It is a good time to do that with several trends I’ve covered in this column over the past three-and-a-half years.

One subject that has arisen several times is the end of analog cable TV. Recently, the FCC suggested it is willing to give analog a reprieve from its imminent demise. Without much warning, the FCC issued a preliminary rule that would drop the end date for analog cable service.

When analog broadcast television ended in June 2009, one of the provisions of the FCC orders that were behind that change was something that, at least at the time, the cable industry wanted: The end to the mandatory obligation to offer low cost, analog service.

With the mandate that the cable industry carry the new digital broadcast signals — sometimes alongside the soon-to-be-ending analog signals of broadcast stations in their area — was relief from the analog service obligation.

The rule stated that three years after the end of analog broadcasting, cable companies would no longer have to offer analog cable service. This made sense for several reasons.

- Without analog broadcasts, the cable systems had to convert the new high-definition broadcast signal back down to low-definition analog just to feed it to the analog customers. Today, that is the case with virtually every channel in the analog service.
- Perhaps more importantly, the analog service took up large amounts of precious bandwidth on their cable. One analog channel uses the same spectrum space as four to six digital signals or many megabits of Internet service. Eliminating that spectrum usage would mean more channels of service to digital cable customers and faster Internet speeds.
- More channels and faster service presumably means a better and more competitive product and happier customers.

### Things Look Different Today

Now, the landscape seems to have changed. The rate of customers converting from analog to

digital cable has slowed, but continues. Most cable systems now have less than 15 percent of their customers using analog service.

Recently though, some customers have reverted to analog. This seems to be a product of two trends: An attempt to cut costs in tough economic times and the “cord cutters.” Strictly speaking, in industry parlance a “cord cutter” is someone who gives up cable service for OTA (over the air AKA broadcast) television or who turns to the Internet for TV.

Combine those cutting costs and those who think they can get all the TV they want from their Xbox 360 or Roku box, and you have a different situation.

Another and perhaps larger problem are the small, independent cable systems. Many small towns and rural areas aren’t served by *the big boys*: Comcast, Time Warner, Cablevision, and so on. *The big boys* don’t find much money to be made in serving lightly-populated rural areas, particularly in the western United States.

As a result, small companies serve these areas. For these systems, the higher costs of implementing the latest and greatest technology mean that it happens on a much longer time scale. They may have customers who don’t own a HDTV, *and never will*. It’s analog cable or nothing. No analog cable and you lose the customer.

The political reasons behind this shift aren’t so clear. By the FCC’s own admission, no one is asking for this. You can be sure however, that there is more to it.

Perhaps, as the Rule and Order work their way through the process, we will learn more about the reasons.

It remains my sense that analog cable will largely disappear, with or without a mandatory FCC order. It may simply take longer than we expected. The forces behind the decline in analog cable will continue.

Will that lead to the end of analog cable? We will have to wait and see. What will the FCC do? That’s even harder to tell until we know what is behind the current rule-making effort.

*Next month, more on the future directions in communications. Is there a trend in communications you would like to see discussed? Drop me a line with your thoughts and suggestions. – K8RKD*

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# Hey Kids, What Time Is It? It's Tropo Time!

## **Gordo Goes Scientific on Why Your Scanner is Picking Up VHF/UHF Signals From 500 Miles Away . . .**

By Gordon West, WB6NOA/WPC6NOA

**H**ow is the weather? If it is warm, sunny and you can see a band of smog hanging on the horizon, get set for some exceptional VHF/UHF radio conditions!

"This past week, the skip conditions between Texas and Florida were rock solid for three days," writes one very excited scanner listener, capturing Public Safety VHF signals from Tampa, Florida at his listening post in Houston.

"The sunspots were really going to town!" adds our scanner listener, likely unaware that this extraordinary long-range reception had *zilch, nada, zero* to do with the ionosphere.

### **Skywaves**

Ionospheric skip — skywave — is a common summertime condition from 27 MHz up through the amateur radio 50-MHz, 6-meter band. Skywaves refract off the E layer during summer months giving us great low-band state police reception between 30 MHz and 50 MHz. And during peak E skip conditions, you might even hear some short-lived rural fire department calls up at 154 MHz.

These skywave conditions, abbreviated  $E_s$ , are extremely short in duration above 100 MHz, lasting only minutes. Sporadic-E skip is characterized by deep fades in signal strength, multiple times, going from S-9 to S-0 in a minute. Seldom is there E skip at night.

### **Tropo**

The summertime path between Texas and Florida is a *weather* phenomenon, separate from sunspots and ionospheric sky-wave refraction, **Photo A**. This weather phenomenon brings summertime excitement all over the country.

- The California/ Hawaii path
- The Chicago/Dallas path
- The Texas/Florida path
- The Great Lakes/Washington, DC path
- The New England/Miami path

The atmospheric weather condition creating enhanced reception from 100 MHz to 1500 MHz and higher is called tropospheric ducting. It occurs every summer, and the VHF band from 30 MHz to 300 MHz is influenced most by this several days and nights of atmospheric phenomena.

As a VHF and UHF scanner listener, or a ham who regularly works 2 meters, 220 MHz, and the 440-MHz bands, you fre-

*"Watch the weather this summer, and let's see who can give us the most-distant tropospheric ducting reception or QSO report!"*



**Photo A.** Gordon West, WB6NOA, works 2-meter SSB DX via tropospheric ducting during a trip to the California desert. His van's wheel-mounted mast and compact Yagi combine to assure his VHF signal is getting out. (Images courtesy of WPC6NOA)

quently experience 20- to 60-mile range to access area repeaters, and occasionally to a simplex (same frequency TX and RX) base station. Signals normally travel line-of-sight to the horizon plus another 15 percent, bending over the horizon.

It's easy to calculate the approximate range to the horizon, based on your height above local terrain in feet. Be sure to include the height of your antenna in this calculation. Take the square root of your total elevation in feet (your location's elevation above local terrain, plus the height of your antenna), and that works out to be the approximate mileage to the horizon.

**For Feet and Miles:**

- 64 feet = 8 miles
- 100 feet = 10 miles
- 144 feet = 12 miles

**For Kilometers and Meters:**

- $D = \sqrt{17H}$ , where:
- D = distance to radio horizon (in km)
- H = height of antenna above local terrain in meters

This formula for microwave tropospheric bending is based on our local weather atmosphere being "normal."  $N = 10^6 (N-1)$ . (IN DEPTH: For an explanation of this formula, refer to *The RSGB VHF/UHF Manual*, published by the Radio Society of Great Britain, and edited by GR Jessop, G6JP. - WPC6NOA.)

**Normal Atmosphere**

Normal atmosphere, up to about the altitude of commercial jet planes, exhibits a decrease in air pressure with altitude, in an approximate logarithmic manner, Figure 1.

Air temperature also decreases with altitude — approximately 20 degrees Fahrenheit for every mile of increasing height.

The number of water molecules also decreases with altitude, resulting in atmospheric density decreasing with height above the surface of the Earth.

VHF and UHF radio waves exhibit a slight bending under normal weather conditions. The lower portion of the VHF/UHF wave front slightly decreases in velocity, with the denser atmosphere below it.

The upper portion of the VHF/UHF wave front encounters slightly less atmosphere, and bends slightly over the lower, slower wave front, giving us that 15 percent bend over the horizon.

In the summertime, in the presence of

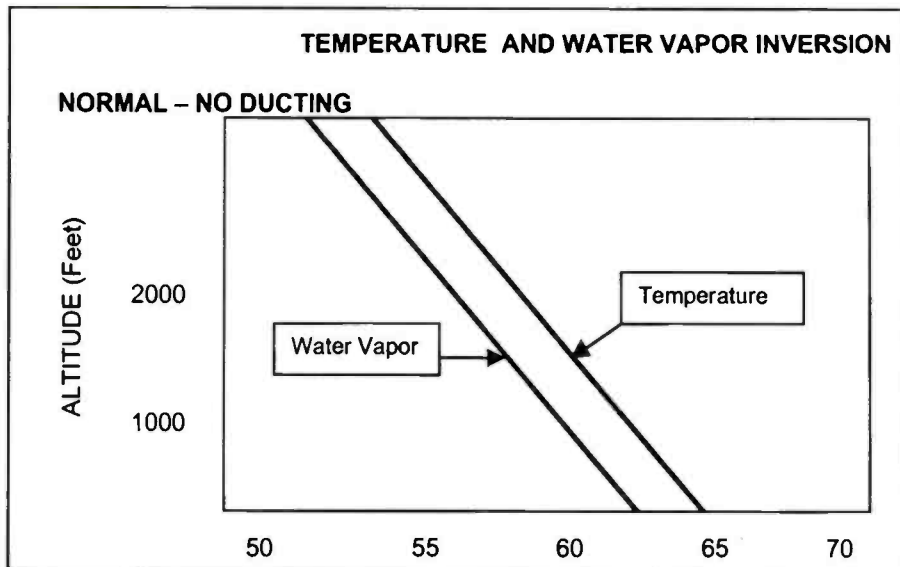


Figure 1

a high-pressure system that has stalled across the Pacific, central United States or the Atlantic seaboard, atmospheric conditions are no longer "normal."

This stratification of air gets squeezed by the descending atmosphere above and the stable wind-less air below. When you squeeze air, it gets warmer.

**High Pressure in Motion**

The clockwise-moving high-pressure area may build up in the stratosphere, pulling up moist surface air from an ocean or ground. This concentration of air aloft ultimately begins to descend because of its volume and weight above. This descending air, called subsidence, may stratify at about 1,000 feet above an ocean or North America, for example, as part of the slow-moving, high-pressure cell.

**Tropospheric Ducting**

That band of brown haze hanging on the horizon is an example of a tropospheric duct. The stagnant air within that band of smog is sometimes 10-degrees warmer than the descending air above it and the non-moving air below. This is called an inversion.

The inversion is fueled by moist air coming up from the tropics, so we have an abrupt increase in temperature, an increase

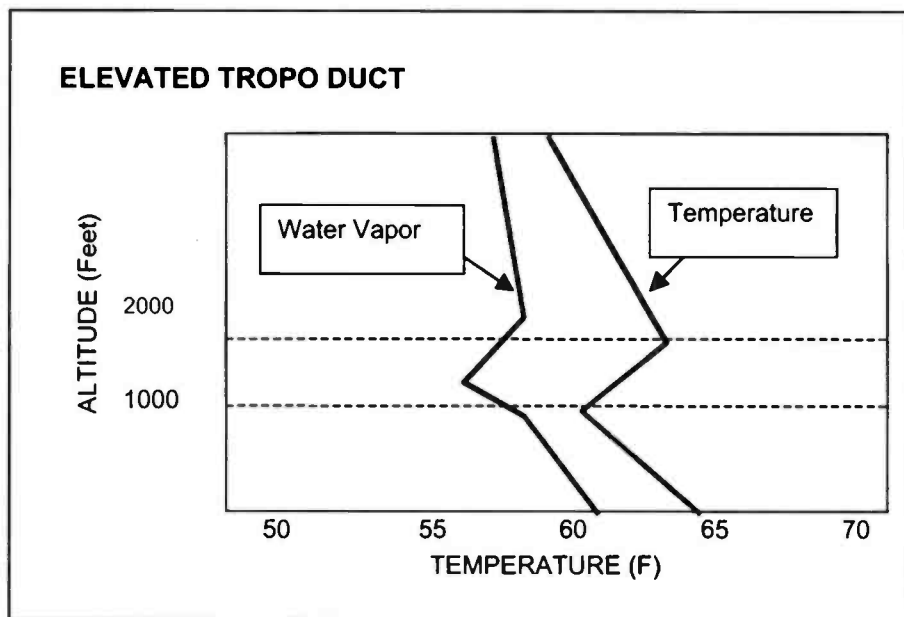


Figure 2

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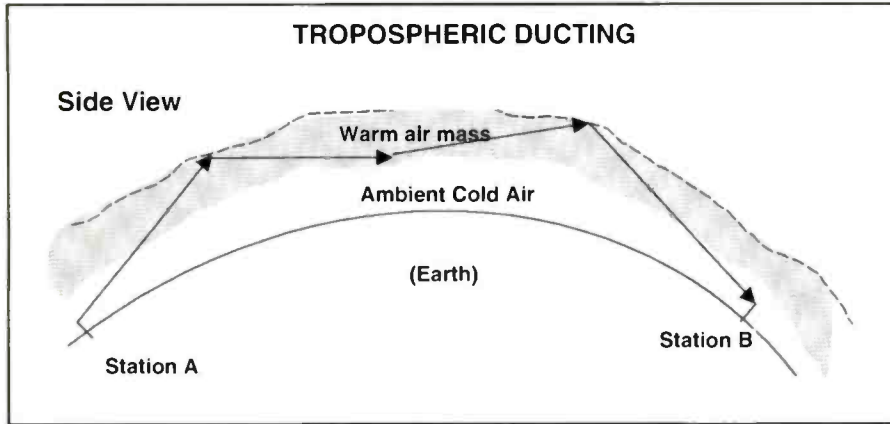


Figure 3

in air density, and an abrupt increase in water vapor content, **Figure 2**.

If this well-defined duct is reasonably thick, the best band that gets *caught up* in the duct is 100 MHz to 200MHz. However, if the duct stratifies in a very thin layer — maybe no more than 100 feet thick — it may propagate signals on 400 MHz, 800 MHz, 1200 MHz, and even microwaves at 2.4 GHz and higher.

High-pressure ducting across North America usually previews for a couple of days in June, and then sets in *big time* in the first week of July. Look on the weath-

er map for a widespread stalled high-pressure system, and you can spot a tropospheric duct in the making!

### Don't Miss the Scanner Action

For scanner listeners, cycle through the continuous VHF weather broadcasts on the eight channels.

- 162.400
- 162.425
- 162.450
- 162.475

- 162.500
- 162.525
- 162.550
- 162.575

Set your scanner lockout to ignore local weather channels, and standby for your scanner to lock up on distant weather channels — *maybe 300 miles to 700 miles away*.

When tropo-ducting VHF/UHF long-range signals begin to break squelch, notice that these distant stations remain steady for hours, **Figure 3**. This is your *guarantee* that you are picking up these VHF/UHF signals via tropo, as opposed to short bursts of ionospheric skip. The chance of finding that kind of skip at 162 MHz is remote, and virtually nonexistent on the 460-MHz Public Safety band.

### Ducting On the Ham Bands

Amateur radio operators work tropo on both FM as well as single sideband (SSB). On SSB, hams will look for contacts on 144.200-MHz upper sideband, and 432.100-MHz upper sideband. **Photo B**. On FM, they will look for simplex contacts on 146.520 MHz and 446.000 MHz. Surprisingly, FM propagates quite nicely within a tropospheric duct.

*(TIP: Besides looking at your local weather map, try the Hepburn Report for tropo paths: <<http://www.dxinfocentre.com>>. It's an accurate predictor of long-range weather inversions.)*

Here along the west coast of the United States, radio amateurs regularly work tropo to Hawaii on both 2 meters and 440-MHz simplex, **Photo C**. Our Hawaii end of the contact is Paul Lieb, KH6HME, who operates a collection of continuously-transmitting beacon stations on the side of Mauna Loa, an active volcano. *Talk about dedication.*

"As I drive up to my operating position at 8,200 feet, my little automobile FM radio begins to pick up stereo music from the mainland, and my scanner is filled with VHF and UHF high-band west coast FM signals — *2,500 miles away*." says Paul, who is known to stay up at the volcano beacon site for several days to work west coast stations from Washington to Mexico.

### Tropo Strategies for Radio Amateurs and Scanners

The Hawaii end of the tropo duct is best accessed at high elevation. Conversely, the west coast tropo duct *sweet spot* is relatively low — sometimes

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just feet above the ocean breakers, and rarely more than 1,000 feet up.

Signal polarization is important for duct contacts. Weather stations and rural public safety agencies are vertically polarized, so a small ground plane may be all you need at your end of the circuit. LMR-400-type coax will minimize feed-line losses.

For ham operators running weak-signal single sideband, polarization is normally horizontal. Most ham radio VHF and UHF propagation beacons run omnidirectional horizontal loops. (**REFERENCE:** Check out the WSWSS Beacon List for stations west of the Mississippi, <<http://bit.ly/yzSD55>>, and the ARRL Beacon List for the east and Atlantic seaboard, <<http://www.ARRL.org>>. — WPC6NOA)

Ham operators with a modest VHF/UHF vertical co-linear gain antenna will, many times, pull in 2-meter and 440-MHz FM repeaters up to 1,000 miles away.

Time to break out the repeater directory — you need to access that far-away repeater with the sub-audible tone listed in the book. After you hear a pair of stations sign off, come in with your callsign, indicate you are operating *tropo ducting DX*, and surprise the heck out of these operators with your signal coming in from hundreds of miles away! Polarization will not change within the duct.

When tropo ducting develops in July, 50 watts of mobile power on your base station or in your vehicle is all you need. For distant repeater operation, don't forget to encode its specific CTCSS!

## So, Get Ready for Tropo

You have about a month before tropo conditions begin to build. Time to check your coax and make sure your outside antenna is working optimally.

For a scanner, load in a host of channels that are not normally received in your area. Keep your squelch right at the threshold, and then check the Hepburn Report along with your local weather maps.

When the next hot day arrives, your scanner locks in to some distant public safety calls — including P-25 digital calls — and it takes you a few seconds of monitoring to discover you're hearing traffic from four states away. Break out that recorder. This could be a great topic for the next club meeting.

Watch the weather this summer, and let's see who can give us the most distant tropospheric ducting reception or QSO report.



Photo B. Gordo's ICOM IC-9100 is tuned to 144.200- and 432.100-MHz upper single sideband (SSB) to assure he doesn't miss a minute of the tropo action.

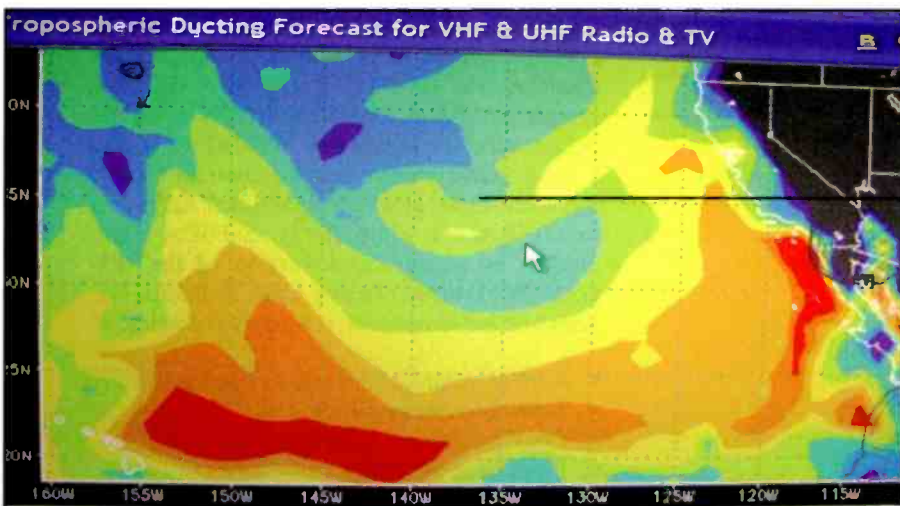


Photo C. The yellow areas in this Hepburn Chart show great potential for tropospheric ducting paths. "Hawaii and California contacts on 2 meters lasted for five days!" Gordo notes.

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# In Review: The WiNRADiO Excalibur Pro WR-G33DDC

By Dan Srebnick,  
KPC2DLS/K2DLS  
<k2dls.rfbits@gmail.com>

*“The Excalibur was a good radio to begin with, and the Pro improves upon it impressively.”*

It was just over a year ago, in the April 2011 edition of *Popular Communications*, that we noted “The WiNRADiO G31DDC, otherwise known as Excalibur, may well be the sword that you need to help you win that elusive DX.”

Well, that most excellent DX sword has been sharpened beyond King Arthur’s wildest imagination. The Merlins in Radixon’s engineering department have done their magic. The Excalibur was no amateur, but the new Excalibur Pro (WR-G33DDC) has emerged as the new contender in the field of software defined radio (SDR).

## Good is Even Better

The G31DDC and its Pro successor, the G33DDC, seem to be similar in appearance, **Photo A**. The G33DDC is an advanced Direct-sampling, Digital Down-conversion software-defined receiver, as was the G31DDC. How does a radio manufacturer improve upon an already top-notch signal processing platform? According to WiNRADiO, <<http://bit.ly/x3aF6U>>: “This product is an advanced version of the WR-G31DDC receiver, offering many additional features and improvements,” citing as examples:

- 4-MHz instantaneous processing bandwidth
- Low-noise preamplifier
- Configurable pre-selection filters
- Filter bandwidth adjustable down to 1 Hz
- 0.5-ppm frequency stability
- Test and measurement functions
- Pause function



**Photo A.** The Excalibur Pro comes in a compact package, about the size of a really long paperback book. On the outside it looks just like the non-Pro model. (Images courtesy of K2DLS)

A full listing of features is shown in **Table 1**. A block diagram of what goes on inside the hardware is shown in **Figure 1**.

## Easy Installation

The box includes a startup manual, but installation passed the “no manual” installation test. I downloaded and installed the latest software version (1.68) from <<http://tinyurl.com/86fqmot>>. I plugged the receiver into its quiet linear power supply — something I liked about the original design and still truly appreciate.

I then plugged in the USB cable to the receiver and the computer, connected an antenna using the supplied SMA-to-BNC connector, turned on the receiver’s pushbutton on/off switch, and started the software install. That’s about all there is.

For my evaluation of this “Pro” receiving platform, I used an Intel i7-based laptop with 4 cores and 8 execution threads. I added this laptop to the shack knowing that I would need it in order to use the capabilities of the next generation of

- 9 kHz to 49.995 MHz continuous frequency range
- Direct sampling
- Digital down-conversion
- 6-bit 100 MSPS A/D converter
- 50 MHz-wide, real-time spectrum analyzer
- 4 MHz recording and processing bandwidth
- Continuously adjustable filter bandwidth down to 1 Hz
- Three parallel demodulator channels
- Pause function
- Waterfall display functions
- Audio spectrum analyzer
- Audio and IF recording and playback
- Recording with pre-buffering
- EIB1, HFCC and user frequency databases support
- Very high IP3 (+31 dBm)
- Excellent sensitivity (0.20  $\mu$ V SSB, 0.10  $\mu$ V CW)
- Excellent dynamic range (107 dB)
- Excellent frequency stability (0.5 ppm)
- Selectable mediumwave filter
- User-configurable preselector
- Selectable low-noise preamplifier
- Test and measurement functions

USB 2.0 interface

**Table 1.** WR-G33DDC Features

## New! - PK-232SC with Sound Card, Rig Control, USB - All built-in!



### PK-232SC Multimode Data Controller\*

Sound Card, Rig Control, USB, Pactor, RTTY, CW Packet & more!

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## Signal Processing, Antenna Analysis, Data & Remote Control



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you'll never want to use any other!*

Sweep and analyze antennas in seconds. Zoom, Compare & Store Data. Sunlight-visible color graphics, handheld, rechargeable batteries, no computer required.



### ■ DSP-599zx Audio Signal Processor\*

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### ■ ANC-4 Antenna Noise Canceller

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Great for suppressing power line noise, plasma TV noise & many other local electrical noises.

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Sound card interface, USB, Pactor, 1200/9600 Packet

- PK-96/100 TNC - 1200/9600 Packet\*  
Available with USB or RS-232

## HamLink™ Wireless and USB Remote Control & Audio



- HamLinkUSB™ Rig Control Plus  
Logic Level plus PTT

### ■ HamLinkBT-BTH+™ Bluetooth® Adaptor

Use a standard cellphone Bluetooth® headset to keep your hands free for driving and operating. Includes USB rig control for your station. Audio, VOX & PTT - Fixed & Mobile.

- PK-232 RS-232-to-USB Adaptor\*  
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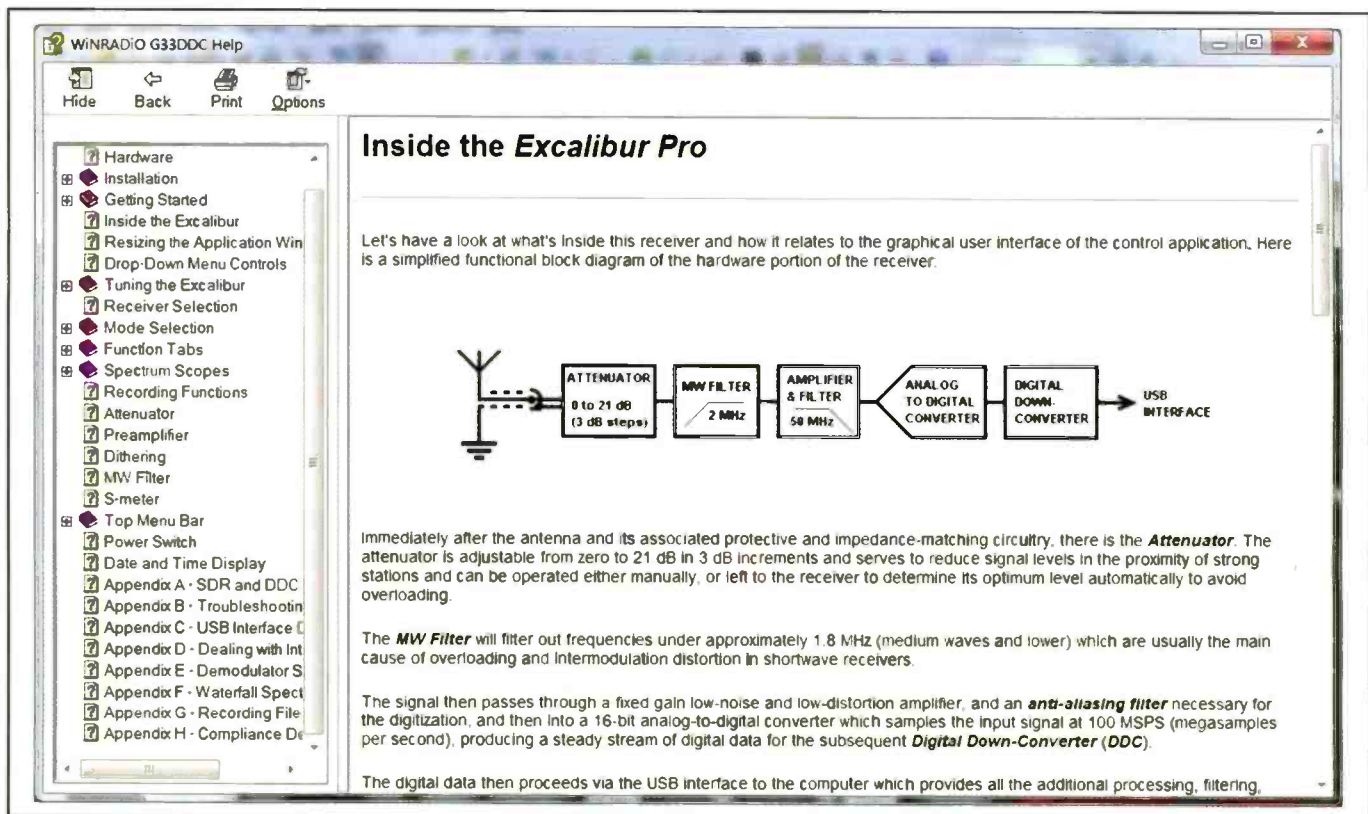


Figure 1. Block diagram of the Excalibur Pro SDR architecture before the signal hits your computer for further processing.

SDRs to their fullest. WinRADIO recommends a four-core machine for full performance, so I was well positioned.

Why four cores? This hot receiving box will fully process up to 4 MHz of spectrum all at once. The software takes full advantage of the multiple CPU threads for full bandwidth, but it doesn't tax the i7 processor either. My shack laptop has 6 GB of RAM and a 7200 RPM hard drive. Under Windows 7 (64

bit), with Openoffice, Outlook 2010, UI-View 32, and the WinRADIO software all open, my CPU usage was only at around 15 percent, **Figure 2**.

## Clean Appearance

The user interface (UI) of the Excalibur Pro is clean and customizable. The Options drop down menu offers selectable "skins." The default is a bright and readable blue theme, **Figure 3**. I tried out some of the other skins and found that I like the military skin, **Figure 4**.

The UI consists of three separate spectrum scopes. Intuitively, each scope offers point-and-click tuning. It is also possible to drag the demodulator filter passband to where you want it to be. Doing this by eye and ear is very different than just tuning by ear, because you can see the waveform and also spot where any QRM in the bandpass is located.

The three scopes are related sets. The bottom one on the display is called the *Wideband* spectrum scope. It covers a selectable 30- or 50-MHz chunk of spectrum. The upper left scope is called the *DDC*, or direct down-conversion scope. The *DDC* scope is a subset of the *Wideband* scope and displays a 20-kHz to 4-MHz spectrum, which can be considered the "current" portion of the spectrum. Finally, the upper right portion of the display is the *Demodulator* scope. This scope can be thought of as a close-up of the current and adjacent signals and is a further subset of the *DDC* scope.

## Easy Tuning, Easy Listening

This radio can be tuned in almost a dozen different ways. Direct keyboard frequency entry is supported and the operator can add a "k" for kHz or an "m" for MHz to the entry. Mouse

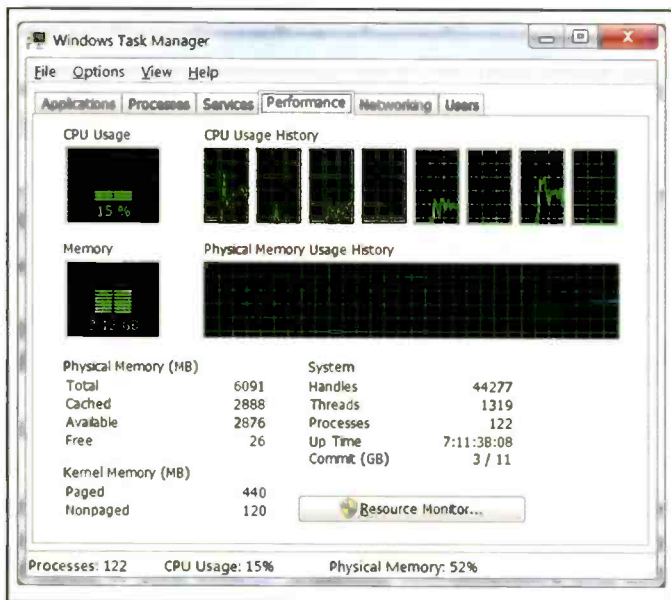


Figure 2. Use a capable multi-core processor and your computer will easily keep up with the Excalibur Pro's processing demands.

## EXCALIBUR PRO SPECIFICATIONS

Receiver type:	Direct-sampling, digitally down-converting software-defined receiver
Frequency range:	9 kHz to 49.995 MHz
Tuning resolution:	1 Hz
Mode:	AM, AMS, LSB, USB, DSB, ISB, CW, FMN, FSK, UDM (user-defined mode) DRM mode optional
Image Rejection:	100 dB
IP3:	+31 dBm (preamp off) +21 dBm (preamp on)
Attenuator:	0 - 21 dB, adjustable in 3 dB steps
SFDR:	107 dB min. (preamp off) 103 dB min. (preamp on)
Noise figure:	14 dB (preamp off) 10 dB (preamp on)
MDS:	-130 dBm @ 10 MHz, 500 Hz BW (preamp off) -134 dBm @ 10 MHz, 500 Hz BW (preamp on)
Phase noise:	-145 dBc/Hz @ 10 kHz
RSSI accuracy:	2 dB typ.
RSSI sensitivity:	-140 dBm
Processing and recording:	20 kHz - 4 MHz
bandwidth (DDC bandwidth):	(selectable in 24 steps)
Demodulation bandwidth:	1 Hz - 62.5 kHz
(selectivity):	(continuously variable in 1 Hz steps)
Spectrum analyzers:	Input spectrum/waterfall, 30 or 50 MHz wide, 1.5 kHz resolution bandwidth DDC spectrum/waterfall, max 4 MHz wide, 1 Hz resolution bandwidth Channel spectrum, max 62.5 kHz wide, 1 Hz resolution bandwidth Demodulated audio, 16 kHz wide, 1 Hz resolution bandwidth
ADC:	16 bit, 100 MSPS
Sensitivity:	AM
(@ 10 MHz, with preamplifier)	-106 dBm (1.12 $\mu$ V) @ 10 dB S+N/N, 30% modulation
	SSB
	-121 dBm (0.20 $\mu$ V) @ 10 dB S+N/N, 2.1 kHz BW
	CW
	-127 dBm (0.10 $\mu$ V) @ 10 dB S+N/N, 500 Hz BW
	FM
	-117 dBm (0.32 $\mu$ V) @ 12 dB SINAD, 3 kHz deviation, 12 kHz BW, audio filter 300-3000 Hz, deemphasis -6dB/oct
Tuning accuracy:	0.5 ppm @ 25 °C
Tuning stability:	0.5 ppm (0 to 50 °C)
MW filter:	Cut-off frequency 1.8 MHz @ -3 dB Attenuation 60 dB min @ 0.5 MHz
Preselection filters:	119 filters available in automatic or manual mode (14 high pass, 14 low pass and 91 bandpass) + bypass
Antenna input:	50 ohm (SMA connector)
Output:	24-bit digitized I&Q signal over USB interface
Interface:	USB 2.0 High speed
Power supply:	11-13 V DC @ 510 mA typ. (preamp off) 11-13 V DC @ 620 mA typ. (preamp on) 11-13 V DC @ 55 mA typ. (power save)



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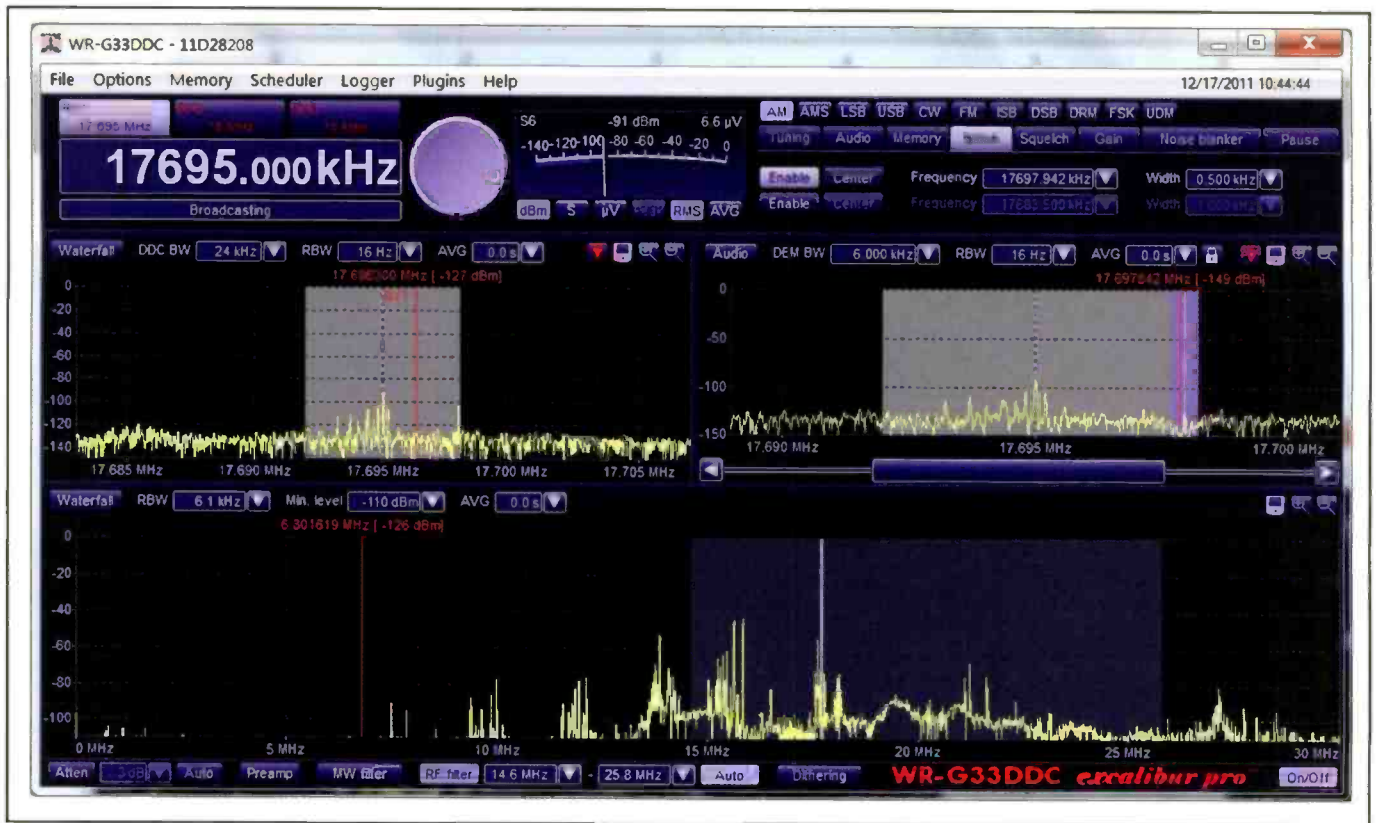
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**Figure 3.** The default blue skin of the Excalibur Pro showing the notch filter in use. The exact frequency and bandwidth of the notch is shown. The meter is calibrated in dBm, but can also display S units or micro-volts.

wheel tuning is available, but was not useful in my case as my laptop has no mouse wheel and requires strange finger movements on the mouse pad to simulate; however, arrow key tuning worked well for me, with the Alt, Shift and Control keys influencing the step rate.

There is a virtual tuning knob that can be controlled with the left and right mouse buttons. There is point-and-click and drag-and-drop tuning available, as well. Right click near a signal and a menu entry allows you to auto-magically tune to the nearest signal peak.

The Excalibur Pro can demodulate three discrete signals at once, pipe them to different sounds devices, or record them for later playback. The only condition is that each of the three signals must be within the current 4-MHz DDC spectrum. The audio output device is set under Options, Audio Output.

The software supports unique settings for each demodulator mode. For example, separate audio gain settings are remembered for AM, USB, LSB, FSK, DRM and so on. Separate audio filter settings are remembered for each mode as well. As expected, the AM syn-

chronous detector allows for selection of upper, lower or both sidebands. This is especially useful for interference evasion.

Need to take a phone call or discuss something with a family member and don't want to miss anything? The Excalibur Pro has a pause button, just like your TiVo or iPod. I love this feature. With the available disk on my system I could actually pause a broadcast program, UTE stream, or ham QSO for nine days! You won't miss a thing. Recording is equally a snap, and files can be automatically stamped with the frequency and a date-time string. An individual signal or a complete 4-MHz chunk of spectrum can be recorded for later playback. The Excalibur Pro has other DV-like qualities. It can record up to three scheduled programs, within that 4-MHz DDC limitation.

The scheduler window is very impressive. Not only can the expected date, time and frequency be specified, but also the demodulator mode, squelch level and audio filter characteristics. Future recordings can be specified as DDC chunks or audio recordings, and the desired bandwidth can be set up from this window.

Settings can vary across multiple scheduled recordings.

## Sharp Filters, Preset or Customizable

The Excalibur Pro also has excellent filtering. The first filtering level is actually pre-selection, which can be used to null out overload from strong mediumwave signals or roughly select the frequency range that you're currently interested in. Look at **Figures 3** and **4** and you'll see the MW Filter and RF Filter settings below the *Wideband* scope. Note that the RF Filter can be set to auto mode and can be manually set.

The Audio Filter — **Figure 5**, above the *Demodulator* scope — allows setting of low- and high-frequency cutoffs, gain, and de-emphasis. As noted previously, these settings are unique to each demodulation mode. You can also set up a mix, where a particular signal is sent to the left speaker, the right speaker, or both. This could be a unique approach to listening to a split frequency DX pileup.

Suggested bandwidth presets are available in each mode and for each preset. The actual bandwidth can be cus-





Figure 4. The military skin is one that I like. Note that the full spectrum scope is now set to the waterfall display. The displayed EiBi memories are shown above the *Demodulator* scope. These are very useful in helping ID a station. The meter is set to familiar S-Units instead of dBm. This radio will develop the operator's personality over time.

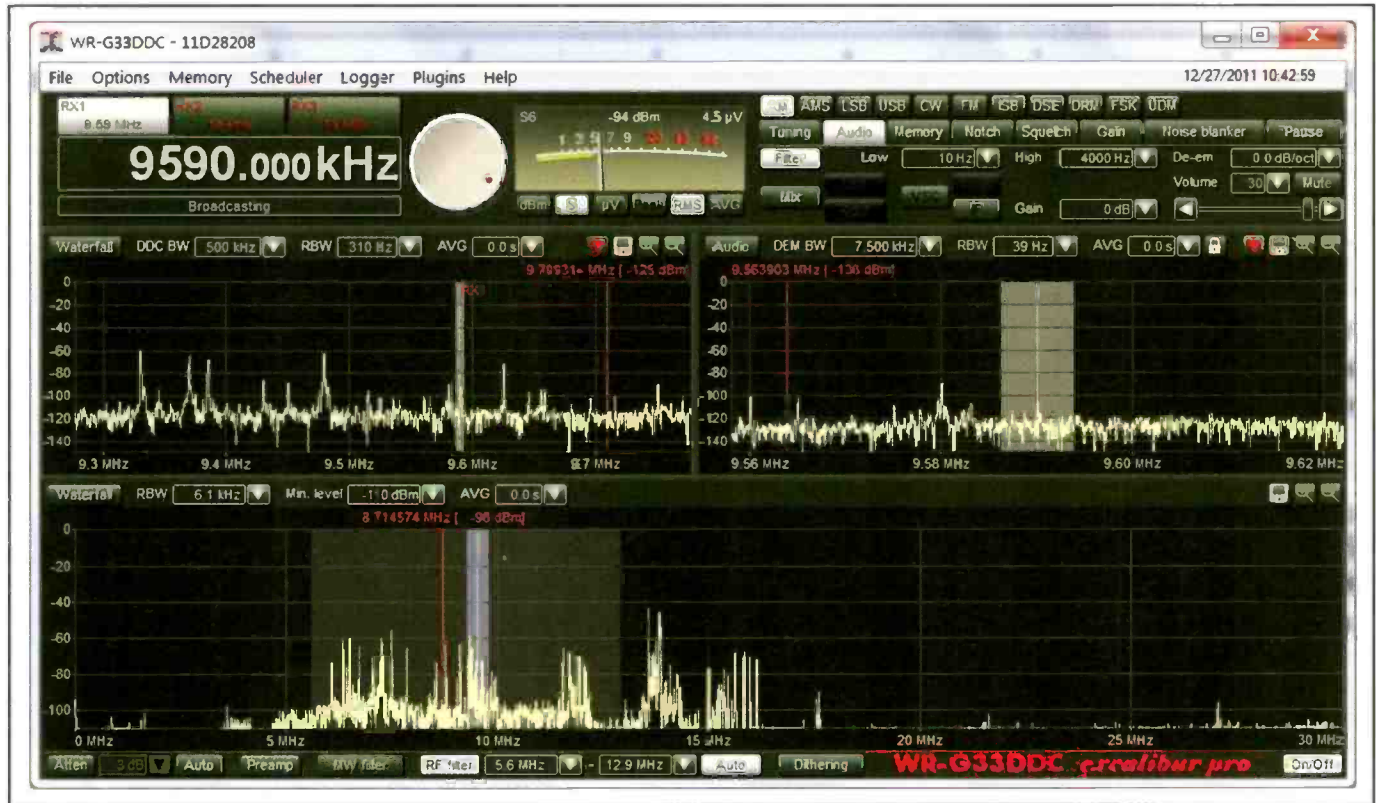


Figure 5. The Audio filter is seen above the *Demodulator* scope, with a low cut at 10 Hz and a high cut at 4,000 Hz. This was a good setting for listening to Radio Australia on 9,590 kHz. Volume was raised from the default setting of 20 to 30 which made for a good match with my soundcard.

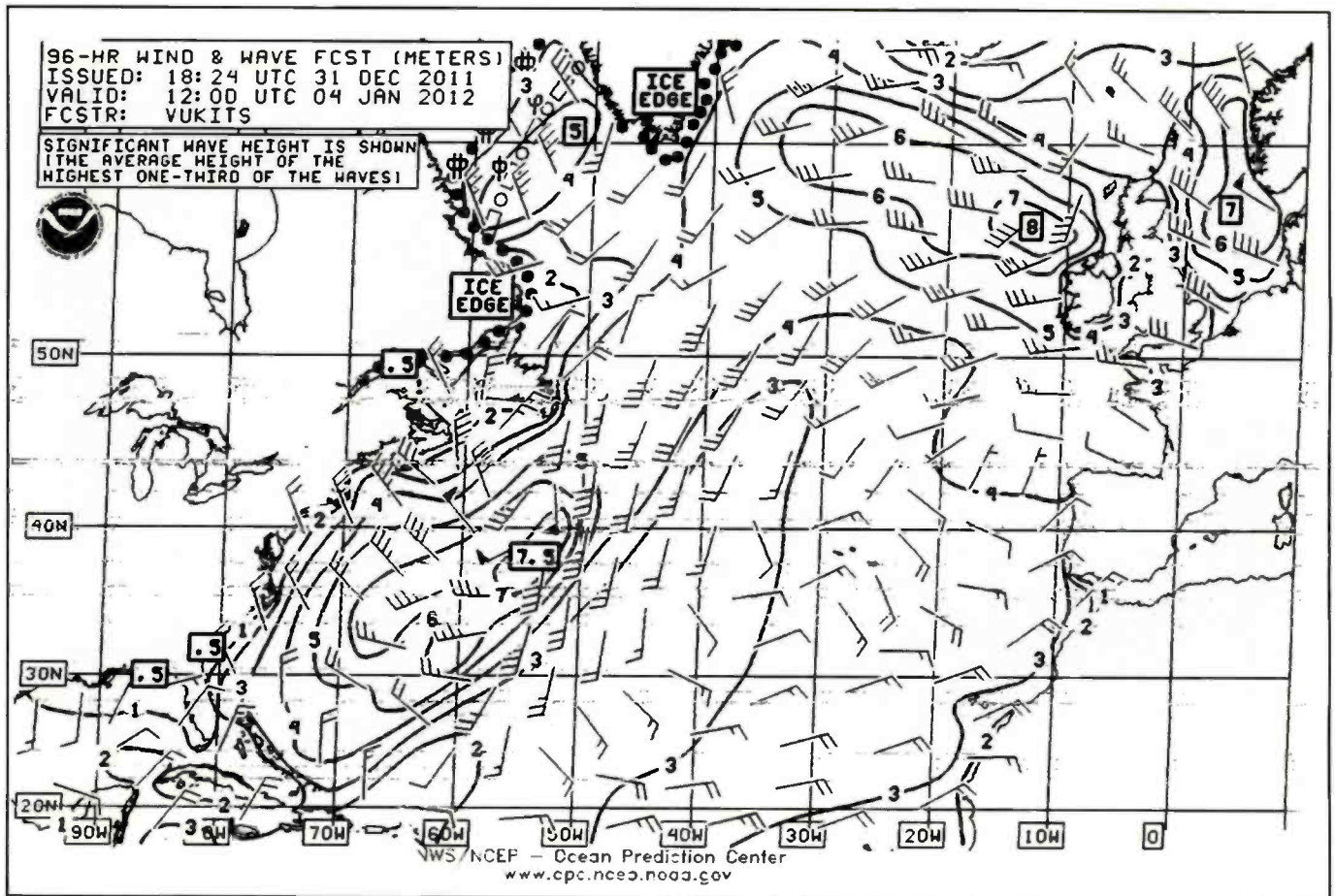


Figure 6. HF Weather FAX from NMF, decoded using the ADS Fax plugin.

tomized to help provide the best-sounding signal with the least amount of QRM. The notch filter is very effective.

I tried it out on the signal shown in Figure 3. Look at the far right of the DDC display and you'll see an annoying QRM spike. Look at the same signal in the Demodulator display and you'll see it notched out on the right. An effective noise blander helps to round out some of the options to make a signal more listenable.

## Thanks For the Memories

The Pro comes with a couple of well-known databases of international broadcasts. EiBi and HFCC both have their uses, and the integration of these two databases into the software memory presets facilitates their use in helping to identify a potential source of an unknown signal. The operator may also set up user defined memories and organize them into groups.

## Tests and Measurements

For the most serious operator, the Excalibur Pro offers some interesting tests and measurements. These can be turned on

from the *Options* menu and offer real-time analysis of USB rate, DDC rate, ADC rate, demodulator rate, soundcard bit rate, audio latency, and CPU utilization. SINAD (signal to noise and distortion ratio) and THD (total harmonic distortion) can also be measured for the currently received signal. These options are available at a click, if needed. The waterfall display can also be time stamped for future reference in a recording.

## G33DDC is eXtensible

One of the things that I liked so much about the G31DDC is also true about the G33DDC — the support for eXtensible Radio System (XRS) plug-in modules. <<http://xrs.winradio.com/>>. The advanced signal processing and decoding packages available include the Advanced Digital Suite (ADS) <<http://bit.ly/xDNsPa>> and the Universal FSK Decoder, <<http://bit.ly/wV5IPV>>. I tried version 1.45 of ADS and version 3.84 of the FSK Decoder. They both work nicely and are feature rich.

The main advantage of XRS architecture is that the operator does not have to

bother with virtual audio patch cables and un-integrated audio decoding software. All decoding action takes place right within the WinRADiO software architecture. Using the FSK decoder I was able to successfully decode an HF Navtex transmission and using the ADS software I was able to decode an HF Fax transmission of weather maps from NMF on 9110 kHz, Figure 6, as part of my test.

These optional add-ons make Excalibur Pro an excellent radio for the utility DX enthusiast. The Universal FSK Decoder has presets for many flavors of RTTY such as Baudot, Navtex, SITOR, ARQ and Packet. ADS can decode Navtex and Packet, in addition to Facsimile and includes some nice utilities such as a signal classifier and DSP noise reduction. If DSP noise reduction is a *must* in your shack then so is ADS, as this function is not built into the main WinRADiO software application.

The Excalibur Pro is an excellent receiver for DRM. While the current schedule does not show much DRM activity directed toward North America, other parts of the world seem to have a lot

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of activity. The optional DRM license is worth it if you have a need for a completely integrated DRM listening experience. The DRM mode also includes data crawl for those stations that broadcast it. The crawl appears under the Audio tab on the Demodulator scope.

## The Pro Makes It Across the Finish Line

The Excalibur was a good radio to begin with and the Pro improves upon it impressively. For roughly the price of what a Drake R8B cost in its day (\$1,650), the serious DXer can purchase an excellent software-defined receiver that would have been unimaginable a few years ago.

Everything installed without difficulty and worked as it should the first time around. The software is stable, well thought out, and perhaps the best looking piece of SDR software that I have seen yet.

The low noise floor, the sensitivity and selectivity, and the software extensibility are all strong factors in favor of this WiNRADiO platform. The Excalibur Pro also performs well on the longwaves.

From my New Jersey location I was able to receive Radio Medi Un on 171 kHz just after local midnight. The signal was at an S5 level while using my 160-meter inverted L antenna.

The Pro does not suffer from the overload caused by strong local mediumwave stations as did its predecessor. For those interested in the VHF Low public service bands, the Pro offers coverage up to 50 MHz, but was unable to put this to a real world test in my area as this band is not used much.

DRM (\$50), ADS (\$200), and the Universal FSK Decoder (\$500) are all worthwhile plug-ins for those listeners with specific needs. Not everyone will need them. ADS is a *must*, however, if you have a need for software based DSP noise reduction (NR).

Radixon's design and marketing teams ought to consider making the DSP NR a part of the base offering for a receiver of this caliber. Most serious users have come to expect this feature in an SDR. The Excalibur Pro also lacks network or Internet-based software remote control and listening capabilities. WiNRADiO offers other platforms such as the 313 or 315 where this feature is needed.

*Praise Excalibur Pro, DXer sword of swords, sharpest blade of the mystical ether.* Translated, I give the Excalibur Pro two thumbs up, particularly for the serious monitoring station.

U.S. dealers include Grove Enterprises (also the authorized North American service center), and Durham Radio. The WiNRADiO line is designed and marketed by Radixon <<http://bit.ly/xhP1kj>> of Australia, a company specializing in monitoring and surveillance products.

## This Just In . . .

Just after this review was submitted for publication, I was contacted by Tariq Hasnie, KF5CPU, of the Radixon team. His colleagues in the engineering department informed him that a client server option (CSO) for the Excalibur Pro will be available in several months. This is said to allow remote control of the Pro via either a local LAN or the Internet.

## MONITORING STATIONS

Listening, Around the World

# Pop'Comm Monitoring Station Community Eclipses 800

By Richard Fisher,  
KPC6PC

*“Even though I was a few years away from my first amateur radio FCC ticket, an exception was made by Florida Power and Light just in my case and the free WPE QSLs were printed.” – Mike Adams, WPC4FKC, Lynn Haven, Florida*

The *Pop'Comm Monitoring Station* community is growing by leaps and bounds — much like distant broadcast band AM radio signals on a starry night.

At this writing, we're well above 800 strong. We'd speculated that by the end of February the initial surge for membership would have subsided, but that doesn't seem to be the case. Requests continue to flow in by the numbers daily. The program coordinators couldn't be happier. As the proverbial broadcast request goes: *Please keep those cards and letter — and emails! — coming in.*

The comments you've made with your requests are so very interesting, we're featuring more of them this month.

**Mike Adams, WPC4FKC, Lynn Haven, Florida**

I received the monitor station identification sign WPE4FKC from Tom Kneitel, WPE2AB, sometime in the late 1950s or early 1960s. I still have that original certificate from *Popular Electronics* magazine and a note from Tom.

Photo A.

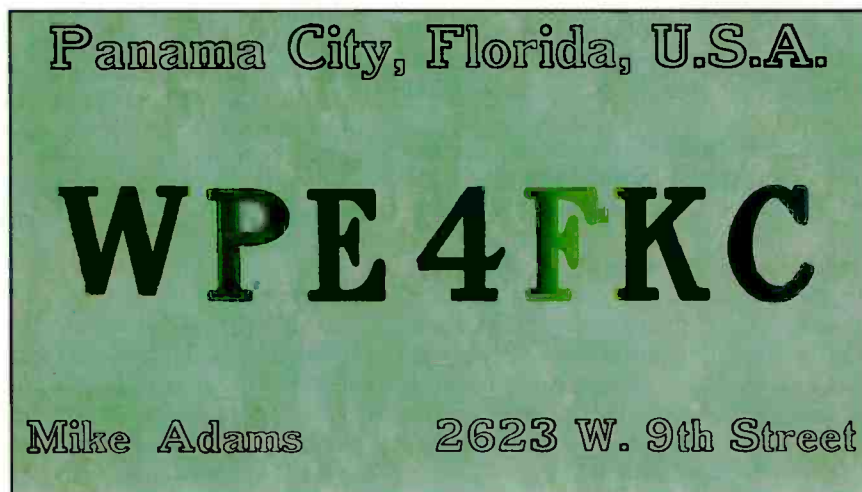
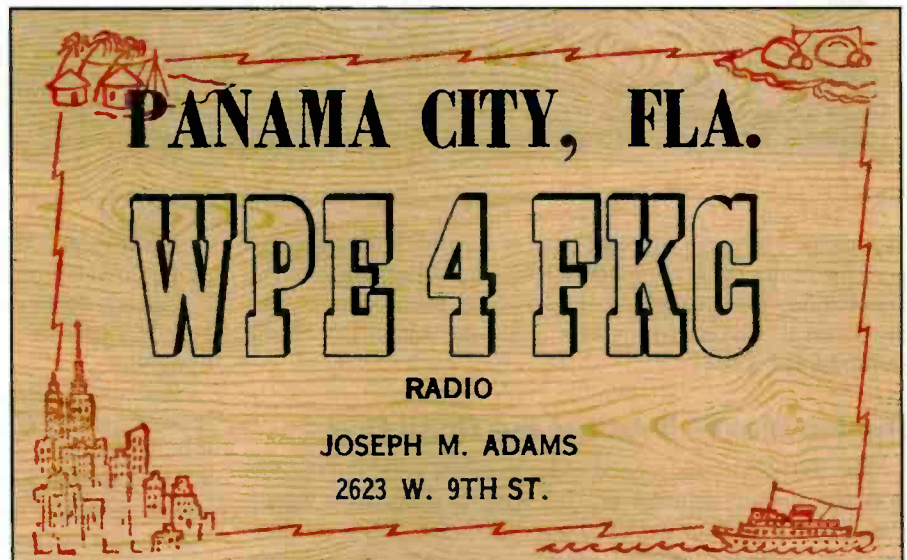


Photo B.

Attached are my first WPE4FKC QSL cards that went all over the world. Photos A, B and C. What a blast for a junior high student at around age 13!

The QSL with the sailboat, Photo C, was from Florida Power and Light, issued free to then-licensed ham radio operators. Even though I was a few years away from my first FCC ticket, an exception was made just in my case and the free WPE QSLs were printed. They proved to be very popular with foreign hams, AM and shortwave broadcast stations — as well as marine, aeronautical, press and other utility stations. *What good memories.*

Thank you Tom (RIP), *Popular Electronics* magazine and the current staff of *Popular Communications*!

### John Rendace, WPC9IAX, Crystal Lake, Illinois

If WPC9IAX is available, I would really rather care for it. Though I am no longer an active amateur radio operator. I am more interested in the shortwave listening hobby these days.

"IAX" were the call letters of my esteemed Elmer back when I was a ham. Today he's in heaven. I miss him dearly.

### Henry Schuett, Jr., WPC5LOW, Springtown, Texas

I was first FCC licensed as a radio amateur in April 1960 as KN3LOW and began SWLing using an old floor model PHILCO shortwave radio a few months before becoming a ham. I really enjoyed it.

I'm now retired from Federal Service and preparing for the next *big* solar cycle. Many high-frequency broadcast stations that I previously listened to are now on the Internet. How times change, and that's too bad.

By the way, WPE3CMI was my original *Popular Electronics* SWL station identification sign. I still have the diploma certificate . . . somewhere!

### SS American Victory, WPC4AVM, Tampa, Florida

The American Victory, Photo D, is a World War II Victory Ship berthed in Tampa Bay. It is one of only a few fully functioning and sailing ships from that war. We have an active ham station — W4AVM — and still operate CW on the maritime frequencies on under callsign

KKUI. We do a lot of listening, too, as WPC4AVM! (*VISIT: The American Victory website: <http://www.american-victory.org/>*). *NOTE: Mark Haskell, WPC9UJS, of Valrico, Florida, is WPC4AVM trustee. — Ed.*)

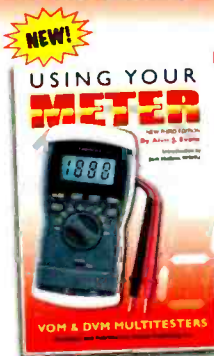
### Russ Anderson, Jr., WPC8WPR, Wilmington, Massachusetts

I received my first shortwave radio at the age of eight — the reason for the eight in my *Pop'Comm Monitoring Station* identification sign. The radio was a Unelco Model 1914 Overseas radio. Since then I have enjoyed listening and collecting shortwave receivers. WPR are the letters I use for an AM Part 15 transmitter I operate.

### Ken Caruso, WPC1HLL, North Billerica, Massachusetts

Years ago I was assigned WPE1HLL by *Popular Electronics* magazine back in the '60s. I went through the whole process of getting the QSL cards from 10 different stations (I believe that was the require-

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ment) and submitting the application. I couldn't have been more than 14 or 15 years old.

I remember all that Communist propaganda I used to receive from Radio Moscow and other Eastern bloc countries! I wonder if I have a file at the FBI. **LOL, Photo E.**

I still have the original 8.5-inch x 11-inch PE certificate in a frame hanging on the wall in my ham shack! Those QSLs were all gathered using my Lafayette Explore-Air 3 tube regenerative receiver, which I still have to this day in operational condition.

**Richard Anderson,  
WPCØGDX, North Liberty,  
Iowa**

I have been listening to shortwave since I was 10. I started with a Lloyds multiband radio, then in the '80s got a Hallicrafters SX99 which I still use today.

In addition, I listen on a Flex3000 SDR (software defined radio). I am currently an Extra Class radio amateur with the callsign WTØG.

**Michael Rosanbalm,  
KPC7OR, Aumsville, Oregon**

I've been involved in ham radio since high school as a member of the Class of '72, and licensed since 1980. I hold a BS-OM, Operations Management from Oregon Institute of Technology, and an AAS in Network Technology.

I am a CET (Certified Electronics Technician), certified through the International Society of Electronics Technicians — ISCET. I have been in the CWOP (Citizen Weather Observer Program) with the National Weather Service for more than two years. I am pointing this out to emphasize my interest in *things science*, especially communications and electronics.

**Bruce Boehrs, KPCØEQK,  
Blaine, Minnesota**

I remember my birthday gift when I was 9 or 10 back in the late '70s was a Panasonic portable radio. My father was a scanner fan at that time, so there was already a listening hobby in the family.

I was fascinated when tuning the AM band at night and hearing the far-away stations. One in particular that sticks out in my mind was KOMA in Oklahoma City, <<http://www.komaradio.com/>>. This fascination turned into shortwave

listening in college and scanning today. Days are busy, but I listen when I can.

### Now, It's Your Turn . . .

We're always interested in hearing the stories of shortwave listeners — especially those in the *Pop'Comm Monitoring*

*Station* program. Share your experiences by writing to: <PopCommMonitor@gmail.com>.

For information on how to become a *Pop'Comm Monitoring Station*, visit: <<http://www.PopCommMonitors.blogspot.com>>.

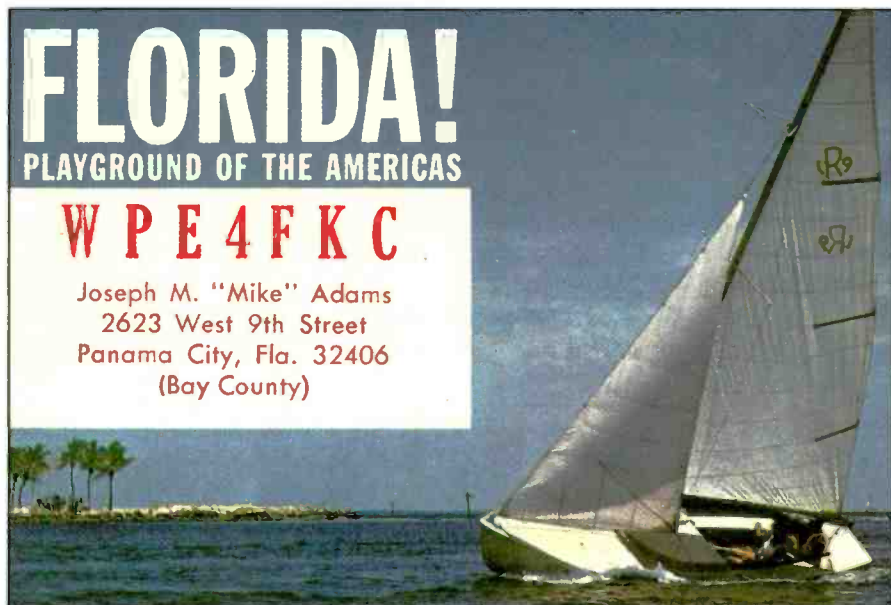


Photo C.



**Photo D.** Aboard the American Victory, "we have an active ham station — W4AVM — and still operate CW on the maritime frequencies on under callsign KKUI. We do a lot of listening, too, as WPC4AVM!" Take a video tour of the ship at: <<http://bit.ly/xfBHIA>>. (*Internet screen grab*)



**Photo E.** This 1979 postage stamp, issued in the USSR, commemorated the 50th anniversary of Radio Moscow. (*Courtesy of USSR Postal Service via Wikimedia Commons*)



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## MONITOR OF THE MONTH

Listening, Around the World

### *Pop'Comm Monitor of the Month:*

## WPC8AA, Allen Park, Michigan

By Brian Rogers,  
WPC8AA

*Brian Rogers, who received his Pop'Comm Monitoring Station identification sign during the first week of registration — WPC8AA — gets a lot of enjoyment from his Drake, Grundig and Bose Wave radios. As you'll see, Brian is a nostalgic sort, with old newscasts among his listening favorites.*

*WPC8AA holds amateur radio callsign KD8HAZ and lives in Allen Park, Michigan.*

*Please send us a photograph of your listening post and tell us about your monitoring experience. We'd be happy to feature you as a **Pop'Comm Monitor of the Month**. Write to Pop'Comm Monitor of the Month at: <PopCommMonitor@gmail.com>.*

*— Richard Fisher, KPC6PC*

I thought a photograph of my *Pop'Comm Monitoring Station Certificate of Registration* with my WPC8AA identification might be interesting to show readers. It hangs above my listening post, **Photo A**.

You can see my Drake SW1 shortwave receiver <<http://bit.ly/wwMaAc>>, along with my Grundig Satellit 800 Millennium, <<http://cnet.co/xzIFYk>>.

Also shown is my Hallicrafters S-38C receiver, <<http://bit.ly/wTq4dW>>, and Bose Wave Radio®, <<http://bit.ly/wW3GzY>>, which I use



Brian Rogers,  
WPC8AA, Allen Park,  
Michigan



**Photo A.** The *Pop'Comm Monitoring Station Certificate of Registration* for Brian Rogers, WPC8AA, has found a home on the wall of his Allen Park, Michigan listening post. (Courtesy of WPC8AA)



**Photo B.** At WPC8AA you'll find a range of receivers from a range of time periods. On the top shelf at the left is a Drake SW1 general coverage receiver sitting beside a Grundig Satellit 800 Millennium. On the right is a vintage Hallicrafters S-38C general coverage receiver, circa 1952 to 1954, with a modern Bose Wave Radio® sitting on top of it. (Courtesy of WPC8AA)



for everything except shortwave — especially playing CDs, **Photo B.**

One of my radio interests is old time radio, primarily newscasts from the period during and preceding World War II.

There are many programs available in mp3 format from the Old Time Radio Catalog <<http://www.otrcat.com/>>, and other sources. They are playable on the Bose, which reads mp3 formatting.

## New Members: *Pop'Comm Monitoring Station Program*

Here are some of the listening posts recently issued a *Pop'Comm Monitoring Station* identification sign, authorized to obtain a Certificate of Registration and welcomed to this new monitoring community.

— Richard Fisher, KPC6PC

### KPC and DX Prefixes

Also: Lloyd Jeffries, **KPC5LGJ**, Georgetown, TX; Vernon Jackson, **KPC5TUL**, Tulsa, OK; Roger Cecchi, **KPC0COL**, Aurora, CO; Robert Finn, **VEPC9SWL**, Saint John, New Brunswick, Canada; Perry Langeler, **VAPC7FC**, Courtenay, British Columbia, Canada; Edward Sylvester, **KPC6EAS**, Whittier, CA; David Brooks, **KPC3TYH**, Leetsdale, PA; Dennis W. Gedeon, **KPC0NHW**, Oak Grove, MO; Paul Butler Sr., **KPC0CHU**, Liberty, MO; Warren DuBuke, **KPC2SM**, North Tonawanda, NY; Donald G. Clayburgh, **KPC0SD**, Rapid City, SD; William Dailey, **KPC5PEA**, Emerson, AR; Forest Osborn, **KPC5FO**, Hooker, OK; Robert M. Sambolin, **KPPC4CI**, Ponce, Puerto Rico; Paula Ann Schleder, **KPC7SWL**, Aloha, OR; Edwin Hotz, **KPC8AID**, Ann Arbor, MI; David Alpert, **KPC6DRA**, Studio City, CA; Michael Bornstein, **KHPC6MB**, Lahaina, Maui, HI; Nancy Johnson, **KPC7YNP**, Billings, MT; Andrew Dimler, **KPC0BCV**, Denver, CO; Richard Billings, **KPC2JFU**, Oriskany Falls, NY; Robert Rhoads, **KPC6CA**, Fair Oaks, CA; Thomas Miller, **KPC3BIG**, Boalsburg, PA; Stephen Wilson, **KPC5SUT**, Mission, TX; Kevin Dwyer, **VEPC1KMD**, Greenwood, Nova Scotia, Canada; Brent Levit, **KPC5DX**, Manvel, TX; Tom Severt, **KPC2UHC**, St. Paul, KS; Larry Garvin, **KPC1LFG**, Lisbon, CT; Joel Goodman, **KPC0DP**, Stanwood, IA; John Buchignani, **KPC3JHT**, Pittsburgh, PA; John Cooper, **KPC6ALL**, Sylmar, CA; Jerry Steck, **KPC5PSH**, Bryan, TX; Vincent Ferme, **VAPC3VF**, Ottawa, Ontario, Canada; Thomas Witherspoon, **KPC4SWL**, Swannanoa, NC; Lee Hiers, **KPC4GA**, Hull, GA;



Gil Ludwig, **KPC0KS**, Gardner, KS; Walter Dufrein Jr., **KPC0AAA**, Wright City, MO; Roy Wotherspoon, **VEPC3QVX**, Cornwall, Ontario, Canada; Karl Kastner, **KPC7KRK**, Lakewood, WA; David Mobley, **KPC5DRM**, North Little Rock, AR; Forest Petrus, **KPC0CQ**, Ames, IA; Tom Hughes, **KPC1EX**, Shirley, MA; Joseph Celentano, **KPC6LDD**, Twain Harte, CA; Claude Squire, **VEPC6ACS**, Fort McMurray, Alberta, Canada; Frederick Terry, **KPC7WPT**, Westport, WA; Richard Berger, **KPC2SC**, Belle Harbor, NY; John Hanna, **KPC7WAH**, Brookfield, IL; George Scott III, **KPC7YMA**, Yuma, AZ; Jack Beatty, **KPC2ZKF**, Chittenango, NY; Jon Moody, **KPC8FOX**, Xenia, OH; John Butler, **KPC6AA**, Novato, CA.

### WPC Prefixes

New monitors are listed by name, station identification sign, and monitoring station location.

Robert Shokler, **WPC8JWN**, Cincinnati, OH; Yonas Parkinson, **WPC2ETH**, Honeoye, Falls, NY; Anthony Arcuri, **WPC2AA**, Staten Island, NY; Richard DiBattista, **WPC9NVJ**, Mount Prospect, IL; Benjamin McCrary, **WPC4PJV**,

# Pop'Comm May 2012 Reader Survey

Your feedback is important to us at *Pop'Comm*. It helps guide us to make the magazine even more valuable to you each month.

Please take a few minutes to fill out this month's Reader Survey Card and circle the appropriate numbers corresponding to the questions below. We'll pick a respondent at random for a year's free subscription or an extension of an existing subscription as thanks for your participation — so don't forget to fill in your mailing address and other contact information.

We encourage your comments and suggestions in the space provided, as well. Thank you.

*Last, but not least:* You can now take this survey online. See details below.

## Is "Attend the Dayton Hamvention®" on your 2012 bucket list?

- Yes..... 1
- No..... 2
- Trying to go, but not sure..... 3

## If you attend, for how many days?

- One day..... 4
- Two days..... 5
- Three days..... 6

## How many years have you gone to the Hamvention?

- 1 to 5 years..... 7
- 6 to 10 years..... 8
- 11 to 15 years..... 9
- More than 16 years..... 10
- This will be my first..... 11
- Never..... 12

## I go for: (Choose all that apply)

- The new gear that is being introduced..... 13
- The technical forums and presentations..... 14
- The camaraderie with fellow listeners and hams.. 15
- The outdoor radio flea market..... 16
- The Hara Arena ambience..... 17

What is the best part of the Dayton Hamvention® weekend? (Use the comment line.)

## Take This Reader Survey Online

You can now participate in this reader survey via the Internet. Simply go to *Pop'Comm On the Web*: <<http://www.popcommmagazine.blogspot.com/>> and click the link to the *Pop'Comm May 2012 Reader Survey*. It's quick and easy.

## May's Envelope, Please . . .

For participating in the *Pop'Comm Readership Survey*, the winner of a free subscription or extension is **A.J Lagerstrom, KBØGUY, of Hershey, Nebraska**, who writes: "I like projects with transistors and tubes — not ICs. OK, I like the LM386, 2N414, NE602 (ICs) . . . I really like *Shannon's Broadcast Classics*, and Peter Bertini, K1ZJH's, *Wireless Connection*."

*Congratulations, and thanks for the feedback, AJ! — KPC6PC*



Murfreesboro, TN; Charles Kaeff, **WPC4AM**, Covington, KY; Ed McLaughlin, **WPC6LOA**, Kennewick, WA; William Waite, **WPC1NHT**, Nahant, MA; Patrick Griffith, **WPC9HVW**, Loves Park, IL; John Teggatz, **WPC9ZMF**, Milwaukee, WI; Douglas Sasse, **WPCØAOA**, Mankato, MN; Ken Bratz, **WPC5JUM**, Palestine, TX; Jason Tojdowski, **WPC4JT**, Otto, NY; Roy Wallace, **WPC4ML**, Greenup, KY; Joseph Rice, **WPC3PHL**, Butler, PA; Thomas Whitlock, **WPC6DGR**, Clovis, CA; Daniel Hageman, **WPC3DAN**, Butler, PA; David Rutter, **WPC6CM**, Galt, CA; Eric Kosko, **WPC7YSU**, Hillsboro, OR; Wes Klinkhammer, **WPC9SWL**, Winamac, IN; Karen Garrison, **WPC1AAH**, Durham, NH; Robert Sanborn, **WPC3RBS**, Lebanon, PA; Charles Belavitz, **WPC2CJJ**, Jackson, NJ; Don McGrath, **WPC4VA**, Staunton, VA; Jeffrey Synder, **WPC3JSS**, Merritt Island, FL; Douglas Hanna, **WPC4YKQ**, Beaver, PA; Gene Melton, **WPC9FTD**, Litchfield Park, AZ; John Gianotti, **WPC9WY**, Munster, IN; Richard Small, **WPC1KRP**, Ellsworth, ME; Paul Spurlock, **WPC4ALP**, Old Hickory, TN; Vickie Petrusis, **WPC3VIC**, McKeesport, PA; Ted McElligott, **WPC1JJJ**, Lynn, MA; Ken Noffsinger, **WPC8DX**, Tipp City, OH; Shawn Beranty, **WPC3SB**, Worthington, PA; NYC OEM Watch Command, **WPC2OEM**, Brooklyn, NY; Hugh Bradshaw, **WPC2NYC**, Brooklyn, NY; Dan Holtz, **WPCØDAN**, Cherokee, IA; Klaus Spies, **WPC9KS**, Niles, IL; Donald King, **WPC3HRX**, Williamsport, PA; Frederick Bennett II, **WPC2FJ**, Ogdensburg, NY; Larry Loeb, **WPC8GUM**, North Haven, CT; Casimir Stankovitz, **WPC3CJS**, Hanover, PA; Jack Eyster, **WPC6NTS**, Woodland Hills, CA; Jay Petrusis, **WPC3JAY**, McKeesport, PA; Joseph Mignone, Jr., **WPC1JM**, Franklin, MA; Jerry Simpson, **WPC4WMO**, Hermitage, TN; Phillip Madison, **WPC2DCH**, Cedar Grove, NJ; Henry DeGregorio, **WPC3HRD**, Philadelphia, PA; Rick Fenlon, **WPC7MIL**, Columbus, OH; William Samsell, **WPC8FXD**, Falling Waters, WV; Vincent Anyzeski, **WPC1EHC**, East Haven, CT; Robert Crain, **WPC3EAR**, Annapolis, MD; Lawrence Lutzak, **WPC2PYZ**, Bellerose, NY; Alan Hill, **WPC5BGC**, Santa Fe, NM; Michael Herr, **WPC6ARA**, Ridgecrest, CA; Kurt Rudolph, **WPC9RPG**, Dayton, NV; David Pritchard, **WPC9DP**, Gurnee, IL; Randall Meshberg, **WPC8RM**, Huntsville, AL; Gary Wilburn, Jr., **WPC8ABC**, Cincinnati, OH; Norman Elser, **WPC8NE**, Tipp City, OH; Gregory Hatzis, **WPC2GDH**, Highland Mills, NY; Edward Wyatt, Jr., **WPC3EGW**, Ljamsville, MD; Brad Wright, **WPC7BUG**, Dayton, OH; Harold Woering, **WPC1HJW**, Easthampton, MA; Ray Dupin, **WPC4RED**, Big Clifty, KY.

For complete information on the *Pop'Comm Monitoring Station Program* see the January 2012 edition of *Popular Communications*. To join, visit *Pop'Comm Monitors On the Web*: <<http://popcommmonitors.blogspot.com/>>. Questions? Write: <[PopCommMonitor@gmail.com](mailto:PopCommMonitor@gmail.com)> in care of **WPC2COD**.

— Jason Feldman, **WPC2COD**  
Director, *PCMS Registration*  
<[PopCommMonitor@gmail.com](mailto:PopCommMonitor@gmail.com)>

# Space WX and Radio Signal Propagation: Some Basic Terms, Part I

by Tomas Hood, NW7US,  
WPC7USA  
<nw7us@arrl.net>

*“Over the next few months we’ll be exploring key topics of this fascinating science.”*

**R**eaders often ask about the various terms and concepts used when discussing space weather and radio signal propagation. Let’s explore key topics, starting this month.

Over the next few months, we’ll continue to explore the basics of this fascinating science, with a view on how it influences the propagation of radio waves.

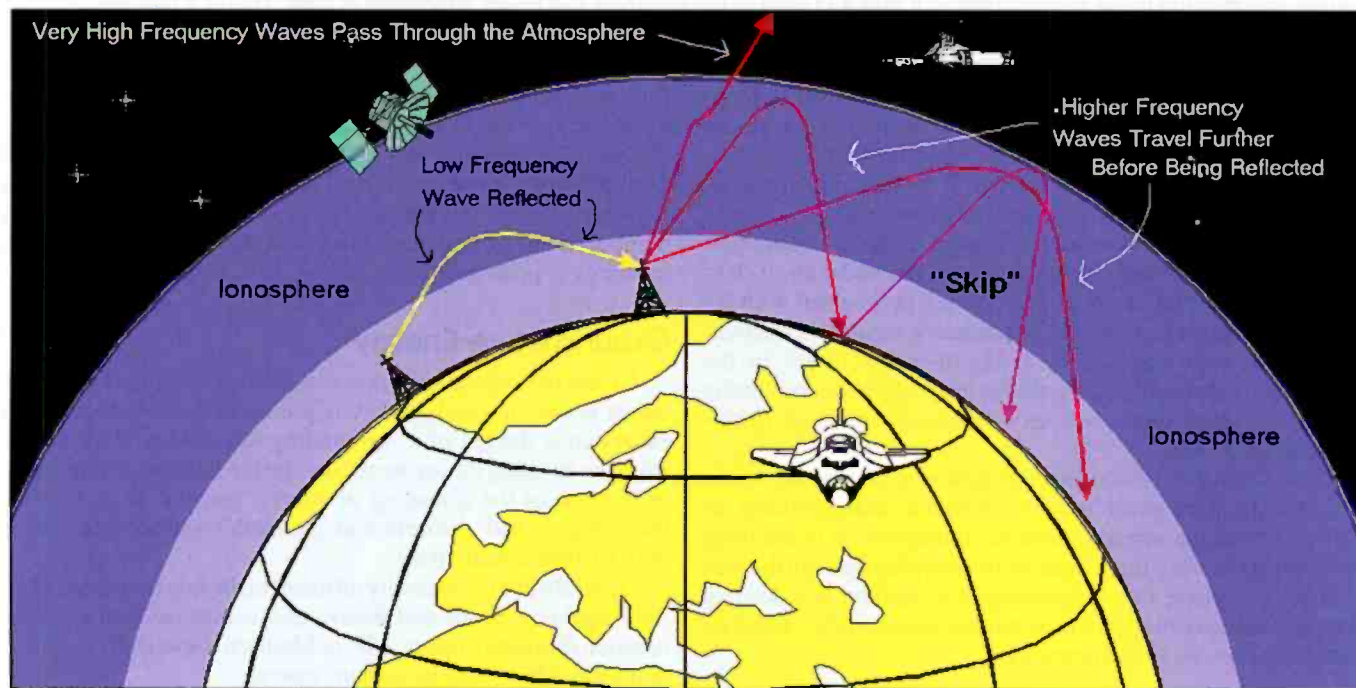
If you are an amateur radio operator, you may remember from studying the exam materials of your license test that the propagation of HF radio signals are affected by the ionosphere. When we consider the radio propagation path between two points when those two points are farther apart than the distance of line-of-sight, we want to factor in the role of the ionosphere. The ionosphere plays an essential role in *bouncing* a signal between the

surface of the Earth and the sky, when we are trying to have our signal reach a remote station.

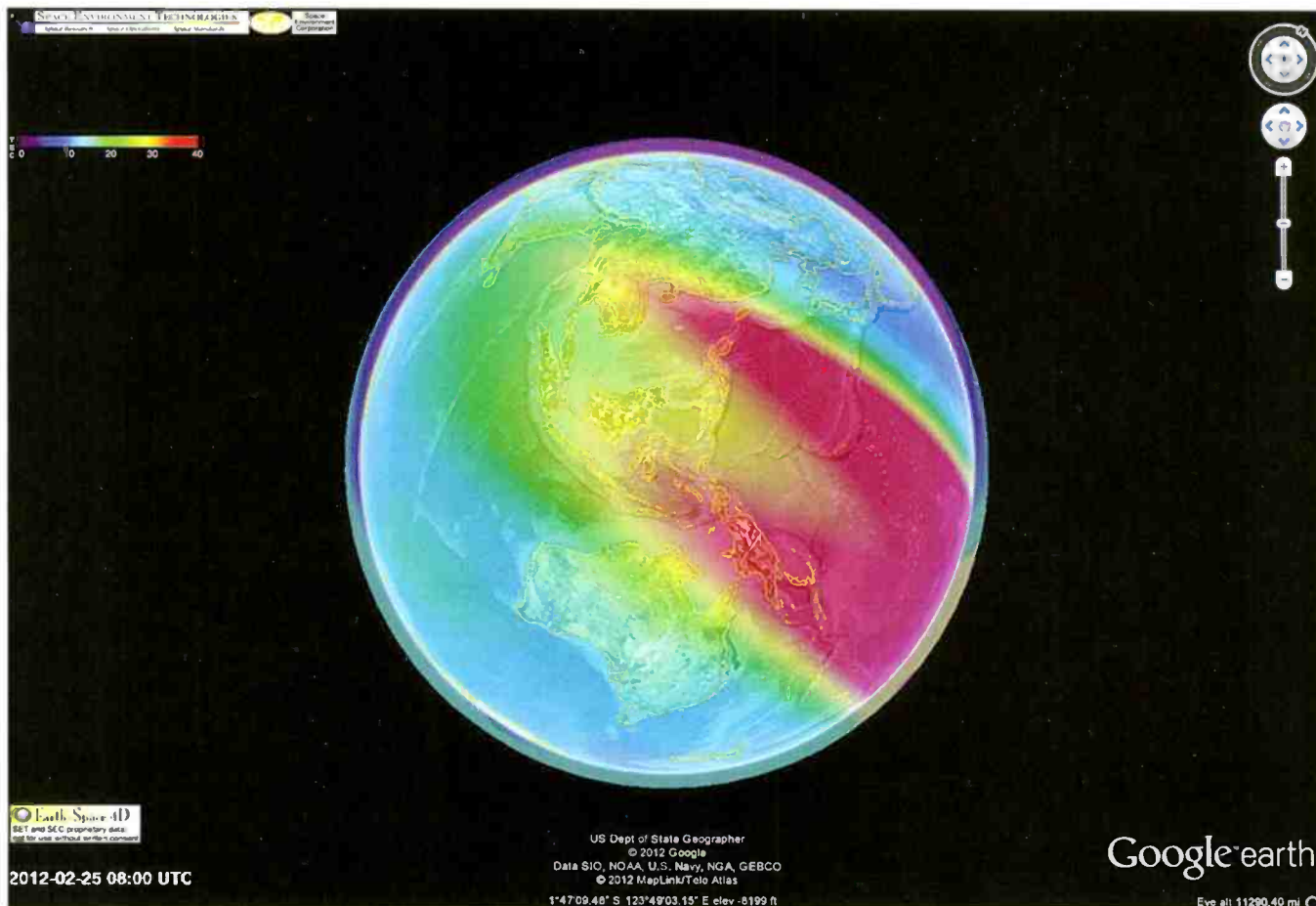
## Mode Combining

Radio wave propagation on earth takes place between two boundary layers: The earth’s surface and the ionosphere. In attempting to explain how such propagation mechanisms work, ionospheric physicists and other scientists have created mathematical models that allow us to predict, or simulate, what we see in the real world.

But the real-world propagation mechanism is much more complex. Consider radio waves emitted from an antenna somewhere above the earth’s surface: The antenna radiates energy in an infinite number of directions which excite a nearly



**Figure 1.** The ability of the ionosphere to diffract radio waves depends in part on the frequency of the radio wave. Higher frequency waves are bent less than those of lower frequencies. At VHF and higher frequencies, the waves usually pass through the ionosphere and are lost to space. So VHF/UHF signals from stations beyond the radio horizon are rarely heard without repeaters, while shortwave transmissions can reach around the world by way of the ionosphere. (Courtesy of NASA)



**Figure 2.** Here is a screen-shot of the 4-D ionosphere as modeled by NASA and Google Earth©. Colors represent electron content. Bright red is high density; that's where radio communications are restricted to few or no frequencies. Blue denotes low density; no problem there, propagation will be as expected. With the intuitive Google Earth interface, users can fly above, around and through these regions getting a true 4-D view of the situation; the fourth dimension is time. This is a real-time system updated every 10 minutes. See: <<http://g.nw7us.us/xs3Zwz>>. (Courtesy of Google Earth/NASA)

unlimited number of propagation modes that then travel — propagate — through the area between the boundaries. Such modes do not travel in isolation, but interact when they come together to create other modes that are different from the original excitation energies. This process is called *mode combining*.

When the radio waves travel through uniform boundaries, such as over uninterrupted lengths of seawater under an all-day-time ionosphere, the combined modes are propagated with little change. But when an abrupt boundary change is encountered, such as a seacoast or a day-to-night change in the ionosphere, previously stable modes interact, mode combining again takes place, and a new set of modes is launched, different in all directions.

Thus, when the real-world environment is considered — one in which complex water and ground terrain changes occur, as well as where the already-unstable ionosphere is continually perturbed by the day-night terminator sweeping through the area — it is easy to see that the propagation medium is indeed so complex that any mathematical models conceived to simulate it must, in fact, be simplifications.

## Propagation Considerations

Scientists have studied and measured radio wave propagation for many years, but the resulting knowledge still doesn't permit us to exactly simulate the natural process. Nevertheless,

for distances greater than a wavelength where near-field distortions can be neglected, emerging theory considers two mechanisms: Groundwave propagation and skywave propagation. The total field can be considered to consist of groundwave plus skywave energy, and that energy is best explained as being a number of interacting modes in which the total electromagnetic energy is propagated.

## Groundwave Energy

Groundwave propagation is easier to understand. The mechanism is one in which energy is propagated along a spherical earth that is devoid of a surrounding ionosphere. As distance from the emitting device increases, the far-field energy decreases because of the spreading of energy, loss due to diffraction from objects and absorption at the earth's surface that varies with surface conductivity.

Groundwave is especially efficient in the low frequency (LF) (or longwave) bands and below, and somewhat useful in the medium frequency bands (MF, or Medium Wave (MW)), where domestic AM broadcast stations operate.

## Skywave Energy

Skywave propagation describes how a radio signal that radiates up and away from an antenna is reflected or refracted by

Optimum Working Frequencies (MHz) - For May 2012 - Flux = 137, Created by NW7US

UTC	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
TO/FROM US WEST COAST																								
CARIBBEAN	22	22	22	21	19	18	16	15	14	13	12	11	12	14	16	17	18	19	20	21	21	22	22	22
NORTHERN SOUTH AMERICA	29	28	28	26	23	21	20	18	17	16	15	14	14	17	19	22	23	25	26	27	28	28	28	29
CENTRAL SOUTH AMERICA	28	25	23	21	19	18	17	16	15	14	14	16	16	18	21	23	25	26	27	28	29	30	30	29
SOUTHERN SOUTH AMERICA	24	18	16	16	15	14	13	13	13	12	12	12	12	15	18	20	22	24	26	27	28	28	28	26
WESTERN EUROPE	12	11	10	10	9	11	13	12	11	11	10	14	16	17	18	19	20	20	20	19	19	18	17	15
EASTERN EUROPE	9	9	9	9	13	15	13	11	11	10	10	10	14	16	18	19	19	19	18	17	16	14	10	10
EASTERN NORTH AMERICA	26	25	25	24	23	22	20	18	17	16	14	14	16	18	20	21	23	24	24	25	25	26	26	26
CENTRAL NORTH AMERICA	14	14	14	14	13	13	12	11	10	9	9	8	8	9	11	11	12	13	13	14	14	14	14	14
WESTERN NORTH AMERICA	8	8	7	7	7	7	6	6	5	5	4	4	4	5	6	6	6	6	7	7	7	7	7	8
SOUTHERN NORTH AMERICA	23	23	23	23	22	21	19	18	16	15	14	13	12	13	16	17	19	20	21	22	22	23	23	23
HAWAII	19	19	19	20	19	19	19	18	17	15	14	13	12	11	10	10	12	13	15	16	17	18	18	19
NORTHERN AFRICA	16	15	13	12	12	14	13	12	11	12	15	17	18	19	19	20	20	21	21	20	20	19	17	19
CENTRAL AFRICA	17	16	15	14	13	14	13	12	11	11	10	14	16	18	19	19	20	20	21	21	21	21	21	19
SOUTH AFRICA	16	15	14	14	13	13	15	17	16	15	14	16	18	20	21	22	23	24	24	23	21	19	18	17
MIDDLE EAST	13	12	12	13	15	15	12	12	11	10	10	12	15	17	18	19	20	20	20	19	18	17	16	14
JAPAN	20	20	21	20	20	20	19	18	18	16	15	14	13	13	14	14	13	12	12	14	16	17	18	19
CENTRAL ASIA	20	20	20	20	20	19	19	18	17	16	15	14	13	13	15	16	17	16	15	14	14	15	17	19
INDIA	18	18	18	18	18	17	15	13	11	10	10	9	9	10	9	9	9	8	8	11	14	15	16	17
THAILAND	17	19	20	20	20	19	18	17	15	14	12	12	12	15	16	18	17	16	15	14	13	13	15	15
AUSTRALIA	29	30	30	30	30	29	28	26	24	22	20	18	17	16	15	15	14	13	13	16	22	25	27	27
CHINA	19	20	20	20	20	19	18	17	16	14	13	12	11	12	15	16	15	13	12	12	14	16	17	18
SOUTH PACIFIC	29	30	30	29	28	26	24	18	16	15	15	14	13	13	13	12	12	12	12	21	25	27	28	29
TO/FROM US MIDWEST																								
CARIBBEAN	25	25	24	24	21	20	18	16	15	14	13	13	14	17	18	20	21	22	23	24	24	25	25	25
NORTHERN SOUTH AMERICA	26	26	25	23	21	19	18	16	15	14	14	13	14	16	18	20	22	23	24	25	25	26	26	26
CENTRAL SOUTH AMERICA	28	25	23	21	19	18	17	16	15	14	14	15	17	20	22	24	25	26	27	28	29	29	29	29
SOUTHERN SOUTH AMERICA	23	18	17	16	15	14	14	13	13	12	12	12	15	18	20	22	24	25	26	27	28	29	28	26
WESTERN EUROPE	15	13	12	11	10	11	13	12	12	14	16	17	18	18	19	19	20	20	20	20	19	19	18	17
EASTERN EUROPE	10	9	9	9	9	13	12	12	11	11	14	16	18	19	19	20	20	19	19	18	17	16	14	10
EASTERN NORTH AMERICA	18	18	18	17	16	15	14	13	12	11	10	10	12	13	15	16	16	17	18	18	18	18	19	19
CENTRAL NORTH AMERICA	9	8	8	8	7	7	6	6	5	5	4	5	6	6	7	7	8	8	8	8	8	9	9	9
WESTERN NORTH AMERICA	15	14	14	14	14	13	12	11	10	9	9	8	8	9	10	11	12	13	13	14	14	14	14	15
SOUTHERN NORTH AMERICA	16	16	16	16	15	14	13	12	11	10	9	9	9	10	11	13	13	14	15	15	16	16	16	16
HAWAII	22	23	23	23	22	21	19	18	16	15	14	13	13	12	12	14	16	17	19	20	21	21	21	22
NORTHERN AFRICA	20	18	17	16	14	14	14	13	12	13	15	16	18	19	19	20	21	21	21	21	21	21	21	21
CENTRAL AFRICA	17	16	15	14	13	13	14	13	12	13	15	17	18	19	19	20	20	21	21	21	21	21	21	19
SOUTH AFRICA	15	15	14	13	13	13	13	19	18	17	16	18	21	23	25	26	28	28	26	22	20	19	17	16
MIDDLE EAST	14	13	12	12	14	15	13	12	12	14	16	17	18	19	19	20	20	20	20	20	19	18	16	15
JAPAN	20	20	20	19	19	18	18	17	15	14	13	13	15	16	15	14	13	12	12	15	16	18	19	19
CENTRAL ASIA	20	20	20	19	19	18	17	16	14	13	12	12	15	16	17	18	18	16	15	14	14	15	17	19
INDIA	12	14	16	16	15	12	12	11	10	10	14	16	17	16	15	14	12	10	9	9	9	8	8	8
THAILAND	17	19	20	19	18	17	16	14	13	12	11	12	15	16	18	19	19	18	16	15	14	13	13	15
AUSTRALIA	29	30	30	30	30	29	28	25	23	21	19	18	17	16	16	15	14	14	13	13	17	23	26	28
CHINA	19	20	20	19	18	17	16	14	13	12	11	12	15	17	18	16	15	14	13	13	14	16	17	18
SOUTH PACIFIC	30	30	29	28	27	25	22	16	15	14	14	13	13	12	12	12	12	13	23	26	27	29	29	29
TO/FROM US EAST COAST																								
CARIBBEAN	20	20	19	18	16	15	14	13	12	11	10	10	12	14	15	16	17	18	19	19	20	20	20	20
NORTHERN SOUTH AMERICA	23	23	22	20	18	17	15	14	13	12	12	11	13	15	17	19	20	21	22	22	23	23	23	23
CENTRAL SOUTH AMERICA	27	25	22	21	19	18	16	15	15	14	14	16	19	21	23	24	25	26	27	28	28	29	29	29
SOUTHERN SOUTH AMERICA	21	18	17	16	15	14	14	13	13	12	12	12	17	20	22	23	25	26	27	28	28	29	27	25
WESTERN EUROPE	16	15	14	13	12	13	12	11	11	13	15	16	17	18	19	19	19	19	19	19	18	18	18	17
EASTERN EUROPE	11	10	10	9	9	14	13	12	13	15	17	18	19	19	20	20	20	20	19	19	18	17	15	12
EASTERN NORTH AMERICA	9	9	8	8	7	7	6	6	5	5	5	5	6	7	7	8	8	8	8	9	9	9	9	9
CENTRAL NORTH AMERICA	19	19	19	18	17	16	14	13	12	11	11	11	13	14	15	16	17	18	19	19	19	20	20	20
WESTERN NORTH AMERICA	26	26	25	24	24	22	20	18	17	16	15	14	16	18	20	21	23	24	24	25	25	26	26	26
SOUTHERN NORTH AMERICA	20	20	20	19	18	16	15	14	12	12	11	11	12	14	15	16	17	18	19	19	20	20	20	20
HAWAII	24	25	25	24	22	20	18	17	16	15	14	14	14	13	13	15	17	19	20	21	22	23	24	24
NORTHERN AFRICA	20	18	17	16	15	14	14	15	14	15	18	20	21	22	23	24	25	25	26	25	25	25	24	22
CENTRAL AFRICA	17	16	15	14	13	13	15	15	14	15	18	20	21	22	23	24	25	25	25	25	24	23	21	19
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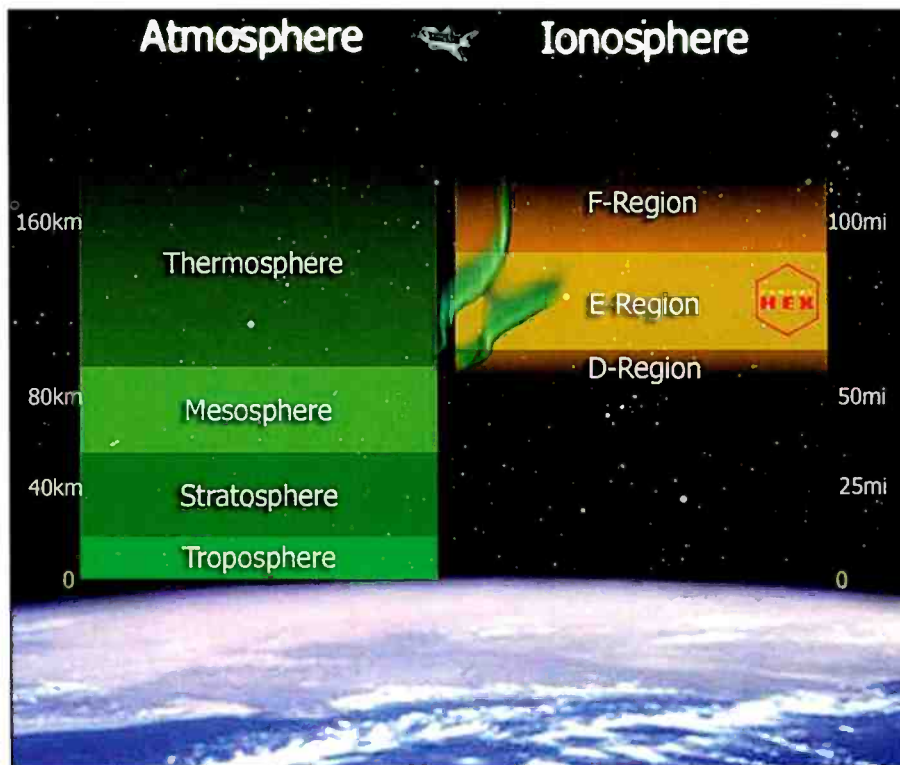
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**Figure 3.** Here's a look at the ionospheric regions in relation to Earth's atmosphere. The ionosphere is composed of three main parts: the D, E and F regions. (Courtesy of HEX — Horizontal E-Region Experiment)

the ionosphere back toward the Earth at the opposite angle from where it came from, causing the radio wave to reach very distant areas.

A simple way to visualize this ionospheric bounce is to think of the reflection of a beam of light from a flashlight. When you stand off to the side of a mirror and shine the flashlight at an angle toward the mirror, the beam will be reflected at the same, but opposite angle, toward a distant spot.

When shortwave radio signals spread out away from their source and reach the ionosphere, they may be reflected back toward the Earth. They might make such "hops" more than once, bounced back toward the ionosphere by the Earth, repeating this skip several times or more. In this way, skywave propagation allows a signal to reach around the world.

Skywave energy is infinitely more difficult to accurately model. Two techniques have been devised after many decades of work:

- A ray-trace theory, where the principal propagation modes are considered to reflect (or refract) back and forth between the earth's surface and the surrounding ionosphere.
- Waveguide theory, where elec-

tromagnetic energy is considered to be guided between reflecting boundaries.

Of the two, waveguide theory is thought to be more accurate. But it must be understood that ray theory and waveguide theory inevitably lead to models that yield only approximations. Both are simply mathematical constructs, in which certain assumptions based on measurement and experimentation have been made.

### Ray-Theory Modeling and VOACAP

While one would prefer to use rigorous waveguide theory models for all propagation simulations in all bands, they become unsuitable for HF propagation. The alternative is ray-theory modeling. Of all HF ray theory models, the one that has been the most highly developed and is considered the most accurate is VOACAP (Voice of America Coverage Analysis Program), <<http://www.voacap.com/>>. Many times in past issues, I've touched on VOACAP and one program that uses VOACAP as its core engine: The ACE-HF software for both SWL and radio amateurs <<http://hfradio.org/ace-hf/>>. Yet one must again rec-

ognize that all such HF models are merely mathematical constructs. They are the best tools we have for simulating real-world propagation, but inevitably the results are approximations of how complex radio waves really behave.

## Space Weather

Since skywave depends completely on the condition of the ionosphere, space weather has been taken into account in the models we now depend upon. One of the key influences on the ionosphere is solar radiation. When the ultraviolet radiation from the sun is weak, the ionosphere is weakly ionized, while intense radiation from the sun creates a strongly-energized ionosphere. This cause-and-effect interaction between the sun and the ionosphere has been modeled and empirically confirmed by years of study and daily observations.

The historical record of our observations of the sun and the ionosphere tells us of daily, seasonal, yearly, and even longer-term cycles in solar activity and the resulting ionospheric properties. One of the most well-known ways to track these cycles is the Smoothed Sunspot Number (SSN). The propagation models in use today use the SSN as a key factor in simulating real-world propagation.

As you might have guessed, since the ionosphere depends on solar radiation for its existence, and since radio waves are refracted by a strongly energized ionosphere, the level of activity on the Sun is tied to radio signal propagation.

## Stay Tuned . . .

Each month, this column contains a report on the smoothed sunspot number for the current sunspot cycle. What are these spots? Why do we keep watching the sun for them, and how do they affect radio propagation? Tune in next month and we'll explore this.

## High-Frequency Propagation

The winter shortwave season is nearly over, and in the Northern Hemisphere, the number of daylight hours is increasing as we move to the height of summer. The overall trend for shortwave propagation is the opening up of the higher frequencies into many areas of the world. Some of these openings will be longer in duration than during the winter season.

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cies able to be propagated on a given path can exhibit variability in signal strength. These openings are subject to fading, and propagation could be short-lived. The cause of this change is complex.

Propagation of shortwave radio signals on the frequencies we're interested in is affected by the length of daylight over a region of the ionosphere, the intensity of the solar radiation, and the density and height of the various layers of the ionosphere.

Winter daytime propagation over a given path could sustain higher frequencies than the same path during the summer daytime, while the summer nighttime frequencies will be higher than the winter nighttime frequencies on that same path (partly due to the proximity of the earth to the sun during these two seasons; in the winter, the Earth is closer).

This month, on the higher HF frequencies (16 through 11 meters), fairly good daytime openings should be possible on paths that are mostly running between north and south stations.

Sixteen meters will be the best bet out of the higher bands, not only because of propagation, but also because more international broadcasters will still use this band around the clock.

The most reliable DX signals, however, will be on the middle and lower HF bands (on and below 25 meters). Look for peaks in signals around the hours of sunrise, and again just before sunset, and into the late evening. Daytime paths are best when they terminate in areas where it is night. This enhances propagation to remote parts of the world and lengthens the DX window. Twenty-five and 22 meters will have more stable signals than those on 19 meters, especially on north to south paths, again around the hours of sunrise and sunset. Thirty-one meters remains one of the most stable and reliable bands. Look for Europe and Africa early in the morning through late morning, then the north-south openings during the day if the solar activity is low (otherwise the D-region absorption will wipe out the band). As sunset approaches, look for South Pacific, then Asia as the sun sets.

During the night, 41 through 60 meters should provide good openings from Europe, Africa, and the east. Some DX should be possible on 75 through 120 meters, but signals are expected to be mainly weak and covered by seasonal noise. Static levels also increase noticeably during May, and signals may sound

weaker on DX openings during the daylight hours.

## VHF Ionospheric Openings

Possible Transequatorial propagation and occasional sporadic-E propagation ( $E_s$ ) will keep the VHF enthusiast happy. The annual summer  $E_s$  season begins around May 1, with the activity sparse during the first two weeks of May, then picking up to about 60 percent of the days by the end of May.

The date of May 1 is like a switch in the ionosphere. Simply, the oxygen ions that are in the E-region of the ionosphere are now being excited more and more by the increasing closeness of the sun such that they are recombining with metallic ions that are present in the E-region at a higher rate than other times of the year. This eventually leads to thin layer formations in the E-region, off of which we can bounce VHF radio waves, the mode of propagation known as Sporadic-E propagation.

Because we expect this  $E_s$  increase considerably during May, fairly frequent VHF short-skip openings should be possible. These are likely to occur over distances of approximately 1,000 to 1,400 miles. Although sporadic-E openings can take place at just about any time, the best time to check is between 10 a.m. and 2 p.m., and again between 6 and 10 p.m. local daylight time.

A seasonal decline in transequatorial (TE) propagation is expected during May. An occasional opening may still be possible on VHF. The best time to check for VHF TE openings is between 9 and 11 p.m. local daylight time. These TE openings will be north-south paths that cross the geomagnetic equator at an approximate right angle.

Auroral activity is generally lower now than during March and April, due to the change in the orientation and position of the earth and magnetosphere in relation to the solar wind. Watch for the Planetary K-index ( $K_p$ ) values above 4, which occur on days when we see coronal holes affecting space weather or the arrival of coronal mass ejections a few days after any major solar flare.

One meteor shower, the Eta Aquarids, <<http://bit.ly/zo7y2P>>, will occur in May, peaking during the beginning of May, but they will start during the end of April. This shower has a peak rate of up to 60 visuals per hour. Listen for FM broadcast pings (short bursts of signals,

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refracted off of the ionized trails from the burning meteorite) during these events. If you are an amateur radio operator, look for 6- and 2-meter openings off of the ionized meteor trails.

magazine or on this columnist's website <<http://SunSpotWatch.com>> for the outlook on what days that this might occur.

## Current Solar Cycle 24 Progress

The Dominion Radio Astrophysical Observatory at Penticton, BC, Canada, reports a 10.7-cm observed monthly mean solar flux of 133.1 for January 2012, down from December's 141.2. The 12-month smoothed 10.7-cm flux centered on July 2011 is 115.4, up from March's 110.9. The predicted smoothed 10.7-cm solar flux for May 2012 is 137, give or take about 9 points.

The Royal Observatory of Belgium reports that the monthly mean observed sunspot number for January 2012 is 58.3, quite a dip from December's 73.0. This continues a two-month sharp decline from the steadily rising activity over the previous three months, but is typical of the fluctuation expected during the rise of any solar cycle. The lowest daily sunspot value of 28 was recorded for January 28. The highest daily sunspot count was 95 on January 16. The 12-month running smoothed sunspot number centered on July 2011 is 57.2, up from June's 53.2. A smoothed sunspot count of 81, give or take about 9 points is expected for May 2012.

The observed monthly mean planetary A-Index ( $A_p$ ) for December 2011 was adjusted to 3, and 6 was recorded for January 2012. The 12-month smoothed  $A_p$  index centered on July 2011 is 7.3, while July's was adjusted to 7.4; these are much the same as the previous few months. Expect the overall geomagnetic activity to be varying greatly between quiet to stormy during May; refer to the Last Minute Forecast published in CQ

## I'd Like to Hear From You

I welcome your thoughts, questions, and experiences regarding this fascinating science of propagation. You may e-mail me, write me a letter, or catch me on the HF Amateur bands. On Twitter, please follow @NW7US (and if you wish to have an hourly automated update on space weather conditions and other radio propagation-related updates, follow @hfradiospacewx). I invite you to visit my online propagation resource at <<http://sunspotwatch.com/>>, where you can get the latest space data, forecasts, and more, all in an organized manner. If you are on Facebook, check out <<http://www.facebook.com/spacewx.hfradio>> and <<http://www.facebook.com/NW7US>>.

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Until next month,

73 de NW7US/WPC7USA, Tomas Hood  
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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.

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0000	6050	HCJB, Ecuador	SS	0400	9835	Radio France Intl, via South Africa	Swahili
0000	13580	China Radio International	CC	0400	4920	Radio Quito, Ecuador	SS
0000	6020	China Radio International, via Albania		0400	7235	V. of Peace and Democracy, to Eritrea.	Tigrinya
0000	11990	China Radio International	SS	0400	9885	Voice of America, Sao Tome Relay	
0000	5990	China Radio International, via Cuba	SS	0400	4775	Trans World Radio, Swaziland	Swahili
0000	6060	Radio Havana Cuba	SS	0400	9840	Radio Rossii, Russia	RR
0000	6155	All India Radio	Urdu	0400	6145	Adventist World Radio, via Austria	Farsi
0000	9420	Voice of Greece	Greek	0400	4885	Radio Clube do Para, Brazil	PP
0000	12105	Voice of Greece	Greek	0400	5025	Radio Rebelde, Cuba	SS
0000	11735	Voice of Korea	SS	0500	6160	CKZU, Canada	
0000	6055	Radio Exterior de Espana		0500	6005	BBC, Ascension Island Relay	
0000	13745	Radio Thailand		0500	9740	Islamic Rep. of Iran Broadcasting	AA
0100	6160	CKZN, Canada		0500	5995	RTV Maliene, Mali	FF
0100	11840	Radio Havana Cuba		0600	9665	Voz Missionaria, Brazil	PP
0100	11905	Sri Lanka Broadcasting Corp.	Hindi	0600	11925	Radio Bandierantes, Brazil	PP
0100	9260	Voice of Russia, via Moldava	RR	0600	6155	Radio Austria International	GG
0100	6040	Vatican Radio, via Bonaire	SS	0600	3290	Voice of Guyana	
0100	7305	Vatican Radio	SS	0600	6090	Radio Nigeria	vernacular
0100	6175	Voice of Vietnam, via Canada		0600	7275	Radio Nigeria	
0100	4825	Radio Cancao Nova, Brazil	PP	0600	7275	Radio Tunisienne, Tunisia	AA
0200	5910	Alcaravan Radio, Colombia	SS	0700	11815	Radio Brazil Central	PP
0200	11710	Radio Argentina al Exterior	various	0700	11725	Radio New Zealand International	
0200	4865	Radio Verdes Florestas, Brazil	PP	0800	6185	Radio Educacion, Mexico	SS
0200	7250	Voice of Russia		0800	5990	Radio Senado, Brazil	PP
0300	4780	RTV Djibouti	AA	0800	9765	Radio New Zealand International	
0300	4930	Voice of America, Bonaire Relay		0800	9835	RTV Maliene, Mali	FF
0300	4877	Radio Roraima, Brazil	PP	0900	6135	Radio Santa Cruz, Bolivia	SS
0300	5960	Radio Japan, via Canada	JJ	0900	6120	Super Radio Deus e Amor, Brazil	PP
0300	7200	Islamic Rep. of Iran Broadcasting		0900	6185	Radio Japan	JJ
0300	6110	Radio Fana, Ethiopia	Amharic	0900	6010	Radio Mil, Mexico	SS
0300	7110	Voice of the Broad Masses, Eritrea	vernacular	1000	5040	Radio Libertad de Junin, Peru	SS
0300	5010	Radio Madagasikara, Madagascar	Malagasy	1000	12085	Voice of Mongolia	unid
0300	3320	Radio Sonder Grense, South Africa	Afrikaans	1000	4717	Radio Yura, Bolivia	SS
0300	7200	Sudan Radio TV	AA	1000	4775	Radio Tarma, Peru	SS
0300	3240	Trans World Radilo, Swaziland	vernaculars	1100	3925	Radio Nikkei, Japan	JJ
0300	3250	Radio Luz y Vida, Honduras	SS	1100	13640	Radio France Intl, French Guiana Relay	
0300	3985	Croatian Radio	Croatian	1100	9975	KTWR, Guam	Mandarin
0300	4965	CVC-One Africa, Zambia		1100	9655	Radio New Zealand International	
0400	6165	RN Tchadienne, Chad	FF	1100	11795	KBS World Radio, S. Korea, via Canada	SS
0400	7390	Radio Station Belarus	RR/BB	1100	9355	Radio Free Asia, via Northern Marianas	Laotian
0400	5055	Radio Verdad, Guatemala	SS	1100	13730	Vatican Radio	

UTC	Freq.	Station/Country	Notes	UTC	Freq.	Station/Country	Notes
1100	5020	Solomon Islands Broadcasting Corp.		1700	11670	All India Radio	
1200	13610	China Radio International	CC	1700	17640	BBC, via South Africa	
1200	11870	KNLS, Alaska	RR	1700	15690	Radio Taiwan Intl., via France	
1200	9580	Radio Australia		1800	17800	Deutsche Welle, Germany, via Madagascar	Hausa
1200	6120	Radio Japan, via Canada		1800	17680	CVC-La Voz, Chile	SS
1200	15850	Galei Zahal, Israel	HH	1800	17790	Radio Canada International	
1200	3315	Rado Manus, Papua New Guinea	Tok Pidgin	1800	15580	Voice of America, Botswana Relay	
1200	3385	Radio East New Britain, Papua New Guinea	Tok Pidgin	1800	15620	Deutsche Welle, Germany, Rwanda Relay	FF
1200	2912	V. of the People, to North Korea	KK	1800	11705	Radio France International	FF
1200	4755	The Cross, Micronesia		1800	15190	Radyo Pilipinas, Philippines	Tagalog/EE
1200	6130	Lao National Radio, Laos	Laotian	1800	15120	Voice of Nigeria	
1200	9720	Radio Thailand		1800	11655	Radio Nederland, Madagascar Relay	
1200	21505	Broadcasting Svc. of Kingdom, S. Arabia		1800	15345	Radio Marocaine, Morocco	AA
1300	11685	Radio Japan, via Singapore	Bengali	1800	7290	Radio PMR, (Pridnestrovie) Moldova	
1300	9595	Radio Nikkei, Japan	JJ	1800	17715	Radio Exterior Espana	SS
1300	9870	All India Radio	Hindi	1800	9855	Broadcasting Svc. of Kingdom, S. Arabia	AA
1300	9525v	Voice of Indonesia	various	1800	17850	REE, Spain, Costa Rica Relay	SS
1300	15575	BBC, England		1800	9410	BBC, Seychelles Relay	Somali
1300	9930	World Harvest Radio, via Palau		1800	13590	CVC-One Africa, Zambia	
1300	11575	Radio Pakistan	urdu	1800	15420	WBCQ, USA	
1300	11530	Voice of Mesopotamia, to Iran	Kurdish	1900	13649	Radio Havana Cuba	SS
1300	15760	Sri Lanka Broadcasting Corp.	Hindi	1900	9445	All India Radio	
1300	15510	Voice of Russia	Pashto/Dari	1900	9425	All India Radio	
1300	15690	Radio Farda	Farsi	1900	21690	Radio France Intl., French Guiana Relay	FF
1400	9625	CBC No. Quebec Service, Canada		1900	15155	Polish Radio, via England	RR
1400	7320	Islamic Rep. of Iran Broadcasting	Bangla	1900	15495	Radio Nederland, via Germany	
1400	11695	Radio Japan, via Uzbekistan		1900	11725	Radio New Zealand International	
1400	11620	All India Radio		1900	15540	Radio Kuwait	EE/AA
1400	15065	Radio Cairo, Egypt	Pashto	1900	15310	Radio Romania International	Romanian
1400	6260	CVC-The Voice, via Uzbekistan	Hindi	1900	17695	CVC One Africa, Zambia	
1400	15140	Radio Sultanate of Oman	EE/AA	1900	9905	Radio Free Asia, via Palau	CC
1400	7295	Traxx FM, Malaysia		1900	13570	WINB, USA	
1400	11890	BBC, Singapore Relay		2000	9760	Islamic Rep. of Iran Broadcasting	Albanian
1400	15460	Radio Romania International	GG	2000	9705	Radio Ethiopia	Amharic
1400	5765	AFN/AFRTS, via Guam		2000	9535	Radio Thailand	
1400	5050	Beibu Bay Radio, China	CC	2000	6100	International Radio of Serbia	Serbian
1500	7200	National Radio of Afghanistan		2000	11940	Radio Romania International	
1500	15150	Islamic Republic of Iran Broadcasting	AA	2000	9755	Vatican Radio	FF
1500	9505	BBC, Cyprus Relay		2000	9780	Republic of Yemen Radio	AA
1500	9410	BBC, Oman Relay		2100	7550	All India Radio	
1500	9430	Far East Broadcasting Co., Philippines	Mandarin	2100	11865	Deutsche Welle, via Rwanda	
1500	9450	Sound of Hope, Taiwan to China	Mandarin	2200	15540	Radio Nederland, Bonaire Relay	DD
1500	9975	Furzato No Kaze, to North Korea	JJ	2200	12095	BBC, Ascension Island Relay	
1500	9335	Voice of Korea, North Korea	KK	2200	9870	Radio Canada International, via South Korea	CC
1500	15200	Voice of Turkey	AA	2200	11715	All India Radio (Goa)	
1500	9655	Radio Romania International	AA	2200	9705	La Voix du Sahel, Niger	FF
1500	15185	Radio Free Asia, USA, via Sri Lanka		2200	7245	Radio Mauritanie, Mauritania	AA
1500	11610	Family Radio, USA, via UAE		2200	9870	Broadcasting Svc. of Kingdom, S. Arabia	AA
1500	9840	Voice of Vietnam		2300	7229	China Radio International	VV
1500	11590	Radio Free Asia, Kuwait Relay	Tibetan	2300	6070	CFRX, Canada	
1500	15360	Adventist World Rado, via France	Hindi	2300	11780	Radio Nacional Amazonia, Brazil	PP
1500	17145	Sudan Radio Service, USA		2300	15345	Radio Argentina al Exterior	SS
1600	9710	Radio Australia		2300	15240	Radio Australia	
1600	9985	Kol Israel	Farsi	2300	13650	Radio Japan	JJ
1600	11935	Adventist World Radio, Guam		2300	5954	Radio Republica, to Cuba	SS
1600	11600	Radio Television Libye, Libya	FF	2300	15720	Radio New Zealand International	
1600	12085	Radio Damascus, Syria		2300	11635	Radio Taiwan International	CC
1600	15205	Broadcasting Svc of Kingdom, S. Arabia	AA	2300	7470	Radio Free Asia, via Mongolia	CC
1600	9640	KBS World Rado, South Korea					

# Communications Trivia and Other Pursuits

By R.B. Sturtevant,  
KPC7RBS/AD7IL

*Q: I heard that the USS Pueblo was supposed to be doing environmental research when she was caught spying on the North Koreans. What is the real story?*

**A:** The *USS Pueblo* was designated AGER which is Navy speak for miscellaneous auxiliary craft or some kind of craft doing miscellaneous work (AG). Any ship with an unusual job can have this classification. ER stands for Environmental Research. When the *USS Pueblo* was commissioned everyone was worried about the Navy polluting the environment so it was partly a PR cover name. The environment, of course, includes the ether or airwaves. The *USS Pueblo* was crammed with more electronic receivers and analyzers than you could imagine, **Photo A**. In his book the Captain said most of the electronics came from off the shelf electronics stores. Imagine your amateur radio shack or more likely radio monitoring station with a \$10 million budget. Naturally this equipment was producing intelligence about the air-



**Photo A.** "The *USS Pueblo* was crammed with more electronic receivers and analyzers than you could imagine," writes R.B. Sturtevant, KPC7RBS/AD6IL. (Courtesy of John Pavelka via Wikimedia Commons)



**Photo B.** The *USS Pueblo* was part of a five-ship task force that the Navy was developing. Designated AGER-2, the AG stands for "miscellaneous work," and the ER indicates "environmental research." (Courtesy of John Pavelka via Wikimedia Commons)

waves around North Korea. The Soviets wanted to get ahold of the coding equipment and manuals that sent all this intelligence back to the United States.

Their friends in North Korea got the equipment for them. The *USS Pueblo*, **Photo B**, was part of a five-ship task force that the Navy was developing. After the attack on the *USS Pueblo*, the *USS Liberty*, and another ship in the program which was attacked by Israel during the Six Days War, the AGER program was scuttled.

*Q: When did America start using radio broadcasts to affect morale in the Pacific War?*

**A:** Large San Francisco radio stations at full power were easily heard in the Philippines, China, Burma and Australia. The Office of War Information produced a daily news program called "*The Voice of Liberty*." The programs were distributed to the stations in 1942. These popular shows were heard by servicemen, POWs and resistance fighters all over the Pacific. The Japanese carried out heavy reprisals — usually death — for anyone caught listening to the program.

*Q: What is Huff and Duff?*

**A:** Huff and Duff is another name for High Frequency Direction Finding or HF/DF. Using directional antennas and several receivers it is possible to find the source of a radio signal by comparing the angle from which each receiver picks up the signal. Chart the location of the known receivers and draw the lines from which each receiver picks up the signal. The lines will cross at the source of the signal. Huff and Duff was first used during World War I to locate enemy headquarters and submarines. The term is thought to be of British origin.

*Q: Is clandestine radio used for more than propaganda purposes by resistance and opposition movements?*

**A:** *Definitely!* Coded messages and orders to resistance groups are often passed on to listeners of the same political persuasion. They are used, as well, to subtly show the opposition flaws in their systems of operating. During Israel's fight to become a nation, the protection arm that kept the kibbutzim and other terror targets from harm was called the Haganah (underground defense) and did a lot of fighting to bring about the dream of a Jewish homeland.

The intelligence unit of the Haganah was called the Shai or Sherut Yediot (information service). Like many elements of Jewish underground units, the Shai had its own clandestine radio station. To demonstrate to the British how compromised the Brits' intelligence system was, Shai broadcast the contents of the British files on the Haganah and members of the Jewish underground. This spy coup, broadcast in 1946, led the Intelligence Chief of the British Army in Palestine to describe the Shai as "a perfect intelligence system." Shai was abolished in July 1948 when Israel, at last, became a nation.

## New from AOR: The AR8200D With APCO 25 Decoder

### You'll Find New USB Connectors and a Micro SD Memory Chip, As Well

Security professionals, government agencies and monitoring enthusiasts will welcome the new digital upgrade to AOR's legendary AR8200D handheld receiver, company officials announced recently. (**SEE:** <<http://bit.ly/wHSxzt>> and **Photo A.** – Ed.)

"In addition to its many standard operating modes, this new version includes APCO 25, USB connectors and a micro SD memory chip for audio recording," according to AOR. "It still offers unparalleled frequency coverage from 500 KHz to 3 GHz, combined with precision stability from the TCXO, superb sensitivity and enhanced resistance to intermod along with excellent audio frequency response and NiMH AA cells that can be charged while operating the receiver." (**NOTE:** *The U.S. consumer version of the AR8200D — the AR8200D[B] — is cellular blocked. There is an unblocked version available to qualified purchasers with documentation. Specifications are subject to change without notice or obligation, officials said.* – Ed.)

The radio includes 1,000 alphanumeric memory channels, two VFOs, 40 search banks and all-mode reception. No optional CTCSS slot card is required. This function is included.

So, what is an APCO 25 decoder and why is it an important addition to the AR8200D[B]?

AOR explained that "APCO 25 (or Project 25) is the national standard of digital communication method in the U.S. (and some other countries) especially for public safety including police, fire, etc. Many states have already switched from analog communications to digital communications and therefore no signals can be monitored without using an APCO 25 decoder capable receiver."

In addition, "audio recording is a useful tool to record any voice signal picked up by a receiver as a reference or a future analysis. It is a *must* feature for the receiver and has been requested by many users," according to AOR.

The AR8200D special government version includes voice inversion capabilities and continuous unblocked frequency coverage.

Existing owners of U.S. versions of the AR8200 MkIII can purchase upgrade service for their units directly from AOR USA, Inc. The upgrade fee for an existing AR8200 MkIII unit includes adding the capabilities of the new D model and the receiver will be thoroughly tested and certified to its new specs before being returned.

The owner is responsible for shipping the existing unit in good operating condition to AOR USA, Inc. The upgrade fee includes parts, labor and return shipping via UPS ground for continental US addresses only.

The upgrade is not available for export versions. "More than 50,000 units are in use all over the world," AOR reported. For more information, visit the AOR website: <<http://www.aorusa.com>>.

**Photo A.** In addition to its APCO 25 decoder, the AR8200D[B] features 1,000 alphanumeric memory channels, two VFOs, 40 search banks, and all-mode reception. No optional CTCSS slot card is required because this function is included. (Courtesy of AOR)



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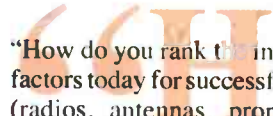
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# The Modern AM Broadcast Band DXer — Defined

by Bruce A. Conti,  
WPC1CAT  
<contiba@gmail.com>

*“Over the next few months Broadcast Technology will attempt to define the modern AM broadcast DXer, beginning this month with the antenna, which ranks number one in my ratings book.”*



“How do you rank the importance of the various factors today for successful AM broadcast DXing (radios, antennas, propagation, skill, etc.)?” asked Tom Walsh, K1TW. “Is it the availability of software defined radios (SDRs) where you can capture and review the reception after the fact, the improvements in antenna technology, the solar cycle, or just hard work?”

The hobby of long distance (DX) AM radio listening is many faceted. Antenna and receiver technology, atmospheric conditions, location, and sometimes persistence and just plain luck all play a role. From casual tuning of an *ultralight* portable radio on a sleepless night, to deployment of high tech gear at a remote site, it’s a hobby without any limitations other than your own imagination.

Over the next few months *Broadcast Technology* will attempt to define the modern AM broadcast band DXer, beginning this month with the antenna, which ranks number one in my ratings book.

## Terminated Broadband Loop Antennas

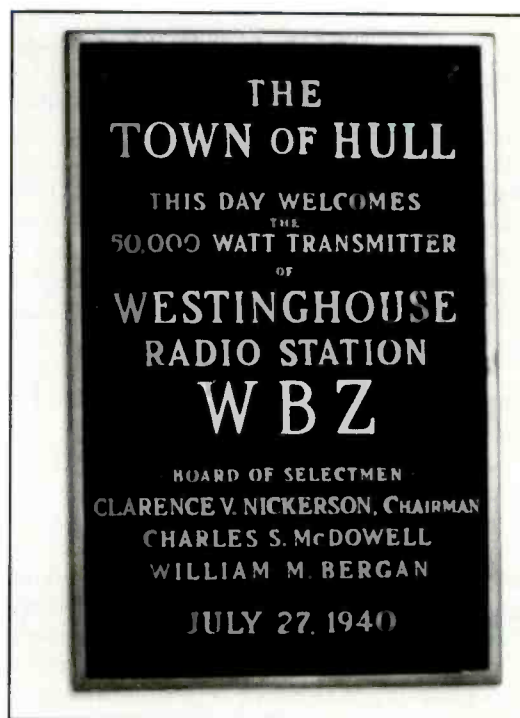
It’s been said that necessity is the mother of invention. It’s also been said that a receiver is only as good as its antenna. Today, both axioms hold true for the AM broadcast DXer.

Advances in antenna design have vastly improved reception. Long gone are the indoor tuned loops, outdoor sloping wires, and pre-requisite thousand-foot long Beverage antennas for exotic DX reception.

Using an air-core or ferrite-core tuned loop indoors or simply throwing a wire out the window may have been adequate decades ago, but the increase of indoor RF interference from TV, computers, light dimmers, energy-efficient lighting, and various digital devices, has brought about new antenna solutions. The outdoor terminated broadband loop (Delta, Flag, Pennant, SuperLoop) represents a significant advancement in the ongoing mission to eliminate indoor RF noise pollution.

The advantages of a terminated broadband loop are three-fold:

- An inherently low-noise loop antenna floats on its own ground reference, therefore not



**Photo A.** The Board of Selectmen of Hull, Massachusetts welcomed the 50,000-watt WBZ radio transmitter to town with this plaque erected July 27, 1940. (Courtesy of WPC1CAT)

requiring an earth ground connection.

- Broadband design using a single loop of wire eliminates the need for pre-tuning.
- Termination converts the figure-8 bidirectional pattern of a standard loop into a unidirectional cardioid beam, <<http://bit.ly/x8UcDH>>.

One can only imagine what might have been accomplished by AM broadcast DXers if broadband loop antennas were available 40-or-more years ago. Back then, of course, an outdoor noise-reduced antenna wasn’t absolutely necessary for long-haul reception.

Amazingly, terminated broadband loop antennas are simple to build. The easiest configuration to make consists of a single loop of wire with a minimum dimension of 16 feet tall in the vertical plane, a 1.2 k-ohm resistor installed in series-in-line at the null corner of the loop, and a 16:1 RF isolation/matching transformer at the direc-

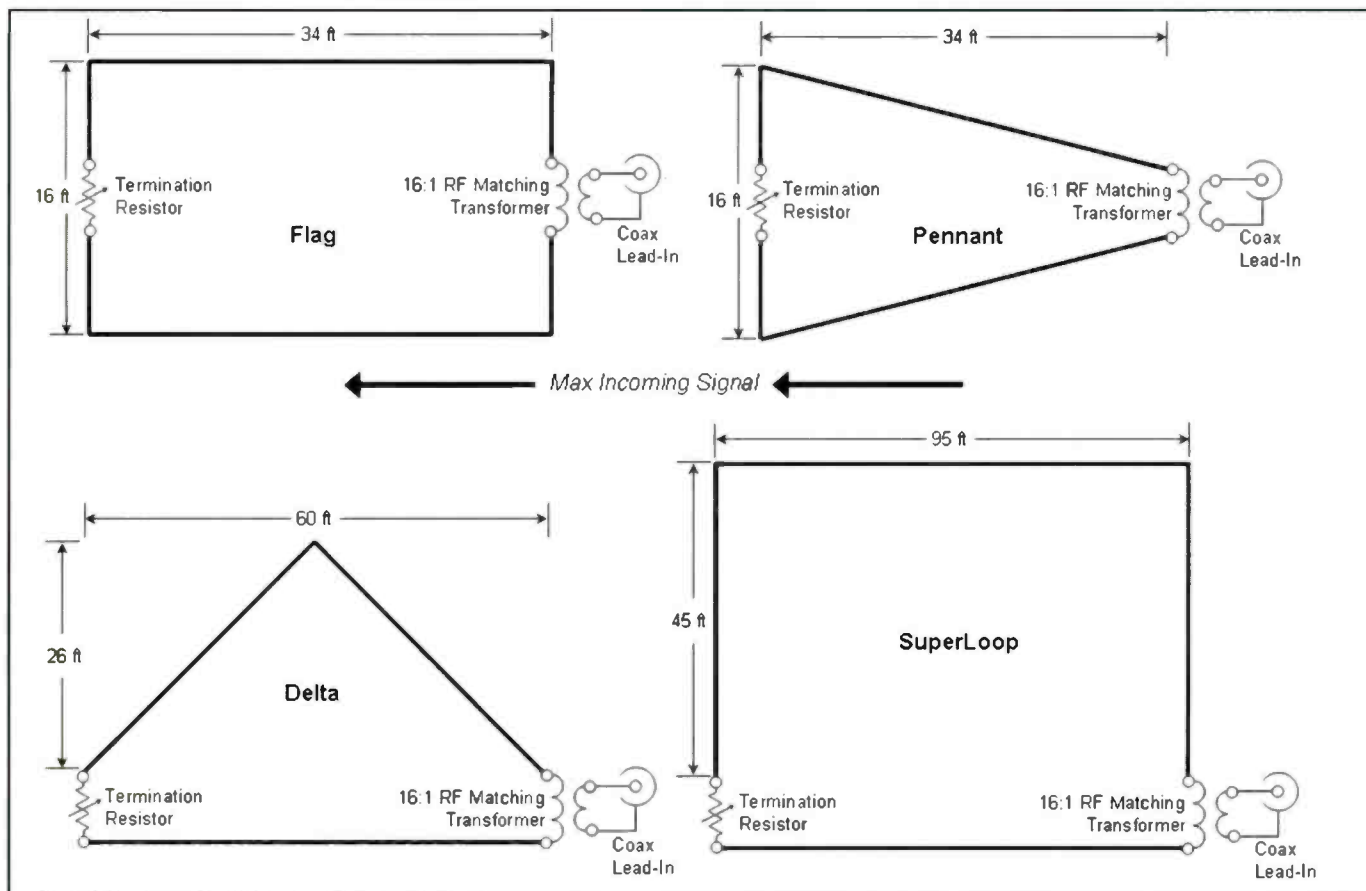


Figure 1.

tional beam corner of the loop — high impedance connected to the loop, low impedance connected to coaxial lead-in to the receiver.

A general rule of thumb for the dimensions of a loop is a 2:1 ratio of width versus height. So for a 16-foot-tall loop, the width should be 34 feet. In reality, the dimensions of these loop antennas are very forgiving. Whatever fits within available aerial supports and real estate will do the job.

There are four basic configurations of terminated broadband loop antennas: The Flag, Pennant, Delta and SuperLoop, **Figure 1**. The names were assigned based upon the shape of the loop of wire.

- **The Flag** is a rectangular loop of wire at some height above ground, like a flag raised on a pole and unfurled by the wind.
- **The Pennant** is a triangle-shaped Flag antenna.
- **The Delta** antenna is a triangular shape like the Greek letter of the same name with the base of the triangle at or near the ground.
- **The SuperLoop** originally got its name as a super-sized rectangular loop with the bottom part of the loop resting on the ground to accommodate a taller antenna.

## Design Alternatives

Since the introduction of the terminated broadband loop antenna, a number of alternative design enhancements have been developed:

Replace the terminating resistor with another RF isola-

tion/matching transformer and lead-in to make a switchable direction antenna. One lead-in connects to the receiver, and the other lead-in connects across a termination resistor. Swap lead-ins to reverse antenna direction.

Replace the fixed termination resistance with a potentiometer. Vary the resistance to deepen the null of a specific source of interference, or to peak the strength of a desired signal.

The unbalanced coaxial lead-in can be replaced with an unshielded balanced two-conductor lead-in such as speaker wire, twisted pair, or lamp cord. The balanced lead-in design requires a 9:1 RF isolation/matching transformer at the antenna, and a 2:1 isolation balun at the receiver to match the balanced lead-in to the unbalanced coax antenna input.

The micro SuperLoop, **Figure 2**, is a more compact 6- by 6-foot design developed by Mark Connelly, WA1ION, that will fit on the roof rack of a car for easy deployment at any location. The micro version requires low-noise RF amplification to make up for the loss of gain due to the small antenna size. This design could be a good alternative for antenna restrictive communities.

Dual or split loop antenna configurations have attained Beverage-like performance. George Wallner, AA7JV, developed the Double Half Delta Loop (DHDL) antenna, the first of what became known conceptually as the split loop variant of the terminated broadband loop antenna.

(SEE: *The Equipment page of the "TX3A Chesterfield Islands DXpedition" for more info about the DHDL, <<http://tx3a.com>>. - WPC1CAT).*

Antenna experimenters like Dallas Lankford and Neil Kazaross have refined the design into highly directional beam antennas. Read more about half-size dual active Delta Flag

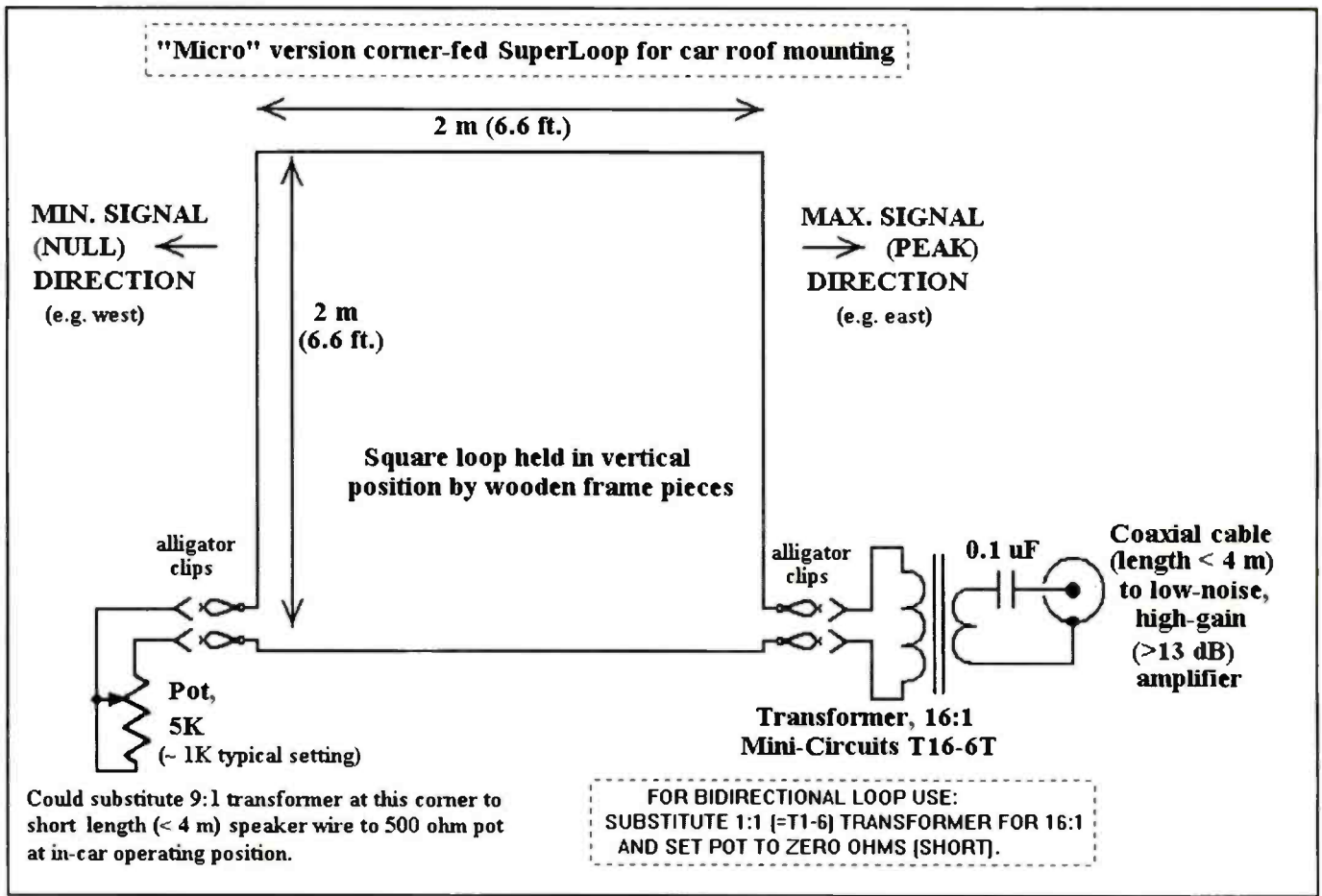


Figure 2.

arrays by Dallas Lankford at: <<http://bit.ly/y6eYUY>>.

Whether it's a simple loop or one of the more complex adaptations, the terminated broadband loop antenna is almost guaranteed to rev up your DX experience.

### 'How I Got Started'

The January edition of *Broadcast Technology* re-introduced readers to AM broadcast DXing and how to get started. Reminiscence about how fellow DXers got started caught the attention of veteran DXer Bob Fraser who shares a similar experience while growing up in towns south of Boston, Massachusetts during the Golden Age of radio.

"We had a big cathedral radio with a long wire, about 150 feet or so, to a tree as an antenna," recalls Fraser. "That radio had four knobs; tuning, on/off, volume and tone.

"It covered from 550 to 1500 kilocycles and Boston had seven stations then: 590, WEEL; 850, WHDH; 950, WORL; 1030, WBZ; 1150, WCOP; 1260, WNAC; and 1410, WAAB.

"WAAB disappeared just before World War II and for years I wondered why. (It was due to) finances I later heard. WMEX came on about this time, (at) 1500 kilocycles, I believe. The radio band was increased to 1600 kilocycles in the summer of 1941.

"Previously, WHDH was on 830 and WBZ on 990 but as the radio had an analog dial, it wasn't noticed. And the wonderful programs they had then — comedies, theater, music — all very entertaining.

"One landmark stands out," Fraser said. "In the summer of

1940, as I was going to bed at my grandmother's in Cohasset, Massachusetts, I noticed a ladder of red lights peeking through the trees in the distance. My grandmother told me that it was the new WBZ towers just built at Nantasket Beach (at Hull, Massachusetts), **Photo A**. Wow, to hear the station and see where it came from. Ever since, while touring the local roads, I'd catch a glimpse of the towers through the trees." (**READ: For more on WBZ, see Shannon's Broadcast Classics in the March 2012 issue of Pop'Comm, p.66. — Ed**)

Much like some of us youngsters remember the migration of Top 40 music from AM to FM radio, Fraser experienced a similar transition from the Golden Age to rock 'n' roll as old-time radio programs moved to television.

"The big stars and entertaining shows all moved to TV and rock came to radio," laments Fraser. "By now, I was an adult, so the new music didn't appeal to me. But I did find WCRB on 1330 with its classical music. When WCRB was forced to give up its AM station in favor of FM, I followed it. I was also pleasantly surprised to find when I moved to Maine several years ago, that the 'W-Bach' classical music network simulcast WCRB with stations in Portland, Rockland and Bar Harbor, Maine."

### AM Déjà Vu, All Over Again

Today many radio enthusiasts are re-discovering AM broadcast DXing, including Bob Fraser.

"With the poor reception of shortwave in recent years, I have returned to my childhood, DXing the AM band," said Fraser.



WSM—America's Tallest Radio Tower, 878 Feet, Nashville, Tenn.



323 Feet Higher Than The Washington Monument

**Photo B.** "One station I always try for is 650 WSM, Nashville and the Grand Ole Opry," writes AM DXer Bob Fraser. "I know the music and performers have changed, but it takes me back to a kid glued to the radio when it was a network program." (Courtesy of WPC1CAT)

"There are no big stations in Maine so the dial is open and I get a station, sometimes two or three, on almost all frequencies.

"There have been times when Boston and New York fade out and more distant stations come booming in. Right now, 840 WHAS Louisville, Kentucky and 1170 WWVA, Wheeling, West Virginia, are loud in my ears.

"One station I always try for is 650 WSM, Nashville and the Grand Ole Opry. I know the music and performers have changed, but it takes me back to a kid glued to the radio when it was a network program."

The Grand Ole Opry on legendary WSM, **Photo B.** is considered the longest-running radio program in history. The facilities of WSM including its 878-foot-tall radio tower were added to the National Register of Historic Places in 2011. Listen to WSM and the Grand Ole Opry on the air at 650 AM, or streaming online at: <<http://bit.ly/Aqbyco>>.

## Made in America

Last December, *Broadcast Tech-*

nology offered suggestions for holiday gifts made in the U.S.A. Well, one reader noted an error by omission.

"Hey, you forgot Ten-Tec, didn't you?" wondered Bill Pietschman, W8LV, of Circleville, Ohio.

Ten-Tec <<http://www.tentec.com>> offers equipment of interest to amateur radio operators and broadcast DXers, and Ten-Tec products are made in America. Of particular interest is the Model 1254 Digital Readout Superhet Receiver Kit. The 1254 is a general coverage communications receiver with a frequency range of 100 kHz to 30 MHz powered by an included 15 VDC external power supply. The best feature is that you build it yourself. (**WATCH:** *A Ten-Tec demonstration of the Model 1254 Receiver*, <<http://bit.ly/yzw43U>>, **Photo C.** — Ed.)

"Building one's own receiver from a kit has launched countless thousands of people into communications careers or the hobbies of amateur radio and short-wave listening," states the Ten-Tec product description. "You will build a true dual-conversion superhet with a micro-processor-controlled frequency synthesizer. Alignment is easy and does not require complicated equipment. You only need a volt-ohm meter and your ear. The kit provides its own 45-MHz test signal."

Ten-Tec recommends an intermediate skill level for potential builders — it is not recommended as a first-time kit building project. *Thanks to W8LV for the feedback.*

## Broadcast DX Loggings

**Norman Hill**, in the Arlington, Virginia-Washington DC area, reports changes on his radio dial. The region's longtime news radio leader WTOP now has some competition with the launch of all-news WNEW on 99.1 FM. "They are the number two preset on my Walkman," writes Norman, "In my opinion, good and quick news, weather and sports, without the talk shows heard on primary news station WTOP 103.5/107.7 FM."

Some DXers may recognize the WNEW callsign formerly from New York City at 1130 kilohertz, now Bloomberg Business Radio flagship WBBR. The vintage WTOP callsign used to reside on 1500 AM, now the home of WFED, Federal News Radio.

WYNY FM, yet another vintage Big Apple callsign, has resurfaced on AM radio in Milford, Pennsylvania, at 1450 kilohertz — broadcasting country music just like the New York original.

Hill notes that 530 *Radio Enciclopedia*

and 590 *Radio Nacional Musical*, both from Cuba, are strong from sunset to sunrise at his location. "Oh, and *Radio Reloj*, Cuba, is walking all over the local sports station WSPZ on 570 at night."

Not everyone has the luxury of being able to erect outdoor loop antennas. Apartment and condominium dwellers are often confined by restrictions on outdoor antennas. Such is the case for **Bob Hill, WIARR**, who writes: "I deal with the many challenges of DXing with only a proximate indoor active loop. No fancy outdoor antennas, no SDR, no looking for online confirmation, plenty of electrical noise."

That's the beauty of AM broadcast DXing. No matter what the situation, it can be done, as demonstrated by the results of Hill's efforts in this month's selected logs.

Thanks to nighttime skywave propagation, all you need is an AM radio. Find a quiet spot to set up a listening post, make yourself comfortable, and let the DX fun begin!

All times are UTC.

**540 XEWA San Luis Potosí, Mexico**, at 0400, fair; chimes. "XEWA 540 AM . . . Cadena W transmitiendo desde las oficinas centrales de MG Radio, palabra que vende." Thanks to Henrik Klemetz at RealDX for help with transcription. (Conti-NH)

**549 Jil FM, Les Trembles, Algeria**, at 2230, fair with Pink Floyd's "Comfortably Numb" from 1980 and female DJ. Parallel to 531 kHz. (DeLorenzo-MA) Note: *Jil FM*, English translation *Generation FM*, is a new radio service for young people being relayed on 531 and 549 AM in Algeria.

**580 KMJ Fresno, California**, at 1430, heard time check and "News/Talk 580, KMJ Fresno," into news break. (Barton-AZ)

**590 KSUB Cedar City, Utah**, at 0230, heard. "We are news talk radio, KSUB." (Barton-AZ)

**590 Radio Musical Nacional, La Julia, Cuba**, at 2348, Irish-sounding flute instrumental, woman in Spanish with Cuba mentions; heard with WEZE Boston nulled. (Connelly-MA)

**621 Radio Nacional de España, Canary Islands and Spain**, at 0654, Spanish news/talk; signal peaking to fair level. (Beu-TX)

**680 WPTF Raleigh, North Carolina**, at 2218, heard with frequent time checks and IDs, "Let's get an update from the WPTF news center," mixing at times but mostly readable against co-channel WRKO Boston. (Hill-MA)

**693 BBC Radio 5, United Kingdom**, at 2329, fair with discussion about Charles Dickens on the 200th anniversary of his birth. (DeLorenzo-MA)

**740 Radio Angulo, Sagua de Tánamo**,



**Photo C.** The Ten-Tec Model 1254 is a general coverage communications receiver with a frequency range of 100 kHz to 30 MHz, powered by an included 15-VDC external power supply. "The best feature is that you build it yourself," writes WPC1CAT. To see a video of the 1254 in action, visit, <<http://bit.ly/yzw43U>>. (Internet screen grab)

**Cuba.** at 0000, old-west saloon style player piano and radio novella, then Radio Angulo jingle and ID; good, over co-channel CFZM and CHCM. (Connelly-MA)

**780 KKOH Reno, Nevada,** at 2210, a powerhouse signal late in the local morning when co-channel KAZM Sedona, Arizona, should be mixing in if not dominant. "News/Talk 780 KKOH" by an announcer with a unique voice that may help DXers ID this one — a very deep bass voice. (Barton-AZ)

**850 WTAR Norfolk, Virginia,** at 2201, heard "You're listening to 24/7 Comedy Radio WTAR," competing with several others in partial null of WEEI Boston which almost always ID's as WEEI-FM 93.7 now. (Hill-MA)

**910 Radio Cadena Agramonte, Camagüey, Cuba,** at 0600, good; talk about library at "la casa de la universidad cultural de la ciudad de Camagüey," slogan, "La radio camagüeyana en el corazón de pueblo," and ID, "Desde la cuna de el mayor transmite Radio Cadena Agramonte, Camagüey, Cuba." (Conti-NH)

**940 WCPC Houston, Mississippi,** at 0600, good; "This is Christian radio, AM 940 WCPC Houston-Tupelo signing off for today. We invite you to join us again tomorrow morning for another full day of Christian preaching and teaching on AM 940 WCPC Houston-Tupelo." and instrumental national anthem. (Conti-NH)

**960 WHYL Carlisle, Pennsylvania,** at 0432, fair/good signal over WELI and Radio Reloj - Cuba; "Bringing back the good times, Nice 960 WHYL" and jingle. 22 watts. (Conti-NH)

**981 Chaîne 2, Algiers, Algeria,** at 2200, pips (5 of one tone and the sixth of a higher pitch), man gave time in French, then woman gave news in Arabic about Morocco, emphasis music between items; good. (Connelly-MA)

**1030 WONQ La Grande-Oviedo, Florida,** at 2307, in good and dominating the frequency for over half an hour with two men talking maybe sports, then at 2318 switched to directional night pattern and like a light shut off they were gone. (Barstow-MA)

**1030 KCTA Corpus Christi, Texas,** at 1129, sign-on with choir singing, promo, "... weekdays at 4 PM on KCTA," more choir singing, then Spanish program. Good, some mixing with co-channel WBZ Boston. (Barstow-MA)

**1030 LS10 Radio Del Plata, Buenos Aires, Argentina,** at 0400, talk in Spanish, *Radio del Plata* ID; fair to good at times with inter-

ference from WBZ and another Spanish station. (Barstow-MA)

**1080 KRLD Dallas, Texas,** at 0000, under WTIC; singing "Newsradio 1080, KRLD," and CBS news. (Conti-NH)

**1089 TalkSport, United Kingdom,** at 0637, news/talk programming with signal strong enough to poke through local interference. (Beu-TX)

**1100 ZYK694 Radio Globo, São Paulo, Brazil,** at 2236, ascending whistle. Globo ID, jingle; briefly over co-channel WTAM Cleveland. (Connelly-MA)

**1130 CKWX Vancouver, British Columbia,** at 1907, news about huge storm hitting the Vancouver area, "News 1130" time checks. (Barton-AZ)

**1140 KNWQ Palm Springs, California,** at 2155, spot for "Desert Radio Group," ID and "K-News" slogan. Very strong and alone on the frequency, but overtaken by KYDZ Nevada at conclusion of news. (Barton-AZ)

**1140 KZMQ Greybull, Wyoming,** at 1448, non-stop country music. "Classic country ... on AM 1140 KZMQ." (Barton-AZ)

**1150 WDEL Wilmington, Delaware,** at 0300, under co-channel WWDJ Boston; "Delaware's station for news, 1150 AM WDEL and 93.7 FM WSTW HD3 Wilmington" and CBS news. (Conti-NH)

**1220 ZYJ458 Radio Globo, Rio de Janeiro, Brazil,** at 2301, Globo ID by man, fanfare music, woman in Portuguese; mixed with WHKW. (Connelly-MA)

**1300 KROP Brawley, California,** at 0330, ID with mentions of Imperial Valley. A very good signal but occasionally tangling with XEP Juárez, Chihuahua, Mexico. (Barton-AZ)

**1340 WEPM Martinsburg, West Virginia,** at 0400, briefly atop the frequency: ESPN Radio promo, "Your home for the West Virginia Mountaineers and the best coverage of high school sports in the eastern panhandle, Sports Radio 1340 WEPM Martinsburg." (Conti-NH)

**1350 KDZA Pueblo, Colorado,** at 1000, improving signal strength with ID. "Pueblo's sports station, Homer 1350," and Fox sports. Heard bedside on DX-375 portable radio. (Barton-AZ)

**1360 WTAQ Green Bay, Wisconsin,** at 0248, more or less atop a muddle introducing guest: "With us here at WTAQ ... here from Scout Leaders of Wisconsin, Joe, you've got a heck of a program." Into an interview with proud but humble Joe, including several more mentions of Wisconsin leaders. Usual pest WDRC not audible but surely in there

## This Month in Broadcast History

**75 Years Ago (1937):** WLS Chicago, broadcast on-the-scene coverage of the Hindenburg airship disaster in New Jersey. Marconi Wireless station WCC Cape Cod, Massachusetts, is believed to have been the last to communicate with the Hindenburg crew before the airship burst into flames.

**50 Years Ago (1962):** "She Thinks I Still Care" by George Jones topped the KWKY Des Moines, Iowa, Big 11-50 Country Records music survey. (**WATCH and LISTEN:** To George Jones sing his 1962 country hit, <<http://bit.ly/yXk6dG>>. — Ed.) WGN Chicago, formerly WDAP, celebrated its 40<sup>th</sup> anniversary with a three-hour special broadcast featuring various personalities and the WGN Orchestra. Download or listen to the WGN program: <<http://bit.ly/AtJSMY>>.



**25 Years Ago (1987):** WMEX veteran broadcaster Larry Glick ended a 20-year run as an overnight talk show host on 1030 WBZ Boston. Glick finished off his career at 850 WHDH Boston before retiring 10 years later.

— Bruce A. Conti, WPC1CAT

somewhere contributing to the hubbub. (Hill-MA)

**1370 WDEA Ellsworth, Maine**, at 0254, briefly out of a jumble with "This is AM 1370 WDEA . . . Red Sox radio network." Ever-reliable co-channel WFEA New Hampshire partially nulled, but no shortage of others joining the party. (Hill-MA)

**1380 WNRR North Augusta, South Carolina**, at 0400, fair; ". . . radio 1380 WNRR AM North Augusta, *Where News Radio Rocks*, streaming live at wnrr1380.com," and Fox news. 70 watts. (Conti-NH)

**1420 WHK Cleveland, Ohio**, at 0100, heard "WHK Cleveland. You're listening to News/Talk 1420 WHK, a service of Salem Communications. Stay tuned for news." Then SRN news. (Hill-MA)

**1480 WDJO Cincinnati, Ohio**, at 2158, out of ABC news with "Oldies WDJO," then weather forecast. "That's your weather from 1480 WDJO." Only bits and pieces making it through, with WSAR commanding the channel as usual. (Hill-MA)

**1540 ZNS1 Nassau, Bahamas**, at 0500, over/under co-channel WDCD and KXEL; instrumental national anthem. (Conti-NH)

**1620 WTAW College Station, Texas**, at 0755, weather ". . . on News/Talk 1620 WTAW." Not a rare catch, but not regular either. KSMH Sacramento is usually heard on this frequency. (Barton-AZ)

**1660 KXOL Brigham City, Utah**, at 0200, with two Spanish language stations mixing, this sports talker emerged with local spots and ID as ESPN Radio and 104.9 FM. (Barton-AZ)

**1680 WPRR Ada, Michigan**, at 0045, popped out of mix with partially nulled WTTM. "Pacifica Radio . . . on KPFK 90.7 FM . . . and in Michigan on . . . WPRR 95.3." (Hill-MA)

**1700 WEUP Huntsville, Alabama**, at 0139, soul vocals and slogan, "WEUP, The People's Station," in a mix with a couple others including a traveler information station. (Hill-MA)

## Much Appreciated . . .

Thanks to Roy Barstow; Rick Barton; Mike Beu, KD5DSQ; Mark Connelly, WA1ION; Marc DeLorenzo; Bob Hill, WIARR; and Norman Hill for the reports.

## Coming in June

*The Modern AM Broadcast Band DXer Defined* continues next month with a look at how software defined radio receivers have revolutionized the hobby.

In the meantime, I'm maintaining my own domestic and international logbooks online. Go to the logbook section of <<http://www.bamlog.com>> if you'd like to keep track of how I'm doing. 73 and Good DX!

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## This Month's Feedback from Pop'Comm Readers

### Remembering the Knight Wireless Broadcaster, SSB/GMRS Station Registration Program and Sensitivity to the Blind

*Pop'Comm appreciates and encourages comment and feedback from our readers. Via email, please write: <editor@popular-communications.com>. Our postal service address is: Editor, Popular Communications, CQ Communications, Inc., 25 Newbridge Rd., Hicksville, NY 11801-2953 USA. – Richard Fisher, KI6SN*

#### Can't Get Enough of Shannon's Broadcast Classics!

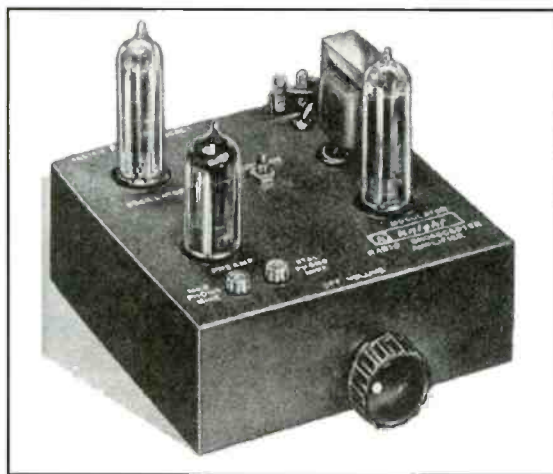
Editor, *Pop'Comm*,

First of all, let me say I have been a dedicated *Popular Communications* reader for years . . . and before that, *Popular Electronics*. I love all the articles. But *Shannon's Broadcast Classics* is my favorite! What a gifted writer, and the wonderful memories that are elicited through that column.

I especially loved the January 2012 column about the Knight Wireless Broadcaster ("*The Media Broker's Littlest Listing*," page 46. – Ed.) I, like many others, built that (kit) as a kid and had my own broadcasting station, **Photo A**.

The kit cost \$12.95, and I know Dad sacrificed to spend that much money! The seeds of my interest in electronics blossomed even further with that kit. Eventually, I had a wonderful career in broadcasting, eventually leading to being part owner and manager of a small AM local station in Spencer, West Virginia — WVRC, <<http://www.wvrcfm.com/>>.

I left there in 1980 and sold my share. I eventu-



**Photo A.** "I can't say that the Knight Wireless Broadcaster was what eventually led me into the things I'm doing today," writes Jim Damron of Charleston, West Virginia, "but it certainly had a direct influence." (Courtesy of Shannon Huniwell, WPC2HUN)

ally started my own production business, which I still have today — writing and producing commercials, appearing as on-camera and voice talent in industrials and commercials, and acting. <<http://bit.ly/wLd97k>>.

I also do video depositions for attorneys. All this had its beginnings as a kid with an interest in electronics.

If you ever listen to *Amateur Radio Newline*, I am one of the regular anchors on the program. I also had the joy of doing a scene with Tom Hanks in the movie "Forrest Gump." (Mr. Damron played CBS Correspondent Charles Cooper opposite Mr. Hanks. – Ed.)

I can't say that the Knight Wireless Broadcaster was what eventually led me into the things I'm doing today, but it certainly had a direct influence. I thank Shannon for the nostalgic trip in the January column! Keep up the wonderful work.

– Jim Damron, N8TMW  
Charleston, West Virginia

(Jim: Shannon Huniwell is a singular talent and *Pop'Comm* is so fortunate to have *Broadcast Classics* carried in its pages each month. You are among a legion of fans, but we never get tired of hearing it. Thanks for telling us and for sharing your story about the Knight Wireless Broadcaster. By the way, I'll never watch "Forrest Gump" again without the anticipation of seeing "Charles Cooper" on the beat! Congratulations. – Richard Fisher, KPC6PC)

#### Remembering SSB Station and GMRS Communities of the Past

Editor, *Pop'Comm*,

First, congratulations on launching the *Pop'Comm Monitoring Station* program. The Certificates of Registration are a palpable link to the past, even as they bring us right into the future of radio monitoring. This is especially important since all such previous programs (to my knowledge) have become extinct.

It was readers who had alerted me to the demise of the SSB Station Registration program (11-

meters), circa 2004. I would learn later (the late) Tom Kneitel had closed CRB Research in preparation for his move to Florida.

While not the same as a monitoring station registration program, the SSB Station Registration Certificates were one way of offering documented recognition to readers. And in a not-too-distant concept, this all reminds me a bit of my GMRS Station Certification and Recognition offer in connection with my *On-The-Go Radio* column in *Pop'Comm* starting in 2003.

Our GMRS-licensed readers obviously valued the special copyrighted certificate and laminated wallet card included in the deal.

So, simply based on that obviously limited (by radio service) audience response, I predict a truly thunderous stampede to the new *Pop'Comm Monitoring Station* certificate of registration! Best of luck with the program.

— Alan Dixon, N3HOE  
Melbourne, Florida

*(Alan: Thanks for your wishes of good luck regarding the PCMS program. It's off to a great start. We're always interested in learning more about communications communities of the past, so your insight into the SSB Station Registration and GMRS Station Certification programs is greatly appreciated. — Richard Fisher, KPC6PC)*

## Keep Blind and Visually-Impaired Operators in Mind

Editor, *Pop'Comm*,

As you may be aware, *Popular Communications* has a number of Braille readers, of which I am one. My complaint is that

many radio manufacturers come out with new products that are inaccessible to the blind. It would be nice if they would do away with touch-screens and the like and put keys on the units — as in days of old.

I am hoping that the 21st Century Communications and Video Accessibility Act of 2010, which was passed by Congress and signed into law by President Obama, will address this situation. (*IN DEPTH: Read the President's October 8 remarks at the signing of the Accessibility Act of 2010, <http://1.usa.gov/y9Qub2>. — Ed.*)

Manuals should be in an accessible format. In reading *Popular Communications*, I feel there is an unconscious assumption that everyone uses computers. This may appear to be the situation with younger and some middle-aged people, but it is not always the case.

Remember, we who are blind and visually impaired have bucks to spend, also. Manufacturers are missing an untouched portion of the radio buying public. I daresay that blind/visually impaired people spend more time with radio in all forms than our sighted counterparts.

— Tom Lykins, K4LID  
Louisa, Kentucky

*(Tom: Operators with physical disabilities contribute enormously to the communications community — as amateur radio operators, station monitors and as valued members of any number of other niches. Thank you for taking the time to underscore the importance of keeping this community in mind in everything from equipment design and accessibility to how magazines such as Popular Communications are effectively delivered to readers of every stripe. — Richard Fisher, KPC6PC)*

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Folded Terminated Dipole

# Sadly, the Sounds of Silence From Radio Bulgaria

by Gerry L. Dexter,  
WPC9GLD  
<gdex@wi.rr.com>

*“There is a website called Save Radio Bulgaria, at which you can sign an appeal for a stay of execution. But, it looks as if there’s no hope . . .”*

As of February 1, **Radio Bulgaria** became the latest shortwave broadcaster to taste dirt, bringing a halt to all of its shortwave broadcasts, leaving the map of Europe with yet another empty, Wite-Out® area.

The reason is an all too familiar one: Lack of money creating an anemic budget that forces an end to everything. But relax, *no worries mate!* You can still listen to Radio Bulgaria via its website!

Admittedly, Radio Bulgaria’s Internet home certainly offers a whale of a lot of information, <<http://bit.ly/yWt8uX>>. But, somehow I, for one, just don’t “get it.”

Websites do not offer the convenience, the warmth or the intimacy of radio. The world has become more and more crass and unfeeling. I guess that shouldn’t be surprising these days. Call my opinion *ancient*, if you like, but I will never turn my computer into a shortwave radio!

Radio Bulgaria (Radio Sofia under the Communist regime.) dates back nearly 76 years — to May of 1936. It broadcast 11 language services, and a DX program that offered an email summary that produced over 700 editions featuring schedule changes for stations around the world.

At this stage of the game I’ve no idea if it’s still active, but as this is written there is a website called **Save Radio Bulgaria**, <<http://bit.ly/zXmsnN>>, at which you can sign an appeal for a stay of execution. But, it looks as if there’s no hope. Indeed, it’s a sad, sad business. The transmitter sites at Kostinbrod (and one other) are due

for demolition. I’ve not had any word on the main, high-powered site at Plovdiv.

One special sidelight to this mess: In one of its last programs the station confessed to its part in clandestine broadcasting during the Communist era. Its transmitters were used to carry the programming of **Radio Espana Independiente**, **Radio Courier** of Iran and **Radio Magallanes** (for Chile) in addition to Bulgarian transmitter time used for relays of **Radio Moscow** during the 1960s to 1980s. At least we now have confirmation that Bulgaria was long suspected as being a host for those three clandestines.

## More Bad News

Here’s another severe negative in our future: G.I.G. reporter **Bob Fraser** (Maine) has received a picture postcard from **Radio Nederland** with this hand-written message: “RNW will undergo major changes in 2012/2013 and shrink to quite a tiny organization.”

That’s the message. The late Eddy Startz must be weeping!

In Germany, **Deutsche Welle**, in what could be considered some kind of sign or acknowledgement of its diminishing state, has announced a name “adjustment.” The broadcaster now prefers to be called simply “DW.” That’ll make spelling easier, at least.

## Around the Dial

Some other stations worth noting: **Sarawak FM**, carried by **RT Malaysia** from the Kajang transmitter site is now being noted on 11630, // 9835. **Myanmar Radio** (Burma) is currently using 7110 being noted in the 1200 hour. This is not // to 5985. There’s late word that this may actually be a different station called Thazin Broadcasting Station or, more likely, a different service of Myanmar Radio. Stay tuned.

*(NOTE: The symbol // indicates the same program is being transmitted on an additional frequency or frequencies. – WPC9GLD)*

If you are lucky enough to log the rare **Canadian CFVP**, Calgary, relaying Classic Country on **CKMX-1060**, the Ontario DX Association has been appointed QSL manager — so reports for these two (in addition to **CFRX-6070**) may be sent to Harold Sellers, 3211 Centennial Drive, #23, Vernon, BC V1B 2TB, Canada, or reports can be emailed to:



Back during the communist era it was Radio Sofia, since then it’s been Radio Bulgaria. Now, sadly, it’s gone from shortwave. (But it does have a website!)



So long and goodbye to Radio Bulgaria, which discontinued its shortwave service as of February 1.

<QSLcalgary@gmail.com> and in the future, <http://www.odxa.on.ca>.

## Now, It's Your Turn

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 country and include your last name and state abbreviation after each.

Also needed are spare QSLs or good copies you don't need returned, station schedules, brochures, pennants, station photos and anything else you think would be of interest.

And how about sending a photo of you at your listening post? It's way past your turn to grace these pages!

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

**AFGHANISTAN**—National Radio of Afghanistan, 7200 at 1532. Just missed the sign on but clearly with news in EE and mentions of Afghanistan, 1542 techno-style Western music, more talk at 1549 but the ARO QRM was too strong by then. Best in LSB. (Sellers, BC)

**ALASKA**—KNLS, Anchor Point, 9655 at 1502 readable under Romania with M/W doing pgm line up, song, another ID. (Sellers, BC) 1520 with pops, but faded out quickly. (Barton, AZ) 11870 at 1200 with religious pgm in RR. (Linonis, PA)

**ARGENTINA**—Radiodifusion Argentina al Exterior, 11710 at 0202 with M anc, ID and opening EE pgm welcoming listeners. Vocal numbers mixed with various features includ-

ing sports. (D'Angelo, PA) 15345 in SS at 2329 with 2 M and vocals. (MacKenzie, CA)

**ASCENSION ISLAND**—BBC South Atlantic Relay, 6005 at 0415 on Egyptian unrest. (Maxant, WV) 0506 ending world news and into report on the Iowa caucus. (Sellers, BC) 9915 at 2116 on seasonal Indian foods, 15400 at 1801 with world news and 17525 at 1228 in FF. (Brossell, WI) 11800 at 0711 with FF talks. (Parker, PA) 12095 at 2255 on the Oman empire and 17885 at 1934 in Hausa. (MacKenzie, CA)

**AUSTRALIA**—Radio Australia, 9580 at 1200 with W anc with news and into a phone-in pgm and 9855 via UAE at 2204 ending news with ID. (Coady, ON) 9710 at 1630 with interview and vocals. (Barton, AZ) EE news at 1637. (Strawman, IA) 9965 via Palau at 1411 with CC/EE language lesson. Poor and //11660-Shepparton. (Sellers, BC) 15240 via Taiwan at 2302 on Iraq and U.S. Congress. (MacKenzie, CA)

ABC Northern Territories Service: 2310, VL8A, Alice Springs, at 0930 with some sort of current events listing. (Barton, AZ) 2485, VL8K, Katherine, at 1420 with M/W and news, weather and ABC News promo anmt. (Sellers, BC)

**AUSTRIA**—Radio Austria International, 6155-Moosbrunn at 0559 sign on with "Blue Danube" waltz, IDs by M/W and M in GG

with schedule, then into news. (Sellers, BC)  
**BELARUS**—Radio Station Belarus, 7255 at 2135 with talk and into music. Also 7390 at 0410. (Maxant, WV) 7390 at 0430 in RR or Belorussian. (Linonis, PA)

**BHUTAN**—Bhutan Broadcasting Service, (t) 6035 with snippets of audio at 1145, but it's a difficult catch. (Rippel, VA)

**BOLIVIA**—Radio Pio XII, Oruro at 0000 with M/W in SS, Andean flutes, modern style huaynos, possible SS news. In the clear and with a good signal. (Sellers, BC) Everyone's favorite Bolivian heard at 1010 with news pgm. Never an easy log but lately more likely to be heard in local early evenings than in the early AM. (Perry, IL)

Radio Santa Cruz, Santa Cruz, 6134.8 at \*0851 sign on with Bolivian music, SS talk at 0856, flute IS at 0857, opening SS anmts at 0858. (Sellers, BC)

**BONAIRE**—Radio Nederland Relay, 6165 in SS at 0035, M/W commenting. (MacKenzie, CA) 15540 at \*2200 with IS, ID, then news in DD. (Linonis, PA)

**BOTSWANA**—Voice of America Relay, 4930 at 0332 with news features. (Strawman, IA) 15580 with report on Equatorial Guinea, other African news and recap at 1830. (Sellers, BC) 1916. (MacKenzie, CA)

**BRAZIL**—(All in PP - gld)

Radio Verdes Florestas, Cruz do Sul, 4865 most mornings from approximate 1000 sign on to nearly 1100, sometimes the best LA on 60m. Segued ballads with no talk until 1055 when goes into an ID sequence. (Perry, IL)

Radio Roraima, Boa Vista, 4877 at 0351-0400\* with Brazilian pops hosted by M, close-down ID at 0358, f/by choral anthem. (D'Angelo, PA)

Radio Brazil Central, Goiania, 4985 at 0107 with M anc and PP music pgm, 11915 with ballads and M anc at 0710. (Parker, PA)

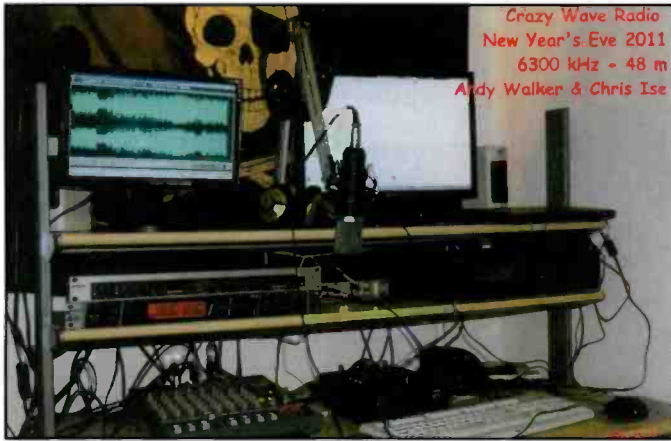
Radio Gazeta, Sao Paulo, (suspected), 5955 at 1020 with U.S. pops and a long phone interview. Another fairly strong station came on at 1029. (Perry, IL)

Radio Senado, Brasilia, 5990, noted several mornings with a big signal at 0755 with PP pops and an ID extravaganza at 0801, f/by ranchero-like selections. (Perry, IL) 0820 with Brazilian pops. "Happy Birthday" song. (Sellers, BC) (t) at 0820 with nice mix of traditional and modern selections. (Wood, TV) Super Radio Deus e Amor, 6120 heard at

## Help Wanted

We believe the Global Information Guide — month after month — offers more logs than any other monthly SW publication! (Nearly 600 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 Gerry Dexter, Global Information Guide, 213 Forest St., Lake Geneva, WI 53147 or email them to <gdex@wi.rr.com>. See the column text for formatting suggestions.

*\*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.*



The pirate Crazy Wave Radio confirmed Rich D'Angelo's reception on New Year's Eve.

0850 with emotional PP preacher. Covered by Radio Nederland after 0900. Fair to good on //6060. (Alexander, PA) 11765 at 0127 with M talking to several women with impassioned talk with responses and choral music in background. (Coady, ON) 0720 with two M preaching to a large audience. (Parker, PA)

Voz Missionaria, Camboriu, 9665 at 0610 with PP inspirational music and anmts. (Alexander, PA)

Radio Nacional Amazonas, Brasilia, 11780 at 0714 with Brazilian hילה music, M ancr with ID. (Parker, PA) 2320 in PP. (Brossell, WI)

Radio Bandeirantes, Sao Paulo, 11925 at 0655 with talks. (Parker, PA)

**BULGARIA**—(Remembering) Radio Bulgaria: 5900-Plovdiv at 0016 with EE features, talk of financial problems and plans to "broadcast" only on the web from February first. (D'Angelo, PA) 0039 announcing an end to shortwave broadcasts. (Goodman, IA) 0325 with domestic easy listening music, 7300-Plovdiv at 0137 in BB. (Parker, PA) 7400 in EE on a railroad strike at 1835. (Fraser, ME) 2050 in GG. (Brossell, WI)

**CANADA**—Radio Canada International, 6160 via South Korea in FF at 2325 with comments by two W, 9870 via South Korea in Mandarin at 2250 with M/W commenting, then some vocals, 11990 in SS at 0040 and 17790 at 1830 with comments on newer jobs there. (MacKenzie, CA) 15180 via Rampisham in AA at 1924. (Brossell, WI) 17790 at 1845 with Ian Jones to 1900 when they went into FF. (Barton, AZ) 1823 on integrating kindergarten children and senior citizens. (Parker, PA)

CBC Northern Quebec Service, 9625 at 0527 with interview on radio frequency identification method. (Parker, PA) 1435 on marriage on the Eastern Catholic Church. (Maxant, WV) 2130 on popular Canadian authors. (Linonis, PA)

CFRX, Toronto, 6070 at 0541 with commls. IDs for "Newstalk 10-10." (Sellers, BC) 0836 with *Comedy Radio* pgm. (Wood, TN) 2340 with discussion. (Fraser, ME)

CKZU, Vancouver, 6160 heard at 0512 on "what is a genius." (Sellers, BC)

CKZN, St. John's (Newfoundland), 6160 with '50s pop hits. (Strawman, IA)

CFVP, Calgary, 6030 at 1608 with Dolly Parton. Difficult through QRM but could check against //MW-1060. (Sellers, BC)

Bible Voice Broadcasting, 6225 via Kazakhstan at 1421 with M preacher. This was Friday at my location, but Saturday in the target zone — and EE is only scheduled for Sat/Sun. (Sellers, BC) 13670 (via Wertachtal, gld) with xylophone music at 1540. (Maxant, WV)

**CHAD**—Radio Nationale Tchadienne at 2225 with local Afro-pops and FF pop ballads. Still running past their normal 2200\*. Also 0427 audible after Radio Nederland signs off. Local Afro-pops, FF anmts. (Alexander, PA) 2105 in FF with M/W with small talk, and M at 2110 with long talks and mentions of N'Djamena and occ. classical

music bits between items. (Coady, ON) 0527 with FF African music with M and speech mentioning Niger and Mali. (Sellers, BC)

**CHILE**—CVC-La Voz, Santiago, 17680 at 1757 with SS pops. (Parker, PA) 1800 in SS with Christian pops. (Linonis, PA) 1815 with an African-sounding music pgm and some seeming OTHR blasts underneath. (Barton, AZ) 2300 in SS with W comments and SS pops. (MacKenzie, CA)

**CHINA**—China Radio International, 5990 in EE at 2306, 6020 via Albania in EE at 0022, 7220 in VV at 0234, 11640 in CC at 0133, 11885 in CC/EE at 0038, 11945 in CC at 1915, and 13580 in CC at 0016. (MacKenzie, CA) 6020 via Albania at 0005. (Fraser, ME) 0112 with Chinese New Year celebrations. (Goodman, IA) 9440-Kunming in CC at 1141, 9745-Urumqi in (I) Esperanto at 2018, 13700-Urumqi in CC at 1815, 13590-Beijing at 1151, 13610-Kashi in CC at 1227, 15600-Kunming in (I) Malay at 1325 and, 17575-Shijiazhuang in RR at 1232. (Brossell, WI) 9570 via Cuba at 0115. (Maxant, WV) 11785 via Albania at 0843 with *Life in China*. (Sellers, BC)

CPBS/China National Radio: PBS Xinjiang, Urumqi, 3990 in (p) Uighur at 0124. There one night, not the next. Also 5060 in CC at 0421 confirmed by parallels 5960 and 7310. (Sellers, BC) 7275 in Uighur at 0314. (Parker, PA) 7280 at 1154 with talks in Mandarin, 5+1 time pips at 1200, closed with anmts at 1258, one time pip at 1300 as carrier was terminated. Apparently was jamming Sound of Hope. Voice of the Strait, Fuzhou, 4940 at 1149 with M/W and Mandarin news. (D'Angelo, PA) Beibu Bay Radio, 5050 in CC at 1432, M/W ancrs. (Sellers, BC) 9455 in CC at 1915, 9870 in CC at 2253, and 13610 in CC at 0015. (MacKenzie, CA) Voice of Han, 9745 in CC at 1907. (MacKenzie, CA)

Firedrake music jammer, 9905 at 1840, possibly against RFA via Marianas. (Barton, AZ)

**COLOMBIA**—Radio Alcaravan, Puerto Lleras, 5910 with LA pops spoiled by digital noise bursts. Good signal: only fair modulation. (Strawman, IA) 0328 in SS with upbeat pops. (Parker, PA) 0430 with soft ballads, SS. (Linonis, PA) 0632 with songs, full ID. (Sellers, BC)

**CUBA**—Radio Havana Cuba, 5990 in EE heard at 2316, 6000 in SS at 0020, 6060 in SS at 0028, 11840 in SS at 0118, 13640 in SS at 1944, 15230 in SS at 2330, and 15370 in SS at 2325. (MacKenzie, CA) 6120 with poor audio at 0410. (Barton, AZ) 17655 in PP at 1753. (Parker, PA)

**DJIBOUTI**—Radio Djibouti, 4780 at \*0300 with short 25-second instl NA, f/by opening AA anmts, local rustic music and chants at 0302. AA talk, local tribal music and indigenous vocals. Also noted

### This Month's Winner

To show our appreciation for your loggings and support of this column, each month we select one "GIG" contributor to receive a free book or other prize. Readers are also invited to send in loggings, photos, copies of QSL cards and monitoring room photos to me at *Popular Communications*, "Global Information Guide," 25 Newbridge Rd., Hicksville, NY 11801, or by email to <gdex@wi.rr.com>. The email's subject line should indicate that it's for the "GIG" column. So, come on, send your contribution in today!

This month's prize winner is **Jerry Strawman**, Des Moines, Iowa, recently returned to DXing and who now thumbs a 2012 edition of the *World Radio TV Handbook* — the one source you need for shortwave broadcast information; from frequencies to transmitter locations, times to email addresses and everything in between. Bottom line: you can't listen to shortwave broadcasters successfully without a copy. Any bookstore either has a copy on its shelves or can order one, or radio dealers (or any online book source) can supply it to you. Don't wait another minute to order your copy!



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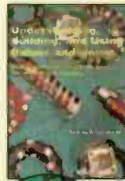
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## Northern Relay Service

northernrelayservice@gmail.com

This is to confirm reception of NRS by Richard D'Angelo Dec 13th, 2011, 0240 utc 6930 kHz AM Radio Blue Titmus relayed Thanks for the great report

Another D'Angelo pirate log was this one from the Northern Relay Service. The photo looks more like it's from a larger and far more legitimate broadcaster.

2140 with a similar format. (Alexander, PA) (Sign on/off times for this one are variable - gld.) 0342 with continuous tribal vocals and drums. (D'Angelo, PA) 0350 with Afar service and HOA music. (Strawman, IA)

**ECUADOR**—HCJB, 6050-Pinchincha, in SS at 0036 with M/W comments. (MacKenzie, CA)

Radio Quito, Quito, 4919 in SS with SS ballads and pops, some Ecuadorian music. (Parker, PA) 0146 to past 0600 with SS talks, IDs. Good signal but somewhat distorted. (Alexander, PA) 0432 with nice pgm of SS pops and several familiar IDs "Radio Quito, La voz de la Capital." Good signal but somewhat watery audio. (D'Angelo, PA)

**EGYPT**—Radio Cairo, 15065 with talks in (I) Pashto at 1440. (Brossell, WI)

**ENGLAND**—BBC, 5790-Wooferton in AA at 0308, 5875 Cyprus Relay in AA at 0318, 5985-Wooferton in Farsi at 0336, 6140 with news about Africa at 0354, 15575-Wooferton at 1340, and 17640 via Meyerton at 1742 on instability in Libya. (Parker, PA) 9410 via South Africa at 1835 on gas prices around the world. (Maxant, WV) 1509 Oman Relay with *World Briefing*, 9490 via South Africa at 1635 with a church service, 9505 Cyprus with *Sports World* at 1550, and 12095 Cyprus at 1816 with *Have Your Say* pgm. (Sellers, BC) 0027. Also 17695 South Africa at 1835. (MacKenzie, CA) 17640 South Africa at 1732 with *BBC Africa News*. (Coady, ON)

CVC-The Voice, 6260 via Uzbekistan in Hindi heard at 1444. (Sellers, BC)

**ERITREA**—Voice of the Broad Masses, 7120 at 0325 with HOA and AA pops, vernacular talk, //7175. (Alexander, PA)

**ETHIOPIA**—Radio Ethiopia, 9705 at 1947. Initially heard under Family Radio via Meyerton, which clears out at TOH. Stronger by 2010 with HOA music and jazz. M ancr in (p) Amharic. (Perry, IL) 2022 with HOA music and vocals. Improved to good level by 2101 close. (Strawman, IA) 2030 in (p) Amharic with news and possible interview pgm. (Linonis, PA)

Radio Fana, 6110 at \*0258 sign on with IS, opening anmts at 0300, Amharic talk and HOA music. (Alexander, PA)

**FRANCE**—Radio France International, 9790-Issoudun, 0500 with FF talks, 9805-Issoudun at 0455 on Senegal, 13695-Issoudun in FF at 1810. (Parker, PA) 11705 in FF at 1808 //11995, 13695 and 21690. (Sellers, BC) 17620 in FF at 1233. (Brossell, WI) 15300 in FF at 1820. (Linonis, PA)

**FRENCH GUIANIA**—Radio France International, 13640 with pgm *RFI Music* at 1149. (Brossell, WI) 21690 in FF at 1810. (Linonis, PA) 1820 in FF. (MacKenzie, CA)

**GERMANY**—Deutsche Welle, 7300 Kigali Relay heard at 1528

## Here's Your "Blast From the Past" For This Month:

Here's your "blast from the past" for this month: Raddio-Television Francaise, St. Denis, Reunion Island, 4820 in FF at 2140 on January 15, 1966 running 4 kilowatts.

in (I) Swahili. (Strawman, IA) 9855 Kigali Relay at 0433 on flying robots and 17800 Madagascar Relay in Hausa at 1830. (Parker, PA) 11865 at 2125 with weather around Europe. (Maxant, WV) 15620 Rwanda Relay in (I) Hausa at 1809. (Brossell, WI) 1840 in FF. (MacKenzie, CA)

**GREECE**—Voice of Greece, 9420 in Greek at 0154 and 12105 in Greek at 0025. (MacKenzie, CA)

**GUATEMALA**—Radio Verdad, Chiquimula, 4055 at 0133 with M in SS. (Parker, PA) 0143 in SS with Xylophone and into a hymn on flute. (Sellers, BC) 0254 with religious vocals. Formal ID at 0305. (D'Angelo, PA) 0458 with flute, ID at TOH. (Wood, TN)

**GUAM**—KTWR, 9975 in (I) Mandarin at 1146. (Brossell, WI) 11580 in KK with several "TWR" IDs. (Coady, ON)

Adventist World Radio/KSDA, 11935 with hymns and EE preacher at 1631. Very poor with strong splatter from 11930. (Sellers, BC)

**GUYANA**—Voice of Guyana, 3290 at 0628 with BBC pgm. Very poor. (Sellers, BC)

**INDIA**—All India Radio, 4920-Chennai at 0113 with W and Hindi vocal, W ancr in Hindi over flute and more Hindi vocals. (D'Angelo, PA) 5010 Thiruvananthapuram at 0035 in EE with news. Into Hindi at 0040 with mix of talk and music. (Sellers, BC) 0117 with M talk in Hindi, later a W. (D'Angelo, PA) 7270-Chennai at 0115 in Sinhala with Bollywood type music to sign off. (Parker, PA) 6155-Bangaluru to Pakistan at 0015 with W ancr in Urdu, 7550-Bangaluru, in 2110 with W EE ancr, 11620 at 1650-1700 in RR with W playing dance music, 11670-Bangaluru at 1743 with lead-in music, open at 1745 with a rundown of the day's programming, then into music. (Lawrence, VT) 2121 in General Overseas Service in EE. (D'Angelo, PA) Fair at 0125. (Strawman, IA) 9425-Bangaluru in Hindi at 1620 with indigenous stringed instls, //9470-Aligarh was fair, but not shown to be on at this hour. (Sellers, BC) 1918 with comments and Indian vocals. (MacKenzie, CA) 9445 at 1940 ID'ing as the "General Overseas Service of All India Radio." (Maxant, WV) 9870 Bangaluru in Hindi with Vividh Bharati service at 1302, 11715-Panaji (Goa) at 2213 with W ending news and into sports by M. (Coady, ON) 11620 Bangaluru, \*1300-1500\* with sign on by M, ID and schedule. Into regional music. (Rippel, VA) 2140 with vocals, talking about India's exports. (Maxant, WV) 11670 at 1802 with news in EE. (Sellers, BC)

**INDONESIA**—Voice of Indonesia, 9525v at \*1330-1400 in EE with AA-type music, maybe Koran at 1400. (Linonis, PA) 1911 with EE chatter, holiday and pop music. (Strawman, IA) 2151-2159\* with a nice selection of Indonesian vocals hosted by W ancr, FF talks, EE ID at 2058. (D'Angelo, PA)

**IRAN**—Islamic Republic of Iran Broadcasting, 7200 in EE news at 0348 and many mentions of U.S. (Strawman, IA) 7320-Kalamabad at 1431 with choral anthem, W with sign on anmts in (I) Bangla, call to prayer, M with news at 1435. (Sellers, BC) 9760 at 2030 with brief Koran recitations, then into listed Albanian. Also, 15150 in AA at 1520. (Brossell, WI) 9740-Klamabad in AA at 0510 and 15735-Zahedan in AA at 1330. (Parker, PA)

**ISRAEL**—Kol Israel, 9885 at 1550 in Farsi with W interviewing M, //13850 with adjacent channel splatter. (Sellers, BC)

Galei Zahal, 15850 in HH at 1255 with pops and talks. (Parker, PA)

**JAPAN**—NHK World Radio Japan, 5955 at 1409 with news and ID, 9770 via France at 0513 with M/W and EE news, 0515 into *Radio Japan Focus*. (Sellers, BC) 5960 via Canada in JJ at 0334 and 9770 via France with talk on aircraft noise pollution in Okinawa. (Parker, PA) 6120 via Canada on Japan's waste washing up on U.S. West Coast. (Maxant, WV) 6185 at 0950 with music which sounds the same as then



Spectacular scenery graces many a QSL card — this one shows a mountaintop view at a national park in Taiwan.

being aired on Radio Nikkei. (Barton, AZ) 11695 via Uzbekistan at 1404 with M/W doing news, ID, more news and into a language lesson. (Coady, ON) 11665 in JJ at 2314 and 13650 in JJ at 2340, into Bengali at 2345. (MacKenzie, CA) 11685 in (I) Bengali at 1305. (Brossell, WI)

Radio Nikkei, 3925 in JJ at 1300, later with jazz. Good and //6055. (Barton, AZ) 1424 with extended JJ talk by M/W. (Strawman, IA)

**KUWAIT**—Radio Kuwait, 11630 at 1427 with Koran. (Strawman, IA) 15540 with Koran at 1925. (Brossell, WI)

**LAOS**—Lao National Radio, 6130 at 1159 with IS and into “Big Bells” at 1200, ID by M, then talks in Laotian. (Rippel, VA) 1157 with exotic Asian vocals and flutes, familiar seven gongs at 1200, f/by flute music. Man with (p) ID and news. (D’Angelo, PA) Propagation window opens for this one as early as 1230 with very enjoyable Laotian pop. (Perry, IL)

**LIBYA**—Radio Libye, 11600 with carrier and sign on in FF at 1602, fanfare music and M again with music bridges, perhaps news. (Sellers, BC) 1640 in FF with W talk and F vocals at 1650 and ID at 1652. (Coady, ON) \*1714 abrupt sign on in FF with talk, some FF ballads. A late sign on this day. (Alexander, PA) 1736-1807\* with M in FF, pop vocal, W with ID “Radio Television Libye” and talk alternating with instls. (D’Angelo, PA) 1804 with FF anmts by W. (Strawman, IA)

**MADAGASCAR**—Radio Madagasikara, 5010 at \*0222 sign on with local choral music f/by choral NA, opening anmts, talk in Malagasy and local African music. (Alexander, PA)

**MALAYSIA**—Traxx FM, 7295 in EE at 1538 with MDJ and pops, talking with someone on the phone. (Sellers, BC)

**MALI**—RTV Malienne, 5995 with carrier on at 0554, stringed inst music at sign on. Recheck at 0611 had local vocals, 0653 better with drums. W in FF. (Sellers, BC) 9635 at \*0800 with vernacular talk, local marimba music. (Alexander, PA)

**MARUITANIA**—Radio Mauritanie, 7245 at \*0647 abrupt sign on with AA talk, short breaks of AA music and indigenous vocals. A late sign on on this date. Also 2315 in AA with M talk over stringed instl music. Apparent interview at 2321. (Alexander, PA)

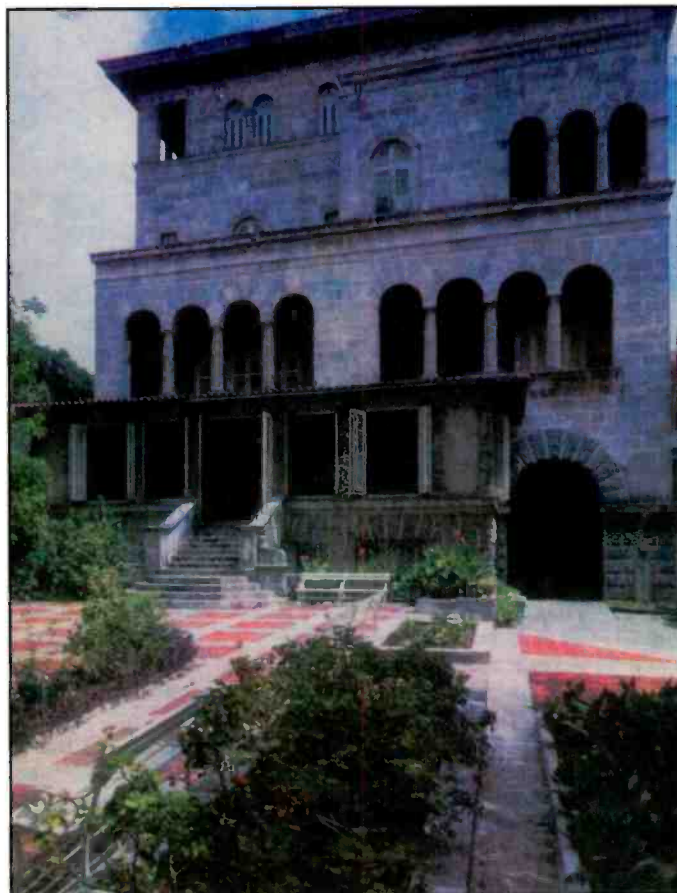
**MEXICO**—Radio Educacion, Mexico City at 0805 in SS with numerous IDs, pgm of classical music. (Sellers, BC) 0857 with heavy metal. ID with freq anmts at TOH. (Wood, TN)

Radio Mil, Mexico City, 6010 in SS at 0816 with romantic and pop tunes. IDs. (Sellers, BC) 0850 with SS pops and IDs. (Alexander, PA)

**MICRONESIA**—The Cross, Pohnpei State, 4755 at 1200 with EE religious pgms under CODAR QRM. (Linonis, PA)

**MOLDOVA**—Radio PMR, 7290 at 1834 with news items and music bridges, ending news and ID “This is Radio Pridnestrovie on the air” and into music. (Sellers, BC) 2030 with a fanfare and M with “This is the next edition of the informational analytic program Pridnestrovya,” then news to 2044 pgm sign off. (Coady, ON)

**MONGOLIA**—Voice of Mongolia, 12085 at 0956 with local music and talk. IS at 0959 f/by talk in unid language. (Alexander, PA)



It’s probably a safe guess that this Radio Havana QSL does not show Fidel’s residence.

**MOROCCO**—RTV Marocaine, 15349 heard at 1822 in AA with W hosting a M and another W in a discussion. Rather low modulation. (Sellers, BC)

**NETHERLANDS**—Radio Nederland, 11655 Madagascar Relay at 1810 with *The State We’re In*. (Sellers, BC) 15495 Madagascar at 1934 with a report on hospital care there. (Brossell, WI)

**NEW ZEALAND**—Radio New Zealand International, 9655 with hymns at 1127. (Brossell, WI) 9765 at \*0759 sign on with bird chirping IS, time pips and news. *Sounds of the Pacific* music pgm at 0813. (Alexander, PA) 0800 open with birdcall IS. Also, 11725 at 0755 on dog licenses. (Parker, PA) 0713 with interview on oil production in sub-Saharan Africa. (Wood, TN) 1925 on the excise tax there. (Maxant, VA) 15720 at 2318 with two M in conversation. (MacKenzie, CA)

**NIGER**—La Voix du Sahel, 9705 at 2250 with indigenous music, FF talk, local chants at 2254, flute IS at 2257, choral NA, seven second test tone at 2259 and off. (Alexander, PA)

**NIGERIA**—Voice of Nigeria, 15120 at 1501 with music, W with ID, pgm lineup. (Sellers, BC) 1810 on the bombing of Christian churches, rise in gas prices there. (Maxant, WV)

**NORTH KOREA**—Voice of Korea, 6285 at 1051 with ID by W just before TOH and 9335 with somber music and military chorus to TOH close. I could hear a jammer station during the quieter moments. (Barton, AZ) 7570. Kujang, with talks in EE at 1305. (Parker, PA) 11710 at 1538 with somber orchestral music, rousing male chorus and M/W on Kim Jung Il’s life. (Coady, ON) 1640 with operatic vocals. (Strawman, IA) 11865 at 1155 with talks in (I) JJ. (Brossell, WI) 11735 at 0000 sign on with IS, ID and into SS. (Linonis, PA)

**OMAN**—Radio Sultanate of Oman, 15140 at 1428 with light pops, chimes at 1433, ID, EE news at 1434. (Alexander, PA) 1440 with EF anmts and pops. (Strawman, IA)

**OPPOSITION**—Sound of Hope (to China), 9450 in Mandarin 1543 with W talk, phone interview. (Coady, ON)



Radio Prague's former towers at the Litomyšl transmitter site.

Radio Republica (to Cuba), 5954.3 via Costa Rica with SS pops from 2345, ID 2357 and into M/W talks. (Rippel, VA) 2354 with music pgm, SS talk at 2355. (D'Angelo, PA)

Voice of Peace and Democracy (to Ethiopia), 7234.8 at \*0400 sign on with HOA music and talk in (I) Tigrinya. Fair at sign on but barely audible on 9558.9. M-W-F only. (Alexander, PA)

Denge Mezopotamia (to Iran), 11530 via Ukraine at 1450-1600\* with indigenous vocals, Kurdish instl music, talk in (I) Kurdish, 5 time pips at 1600. Also, tentative on 7540 at 1601 sign on. (Alexander, PA) 1324 in Kurdish with M and apparent phone interview, then ID. (Coady, ON)

Fursato No Kaze (to North Korea), 9950 at 1311 in JJ with W talk, occasional chimes between items. (Coady, ON) 9975 via Palau in JJ at 1527 with W and sign off anmts to 1529. (Coady, ON)

Voice of the People (to North Korea), 3480 via South Korea at 1130 with music pgm. 3912 at 1245 with more jamming heard than on 3480. (Barton, AZ)

Radio Tamazuj (to Sudan), 7315 via France. \*0358-0428\* with M opening in AA over instl music, ID and news by W. Radio Dabanga picked up right after close. (D'Angelo, PA) \*0359 "Huna Radio Tamazuj" IDs. (Alexander, PA)

Sudan Radio Service, 17745 with abrupt sign on at 1500, opening jingle and IDs, program schedule. (Rippel, VA)

Radio Dabanga (to Sudan), 7315 via France at \*0428 right after Radio Tamazuj closed. Opening with singing ID, M anc in AA f/by news. (D'Angelo, PA)

Radio Damal (to Somalia), 11740 via Wooferton at 1910 with mix of local chants and indigenous music. Abrupt sign off. (Alexander, PA)

**PAKISTAN**—Radio Pakistan, (p) 3975-Islamabad at 0107 in Urdu with chorus at tune in, M with speech, Islamic devotional song. Not heard the following day. (Sellers, ON) 11575 at 1347 in (I) Urdu with Asian sub-continental vocals, M with brief talk, single time pip at 1400, ID and into news. (Coady, ON)

**PALAU**—World Harvest Radio, 9930 with an EE sermon at 1314. (Brossell, WI)

**PAPUA NEW GUINEA**—Radio Manus (p), 3315 (Admiralty Islands), at 1204 in Tok Pidgin with a variety of western music. (Rippel, VA)

Radio East New Britain (t) (New Britain), 3385 at 1200 in Tok in. (Linonis, PA)

**PERU**—Believed to be Aroma Café Radio, 6059.99, Dist. De Junin Dept., heard signing on after 1100. Overwhelming cover RM begins around 1120. (Perry, IL) (This log deserves being ever-before-used category: **Testosterone**. Perry digs up a complete with ID and location and surrounded by QRM.) Junin, 5039.4 being noted many mornings around air signal. Generally, the Peruvians were not doing v, IL)

**PHILIPPINES**—Far East Broadcasting, 9430 at 1533 in Mandarin with W with religious talk over light piano music. (Coady, ON)

Radyo Pilipinas, 15190 in Tagalog with some EE at 1811 with M doing interview. (Sellers, BC)

**PIRATES**—Radio Bleh Bleh Bleh, 6925v at \*0010-0038\* with pops, elongated IDs repeating the word Bleh over and over. (Alexander, PA)

Captain Morgan Shortwave, 6924.8 at 0039 with pop numbers, IDs, email address. Possibly the same transmitter as Bleh Bleh. (Alexander, PA)

The Crystal Ship, 6930.2 relayed by Northern Relay Service with clips of spoof songs, bits from Yosemite Sam and Commander Bunny. (Hassig, IL)

WBNY, 6275 at 2233 with various parody bits, occasional cryptic messages and Radio Bunny IDs by Commander Bunny. Also 6949.7 at 0035 with pgm of sketches mixed with some rock, multiple WBNY IDs. No address announced, but they use Belfast. (Zeller, OH)

Liquid Radio, 6925.1 at 0600 with electronic dance stuff and IDs. (Alexander, PA)

Radio Junk, 6925u at 0100 with pops, CW IDs, audio clips and Obama clips. (Alexander, PA)

Radio Free Euphoria, 6294.9, at 0252 with Captain Ganja, rock and comedy selections centering around marijuana. (Zeller, OH)

XFM, 6940 at 0507 reading emails from all over, IDs as "XFM — the power of X," email ancd as <xfmshortwave@gmail.com>, then pops. (Hassig, IL)

Radio GaGa, 6925u at 0028 with pgm of rock, clear ID at 0030. (Zeller, OH) 0030 with multiple audio dropouts, Paladin TV theme, beer ad, ID and off. (Hassig, IL) 0645 with pop, SSTV and ID at 0658 close. (Alexander, PA)

(Euro) Radio Borderhunter, 15500 at 1515 with polkas, IDs, email as: <borderhunterrado@hotmail.com>. (Zeller, OH) 15515 at 1606 moved here to avoid Sudan Radio Service that came on the air at 1600. Pops and ID as "free music radio... Borderhunter Radio." (Alexander, PA)

Ann Hofer Radio, 6925u at 0028 with W playing guitar. (Hassig, IL)

Radio Ronin Shortwave, 6824.8 at 2052 with classic rock. Gave Belfast address and asked for reports to FRN. (Zeller, OH) 6930 at 2300 with various rock. Weaker at 2330 with slightly muffled ID. (Alexander, PA)

Thinking Man Radio, 6935u at \*2110 providing subjects to think about. (Rippel, VA)

Wolverine Radio, 6925u at 0112 with classic oldies for the '40s and '50s. (Alexander, PA) 0118 with jazz, big band, blues and pops. SSTV and FAX tones at 0234. (Hassig, IL)

Excentric Shortwave (t), 6925 at 0000 with jazz, some played with woodshop tools. Ancd email address bounced. (Hassig, IL)

Radio Free Harrison, 6924.5 at 2221 with coughing, rap, comedy tunes. Email: <freeradioharrison@yahoo.com>. (Hassig, IL)

(England) WR International, 12257 came up from noise at 1100 with ID, old rock. Sked is 0000-1300 Sundays; live at 0800-1300. (Arthur, NY)

(Euro) Crazy Wave Radio, 6300 at 2130 with '70s-'80s pops, DJ chatter, SFXs. IDs as "Crazy Wave Radio" and "CWR." (Alexander, PA) 2241 with '70s-'80s rock and dance. Several good IDs. (D'Angelo, PA)

(Euro) Radio Star International, 6205.1 at 0845 with light pops, DJ chatter, EZL music, contact info. (Alexander, PA)

**POLAND**—Polish Radio, 15155 via Skelton with talks in RR at 1920. (Brossell, WI)

**ROMANIA**—Radio Romania International, 6030 in FF at 2120. (Brossell, WI) 6130-Tiganesti at 0400 with mix of pgm and a DX feature at 0445. (Goodman, IA) 9435 at 2138 ending *Radio Newsreel*. (Coady, ON) 9525 in Romanian at 0006. (MacKenzie, CA) 9655 at 1458 with IS, into classical music, W with ID and into AA service. (Sellers, BC) 11940 on imports from and exports to Australia. (Maxant, WV) 15310 in (I) Romanian at 1931. (Brossell, WI) 15460-Tiganesti in GG at 1457. (Parker, PA)

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**RUSSIA**—Voice of Russia, 4975 via Tajikistan, at 1548 with EE, ID and interview, //9470, 7205-St. Petersburg, at 1530 in (I) Farsi with W ancr, RR pops, maybe language lesson or simple translation with W doing Farsi, M in RR, also 9840 (Asiatic Russia) at 0517 with EE interview on Russian-U.S. relations. (Sellers, BC) 6090 in PP at 2125 and 15510 in Pashto/Dari at 1324. (Brossell, WI) 7250-Krasnodar at 0309 on a Russian composer, 7260-Kishinev via Moldova in RR at 0220, 7290-Kishinev at 0320, //to 7250, 9680-Samara in RR at 0518. (Parker, PA) 7250 in EE at 0250. (Fraser, ME) 9885 via Tajikistan in (I) Urdu at 1510. (Strawman, IA) 17650 via Tajikistan at 1815 in RR with possible interview. (Linonis, PA)

Radio Rossii, 7320-Madagan in RR at 0146 and 9840-Moscow in RR at 0446. (Parker, PA)

**RWANDA**—Radio Rwanda, 6055 at 2045 with domestic and Christmas songs. Still on late at 2300 when REE came on. 2030-2101 close with Afro-pops and vernacular talk. (Alexander, PA) 2057-past 2220 in FF and local languages, also phone calls. Several nice IDs during 3-way conversation. (D'Angelo, PA)

**SAO TOME**—VOA Relay, 6080 with news at 0544. (Sellers, BC) 9780 in FF at 2112. (Brossell, WI) 9885 on Kim Jung II. (Parker, PA)

**SAUDI ARABIA**—Broadcasting Service of the Kingdom, 9555 in AA at 1844, //9870.



Some of the antennas that radiate from Radio Canada International's Sackville site.

(Sellers, BC) 9870 in AA with local music. (Goodman, IA) 15120 in (I) Bengali at 1445. (Brossell, WI) 15205 in AA at 1615 and into Koran. (Rippel, VA) 17560 at 1735 with Koran at 1735. (Parker, PA) 21505 in AA at 1237. (Parker, PA)

**SERBIA**—International Radio of Serbia, 6100 in (I) Serbian at 2039. (Brossell, WI)

**SEYCHELLES**—BBC Indian Ocean

Relay, Mahe, 9410 ending pgm in Somali at 1828, Off briefly, then back going into EE news. (Sellers, BC) 11860 at 0400 Beginning *The World Today*. (Coady, ON) 21470 at 1233 with M/W ancrs. (Parker, PA)

**SINGAPORE**—BBC Far East Relay, 9740 at 1513 with *World Briefing*. (Coady, ON) 11890 at 1446 with *Sports World*. (Sellers, BC)



A QSL from the long ago active Stichting Radio Omroep Suriname, active in the 1970s on 4750.

**SOUTH AFRICA**—Radio Sonder Grense, 3320 at 0342 with classical music. (Strawman, IA)

**SOUTH KOREA**—KBS World Radio, 6155 at 0845 with W anc in JJ. (Barton, AZ) 9640 in EE at 1604. (Sellers, BC) 11795 in SS at 1153. (Brossell, WI)

**SPAIN**—Radio Exterior Espana, 6055 in EE at 0045. (Fraser, ME) 2322 in FF, 6125 in SS at 0032, 9535 in SS at 2305, 9675 Costa Rica Relay in SS at 1910, 9765 Costa Rica in SS at 0140, 17850 Costa Rica in SS at 1825. (MacKenzie, CA) 9605, //9665 at 1928 with an interview. (Coady, ON) 9675 Costa Rica in SS at 0520, 17115 in SS at 1817, 17850 Costa Rica in SS at 1833, 21610 in SS at 1610. (Parker, PA) 15110 in SS at 2140 and 17850 Costa Rica in SS at 1807. (Goodman, IA) 15125 Costa Rica at 2245 to IS and close at 2300. (Barton, AZ)

**SRI LANKA**—Sri Lanka Broadcasting Corp., 11905 at 0138 in Hindi with lively vocals and W anc between. (Coady, ON) 15760 in Hindi at 1315 with comedy sketch and audience laughter. (Parker, PA)

**SUDAN**—Sudan Radio TV, 7200 at \*0234 sign on with local recitation, AA talk and indigenous vocals. Covered by Iran at their 0329 sign on. (Alexander, PA) 0305 in AA with talks and recitations. (Parker, PA)

**SYRIA**—Radio Damascus (p), 12085 fair signal but no detectable audio. (Strawman, IA)

**SWAZILAND**—Trans World Radio, 3240 at 0332-0340\* with M in (I) Ndu, group vocals to 0339 when another ID and closedown. (D'Angelo, PA) 4775 in Swahili at 0345. (Strawman, IA)

**TAJIKISTAN**—Tajik Radio, Dushanbe, (p) 4765 at 0140 with Islamic devotional song. (Sellers, BC)

**TAIWAN**—Radio Taiwan International, 9440 in EE at 1606. (Sellers, BC) 15690 via France in FF at 1937. (Brossell, WI) 1700 sign on and news read by W. (Fraser, ME)

**THAILAND**—Radio Thailand, 9535 at 2034 with W and EE news, several IDs, promo anmts. Carrier broke around 2043 but back at 2044 with familiar bells. Thai language started at 2045, 9720 at 1245 with W and news, IDs and ads. (D'Angelo, PA) 13745 with abrupt sign on at 0000, 4+1time pips, ID, anthem and news. (Rippel, VA)

**TURKEY**—Voice of Turkey, 7205 on Syrian unrest at 2115. (Maxant, WV) 0513 in TT with talks. (Parker, PA) 15200 in AA at 1500. (Brossell, WI)

**TUNISIA**—RT Tunisienne, 7225 in AA at 2050. (Brossell, WI) 7275 in AA at 0626 with instl music, M talk with music bridges. (Sellers, BC)

**UNITED STATES**—Voice of America, 5585 via Vatican with Afia Darfur service in AA at 0320, 9690 Lampertheim in Kurdish at 0515, and 9760 Philippines Relay in Kurdish at 0508. (Parker, PA) 5925 Sri Lanka Relay in Pashto service at 0050. (Strawman, IA) 6140 Thailand Relay at 1517 with *Functioning in Business* pgm. (Sellers, BC) 9315 Thailand Relay in Tibetan at 1402 and 9950 Sri Lanka with EE language lesson at 1522. (Coady, ON) 9570 Philippine Relay at 0010 and 11925 Philippines in CC at 0050. (MacKenzie, CA) 9930 Northern Marianas Relay with news at 1500. (Arthur, NY) 9760 Philippines with dramatized EE lesson at 1517. (Sellers, BC) 11785

Thailand in CC at 1220 and 13585 Philippines in KK at 1204. (Brossell, WI)

Radio Free Asia, 7470 via Mongolia in CC at 2350, 9905 via Palau in CC at 1922, and 15550 Northern Marianas Relay in CC at 2322. (MacKenzie, CA) 9355 Northern Marianas Relay in (I) Laotian at 1139, 11540 Northern Marianas in CC at 1504, 11590 Kuwait Relay in (I) Tibetan at 1506, and 15185 Sri Lanka Relay in (I) Kyrgyz at 1513. (Brossell, WI) 9455 in Mandarin at 1611. (Coady, ON) 13670 Northern Marianas Relay in CC at 1820. (Parker, PA)

Radio Free Europe/Radio Liberty, 5830, Kuwait Relay, at 0312, 5975 Lampertheim in Tatar at 0328, 6105 via Germany in Belarusian at 0349, 6155 via Germany in Belarusian at 0412, 7275 Lampertheim in (I) Tajik at 0134, and 15530 Lampertheim in Kazakh at 1451. (Parker, PA)

Radio Farda, 5860 Kuwait Relay in Farsi at 0315 and 15690 Sri Lanka Relay in Farsi at 1340. (Parker, PA)

AFN/AFRTS, 5765 via Guam at 1430 with PSAs and news feeds. (Sellers, BC)

Family Radio/WYFR, 5835 via Kazakhstan in EE at 1401. Closed at 1500, 9440 via Russia at 1359 with fanfare and anmts in (I) Assamese, 1401 Bible reading, 11610 via U.A.E. in EE at 1556. (Sellers, BC) 9925 via Germany with religious programming. (Goodman, IA) 17545 via Ascension Is. with Harold Camping at 1727. (Parker, PA)

WWCR, Tennessee, 13845 at 1940 and 15825 at 1840. (MacKenzie, CA)

WWRB, Tennessee, 3185 at 0445. (Wood, TN)

WTTW Tennessee, 5755 at 0010. (MacKenzie, CA) 0810. (Wood, TN)

WBCQ, Maine, 15420 heard at 1725. (Maxant, WV) 1840. (Goodman, IA)

WJHR, Florida, 15550 at 1820. (Maxant, WV)

WEWN, Alabama, 15610 at 1815. (Maxant, WV)

Adventist World Radio, 6145 in Farsi at 0410 and 15480 via Naauen in CC at 1454. (Parker, PA) 9770 via Austria in (I) Dyula at 2022 and 15360 in (I) Hindi at 1536. (Brossell, WI)

Trans World Radio, 6105 via Germany at 0757 going into *Rendezvous* pgm. (Sellers, BC)

Studio-Transmitter links: WBAP, Dallas, 25910 at 1539, KOA-Denver 25950 at 1625 with sports news. (Parker, PA) KSCS Ft. Worth 25990 at 1530. (Alexander, PA)

**VATICAN**—Vatican Radio, 3975 in II/FF at 0713. (Wood, TN) 6040 via Bonaire in SS at 0156, 7305 in SS at 0143, 9660 at 0523 and 13765 in PP at 1804. (Parker, PA) 9660 in African Service at 1435 and 9755 at 2015. (Maxant, WV) 9755 in FF at 2030 and 13730 at 1128 with IS melody and close. (Brossell, WI)

**VIETNAM**—Voice of Vietnam, 6175 via Canada at 0120. (Maxant, WV) 0418. (Parker, PA) 9840 at 15180 with M/W and news. (Sellers, BC)

**YEMEN**—Republic of Yemen Radio, 9780 in AA at 2040. (Brossell, WI)

**ZAMBIA**—CVC-One Africa, 13590 with EE talks at 1941. (Brossell, WI) 17695 at 1508. (Sellers, BC) 1603 with W hosting discussion. (D'Angelo, PA) 1803. (Parker, PA) 1915. (Goodman, IA) 1920. (Barton, AZ)

And that's a wrap! Salutes and high fives to the following who came through for you this time: Joel Goodman, Stanwood, IA (welcome!); Harold Sellers, Vernon, BC; George Zeller, Cleveland, OH; Brian Alexander, Mechanicsburg, PA; Rich Parker, Pennsburg, PA; Stewart MacKenzie, Huntington Beach, CA; Jim Lawrence, Randolph, VT (welcome!); Rich D'Angelo, Wyomissing, PA; Mark Coady, Peterborough, ON; Rick Barton, El Mirage, AZ; Jerry Strawman, Des Moines, IA; Jack Linonis, Hermitage, PA; Robert Brossell, Pewaukee, WI; William Hassig, Mt. Prospect, IL; Charles Maxant, Hinton, WV; Ralph Perry, Wheaton, IL; Robert Fraser, Belfast, ME; Joe Wood, Greenback, TN; Charles Rippel, Chesapeake, VA and John Arthur, Belfast, NY. Thanks to each of you, and, until next month — good listening!

## Is Ham Radio Suffering From Low Expectations?

by Kirk Kleinschmidt,  
NT0Z, KPC0ZZZ  
<kirk@cloudnet.com>

*“... the experiences that create our individual concepts and contexts about ham radio are fundamentally different from generation to generation.”*

**M**ine is the first generation of Americans who do not expect to do better than their parents. And at a month shy of my 50th birthday, there are at least two generations behind me who have even lower expectations. These folks are entering a whole new political, social and economic reality that is the 21st century.

The differences in “youthful expectations” are especially apparent in the workplace — if younger workers can even find a workplace. People of my generation and older expected better benefits, better insurance coverage, better retirement packages — better everything.

Today’s workers are so beaten down and so happy just to have a job that they will put up with just about anything, from ridiculously low wages, to substandard or non-existent health insurance, to little or no vacation time, you name it.

The large employers in my town are hiring folks right out of college, many with advanced degrees, and putting them to work — often inadequately prepared — in positions that would otherwise have been filled by older, more experienced workers. And many of those workers have solid experience, but without advanced

degrees. Why? Because younger workers expect less, toe the line, don’t raise a stink and are resigned to their tiny piece of an apparently dwindling pie.

It makes sense when you think about it. Younger people have grown up with all of the aforementioned uncertainties for most of their lives. *Poor slob.*

Recent decades have seen a steady stream of foreign expeditionary wars, crazy gas and energy prices, the rise of the Internet, the dotcom bubble, presidential impeachments, the mortgage crisis, political insanity, wacky Wall Street hijinx, billionaire CEO scandals, mass migrations of jobs overseas, government bailouts, an abject lack of personal and corporate accountability, escalating divorce rates, rampant bankruptcies, non-nuclear families, the biggest recession since the Great Depression, etc. I could go on.

To me and my peers, this stuff is *crazy talk* in a world turned upside down. For young people, this stuff is the norm. It’s all they’ve known. So when they have a chance to get a job that pays something — even if it’s less than it should — has a few meager benefits (but little of substance) and exploits them all the way to the bank (the company’s bank), they take it. And unlike workers from my generation, they don’t complain, form unions, call their Senators or make waves.

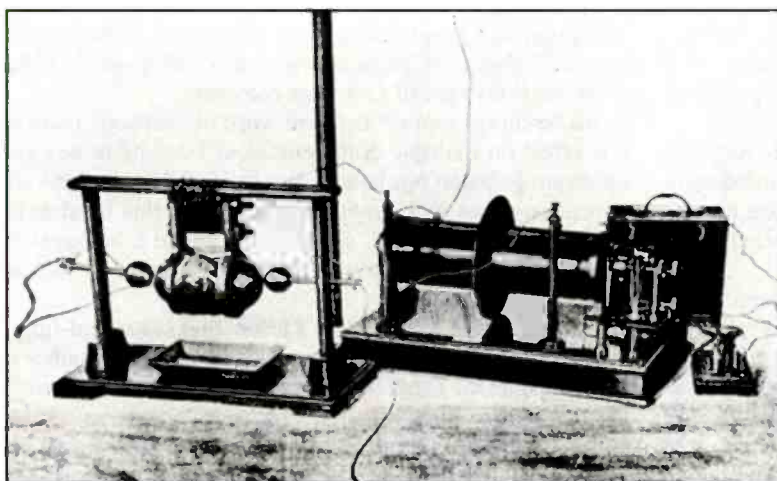
They have low expectations. *plain and simple.*

### Transition to Hamdom

Amateur radio, I’m afraid, may also be suffering from low expectations for many similar reasons and parallel circumstances. We may not be in a ham radio recession per se, but our survival is being challenged on many fronts, and these challenges have intensified over the past decades.

Deed restrictions, homeowner associations and CC&Rs have had devastating impacts on our ability to enjoy ham radio at the most basic levels. Until I moved into a condominium several years ago, these were of absolutely no consequence to me.

In small-town mid-America I had never worried about putting up a tower or an antenna because they were never an issue. Modern hams may find it easier to build a new nuclear reactor than to put



**Photo A.** This early spark-gap radio transmitter was used by Guglielmo Marconi during pioneering wireless telegraphy experiments at La Spezia, Italy in July 1897. A common transmitter at the time, generations of hams who followed those *old timers* would have no concept of *the spark days*. And expectations for what amateur radio could and should be would be vastly different. (Courtesy of Wikimedia Commons)



**Photo B.** In this 1970s vintage video by the late Roy Neal, K6DUE (SK), titled *Moving Up to Amateur Radio*, one CQ DX resulted in a solid contact with a station in Guatemala — perhaps something a young radio amateur of today might not have yet experienced, especially with the challenges presented by the current solar cycle. See the full video at: <http://bit.ly/xDIRvI>. (Internet screen grab)

up a simple dipole. And if you grew up entirely in this era, this is your norm. You will have no concept of how different things used to be.

Our modern environment is monstrously polluted by garbage RF from a sea of unintentional radiators. Thirty years ago the bands just sounded better and background noise levels were lower. At the time I didn't know that the bands sounded even better an additional 30 years earlier!

Cherished publications, products, manufacturers and ham stores are long gone. Lots of stuff is different, and it took a recent visit with a *younger generation* ham and an ARRL email bulletin to really drive home the realization.

Hams come in all shapes and sizes, from ages 5 to 105, but the average age of U.S. amateurs (about 60 years old) has been higher than we'd like for decades. This is true especially when it comes to political and social relevancy, the future viability of the service, and so on.

Many of those 60-year-old hams have been licensed for years and years. Much like the experiences and expectations of modern employees, the norms of these *average hams* are not the norms of today's younger hams. In fact, their experiences may be completely different!

As I mentioned, I was visiting a friend who has been a ham for a couple of years. He's a software developer in his mid-20s, and because I helped him study for his tickets and set up his station and antennas, I was used to the idea that he wasn't as experienced at ham radio as I am. But what really shocked me was the realization that his entire perception of amateur radio was fundamentally different from mine because our accumulated experiences were generationally separated.

And like the contrasting worker experiences from our respective generations, his expectations of amateur radio were much lower — or at least much different — than mine!

In my ham radio reality I had enjoyed two excellent solar cycles and one that wasn't too shabby — plus the relatively

dismal present cycle. He'd only been in the game for a couple of years, so he had no context for my expectation of working easy global DX on one band or another, round the clock, for months on end.

In my formative, pre-Internet years, ham radio meant daily Morse and voice contacts with people in far-flung locations, with each spin of the VFO representing something new to discover.

Being a new ham, a software developer and a child of the Internet age, his norm includes software-defined radios, DSP, global spotting networks, easy digital modes and inexpensive high-tech radios. I now enjoy the same things, of course, but having started out with tube radios and *digital-mode boxes* that made mechanical clunking sounds, I realized that he had never had to tune a transmitter by dipping a plate-current meter, worry about safely handling 3,000 volts of DC, or figure out how to use separate transmitters and receivers — let alone how to use the "spot" button.

It's not that one way is better or *more real* than the other. What I'm noting is that the experiences that create our individual concepts and contexts about ham radio are fundamentally different. And until now I just hadn't seen it that clearly. Although we're both hams and both operate in the present moment, our bedrock conceptions of what ham radio is and what it means are radically different.

Two specific items in the aforementioned ARRL email bulletin really got things moving.

## Teeny Weeny WRC

The ARRL bulletin's headline proudly announced, *Amateur Radio Gets Secondary MF Allocation at WRC-12*.

I had known that various interests were trying to wrangle an amateur radio allocation from the World Radiocommunication Conference 2012 below the broadcast band, but I hadn't been paying close attention as of late.

When my friend announced the news, I was initially thrilled. Then he mentioned the particulars: The segment, starting at 472 kHz, is 7 kHz wide, will be unavailable until sometime in 2013 at the earliest, and is limited to an EIRP of 1 watt or 5 watts depending on how far from an ocean you might be.

According to the ARRL bulletin, an IARU official hailed the allocation as a "fantastic achievement for the Amateur Radio Service." From my point of view, that statement is suffering from a serious case of *Low Expectations*.

To be sure, I support the hard work of everyone involved in this effort on multiple continents, and I celebrate any and all spectrum gains on our behalf. But the EIRP limitations on this allocation alone will almost certainly limit this band to fringe experimenters whose PC sound cards will talk amongst themselves using WSPR or some other semi-automated "below the noise" digital mode.

As a QRPer for 30+ years I know that some real-time CW contacts will be possible (just as they are for moonbounce operators) despite the harsh restrictions, but there won't be much (or any) casual rag-chewing, that's for sure.

It's hard to see this allocation benefitting the average ham in any way. A small but dedicated number of die-hard experimenters (or their computers) will operate there, but that will probably be that . . . I would love to be proven wrong on this.

In contrast to the present WRC, WARC 79 (they were called World Administrative Radio Conferences back then), my first WARC as a ham, gave us 30, 12 and 17 meters — awesome, expansive spots on the RF landscape with usable power levels





**Photo C.** In stark contrast to amateur radio in the *spark days* and even the 1970s, this news report from Greensboro, North Carolina's WFMY, focuses on 2011 ARRL Field Day, showing viewers what advanced technologies are found in today's ham radio station, and what expectations are commonplace — those never dreamed of by previous generations of radio amateurs. See the full report at: <<http://bit.ly/AiXfFd>>. (Internet screen grab)

— bands we all use and enjoy. To my young friend, WRC-12 was the norm. To me, it was anything but.

## Teeny Weeny Satellites

Next up in the bulletin was an announcement that a new FM repeater CubeSat called Fox-1 would be next in line for launch by NASA. My new ham friend thought this was nifty, and in its own way, of course, it is. It's true of the many FM mini-sats hams have launched into low orbit in past years, with their small footprints and fast passes.

My new ham friend, however, had no idea that, 20+ years ago, we had glorious, high-orbit ham satellites in elegantly elongated Molniya-type orbits that flung the birds up to 40,000 km into space, giving them enormous footprints that covered nearly half the globe. Or that we had a swarm of low-orbit satellites launched by Russian hams that used HF bands for uplink and/or downlink frequencies, making them accessible to just about anyone with garden-variety HF gear.

It's true that several more recent ham sats intended for high orbits suffered cat-

astrophic failures during or just after launch, but there's no mistaking the fact that the '80s and '90s were the Golden Age (the first of many to come?) of amateur radio satellites.

If you think you might be suffering from *Low Expectations*, read up on OSCAR 13 and Radio Sputniks 10 through 15 (RS-10, RS-11, and so on).

Who would have thought that a single news bulletin could have sparked so much *inter-generational discourse*!

As I mentioned, one ham radio generation isn't *better* than another. But this encounter reminded me that the subjective experiences of members of differing generations can be tremendously different.

As a hobby-service, we have fellow members from 5 to 105 whose internal understanding of what ham radio means to them is substantially similar, but may be specifically quite different.

The generations and their expectations overlap to weave the tapestry of what amateur radio *means* in the present moment.

In this global era of struggle, strife and uncertainty, I'm not suggesting, to steal a phrase, that we *go big or go home*. I'm suggesting that we simply *go big*!

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## A Cheesy Little Stake in Philly Broadcast's Past

by Shannon Huniwell,  
WPC2HUN  
<melodyfm@yahoo.com>

*"Never before had Trudy had anybody speak directly to her over the radio — especially a somebody she considered 'really cute.'"*

**T**here's a fascinating loneliness factor in the heart of many a devoted radio enthusiast. While I can't prove that psychologists are anywhere close to accepting my theory, its theme has been clearly received time and time again via stories transmitted to me through a chance conversation, the U.S. Postal Service, or email.

For your consideration, I submit the lonely listenership account of one Trudy Keesen. Just shy of her 14th birthday, her mother was killed by a career criminal who had easily smashed the glass on the kitchen door and then committed a series of unspeakable events.

Trudy, rather than her father, found the results. A well-traveled, high-level insurance adjuster, her dad was on the other side of America when receiving the gruesome news. "My father was an honorable man," Trudy wanted me to know, "but, the loss of my Mom sent him even further inward. I knew he sincerely loved me, too, but other than insurance business talk that I'd overhear him relating on the phone, our home — no matter where that might be — was a very quiet place."

Trudy says her father's company usually transferred him every two to three years. "After hearing about the murder, the insurance firm's president pledged to relocate us wherever we wanted to go. That CEO also had the company quickly buy our house, as it held some horrible memories.

"We left almost everything there: Furniture, pictures, and whatever of my mom's personal

things that I couldn't fit into one cardboard box. Dad picked Philadelphia because his sister lived in the vicinity. Aunt Rebekkah was the only family we had left. She'd offered to keep an eye on me periodically during my teen years — a span that my taciturn father apparently felt ill-equipped to navigate."

Likely in response to the easy first floor break-in, Trudy's dad chose a high-rise building with a secure entrance for their Philly-area venue. He also bought her a radio so that things there wouldn't be completely silent. Actually, to call it just a radio would be the definition of *understatement*.

Shortly after her Aunt Rebekkah completed the assignment of making the place look acceptable with a trendy smattering of what we'd now term as mid-century modern furnishings, Trudy's father spotted a huge 1957 Fisher sound system in the showroom of an upscale TV and appliance store. It was equipped with 38 tubes, separate AM and FM tuners and dials, a record changer, and AMPEX reel-to-reel tape deck.

Finished in rich teak woodwork, the cabinetry wore 10 selector knobs between its six-speaker network, and looked more electronically decorative than a high-end, early Kennedy-era color console television.

A salesclerk noticed Mr. Keesen eyeing the unit and nodded that he certainly possessed good taste. "That's the kind of thing a NASA astronaut would have in his home near Cape Canaveral," the fellow commented. "The manufacturer put some real quality workmanship in that baby!" The salesman paused before admitting, "It's been in the store for almost four years and, quite frankly, was originally so expensive that it was more costly than some of our top-of-the-line TVs."

Trudy's father confirmed that the piece appeared to represent the apex of audio swank, but explained that he was simply looking for a basic radio-phonograph for his teenage daughter. He pointed to a vinyl covered plug n' play portable on a nearby display shelf.

The store guy shook his head to signal reluctant compliance, walked over to the item, and switched it on. About 20 seconds later, a newscast could be heard over some fluorescent lighting-induced static. The clerk fiddled painfully with the little side-mounted tuning knob in



**Photo A.** A postcard view of the Benson East. Located a few miles north of Philadelphia in suburban Jenkintown, Pennsylvania, the 12-story apartment complex was not only home to hundreds of people, like Trudy Keesen and her father, but served as headquarters for an FM broadcast outlet and UHF-TV station. Close inspection of the image's upper center reveals traces of the roof-mounted tower from which the radio facility transmitted between 1960 and 1969.

order to demonstrate all that an 8-inch oval speaker could be able to do.

He dialed Top-40 outlet WIBG 990. Traces of static remained within the directional signal, though, by rotating the portable in an almost theatrically pained fashion, the store guy eventually got it sounding a little cleaner. Then, he switched it off with an attitude of *good riddance!* Then he made his way to the good ship Fisher, and fired up that Rolls Royce of radios.

Shortly thereafter, he sensed those massive tube banks blinking, "all systems go!" Several selectors got clicked, the AM slide-rule was precisely driven to 990 kilocycles, and the furniture began filling its sizable speaker network with the presence of WIBG, as if the station's studio were in the next room.

Trudy's dad instinctively stepped away from the Fisher, but smiled back like someone who had just experienced something amazing for the first time. "Now, listen to this," the salesman beamed while sliding open a drawer and enlivening a pre-recorded tape rack-up on the AMPEX. "Sinatra never sounded so good! And tapes like this reproduce in stereo: Trumpets here, violins and *Old Blue Eyes* over in that speaker" the fellow practically shouted.

"I must say I am impressed," Trudy's father granted, "but I'm only looking for something for my daughter to listen to her music on — not some complex electronic concert hall."

"Is she good in science?" the guy wondered rhetorically while pointing at all of the Fisher's fabulous dashboard features. Trudy's dad smiled one of those *you-got-me-there* grins. "The real question is, sir," the store man pointed, "are you good in recognizing a fantastic offer?"

"OK, I'm listening." With that bridge crossed, the sales guy explained that while the 1957 Fisher sounded just as great as it did when it came out of the factory some four years earlier, the store's management understood that they would need to price it as befitting of a special interest floor model in order to make room for newer merchandise. The reduced figure surprised Trudy's father to the point where he began seriously considering the Fisher's purchase. Sinatra was throttled back to allow some quiet time for thinking.

"Perhaps you'd like to tender an offer that my manager might entertain? Feel free to jot it down on this notepad."

Mr. Keesen hesitated a moment. He glanced over to the portable AM-record player, and then slowly brought up the Fisher's volume. The salesman took the opportunity to slide a pencil and the pad across the console's rich wooden top. Trudy's dad scribbled three lowball numbers on the paper, then watched the clerk disappear into an office marked PRIVATE. Just as Sinatra and Nelson Riddle's Orchestra finished their 7.5 inches-per-second track, the guy returned. "Sir, where and when would you like us to deliver your incredible purchase?" he queried affirmatively.

## The S.S. Stereophonic

Trudy recalls she and Aunt Rebekkah watching from the apartment window at the appointed rendezvous hour. From their high-rise vantage point, the appliance store's truck looked like one of those die-cast Matchbox toys. No sooner had the deliverymen negotiated the final doorway in the Fisher's voyage, than the ladies christened it the S.S. Stereophonic. "It does kinda look like an ocean liner on legs," one of the stevedore crew remarked. "And as heavy as a battleship, too!" his partner laughed.

Apparently, the first fellow — who looked to be in his early 30s — was the more tech savvy of the two, so commenced with

**Photo B.** A 1965 promotional ad for stations of Storer Broadcasting Company, among them WIBG in Philadelphia. Before better-coverage competitor WFIL 560 and (later a host of FMs) got into the Philly Top-40 game, 50 kilowatt, though somewhat directionally handicapped "WIBBAGE Radio 99" easily attracted the lion's share of contemporary music listeners. When I emailed this picture to our story's originator, Trudy Keesen, she noticed that one of the depicted homes in which "more people everywhere listen," is a high-rise apartment like her Benson East digs where she tuned to WIBG much more often than dialing-in the station transmitting from a couple of floors above her place. During WIBG's rock 'n roll heyday, irritated parents would have been surprised to know that their kids' favorite loud spot on the dial started as a religious outlet with calls denoting I Believe in God. Most of those young folks might also be shocked, however, if they knew that the future signal occupying their hip 990 kilohertz would discard the Top-40 in favor of Christian programming.

instructions while completing the Fisher's hook-up. He quickly rattled off more details than either Aunt Rebekkah or Trudy could hope to comprehend in a single lecture.

The store had thrown in a pair of rabbit ears and enough twin-lead so that they could be discretely deployed on the floor of a nearby closet. "The AM side has a built-in antenna, but these are for FM reception," he noted.

"You're up 10 floors, anyway . . . My guess is that you'll have no trouble pulling any FM radio wave that passes through the Delaware Valley. But, I bet," he predicted to Trudy while demonstrating the frequency modulation capabilities of the big Fisher, "you ain't gonna dig the kinda symphonic stuff and elevator music that they play on FM."

When the teen agreed with a smile, the younger deliveryman switched to the AM section and grabbed the "modern" sounds of WIBG. "That's more like it!" he winked, and then asked Trudy, "Got any records?" She ran to her room, almost immediately re-emerging with a case of singles. "Hey, I just happen to have a couple 45-rpm spindle adaptors," he announced as his hand came out of his pocket with several little red plastic inserts. "Don't loose 'em," the guy pointed, "'cause not even Elvis, Ricky Nelson, or the Shirelles sing too good when their records wobble on the very proper British-built Garrard turntable."

And, wow! They all agreed that Trudy's collection really came to life when played through the Fisher. Aunt Rebekkah offered the crew a Coke and some chocolate Tastykake snacks right after a fast lesson on how the AMPEX recorder worked.

The demo tape from the store was still on the reel-to-reel deck. Raising a celebratory glass of soda with the others, Trudy's relative admitted to much preferring Sinatra over the console's earlier trial fare. "Ma'am, we'd better take them Tastykakes for the road," the older stevedore noted while tapping his colleague on the shoulder. "We got six more deliveries to make, including a color TV installation for somebody my sales manager says can be a pain in the *you-know-where*."

## Were You Aware There's A Radio Station In This Building?

Trudy guesstimates it was probably about a month after the Fisher arrived when she happened to meet, in her apartment complex's elevator, a young man who seemed interested in the paper bag she was carrying. It was marked with the logo of a Philadelphia music store where she typically bought four or five records each weekend.

Trudy considered it to be a tremendously fortunate coincidence when this late afternoon record revealing rendezvous occurred for a third time. The well-dressed fellow listened to her explanation of what she liked about the songs she'd just bought, and then asked if she had an FM radio. "Yes," she smiled, "But it only gets music that parents like."

"Well, if you really listen to the quality that goes into many of those artists' recording sessions, there's a lot to appreciate and enjoy," he noted with a bit of recently manufactured maturity in his voice. "I'm not

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- Full flexibility stereophonic master audio control center.
- Program clock and timer, three volume controls, two bass controls, two treble controls, two loudness contour controls, a five position record equalization and channel selector, and five broadcast console-type indicator lights for easy reference of what one was controlling.
- While the unit's AMPEX tape deck could happily play stereo tapes, it went monophonic whenever "recording from AM, FM, phonograph, or microphone."
- After the deliverymen finished their struggle to carry the Fisher into its new home, Trudy's Aunt Rebekkah spotted Fisher's songbird with a musical note in its mouth logo and joked that the poor creature would have crashed had it been assigned to fly the huge console somewhere.

**Photo C.** Furniture lovers could choose the 70-inch-wide by 33-inches-high Fisher President in finishes of walnut, teak or mahogany. Those more focused on electronics enthused over the instrument's 38 tubes throughout a half dozen chassis. A pair of audio amplifiers were capable of yielding 120 watts. Other notable features included "separate AM and FM radio tuners for regular broadcasts as well as stereophonic reception of binaural broadcasts." Prior to 1961 FCC approved FM stereo, the 2-channel effect was achieved by commonly owned AM/FM stations that experimented with the left channel on one band while sending the right side over its other frequency. Between the upper window containing "two indicating meters for micro-accurate tuning of even the weakest signals," were the completely independent AM and FM slide-rule dialed tuners. A so-called, "full-flexibility stereophonic master audio control center" boasted "program clock and timer, three volume controls, two bass controls, two treble controls, two loudness contour controls, a five position record equalization and channel selector, and five broadcast console-type indicator lights for easy reference" of what one was controlling. While the unit's AMPEX tape deck could happily play stereo tapes, it went monophonic whenever "recording from AM, FM, phonograph, or microphone." After the deliverymen finished their struggle to carry the Fisher into its new home, Trudy's Aunt Rebekkah spotted Fisher's songbird with a musical note in its mouth logo and joked that the poor creature would have crashed had it been assigned to fly the huge console somewhere.

too terribly older than you are, and I've developed a taste for good album music."

Suddenly, Trudy felt like a bit of a teenybopper in the presence of a suave 20-something.

"Tell you what," he offered, "If you can get that FM radio of yours tuned to *one-hundred-and-three-point-nine megacycles* by six o'clock, I shall play some records just for you."

The last three words of that proposition were spoken as the elevator door opened. Then he saluted her and walked coolly down the hall. The teen felt an unmistakable crush.

By 5:55 p.m., she'd activated the Fisher's FM side and was pretty sure that the pointer was spot on 103.9. Anyway, the tuning meter pegged itself at the max-

imum position and the music sounded crystal clear. Trudy reclined on the couch for a while, trying to develop a sophisticated taste. Then she went to get something to eat and heard something that practically caused her to drop her sandwich and chips on the kitchen floor. "The sounds of Bert Kaempfert and His Orchestra with the pretty tune, *Wonderland By Night* on your good music station, WIBF-FM," the announcer carefully intoned. And then with an engaging smile in his voice, he indicated, "Now I'd like to warm up the world of a young lass who is fond of records and elevators . . . Here's Percy Faith's *Theme From A Summer Place* from me and WIBF-FM 103.9 on frequency modulation radio dials all over the Delaware Valley."



**Photo D.** Seasoned audiophiles who were once on a budget will certainly recognize this tape box. It's like the one that came with Trudy Keesen's Fisher-based AMPEX reel-to-reel deck. Inside, there's a 1961 recording of her very brief Philadelphia on-air experience that may or may not have survived. Though many a veteran Shamrock tape user will agree that the marque long possessed the reputation as a "bargain" brand ranking far below industry leaders like 3M's Scotch or Germany's BASF, more than a few admit pleasant surprise to decades-old Shamrock Mylar that still has something to say or sing. One doesn't need to be a leprechaun to understand that it's all in the luck of whatever particular factory/production run from which the tape happened to have originated.

Never before had Trudy had anybody speak directly to her over the radio — especially a somebody she considered "really cute." Later that evening, her Dad enthusiastically listened to her story and recalled having heard that their building was also home to a radio station. "I rather imagine," he suggested, "that they'd be happy to provide an interested resident with a brief tour of the operation. Maybe you could even write up your experience and submit it as some sort of extra credit in English class."

Trudy did a little homework and found WIBF-FM. It wasn't until the following Friday, though, when she attempted a foray into the station. She simply calculated when the best chance might be to run into her elevator acquaintance and then waited casually. As Trudy had hoped, the fellow's response to her gushing *thank you* for the song dedication included an invitation to the WIBF (FM) studios. "If you come by a little after 9," he pledged, "you can help me select some records for airplay."

And the young radio pro made good on that promise and then some. "He actually let me announce a couple of station breaks," Trudy fondly remembers. "I sure was nervous at first, but he had a way of putting me at ease. I told him I was afraid to speak to thousands of people."

"Well, you're in luck then, he winked, because there probably aren't even dozens of people in our audience." Trudy's gracious host adjusted the microphone so it'd reach where she was sitting in that little studio and then he worked the switches and cued her when to start talking.

"It was quite a broadcasting debut," Trudy remarked in her email accented

with an *LOL* — short for *laughing out loud*. She also expressed a curiosity about WIBF-FM. "Can you tell me anything about that long-ago station? Could anybody more than a few miles away receive it? None of my WIBBAGE-loving friends at school had ever heard of it . . . Is it still on the air?" she wished me to research.

### Yes Trudy, There Was a WIBF-FM in the Philly Airwaves

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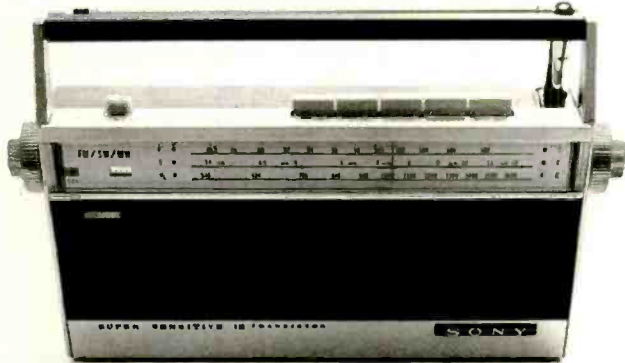
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of your favorite stations that used to be 1/16" wide can offer you a full 1/2" to line-tune in. We work small, but we think big. **Two and three** are AM—medium wave and short wave. Because they use the audio circuitry and speaker specified for the FM, the MW and SW produce a sound they'd never be able to make if it weren't for the band next door. The medium wave, of course, has a longer range than the FM. And if your listening taste is really far out the shortwave band takes you from 3.9 to 12 megacycles. We built this radio to go the distance, and we can truthfully say that with this Sony you'll run out of travel money before you run out of travel music.

**Now put them all together** and you save money. If each band on this 12-transistor portable were a single radio of comparable quality, the 3 radios would be very nearly twice as much. And not half so portable as this little Sony—Automatic frequency control. Continuous tone control. Dial light. Pushbutton band selection. Fine-tuning for shortwave. 2 earphone jacks. Recording jack. FM stereo multiplex jack (for optional stereo adaptor). Operates on flashlight batteries or house current (with optional AC adaptor). We could say a lot more, but with an 800 mw output through a 3" x 5" oval speaker this Sony can pretty well speak for itself.

## THE SONY "LONG RANGER" TFM 117-WB FM/AM/Short Wave Portable

**Photo E.** As far as she could tell from an image that I emailed her way, Trudy says that this 1966 SONY 3-band portable is just like one that still faithfully keeps her company. The transistorized classic was a gift from her father who bought it while on some overseas business trip. It's interesting to note that the SONY Corporation of America-sanctioned ad calls the model TFM 117-WB an FM/AM/Shortwave portable, though the pictured unit's AM side is labeled MW or medium wave. Trudy says her radio says MW instead of AM and that all 12 of its "super sensitive" transistors remain in great health. Even though the SONY is a lot easier to move than her venerable old FISHER, she notes that it would probably take a dozen of the battery-powered receivers to sound half as good as that humongous tube-fired console.

*mation about an old Class "A" FM operation in Jenkintown, Pennsylvania.*

And Jan's faithful 10-4 keyed that suburban Philly station's microphone for the first time on November 1, 1960. Licensee, William Fox had taken less than eight months to build 750-watt WIBF-FM at 103.9 MHz in the dozen-story Benson East apartment complex on Old York Road and Township Line Road in Jenkintown that he owned with his brothers.

The calls conveniently fit the siblings names, William, Irwin, and Benjamin Fox. The station's transmitter site selection had also been an easy choice, as a modest tower erected on the Benson East's roof provided an antenna height of approximately 300 feet above the average surrounding terrain.

WIBF-FM's programming sounded pretty typical of an independent frequency modulation outlet in the final days of the Eisenhower era: "Good album music." In other words, those

spinning the LPs, cued cuts featuring melodic instrumentals and tasteful vocals suitable for sophisticated adults who enjoyed relaxing with some nice songs and basic that was, this is title-artist announcing.

Jan's FCC detective work picked-up several subliminal and minor power-antenna height changes through 1964, and a significant boost to the then Class "A" limit of 3-kilowatts at 300 feet. This put the modest Jenkintown station within earshot of most FM radios within the Philadelphia area — not that FM penetration was anywhere near that of AM at the time. No matter, by early summer 1964, those with frequency modulation sets could enjoy WIBF-FM 24-hours per day.

In mid-May 1965, savvy electronic media buffs noticed the presence of Philly's first commercial UHF television outlet. Born in the Benson East complex as younger sister of the Fox Brothers radio facility, this new Channel 29 utilized the WIBF-TV moniker. (**LISTEN and WATCH: To WIBF's rare station ID jingle and see a recreation of WIBF-TV's short-lived logo,** <<http://bit.ly/we7tPC>>. — WPC2HUN.)

Running a small FM facility was easy and economical compared to logistics and costs associated with trying to turn a profit with a video operation. The Fox Brothers understood that full market coverage was especially essential in the TV game, so they invested considerable dollars in an approximately 1,100-foot-tall stick "on the south side of East Domino Lane, in the Roxborough section of Philadelphia."

Eventually, the Domino Lane area became home turf for several other such giant towers. My father once asked an engineer, who was often assigned to transmitter duty there, how the little street got its name. "It's all those towers standing next to each other," he reported matter-of-factly. "You see, if one goes, they'll all go." Anyway, with WIBF-TV's transmission shifted from the apartment house roof to the big Roxborough stick, it was decided that WIBF-FM might get a louder voice if sent from 1,109 feet above average terrain.

Sometime in 1969 this change got implemented along with a power reduction to 180 watts. Incidentally, 1969 also saw the Fox family selling its television property.

Though it would seem that WIBF-FM's rooftop 3 kilowatt should have trumped the 180-watt output that the FCC then required of a Class "A" licensee with an antenna situated at about a thousand feet, most RF engineers who are tasked with estimating useful signal coverage opt for height over power. As it turned out, the relatively tiny WIBF-FM wattage shot from a grand height over Philly turf, did not disappoint.

By the early 1970s, emerging mainstream competition from larger and more aggressive FMs caused WIBF to adopt a variety format emphasizing foreign language programming, though some middle-of-the-road "good" music and country and western shows remained in the lineup through about 1974. That's when WIBF-FM's evolution shaped it into a "religious and ethnic" outlet.

For several years in the '70s, a smattering of ABC network news could be heard on the Jenkintown station, but foreign tongues — from Spanish and Italian to Greek and Portuguese — became the standard fare of the then newly (in 1977) power-boosted 270 watt WIBF-FM.

The Fox Brothers connection with the second-city FM concluded when Jarad Broadcasting bought WIBF for \$3.4 million in late 1992. The new management dumped the religious/ethnic offerings in favor of a "new rock" simulcast of its co-owned WDRE (FM) Garden City (Long Island), New York. That last-

ed until November 1995 when WIBF-FM “began originating its own new rock music format.”

Jan reports that the Pennsylvania station’s calls were switched to WDRE (FM) in July 1996, but by the following winter, the legacy rocker lettering became moot, as the format got flipped to urban contemporary.

A year later, WDRE (FM) earned Jarad Broadcasting \$20 million in a sale to Radio One Licenses, Inc. The new identity of WPHI-FM, Philly 103.9 coincided with this sale. Spring 2002 ushered in an urban hip-hop format, under the name of *The Beat*. Then, in 2003, WPHI-FM beat it to new studios in Conshohocken, Pennsylvania.

Other changes included a late February 2005 call letter switch to WPLY (FM) and gospel formatting. Several weeks later, the station’s ID morphed again, this time to WPPZ-FM with the subtitle *Praise 103.9*.

Over the decades, the operating frequency and postcard image of a modest tower atop the old Benson East building appear to be just about the only remaining vestiges of the original WIBF-FM. Truthfully, Jan Lowry and I were rather surprised that even an extensive web search yielded little related to the Kennedy-era FM.

We wished that Trudy Keeson could have recalled greater detail about her guest stint at WIBF-FM. She remembered being the now-forgotten DJ’s guest on three occasions, and then instantly lost access to “the small studio containing a couple of turntables, shelves stuffed with records, a control console with one big meter in the center, and a capsule-shaped silver microphone” when a new, but humorless evening announcer seemed to take cruel pleasure in reporting that the fellow she could hardly wait to visit again no longer worked there.

“For the life of me,” Trudy confessed, “I can’t remember my radio benefactor’s name or much else about him except for his sandy blonde hair, and a penchant for turtleneck sweaters. He possessed a very pleasant broadcast voice with a hint of a smile at the end of each sentence. I suppose that kind of inflection is not uncommon in radio personality circles. but,” she admits wistfully, “every so often over the past 50 years, I hear someone on the air somewhere who touches some long ago emotion and makes me wonder if that might be him.”

## Do You Still Have a Hook in That Fisher?

It slipped my mind to mention how Trudy came to contact me with her story. The explanation is as simple as having thumbed through several magazines, including an issue of *Pop’Comm*, while in her doctor’s office . . . She was awaiting the results of a critical test and says pieces of her past were drifting in on all sides.

An article on vintage radio repair triggered memories of the Fisher and the little radio station living in her apartment building. Happily, Trudy’s medical prognosis turned out to be fine. With that worry gone, that old stereo console, WIBF-FM, and the ephemeral happiness they generated occupied her thoughts to the point where she emailed me wondering if the Fisher was, in fact, the rather uncommon Cadillac type of thing that her dad reported it to have been.

“Have been?” I begged of Trudy in a subsequent email, reading between the lines that the upper-crust audio ship had long since been dry-docked or perhaps sunk into some landfill.

“In March 1962, Aunt Rebekkah married and moved to suburban Washington, DC. About a month later, my father got a promotion opportunity and we relocated to the San Francisco area. We didn’t even wait for school to end.



**Photo F.** A YouTube video features WIBF’s rare station ID jingle and a recreation of WIBF-TV’s short-lived logo. To hear the jingle and see the logo, WPC2HUN encourages readers to visit: <<http://bit.ly/we71PC>>. (*Internet screen grab*)

“Dad wasn’t much for attaching sentiment to things, so he sold our apartment furnishings to a young colleague and his wife who had greatly admired the decor during one of the rare occasions when we’d entertained company in Jenkintown. I remember the fellow’s wife thanking dad profusely for making the purchase possible on their modest budget. She said something about my father being incredibly generous and letting everything go for a song.

“Obviously pleased to be able to do a happy young couple a good turn, my father quipped that the deal included the Fisher and hopefully lots of ways they could make music together. I know he was thinking of the long-ago happy times with my mom.

“After they went home, dad said he sincerely hoped that I understood why he figured it best for us to start over again out West . . . where it would be sunny almost every day. Our new place did impress me. And, he faithfully replaced the giant Fisher with a series of user-friendly transistor portables, including a pretty deluxe SONY that I still have, featured prominently on a granite-topped island in my kitchen.”

Trudy wanted to let me know that something else *audio* remains of her life with the venerable Fisher . . . “On the night I was first invited to see WIBF-FM,” she reflects, “I did my best to thread a reel of blank tape (that the appliance store had included with the Fisher) on the AMPEX recorder. Seconds before heading out of the apartment, I pushed the record-play buttons, just in case my host’s promise came true. A few days later, dad smiled that I was very lucky to have barely captured my one and only broadcasting debut . . . *You are tuned to WIBF-FM in Jenkintown, Pennsylvania at one-hundred-and-three megacycles on your FM*. . . the tape ran out as I was saying dial. Anyway, I kept the reel all these years. There are flakes of oxidation in the box and some of the tape is rubbed off clear. Who knows if it even plays anymore?”

In fact, Trudy has no desire to put the mechanism to the test. She fears unlocking a lonely reality that some cherished little piece of her past might no longer be free to remember out loud.

. . . *And so ends another fleeting day of radio history at Pop’Comm.*

# Restoring: The Heathkit GC-1A Mohican Receiver, Part III

## After Frustrating Nights at the Bench, It's Now Working — and Worth Every Bit of the Effort!

By Peter Bertini, K1ZJH

*“The Mohican GC-1A general coverage receiver was a triumph of early Heathkit engineering ingenuity.”*

Well, the good news is that we were pretty excited and occupied with the birth of our first grandson. The bad news is we found far more problems with the Heathkit GC-1A Mohican receiver than we had anticipated. Thus, the delay between Parts II and III in this series.

We're back on track now, but I'll confess I was ready to toss the receiver into a dumpster after a few frustrating late-night workbench sessions. Our deadline loomed — and alas, passed — with little progress to show and nothing to write about.

We're happy to report the GC-1A has been brought back to life and is playing away as I am preparing this column. More on this later: I'll share my opinions of this very unique and interesting SW receiver. One hint, though: *It was worth the effort!*

(NOTE: Respectively, Parts I and II of K1ZJH's Mohican restoration appeared in the January and February 2012 editions of Pop'Comm. — Ed.)

### Sourcing Replacement Transistors And Diodes

The GC-1 was cutting edge technology in the early 1960s. But rapid advances in semiconduc-

tor technology meant the PNP-type germanium semiconductors used in the GC-1A were obsolete by the time the kit was discontinued several years later.

Many of these devices probably haven't been made in 50 years. It isn't unusual to find early germanium transistors that have failed, developed leakage, or loss of gain. Finding exact, new old stock replacements for the 10 transistors and six diodes used in the GC-1A can be a challenge.

Many years ago Sylvania (ECG), Motorola and RCA (SK) offered semiconductor replacement lines. As the consumer repair industry waned, and the demand decreased, the only remaining supplier is NTE, Inc. Most of the GC-1A transistors can be replaced with devices from the NTE general replacement line. Visit <<http://www.nteinc.com>> to cross reference devices and to find stocking distributors.

For example, the NTE, Inc. online search engine suggests their NTE-126 transistor should be a suitable replacement for the 2N1396 RF amplifier, and the two 2N1225 devices used for the mixer and local oscillator stages, and also for the three 2N373 transistors used in the IF stages.

The NTE-107A will replace the 2N407 transistors used for the 1st audio and the pair used for



The Heathkit Mohican GC-1A general coverage receiver presented its share of headaches and challenges to expert restorationist Peter Bertini, K1ZJH, but he underscored that bringing it back to life was *well worth* the effort. (Photography courtesy of K1ZJH)



audio output transistors. I was fortunate: All of the original transistors in my GC-1A were still good. It's possible that a generic cross-referenced replacement

may not work in all of the circuits that used the original part.

All of the GC-1A transistors use sockets, so it is easy to swap out suspected

defective parts with a replacement as a quick test. The remaining supply of these generic replacement parts is finite and will be eventually depleted. I'm salvaging early semiconductors from scrapped germanium era sets just in case!



Photo A. A top view of the Mohican GC-1A chassis shows its condition before restoration work commenced.

## Germanium Diodes Are a Challenge

Of the six diodes used in the GC-1A, only 1N754 Zener diode is still available. This is a 6.8-VDC Zener diode, and either an NTE-5071A or 1N4736 would make an ideal replacement.

The two 1N2236 "compensating diodes" are worth discussing. These diodes set the biasing for the two 2N407 transistors that are used in a totem-pole arrangement for the audio output stage. Their purpose is to track temperature changes that might affect the audio stage biasing.

Too-low voltage drop across the diode junction means increased crossover distortion. Too-much bias means wasted battery power and maybe even a possible thermal run-away condition in the audio stage.

According to the 1N2236 specification sheets, they are 1-volt, 100-mA ger-

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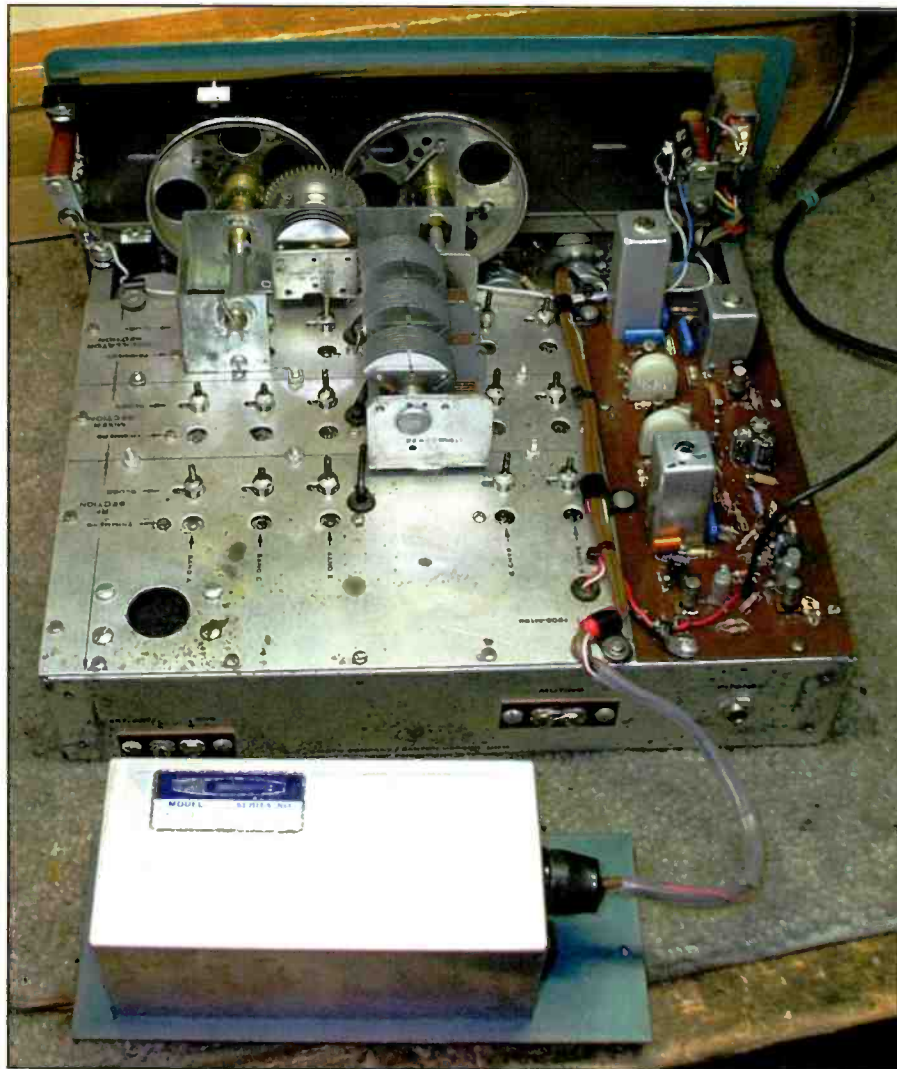
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**Photo B.** Here's a top view of the Mohican GC-1A after restoration. The point-to-point wiring and power cabling have all been redone. The restoration of the printed circuit board for the IF stages was featured last month.

manium diodes. I can't offer suggestions for replacing these *unobtainium* devices, but it appears that there might be three forward-biased Ge junctions hidden inside of each housing. Perhaps three NTE-109 germanium diodes in series might be a good substitute?

The remaining diodes are HD-2257 germanium diodes used for the ANL (automatic noise limiter), BFO *varicap* tuning diode, and for the AVC detectors. Heath must have found a good deal on a boatload of these devices on the surplus market. I haven't been able to cross-reference them!

I'd replace them with NTE-109 or any generic germanium small-signal diodes. Indeed, an NTE-109 is probably a suitable substitute for any of the small-signal germanium diodes used in the GC-1A.

The BFO diode is tuned by varying the voltage on a reverse-biased germanium

diode. (**NOTE:** A variable reverse bias tuning voltage on a diode junction can be used as an inexpensive *varicap* tuning diode. - K1ZJH.)

One final point: The detector diode is hidden inside of the last IF transformer and is not on the printed-circuit board! I had to open the last IF can to find it. Again, an NTE-109 or almost any generic small-signal germanium diode should work here.

## Problems, And More Problems!

My Mohican was a kit, and not factory wired. The poor soldering and workmanship left little doubt that the radio probably never worked properly. The kit price was not a piddling sum back in the 1960s.

Every nut, screw and spade bolt was loose. If it should have been tightened,

it wasn't. This meant that ground returns for terminal strips would be intermittent. Even the mounting nuts for the two feed-through capacitors in the RF section were loose.

I spent hours going around with ignition wrenches trying to tighten loose nuts

that were obscured by layers of wires and parts. The builder even substituted excessively long setscrews on the chrome knobs!

The soldering was horrendous, and a majority of the connections had to be redone, as well as replacing all of the

point-to-point wiring above and below chassis. **Photos A and B** are before and after topside shots of the GC-1A chassis. The *as-found* underside wiring is shown in **Photo C**.

Besides the large number of poorly soldered joints, there were burn marks on the hookup wiring PVC insulation, and sloppy lead dress throughout. The builder used yellow tape to cover the worst of the damaged wire insulation.

As I mentioned in the beginning, the original, or a good copy, of the original complete assembly manual is crucial when undertaking a major restoration for any kit-assembled radio. Good quality manual copies can be ordered from <http://www.manualman.com/>.

### The Halfway Mark!

**Photo D** shows the under-chassis progress at the halfway mark. The replacement wiring from the AVC switch and S-Meter can be seen in the upper left hand corner.

The remaining free wire leads are in the process of being replaced. I followed — as best possible — the PVC wire insulation color scheme used in the assembly manual. The builder didn't, and that led me into making a few wiring errors.

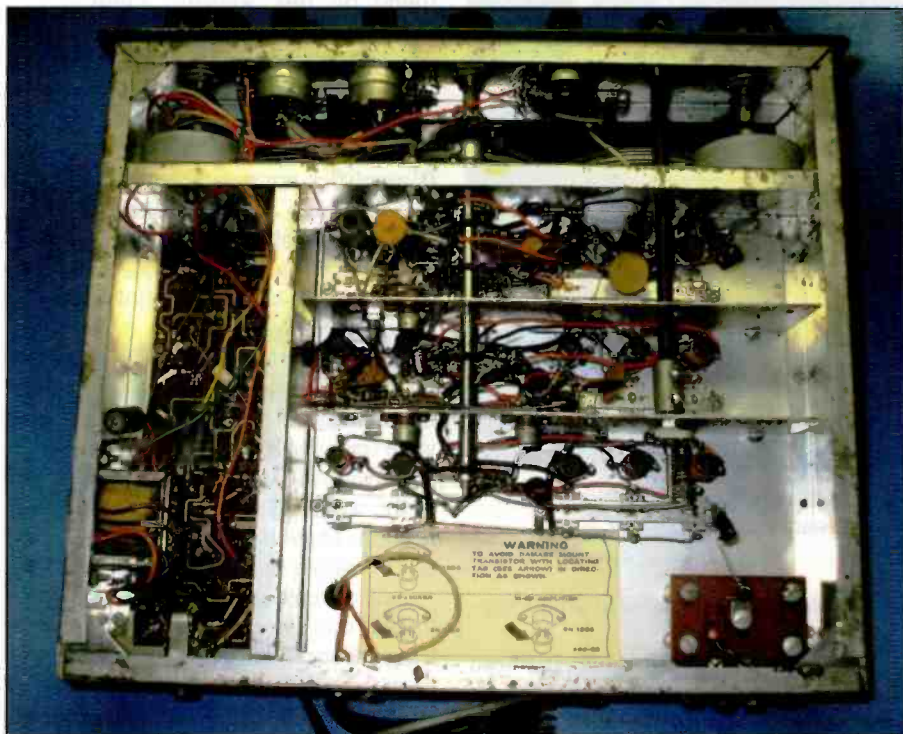
The wire was salvaged from old intercom cabling. It was tinned, and used PVC insulation colors that closely matched the original Heathkit supplied wire. The finished chassis can be seen in **Photo E**. I added a few tie-wraps to neaten up the wire harness bundles and dressed the wire leads to further improve the chassis appearance.

### The XP-2 Power Supply

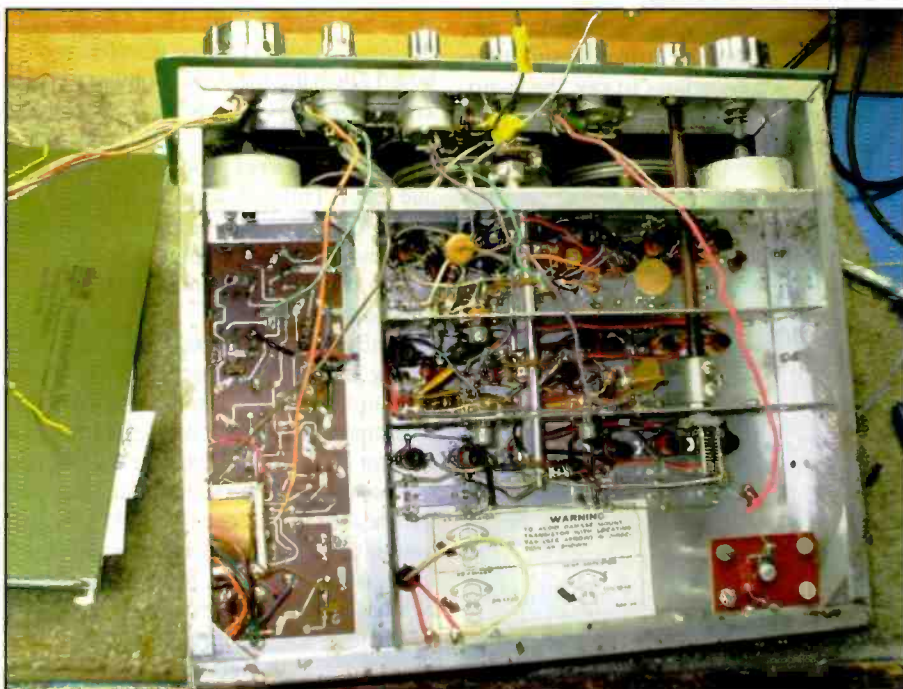
The Mohican came with a battery pack enclosure that held eight C cells. This assembly mounted into an opening on the rear cabinet panel. Power connections between the radio and power packs were made using a miniature 7-pin plug on the end of a cable. Heath claimed up to 400 hours of intermittent operation from a set of batteries. Modern Alkaline C cells would provide even longer service.

The XP-2 was the optional AC power supply for home use. The battery pack was removed and replaced by the XP-2. The original battery packs are scarce as most were misplaced soon after the XP-2 supplies were installed.

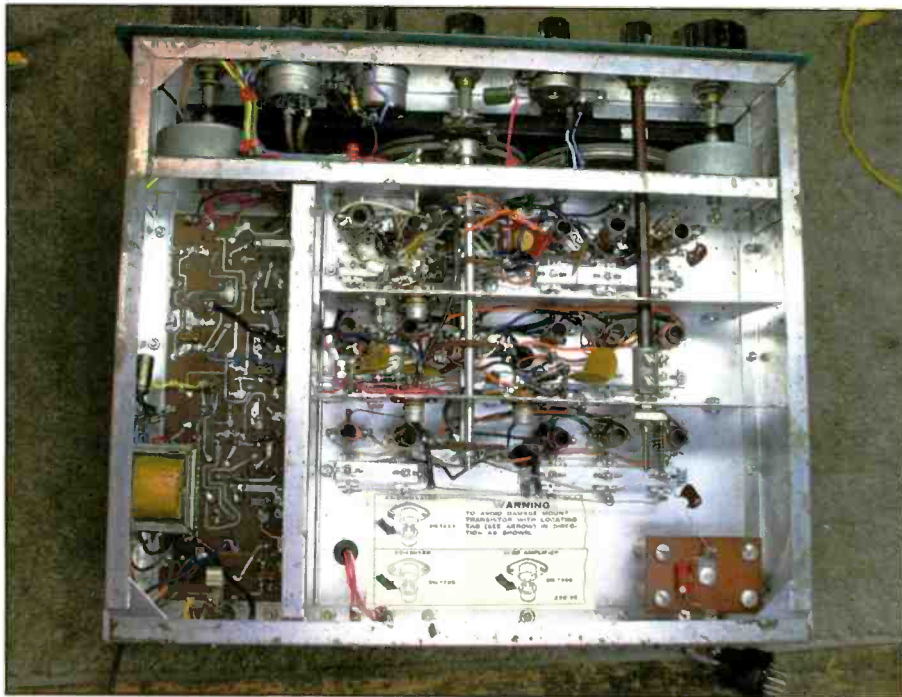
The original XP-2 supply, with the cover removed, is shown in **Photo F**. I made some minor changes to the original



**Photo C.** Things below chassis didn't look well upon initial inspection. Wire insulation was burned and the soldering and mechanical assembly was horrible!



**Photo D.** Replacing all of the point-to-point wiring was tedious, but the end result was worth the extra effort. This photo was taken at the halfway mark during the restoration.



**Photo E.** Here's an under-chassis view taken after the point-to-point wiring was replaced. Additionally, the RF section wiring was cleaned up a bit.

design, and mine is rewired according to the schematic in **Figure 1**. Note that the GC-1A is a positive ground radio! I added a 1N7004 diode between the chassis ground and the 12-volt line from the power plug to protect the set from reverse polarity voltages.

This diode was installed between the ground lug and the 12-volt terminal on the printed circuit board at the rear of the chassis. The XP-2 supplies an unregulated 13-volts DC voltage. But since critical RF stages in the radio are regulated by an internal 6.8-VDC Zener

diode, the set is immune to small supply voltage variations.

The reworked XP-2 is shown in **Photo G**. This radio is positive ground, and it isn't a good idea to try operating it directly from a negative ground car system.

### Trouble Shooting

It might be informative to explain the steps I went through in troubleshooting this radio. And needless to say, the radio did not work when I first powered it on.

Three problems were quickly traced to

point-to-point rewiring errors that were my fault. Back tracking my work against the manual's pictorial diagrams and directions spotted these errors.

If you don't have a manual, some information (alignment and schematics for the export GC-1U model) can be found on this website: <<http://bit.ly/yLb1p1>>.

There was no audio — and except for the pilot lamps — the radio appeared to be completely dead! I wasn't able to force a 455-kHz modulated signal through the IF amplifier, nor was there any indication that the audio amplifiers were working. This made troubleshooting extremely difficult since I wasn't able to troubleshoot the set using signal injection or signal tracing techniques.

I ended up temporarily tying in an external audio amp to the IF output terminal on the IF board. The dead IF stages were traced to a poorly soldered connection inside the last IF transformer — one of the windings had an open solder connection. Once that was repaired I could force a strong signal through the IF stage.

I discovered the loss of audio was due to dirty transistor sockets. A few drops of Caig's *DeoxIT* <<http://caig.com/>> cleaner on the transistor leads brought back the audio stages back to life. *Progress was being made.*

Now strong stations were becoming audible with a long-wire outside antenna. The audio was distorted, and the signals would fade in and out. This was an AGC problem due to a broken trace on the PC board allowing the AGC voltage to float. *The problem was found by accident.*

I noticed that the distortion cleared up slightly whenever I probed the AGC voltage level. This was an indication that the AGC line was open and not loaded. Ohmmeter readings quickly back-traced the problem to the damaged printed circuit board trace.

Once that was fixed, I could hear strong stations on most bands. The next problem was a short in the antenna trimmer capacitor unless it was left fully open. During kit assembly excessive soldering temperatures on the stator plate terminals overheated the solder that held the plate assembly in position on the ceramic insulator, allowing them to shift and short against the rotor plates.

Heating the solder joints and repositioning the stator plates fixed this problem. *Signals were heard on four out of five bands with the internal whip antenna.*

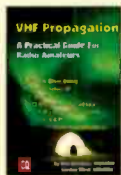
Band C was not working. I was able to



**Photo F.** The XP-2 AC power supply was an additional cost option for the Mohican receivers. The original supply is shown here.

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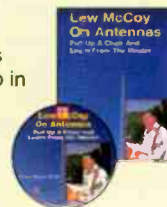
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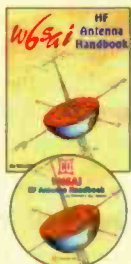
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see that local oscillator wasn't working on Band C by using my scope as a signal tracer. There is enough RF being radiated from the local oscillator to show on a Tek 2235A scope with the vertical gain set for 2mV per division when the scope probe is held near the stator plates.

I traced out the oscillator coil and bandswitch wiring used for Band C. While probing with the ohmmeter test leads I got lucky and spotted a wire lead that was freely moving on a band-switch

lug. Resoldering the connection fixed the problem and Band C was working.

One of the last problems I noticed was that there were several dead spots on the dial when tuning across any of the five bands. The local oscillator tested okay, but I noticed when the problem occurred that if I placed a finger on the tuning capacitor mixer stator plates I could hear signals and band noise.

The problem was a rubbing rotor plate on the antenna section of the tuning

capacitor. Gently bending that plate corrected the problem.

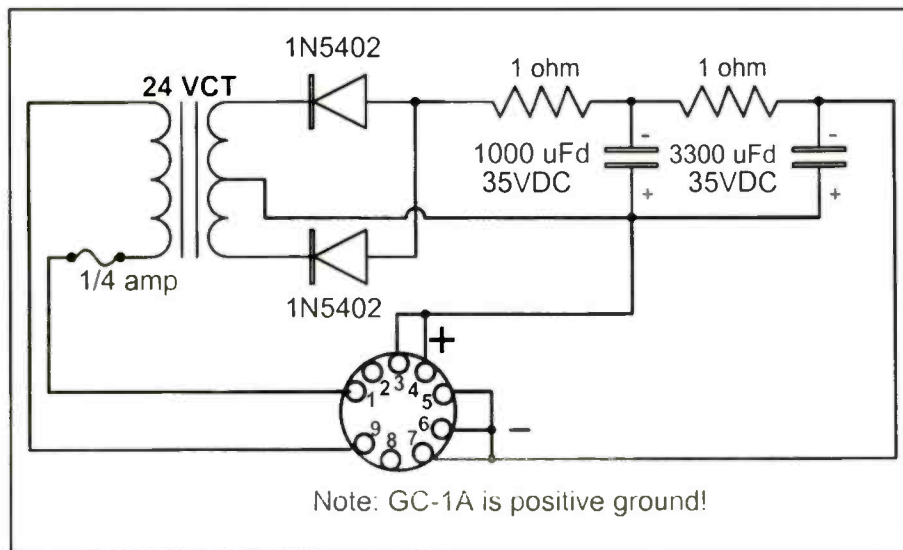
The last problem was an inoperative RF Gain control. The potentiometer was defective, and upon opening it up I discovered that most of the carbon track was missing. I suspect either the pot was defective, or the carbon track was destroyed by the use of a strong contact cleaner.

**Photo H** shows the damaged area on the RF gain pot. Caig's *Fader F-Series* is safe to use on pots with carbon tracks, <<http://bit.ly/yMU46U>>.

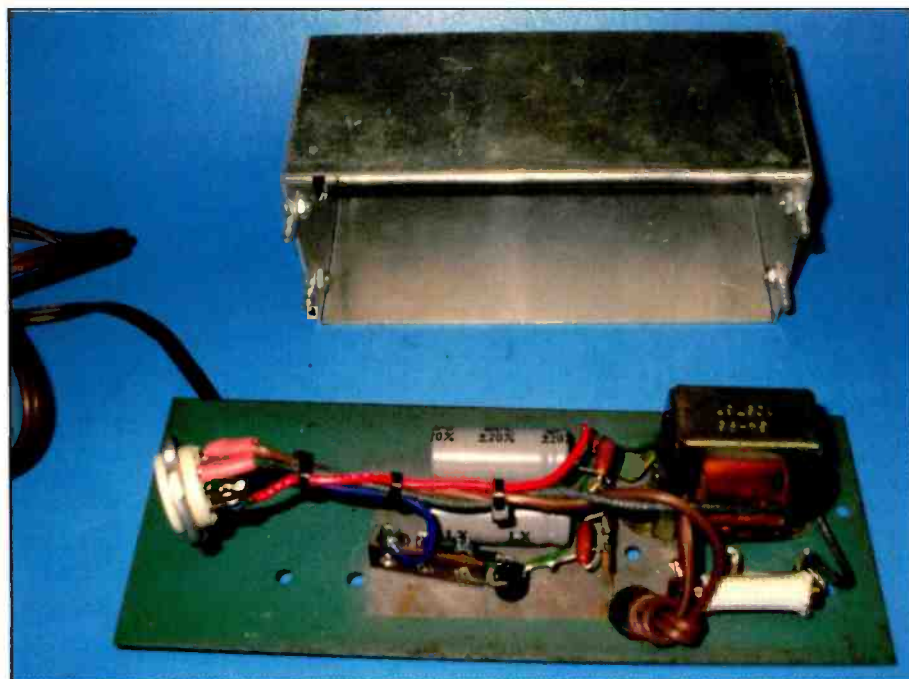
After a good alignment, the radio was playing good as new. The cabinet was scratched and could stand to be repainted at a future date. There is a tad of rust on the lower bottom lip of the wrap-around cabinet. In the meantime an application of car wax and a good buffing resulted in a finish that is acceptable for the time being.

Before sliding the Mohican back into its cabinet I added female slip-on crimp terminals for the speaker leads. This is easier than needing to solder and unsolder the speaker leads when removing or installing in the case. See **Photo I**.

Our June column will be featuring a special award-winning crystal set that has received recognition in the USA and in Australia. *You can build it!* But I'll include a short piece to highlight important Mohican alignment information — getting the IF alignment correct, and the local oscillator injection correct, require carefully following the steps outlined in the manual.



**Figure 1.** This schematic shows what was done when rebuilding my XP-2 AC supply. I increased the value of the second filter to 2200 uF from the original 1000-uF value.



**Photo G.** Modern components are much smaller than what was available 50 years ago! In this photo the streamlined XP-2 is rebuilt and ready for action!

## Overall Impressions

The GC-1A has been my daily player by my computer desk for several days. The radio is all-metal construction and it is no lightweight. It is a very stylish radio.

While many early SWL radios crammed coverage into four bands, the Mohican uses five bands for better dial resolution and features calibrated slide-rule scales for band-spread coverage on the 80-, 40-, 20-, 15-, 11- and 10-meter bands. The coverage is from 540 kHz to 32 MHz. The set has a tuned-RF stage, separate mixer and local oscillator stages, and a three stage IF. The GC-1A is single conversion.

Two ceramic filters in the 455-kHz IF stage gives a 3-kHz bandwidth at 6-dB down. The sharp bandwidth limits AM fidelity. My high frequency hearing is shot, so this wasn't a big concern to me.

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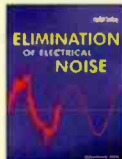
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Photo H. The damaged area on the RF gain pot.

On the other hand, the radio does a super job of separating signals on a crowded nighttime AM broadcast band.

The Mohican is very sensitive, and because there is very little internal heating it is also fairly stable. The BFO injection level is very adequate, and the set works on SSB and CW — although the drift is noticeable on those modes.

The tuning rate is a bit fast for SSB, and if you don't mind riding the band-

spread tuning to keep up with the drifting, it does a passable job on SSB. Adjusting the RF or IF gain controls doesn't affect the tuning or pull the oscillators. Many cheap AC tube radios exhibit that problem, and I was surprised how well the GC-1A passed those tests with flying colors.

The radio has a terminal strip on the rear panel for an external ground and antenna connection, or it can use the internal whip for all-band reception. Because of the low battery drain and modest 12-volt battery requirements, a Mohican is an excellent emergency backup receiver for your home or shack. I wish my GC-1A was ready to go when we lost power for nine days late last October.

The AGC should be switched off for SSB or CW reception, otherwise the BFO will swamp the AGC. The S meter is small, uncalibrated, and has very poor damping action.

I feel the GC-1A outperforms many of the later SW receivers offered by Heathkit, with the exception of the SB-313. It was a triumph of early Heathkit engineering ingenuity. While late 1950s technology can't compete with the performance offered by modern SW receivers, the Mohican does a very credible job as a pleasant SW companion for occasional use.

*Until next time, keep those old tubes glowing, and your soldering irons warm!*



Photo I. Adding push-on female spade terminals for the speaker connections make it easier to remove and install the Mohican in its cabinet.



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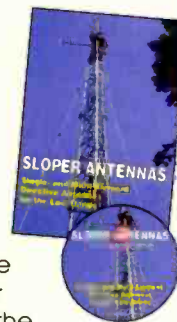
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## Sending Hot Dogs via FAX

by Bill Price, N3AVY  
<chrodod@gmail.com>

*"To avoid road rage, we began to discuss 'stuff' and the subject of electronic inventions came up."*

*(Bill Price, N3AVY, reports by smoke signal he's in the far reaches of Cowfield County and unable to file his Loose Connection this month. No Internet access. So, for your reading pleasure, we're reprising one of Bill's greatest hits, from 10 years ago this month. - KPC6PC)*

It's a long commute from Cowfield County to my high-paying job in electronics (as described in the ad for the HPJIE Correspondence School), and that gives me lots of time to think. Then too, the workday can take me many more miles in heavy traffic, as it did one recent day while on the way to "see if it's plugged in" with my fearless sidekick Steve Bradley (not his real name, which is Dave). To avoid road rage, we began to discuss "stuff," and the subject of electronic inventions came up. Actually, he referred to a FAX machine which was invented in the 1600s (he thinks) which was based on a swinging pendulum, paper fastened below, and some ink. If he remembers correctly (and he was NOT at Woodstock, so the chances are good) the inventor was Italian and his major problem was that he could not find a radio in all of Milan, or Venice, or wherever it was he was looking. I could have told him to just wait a while, but I wasn't there.

After Dave's inventor gave up his quest for the radio (he apparently never looked for a telephone either), he tried what was left — mechanical coupling between the sending pendulum and the receiving pendulum. While we sat in traffic, we came up with a few ideas of our own for pre-electronic communication.

I pondered the big pendulum swinging back and forth, with Michelangelo's hand guiding it across a magazine cover, and a really long string stretched across one of the canals of Venice, so that he could send a copy of the picture to a friend across the "street." For the life of me, I couldn't figure how to make two pendulums swing at the same rate without using a solid bar between them.

Dave and I wondered what invention we might think of that would be the ultimate invention — one that would free us at last from our high-paying jobs in electronics and allow us the freedom to have our own talk show. Dave's light bulb lit up first.

"A Beemer! We can make a Beemer!" he said.

"Someone already did. I've got one back at the office. It's an '82, but it still runs ok," I said.

"No—I mean a B-E-A-M-E-R beamer!" he said, frustrated. "To beam things up! Like Scotty did, bufoon!" Dave knew that the way to my heart was to mention my favorite orchestra instrument.

"Oh," I said, "that kind of beamer! Now I get it.

How are we gonna do that?"

"I don't know yet — that's the part we have to invent."

It must have been a good minute or two until he spoke again. "First, we have to disintegrate the thing we're gonna beam. Then we transmit the particles and put them back together on the other end. Sort of like scrambling a TV signal at the transmitter and descrambling it at the other end."

"Yeah," I said, "The descrambling part is always the hardest."

Back at the office, we raided the kitchen for a blender that some former employee had donated to the cause, and took it to our workshop.

"This," he said, "Will be our disintegrator. It may take longer than other devices, but eventually, it will reduce an object to its smallest particles."

"Wouldn't that be painful for humans?" I asked.

"Well, of course! This will be for inanimate objects! We'll get to beaming people after we get the basics down."

Applying my vast knowledge in physics, I began to look around for something that would increase the vibration of the molecules of the object we wanted to beam somewhere. Dave was busy connecting metal rods to the blender, and came back downstairs with a crockpot.

I found a small 23-GHz microwave transmitter which should increase the vibrations in just about any molecules we'd find. I connected a piece of wave guide to the output port and noticed that Dave was connecting two more metal rods — this time to the crockpot.

Noting my curiosity, he said, "It's a re-amalgamator."

"How far apart will you have to put the rods to make it work?" I asked.

He said that six feet ought to do it.

We took our inventions out to the backyard for initial testing. Hot dogs were chosen for the test objects.

In the end, mine provided lunch. My hot dog was cooked within a few minutes, though not evenly, and it really did transmit some of the test object to the waiting receiver, when it exploded from the internal pressure.

(Kids, don't try this at home.)

Dave's "Dog-O-Matic" had indeed reduced the dog to its lowest common denominator as well, but no matter how he spaced the rods, none of it ended up in the crockpot.

My microwave radios cleaned up easier than Dave's blender, but his was more fun to watch. As we drive off into the sunset, we call it a draw — 'til next time.

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