

POPULAR COMMUNICATIONS

Shortwave Listening • Scanning • AM & FM • Radio History

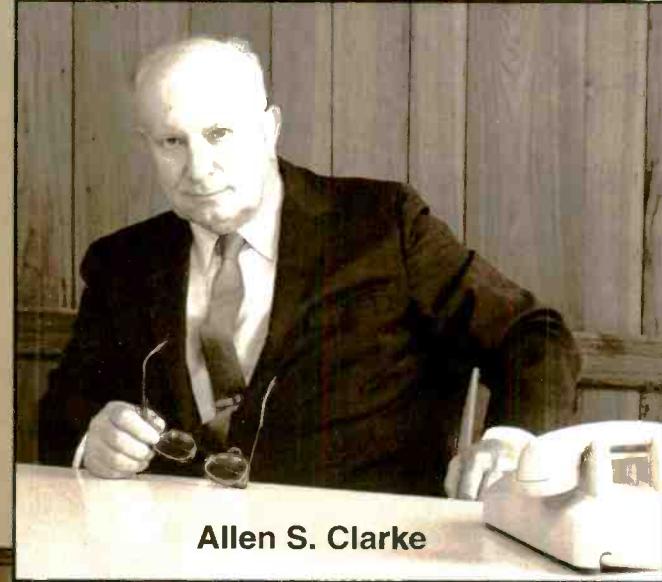
JUNE 2009

The Father Of Modern Spy Radios The Man Who Spurred American Superiority

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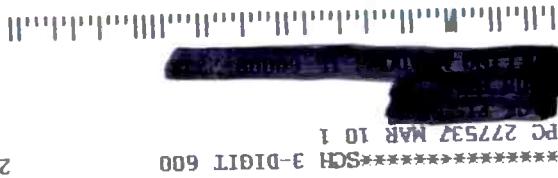
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Allen S. Clarke

PLUS: Scanning On Vacation
• Seventeen-Station Radio
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*Cellular blocked

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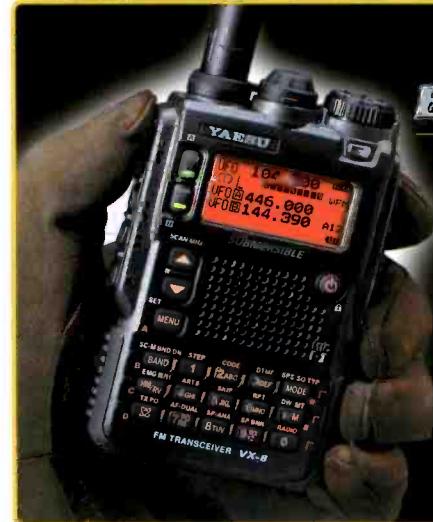


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*222 MHz: 1.5 W (USA version)

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*1 With optional accessories

*2 Cellular Blocked per FCC rule Part 15.121, may not receive 900 MHz Amateur band

*3 Assuming a duty cycle of 6-second transmit, 6-second receive, and 48-second standby (50 MHz 5 W)

* APRS® is a registered trademark of Bob Bruninga WB4APR.

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List \$400.00

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G6



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This special **Buzz Aldrin Edition** model celebrates 50 years of space travel. It comes with an AC adapter, ear buds, impressive gift box and certificate of authenticity.

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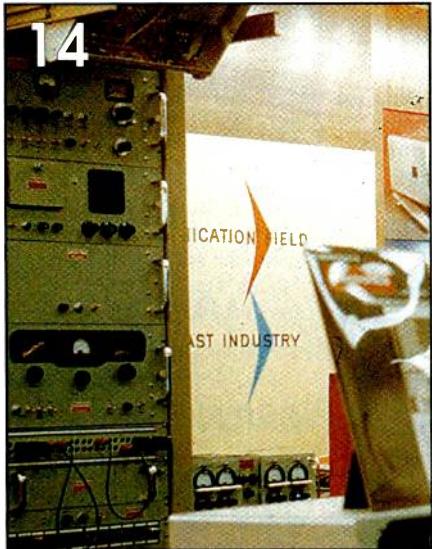
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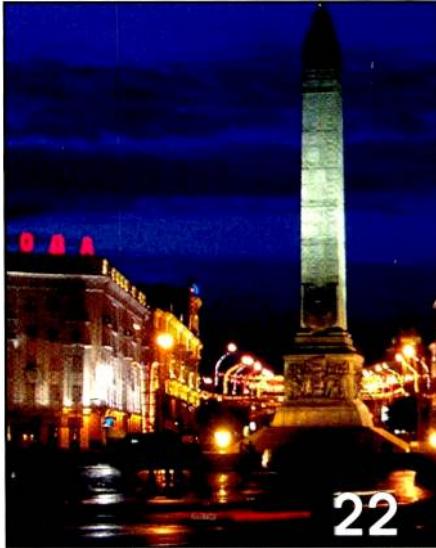
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- Prices and specs. are subject to change.
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ON THE COVER

Even something as seductively dangerous—in most minds at least—as surveillance or spying isn't all glamour. There's a lot of hard slogging that goes on behind the cloak-and-dagger scenes. The same goes for the radios used in the intelligence gathering efforts. Our cover feature this month tells the story of one dogged slogger whose innovations helped spur the U.S. superiority in VHF and UHF surveillance radios. Then virtually disappeared...

See "The Father Of Modern Spy Radios—Allen S. Clarke," by Terry O'Laughlin, starting on page 14. (Cover photo of a print used to assemble Clarke 167-A tuners, private collection; inset of Allen S. Clarke from photo archives of Communications Electronics, Inc. Both used with permission)

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Radios & High-Tech Gear

Tap into secret Shortwave Signals

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

MFJ-162B
\$199⁹⁵

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

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

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

Eavesdrop on the World

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

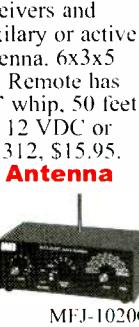
Copy RTTY weather stations from Antarctica, Mali, Congo and many others. Listen to military RTTY passing traffic from Panama, Cyprus, Peru, Capetown, London and others. Listen to hams, diplomatic, research, commercial and maritime RTTY.

Super Active Antenna

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

Receives strong, clear signals from all over the world. 20 dB attenuator, gain control, ON LED.

Switch two receivers and auxiliary or active antenna. 6x3x5 in. Remote has 54" whip, 50 feet coax. 3x2x4 inches. 12 VDC or 110 VAC with MFJ-1312, \$15.95.



MFJ-1024
\$159⁹⁵

Indoor Active Antenna

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



MFJ-1020C
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Tuned circuitry minimizes intermod, improves selectivity, reduces noise outside tuned band. Use as a preselector with external antenna. Covers 0.3-30 MHz. Tune, Band, Gain, On/Off/Bypass Controls. Detachable telescoping whip. 5x2x6 in. Use 9 volt battery, 9-18 VDC or 110 VAC with MFJ-1312, \$15.95.

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Plug this compact MFJ-1022 MFJ all band active antenna into your receiver and you'll hear strong, clear signals from all over the world, 300 KHz to 200 MHz including low, medium, shortwave and VHF bands. Detachable 20" telescoping antenna. 9V battery or 110 VAC MFJ-1312B, \$15.95. 3 1/2" x 1 1/4" x 4 in.



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EDITORIAL

Tuning In

From Fireside To FiOS

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

What goes around comes around—it's just not dressed in the same clothes. Of course, now with the economy in the state it's in, it feels more like round and round and round. In attempts to slow the spinning and ease the general foreboding, the 44th president reached back to the playbook of earlier leaders and is addressing the populace directly, bypassing the media filter—now there's a modern phrase for you. It's nothing new in substance, but constantly evolving in execution.

The names have changed, the dollar amounts have certainly increased, and entering the common lexicon are other phrases, like "toxic asset." But president number 44 is facing a situation similar to the one faced by 32, which gave rise to the most famous of all presidential addresses, bypassing the media filter: Franklin D. Roosevelt's Fireside Chats of the Great Depression. These radio broadcasts were started in 1933, but bringing powerful voices to the people goes back even further.

Fun Facts:

The earliest known recording of a U.S. president is that of Benjamin Harrison (#23, as long as I'm counting chief executives), his voice etched onto an Edison wax cylinder in 1889. That 36-second snippet, and other presidential voices, can be heard through the Michigan State University Libraries site at <http://vv1.lib.msu.edu/index.cfm>.

On June 14, 1922, Warren G. Harding (#29) became the first U.S. president to be broadcast over the radio. He was also the first to own a radio and the first to have a radio installed in the White House.

In 1924, Calvin Coolidge (#30) became the first president to broadcast directly from the White House.

The "Great Communicator," President Ronald Reagan (#40), began the tradition of broadcasting a weekly radio address in the 1980s.

Television was the next big leap forward, of course, and those of us of, umm, a certain age, remember pivotal communiqués from John F. Kennedy (#35), Lyndon Johnson (#36), Richard M. Nixon (#37), and more (various).

Starting with George W. Bush (#43), political addicts could download podcasts of the now traditional weekly radio addresses. True junkies could transfer them to portable listening devices via a USB or FireWire connection.

Barack Obama is just the latest president to take advantage of technological advances. He has been the first to issue a YouTube version of the weekly radio address, and he upped the techno-ante even further with his "online town hall" in March. This marked the first time a president fielded questions in real time over the Internet. Prior to the start of the event, over one hundred thousand questions were submitted to the "open for questions" section of the White House website (www.whitehouse.gov). The site allowed people to vote on the questions they most wanted to see asked, and some 3.6 million votes were cast. That's pretty direct communications with a lot of "the people."

We may still huddle around radios or televisions for momentous occasions, but nowadays the experience seems to be becoming more solitary, as we sit alone at laptops or listen over our iPods. Perhaps next up is Direct-to-TV brainwaves. Who knows? But I bet the message will be the same: We're in this together and things are going to get better.

Issue Notes

Let me take a moment to answer some recurring questions. Many readers have asked about the frequency of certain columns, especially "Wireless Connection" and "Shannon." I want to assure fans that these columns aren't going anywhere. Sometimes we just don't have enough pages to squeeze in all the content we have in a given month; sometimes the writers themselves ask to sit out for various reasons. These columns are affected most because they tend to be less time-sensitive than the others. Lately I've tried to mix it up in the interest of fairness, and have "bumped" some others instead. As #42 would say, "I feel your pain." ■

AOR introduces the AR-Mini

Big Features! Small Size!

**This pocket-size
communications
receiver delivers BIG
performance!**

The AR-Mini offers legendary AOR quality and a wide array of the most popular features found in the AR-8200 Mark III.

But, the new AR-Mini does it all in a convenient pocket size water resistant version that's very easy on a budget.

Whether you use it for work or pleasure, you can take the AR-Mini with you to listen to public safety communications, airline traffic, marine communications, weather channels, trackside communications at car and motorcycle races, radio and television reporters in the field, shortwave communications from around the world, amateur radio frequencies, AM and FM radio signals, analog TV audio and more.

Powered by two AA Ni-MH cells (1.2v), the AR-Mini operates for approximately 22 hours on a single battery charge but it can also be used with AA alkaline batteries or with an optional DC cigar-lighter adapter.



Actual size

AR-Mini Features include:

- 1000 memory channels (10 banks x 100 channels)
- AM, NFM: Triple conversion WFM: Double conversion
- TCXO for greater stability
- 100kHz ~ 1299.995 MHz (+/-2.5ppm)*
- CTCSS and DCS
- Cloning capability (AR Mini to AR Mini or through PC connection)
- RF attenuator
- Automatic or selectable tuning steps
- Scan speed: 8 steps/sec.
- Priority Channel
- 2 VFOs
- Memory channel skip
- Battery save function with auto power off timer
- Free downloadable memory management software
- Preprogrammed "bug" detector frequencies with level beep to find hidden transceivers
- Small size: 2.4" x 3.7" x 0.9" (without projections)
- Weighs only 7.4 oz with antenna and batteries
- Signal meter
- Low battery indicator
- SMA antenna connector

The AR-Mini is now available at your favorite AOR dealer!



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The Weirder Side Of Wireless

by Staff

Horse Cents

According to a report on Telegraph.co.uk, a British woman who plays "Classic FM" on 100.8 MHz FM in her stable to calm her horses has been told that she must pay a £99 (about \$142) annual license fee, as it constitutes a "performance."

As part of a drive to get commercial premises to pay for licenses, the PRS (Performing Rights Society, the UK's version of ASCAP) has recently been targeting stables with phone calls demanding payment—just as it has been doing for years with shops, bars, and cafés, which have to apply for a license to play the radio.

The target in question, Rosemary Greenway, has been playing radio passages of opera and orchestral symphonies to the 11 horses in her stable for more than 20 years, convinced it helps soothe them. "We are right next to the RAF Lyneham air base so it dulls the noise from the aircraft and the wind. It gives them a nice quiet atmosphere; you can only exercise one horse at a time so it helps the others to stay calm," says Greenway.

Chris Doran of the British Horse Society said her organization heard from several stables reporting calls—with an "abrupt" tone—coming from the PRS. Rather than pony up the annual license fee, Greenway now leaves her radio off, explaining, "You would have thought that playing music to your own horses was allowable, but apparently not."

Her horses might suggest that she can get over this hurdle with a stable CD/MP3 player mounted with public-domain classical music. They might also supply her with £99 worth of fresh manure to send the PRS as a "thank you."

Fishy Nokia Okay

The UK's Andrew Cheatle may own the most reliable cell phone in the world. He told The Sun newspaper, "I was messing about with my dog, and my phone must have fallen out and been swept out in the swell. I kept calling it, but I gave up hope after a couple of days."

A week later he was out shopping for a new cell phone with his girlfriend when her cell phone rang. She told him, "Your old mobile number is calling my phone." The chap on the other end, trawlerman Glen Kerley, said he was gutting a large codfish that morning for his fish stall and found Cheatle's Nokia 1600 phone inside. Kerley tried using the phone, but it didn't work. So he removed its SIM card, put it in his own handset, and started calling numbers from the SIM's phonebook to find the owner.

"I didn't believe him, but went to meet him and found it was my phone—a bit smelly and battered—but incredibly it still worked after I let it dry out," Cheatle said.

Kerley, of Worthing, West Sussex, said, "Cod are greedy fish—they'll eat anything. They have big heads

and big mouths. "I've found plastic cups, stones, teaspoons, batteries, and I've also heard of someone finding false teeth in one. "This fish was about 25lbs and about 4ft long—not unusual but bigger than average."

Cheatle, who runs an online retail company, apparently still uses the fishy phone, because cats follow him everywhere.

Pirate Broadcast Up In Smoke

FCC officials and Orange County, Florida, Sheriff's deputies from the gang unit busted an unlicensed FM radio station they say was reportedly broadcasting information about where vice crimes were taking place. Authorities say the "Street Heat" broadcast on 91.3 MHz included live ads for criminal gangs and discussions of where to buy drugs and find prostitutes.

After receiving a complaint from a concerned listener, the FCC monitored the frequency and located an antenna in a tree with a feedline leading into a house. Police say that when they broke in they were shocked to find Balthazard Senat and Robert Roth smoking marijuana and negotiating a sale of the substance to one of their listeners, live on the air.

Senat and Roth were arrested and charged with unauthorized transmission, and with possession of cannabis with intent to deliver. FCC officials dismantled and seized the radio station equipment and other assorted booty.

The Songs That Make The Young Girls Cry

The New Zealand city of Christchurch thinks it's come up with an easy (at least easy-listening) way to soothe the savage teenage breast—maybe even disperse it. The city intends to add the mellow song stylings of Barry Manilow to the musical mix broadcast through its central mall district in the hopes of making the unruly teens who congregate there equally mellow, according to a report by the Associated Press.

"The intention is to change the environment in a positive way...so nobody feels threatened or intimidated," Central City Business Association manager Paul Lonsdale recently told AP. A group of several dozen young people regularly spread rubbish, spray graffiti, get intoxicated, use drugs, swear and intimidate patrons at the outdoor mall, Lonsdale said. Local authorities and local property owners are banking on "nice, easy listening" songs like Manilow's "Can't Smile Without You" and "Mandy" to change such anti-social behavior. But one 16-year-old said that unfashionable music wouldn't deter them. "We would just bring a stereo and play it louder," the teen told AP. Lonsdale countered that the city would then hit them with anti-noise laws, according to the report. ■

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News, Trends, And Short Takes

by D. Prabakaran

VOA Audience In Russia “Obliterated” By BBG

Free Media Online reports that according to an independent study commissioned by the U.S. Broadcasting Board of Governors (BBG), the total annual audience reach in Russia for the Voice of America (VOA) Russian-language radio, TV, and Internet dropped from 10.3 percent in 2007 to 2.5 percent in 2008. It is believed to be the greatest audience loss in the history of international broadcasting in a one-year period for a major media outlet which maintains its market presence. In fact, Free Media Online estimates that the annual reach for VOA in Russia is now well below 1 percent.

According to FreeMediaOnline.org president Ted Lipien, the BBG is to blame for causing a 98-percent loss of audience in just one year. Lipien said that BBG's actions have caused hundreds of thousands of U.S. taxpayer dollars to be wasted at a time when audiences in Russia are faced with increased media censorship and need access to objective news and opinions from the U.S.

Russia And India To Adopt DRM

Russia's General Radio Frequency Centre has decided to introduce DRM in Russia in the medium and shortwave bands. The Russian General Radio Frequency Centre, the organization that coordinates national spectrum management issues, made the decision in January 2009 following a series of tests on the future use of transmission networks with digital technology. The Russian text of the decision is available on the website of the Ministry of Communications and Information of the Russian Federation.

After extensive trials in 2007, All India Radio (AIR) has also decided that DRM is the best technology for converting its vast public service broadcasting network to digital. After conducting trials over a one and a half year period, AIR started regular DRM transmissions from a 250 kW shortwave transmitter installed near the capital city New Delhi in January this year. AIR is also in the process of converting four shortwave transmitters (250 kW) to DRM mode. There are plans to introduce DRM transmissions in 42 new mediumwave, 36 existing mediumwave, and five new shortwave transmitters, though the cost and availability of good receivers remains a critical issue in their implementation strategy for the next five years.

(Source: Digital Radio Mondiale Consortium)

Israel Radio Cutting Mediumwave Broadcasts

The Israel Broadcasting Authority is gradually eliminating mediumwave broadcasts, a cost-cutting measure that will seriously harm Israel Radio's news in English and a dozen other foreign languages. A date for closing the AM service completely has not been announced, but insiders indicated that the move was imminent.

Until recently, anyone wishing to ascertain the frequencies used by the IBA for its radio news could find details of both AM and FM transmitters on its website.

The AM listings have, however, disappeared without any explanation. Asked about the development, an IBA spokesperson confirmed that AM broadcasts were being cut. The spokesperson said the annual cost of maintaining an AM transmitter is NIS (New Israeli Shekel) 20 million, a sum the IBA, in its current financial situation, can no longer afford.

Informed sources voiced particular concern about the future of REKA, the foreign-language network that serves immigrants, the diplomatic community, and anyone else whose Hebrew is insufficient to follow regular broadcasts. They said that FM reception for REKA is poor or nonexistent in many parts of the country due to the location and limited power of IBA transmitters. This includes many areas of Jerusalem.

(Source: *Jerusalem Post*)

New Clandestine Station Broadcasting To Madagascar

A station calling itself Radio Mada International (but apparently not connected with the domestic station called Radio Mada that has been on the air since 1995) has begun daily broadcasts on shortwave. The station supports the deposed president Marc Ravalomanana. Broadcasts are scheduled at 0400–0430 and 1700–1730 UTC on 5895 kHz. There are also broadcasts every three hours from 0300 UTC on the website at www.radiovazogasy.com. The station is an initiative of Tiako I Madagasikara (I Love Madagascar, TIM) which is a political party in Madagascar founded in 2002 to support President Marc Ravalomanana. It is now the largest party in the National Assembly of Madagascar, with 106 of 127 seats after the 2007 parliamentary election.

(Source: *Wikipedia*)

RTÉ To Begin Daily Shortwave Service To The Irish In Africa

RTÉ begins daily shortwave service to the Irish people in Africa. This link with home is in response to many requests from Irish people scattered throughout the continent, involved in providing aid, peacekeeping, construction projects, and missionary work. According to the Irish government there are many thousands of Irish working in Africa.

Although RTÉ has long been available on satellite and via the Internet, those in remote regions of Africa have asked for shortwave transmissions that will reach portable radio sets in areas that do not even have electricity, let alone easy access to satellites and the Web. The main coverage areas are West, Central, and East Africa.

A one-hour selection of RTÉ radio programs will be broadcast each evening from 1930–2030 UTC on 6220 kHz. The transmission is provided by WRN, the London-headquartered international radio and TV transmission company that has been transmitting RTÉ around the world since 1994.

(Source: WRN)

(Continued on page 11)

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Capitol Hill And FCC Actions Affecting Communications

by Richard Fisher, KI6SN

Milwaukee FM Pirate Fined \$10,000 By FCC

A \$10,000 fine has been issued by the FCC to a Milwaukee man for allegedly operating a pirate radio station on 92.9 FM, according to FCC documents.

Agents began monitoring the broadcast in 2006 after receiving complaints. The signal was tracked to a single-family home, later determined to be occupied by Steven Skalecki, the FCC said. After getting no response from a knock on the door, a notice was left warning about the penalties for operating an unlicensed station and directed that the station stop broadcasting.

A search of property ownership records gave agents the information they needed to mail the notice of violation directly to Skalecki. Subsequent FM transmissions on 92.9 MHz were repeatedly tracked to the same address in 2007.

Skalecki told the Commission that he had no transmitting equipment, that he had a weather monitoring station, and that the illegal broadcasts were coming from a nearby residence "on which several antennas are located," according to the FCC report.

After review, the Commission discounted Skalecki's account and arguments and issued a \$10,000 notice of apparent liability and subsequently issued an order of forfeiture.

Commission Pulls Alabama TV Station's License

A Florence, Alabama, television station that attempted to satisfy FCC requirements by broadcasting a test pattern for 24 hours has had its license and

construction permit cancelled and the station's call-sign—WYLE—deleted. The action came on the heels of the station's shutdown for a yearlong period beginning in early 2007.

The FCC stipulates that if any station remains off the air for 12 consecutive months, its license will expire at the end of those 12 months. Station owner ETC Communications had taken the station off the air February 8, 2007, due to "financial problems," according to the FCC.

In an effort to prevent license revocation, WYLE owner ETC Communications informed the FCC that on February 3, 2008, it had put the station back on the air for 24 hours before going off the air again. When the FCC asked what WYLE had broadcast, ETC responded it had been a test pattern "for the entire 24 hour period."

According to a report on *Broadcasting & Cable* magazine's website, the FCC's Media Bureau determined that the station's action "was insufficient to exempt ETC from automatic expiration of the station's license," and in March cancelled the license, the construction permit and deleted the WYLE call sign.

FCC documents stated that "while the station was silent, ETC entered into an asset purchase agreement to sell the station to WYLE TV, LLC ("WTL"). Because WTL is commonly owned with the licensee of WHDF (TV), Florence, AL, and there are less than eight independently owned and operating television stations licensed to the Huntsville-Decatur, AL DMA, the parties filed a failed station duopoly waiver request."

List Of TV Stations And DTV Conversion Dates Available Online

A list of U.S. television stations which announced intention to switch from analog to digital signal prior to the June 12 conversion date has been released by the FCC and is available online. To access the list, visit http://hraunfoss.fcc.gov/edocs_public/attachmatch/DA-09-589A3.pdf. The Commission has also released a list of TV stations intending to hold to the June 12 conversion date. That list can be accessed at http://hraunfoss.fcc.gov/edocs_public/attachmatch/DA-09-589A2.pdf.

According to a published report on *SlashGear.com*, 158 stations planned to make the switch prior to the June 12 deadline. "Different conditions have been set for stations depending on whether they are commercial or otherwise, together with their financial situation," the online item said. "The FCC requires stations to give viewers 30 days notice before ceasing their analog service." Non-commercial stations with budgetary constraints are exempt, however, and could have



started shutting off analog transmissions as early as March 27, SlashGear said.

In major markets, the FCC requires a minimum of an "enhanced analog nightlight signal" from at least one major network TV outlet until June 12th.

Remaining Analog TV Stations Directed To Give More Conversion Information

The FCC has instructed analog television stations that did not switch to digital signals earlier this year that they must "provide on-air and other notifications of potential signal loss if two percent or more of their analog viewers are predicted to lose service."

In said report by Mark Hefflinger in the online site Digital Media Wire the Commission cited "lessons learned" from the one-third of U.S. TV stations that switched to digital broadcasting on February 17, and directed stations discontinuing their analog signals June 12 to give additional information to viewers. Specifically, the FCC called for information on use of antennas, "especially if they are switching between VHF and UHF bands," and information on the possibility that viewers might need to purchase a new antenna to receive the new digital television signals.

Also, stations "must inform and remind viewers using a digital TV converter box with an analog TV set to set the [converter] to 'rescan' for channels, as many stations are switching their channel numbers during the transition," Hefflinger wrote.

Commissioner Adelstein Nominated To Oversee Broadband Expansion

A two-term member of the FCC has been nominated by the Obama Administration to an agency of the U.S. Department of Agriculture that will have a major part in the expansion of high-speed Internet.

According to published reports, the White House has put forth the name of Jonathan Adelstein to run the Rural Utilities Service, which is receiving funding to increase broadband Internet service in rural areas under the economic stimulus plan.

Adelstein, a Democrat, has been a member of the FCC since 2002.

FCC Denies Petition To Increase Question Pools For Amateur Exams

A petition to significantly increase the size of question pools that make up licensing exams for radio amateurs was denied by the FCC

on grounds that the Raleigh, North Carolina, operator seeking the increase did not make a strong enough case.

According to the American Radio Relay League's *ARRL Letter*, Michael Mancuso, KI4NGN, filed a petition with the FCC in April 2008, seeking to increase the question pool from 10 times the number of questions on an exam to 50 times more questions.

In his 2008 petition, the *ARRL Letter* said,

Mancuso claimed that the current question pool is too easy to memorize and that there has been a significant increase in the number of amateur radio operators receiving their licenses over at least the last decade or more who do not appear to possess the knowledge indicated by the class of license that they have received. Most discussion about this topic, both on the air and on Internet forums, generally refers to these widespread observations as the "dumbing down" of amateur radio. It has been widely assumed that the cause of this observed situation is based upon the subject material addressed by the license examinations, that the material requirements specified for the examinations does [sic] not meet some minimum level of knowledge expected by some or many in the amateur radio community.

The Commission wrote that Mancuso argues "the current question pool size is no longer adequate, because online practice examinations enable examinees to memorize a question pool without fully comprehending the subject matter being tested. Consequently, you propose to increase the size of the question pools, in order to hinder memorization."

According to the *ARRL Letter*, the Commission "concluded that Mancuso did not present grounds for the Commission to amend its rules: 'As noted above, the purpose of the examinations is not to demonstrate an applicant's comprehension of certain material, but rather to determine whether he or she can properly operate an amateur station. Moreover, your contention that there has been "a significant increase in the number of amateur radio operators...who do not appear to possess the knowledge indicated by their class of license" is not supported by any data or facts.'"

The FCC pointed out that the Commission's rules only dictate the minimum number of questions in the question pool for each amateur radio license class. This "does not prevent the National Conference of Volunteer Examiner Coordinators (NCVEC) from increasing the number of questions in a question pool should it decide that this is appropriate. We conclude, therefore, that the petition presents no evidence of an existing problem or other reason for a rule change," the FCC told Mancuso.

NEWSWORTHY

InfoCentral (*from page 8*)

Sirius XM To Roll Out iPhone App In Second Quarter

Sirius XM Radio Inc. is looking to expand the reach of its satellite radio service with the second-quarter launch of an iPhone application as it explores a potential marketing partnership with satellite TV provider DirecTV Group. The company, which had to sell a 40-percent equity stake to John Malone's Liberty Media to resolve looming debt problems, is looking for new revenue streams as its primary distribution outlet, new car sales, is looking "terrible" this year, according to management.

Sirius said the iPhone application would be available to its 19 million subscribers and to Apple Inc.'s 7 million U.S. iPhone users. It can also be used by iPod Touch Wi-Fi users.

Sirius also sells satellite radios through traditional retail outlets, but it had a very weak fourth quarter, when electronics chain Circuit

City, a major customer, filed for bankruptcy. "There's a lot of opportunity for [Sirius] with iPhone," said Miller Tabak analyst David Joyce. "Unlike buying a new car, it's not an expensive proposition, but it's a tough time for consumers to be trying new products."

(Source: Reuters)

Radio Romania International Broadcasts To Africa

As of March 29, 2009, Radio Romania International's English Service was to begin broadcasting programs to Central Africa at 1100–1200 UTC on 15430 and 11790 kHz. From the same date, the English broadcast to Western Europe, which had been at 1200–1300 UTC, was to advance an hour, to 1100–1200 UTC on 11775 and 15210 kHz.

What Is Communications?

by Rob de Santos
commhorizons@gmail.com

"I think...that the communications hobby in general will instead evolve with the technology, and that in 2059 there will be a gathering of hobbyists following popular communications who we wouldn't recognize as hams or SWLs but who can trace their history back to those of us today."

How do you communicate? Sign Language? Talking in Swahili? Letters? Email? Ham radio? Twitter? The answer to that question is directly related to the answer to this question: How will we communicate in the future?

First though, we probably should ask something else: how is communication defined? Merriam Webster Online defines it this way, *1: an act or instance of transmitting; 2a: information communicated; b: a verbal or written message; 3a: a process by which information is exchanged between individuals through a common system of symbols, signs, or behavior <the function of pheromones in insect communication>; also: exchange of information.* This is a pretty good definition from the standpoint of someone interested in communications.

As readers of *Popular Communications*, we would certainly be considered a group that is more concerned than the average person with the current state of communications and its future. Most of us would classify ourselves as scanner hobbyists, SWLs, hams, low band DXers, etc., or even all of the above. If you read this column, I'd go a step further as you clearly must be interested in what is on the horizon of communications.

So what can we say about future communications? To answer this I'll pose the following hypothesis: *"Future modes of communication will be evolutionary developments of current methods facilitated by unpredictable advances in technology."* Here's what I mean: Modes of communication are invariably evolutionary. The origins of human language stretch unknown eons into the dim past, with the written word tracing back "only" some seven to eight thousand years. Technology though tends to have sharp points of demarcation, such as the invention of the printing press, telegraphy, radio, computers, the Internet, etc. We can date these inventions and their impact very specifically, but what the technology did was facilitate more efficient means of using the modes we already had.

As humans we can only do certain things with our mouths, hands, etc., so new modes of communications are rare and far between, constrained by our physiology. Technology, however, comes at an accelerating pace, fueled by the incredible inventiveness of the human mind.

You're probably saying: "Okay, Professor Rob, but what has all this got to do with my

hobby?" Probably more than you think. First consider how long you've been a communications hobbyist. For me, depending on whether you count "DXing" with my transistor radio under the pillow at age five, it encompasses 30 to 45 years. For you, perhaps it's a month or many, many decades. Without a doubt, the means we use daily to communicate or to receive communications (including as a SWL or DXer) have changed in myriad ways. Now suppose you had to sit down and write a list of predictions for how we will communicate 30 or 50 years from now. Beyond knowing that we will use our brains and five senses (this is the modes part), this is a pretty tough task because the technology part is hard to anticipate.

Recently, I received a letter and some clippings from a gentleman deeply worried about the future of the ham radio hobby. He felt I needed to address the subject here. I'm sure he feels that amateur radio is in crisis, and there are good reasons for concern. Despite the recent modest uptick in new licenses, the hobby is still dominated by an aging male demographic. Similar things can be heard at gatherings of shortwave listeners or scanner hobbyists. What my hypothesis of communications tells us is that humans won't stop communicating or finding new ways to do so. What we cannot be sure of is what technology we will use to do it.

It may well be that amateur radio as we know it will pass into history as a comparatively short-lived, but influential hobby, followed by a cadre of dedicated and creative people. I think it's more likely, though, that the communications hobby in general will instead evolve with the technology, and that in 2059 there will be a gathering of hobbyists following popular communications who we wouldn't recognize as hams or SWLs but who can trace their history back to those of us today.

Instead of worrying about the death of our hobby we would be better served by finding ways to incorporate the newest technology and let the hobby evolve with it. That will bring younger people along with it and ensure that there's a gathering of equally dedicated and creative people in 2059.

Drop me a line and let me know what you think should be on our horizons of communication and I'll try to cover it in a future column. ■



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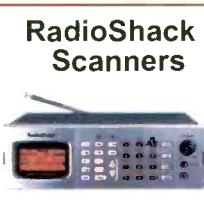
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The Father Of Modern Spy Radios—Allen S. Clarke

The Man Who Fostered Critical Receiver Innovations During The Tumultuous Fifties

by Terry O'Laughlin

To the few radio hobbyists who have seen one, a Clarke Instruments 167 receiver is just another unremarkable, old VHF receiver. Nothing about the radio hints that it is the root of decades of American superiority in telemetry and surveillance radios. Even more obscure is the remarkable man who made it, Allen S. Clarke.

Starting with Clarke Instruments, which he founded in his home immediately after World War II, Clarke and his employees founded an impressive group of early high-performance VHF and UHF radio manufacturers, including Nems-Clarke, Communication Electronics, Inc., (later known as Watkins Johnson, Gaithersburg, Maryland, division), Astro Communication Laboratories, Defense Electronics Inc., and Regco. Despite his many achievements and a Presidential Award, Clarke has simply slipped into oblivion.

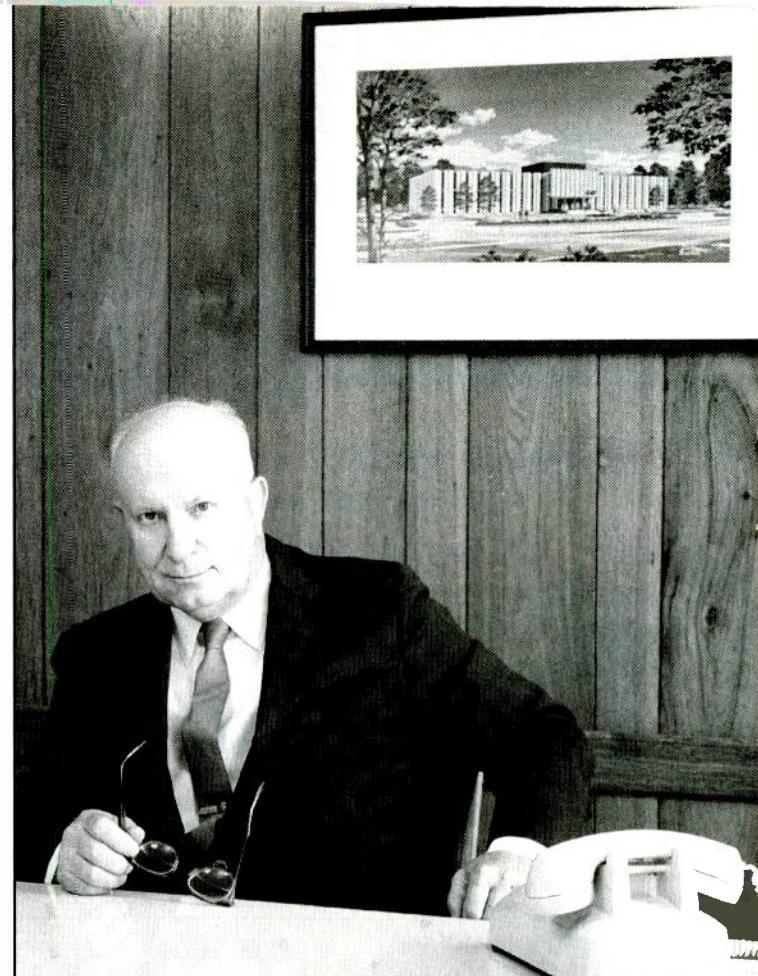
Early Years

Allen Clarke's interest in radio started when he built his first radio and transmitter and went on the air as an amateur radio operator in 1913. In 1917, he enlisted in the Signal Corps, where he rose to instructor for the 79th Division Signal School at Camp Meade, Maryland. Posted overseas, he became a technical sergeant in charge of communication equipment for the 157th Infantry Brigade and the 79th Division Headquarters.

After World War I, Clarke started a business supplying parts and radios to people who wanted to hear the early commercial AM broadcasts. Soon, he obtained an FCC commercial license and moved into the commercial radio supply business. He turned this business over to his brother in 1928, when he started a new business installing sound motion picture equipment for the new "talkies" in theaters across Virginia and North Carolina.

In 1930, Clarke obtained a construction permit for WBPM, a 100 watt AM station on 1370 kHz in his hometown of Danville, Virginia. He built and ran it as the sole owner until selling it in

Terry O'Laughlin is the director of the electronics department at Madison Area Technical College.



Allen S. Clarke, whose businesses nurtured the engineers who created early American superiority in VHF and UHF receivers.

1933. He then went to work for the Radio Research Corporation (RRC), starting at the bottom. By the time Vincent Bendix bought RRC in 1936, Clarke was running the company. Though RRC became the core of the new Bendix Radio Division, the ever restless and ambitious Clarke quit to found his first engineering consulting firm.

Engineering His Own Success

Clarke's consulting firm specialized in design and construction of AM radio stations and, as was often true throughout his career, he was in the right business at the right time. He engineered and supervised installation of broadcast stations all over the U.S. His business prospered until the prospects of another war put a damper on new station licenses.

When the U.S. entered World War II, Clarke was asked to join a small group at the National Bureau of Standards charged with adapting proximity fuse prototypes for large scale production. After practical designs had been developed, Clarke was promoted to the National Defense Research Committee (NDRC) of the Office of Scientific Research and Development. He set up and managed plant operations for producing proximity fuses at the Zell Corporation in Baltimore and Bowen and Co. in Bethesda, Maryland. For his efforts in making the proximity fuse a plentiful weapon in the war effort, Clarke received the Presidential Certificate of Merit in 1946.

At the end of World War II, Clarke became a consultant for the Ordnance Development Division of the National Bureau of



Clarke Instruments 167-E. Many different versions were manufactured. Most surviving models have Nems-Clarke name plates.

Standards (NBS). He set up an engineering and design firm, Clarke Instruments, to handle this and other consulting work. His first employee was Miller Reddin, who later co-founded Defense Electronics, Inc. (DEI). His third employee was Ralph Grimm, who went on to found Communication Electronics, Inc. (CEI) and Regco. Clarke's company expanded to nine employees while still working out of his house.

Clarke Instruments' volume of work and reputation for quality grew rapidly. In mid 1946, Clarke Instruments moved into a 5,500-square-foot area in the rear of the National Electric Machine Shops (NEMS) plant at 919 Jessup Blair Drive in Silver Spring, Maryland. Clarke Instruments had its own entrance and used a King Street address. Clarke knew NEMS and its history because he began his radio career using Signal Corps radios built by NEMS' progenitor, the National Electrical Supply Company (NESCO).

NESCO had been founded in 1899 in Arlington, Virginia. The earliest evidence of radio work by NESCO is a 1909 photograph of a radio built for the Navy and a 1910 order from the Signal Corps for a receiver-transmitter. NESCO grew rapidly during World War I as a prominent producer of military radios, from mule-pack radios, to windmill-powered airplane radios, to complete truck-transported transmitting and receiving sets.

NESCO survived Black Friday and the early years of the Depression only to hit the ropes during the aftershock of 1937. NESCO was liquidated and the assets transferred to the employees and a small group of investors who incorporated as the National Electrical Machine Shops on March 24, 1937. The business survived by workers voluntarily rotating through

planned three-month layoffs and nine-month hires. After a few shaky years, NEMS prospered and, by the end of World War II, it had grown into a sizable and well-respected production house making equipment for many well-known electronics firms.

As a small engineering and design firm, Clarke Instruments did not have the resources to manufacture the equipment its engineers designed. Clarke was well aware of NEMS production capabilities through a contract he had with RCA to design a new AM broadcast field intensity meter, the WX-2A, which RCA had manufactured by NEMS. Locating his design firm on the backside of a reliable production house was good business.

The 167— Clarke's First Radio

In the late 1940s, Clarke Instruments was awarded a large contract to develop telemetry equipment for the early hydrogen bomb tests. As part of Operation Greenhouse, scientists were trying to take field strength measurements during the tests. Existing scientific equipment often did not survive atomic bomb blasts. Clarke's contract arose from scientists trying to find out more about the intense bursts of radio energy, now known as an electromagnetic pulse (EMP), originating from the explosions.

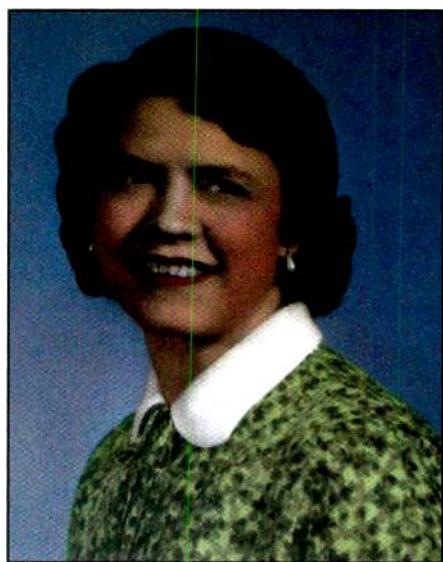
Clarke's engineers received preliminary designs for the test equipment from the NBS and made them practical for mass production and field reliability. Clarke assigned the telemetry receiver development to Grimm. The receiver was designated the 167, probably because the design was capable of covering 1 through 6.7 meters.

"The rise of the Cold War and the Missile Gap mania saw the 167 receiver move from scientific and medical work to extensive roles on the Florida Missile Test Range."

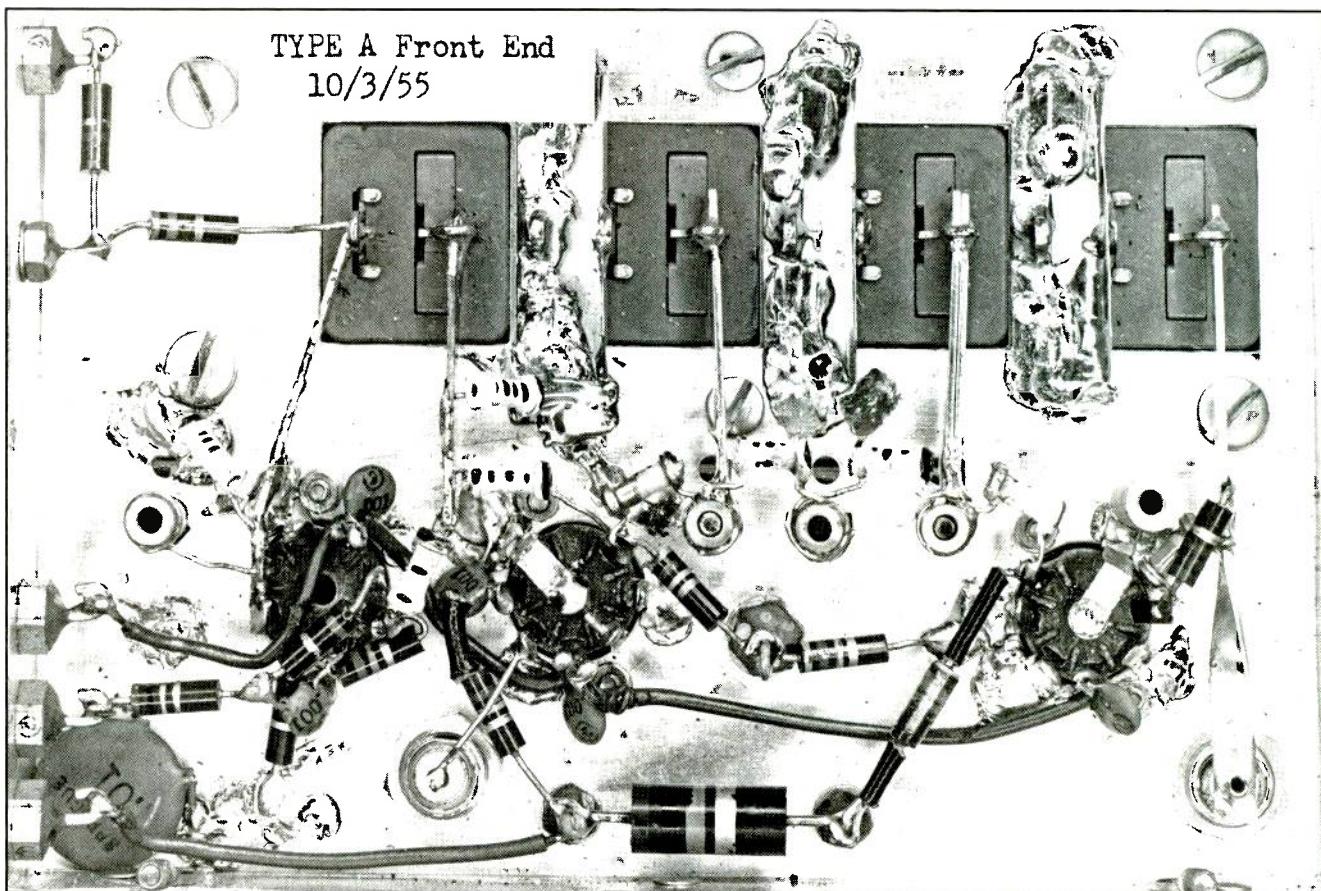
According to Harley Peter, a former engineer, the design of the 167 grew out of early post WWII television sets like the DuMont RA-103 series and the enormously popular RCA 630 series. The DuMont RA-103 featured continuous tuning with FM radio coverage and the picture could be switched off to use the set as just a radio. The 167 contains many design elements adapted from these early television sets.

DuMont's continuous tuning relied on a Mallory Inductuner for the radio frequency (RF) and local oscillator (LO) tuning elements. The Inductuner was a ganged variable spiral inductor. Adapting this multi-stage variable inductor to a telemetry receiver was tricky. The inductance of each section changed in a manner that could not be mathematically modeled. Since the LO section operated at a higher frequency than the RF sections, proper tracking was a tough design goal. Grimm developed a usable design, but construction and alignment of the radios on the assembly line remained an arcane, almost black art.

For the intermediate frequency (IF) amplifier stages, Grimm selected 21.4 MHz because he could use another tele-



Polly Gilbert, whose meticulous RF construction skills enabled Nems-Clarke to mass produce early VHF receivers.



A photographic print from Ralph Grimm used by Polly Gilbert to assemble Clarke 167-A tuners in her home.

vision part, the 21.25 MHz IF transformers used in audio stages in the 1940s. Grimm told fellow engineer Peter Pao that he selected 21.4 MHz to gain the component selection advantages of using the second harmonic of the standard 10.7 MHz FM receiver IF.

The most obvious external sign of the 167 receiver's origins in television is the 75 ohm antenna input impedance. The performance of the 6J4 RF amplifier tube in the Inductuner front end suffered at the standard 50 ohm radio antenna impedance. Grimm simply left the antenna impedance at 75 ohms until tubes better suited to 50 ohm input had been developed.

Clarke contracted with NEMS to manufacture the 167 receiver under his name, Clarke Instruments. NEMS had little trouble manufacturing low frequency test equipment like the AM broadcast band RCA WX-2A, but the 167 VHF receiver was a high spirited beast. RF design in the early 1950s was a mysterious art. Even today many hobbyists who tackle point-to-point wiring for homebrew VHF projects encounter similar vexing problems. (There's an ongoing banter between RF

and digital engineers wherein the digital guys make snide remarks about the Voodoo and pocketed chicken bones RF guys use to work their magic. Going from building a single prototype to a successful production run further compounds these mysteries.)

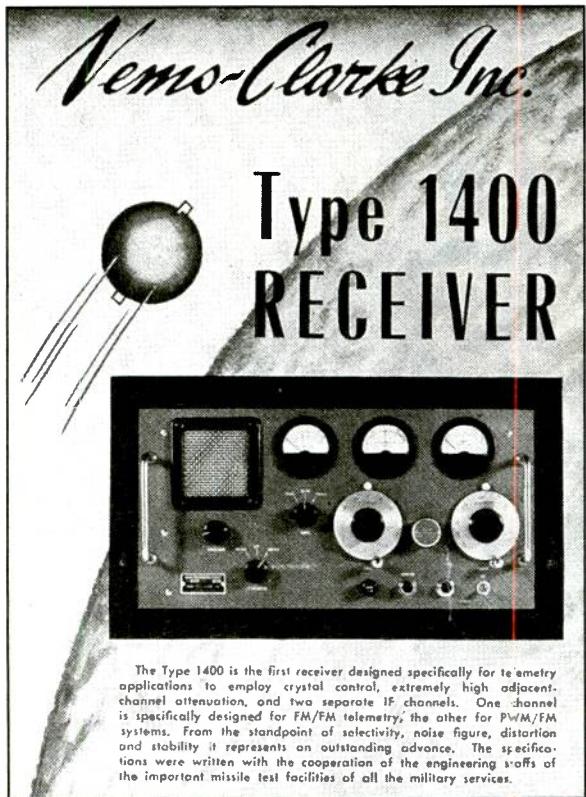
Clarke had encountered and conquered similar problems moving proximity fuses from a prototype to production while working for the NDCR in World War II. The breakthrough on the 167 came as an outgrowth of one of Grimm's hobbies: photography. Grimm took close-up photographs under the chassis of a 167 tuner that met specifications and printed them as 8 x 10s for guidance in assembly.

Jim Gilbert, a quality control technician working for Clarke, took the tuner parts and the photographs home to his wife Polly who assembled them in the basement of their home. Polly would meticulously duplicate the point-to-point wiring following Grimm's photographs while her sons, Russ and Bob, were in school. The project was so secret that Polly has remained silent about her work to this day. Her sons never knew any details about the "rectangular boxes with a shaft coming out of them."

Polly's work was excellent, and she would eventually wire large numbers of RF tuners for several different Nems-Clarke units. Years later, she built tuners for Potomac Instruments field strength meters and Potomac co-founder Dave Harry refers to her as "the best coil winder in the business."

Once in production, the 167 receiver was a big success, with sales expanding across a variety of research institutions and projects. The Naval Medical Research Institute published groundbreaking work based on data obtained through a 167 receiving telemetry from miniature transmitters strapped to patients as they moved freely through exercises.

National Geographic magazine printed a picture of the 167 receiver in a story on Dr. Paul Dudley White of Harvard University, who was a noted pioneer in heart research. Dr. White was using the 167 to obtain the first electrocardiogram transmitted from sensors on a whale. The electrodes were applied to the whale in mid-ocean using a twin harpoon gun with wires trailing back to a transmitter enclosed in a small boat carried below a helicopter. When the electrodes were successfully implanted, the helicopter



The Type 1400 is the first receiver designed specifically for telemetry applications to employ crystal control, extremely high adjacent-channel attenuation, and two separate IF channels. One channel is specifically designed for FM/FM telemetry; the other for PWM/FM systems. From the standpoint of selectivity, noise figure, distortion and stability it represents an outstanding advance. The specifications were written with the cooperation of the engineering staffs of the important missile test facilities of all the military services.

A Nems-Clarke 1400 receiver. Hundreds of these radios were installed in the "Tel-4" building at Cape Canaveral, Florida.

dropped the transmitter boat, which the whale towed by a wire sending its heartbeat to a 167 receiver on an airplane circling overhead. Heart diseases were poorly understood at the time and Dr. White became quite famous for his research. When President Dwight D. Eisenhower experienced heart problems, Dr. White was appointed his personal physician.

Clarke's Star Continues To Rise

Clarke Instruments had expanded rapidly based on Clarke's ability to secure government contracts for his design firm and the high-quality manufacturing standards at NEMS. The combination of Clarke Instruments, a well-respected engineering firm and NEMS, a well-respected production house would strengthen both aspects of their businesses. Within months of the Operation Greenhouse contract, Clarke shrewdly negotiated a favorable merger of the two firms.

On January 1, 1951, Nems-Clarke was born, with Clarke appointed Engineering Vice President. Clarke Instruments had started less than six years earlier with nine employees, and NEMS had been around for one half century with hundreds of employees. After the merger with the much larger company, Clarke continued to rise, becoming the president of the entire company in October 1954.

Clarke's star rose because he astutely expanded the business in whatever direction yielded profits. While working with research scientists on the 167, Clarke discovered they were having trouble taking certain photographs using microscopes. Grimm's interest in photography and engineering skills helped Clarke start a microscope illumination line with the Mercarc, Pulsarc, and Zenarc for medical and scientific research. Grimm

also developed the Megalume portable electronic strobe light for photographers.

Mechanical engineers, like Grimm's brother Robert, developed chart recorders to collect data. They also developed mechanical CW keyers for automated ID transmissions from lighthouse and aviation navigational beacons. They revised and expanded a line of RF patch bays originally developed by RCA for quickly routing wideband signals with minimal loss.

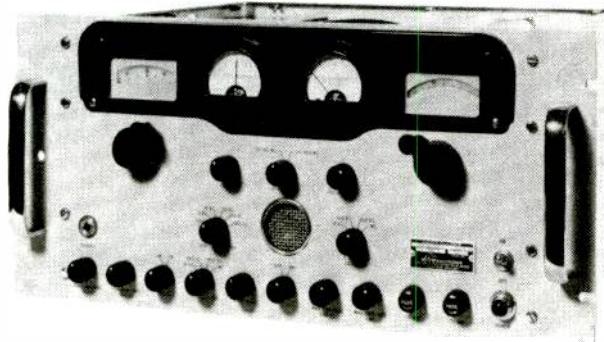
The burgeoning postwar broadcast industry, now including television, opened doors for Clarke's sharp electrical engineers to develop new products. Some were developed under their own name like the TR-1, a television rebroadcast receiver but most were for other companies. For example, Nems-Clarke made most of RCA's television signal, sweep and marker generators. When RCA abandoned the RF field intensity meter business, the WX-2A reappeared as the Nems-Clarke 120-E, a widely respected meter among broadcast engineers. Grimm redesigned the RCA WX-1A VHF field intensity meter which was subsequently marketed as the Nems-Clarke 107-A.

From Telemetry To Surveillance

The rise of the Cold War and the Missile Gap mania saw the 167 receiver move from scientific and medical work to extensive roles on the Florida Missile Test Range. As research expanded, the 167 was updated and emerged as the 1400, of which several hundred were installed in the "Tel-4" building at Cape Canaveral, Florida, and along the expanded and renamed Atlantic Missile Test Range. To maintain the integrity of the data, these radios ran 24 hours per day and were calibrated daily by technicians like Jim Lyon, who later became a Watkins-Johnson engineer.

These missile tests attracted the attention of the Soviet Union who monitored the launches and communications from their trawlers in the Atlantic. The increased radio traffic sometimes led to conflicting frequency usage, perhaps deliberate, that sometimes destroyed months of work by interfering with reception of the launch and flight performance data. The Air Force, in response, requested telemetry radios adapted for monitoring

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The top-of-the-line Nems-Clarke 1306. The 1300 series were probably the first commercial surveillance radios offered in a catalog (\$3,500 in 1961).

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the spectrum use around the missile test range. The 1301 and 1302 receivers and matching spectrum display units were developed for this special purpose.

The 1301 and 1302 were multi-mode receivers with AM, FM and, for the first time at Nems-Clarke, CW. The 1302 featured a high sensitivity, low noise figure RF stage using the Western Electric 416B tube. These high performance radios were noticed by newly developing agencies seeking better equipment for signal intelligence (SIGINT) and communications intelligence (COMINT) applications. These agencies typically made their own spy radios, but found increasing uses for mass produced surveillance receivers.

Through Clarke's extensive government, military, and national security connections, sales of the widely respected Nems-Clarke receiver line steadily grew. New models and accessories were added as requested by customers. In later catalogs, these "Special Purpose Receivers" were more forthrightly labeled "Surveillance Receivers." The 1301, 1302 and top of the line 1306 were, to my knowledge, the first surveillance radios ever to be advertised as such in a catalog.

Despite the appearance of these "Precision Surveillance Receivers" front and center in Nems-Clarke catalogs from this period, they were not shown at some trade shows, like the 1961 Institute of Radio Engineers convention in New York City.

At these shows, Clarke exhibited a fully restored 1915 NESCO receiver from his personal collection. Built for the Bureau of Steam Engineering in a finely crafted walnut cabinet, Clarke used this receiver to highlight the decades of experience Nems-Clarke had in the industry. Clarke was proud of these connections and kept photographs of himself in uniform operating NESCO-built Signal Corp radios at Fort Meade, Maryland, and during World War I in France.

Big Business Moves In

The aggressive growth in revenue and government contract awards at Nems-Clarke did not go unnoticed. As business suitors emerged, Clarke, in his usual fashion, negotiated a handsomely profitable sale of Nems-Clarke to Vitro Corporation, in September 1957.

Vitro was one of the first true conglomerates, with holdings spanning chemical, nuclear, aircraft, and a variety of other lucrative industries. Its aim was to make money through its holdings. The



Nems-Clarke equipment in the Vitro Electronics booth at the 1961 Institute of Radio Engineers convention in New York City.

company renamed its newly acquired property "Vitro Electronics," but kept the Nems-Clarke name on the product line and nomenclature plates for continuity.

Clarke sold Nems-Clarke to Vitro with little advance notice to most of the middle managers and almost no notice to the engineering staff. The acquisition created widespread dissatisfaction as many of these employees had few or no stock options. Several popular long-time managers began to seek other employment.

Rather than promote internally, Vitro brought in new managers from its New York offices. Vitro's plan for Nems-Clarke was to eliminate what it saw as the wasteful profusion of customized products and channel the output to a standard catalog of equipment with set features.

The new managers, unpopular with the old staff from the start, failed to correctly understand the customer base. Engineers were used to tweaking "a dB here and adding a feature there" upon customer request. The Vitro managers attempted to discontinue this practice and tried to force development of stock items for an expanded catalog. Their heavy handed style riled the engineers who were used to managing the technology on their own terms. Customers complained and engineers chafed, but revenue for Vitro

Electronics held steady for a while due to the contractual nature of the business.

Before the Vitro buyout, Nems-Clarke was an engineer's company. The phenomenal growth of Clarke Instruments and Nems-Clarke arose from their experienced and capable engineering staff. Miller Reddin and Ralph Grimm were excellent electrical engineers, deftly creating and adapting designs for a variety of customers.

Nems-Clarke mentored young engineers, giving them substantive challenges as soon as they were hired. Peter Pao's first assignment was to develop a 250 - 500 MHz tuner first used in the REU-100-A. He became a highly respected RF designer under Grimm's tutelage. Harley Peter's first assignment was to develop a stealth version of the 1306 surveillance receiver which he accomplished by eliminating the noisy fan for the 416B RF tube, replacing it with a heat pipe and beryllium oxide heat sink at no sacrifice in performance. As the profit-oriented Vitro managers tightened their grip, this engineering culture changed.

When Vitro managers announced that profit sharing for engineers was being discontinued, the staff began to bolt. A string of departures starting in 1959 and 1960 crippled Vitro Electronics. First, a cluster



Allen S. Clarke views the RS-111 at its debut in the 1964 open house at Communication Electronics, Inc. (see *Pop'Comm* June 2008 for more on the RS-111).

of Nems-Clarke personnel led by Miller Reddin, Clarke Instrument's first employee, left to found DEI, which captured much of the telemetry receiver business. Then Dave Harry and another group left to start Potomac Instruments, capturing the field intensity meter business where Vitro was milking its decade-old designs in the absence of competition. The West Coast sales representative, Ed Trompeter, started a business that undercut Nems-Clarke prices with a lower cost manufacturing technique and garnered the bulk of the unpatented RF patch bay sales.

The fatal blow came when Ralph Grimm, the third employee Clarke had hired, and another cluster of staffers left to found CEI. Nems-Clarke built its reputation on telemetry receivers

but, by the late 50s, the surveillance receiver and accessory line was big business. CEI attracted the best and the brightest from Nems-Clarke. CEI in short order started capturing most of the surveillance receiver business. Peter Pao, who had left with Grimm, quickly moved on as one of the founders of Astro Communication Labs.

A Fine Legacy Fades Away

Allen Clarke resigned from Vitro Electronics on April 1, 1960. Almost immediately, he was seen in the offices of CEI, Grimm's fledgling company, though he supposedly had no official role. After the no-competition clause from his Vitro contract expired, he became a director on the board of CEI. He participated in public events like the 1964 CEI Open House at their new Rockville, Maryland, headquarters, where the RS-111, later made notorious by Watergate, made its debut (see *Pop'Comm* June 2008). He was edged off the board in the mid 1960s as, true to form, he agitated for increased director compensation.

The Nems-Clarke name and the remains of the telemetry line were sold to DEI in the mid 1960s. The R-1037 and R-2074, developed by Nems-Clarke for the Mercury and Gemini space programs and the Saturn rocket program, appeared briefly with nomenclature plates bearing DEI over "Nems-Clarke Division." The remaining Vitro Electronics - Nems-Clarke Division equipment was sold at public auction and the few remaining employees moved to nearby Vitro Laboratories. After that, the Nems-Clarke name quietly disappeared.

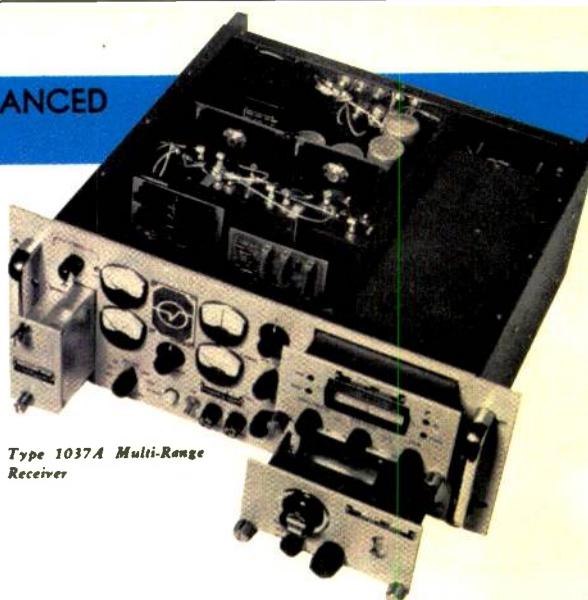
Allen S. Clarke's business acumen, his canny use of government contacts, his sharp eye for talented people, and his ability to keep good employees happy were well honed by the time he'd started Clarke Instruments. Beginning with this small firm run from his house, Clarke's businesses nurtured the people who became the nucleus of America's superiority in VHF and UHF radio receivers, a technological edge that served us well through the Missile Gap, the Cold War, the Space Race, and beyond. In light of all his contributions, it's remarkable how this fascinating electronics pioneer has virtually disappeared from radio history.

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General Description — The new Nems-Clarke Type 1037A Receiver is specifically tailored for universal telemetry and surveillance applications where highest reliability, minimum power consumption, and space economy are in greatest demand.



Type 1037A Multi-Range Receiver

Nems-Clarke R-1037A receiver widely used in the space program including the Mercury and Gemini flights (as shown, it was \$3,200 in 1964).

An Internet Listening Guide To Radio Station Belarus

Programs In The Stream—Net English Content Online From The Land Of 11,000 Lakes

by Eric Bryan



Eric Bryan is a freelance writer whose articles have appeared throughout North America and Britain. He has been a shortwave listener since he was a teenager.

Victory Square in the heart of Minsk, the capital of Belarus.
(Via Wikipedia by Mikkalai)

For shortwave listeners on the West Coast (and elsewhere), Radio Station Belarus' English program is one of those broadcasts that, realistically, under normal propagation conditions, just isn't going to be heard. Radio Station Belarus' English schedule of 2000–2200 UTC, transmitting in the 41-meter band, uses frequencies too low for normal reception at that time of the day in the Western U.S. (These shortwave broadcasts are primarily meant for Europe, where, in their evenings, 41 meters would work well.) But for those on the West Coast and in other areas where regular reception of RSB (or any number of other stations) isn't possible on shortwave, there are other possibilities. This article is primarily intended as a primer for those new to Internet monitoring and to all the programming delights that await them, even if the propagation gods aren't smiling.

Note: As we went to press, there were rumors of the Beltelecom company, which owns Radio Station Belarus, shutting down all shortwave transmissions. However, last-minute checks showed Radio Station Belarus' live and on-demand streams operating normally.

Radio Station Belarus

Radio Station Belarus has been broadcasting on shortwave since 1962. With programming at first in only Belarusian, the

"The 2000 English broadcast began with news, focusing mostly on Belarus and the region...Rounding out the segment were reports on topics as diverse as Belarusian holy water and sports."

station added German in 1985, English and Russian in 1998, and Polish in 2006. There's a great variety in RSB's programming. Besides the usual expected news and analysis coverage, the station offers interviews with scientists, politicians, musicians, religious notables, folklorists, and sports figures. There are features about Belarusian culture, history, and spiritual life. And most broadcasts include music, ranging from classical and folk to pop and rock.

As of this writing, RSB's shortwave schedule is as follows:

1100 to 2300 UTC on 7210 and 7390 kHz

1705 to 2300 UTC on 7255 kHz

The English program is broadcast from 2000 to 2200 daily.

RSB Online

In 2005, RSB began Internet streaming in English. Currently, it offers 10 hours of webcasting a day, with two five-hour blocks (the second a repeat of the first). To view RSB's website in English, visit <http://radiobelarus.tvtv.by/eng/default.asp>. Here you'll find the day's news in text in the main body of the page, with various links running down on either side.

To listen to RSB online streaming, click the LIVE Air link to your left. This will bring up a media application, such as Windows Media Player, depending on how you have your operating system configured, and stream the shortwave broadcast. At 2000 to 2200, you'll hear the shortwave English language service.

A Sample Streamed Webcast

Here's a brief breakdown of a webcast I recently enjoyed. The 2000 English broadcast began with news, focusing mostly on Belarus and the region. Coverage included Belarus-EU relations; devaluation of the Russian ruble against the Belarusian ruble and the latter versus the U.S. dollar; joint projects and relations between Belarus and China; and an economic report forecasting that the global financial crisis will have the least effect on Russia, Belarus, Ukraine, and Kazakhstan out of the former Soviet republics. Rounding out the segment were reports on topics as diverse as Belarusian holy water and sports.

There followed a piece of Belarusian folk music and an in-depth cultural interview program about Belarusian animation art. Next up was a pop music selection, then *Theatre Life*, and another long, detailed program about stage arts in Belarus. After this was more news and

The Radio Station Belarus homepage in English, with live streaming and on-demand links to the left.



State Belarus TV station is owned by the National State TV and Radio Company, or Beltelevisiocompany. (Via Wikipedia by Galantereischik)

analysis, with a report on the Commonwealth of Independent States (the CIS, made up of former Soviet republics), focusing on CIS members Russia, Georgia, and Moldova. More pop music rounded out the two-hour program. (Note: Some of the first part of the second hour of the webcast repeated the first hour, but then departed into new programming.)

Though the stream goes off at 2200, checking back later. I found that English was on again at 2300, 0100, and at 0300 to 0500. This certainly gives you plenty of shots at catching RSB's English program.

RSB On-Demand

Another option to hear some RSB English programming is through the website's on-demand facility. On the same webpage, go to the link on your left under RADIO PROGRAMMES

The History Behind The Modern Voices

Belarus translates as “white Rus,” or “White Russia.” “White” in Belarusian and other early Slavic tongues meant “free,” in this case signifying that white Rus never suffered a Tartar invasion in the 13th to 15th centuries, which many other Russian regions did. Their luck was not always so good...

Modern Belarus is a landlocked country of over 80,000 square miles and is surrounded by Latvia, Russia, Ukraine, Poland, and Lithuania. The word that would best describe Belarus’ terrain is “level.” Belarus’ countryside ranges from plains and forests to lowlands, modest highlands—with the country’s highest point rising to only 1,135 feet—and to swampland in the south, then many lakes and rivers, which continue into Ukraine. In fact, Belarus has 11,000 lakes and over 20,000 rivers and creeks, and has been known since ancient times as “Lakeland.” More than a third of the country is forested. The capital city is Minsk.

The early origins of Belarus are hazy. Belarusians are believed to be descended from three Slavic tribes that settled in the area between the 6th and 8th Centuries. Prince Rogvold ruled part of the region in the late 10th Century, the beginning of Belarus’ medieval period. At this time, Rogvold’s realm of Polotsk was absorbed by Kievan Rus, the earliest real East Slavic nation. Portions of Kievan Rus, including Polotsk, eventually became part of Belarusian land. Tartar invasions razed Kievan Rus and demolished its city of Kiev in 1240, but the Belarusian districts survived.

These Belarusian lands fell under Lithuanian rule in the 14th Century. The Belarusian Slavs maintained some independence and preserved their own language. A defined Belarusian Slavic culture arose in the 16th Century, but in 1569 Lithuania formed a commonwealth with Poland, with the result being Polish control of the Kingdom of Lithuania, and Belarusian territory. This political union between Lithuania and Poland continued until the late 18th Century, when the divisions of Poland led to Belarusian lands coming under the authority of the Russian Empire.

Nineteenth Century imperial Russian control of Belarusian territory destroyed the freedom of religion and civil rights that Belarusians had enjoyed under Lithuanian

rule. Russia finally allowed Belarusians to publish books, pamphlets, magazines, and newspapers in their own Slavic language in 1905.

With the Russian Revolution in 1917, the Belarusians tried to form a democratic government, but their attempts were squashed by the Bolsheviks. As a result of the Bolshevik’s dealings with Germany, Belarusian lands fell under German authority in 1918. Another bid for autonomy, in an agreement with Germany, failed when Germany lost the war. The Red Army invaded, cemented Bolshevik rule, and in 1919 the Belorussian Soviet Socialist Republic was established. (During this time the Soviets renamed the Belarusian territory “Belorussia,” but for clarity’s sake, I’ll continue to refer to it as “Belarus.”) In 1921 Belarusian territory was divided between Poland and Russia, and in 1922 Belarus became part of the new USSR. Russia allowed Belarusian lands it had absorbed to be ceded back to Belarus in the 1920s, and in 1939 Belarusian territory annexed by Poland was reunited with Belarus.

The people of the area suffered great atrocities toward the middle of the 20th Century. The Belarusians were oppressed under Stalin, with an estimated 250,000 of them executed by the Soviet secret police in a forest near Minsk. Many thousands more were sent to Siberian labor camps. In 1941, the Nazis occupied Belarus, killing perhaps two million people before the Soviet Red Army expelled the Germans, in 1944.

As wounds of the war healed, Belarus rose to become the USSR’s chief manufacturer of tractors and vehicles. Though Belarus made huge economic and cultural strides in the post-war decades, the Soviets continued their efforts to erase an independent Belarusian identity through the vigorous imposition of Russian culture and language.

In 1986 the Chernobyl nuclear explosion in Ukraine dealt a severe blow to Belarus, with over a fifth of the country contaminated. But, on the positive note for the decade, Gorbachev’s rule in the 1980s facilitated a renaissance in Belarus. The Belarusian Popular Front worked at reversing the Stalinist police state policies, and by 1990 the Belarusian language was once again the official tongue of the region.



Francysk Skaryna, developer of the Belarusian language, depicted in an engraving from 1517. (Public domain, via Wikipedia)

Belarus declared its independence from the USSR in 1991, becoming the Republic of Belarus (officially breaking away from the Soviet moniker, “Belorussia”). Although largely symbolic, this act was one of the significant events leading up to the collapse of the USSR, which occurred shortly thereafter.

Since 1994, Alexander Lukashenko has been president of Belarus, having been reelected in 2001 and 2006. Unfortunately, Lukashenko has instituted some Soviet-esque, police-state policies, and under him the economy of Belarus has become state-owned, elections have drawn fire for being unfair, and the government of Belarus has been accused of human rights violations. And, in the spirit of Russia’s Vladimir Putin, Lukashenko altered the constitution so he can stay in office for as long as he likes following an election.

After their long history of strife, having been buffeted by Lithuanian, Polish, Russian, and Russian-Soviet control, before acquiring their independence in 1991, we can hope that the Belarusians may soon enjoy true freedom, liberated from the bonds of dictatorship.

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The Radio Station Belarus page with links to radio programs in convenient text format.

The screenshot shows a web browser displaying the Radio Station Belarus website. The main header features the station's logo with 'radio station Belarus' and 'AIR' indicators. Below the header, there's a navigation menu with links to 'RADIOSTATION', 'NEWS', 'AIR', 'PROJECTS', and 'CONTACTS'. The main content area is titled 'INFORMATION BLOCK' and contains several news items under categories like 'International Relations', 'Economy', and 'Society'. To the right, there's a sidebar titled 'RADIO PROGRAMMES' listing various programs. At the bottom, there's a toolbar with icons for 'start', 'My Documents', 'iTunes', 'Travel & E...', 'Z Internet', 'Windows', 'Features...', 'Acrobat R...', and 'Help'.

and click "Programs block," with the speaker icon. This will bring up, for example, the Media Player, through which you can hear the on-demand stream.

Obviously, the great advantage of on-demand versus live streaming is that you can hear it when it suits your own schedule. But there are two downsides to RSB's on-demand feature: the program is one hour rather than two, and at the time of this writing it hadn't been updated for five days. This makes RSB on-demand better for those who just want to sample a broadcast, or for those who will tune in only occasionally to get an idea of what the program's features have been.

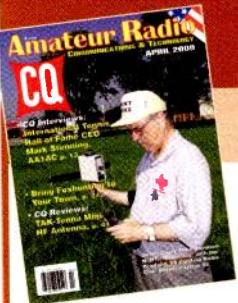
A Sample On-Demand Webcast

As with the live streaming transmission, the on-demand program I'm summarizing here began with the usual news, focusing on Belarus and the region. This included coverage of how Belarus plans to deal with the global financial crisis in 2009; relations between Belarus and Ukraine, Finland, Lithuania, Latvia, and Poland; news on the European

Parliament; cultural news on art, dance, and concerts; and sports.

After the news was *Opinions*, which discussed Belarus' achievements in 2008, and the country's relations with its immediate neighbors. The program was interspersed with Belarusian pop music, some sung in English. Next followed *Cultural*

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Palette of Belarus, which had two in-depth features, one about modern art in Belarus and the other about a legendary Belarusian author. The two topics were separated by a folk-pop song.

English Text

If you'd like, you can also access RSB's radio program information in written form, as many items are available in text on the website. Besides the news in text on the English homepage, clicking "Information block" (beneath "Programs block") brings you a selection of the recent radio features in text format. There are a few links to choose from, each under the categories "International Relations," "Economy," "Society," "Culture, Education," "Ecology," and "Sport, Tourism." These appear to be literal transcriptions of the programs.

More Radio Streams From Belarusian Radio

Radio Station Belarus is the international shortwave service of the National State Teleradiocompany of the Republic of Belarus, simply called Beltele-radiocompany. There are four other radio streams available under the Beltele-radiocompany umbrella besides RSB: 1st Channel (which played American and Euro Pop when I heard it); Radio Stolitsa (on which I heard The Beatles, American and Euro Pop); Channel Culture (heard playing classical, orchestral, and instrumental "soundtrack" music); and Radius FM (where I heard more Euro Pop, some sung in English).

To hear these streams, go to the Beltele-radiocompany homepage at www.tvr.by/eng/default.asp. Here, near the top of the page, you'll see TV and radio links. Just click the LIVE AIR link corresponding to the stream you want to listen to. For talk in English, you'll have to stick with RSB, but the other streams are worth a go for exploring the music you'll find there.

Music On-Demand

There's more music available on demand from the Beltele-radiocompany website. From the English homepage, go to "Company" in the links along the top, and select "Music groups" from the drop-down menu. This takes you to www.tvr.by/eng/musiccol.asp, a page about the Symphonic Orchestra of the Beltele-radiocompany. Here you'll find a "Listen" link where you can hear, on-

demand, one or more pieces performed by the orchestra.

For more, in the vertical menu to your left, under "Music groups," click "Ensemble 'Symphonietta.'" This brings up a page about this 15-piece string ensemble and offered, as of this writing, four "Listen" on-demand links to try. Again in the menu to the left, click "Folk Band 'Beseda,'" which will take you to a page about this Belarusian folk band, a 10-piece group that plays traditional instruments and dresses in folk costumes. The site describes performances of this band as "a kind of theatre of song." To see and hear for yourself, click the "Watch" link on this page. When I checked it out, I was treated to a video of "Cossack Song." There's also a link in the vertical menu for "Children's Choir 'Voice of Childhood.'" This takes you to the description page about the Beltele-radiocompany children's choir, though when I tried it out no audio samples were available.

Belarusian Creeds

There is an peculiar, personal aspect to both the Beltele-radiocompany and RSB websites that I found especially endearing. Both have pages featuring their announcers or hosts, with photos and a brief commentary from each one. Most of these commentaries include a life creed, or philosophy, the announcer. The RSB Program Hosts page can be found at <http://radio.belarus.tvr.by/eng/vedradio.asp>.

Rather humorously, some of the hosts' images are clearly meant to be glamour-shots, such as that of Elena Shikun, whose creed is, "If we fight, we may lose; if we don't fight, we have already lost." Or the romantic, sepia-tinted image of Tatiana Volosnik, whose creed states, "Appearances are often deceptive, words-polysemic. Hear when you listen." Some of the more memorable of these staff creeds are on the Beltele-radiocompany's TV newscasters' page at www.tvr.by/eng/atnved.asp. These include Denis Kurian's "Fear your dreams—they tend to come true," and Natalia Kirsanova's "Let nobody know about your life creed" (perhaps hers is the wisest, too).

But by and large, most of the personnel's creeds are of the "think positive"-type. Maybe this is an outgrowth of Belarus' long history of occupation, suffering, and rejuvenation. Through all their hardships, the Belarusians managed to hold on to their language and culture. If there's one thing they are, it's survivors. ■

Trivia And Toons

by R.B. Sturtevant, AD7IL

Q. Who were the very first amateur radio operators and where did they come from?

A. There have always been people who experimented with anything new and different. There were many people who, after 1840, set up their own telegraph systems. People who read about Marconi and other early experimenters would say they might just try something like that. Just how many, who, and where they were can't be figured out at this late date, but we certainly know they existed—and they're still among us today.

These early "Wireless Experimenters" were actually licensed in Britain by the Post Office beginning in 1904. The license was for use of "wireless telegraphy for experimental purposes." In his annual report to Parliament for the year 1905–06, the British Post Master General he said he wished "to promote experimental investigations in this promising field." Other evidence left behind by our enterprising pioneers includes the 1908 publication in Britain of a book entitled *Wireless Telegraphy for Amateurs* by R.P. Howgrave-Graham. By 1914, when the British Government shut down all amateur wireless activity for the duration of World War I, there were 1,600 licensed Wireless Experimenters.

Q. I've seen pictures and films of people tagging various kinds of animals for radio frequency identification equipment. These can only be used on large animals, correct?

A. Well, that depends on what you call large. There was a project done recently by the Zoological Society of London on the behavior of individual paper wasps in 33 hives of these social insects. A total of 442 individual females were tagged with the radio devices to track which of the various hives the wasps entered and left, recording their "nest drifting." The entrances of the hives themselves were tagged with RF sensors, so researchers could record information on each wasp's movements in and out of the hives, including frequency and duration of time spent. The insect scientists

studying the wasps got the idea from the card-reading sensors on the London Underground.

Q. I've heard that radio operators on opposite sides of a war often play tricks to confuse each other. How does that work?

A. During World War II, it seemed like pretty much everyone on the Allies' side tried to confuse the Nazi radio monitors. Both Britain's Royal Army and Home Guard radio operators often played chess over the air. This was encouraged from the highest levels because European resistance organizations had reported that it confused the Germans. It was later found, however, that the Germans were doing exactly the same thing.

Q. When was the first World Series broadcast and from where?

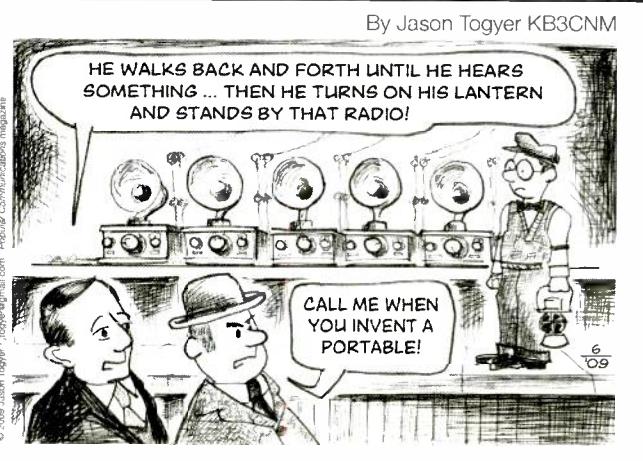
A. In October 1921, the *Newark* (New Jersey) *Sunday Call* newspaper made arrangements with the broadcasters at WJZ to give a play-by-play broadcast of the World Series. (By the way, on October 9 of the same year the *Sunday Call* also began running the first column in an American newspaper devoted to Radio Experimentation.) The World Series broadcast was so popular that the *Sunday Call* followed it up with broadcasting college football games as well. When not carrying football, the *Sunday Call*-sponsored programs featured talks, lectures, and Church services on the airwaves. It also began Children's programming at about the same time.

Q. I've heard the terms COMINT, SIGINT, and ELINT, and they seem to mean the same thing. Are they different?

A. Not really. Over time, particularly in government services, terms simply change, and that's what happened here. These abbreviations stand for Communications Intelligence, Signal Intelligence and Electronic Intelligence, respectively, but they all refer to interception of traffic from a source of interest, decoding it, and distributing the results. Also understood within the concept is direction finding (to determine the location of the sending source by triangulation), and traffic analysis (to determine if the various sources and their listening stations are becoming more or less active, which would be revealed through the amount and frequency of the traffic going to or coming from the various stations).

You'll also hear the terms IMINT (Imagery Intelligence) and MASINT (Measurement Intelligence, as in measuring incoming radar signals, microwave signatures, etc.), OSINT (Information from Open Sources, such as newspapers, books, non-secured radio transmissions), PHOINT (Photo Intelligence), RADINT (Radar-gathered Intelligence) and TECHINT (analysis of equipment to gain information on its capabilities). HUMINT, of course, is the use of spies on the ground in the area of interest. ■

Spurious Signals



Help Save The New York Hall Of Science Amateur Radio Club

*This Treasure Of Radio, Science—
And A Community—is Under Threat,
But You Can Make A Difference...*

by Ed Muro, K2EPM



The Queens Hall of Science, located in Flushing Meadows Park on 111th Street and 47th Avenue in Corona, NY. (All photos courtesy of the New York Hall of Science Amateur Radio Club)

Where did you first experience the wonder of radio communications? Where is the next generation of radio hobbyists coming from? Those are two very important questions. It's easy for most of us to answer the first; the answer to the second is much harder to come by, but may be even more important.

For me, it all started on an obscure New York City street in the Corona section of Queens, New York. In my younger years, I was lucky enough to live on 46th Avenue. At one end of the block was my father's auto body repair shop. The shop had a 40-foot tower and that's where I first was exposed to commercial two-way radio and monitoring, listening to the local police communications on a Regency scanner and a bank of Sonar monitor radios. At the other end of my block was the entrance to Flushing Meadows Park, or as the locals called it "The World's Fair" (it had been the home of that exhibition in 1964-65).

But best of all, within walking distance of my home was the New York Hall of Science Children's Science Museum.

Ed Muro, K2EPM, has been a radio hobbyist since his early teens. He served three terms as vice-president of the Long Island Mobile Amateur Radio Club and is a public information officer and VE for the ARRL.

My grandmother and mother would often walk me down the block and take me to the museum, and it became one of my favorite places (one of my uncles had actually helped build it as an iron worker).

At that time, NASA's space program was going strong and the rocket display outside "The Hall" always made me feel warm and fuzzy. Inside The Hall, I loved many of the displays we'd visit, but the one that really left an impression on me was the amateur radio station. In an era long before the Internet and email, I was amazed that there was a way to communicate with people from all over the world. Little did I know then that this exposure to amateur radio at the Hall of Science would lead to a lifetime hobby and a part-time career as a writer. Nor, did I ever imagine that as an adult I would amass many dozens of friends around the country and around the world through the magic of radio.

Youngsters can still find inspiration there, but maybe not for much longer.

Making Magic At The Hall Of Science Amateur Radio Club

At the New York Hall of Science Children's Science Museum in Queens, New York, a group of about 100 amateur

radio operators has been hard at work demonstrating the wonders of amateur radio to the public with its museum exhibit station, WB2JSM, which has active for more than 35 years. WB2JSM is a ham station in a glass-enclosed radio booth on the floor of the Hall of Science Museum, operated by the unpaid volunteers of the Hall of Science Amateur Radio Club (HOSARC) at no cost to the city or the museum.

According to the club's president, Tom Tumino, N2YTF, HOSARC members, through their own donations and fundraising, pay all equipment and operating costs of the museum exhibit station.

The enterprising members of HOSARC have over the years erected an impressive station with a large rotatable HF Yagi on top of the museum at about 140 feet above sea level, along with 22-element VHF/UHF Yagis on an az/el mount for satellite contacts and dipoles

"At the Hall of Science Children's Science Museum in Queens, New York, a group of about 100 amateur radio operators has been hard at work demonstrating the wonders of amateur radio to the public with its museum exhibit station, WB2JSM, which has active for more than 35 years."

for the lower HF bands, as well as repeaters on 2 meters and 70 centimeters. In preparation for a much-needed new roof, HOSARC had to temporarily remove its rooftop antennas this fall and has replaced them with more modest ground-mounted antennas. Equipment in the station includes a Kenwood TS-850 and TM-D700 APRS mobile, a Yaesu FT-847, a Uniden Trunk-Tracking Scanner, and much more.

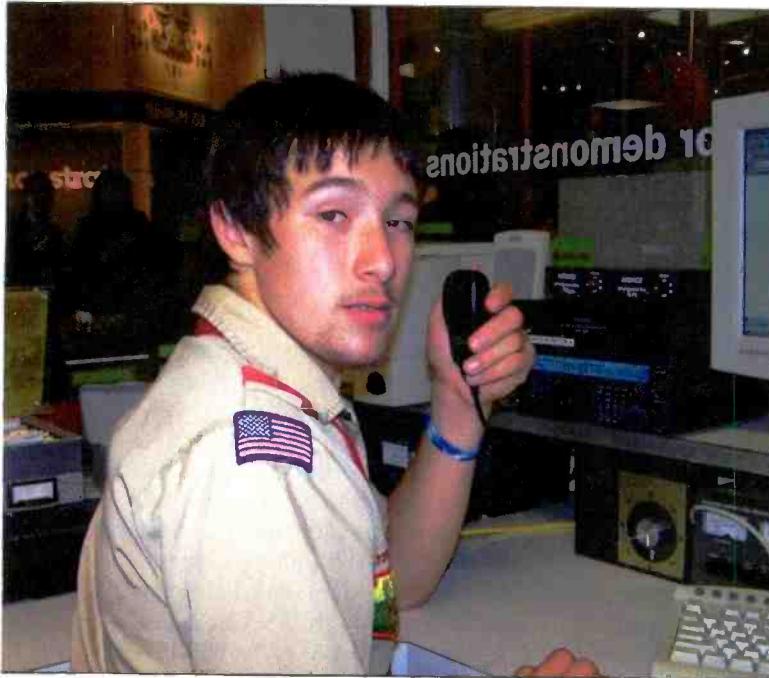
Children who come to the museum are invited into the booth and shown some of the more unusual QSL cards from around the world. WB2JSM operators explain to the young guests that from the station they

can "bounce their voices off the sky and talk all around the world," and then "exchange postcards." Sometimes guests to the shack are amazed that just that day WB2JSM has contacted several continents and some countries they haven't even heard of.

The very youngest children are then shown a Morse code practice oscillator, where a WB2JSM operator can tap out their name and invite them to do the same. Older children and adults are treated to a live display of notable ham radio contacts around the world (a DX cluster) superimposed on a digital globe that is highlighted according to live NASA data on



The roof of the Hall of Science, showing the Hall of Science Amateur Radio Club's (HOSARC) HF antenna, with Shea Stadium in the distance.



Scouting and ham radio go hand in hand at HOSARC.



HOSARC's station, WB2JSM, is fully equipped with HF gear, radios capable of working 2 meters, 70 centimeters, and D-star. There's also a Uniden BC-780 scanner.



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Visitors are reminded that science has not yet progressed to the point where we can say for sure where the signals will land and that every call on the air is truly a live experiment. All but the very youngest guests are invited to try their hand at making a contact to see who'll answer their call. Younger children particularly enjoy turning the station's HF beam, especially after being told that "any birds on the antenna are going to be very surprised" when the beam starts turning. The robust HOSARC antenna setup and 1000 watt HF amplifier, along with a call from a child on the air almost always brings a response, but when conditions fail the station's operators always explain that unpredictable results are what separates ham radio from something boring like a telephone, which is almost always predictable.

Older guests are reminded that ham radio is similar to fishing, perhaps not as efficient as going to the grocery store to pick up a fish (which is kind of like making a phone call) but definitely a lot more of an adventure. A successful contact for the young guests is always rewarded with a handsome "First Contact Award" certificate. WB2JSM has also been active in several Jamboree On The Air (JOTA) events, hosting boy scouts at the station



A visitor to the operating console at WB2JSM looks over the log book.



QSL cards from HOSARC's station, WB2JSM

and running the special event callsign N2S (In To Scouting).

Over the years the volunteers from the ham radio community have reached out to countless visitors to the station, sharing stories from their own ham radio adventures. The radio experiences of the young guests, and their "First Contact Awards," have been the subject of countless more "show-and-tells" at their grade schools. Those who are particularly interested in the hobby are referred to the free ham radio licensing classes that take place at the museum. Truly, as long as WB2JSM is on the air there will be one more source of new blood for the radio hobbies.

Your Help Is Needed

Unfortunately, after 35 years, HOSARC was informed last December that unless it can convince the new museum president, Dr. Margaret Honey, of ham radio's value to the museum and the community at large, the WB2JSM station will be permanently removed from the museum. To that end, the HOSARC would like to ask for help from all who feel that the work being done at the station is important to the future of the radio

hobby. If that's you, you're encouraged to sign their online petition at www.tinyurl.com/hosarc. Please add your own thoughtful and convincing statements to the long list of supporters who have already weighed.

While my first exposure to ham radio was at the Hall of Science, I still wonder where the others found their first inspiration. How were you exposed to the wonders of radio? Whether it was walking down an obscure street to a museum, hearing a special event from the radio room on the *Queen Mary*, these opportunities are life-changing—and are the lifeblood of our hobby. Let's preserve them, let's create more of them, and let's share them. Please drop me a line and tell me about such places of radio inspiration in your neck of the woods. ■

Save HOSARC

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Scanning On Vacation

by Ken Reiss
radioken@earthlink.net

"Most car cigarette lighters use a positive center (negative ground) and most scanners are wired that way, too, but once in a while you come across one that doesn't work as expected. This is a good way to ruin a radio if you're not careful."

Summer typically brings with it outdoor activities and many other things to do with your leisure time besides play radio. But, paradoxically, there may be even more to hear, because as people get busier, more things happen. Lots of accidents, injuries, rescue operations, fires, and even squabbles between neighbors happen during the summer months.

Summer is also likely to include the family vacation. These days, with the economy in the mess it's in, many people will probably be sticking closer to home, but that doesn't mean you can't find things to do. And when you do head out, don't forget to include your scanner when you pack up, even if it's just a short day trip or a weekend getaway.

Of course, the first part of any vacation or trip is the journey. If you're driving, there should be lots of scanning opportunities all along the route, but don't leave your scanner in your luggage if air travel is involved, either. You can't listen during the flight because of airline regulations that prohibit radio devices in flight (and even if you did

you wouldn't hear much...you're in an aluminum can, remember?), but you can listen on the ground. There should be plenty of time for that between changing planes, waiting to go through security, waiting to board, and waiting for your luggage to return (and did I mention waiting?). Your scanner can help pass the time. I'd probably recommend headphones if you're listening at the airport. With the heightened security, you won't want to call attention to yourself, or your scanner.

Getting Equipped

We'll focus mainly on driving since getting ready for that takes a bit more preparation, but most of what's suggested here applies to any other form of transportation, too.

Putting in a permanent mobile installation is beyond the scope of this article, but even a temporary installation is adequate for fun scanning. There are about as many variations on mobile equipment as there are mobile scanning enthusiasts. Simple installations like using a handheld in the car may turn out to be the perfect traveling arrangement for you. Let's face it, it's supposed to be a vacation, and hopefully you'll have other things to focus on besides the radio most of the time. Still, having a scanner in the car can be helpful for those long drive times, and in places where you might encounter traffic. Having a handheld can also prove convenient for times when you'd like to scan in the hotel, or around the camp fire at night. Earphones might be a good idea here, too, so that others can sleep.

You can also install a small base unit or mobile scanner in your car on a temporary basis. Just a simple cigarette lighter plug is about all you need for power (make sure the adapter you get is compatible both with the voltage and current of your radio) and, of course, watch the polarity. Most car cigarette lighters use a positive center (negative ground) and most scanners are wired that way, too, but once in a while you come across one that doesn't work as expected. This is a good way to ruin a radio if you're not careful. It's been my experience that the radio will fail long before the fuse, so a little extra caution can save you a big headache. If you're not sure, don't do it.

You'll get far better results in a mobile installation if you can manage an external antenna. The



Most base and mobile scanners made in the last several years, including this AR-5000 base unit, can be powered by DC from the car. Note, however, that this one requires a special cable; most do not.

metal body of the car makes a great ground plane, so any quarter-wave whip or gain antenna on a magnetic mount should provide reception for several miles. You can also compromise on rubber duck antennas for handhelds, and if necessary, suction cups mounted on the inside of the glass. They don't work as well as an external antenna, but something is better than nothing.

If you're going to use an "internal" antenna, I've found that longer tends to be better. Those quarter-wave telescoping antennas work quite well, or there are a number of other models that offer some gain on the higher frequencies. One that's long enough to stick up above the dashboard or window when the radio is sitting where you intend to use it can improve reception considerably. Glass passes the radio signal much better than metal.

You can also use the same method that car manufacturers use to keep from having to "spoil the lines" of the car with the likes of an antenna: the old wire on the windshield trick. Solder one end of the wire to an appropriate connector for your radio, and then run the other from where the radio will sit up and around the edges of the front or back window. You can build a dipole this way, simply hooking a second wire to the other side of the connector, but my experience has been that this is probably not necessary and makes the installation harder.

Try to make the wire an even multiple of quarter wave for maximum effectiveness on the frequencies you're interested in. If you divide 2832 by the Frequency in MHz, you'll get the quarter wavelength in inches. You can then multiply that number by 2 or 4 or 8 to give you a long enough wire to make it from the radio in the console to the front or rear windshield (or a side window that won't be going up and down on the trip). A small thin wire works best as it's the easiest to hide, but you'll probably want it insulated—at least until you get up as high as the glass; after that, it really makes no difference. Stripping off the insulation makes it a bit less visible, but won't affect performance.

Unfortunately, because this type of antenna is not shielded it can also be a magnet for electrical interference from the car's electronics and engine. Newer cars are better shielded themselves, so this may or may not be a problem, but if it is, you'll quickly want to find another solution. When it works, this antenna will outperform many stock antennas for

handhelds because of the increased exposure to the signal through the glass. If you do end up with noise, the best solution is a coax-fed antenna mounted outside the vehicle, if that's an option.

Listening: What, When, How

This is where things tend to get a bit complicated for vacation scanning. You're likely to be driving through a



Any simple antenna will do, but inside a vehicle, this telescoping antenna might be a better choice. It's also easy to fold and store when not in use.



While any simple handheld scanner is better than none, if it happens to be computer programmable, like this Uniden BC246, it will be much more convenient.

Pop'Comm June 2009 Reader Survey Questions

With hamfest season well in swing, this month we'd like to ask you about your experiences attending such events. Please use the Reader Survey Card and circle all appropriate numbers. Thanks for participating.

Have you ever attended the Dayton Hamvention?

Yes	1
No	2

Did you attend this past Hamvention?

Yes	3
No	4

If not, why not?

Too expensive	5
Other commitments	6
Could not get time off	7
Not interested	8

Have you attended, or do you plan on attending, any other hamfests or similar hobby-related shows this year?

Yes	9
No	10
Not sure	11

Have you ever visited the CQ/ Pop'Comm booth at a show to subscribe/renew?

Yes	12
No	13
Can't remember	14

February Survey Highlights

February's survey asked readers about the evolution of their hobby. While 83% said they've broadened their interests and activities over time, only 5% said they were not as active as they once were. That's great news. Most readers were first exposed to AM/FM broadcast radio (38%); the next largest demographic was shortwave radio (33%); scanning came in at 11%; ham radio pulled up the rear with 7%. Regarding mentoring, 62% said they did not have an "Elmer" to help them get started, yet 57% said they did. A bit of confusion there.

This is interesting: a full 77% of respondents first picked up the "radio habit" at age 15 or younger; 12% in their high school years; but no respondents said they started after retirement. That can't be right. If you started your radio days after you retired, drop me a line.

The winner of a free subscription or extension to *Pop'Comm* this month is **Dan Ramos** of Huntington Beach, California. Congratulations, Dan!

bunch of areas that you're unfamiliar with and don't have detailed frequency information available. Or perhaps you're flying into an area and want to concentrate on that city's system. Programming your radio in advance is very helpful and will let you make the most of the time you have, but is not completely necessary.

The best place to go for frequency information is www.radioreference.com. There, you'll find by state more information than you can probably use. Pick the states you'll be traveling through and concentrate on the major agencies that you're likely to hear in your travels, like state highway patrols or police, major metro area police dispatch, and fire alarm frequencies. Pick out the services you're most interested in and punch those into your scanner. I try to keep each geographic area in its own bank. It can also be fun to plug in the itinerant frequencies if you have room. These are used by lots of businesses all over the country. If you have a spare bank, the FRS and MURS frequencies can be entertaining also.

At your destination itself, hopefully you'll have a little time concentrate more on local things of interest. Local police and fire, business frequencies, etc. all make for interesting listening when you're unfamiliar with them. It can also



Of course, something like this ICOM IC-R3 might get more use since it can also be used for TV reception in places where the digital transition hasn't occurred. Digital TV will make this kind of receiver a specialty device for security cameras and those few analog translator stations that will still be on the air.

Frequency Of The Month

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

Our frequency this month is **467.5625**. Check it out and see what you hear, or don't. Let me know and we'll enter your name into the monthly drawing. Send your entries, as well as suggestions and questions, to radioken@earthlink.net or via more traditional methods to Ken Reiss, 9051 Watson Rd. #309, St. Louis, MO 63126. Please note frequency of the month entries with the frequency on the envelope or subject line for correct routing. And don't forget that address!

The most recent winner of our drawing is **George Speck** of Forest Hill, Texas. Congratulations, George!

be a fun challenge to figure out exactly what you're listening to.

Also, keep your schedule in mind. If you're likely to be traveling at times when the noise from the radio would disturb others, you're not likely to listen at those times. If you're in a resort or other area with lots of other things to do, again you

won't be listening as much during those times. Think about when during the trip you might be able to listen without riling family members or otherwise tainting the vacation. Remember, you're supposed to be having fun. (And don't forget that pair of headphones—it might be a holiday-saving accessory!)

At-A-Glance Frequencies For Travel

FRS

Here's a handy chart of the FRS (Family Radio Service) frequencies. Remember that Channels 1–7 are also part of the GMRS service where higher power is allowed. You can hear anything on these frequencies.

1	462.5625	5	462.6625	9	467.5875	13	467.6875
2	462.5875	6	462.6875	10	467.6125	14	467.7125
3	462.6125	7	462.7125	11	467.6375		
4	462.6375	8	467.5625	12	467.6625		

MURS

VHF	UHF	VHF	UHF
151.6250	462.5750	151.6850	462.6750
151.7150	464.5000	151.8050	464.8250
151.8350	467.8125	151.9250	467.8750
151.9550	467.9250	154.5700	469.2625
154.6000	469.5500		464.3250
151.6550	462.6250		467.7625
151.7750	464.5500		467.9000
151.8950	467.8500		469.5000
154.5150	467.9250		

And here's an equally handy table of the MURS (Multi-Use Radio) frequencies.

Weather Channels

Don't forget to listen for the weather! Here's the NOAA (National Oceanic and Atmospheric Administration) weather channels. Most, but not all, areas are covered by one or more of these. My advice is to put them in a bank and scan for the strongest signal, not necessarily the first one you find.

1	162.550	3	162.475	5	162.450	7	162.525
2	162.400	4	162.425	6	162.500		



As you travel, keep your eyes open for interesting radio landmarks as well. There's no telling how many transmitters are coming off this tower.

A computer programmable radio comes in extremely handy for this kind of application. Hook up the computer, back up the current data (if your radio has that option), and then download the new stuff. If you make the same trips on any kind of regular basis, this is worth its weight in gold. It's very quick and easy to connect the computer and download a new frequency file. Hundreds of channels can be programmed in just a few minutes, and most of that time involves getting the thing connected and starting the download software. Many newer scanners and ham transceivers (which have broadband receive capabilities) offer this feature. You'll need to check with the manufacturer or dealer about software and cabling for your particular radio.

It's worth leaving all your banks on for a little while when you get to the destination. If you're in or near any decent-sized metropolitan area, lots of frequencies are likely in use. In fact, if you're in a major metro area, there are probably very few *unused* frequencies. You might find something you hadn't planned to on one of those frequencies you were using for somewhere else along the way. I've found some very interesting listening quite by accident. Of course, then there's the challenge of figuring out what it is you've picked up by accident, and sometimes that's half the fun.

I've also forgotten to reprogram my scanner before I left and thought I'd take the time to do it once I got to the destination. Once I got there, I found that listening to the same frequencies I had at home was more than adequate to keep me guessing as

to what I was hearing. So don't hesitate to bring the scanner even if you don't want to reprogram it.

You can also search for frequencies using the scanner's search modes if you're so inclined. It's a good idea to have ranges pre-programmed into the scanner if you have that option, or take along a reference page or two regarding the expected ranges to help you find things. If nothing else, you'll get a feel for how much two-way radio traffic is around you waiting to be captured.

Scanner Laws!

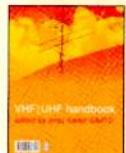
IMPORTANT: You'll need to do a bit of research before your trip to make sure you're not opening a can of worms by carrying your scanner in the car. Some states prohibit any kind of public safety receiver in the car, while others have virtually no restrictions. Some of the states that have restrictions also have exemptions for amateur operators and others, so you'll want to look into the situation before you find yourself on the wrong end of an innocent traffic stop. If in doubt, pack the scanner away in the trunk and don't use it until you get to your destination.

Till Next Time...

That's it for now. We hope our travel scanning tips help you get even more out of your next vacation. As always, we welcome any input or questions that you may have regarding scanning. And if you find some cool new frequencies in your monitoring, send them in! Drop us a line and let us know about your vacation scanning experiences.

Until next month, good listening!

RSGB Books from



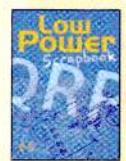
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DTV Transition: Take Two

by Bruce A. Conti
BACConti@aol.com

As we all know by now, the cutoff date for analog television was pushed from February 17 to June 12. Despite the additional time to prepare for the switch to digital, for many the picture remains the same. Millions of antenna TV viewers will likely lose service if analog television broadcasting goes dark this month. We thought we'd share the following anecdotal accounts, as they're typical of the challenges encountered by antenna TV viewers.

For instance, reader Don Hallenbeck, whose situation reflects that of many Americans, writes:

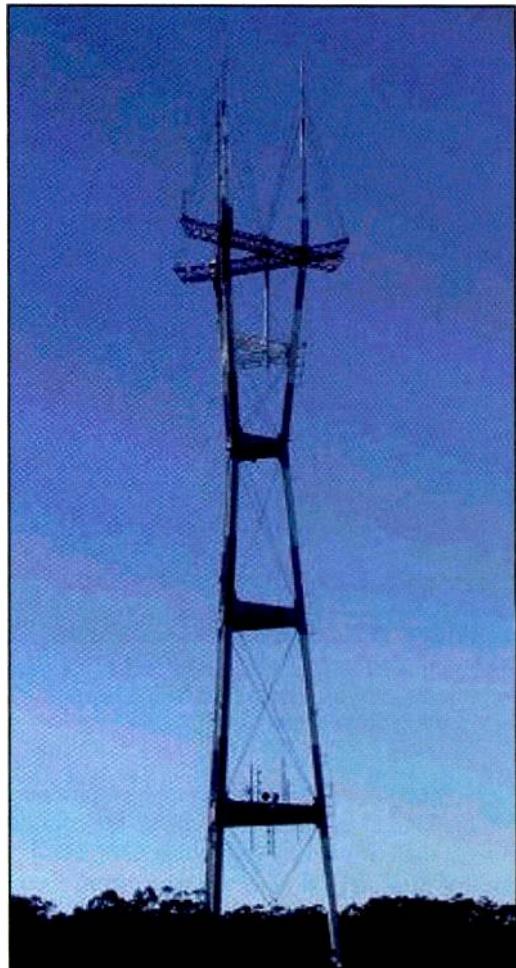
Living here in Maine in what's called "Section 8" housing, you have three options for TV: cable, rabbit ears, or no TV. Housing regulations don't allow for outside antennas or satellite dishes. WABI (CBS) is the most powerful station in this part of Maine, transmitting from Dixmont Mountain, which is about 30 miles or so away from me. The PBS transmitter is piggy-backing on the WABI site in Dixmont, but with less power not covering as wide an area. The transmitters for the ABC and NBC stations are located elsewhere in Maine (out of range).

I'm dependant on rabbit ears for my TV viewing, using a set-top amplified model made by RCA. With a DTV converter box, I get the local CBS station WABI 5.1 and the CW station on WABI 5.2. If weather conditions are right I can also get the Maine Public Broadcasting Network (PBS) 12.1 and 12.2. If the weather is wrong I get nothing. When trying to watch something on PBS for example, if the weather changes, I'm out of luck as the signal shuts down till weather improves and the converter can figure out what's what again.

Ed Morris, an antenna TV viewer well within the range of analog TV reception, reports similar unreliable DTV reception beyond 30 miles.

I am located in rural southwest Georgia, 50 to 55 miles from major network transmitters in Macon, Columbus, and Albany. Two PBS transmitters are a lit-

"...for many, the switch to digital means the end of free over-the-air broadcast reception. An independent formal investigation of DTV reception in San Francisco conducted by two broadcast engineers confirmed such reports of reception difficulties."

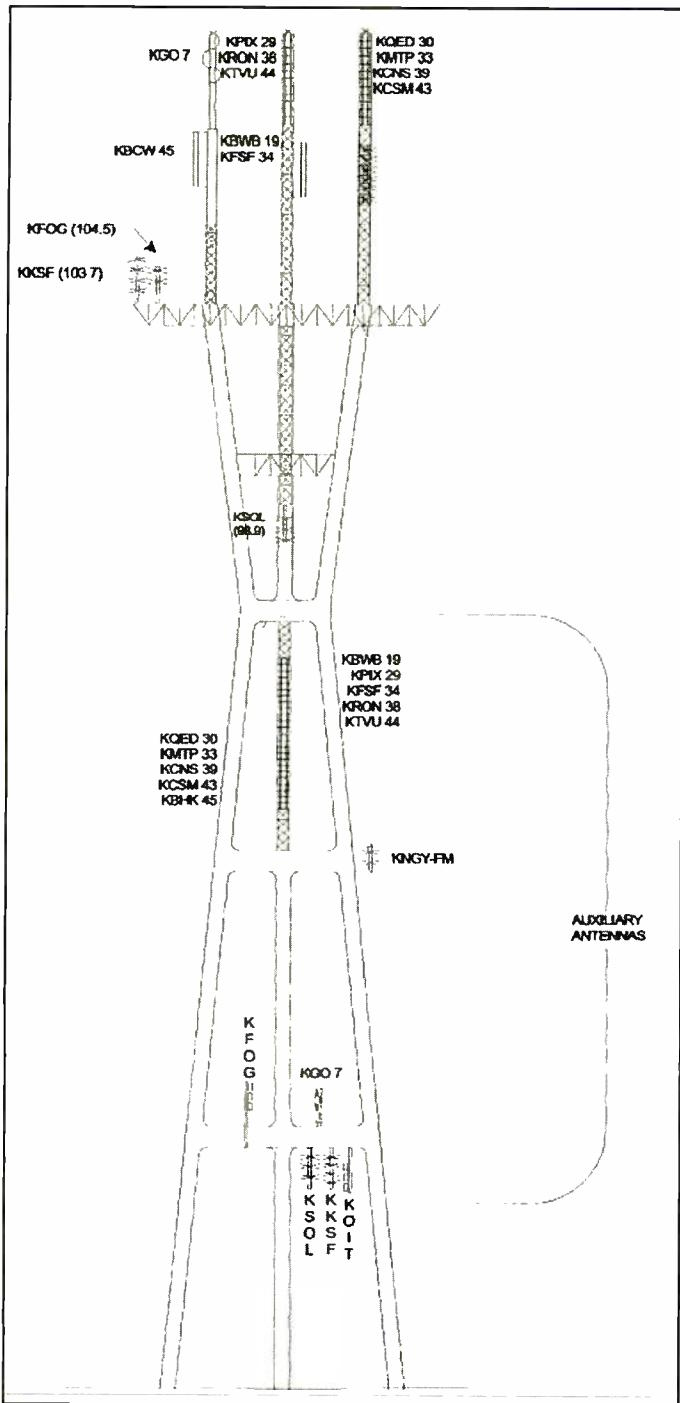


The Sutro Tower transmitter site in San Francisco.
(Dorren and Lewis photo)

tle closer—40 and 42 miles. I have come to the following conclusions regarding DTV: The maximum range of a full-power station for consistent reception, using the typical outdoor rooftop antenna at 30 feet above ground, is about 35 miles over average terrain. The range can be extended to 40 miles or so by using an amplified antenna at about 45 feet above ground. Again, I stress that these limitations are for consistent reception, without dropouts or dead periods.

Not every experience has been negative though. Alan Tabor, N9MAF, writes,

I set up converters for my mother-in-law. She lives about 35 miles east of St. Louis, Missouri. I went to the Super Wal-Mart in Highland, Illinois, and found only one model to choose from. I guess we Midwesterners wouldn't know how to decide if more than one model of converter was on the shelf at the same time. I did get a pleasant surprise after installing the converters, how-



FM radio and DTV antenna positions on the Sutro Tower.
(Dorren and Lewis)

ever. The TV [my mother-in-law] had on used rabbit ears and didn't loose any channels.

Still, for many, the switch to digital means the end of free over-the-air broadcast reception. An independent formal investigation of DTV reception in San Francisco conducted by two broadcast engineers confirmed such reports of reception difficulties. Louis Dorren, WB6TXD, and Noland Lewis, WB6CKT, co-authored an investigative report after discovering just how many DTV signals could not be received reliably.

"This report was the result of extensive coverage area tests of the three major television transmitter sites in the San

Francisco Bay Area," wrote Dorren and Lewis. "It was instigated when the authors, one 11.3 miles from a major transmitter site and the other 17.2 miles from the same site, could receive 15 or more analog stations but only one to four DTV stations."

As Dorren explains,

I am not a cable TV subscriber because I don't believe in the high costs of cable TV, so I designed and installed a high-gain, multi-element antenna system that consists of a 27-element log periodic VHF/UHF antenna and a 40-element UHF corner reflector Yagi on an antenna rotor. With this antenna system, I get all of the analog TV stations in the Bay Area; that is, Channels 2, 4, 5, 7, 9, 11, 14, 20, 26, 28, 32, 36, 38, 40, 44, 54, and 60. The Bay Area has three major television transmitter sites: Sutro Tower in the middle of San Francisco with 10 stations, San Bruno Mountain in the city of Brisbane with three stations, and Monument Peak in Milpitas Hills with two.

Like many who purchased a DTV converter box expecting better picture and sound, Dorren found the results "demoralizing." Of all the analog stations previously received, Dorren could only pick up five DTV signals—Channels 11, 14, 26, 36, and 65. Lewis received even fewer channels reliably. The report identifies three significant problems with DTV: the digital cliff effect, UHF susceptibility to surrounding terrain, and prohibitive outdoor receiving antenna requirements.

The Cliff Effect

As Dorren explains,

Over the years that the National Television Systems Committee (NTSC) analog system has been in use, many improvements have been made while maintaining compatibility with existing television receivers. These include color TV, a Vertical Interval Reference Signal (VIRS), which corrected color anomalies in the picture, ghost cancellation, precision comb filtering, and velocity modulation. These improvements have delivered a highly robust picture and sound in good signal areas and usable picture and good sound in weak signal areas.

DTV signals by their very nature do not respond to the vagaries of propagation the same as analog signals. There is a very narrow weak signal area where the picture pixelates (pixelation displays random checkerboard patterns on the TV screen instead of actual content) and the sound stutters. This immediately leads to no picture or sound at all. This has been dubbed the "cliff effect" because for a very small signal level change the DTV receiver goes from picture and sound to nothing.

The cliff effect results in a significant reduction in coverage area for DTV versus analog. The use of UHF spectrum compounds the situation, as Dorren further testifies:

Most of the DTV signals are in the UHF band, which creates additional problems. UHF signals are essentially "line-of-sight" signals. Any obstructions, diverse terrain, buildings or trees will reduce signal strength significantly. Analog TV will still deliver a viewable snowy picture and good sound under these conditions, while DTV will deliver no reception at all.

The investigation concluded an estimated DTV signal contour of 3.5 millivolts as the minimum signal strength before the signal is lost, versus an equivalent analog contour of 750 microvolts. Moreover, an analog signal can still be received beyond a 750-microvolt contour, albeit with a snowy or less-than-perfect picture.

The report continues.

Analog TV has a large signal threshold range. This means you can go from a perfect analog picture, zero to 30 miles from the transmitter, to a moderate analog picture with some snow, 30 to 50 miles, and finally a very weak but still viewable analog picture 50 to 80 miles from the transmitter. As the signal gets weaker the result is an increase in snow in the picture although viewable, and the audio still remains

Display Channel	Digital Channel	Station	City	State
2	58 → 7	WJBK	DETROIT	MI
4	45	WDIV-TV	DETROIT	MI
7	41	WXYZ-TV	DETROIT	MI
9	35 → 9	CBET	WINDSOR	ON
16	66 → 16	CHWI-TV	WHEATLEY	ON
20	21	WMYD	DETROIT	MI
22	6 → 22	CIII-TV-22	STEVENSON	ON
31	31	WPXD	ANN ARBOR	MI
32	25 → 32	CICO-TV-32	WINDSOR	ON
38	39	WADL	MOUNT CLEMENS	MI
50	14	WKBD	DETROIT	MI
54	69 → 35	CBEFT	WINDSOR	ON
56	43	WTVS	DETROIT	MI
60	65 → 25	CHWI-TV-60	WINDSOR	ON
62	44	WWJ-TV	DETROIT	MI

What channel is it? This list of DTV stations in the Detroit market obtained from www.rabbitears.info shows how the channel displayed on your TV may not be the actual assigned digital channel. The arrow in some entries indicates the change from temporary to final dial positions when analog ends.

solid until you are out of range of the transmitter. With the DTV signal, the threshold range is very limited. The picture and sound may be perfect close in, zero to 25 miles from the transmitter, and at 27 miles you get no picture or sound. This is very terrain dependent. There is a small window from solid picture and sound to no reception (cliff effect). Environmental and terrestrial conditions can grossly affect cliff effect.

The Egregious Omission

Because of the susceptibility of UHF signals to such things as trees, buildings, and weather, the report labels the DTV antenna situation critical. Dorren calls it "the egregious omission" when those DTV conversion promos say, "All you need to convert to DTV is this low-cost converter."

"Even though it has been touted that you can receive DTV stations with rabbit ears, that really only works if you have a good unobstructed path between your rabbit ears and the transmitter. In fact, with the indoor antennas I tested, you have to be almost on the transmitter site doorstep," reports Dorren. "Observing the antenna and amplifier prices, the cost of DTV conversion is much higher than the \$40 to \$80 that is being advertised in all of the conversion commercials and half-hour 'how to convert' infomercials."

The DTS Fix

To help television stations recover coverage area lost in the switch from analog to digital, the FCC has come up with the Distributed Transmission System (DTS) as a solution to the problem. Essentially, DTS allows a station to install co-channel low-power synchronized transmitters within its former analog coverage area to improve DTV reception.

"With some of the FCC realizing that the DTV propagation problem is more serious than they originally thought, they decided to throw more chewing gum, bailing wire, and duct tape at

This Month In Broadcast History

75 Years Ago (1934)—The Communications Act of 1934 was signed into law by President Roosevelt, replacing the Federal Radio Commission with the Federal Communications Commission to regulate radio and television. *Billboard Magazine* published its first weekly music survey. The Swiss Broadcast Corporation broadcast its first mediumwave program.

50 Years Ago (1959)—"The Battle of New Orleans" by Johnny Horton was #1 on the *Billboard Magazine* "Hot 100" chart of record sales and airplay.

25 Years Ago (1984)—The FCC was accepting comments regarding the proposed AM broadcast band expansion from 1605 to 1705 kHz.

yet another untested fix," says Dorren. "In November of 2008 they approved a report and order for DTS allowing a DTV station to put as many terrestrial repeaters [as needed] to fill in the serious propagation holes in the DTV transmission system."

However Dorren and Lewis concede that DTS is no fix at all, and in fact the potential for multipath-like interference from competing transmitter sites may cause more problems. While multipath interference would cause "ghosting" of an analog picture, the same interference would freeze a DTV signal or terminate reception.

"In our tests the DTV signal was very susceptible to multipath signals at the receiving antenna," the report continues. "Multipath is the reception of signals from the transmitter plus the reception of reflected signals from the local environment and terrain simultaneously at the receiving antenna. These also cause pixelation in spurts with stuttering sound and sometimes complete loss of signals."

Furthermore, broadcasters may not be able to get new DTS transmitters installed and operating in time for the deadline. Broadcast engineers and antenna riggers already have enough to worry about with completing the switch from analog to digital.

"We estimate as high as 50% of the viewers using an outdoor antenna will get few or no DTV signals," conclude Dorren and Lewis. "This number could be as high as 90% for viewers with rabbit ears or other indoor antennas. Coupled with this is the fact that renters, condominium dwellers, and apartment house residents may not be able to use anything but an indoor antenna."

Louis Dorren, founder and CEO of Xytar Digital Systems, developed the method for broadcasting quadraphonic sound that was eventually adopted by the FCC as the standard for FM radio in the 1980s. Noland Lewis founded ACO Pacific, an international supplier of measurement microphones and systems, and is involved with resolution of noise pollution issues.

We Pause For Station Identification

Adding to the DTV transition confusion is the reluctance of over-the-air broadcasters to "advertise" new digital channel assignments. This holds especially true for analog television stations on low VHF Channels 2 through 6 that have been reassigned to UHF digital channels. These stations don't want to give up decades-old name recognition associated with low channel numbers and the legacy of being first on the dial. Analog

Channel 2 WGBH in Boston, for example, has been assigned digital Channel 19 for WGBH-DT, yet on-the-air promotions and digital data contained in the DTV signal still identify it as Channel 2.

Meanwhile some stations have changed on-the-air identification to reflect new assignments. The former analog Channel 60 WNEU that used to identify as "T60" on the Telemundo network now identifies as "T34" in recognition of its new WNEU-DT digital Channel 34 assignment. Yet other stations have found another work-around by dropping the channel number from on-the-air identification, reverting back to old-fashioned callsign identification only. WBZ-TV on analog Channel 4 used to identify as "CBS4," but now only identifies as "WBZ" without any references to channel number. However the data contained in the WBZ-DT digital signal still displays it as Channel 4, even though it's assigned to digital Channel 30.

Confused? Check out www.rabbitears.info on line for a complete listing of DTV channels in your area. Select the listings section, then type in the callsign of a local station or choose one of the major market areas to obtain a list of stations sorted by display channel that includes the actual digital channel assignment, network affiliations, multicast channels, transmission information and contour range with links to the FCC database for individual stations.

Witness

My reception experience of over-the-air DTV signals supports the Dorren and Lewis investigation as well as the Hallenbeck and Morris accounts. Yes, the DTV signals when receivable do provide better picture and sound, and the multi-channel digital signals from some broadcasters result in more channels, but reliable reception is an issue that has me watching less TV than before. At 30 or more miles from most of the major transmitter sites, the hilly terrain, tall trees, and weather make DTV reception a challenge. Anytime the wind blows or the weather is poor, so goes DTV reception. Only a handful of stations are received reliably under any conditions with an outdoor antenna. An indoor antenna is useless.

In the rush to digital, the plan for DTV rollout was poorly conceived and tested by the NAB and FCC. Perhaps they presumed that most viewers get their TV from cable or satellite, thus making the DTV transition invisible. Now the new June deadline

is upon us and nothing has changed. Broadcasters can only hope for the best.

Correction

In the last DTV update in the February edition of "Broadcast Technology," it was reported that analog broadcasters would be giving up spectrum with the transition to digital, citing that the VHF-Lo band (Channels 2 through 6) and UHF above Channel 50 would be reassigned for non-broadcast purposes. Well, several astute readers have since correctly pointed out that although many analog VHF-Lo sta-

tions were given digital UHF channel assignments, some 300 stations will remain on low VHF channels.

In addition, the digital UHF band covers up to Channel 52. For TV DXers it still means that a number of VHF-Lo channels will become open for long-distance reception once analog broadcasting ends. Unfortunately, because of the new June deadline, DXers weren't able to take advantage of the empty channels during the prime spring tropospheric ducting season.

Until next time, 73 and Good DX!

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BROADCASTING

World Band Tuning Tips

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

T

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

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

UTC	Freq.	Station/Country	Notes	UTC	Freq.	Station/Country	Notes
0000	4985	Radio Brazil Central	PP	0400	7325	Voice of Turkey, via Canada	
0000	9570	China Radio International, via Albania		0400	7280	Sudan Radio Service, USA, via UAE	EE/AA
0000	11810	KBS World Radio, South Korea	KK	0400	7405	Radio Marti, USA	SS
0000	9490	Radio Sweden International, via Canada	Swedish	0400	4976	Radio Uganda/UBC	
0000	11935	Radio Veritas Asia, Philippines	Karen	0400	3200	Trans World Radio, Swaziland	GG
0000	9700	Radio Nederland, via French Guiana	SS	0400	4965	CVC, Zambia	vernacular
0030	11975	Radio Free Asia, USA, via Germany	unjd	0400	4828	Radio Zimbabwe	
0030	4747	Radio Huanta 2000, Peru	SS	0400	6110	Radio Fana, Ethiopia	Amharic
0100	11710	Radiodifusora Argentina al Exterior (RAE)		0403	7315	Radio Dabanga, Sudan, via Germany	AA
0100	9565	Super Radio Deos a Amor, Brazil	PP	0430	6100	Radio Tirana, Albania	
0100	9455	RDP International, Portugal	PP	0430	6165	Radio Nederland, Bonaire Relay	DD
0100	5110	WBCQ, Maine		0430	9790	China Radio International, via Cuba	Cantonese
0130	4815	Radio el Buen Pastor, Ecuador	SS	0430	5925	Radio France International	
0130	9420	Voice of Greece	Greek	0430	5945	Deutsche Welle, Germany, via Portugal	
0130	4717	Radio Yura, Bolivia	SS	0430	4770	Radio Nigeria	
0130	7395	Christian Voice, via Uzbekistan		0430	7230	Channel Africa, South Africa	
0200	3985	Hrvatski Radio, Croatia	Croatian	0430	6020	Voice of Turkey	
0200	4800	Radio Buenas Nuevas, Guatemala	SS	0500	6005	BBC Atlantic Relay, Ascension Is.	
0200	3810	HD2IOA, Ecuador	SS time signals	0500	4885	Radio Clube do Para, Brazil	PP
0200	3340	Radio Misiones Intl, Honduras	SS	0500	4905	RN Tchadienne, Chad	FF
0230	4915	Radio Difusora de Macapa, Brazil	PP	0500	6290	Radio Cairo, Egypt	AA
0230	7535	Radio Cairo, Egypt	AA	0500	5005	Radio Nacional, Equatorial Guinea	SS
0240	5920	WBOH, North Carolina		0500	7255	Voice of Nigeria	
0300	5910	Marfil Estereo, Colombia	SS	0500	9745	Channel Africa, South Africa	
0300	4930	VOA Relay, Botswana		0500	7275	RTV Tunisienne, Tunisia	AA
0300	5980	Voice of the Tigray Revolution, Ethiopia	Tigrinya	0500	4960	VOA Sao Tome Relay	Hausa
0300	5010	Radio Malagasy, Madagascar	Malagasy	0500	5890	WWCR, Tennessee	
0300	7505	WRNO, Louisiana		0530	6010	La Voz de tu Concencia, Colombia	SS
0300	4755	Radio Imaculada Conciecao, Brazil	PP	0530	11805	CVC-La Voz, Chile	SS
0300	5925	Radio Farda, USA	Farsi	0530	7200	Republic of Sudan Radio	AA
0300	3185	WWRB, Tennessee		0600	5865	Radio Algerienne, via France	AA
0330	4780	Radio Djibouti	AA	0600	6090	Caribbean Beacon/University Network, Anguilla	
0330	9895	Voice of Islamic Republic of Iran		0600	7850	CHU, Canada	time signals
0330	3320	Radio Sondergrense, South Africa	Afrikaans	0600	5900	Radio Bulgaria	RR
0330	7215	Trans World Radio, via South Africa	Amharic	0600	4800	Radio Transcontinental de America, Mexico	SS
0330	5915	Radio Zambia	vernacular	0600	4845	Radio Mauritania, Mauritania	AA
0400	7210	Radio Fana, Ethiopia	Amharic	0600	11725	Radio New Zealand	
0400	4790	Radio Vision, Peru	SS	0600	5995	RTV Malienne, Mali	FF, vernacular
0400	11510	Radio Voice of the People, via Madagascar	vernacular	0600	6080	Voice of America Relay, Sao Tome	
0400	4775	Trans World Radio, Swaziland	GG	0600	5965	Vatican Radio	
0400	6055	Radio Exterior de Espana, Spain	SS	0630	7811	AFN/AFRTS, Florida	USB
0400	7335	Voice of Russia		0700	9560	Radio Ethiopia	Amharic
				0700	6185	Radio Educacion, Mexico	SS

UTC	Freq.	Station/Country	Notes	UTC	Freq.	Station/Country	Notes
0900	11750	HCJB Global, Australia		1530	15650	Miraya FM, Sudan, via Slovakia	AA
0900	6160	CKZN, Canada (Newfoundland)	relay CFGB	1600	12015	BBC Relay, Oman	unid
0900	9765	Radio New Zealand		1600	13675	Radio Austria International	GG/EE
0900	5995	Radio Australia		1630	11585	Kol Israel	HH
0900	2210	Radio Mosoj Chaski, Bolivia	QQ	1630	15605	Radio France International	
1000	6155	Radio Fides, Bolivia	SS	1700	12080	VOA Relay, Botswana	vernacular
1000	6285	Voice of Korea, North Korea		1730	15420	BBC, via South Africa	
1000	6010	Radio Mil, Mexico	SS	1800	9610	Radio Canada International	FF
1030	9465	Radio Australia		1800	11745	SW Radio Africa, via Wooferton	
1030	3280	La Voz del Napo/Radio Maria, Ecuador	SS	1800	15215	Radio Jamahiryia, Libya	Hausa
1030	9355	Voice of Korea, North Korea		1800	11990	Radio Kuwait	
1100	3220	HCJB Global, Ecuador	Quechua	1800	9555	BSKSA, Saudi Arabia	AA
1100	3250	Radio Luz y Vida, Honduras	SS	1800	15120	Voice of Nigeria	various
1130	15190	Radio Africa, Equatorial Guinea		1900	11725	Deutsche Welle,Germany, Rwanda Relay	
1130	5040	Radio Libertad, Peru	SS	1900	11860	Radio Jamahiryia, Libya	Hausa
1200	4460	China National Radio	CC	1900	9575	Radio Medi Un, Morocco	FF
1200	2485	ABC Northern Territories Service, Australia		1900	11830	Radio Nederland, via South Africa	AA
1200	15220	Radio Romania International		1900	15290	Radio Nacional de Venezuela, via Cuba	SS
1200	15380	BSKSA, Saudi Arabia	AA	1930	9550	Far East Broadcasting Assn., via Rwanda	AA
1200	9541v	SIBC, Solomon Islands		1930	11660	Radio Nederland, via France	
1200	4790	Radio Republik Indonesia-Fak Fak	II	1930	11735	Radio Tanzania, Zanzibar	EE, Swahili
1200	4900	Voice of the Strait, China	CC	1930	9970	RTBF International, Belgium	FF
1230	15150	Voice of Islamic Republic of Iran	AA	2000	11655	Radio Nederland	
1230	3280	Voice of Pujang, China	Mandarin	2000	9580	Africa No. One, Gabon	FF
1230	3235	Radio West New Britain, Papua New Guinea	Pidgin	2000	9830	Radio Jordan	AA
1300	9625	CBC Northern Quebec Service, Canada	Inwit	2000	17680	CVC-La Vozl, Chile	SS
1300	11810	Radio Jordan	AA	2030	9825	Radio Free Asia, via Palau	CC
1300	9525v	Voice of Indonesia	EE, others	2030	9535	Radio Thailand	Thai
1300	11935	Adventist World Radio, Guam	JJ	2100	6973	Galei Zahal, Israel	HH
1300	11730	BBC, Cyprus Relay	Uzbek	2130	12080	Radio Australia	
1300	3385	Radio East New Britain, Papua New Guinea		2130	11620	All India Radio	
1300	9900	Voice of Russia	Pashto	2130	9330	Radio Damascus, Syria	
1300	7365	VOA Relay, Philippines	Cantonese	2130	6150	Radio Romania International	
1300	9990	Radio Liberty, USA, via Sri Lanka	Pashto/Dari	2130	5240	Family Radio,USA, via Moldova	
1300	9735	Radio Taiwan International	JJ	2130	9445	All India Radio	
1300	13580	Radio Prague, Czech Republic		2200	5930	Radio Prague, Czech Republic	
1300	11970	Radio Romania International		2200	11780	Radio Nacional da Amazonia, Brazil	PP
1300	11590	Radio Free Asia, USA, via Kuwait	Tibetan	2200	11965	Adventist World Radio, Guam	II
1300	5764.5	AFRTS, Guam	USB	2200	6125	Radio Exterior de Espana, Spain	
1330	7365	Radio Thailand	Thai	2200	9600	Vatican Radio, via Russia	CC
1330	12035	Voice of Turkey		2230	6250	Radio Wadi el Nile, Egypt	AA
1330	6075	Kamchatka Radio, Russia	RR	2230	6070	ELWA, Liberia	
1330	6065	China National Radio-China Business Radio		2230	5850	Radio Sweden International	
1400	6070	CFRX, Canada	relay CFRB	2230	5830	Radio Ukraine International	
1400	12000	Radio Havana Cuba		2230	7320	Magadan Radio, Russia	RR
1400	7235	Voice of America Relay, Northern Marianas	KK	2230	9760	Cyprus Broadcasting Corporation	Greek, wknds
1400	5985	Shiokaze, via Japan	various	2300	5035	Radio Aparecida, Brazil	PP
1400	9450	Sound of Hope, Taiwan	CC	2300	6070	CVC-La Voz, Chile	SS
1430	15585	Radio Exterior de Espana, Spain	SS	2300	4319.5	AFN/AFRTS, Diego Garcia	USB
1500	9870	All India Radio	Hindi	2300	5025	Radio Rebelde, Cuba	SS
1500	15275	Deutsche Welle, Germany, Rwanda Relay	GG	2300	12040	HCJB Global, Ecuador	GG
1500	15345	RTV Marocaine, Morocco	AA	2330	11975	China Radio International, via Mali	CC
1500	21695	Radio Jamahiryia, Libya		2330	11975	Trans World Radio, Guam	CC
1500	15565	Radio Liberty, USA, via Germany	Avar	2330	9595	Radio Nikkei, Japan	JJ
1500	15235	Vatican Radio	Tamil	2330	11910	Radio Japan	JJ
1500	6150	KNLS, Alaska	RR	2330	13680	Radio Nacional de Venezuela, via Cuba	SS
1530	13720	Radio Tirana, Albania		2330	9840	Voice of Vietnam	

New, Interesting, And Useful Communications Products

by Staff

Dual Electronics Portable Navigation Device (PND) With HD Radio Real-Time Traffic

Hobbyists hitting the road this summer will want to check out Dual Electronics recently announced flagship portable navigation device (PND), the Dual XNAV43HD. Unlike other mobile GPS systems, the XNAV43HD features built-in HD Radio technology and live traffic updates via a generous 4.3-inch color touchscreen.

The XNAV43HD alerts the driver to real-time traffic conditions through HD Radio TMC (Traffic Message Channel) broadcast by Clear Channel's HD Radio stations. The traffic data for this service is created by a combination of Clear Channel's Total Traffic Network and INRIX floating car data. All the data provided is continuously monitored and updated by Clear Channel's staff of local traffic data producers.

Other features of the XNAV43HD include intuitive operation and a simple interface via a large, bright 4.3-inch TFT LCD color touchscreen, highlighted by a built-in light sensor that automatically dims the display in daylight conditions. The unit's fast 533 MHz processor is fed by NAND flash memory, assisted by both 128 MB of random access memory and an external slot for SD/SDHC/MMC cards. Text-to-speech for announcing navigation guidance is included along with complete maps of North America and millions of points of interest. The XNAV43HD can also play music, videos, and photos from SD/SDHC and MMC cards.

Dual's XNAV43HD comes complete with a 12-volt power cord that charges its internal lithium



Dual Electronics' XNAV43HD portable navigation device features built-in HD Radio technology and live traffic updates.

um ion battery, which lasts up to four hours, as well as a USB cable, a cradle and suction cup for easy dash or windshield mounting.

The Dual XNAV43HD has a suggested retail price of \$279.99. For more information, visit www.dualav.com, or call the company toll-free at 866-382-5476.

Fuji EnviroMAX High-Performance Green Batteries

Also of interest to those traveling this season is the Fuji's EnviroMAX line of high-performance batteries, which are as kind to the environment as they are to your wallet. The battery line includes Super Alkaline and Digital Alkaline varieties which are free of poisonous mercury and cadmium, are safe in most landfills, and can be disposed of through normal waste systems.* They have no ingredients that could harm the environment as the batteries degrade.

Competitively priced, Fuji EnviroMAX batteries equal or exceed the performance and longevity of major equivalent brands. The Super Alkaline, available in AA, AAA, C and D (MSRP \$3.99), offer dependable power for most common applications, such as radios or flashlights. Digital Alkaline, available in AA and AAA (MSRP \$5.99), are engineered to provide superior per-



Fuji's EnviroMAX "green" batteries are free of poisonous mercury and cadmium, are safe in most landfills, and can be disposed of through normal waste systems. But make sure to follow local guidelines.

formance in high drain electronic devices. Fuji EnviroMAX batteries are also packaged in over 75-percent recycled and recyclable materials, including recycled paper and PET plastic.

Fuji EnviroMAX batteries are available in many consumer outlets or direct from the company at www.greenfuji.com.

**Please follow your state and local regulations regarding the proper disposal of all batteries.*

New iPhone App Simplifies HF Beacon Net To Help Find DX Openings

According to a product release, radio amateur Danny Goodman, AE9F, is offering the BeaconAid-HF, a \$2.99 application for the iPhone and iPod touch, that helps hams and shortwave listeners easily determine current propagation. Available now on Apple's iTunes App Store, the program lets HF amateur radio operators and shortwave listeners take full advantage of the NCDXF/IARU global beacon network to determine actual propagation conditions.

According to Goodman, rather than requiring the user to look up a table and calculate which station is supposed to be transmitting its 10-second signal on any given band at any given moment, BeaconAid-HF shows exactly where on the clock and VFO the beacons are supposed to be. The program provides two different views of the changing data, depending on whether the user is interested in seeing to where a particular band is open, or which band might be open to a specific beacon location. The user selects the leftmost thumbwheel, and BeaconAid-HF spins the other in sync with the beacon schedule. Within three minutes of sitting with BeaconAid-HF in front of a receiver, the user knows how 20 through 10 meters are behaving, even without knowing Morse Code to read the CW IDs of the stations, says Goodman.

In addition to showing current beacon schedules, BeaconAid-HF provides a gateway to viewing graphical charts posted by live beacon monitor stations around the world. A list of monitors is presented with the one closest to the user in the top position. Availability of monitor reports is shown in real time (Wifi, 3G, or Edge Internet connectivity required), and monitor station websites are viewable within BeaconAid-HF. The current solar-terrestrial indices (solar flux, A-index, and K-index) are also displayed with the monitor pages.

For more information, contact the author at iphone@dannyg.com.

Genius Noise Canceling Headphone

Genius, a brand division of KYE Systems Corp., has announced a new headphone designed to block outside sound for people who are only interested in hearing their target audio rather than extraneous sounds. The company's GHP-04NC cancels out background distraction noise allowing only the desired audio through. Built for comfort and long wear, the GHP-04NC is appropriate for audiophiles who travel or work/live in a noisy environment.

Incorporating the "superposition principle," the GHP-04NC uses an inverted version of the noise signal to cancel outside noise when two identical sound waves combine. This results in destructive interference, the most effective way to cancel noise from low-frequency sources. For high-quality sound, the GHP-04NC uses a 40mm unit driver. The padded swivel ear-cup can be adjusted to fit any face contour and the soft headband sponge and leather ear pad are comfortable, even for long-time wear. Perfect for trains, airplanes, subways, and work-spaces, the GHP-04NC helps fade away background noise for up to 50 hours of uninterrupted enjoyment on just two AAA Alkaline batteries.

Priced at \$49.99, the GHP-04NC comes complete with a 6.3mm dual-plug stereo adapter, which can connect to a variety of flight audio sources, and a travel leather bag. For a list of retailers and distributors, visit www.geniusnetusa.com/buy.php; for more information on all of Genius' headphones and other products, visit www.geniusnetusa.com.



Genius GHP-04NC noise canceling headphones block distracting background noise and offer long-wear comfort for audiophiles who travel, work, or live in a noisy environment.

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The AOR AR-Mini Handheld Communications Receiver

by Ken Reiss

"The 100 kHz to 1299.95 MHz (less cellular, of course, in the U.S.) wide band coverage in a shirt pocket-sized, 7.4 oz package is the real attraction of this receiver."

T

here have been a lot of shirt pocket receivers released over the years, but every once in a while one proves highly distinguished. Such is the case with the AR-Mini, which is truly a communications receiver in your pocket. Listing for \$299 MSRP, it's certainly worth a good look.

The Specs

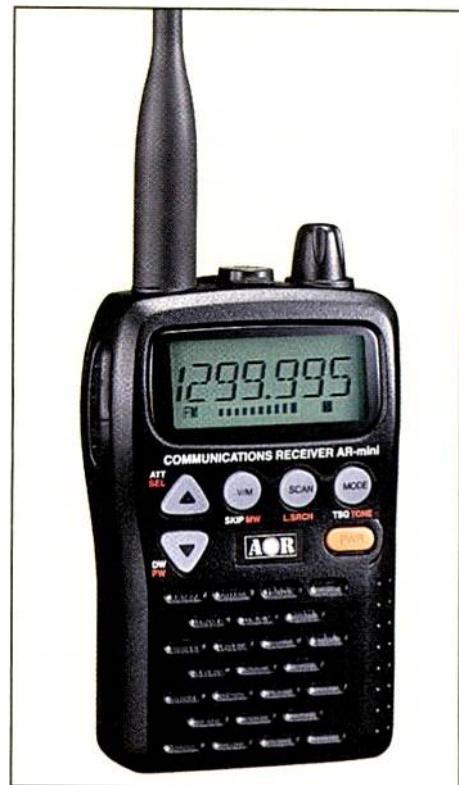
From a pure receiver standpoint, the AR-Mini is impressive. The 100 kHz to 1299.95 MHz (less cellular, of course, in the U.S.) wide-band coverage in a shirt pocket-sized, 7.4 oz package is the real attraction of this receiver. Its 1,000 memory channels in 10 banks are also noteworthy, and a triple-conversion design rounds out the impressive specs on the AR-Mini.

The receiver also includes tone squelch, which is a welcome addition on a small radio. Both CTCSS (Continuous Tone Coded Squelch System, also known by the Motorola trade name, Private Line) and DCS (Digital Code Squelch) are available. Once again, these are somewhat rare features on such a small receiver.

Dual VFOs are available or, rather, simulated by using a special dual memory channel, or by using the VFO and a regular memory channel. This allows you to monitor both the VFO frequency and the frequency in the designated memory channel at the same time. It's similar to a priority/VFO operation on many other receivers, and there's also a priority function available on the AR-Mini. In short, there should be lots of options for listening to a frequency or two when using this receiver.

As an interesting aside, the AR-Mini supports the European 8.33 kHz tuning step used in the air band. Should that be adopted in the U.S. (and there have been discussions about that), you'll be all set with this receiver, which should make an excellent air band scanner. It covers the military

Ken Reiss is *Popular Communications'* "ScanTech" columnist.



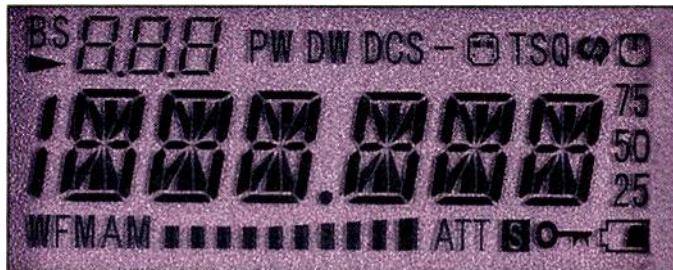
AOR's AR-Mini is truly a communications receiver in your pocket.

air band, as well; since this feature is becoming a rarity these days, the receiver may be of particular interest to MilComm fans.

Rounding out the AR-Mini's impressive résumé is a stabilized crystal oscillator and a receiver that's very easy on batteries (AOR claims up to 22 hours of operation on a single set of batteries!).

Some Necessary Compromises

As with many small handheld receivers, there are tradeoffs to be made for the size. The main tradeoff with the AR-Mini is that there is no numeric keypad on the receiver for direct frequency entry, which is no doubt a compromise based on the size of the unit. This presents a limitation on something billed as a communications receiver that goes anywhere and does everything. Entering frequencies manually is not impossible, but you certainly



The AR-Mini's large, easy-to-read alphanumeric display is particularly impressive for such a small receiver.

wouldn't want to fill up 1,000 memory channels that way. There is a PC-based application that's fairly easy to use for this purpose and it makes the AR-Mini a useful package.

The absence of a keyboard also leads to a general lack of controls and buttons to access functions. As a result, many buttons do several things based on which other buttons are pressed at the same time. Simple functions like volume and squelch are hidden on the top control knob, which also adjusts the frequency. Once you know where it is, it's easy and quick to adjust, but finding it without the manual would be a challenge. Spend some time with the manual if you get one of these receivers.

Another compromise that seems to be common with communications receivers is that they're not ideal scanners. The AR-Mini will scan conventional memory channels, and even includes a unique Bank Link function that allows for multiple banks to be scanned together (a rather unusual feature on all but top-of-the-line communications receivers). Unfortunately, configuring the Bank Link list is a bit tricky (although not difficult once you get used to it) and would be inconvenient to do in a hurry if you wanted to focus on a particular bank where the action was. It's also not the fastest scanner, rated at eight channels per second.

Like most other communications receivers, it also does not include trunking functions, so it may not be the best choice as a first scanner if you're in an area with trunked systems.

Hands On

Before you even turn on the AR-Mini, the first thing that grabs you is the AA batteries. I'm always happy to see this option in a portable. Included in the package are rechargeable AA NiMH batteries, but it will take standard alkalines just fine. That's a great feature for when you're out and about or on a trip with no power source available. There's a very secure clip and cover that keeps the batteries securely enclosed. The receiver is water resistant—you won't want to dunk it in the pool, but it will stand up to a few splashes or rain drops without harm.

The first thing that grabs you about the AR-Mini *after* you turn it on is the large display at the top of the receiver greeting you with a friendly "Hello." The display is quite readable by the standards of any handheld, but it's particularly impressive for such a small receiver. Large digits display the frequency or memory label clearly and make it easy to read even from some distance. Even the memory channel numbers are larger than most radios I've seen lately.

Up to six alpha characters can be assigned to any memory position, making it unnecessary to remember what's loaded into what memory. With 1,000 memories, that's a real help! Between the memory alpha tags and the labels on the buttons, it really doesn't take all that long to get comfortable with the

No.	Function	Settings
0	STEP	AUTO
1	F STEP	1 M
2	LAMP	AUTO
3	TIMER	OFF
4	SM SEN	NORMAL
5	SM BUZ	OFF
6	CARLOR	CARLOR
7	PAUSE	5 sec
8	SEARCH	VFO
9	M-SCAN	ALL
10	SRH LK	LTLINK 0
11	MBK LK	BKLINK 0
12	SCHMEM	
13	BANKCL	
14	SKP CL	
15	MSKPCL	
16	S MUTE	ON
17	BARANT	BAR
18	ERANT	EXT
19	AUTOVR	OFF
20	TSQ	88.5

No.	Function	Settings
21	REVTSQ	88.5
22	TRIFONE	2380
23	SCRMBL	3300
24	CHWS	OFF
25	DCS	023
26	REVDCS	NORMAL
27	BEEEP	ON
28	SAVE	1 sec
29	VOLT	
30	CHARG	
31	RPTSF	OFF
32	FLEX S	ON
33	CLKSF	OFF
34	ADJUST	

Almost all the parameters of the AR-Mini can be set from the PC software. This makes finding obscure settings much easier than digging through the radio's control structure for features you don't often need.

No.	Frequency	NAME	Mode	TONE SELECT	TSQ	REV TBQ	DCB	REV DCS	8CALR	TRAIN
800	6.03000	VOA	AM	VFO						
801	8.15000	VOA	AM	VFO						
802	9.78000	VOA	AM	VFO						
803	11.93000	VOA	AM	VFO						
804										
805	5.98500	CANADA	AM	VFO						
806	7.23500	CANADA	AM	VFO						
807	9.73500	CANADA	AM	VFO						
808	11.70500	CANADA	AM	VFO						
809										
810										
811										
812										
813										
814										
815										
816	9.78000	PORTUG	AM	VFO						
817	11.96000	PORTUG	AM	VFO						
818	15.55500	PORTUG	AM	VFO						
819	21.65500	PORTUG	AM	VFO						
820										
821	7.27000	SPAIN	AM	VFO						

Here's a sample memory entry screen. All the settings for each memory are easy to configure in one spot. Files of memory sets can also be saved to the computer for quick recall and fast reprogramming as desired.

basic functions. I do highly recommend the PC programming cable, which is a \$62 MSRP accessory. Software is available from AOR Japan at www.aorja.com/index-e.html. You'll need both the driver and the programming tool.

The Skinny On The Mini

All in all, the AR-Mini represents a unique receiver in a small package. It will find a home with those who simply like the small size, or who need a communications receiver that's great for traveling. It probably won't replace the AR5000 or even the 8000 series, but as a second and very portable receiver, it's easy to get used to having around. Add a coil of wire and the included rubber duck for antennas and you're all set for travel reception! Check it out. You may find a receiver you simply can't live without. ■

Happy News About *The Happy Station*, And Lots More To Report

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

"For us shortwave guys, the resurrected Happy Station show, initially, will be on WRMI-9955 and will air on Thursdays from 0100-0155."

An old friend has returned: *The Happy Station*, the program, begun in 1927 by a young fellow named Eddie Startz on what was then PCJ in Holland. In the ensuing years PCJ became Radio Nederland and the program went on—and on, and on, and on—becoming one of the world's most popular shortwave shows. Startz, with his “nice cup of tea,” stayed at the helm until early 1970, when he retired. He was followed by hosts Tom Meijer, later Pete Myers, and then Jonathan Grouper, until the program went off the air in 1997—a run of 70 years!

The new version will be hosted by Keith Perron, who has been with several Canadian domestic stations, including RCI, as well as done stints with Radio Havana Cuba and China Radio International. He'll be based in Taiwan where the show will be produced, and the connection with Radio Nederland will be in program name only. It will be available from several sources (or “platforms” in newspeak). For us shortwave guys, the resurrected *Happy Station* show, initially, will be on WRMI-9955 and will air on Thursdays from 0100-0155.



Radio Nederland (PCJ when it began) has no connection with the new version of *The Happy Station* program.

Shortwave has lost its “Solh”...at least it seems so. No one—not even the real hotshot DX guys—has been able to trace any broadcasts from Radio Solh, the U.S. Army “psy-ops” broadcast for Afghanistan. Oddly (or maybe not) the cessation seems to have occurred just a week or so after the new Obama administration took the reins in Washington. Nothing official has been said one way or the other.

An odd, apparent clandestine station has appeared in the Middle East. Radio Al Aqsa seems to be carrying programs in support of the Gaza uprising and appears to be the audio portion of a TV channel using the same name. There are hints that Iran's DNA is on this operation in one form or another. When the radio is in operation, it's been using 5815 and 5835. The few reports of it I've seen have been during daytime hours, which make for very difficult, if not impossible, U.S. reception.

There's a new, and apparently unlicensed, station in Colombia. Radio Juventud (Youth) is testing occasionally on 5553.5, but that may not be where this one finally lands; it has the ability to use 5585 and 5590 as well. The station is in Pasto, Nariño Department, and uses only 300 watts.

Another new one that looks as if it will be on “level tough” is Amhara Regional State Radio in Ethiopia using 6090 from 0300-0600, 0900-1000 and 1400-1700 and broadcasting in Amharic. Also said to be in operation are 7264 (correct) and 9740. At this writing the station is still in test mode.

Lithuania has pulled the plug on Radio Vilnius. They are out of money. If the day ever dawns when they have enough *litas* in their treasury, they hope it will return to shortwave. We hope so, too.

KTMI is the call of a new shortwave station planned for Albany, Oregon, and about to go on the air with tests—or likely may be on already—using 6025, 9445, and 11615. The call stands for Transformational Media International (not “too much information!”). We welcome it, but I'm



Radio Slovakia International puts on a happy face, at least on this QSL version.

afraid we can expect a format consisting largely of still more commercial religion. The station plans to focus on the rather odd combination of Mexico, Cuba, Canada, and Kamchatka as its target areas.

The VOA Urdu service, Radio Aap ke Dunyaa, which was discontinued at the end of December last year, is back. Those broadcasts are scheduled from 0100–0200 on 9520 and 9820 and from 1400–1500 using 7440 and 9390.

Reader Logs

Remember, your shortwave broadcast station logs are always welcome. But *please* be sure to double or triple space between the items, list each logging according to its home 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, general information, and anything else you think would be of interest. And c'mon now...how about that photo of you at your listening post? It's high time your face graced 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.

ALBANIA—Radio Tirana, 6100 at 0445 with classical music and a feature on Albanians sheltering Jews during WWII. (Wood, TN) 13720 heard at 1545 on the minister of consumer protection. (Maxant, WV)

ALGERIA—Radio Algerienne, 5865 via Issoudun in AA at 0614. (Parker, PA)

ANGUILLA—Caribbean Beacon, 6090 with sermon by a woman at 0437. (MacKenzie, CA) Gene Scott preaching at 0620. (Maxant, WV)

ARGENTINA—RAE, 11710.8 at 0115 with SS ballads, EE talks. Weak modulation. (Alexander, PA)

ASCENSION IS.—BBC South Atlantic Relay, 6005 with news at 0513. Also 7160 at 0520 with a wake-up pgm for Africa. (Wood, TN) 6145 at 0333, //7255. Also 7160 at 0422 with pop vocals. (MacKenzie, CA) 17830 heard at 1542 on global economic instability. (Brossell, WI)

AUSTRALIA—Radio Australia, 6020 at 1106 with sports talk, //9475. (Yohnicki, ON) 1200 discussing the Australian fires. (Barton, AZ) 6080 at 1359 with IS, 1400 time check and news, //5995. (Strawman, IA) 9475 at 1030 with news, preview of *Health Report* pgm. (Linonis, PA) 9475 with news at 0910, 9660 at 0610, 9710 at 0935 and 11660 with an interview at 2120. (Maxant, WV) 12080-Brandon at 2145 with C&W, regional news items. (Ronda, OK)

ABC Northern Territories Service: 2310-Alice Springs with news at 1230. (Brossell, WI) 1330 (Strawman, IA) 2325-Tennant Creek at 1120, best signal of the three stations. (Wilkner, FL) 2485-Katherine at 1340 with news feature. (Strawman, IA)

CVC, 15250 at 0050 with "CVC-Queensland, Australia" ID in II f/by music. (Ng, Malaysia)

HCJB-Australia, 11750 with *DX Party Line* at 0800. (Ng, Malaysia) 0915 with religious talk. (Maxant, WV)

AUSTRIA—Radio Austria Inter-national, 7325 at 0000 in EE, GG, FF, SS during the half hour then repeated the second half hour. (Fraser, ME) 13675 with news in GG/EE at 1615. (Maxant, WV)

BOLIVIA—Radio Mosoj Chaski, Cochabamba, 3310 at 0054 with apparent SS commentary, but barely above the noise level. (Wilkner, FL)

Radio Fides, La Paz, 6115.3 at 1035 with SS talk by M/W, ID, commls, and jingles. Poor. (Alexander, PA)

Radio San Miguel, Riberalta, 4669.4 at 0157 with M ancr and slow music, but audible only briefly. (Parker, PA)

BONAIRE—Radio Nederland Relay, 6165 in SS heard at 0255. (Parker, PA) DD heard at 0455, M with comments. (MacKenzie, CA)

BOTSWANA—VOA Relay, Mopeng Hill, 4930 at 0306 and 9885 at 0347 with *Today in History*. (Parker, PA) 9600 at 0505–0530* with mentions of several African countries. Off with Yankee Doodle IS. (Wood, TN) 12080 in an African language at 1725. (Yohnicki, ON) 17895 on US songwriters at 1544. (Brossell, WI)

BRAZIL—(All in PP) Radio Imaculada Conceicao, Campo Grande, 4755 heard at 0335 with slow M vocal and near perfect copy through weak CODAR. (Parker, PA) 0455 with M/W religious discussions, inspirational music. (Wood, TN)

Radio Cultural Ondas Tropicales, Manaus, 4845 at 1040 with M and into easy listening music. (Ronda, OK)

Radio Clube do Para, Belem, 4885 at 0425 with M and Latin pops, echo effects. (Wood, TN) 0628 with M ancr and reverb. (Parker, PA)

Radio Anhanguera, Anhanguera, 4905 at 0434 with mentions of Brazil, Latin pops. (Wood, TN)

Radio Nacional Macapa, Macapa, 4915 at 0430 with M ancr, pops. (Parker, PA) 0510 with ID by W and interviews with young people. (Wood, TN)

Radio Educacao Rural, Tefe, 4925 at 0050 with vocal ballads, CODAR QRM. (Strawman, IA) 0140 with M/W talks, jingle, pops. (Parker, PA) 0150 to 0202 close with light music, M/W talk, closing ID anmts at 0201. (Alexander, PA)

Radio Capixaba, Vitoria, 4934.9 at 0225 with M giving boisterous speech before a cheering audience. (Parker, PA)

Radio Mundial, Osasco, 4974.8 at 0228 with impassioned speech by M. (Parker, PA)

Radio Brazil Central, Goiania, 4985 with lively local songs at 0210 with two M talking. (Parker PA) 0211. (Ronda, OK) 0434 with pop vocals. (D'Angelo, PA) 0610 with fast-paced pops. Also 11815 at 0555 with preaching, several IDs, //4985. (Wood, TN) 4985 at 2320 with soccer match. (Strawman, IA)



This ex-Swiss Radio International transmitter will soon be in use at WMLK, Bethel, Pennsylvania. (Thanks Charles Maxant, WV)



The re-erected antennas at WMLK, which had been downed in a monster ice storm. The transmitter building sits just behind them. (Thanks Charles Maxant, WV)

Radio Aparecida, Aparecida, 5035 at 0520 with M talk f/by inspirational group vocal. (Parker, PA) Romantic ballads, IDs at 2330 and 2359. (Ronda, OK)

Radio Bandeirantes, Sao Paulo, 6090 at 0525 with Anguilla off. Good signal with a talk, //9645.3. Anguilla was back at 0602. (Alexander, PA)

Radio Record, Sao Paulo, 6150 at 2321 with various fast-talking men, ID, jingles and commls. (Strawman, IA)

Super Radio Deus e Amor, 9565 at 0125 with a preacher, short music bridges, //6060 which was weak under Cuba. (Alexander, PA)

Radio 9 de Julho, Sao Paulo, 9819.1 with M/W slow ancrs and ballads, ID at 0425. (Parker, PA)

Radio Nacional da Amazonia, Brasilia, 11780 at 0635 with M ancr and up-tempo music, several mentions of Brasilia. (Wood, TN) 1918 with talks. (Brossell, WI)

BULGARIA—Radio Bulgaria, 5900 at 0600 with IS, talks in RR. (Parker, PA)

CANADA—Radio Canada International, 7195-via South Korea in CC at 2200. (Ng, Malaysia) 9610 in FF at 1840. (Linonis, PA) 13730 in SS at 2328. (MacKenzie, CA)

CBC Northern Quebec Service, 9625 at 1300 in Inuit with news, weather, sports. (Linonis, PA)

CFRX, Toronto, 6070 with a talk show at 1550. (Maxant, WV)

CKZN, St. John's (Newfoundland), 6160 at 0920 on harvesting oysters. (Maxant, WV)

CHU, Ottawa, 7850 with EE/FF time signals at 0605. (Maxant, WV) 1110. (Yohnicki, ON)

CHAD—Radio Nationale Tchadienne, 4905 at *0429 sign on with balafon IS, nation-

al anthem, opening anmmts at 0430, then Afro-pops and local tribal music. I usually don't hear the IS. (Alexander, PA)

0441 with several IDs for "Radio Nationale." Widely fluctuating signal levels, from nothing to S9 +20! (Wood, TN) 0448 sign on and into presumed FF news. (Brossell, WI) 0510 with M/W reading news in FF. (Ronda, OK) 0635 in (p) AA with upbeat tunes. (Parker, PA)

CHINA—China Radio International, 5985 via Albania in CC at 0634, 6115 via Canada at 0618, 6190 via Canada in EE at 0432, 9435 in CC at 0028, 9460 in CC at 0025, 9790 via Cuba with EE/CC lesson at 0352. Also 11820 in CC at 0003, 11970 at 2353, 9570 via Albania at 0012, 9665 via Brazil in SS at 0356 and 11975 via Mali in CC at 2347. (MacKenzie, CA) 5955 at 1010 sandwiched between WYFR and CVC. (Barton, AZ) 9685-Urumqi in RR at 1210 and 11965 via Albania in FF. (Brossell, WI) 9790 via Cuba in Cantonese at 0433. (Parker, PA)

CPBS/China National Radio: CNR-1, 4460-Beijing in CC at 1344. (Strawman, IA) 1350. (Ronda, OK) PBS Xizang (p), 4905 poor with listed Tibetan service at 1345. CNR-1, 5030-Beijing with usual M/W talk at 1346. Also CNR-2, 11845-Xi'an at 0041 with Xi'an outlets on 11820, 11885 plus 11770-Beijing all good at the same time. (Strawman, IA) CPBS-Shijiazhuang, 7110 in CC at 1203. (Brossell, WI) CPBS, 11750 in CC at 0010. (MacKenzie, CA) 15500-Beijing in CC at 0115. (Ng, Malaysia)

Firedrake jammer, 9905 over RFA-Palau at 1514. (Brossell, WI)

CHILE—CVC-La Voz, 6070 with M in SS at 2340. (Yohnicki, ON) 6110 at 0945 with

In Times Past...

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

CLANDESTINE—Radio Truth 5015 at 0431 on 8/14/83 in PP. Based in South Africa, opposing the Mugabe government in Zimbabwe. (Dexter-WI)

Christian music. (Linonis, PA) 11805 at 0550 booming in with LA inspirational music. (Wood, TN)

COLOMBIA—Marfil Estero, Puerto Lleras, 5910 at 0443 in SS with MoR pops, alternating between slow and up-tempo tunes. (Wood, TN)

CROATIA—Hrvatski Radio/Voice of Croatia, 3985 in Croatian at 0227. News in EE from 0301-0305. (Parker, PA) 15360 monitored at 0700 with EE news. (Ng, Malaysia) (*Presume this is via Germany.*—gld)

CUBA—Radio Rebelde, 5025 at 0435. (Maxant, WV) 2340 in SS with music. (Yohnicki, ON)

CZECH REPUBLIC—Radio Prague, 5930 at 2225 with domestic songs. (Maxant, WV) 15380 at 1308 on energy security meetings. (Fraser, ME)

DIEGO GARCIA—AFN/AFRTS, 4319u at 2255 with mostly news features. Peaked at 2330-35. First time heard here! (Strawman, IA)

DJIBOUTI—Radio Djibouti, 4780 at *0259 sign on with national anthem and into Koran, AA talk, HOA music. Also noted 2230-0159* close. (Alexander, PA) 0320 in vernacular with marvelous native selections featuring drums, strings and vocals. (Parker, PA) 0337 with M in AA. (Ronda, OK) 0405 with HOA music, CODAR QRM. (Strawman, IA) 0439 in AA with ME, Afro-pops and HOA. (Wood, TN)

ECUADOR—HCJB, 3220 at 1054 with flutes and vocals in Quechua. (Ronda, OK) 6050 at 0009 in listed Cofan language, TS at 0030. Cofan is spoken in Napo province in Ecuador's NE. (Ronda, OK) 6125 in unid language at 0950. (Linonis, PA) 12040 in GG at 2343. (MacKenzie, CA)

La Voz del Napo/Radio Maria, Tena, 3280 at 1040 with lively religious songs. (Ronda, OK)

Radio el Buen Pastor, Saraguro, 4815 at 0147 with SS M ancr and ballads just barely making it through strong CODAR. (Parker, PA)

HD2IOA, Guayaquil, 3810 at 0250 with SS time signals. (Parker, PA)

EGYPT—Radio Cairo, 6255 at 2140 talking about listener emails. (Maxant, WV) 2203 with W and EE news. (D'Angelo, PA) 2233 with commentary about Gaza. (Ronda, OK) 6290 at 0522 with call-in show that sounded staged. (Wood, TN) 7535-Zaabab at 0248 in EE with talks f/by AA music. (Parker, PA)

Radio Wadi el Nile, 9250-Zaabab, at 2257-2300* with Koran, AA anmmts, closing music and off. (Alexander, PA)

ENGLAND—BBC, 3255 Meyerton Relay at 0401 with news. Also 6110-Skelton with 2100 opening and into news. (D'Angelo, PA) 3915 Singapore Relay with news at 2303. (Alexander, PA) 5975 Singapore Relay at 1358 with anmmts, numerous IDs. (Barton, AZ) 5875-Rampisham with *The World Today* at 0605. (Parker, PA) 7255 at 0440 on Sudan's civil war. (Maxant, WV) 9605 Singapore relay at 1403 in presumed CC. (Strawman, IA) 9610 Meyerton Relay in Swahili at 0322. Also 15420 South Africa Relay with sports report at 1750. (Ronda, OK) 11750 Cyprus Relay in listed Uzbek at 1320. (Brossell, WI) 17615 Singapore Relay with *World Briefing* at 0105. (Ng, Malaysia)

Far East Broadcasting Assn., 9550 via Rwanda in AA at 1933. (Brossell, WI)

EQUATORIAL GUINEA—Radio Nacional, Bata, 5005 at 2215 with SS talk, many IDs, off with national anthem at 2255. (Alexander, PA)

Radio Nacional, Malabo, 6250 monitored at 1950 with SS talk, local tribal music, Afro-pops. Off abruptly at 2011. (Alexander, PA)

Radio Africa, 15190 noted with EE religious pgms at 1130, low modulation. Also at 2110 with gospel music. (Alexander, PA) 1926 with M/W and religious discussion. (D'Angelo, PA)

ERITREA—Voice of the Broad Masses, 7165 with Program 2 at *0356 with IS. This was initially on 7175 but moved here at 0356. HOA music at 0406. Good until covered by noise jammer at 0409. Also 7210 Program 1 at *0355, talk at 0400, short HOA music breaks. (Alexander, PA) *0356 with ancr and multiple IDs in different languages, Amharic ID, W with news in Amharic. Break in the signal monitored at 0420. (D'Angelo, PA)

Radio Bana (p) 5100 at 0412 with talk in Tigrinya, series of HOA vocals. (D'Angelo, PA)

ETHIOPIA—Radio Ethiopia, 7110 at *0259 with electronic keyboard IS, Amharic talk at 0300, HOA music, very weak on //5990 and 9704. (Alexander, PA) 0409 with HOA music and two men in Amharic, //9704 was poor. (D'Angelo, PA) 9559v at *0659 sign on with IS, talk, HOA music. Drifting between 9559.25 and 9559.67. (Alexander, PA)

FRANCE—Radio France International, 5925-Issoudun at 0436 discussing the French president and various African countries. (Wood, TN) 11620 at 1620 on the Tamil Tigers. (Maxant, WV) 11660 via Madagascar heard at 1936. (Brossell, WI)

GERMANY—Deutsche Welle, 5945 Portugal Relay at 0442 on greenhouse gas effects. (Wood, TN) 11690 via South Africa at 1912 on economic turmoil. Also 12090 Sri Lanka Relay in (I) Dari at 1330, 15275 Rwanda Relay in GG at 1511 and 15440 Portugal Relay in FF at 1243. (Brossell, WI) 6075 in GG at 2200. (Fraser, ME) 11725 Rwanda Relay in GG at 1850. (Linonis, PA) 13680 Sri Lanka Relay in CC at 1130. (Ng, Malaysia)

GREECE—Voice of Greece, 9420 in Greek at 0032. (MacKenzie, CA) 0145 with Greek vocals. (Maxant, WV)

GUAM—Adventist World Radio/KSDA, 11935 in JJ at 1325. (Ng, Malaysia) 11965 in Indonesian at 2209, //11850. (Ronda, OK)

Trans World Radio/KTWR, 11975 in CC at 2348. (MacKenzie, CA)

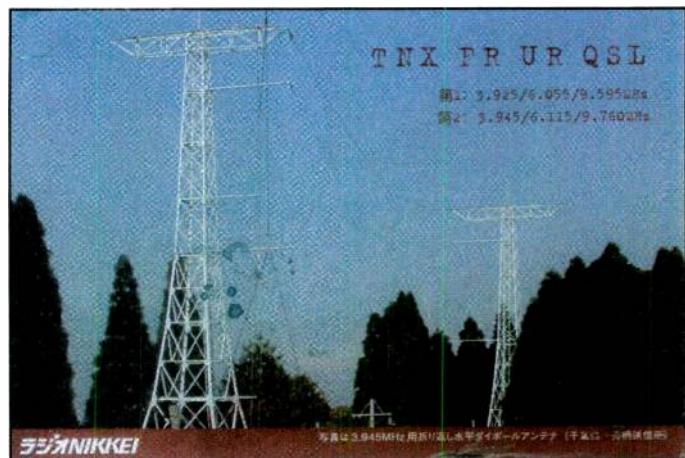
GUATEMALA—Radio Buenas Nuevas, San Sebastian, 4780 heard at 0210 with M ancr in SS and ranchero music. (Parker, PA)

GUINEA—Radio Conakry (t), 7125 in FF at 2210 with local tribal music and Afro-pops. (Alexander, PA)

HONDURAS—HRMI/Radio Misiones Internacional, 3340 at 0815 with SS ballads and ID at 0830. Very good signal. (Alexander, PA)

Radio Luz y Vida, San Luis, 3250 at 0250 with SS conversation, instls. Also at 1134 with W in SS and phone-in pgm. (Ronda, OK) 1110 in SS with M/W talks. (Parker, PA)

INDIA—All India Radio, 4820-Kolkata (p) at 1340, mixing with (p) PBS-Xizang. M shouting or wailing and 4860-Chennai, with threshold signal at 1350 barely above the noise level. (Strawman, IA) 5010-Thiruvananthapuram in presumed Hindi at 1223 and 9870-Bengaluru with talk and songs in Hindi at 1548. Also 11585-Delhi with talks in Hindi at 1518. (Brossell, WI) 9870-Bangaluru at 0401 with local flutes and M vocal. Also 9910-Aligarh at 0323 in Dari with M ancr and indigenous music. (Parker, PA) 11620 with Indian music at 2130, AIR ID, (Maxant, WV) 11620-Delhi at 1400 with a Republic Day speech by



The antennas at Radio Nikkei's transmitting site in Nagara, Japan (Thanks Rich D'Angelo, PA)

the Indian president. (Ng, Malaysia) 13620-Bangaluru at 1730 with W in AA (Ronda, OK)

INDONESIA—Radio Republik Indonesia, 4790-Fak Fak at 1338 with fast paced II talk by M/W. Heavy CODAR QRM. (Strawman, IA)

Voice of Indonesia, 9525v monitored at 1005 with news of Secretary Clinton's visit. (Maxant, WV) 1302 with opening anmmts heard in EE, then into news. (Alexander, PA) 1320 with EE *Today in History*. (Ng, Malaysia)

IRAN—Voice of the Islamic Republic of Iran, 9865 in Azeri at 0406 with W ancr. AA music. Also 9895-Zahedan at 0333 in AA with M and phone interview. (Parker, PA) 15150 with talks in AA at 1238. (Brossell, WI)

ISRAEL—Galei Zahal, 6973 at 2120 in HH. M/W with items on Israel, then music. (Fraser, ME)

JAPAN—Radio Japan/NHK, 11910 in JJ at 2358, time pips at off at 0000. //11665 (MacKenzie, CA) 13650 in VV at 2336. CRI via Cuba was in the background. (MacKenzie, CA)

Radio Nikkei, 3925 in JJ at 1315 with M/W talk in JJ. (Ronda, OK) 1329 with open carrier at 1330. (Strawman, IA) 9595 in JJ at 2340. (Ng, Malaysia)

JORDAN—Radio Jordan, 11810 in AA at 1331. (Brossell, WI)

KUWAIT—Radio Kuwait, 11990 (reactivated) at 1818 with EE *Under the Umbrella of Islam* pgm, f/by pop and rap. ID and frequencies at 1828. 5 + 1 time pips at 1830, f/by ID, local time check and news. (D'Angelo, PA) 1930 with EE talks and features. (Lionis, PA; Maxant, WV)

LIBYA—Radio Jamahiriya/Voice of Africa, 11860 in listed Hausa at 1920 (Brossell, WI) 15215-Sabrata fair-good at 1800 with sign on in Hausa (Ronda, OK) 21695 at 1455 with EE talk, ID, talk on Libyan politics, Afro pop. (Alexander, PA)

MADAGASCAR—Radio Malagasy, 5010 at 0240 in Malagasy with M ancr, highlife, Afro-pops, "oom-pa-pa," jazz fusion. (Parker, PA) 0313 with a variety of Euro-pop songs. (Ronda, OK) 0325 with W hosting blues pgm, long stream of talk including frequency anmmts. (Wood, TN) 2352 with vocals. (D'Angelo, PA)

MALAYSIA—Voice of Malaysia, 6175-Kajang at 0705 with EE talk on multi-racial dance. (Ng, Malaysia)

MALI—Radio Mali, 5995 with instl music to 2230 ID. (Ronda, OK) 2250 with M in FF hosting highlife vocals. (D'Angelo, PA) *0556 with guitar IS, national anthem at 0558, flute IS, FF ID, Koran recitations at 0601 and vernacular talk. Also 9635 at 0800 sign on with opening FF anmmts and flute IS. //7285 was very weak. (Alexander, PA)

MAURITANIA—RTV Mauritanie, 4845 with M in AA at 0618 in (p) AA with M and Koran recitations. (Parker, PA) 2323 with HOA music AA anmmts. (Strawman, IA)

MEXICO—Radio Transcontinental de America, 4800 at 0458 with M in SS hosting vocals. Nice ID at 0518 f/by a formal ID with

**AMERICAN FORCES
Radio and Television
SERVICE**



Armed Forces Radio sent Rich D'Angelo this QSL for reception of its outlet at Diego Garcia.

call letters at 0522, more music. (D'Angelo, PA) 0602 with beautiful chorals, lengthy SS talk. (Parker, PA)

Radio Educacion, 6185 in SS with domestic music at 0719. (Yohnicki, ON)

MOROCCO—RTV Marocaine, 15345 heard at 1513 with talks in AA. (Brossell, WI)

Radio Medi Un, 9575 at 1830 in AA/FF with AA pops. (Linonis, PA) Talks in FF at 1935. (Brossell, WI)

NEW ZEALAND—Radio New Zealand International, 9765 with Asia-Pacific news at 0700. (Linonis, PA) 0905. Also 11725 at 0530 on Mauri elections. (Maxant, WV) 0624 to 0658 close with mix of marches to classics to indigenous music and some jazz and ragtime thrown in. (Wood, TN) 15720 with M in EE at 0350. (Parker, PA)

NETHERLANDS—Radio Nederland, 9670 via Northern Marianas with ID in DD at 1210. (Ng, Malaysia) 11655 Madagascar Relay at 1845 in EE to Africa talking about websites and computers. (Linonis, PA) 2020 on farming in Holland. (Maxant, WV) 1910 on conditions in Somalia. Also 11830 via South Africa in AA at 11920. (Brossell, WI)

The Mighty KBC, 6055 via Lithuania at 2135 with U.S. pops. (Maxant, WV)

NIGERIA—Radio Nigeria, Kaduna, 4770 at *0429 with drums, choral national anthem, man with EE prayer, another M with opening anmts and pgm previews, brief music to drums at 0459, ID, TC and news. (D'Angelo, PA) 0457 with native highlife music, deep-voiced M with "Radio Nigeria" ID at 0500. (Parker, PA) 0532 barely above the threshold with Afro-pops. (Wood, TN) 6090 at 2157 with local tribal chants. Very poor with DRM QRM. Covered by Anguilla at their 2305 sign on. (Alexander, PA)

Voice of Nigeria, 9690 at *0758 with opening theme, vernacular talk, tribal music, vernacular talk at 0800 f/by radio drama. (Alexander, PA) 7255 in listed Hausa at 2253. (Brossell, WI)

Aso Radio 15180 (via Russia or France) monitored at 1600 with opening ID, anmts and talk in Hausa. Many mentions of Nigeria, some Afro-pops. (Alexander, PA)

NORTH KOREA—Voice of Korea, 4405-Kujang at 1345 poor to very poor with W talk in KK. Also 6285-Kujang at 1055 with opera, ending EE with ID and schedule. Dead air till 1100 and opening in FF. (Ronda, OK) 9355 at 1045 with EE *Song of Korea*. Also 15100 in CC at 0000. (Ng, Malaysia)

Korean Central Broadcasting Station, Pyongyang, 2850 at 1345 with opera or patriotic speech in KK. (Strawman, IA) 9335 with Korean martial music at 1741. (Brossell, WI)

OPPOSITION—Al Aqsa Radio (p), (to Gaza), 5835 at 2126 with continuous ME vocals to AA talk at 2206. No ID noted. Fair, with sporadic UTE QRM. (D'Angelo, PA)

Ginbot 7 Dinst Radio (to Ethiopia), 7485 via Samara at *1700 sign

on with HOA music, into Amharic, //9610 under strong RCI. Scheduled for Tu-Th-St only. (Alexander, PA)

SW Radio Africa (to Zimbabwe), 11745 via Wooferton at 1814 with M and interviews in EE, local language ID heard at 1820. (D'Angelo, PA)

Radio Voice of the People (to Zimbabwe), 11610 via Madagascar at 0402 with M in vernacular talking and highlife music bridges. (Parker, PA)

Sound of Hope (to mainland China), 7105 in CC heard at 2249. (Brossell, WI)

PAPUA NEW GUINEA—Radio East New Britain, Rabaul (New Britain), 3385 poor to fair at 1328 with pops. (Strawman, IA)

PERU—Ondas del Huallaga, Huanuco, 3329.6 at 1115 to 1145 in SS with several IDs. (Wilkner, FL)

Radio La Hora, Cusco 4857.5 in SS with ID between 1115–45, also noted in the evenings, 2300–0030. (Wilkner, FL)

Radio Libertad, Junin, 5039.2 from 1120 to 1200 in SS. (Wilkner, FL)

Radio Vision, Chiclayo, 4790 at 0545 with slow ballad at tune in, then preacher with usual impassioned speech over a distorted PA system. (Parker, PA)

PIRATES—Radio Free Speech, 6925.5 noted variously at *1345, *1410, *1446, *1509, *2201, 2230, *2250, 2255, and *2237 in a multi-day marathon of various program repeats. (Zeller, OH) 2305 on 6913am ancng Wellsville address. (Hassig, IL)

MAC Shortwave, 6925u monitored at 1559, 1603, 1652, *1654, *1656, 1755 with some rock oldies, theme from *Dr. Who* and various other bits. Hosted by "Ultra Man." Email to maeshortwave@yahoo.com for reports. (Zeller, OH) 1802 with the *Paul Starr Show*. (Patterson, PA)

WBRY/Radio Bunny, 6925u at 1358 mixing with Radio Azteca, *1525 1644, 1901 and 1948, sometimes old rock, some radio dramas. Belfast address, (Zeller, OH) *2158 with parodies and songs. (Wood, TN) 0004 with the *Good Monkey Conspiracy Show*. (Patterson, PA) 6925am at 2249 and 2330 with IDs, talks by Commander Bunny, phone call from Bozo. (Lobdell, MA)

"WBCQ" 6925u at 1733, likely a relay by WBRY, partly an Alan Weiner speech and partly a discussion of God and psychiatry. Used the old Lincolnshire Poacher number station IS at 1752*. (Zeller, OH)

Channel Z Radio, 6925 and 6937am at *2141 and 2148; 6937 was poor, supposedly a test and not nearly as good as the 2141 low-power test, confirmed in an email from the station. (Zeller, OH)

WMR-We Monkeys Radio, 6924.7am at 1632 with several rock numbers but most played only part way through due to "the short attention span of monkeys in the audience." (Zeller, OH)

Undercover Radio, 1710u heard at 0458 with Dr. Benway with IDs. Said was using a 1000 watt mobile transmitter. A repeat of their 20th anniversary special. (Alexander, PA) 6925u at 0511 with New Year show and undercoverradio@gmail.com. (Patterson, PA)

Pirate Radio Fansome, 6926am at 2030-2041. (Patterson, PA)

Help Wanted

We believe the "Global Information Guide" offers more logs than any other monthly SW publication (490* shortwave broadcast station logs were processed this month!). Why not join the fun and add your name to the list of "GIG" reporters? Send your logs to "Global Information Guide," 213 Forest St., Lake Geneva, WI 53147. Or you can email them to gdex@wi.rr.com. Do not send files as attachments, as they do not always go through. Please see the column text for formatting suggestions and observe the deadline, which is now the 20th of each month.

*Not all logs get used: there are usually a few which are obviously inaccurate, unclear, or lack a time or frequency.



Re: Reception Report: Addis Dimts Radio on 15,195 kHz via Samara, Russia
From: Abebe <abelewrd@yahoo.com>
To:rangelo3@aol.com <rangelo3@aol.com>
Date: Sun, 11 Jan 2009 12:40 pm
Abebe to you - 13 min ago

Thank you for your report
Yes you heard our program
Thank you yours
Abebe
Host and producer

Sent from my iPhone

Addis Dimts Radio, an opposition broadcaster to Ethiopia, uses 15195 via Samara, Russia. (Thanks Rich D'Angelo, PA)

Majick Radio, 6925u at 0037 sending SSTV images. (Patterson, PA)

Syco Radio, 6924.9u at 2051 with *Live-Mix Program*. (Patterson, PA)

WTCR, 3433u monitored at 0254 with light rock, IDs. (Alexander, PA) 0323, Belfast address. Also 6925u at 0208. (Patterson, PA)

Wolverine Radio, 6925u at 0036. (Patterson, PA)

Fellatio Radio, 6925u at 1928 with music. Transmission ended with a very graphic SSTV image. (Patterson, PA)

Yahweh Radio, 6925u heard at 2159 with "B-I-N-G-O" and "Number 9" repeated. (Patterson, PA)

Radio Azteca, 6925u at 1952 with *Rocky and Bullwinkle* audio clip and letters from "Dr. Radio." (Patterson, PA) 6925u at 2236 weak signal but typical pgm of DX humor and parodies with Bram Stoker. (Zeller, OH)

Radio Playback Intl (Euro) (t), 6880 at 0225 and 2315 with '50s pops but not strong enough for an ID. (Alexander, PA)

Mystery Radio (Euro), 6220am monitored monitored at 0703 with dance beat music. (Patterson, PA)

PORTUGAL—RDP Intl, 9455 at 0140 with PP vocals. Closed at 0200, making way for WEWN. (Maxant, WV)

ROMANIA—Radio Romania International, 6150 at 2130 on Albanian community in Romania. (Maxant, WV) 9640 at 1830 on "football." (Linonis, PA) 11970 with *Practical Guide* pgm at 1320 on driving cars. (Fraser, ME) 15220 with a mailbag pgm at 1235. (Brossell, WI) 15560 at 0650 with the *Song of the Day*. (Ng, Malaysia)

RUSSIA—Voice of Russia, 6115-Irkutsk at 1259 with IS, ID, talks in RR. Also 9900-Samara in listed Pashto at 1320, 11645-St.

Petersburg in AA with IS at 1559 close, 12030-Moscow in AA at 1602. (Brossell, WI) 6115-Khabarovsk in (p) Mandarin at 1322 and 7335-Chita in EE at 0414. (MacKenzie, CA) 7305 with EE news at 1600. (Ng, Malaysia)

Kamchatka Radio, 6075 in RR at 1345. (Brossell, WI)

Magadan Radio, 7320 in RR at 2255. (Brossell, WI)

SAO TOME—VOA Relay, Pinheira, 4960 at 0427 with news. (Parker, PA) 0516 with M/W aners in Hausa and EE music. EE ID at half past. Also 6080 in EE at 0622, pgm as 4960. (Wood, TN) 6080 heard at 2155 with US folk songs. (Fraser, ME)

SAUDI ARABIA—BSKSA, 4790-Jiddah in AA at 0444 with prayers. (Wood, TN) 9555 in AA at 1815. (Linonis, PA) 15380 with Koran recitations at 1226. (Brossell, WI) 21670 in II, Koran at 0900. (Ng, Malaysia)

SOUTH AFRICA—Channel Africa, 6120 at 0308 in Swahili. (Strawman, IA) 7230

at 0430 on new elections there. (Maxant, WV) 7390 at 0355 with ID and off in mid-song at 0358. 15235 at 1755 with several IDs and pgm notes with info in some other languages including Hausa, Swahili and Afrikaans, off at 1759. (Ronda, OK) 9625 at 0930 with African news. (Linonis, PA) 9745 at 0504 with ID and *Africa Live* pgm. (D'Angelo, PA)

Radio Sondergrense, 3320 in Afrikaans at 0338. (Yohnicki, ON)

SOUTH KOREA—KBS World Radio, 11810 in KK heard at 0005. (MacKenzie, CA)

SPAIN—Radio Exterior de Espana, 6055 in SS at 0438. (MacKenzie, CA) 6125 at 2215 discussing anarchy. (Maxant, WV) 15585 in SS at 1452. (Fraser, ME)

SUDAN—Republic of Sudan Radio, 7200 at 0539 in AA with ME music. (Wood, TN)

Miraya FM, 15560 via Rimavská Sobota (Slovakia) with EE news about Sudan. Mentioned mirayaFM.com. Into AA at 1514. (Alexander, PA) 1538 in AA with news, features and discussions. Several IDs at 1512. (D'Angelo, PA)

SWAZILAND—Trans World Radio, 3200 at 0400 in GG program. Also 4775 at 0351 in Lomwe, f/by ID and closedown at 0358, then reopened in GG at 0400. (D'Angelo, PA) 0405 in GG. (Ronda, OK) 0410 in GG. (Wood, TN) 7215 via South Africa at 0341 in Amharic. Off at 0345. (Ronda, OK) 9720 at 1937 in listed Moore language. (Brossell, WI)

SWEDEN—Radio Sweden Intl, 5850 at 2240 on one of their political parties there. (Maxant, WV) 9490 via Canada heard at 0022 with M/W comments in Swedish. (MacKenzie, CA)

SYRIA—Radio Damascus, 9330 at *2103-2201* with local music, EE anmts, ID and EE news at 2105, weaker on //12085. (Alexander, PA) 12085 at 2143 with instl music, W aner, feature about Syrian civilization. Fair. //9330 was poor. (D'Angelo, PA)

TAIWAN—Radio Taiwan Intl, 5950 via Florida in SS at 0645. (MacKenzie, CA) 9680 at 1407 M/W alternating in (p) news. (Strawman, IA) 9735 in JJ at 1320. (Brossell, WI) 9785 with *Chinese to Go* pgm at 1645. (Ng, Malaysia)

TANZANIA—Radio Tanzania, 11735-

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. 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 prizewinner is **Mark Taylor**, who now has a copy of the 2009 edition of the *World Radio TV Handbook* on his DX bookshelf. I've been buying the *WRTH* for over 50 years! It's jammed with essential details on international broadcast and domestic shortwave stations. Nearly 700 pages of good "stuff"! Your favorite bookstore very likely has it in stock, as of course do shortwave dealers. Don't turn on your radio without it!

Zanzibar at 1749 in Swahili f/by music pgm at 1800. No relay of Spice FM this time. (D'Angelo, PA) 1800 with Spice FM EE relay, into Swahili at 1808, (Alexander, PA) 1930 in (p) Swahili with AA-type music. (Linonis, PA)

THAILAND—Radio Thailand, 7305 with M in Thai at 1348, suddenly off in mid-sentence at 1359. (Ronda, OK)

TUNISIA—RT Tunisienne, 7190 in AA at 2104. (Brossell, WI) 7275 in AA at 0501 with news, music interludes. (Wood, TN)

TURKEY—Voice of Turkey, 7180 at 2150 talking about listening to them over the Internet. Also 6020 in TT at 0430. (Maxant, WV) 7325 via Canada in EE at 0420. (MacKenzie, CA) 12035 with EE news at 1330. (Brossell, WI)

UGANDA—UBC Radio Uganda, 4976 at 0407 with EE news. (Brossell, WI) 0409 with low audio. (Strawman, IA) 2120–2130* with continuous high-life music. On late this day. (Alexander, PA)

UKRAINE—Radio Ukraine Intl, 5830 at 2220 with *Ukraine* and *Ukrainia* series. (Fraser, ME) Local vocals at 2235, ID and sign off. Also 7440 monitored at 0445 with music by Ukrainian composers. (Maxant, WV)

UNITED STATES—VOA, 6020 in FF at 0625, off at 0630. (MacKenzie, CA) 6040 via Nauen at 2047 to 2100* in Hausa with a woman in EE. (D'Angelo, PA) 7235 Northern Marinas Relay in KK at 1405. Also 7365 in

(I) Cantonese at 1305. (Brossell, WI) 7235 via Northern Marianas in KK at 1335. (Ng, Malaysia) 7255 Thailand Relay at 1131 with W in II to SEA. (Parker, PA)

Radio Marti, 7405-Greenville in SS at 0405. (MacKenzie, CA)

Radio Free Asia, 11975 via Germany at 0055, music jammer off heard at 0100. (MacKenzie, CA)

Radio Liberty, 9990 at 1325 in (p) Pashto/Dari. (Brossell, WI) 15565 in (I) Avar at 1515. (Brossell, WI)

AFN/AFRTS, Florida, 5446.5 at 0546 with the late Paul Harvey's *Rest of the Story*. (Parker, PA) 0625 with Rush Limbaugh. (Maxant, WV) 7811 at 0511 carrying CNN Radio ID. (Wood, TN) 0630. (Maxant, WV)

Family Radio/WYFR, 6240 via Moldova at 2148 with Harold Camping. (D'Angelo, PA) 9485 via Russia at 1300. (Ng, Malaysia)

WWCR, 5890 at 0527 with Johnny Cash song, religious song. (Wood, TN) 5935 carrying Gene Scott at 0238. (Yohnicki, ON)

WBOH, 5920 at 0240 with sermon. (Yohnicki, ON)

WEWN, 9455 with rosary. (Maxant, WV) 11870 at 0640 in SS. (Wood, TN)

WRNO, 7505 with Christian music. (Maxant, WV)

Adventist World Radio, 11730 via Germany in listed Hausa heard at 1941. (Brossell, WI)

WWRB, 3185 at 0305 with nice pgm of swing music at 0305. Back to the usual format at 0330. (Wood, TN)

Gospel for Asia, (t) 11645 via Germany at 1730 in unid Asian lang. (Linonis, PA)

Sudan Radio Service, 7280 via Dhabbya from *0359 and into AA ID and anmts. music segment, EE ID and AA talk. (D'Angelo, PA) 11745 via Portugal at 1500–1530 in EE on local Sudanese elections. (Alexander, PA)

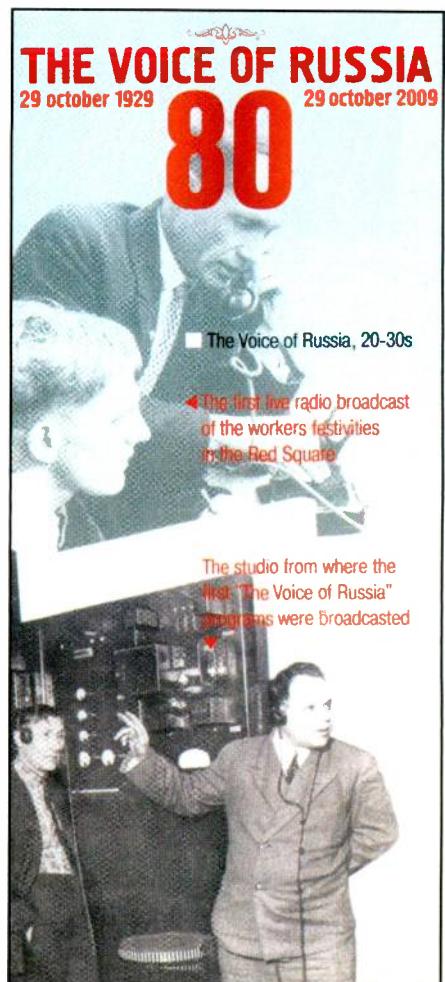
VATICAN—Vatican Radio, 5885 at 2155 on education in Sri Lanka. (Fraser, ME) 5965 at 0616 on the genocide of children in Darfur. (Maxant, WV) 15235 in (I) Tamil at 1500. (Brossell, WI)

VENEZUELA—Radio Nacional, 13680 via Cuba in SS at 2333 with an ID at 2335. (MacKenzie, CA) 15290 via Cuba at 1900 in SS with "Informativos," then possible speech by Chavez. (Linonis, PA)

ZAMBIA—Radio Zambia, 5915 at 0340 with highlife vocals, drum selections hosted by M in vernacular. ID and news at 0430 and back to music at 0435. (D'Angelo, PA)

CVC/The Voice-Africa, 4965 at 0406 in unlisted African vernacular with M ancr, various calypso-type pops. went off for a moment at 0413. (Parker, PA) 0415 in vernacular with contemporary Christian songs. (Wood, TN) 0438 with man in vernacular, W with vocals. ID at 0500. (D'Angelo, PA) 2318 with pop songs and EE sermon. (Strawman, IA) 9420 at 1955 with program info and Web address. (Ronda, OK) 7160 at 0455 with vocals and ID. (Maxant, WV)

ZIMBABWE—Radio Zimbabwe, 3396 at 0347 with tribal vocals, M in local language.



The Voice of Russia celebrates the 80th anniversary of radio in Russia this year. (Thanks Paul Gager, Austria)

(Strawman, IA; D'Angelo, PA) Also 4828 at 0410 with lively non-stop highlife vocals. Transmitter breaks heard at 0446-53. (D'Angelo, PA)

A thousand thank-yous to the following who contributed this time: Jerry Strawman, Des Moines, IA; Gene Patterson, Gibsonia, PA; Brian Alexander, Mechanicsburg, PA; Joe Wood, Greenback, TN; Charles Maxant, Hinton, WV; Peter Ng, Johor Bahru, Malaysia; Michael Yohnicki, London, ON; Rick Barton, Phoenix, AZ; George Zeller, Cleveland, OH; Rich D'Angelo, Wyomissing, PA; Stewart MacKenzie, Huntington Beach, CA; Jim Ronda, Tulsa, OK; Jack Linonis, Hermitage, PA; Robert Wilkner, Pompano Beach, FL; Robert Brossell, Pewaukee, WI; William Hassig, Mt. Prospect, IL; Richard Parker, Pennsburg, PA; Robert Fraser, Belfast, ME; and Chris Lobdell, Tewksbury, MA. Thanks to all of you!

Until next month, good listening!

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US TO MAKE A
CHOICE. WE CAN BE
AFRAID. OR
WE CAN BE READY.**

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Planes, Trains, And...

by Mitch Gill, NA7US,
NA7US@yahoo.com

I'm so glad winter is over—I was really getting tired of the snow and the rain. This winter has been a hard one, with the melting of substantial snowfall causing flooding in quite a few areas of my state. I lost three antennas in the record snow, but I'm now in the process of replacing them so I can continue to monitor.

But enough of my farewell to bad weather, let's get down to business. In this month's column I'm going to discuss interoperability issues and how they may be resolved, we'll look at the proposal the TSA has made so they can "whisper" to each other over a radio (no, I'm not making this up), and check in on what's happening with our railways.

Changes In Communications

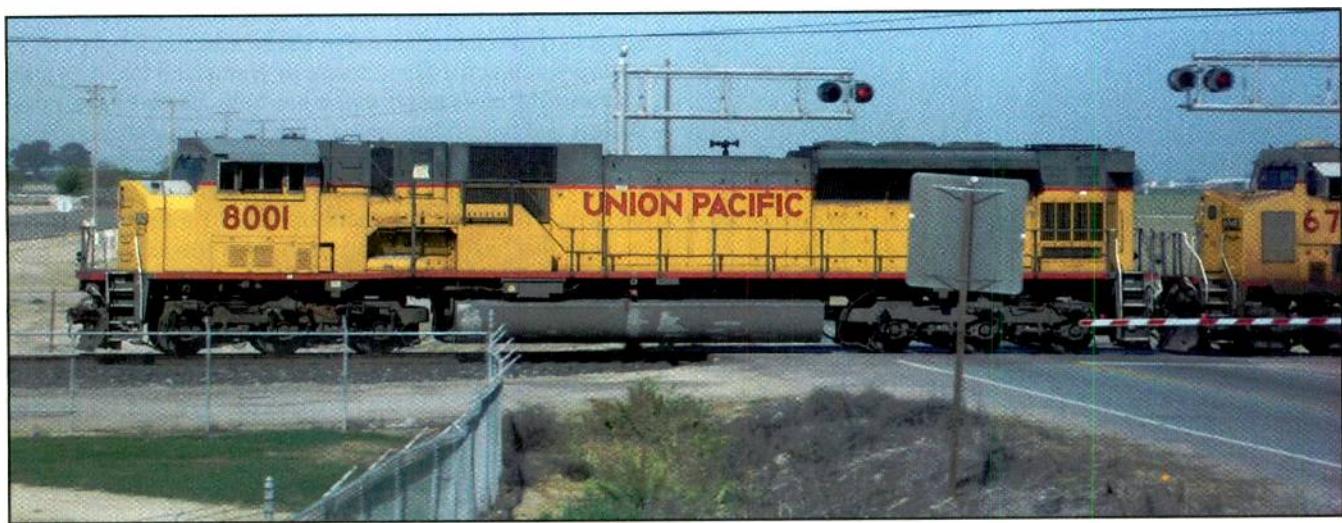
It's been eight years since we were attacked by terrorists and even though we are better protected today, the government still lacks the ability to safeguard all the areas that are vulnerable. For instance, there are still problems with our ports and our borders. Part of the dilemma is the ongoing issue of interoperability among the different agencies responding to any emergencies. The

problem is not that they're on different frequencies, but that they may be operating on older or newer systems, like analog and digital.

Adding to the quandary is that each company developed its own proprietary communications in order to protect their investments and in the hope of capturing a market. But in today's world, proprietary is no longer desirable. Since 9/11, these same companies began embracing the concept of interoperability. Companies like Harris and Thales Communications developed radios that have the capability to "cross the lines." These companies have developed radios so they can utilize both the old and the new technologies. Soon, all the radios will fall under one standard and one set of rules, and proprietary systems will no longer have a place in the market.

The new mandates of homeland security are forcing communications experts from federal, state, and local government entities to find new ways of sharing wireless information so they can respond quickly and efficiently in the event of a major domestic attack. The major force behind this is SAFECOM.

SAFECOM is a communications program of the Department of Homeland Security. It provides



A Union Pacific locomotive heads south along California's Highway 99, near Delano in the San Joaquin Valley.

research, development, testing and evaluation, guidance, tools, and templates on interoperable communications-related issues to agencies throughout the United States.

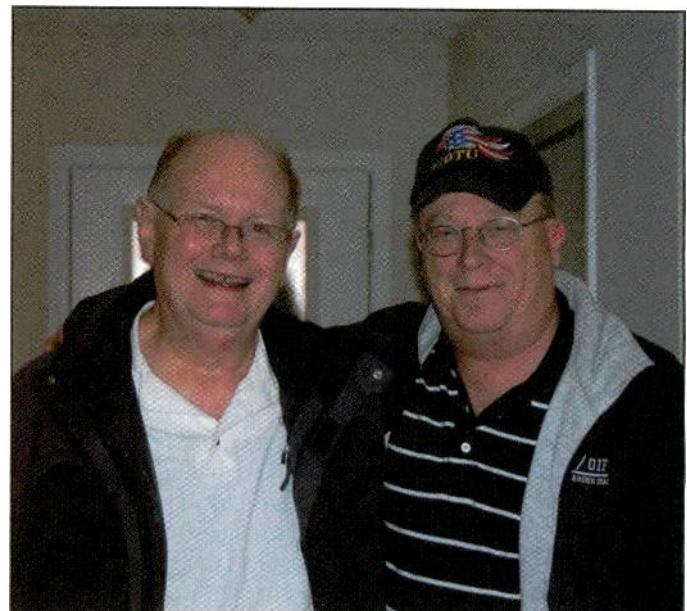
SAFECOM is an emergency responder-driven program that works with existing federal communications initiatives and emergency responders to define future networks and radio communications in order to serve the community. If you would like more information, check out its website at www.safecomprogram.gov.

Interoperability, though slow in coming, is the future of communications. It's necessary in order for first responders to be able to communicate and work together in any disaster.

Whisper While You Work

In an effort to reduce shouting between its security officers at airport security checkpoints, and reduce overall stress levels for passengers, the TSA is planning to purchase as many as 20,000 land mobile radios that would enable its personnel to whisper to each other. I have a hard time believing that shouting between security officers causes passenger stress, but maybe that's just me. Now instead of hearing, "Full body search needed here!," they'll merely whisper it through their radio and then politely walk up to you and advise you that you have been chosen.

The TSA's Office of Operational Information Technology intends to procure at least 9,260 Very High Frequency land mobile radios, and perhaps as many as 20,000 of the units to enable officers to speak more quietly. It will consist of the radio and a speaker microphone that's intended to be worn on the uniform.



"Homeland Homies"—your two favorite "Homeland Security" columnists, together at last. That's Rich Arland on the left and yours truly on the right.

According to the statement of work, the radios will have the following capabilities:

- Weigh no more than 12 ounces, including the battery
- Operate in the 162–174 MHz VHF spectrum
- Provide a vibrating alert on message reception
- Prevent unauthorized eavesdropping on voice transmissions through voice scrambling, encryption, or other technologies.

This is an actual Request for Proposal (RFP) and you should see these new land mobile radios (LMR) in the larger airports soon, but of course they will be encrypted.

All Aboard!

One of the least discussed threats to our homeland is the vulnerability of our railway system. We have tracks entering and exiting Mexico and Canada that carry both materials and passengers. Even though we don't read a lot in the papers, I can assure you that the Department of Homeland Security and the Department of Transportation are both aware of the possible danger and have taken action to ensure our safety.

Being the curious kind of guy I am and since I have railroad tracks not more than a mile from my house, I thought I'd look up some frequencies to monitor. What I found instead was a website that has live railroad radio feeds from all over the country. In addition, it provides information on the railroad and frequencies you can monitor if you're in the area. The Internet site is www.railroadradio.net (look for an upcoming feature article on the site and how to use it). The following information comes from the site and will give you a good example of the great stuff you'll find:

Tacoma Rail - Tacoma, Wa

Tacoma Rail is owned by the City of Tacoma and is a part of Tacoma Public Utilities. Tacoma Rail has a long history that includes the city acquiring a few different railroads. Formally the Tacoma Municipal

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"The TSA's Office of Operational Information Technology intends to procure at least 9,260 Very High Frequency land mobile radios, and perhaps as many as 20,000 of the units to enable officers to speak more quietly."

Belt Line. Most of Tacoma Rail's trackage is ex Milwaukee Road. When the Milwaukee Road met its demise, the tracks in the Tacoma's tide flats, now known as the "Tidelands" Division, were acquired by the city, while what is now known as the "Mountain" Division was acquired by Weyerhaeuser and used to haul logs from Centralia to Tacoma. The city acquired that portion of the line in the late 90's. In 2004 Tacoma Rail acquired the "Capitol" division and serves various industries in the downtown Olympia area. This scheduled-job also has trackage rights from Centennial to Nisqually over BNSF Mainline which enables it to serve industries on BNSF's Lakeview Sub.

Tacoma Rail has a nice google map of their service territory on their website. The map can be accessed here.

Tacoma Rail frequencies:

161.070 AAR ch64 (Tacoma Rail Channel 1)
 161.145 AAR ch69 (Tacoma Rail Channel 2)
 161.295 AAR ch79 (Tacoma Rail Channel 3)
 161.190 AAR ch72 (Tacoma Rail Channel 4)
 161.445 AAR ch89 (Tacoma Rail Channel 5)
 161.475 AAR ch91 (Tacoma Rail Channel 6)
 160.575 AAR ch31 (Tacoma Rail Channel 7)
 161.415 AAR ch87 (BNSF Centralia North Dispatcher - From TR Junction to D Street. for accessing the Mountain Division) <not active in scan list>

161.100 AAR ch66 (BNSF Centralia South Dispatcher - From Nisqually, Wa to Centennial, Wa) <not active in scan list>

160.515 AAR ch27 (UP Seattle Sub Dispatcher. for accessing the Mountain Division) <not active in scan list>

Tacoma Rail does not use train numbers. Trains are identified by the crew start time. i.e... Job 730 refers to 7:30am crew start time

Tacoma Rail Locomotive Roster:

1203 - 1204 (2 - SW1200s)
 1521 - 1524 (4 - MP15s)
 2000 - 2006 (6 - GP20s {no 2004})
 3000 - 3001 (2 - SD40-3s)
 3801 - 3802 (2 - GP38s)
 4000 - 4001 (2 - GP40s)

Check it out when you get a chance.

Hello From An Old Friend

I was in Atlanta recently and had the pleasure of finally shaking the hand of someone who supported me throughout my time in Iraq, kept in contact with me, and recommended me to take over his column—Rich Arland. He wanted me to make sure I said hello to all of you.

Until next time, keep listening!

Pop'Comm Salute

This month it's my pleasure to salute the doctors, nurses, and volunteers who work in our emergency rooms across the nation. Most of us have had personal experiences of their professionalism and caring. While we hobbyists may be preparing for emergencies that, we pray, may never happen, they work with emergencies every day.

Thank you for your dedication.



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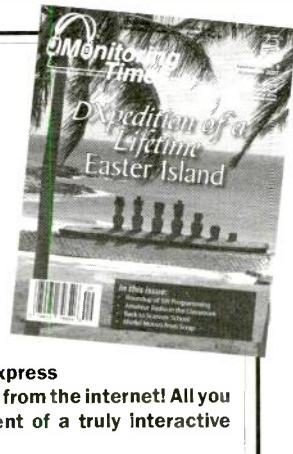
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Six Meters: Bring Back The Magic!

by Kirk Kleinschmidt, NTØZ
kirk@clouynet.com

*"So here I am,
after 30 years of
HFing, hooked up
with a pair of VHF
guys. If I want to
operate in their
hemisphere (which
I do), I will need to
get something
going on 6 and 2
meters."*

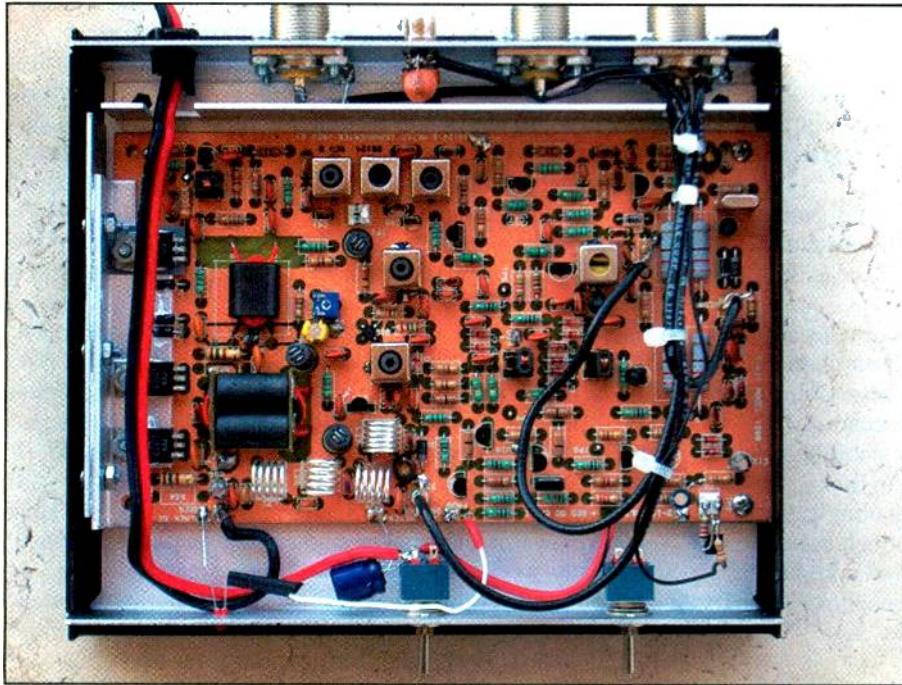
Hams know 160 meters as the Gentleman's Band, or Top Band. The whole swath from 160 through 30 meters is referred to as the Low Bands. The High Bands, as you might expect, comprise 20 through 10 meters. So what's 6 meters called? I call it "the highest band that average hams can still build stuff for," which is grammatically atrocious, but everyone else calls 6 meters the Magic Band!

Why? Because propagation is strange, odd, eerie, and mysterious in the No Man's Land

between 50 and 54 MHz. And quirky, too! Sometimes it's like HF, sometimes it's like 2 meters. On SSB and CW, the band might be deader than a mackerel for a week at a time, then boom: wall-to-wall signals from hundreds or thousands of miles away! If your area has a 6-meter repeater, its operation isn't "sporadic" like its weak-signal counterparts. Six-meter repeaters—when and if you can find them—work like any other VHF repeater system, and signals are usually steady and predictable.



If you'd like translate the excellent performance of your existing HF transceiver to 6 meters and up, a "transverter" is in your future. A "converter" receives at one frequency and outputs at another. Put one in front of your receiver and you can "convert" 6-meter signals (or whatever) to 28 or 14 MHz, allowing you to use your existing rig to monitor the action on another band instead of buying all new equipment. A "transmitting converter" works in reverse, taking RF from your existing rig and converting it to another band, say 6 meters. Both converters in a single package, plus a switching circuit, is called a transverter. Many VHF/UHF ops use a high-performance HF transceiver to drive a stack of transverters for all of their favorite bands. Pictured here is my latest project: Testing and successfully interfacing my HF rig to this 6-meter transmitting converter from the 1991 ARRL Handbook. I think this little beauty was built by Clarke Greene, K1JX, but I'm not 100 percent sure about that. When paired with a companion receive converter, a transverter will (hopefully) be born. A companion amplifier (not pictured) boosts the 6-meter output from 40 mW to 3 W. It's still QRP! (Photo by the author)



If building your own transverter is too daunting, you can buy used Ten-Tec 6- or 2-meter transverters on eBay for about \$100 each. They get excellent reviews, they're easy to hook up, and as you can see, they're "pretty." The Model 1208 6-meter transverter shown here was modified by Tony, IØJX, for use on the European 4-meter band at 70 MHz.

Despite the Magic, or perhaps because if it, 6-meter ops could easily vie for the right to call their favorite slice of spectrum the Gentleman's Band, because they're definitely a friendly bunch. And that should bode well for my newest ham buddies, Garrett and Kevin, KDØGTI and KDØGTJ, respectively.

You may have seen photos of the pair's outrageous TV DXing antennas in this column over the past few months. They're younger ops, in their early 20s, and they got into ham radio via TV DXing (and through seeing the usual goodies in my shack). The DXing part I get. The TV thing, not so much. But over time I learned that it was a VHF thing that drove their interest.

TV, digital and analog, is a VHF/UHF happening, and through the process of maximizing their TV receiving setups they learned about antennas, feed lines, towers, VHF/UHF propagation, etc. As a ham, I could contribute lots of practical information and advice to enhance their efforts (stuff not always forthcoming from other TV enthusiasts). They were especially interested in the many unusual propagation modes that take place above 30 MHz.

Being their *de facto* Elmer and a generation-plus older, I wanted to find some common operating ground with my new radio buddies, and *none* of my present

ham stuff was going to work. These guys, raised on video games and fast Internet, were totally uninterested in HF—ham or SWL! Uuh! It was like a stab to the heart! Not interested in HF and working hams in faraway foreign lands? Unthinkable (to me, anyway)!

When I was a kid, HF was my lone desire. I worked mostly DX, with some contesting and a bit of rag-chewing. But no VHF. And no UHF. There were only four hams in my town, and no repeaters. The ham who gave me my Novice test had a tribander on a tower and a Swan 350C HF transceiver. He was a DXer through and through, which was right up my alley. I learned later that his wife, a somewhat unenthusiastic ham, had a Swan 250 transceiver for 6 meters! It put out a ton of power and worked a lot of TV sets back in the days when Channels 2 through 4 were right above the Magic Band (which was then known as the TVI Band)!

So here I am, after 30 years of HFing, hooked up with a pair of VHF guys. If I want to operate in their hemisphere (which I do), I will need to get something going on 6 and 2 meters. I'm sure they'll eventually ratchet through the bands to 10 GHz or so, but because they've never operated anywhere, I'm sure they'll cut their teeth on the Magic Band and 2 meters.

That should be fun for me, too. I've

worked through a repeater or two in my day, but have never worked even a single station on 2-meter SSB or CW. About eight years ago I had an Alinco DX-70 transceiver (160 through 6) that provided a summer of fun on 6 meters. With 10 watts and a three-element beam at 20 feet I worked stations from coast to coast (almost all SSB), but no "DX" other than Canada. I was rarely in my shack during sporadic openings, so I'm sure I would have done better if I'd been able to operate more.

On these bands, then, is where we'll start. Our timing is perfect. Although 50 MHz supports reliable ground-wave communications up to 100 miles with low power (200 miles-plus from mountaintops or skyscrapers), long-distance propagation on the Magic Band starts taking off in the spring and summer just about every year.

Let The Magic Begin...

And, of course, it usually begins with a strange brew. For starters, on HF, signals are typically propagated via ground-waves or skywaves. According to lore, groundwaves travel a short distance before fading away and skywaves (if we're lucky) reflect from the ionosphere to the ground (and back again), covering longer distances.

At 50 MHz, the transition zone between HF and VHF, we have a veritable circus of possible propagation modes. These include sporadic E (also known as E skip, and abbreviated as Es), tropospheric ducting (tropo), field-aligned irregularities (FAI), backscatter, auroral propagation, meteor scatter, trans-equatorial propagation (TEP), and moonbounce.

Because it's summer, and because the sunspot cycle is essentially bottomed out, the most important propagation mode for most 6-meter ops is probably Es. Global F₂ propagation (used by HF operators to work the world) is very unlikely until the sunspot cycle perks up in a few years (if ever, it seems).

Es, which occurs throughout the solar cycle and does not depend in any way on sunspots, follows a seasonal pattern. When metallic ion clouds form in the E layer of the ionosphere, they act as large "floating radio mirrors" that reflect and refract 6-meter signals back to Earth. Because these ion clouds don't exactly form on schedule, we call this *sporadic E* propagation.

Typical Es contacts can span several hundred to 1,000 miles or more. When two or more Es clouds are positioned correctly, "double-hop" contacts can take

place at distances of 2,000 miles or more. This is how East Coast hams are occasionally able to work European hams on 6 meters when the sunspot cycle is bottomed out.

Most *Es* action takes place between May and August, although winter openings in December and January are not uncommon. The hours from 9 a.m. to noon local time, as well as the early evening, seem to be best.

Although *Es* contacts can last for hours, brief openings are the norm. Distant stations will pop in and out of the noise, become quite strong, and disappear just as quickly. This is exciting, and a bit unnerving.

Other important long-distance propagation modes at 6 and 2 meters are tropospheric propagation and tropospheric ducting. Like *Es*, "tropo" is weather-related and doesn't depend on solar radiation and sunspot cycles. It usually occurs during the summer and fall along the boundaries between stable high-pressure areas and the colder air masses adjacent to them.

Signals propagated via tropo and tropo ducting can travel 500 to 800 miles (maybe a bit more). Even though tropospheric ducting has been occasionally observed down to 40 MHz, signal levels there are usually weak. Frequencies above 90 MHz are generally better via this propagation mode.

Gear

In the bad old days, 6-meter SSB/CW gear was nonexistent or expensive. Today, however, 6-meter hardware is readily available and much more affordable. Most new HF transceivers offer 6 meters, and many also include 144, 222, and even 432 MHz coverage in a single, tiny box. Dedicated 6-meter multimode radios (the same goes for 2 meters) are also affordable, and used 6- and 2-meter hardware from the 1970s on up can be found at rock-bottom prices.

And when it comes to antennas, 6 meters is an "easy access" band. A half-wave dipole is only 112 inches long, and a half-wave vertical totals just 56 inches. Full-size beams look like teeny television antennas! Rotators, masts, and antenna hardware of all sorts seem small by HF standards. Wire dipoles and full-wave loops work very well at 50 MHz and are easy to conceal, if necessary.

About the only antenna requirements that are more stringent on 6 meters are feed lines. If you use bargain-basement coax you'll likely waste precious RF energy heating your cable. Coax losses at 50 MHz are about double those experienced at 10 meters. So do yourself a favor and spend a few more dollars on high-quality coax that's rated for use at 50 MHz or higher. You'll be glad you did!

As mentioned in a previous column, I use quad-shield RG-6 satellite TV cable for 6-meter antenna runs. It's rated for 1 GHz, is inexpensive, and good-quality F connectors are affordable and easy to attach to it.

Activity

Because 6-meter activity seems to come in "waves," hams tend to use calling frequencies to find each other. Once contact has been established the operators can move up the band to clear frequency. The FM calling frequency is 52.525 MHz. On USB, listen to 50.125 MHz. Veteran ops have been trying to get folks to use 50.2 MHz for years now, with mixed results.

Unfortunately, 6 meters is closed more than it's open, so hams use a variety of techniques to determine when conditions are good. A series of Morse code beacons can be found between 50 and 50.1 MHz. If you can hear these low-power stations, you

know the band is open between your part of the world and its part of the world (or that the beacon is down the street!).

Other "band opening" detectors include monitoring for distant television and FM signals. The low end of the FM broadcast band is just above 6 meters (88 MHz), so when distant stations start showing up it's time to run for the radio! Old analog TV Channels 2 through 5 used to be prime indicators of enhanced propagation, but with the switch to Digital TV, VHF-low is a television dead zone for most of the U.S. DX reception still takes place on VHF-high and UHF, but its usefulness as a propagation predictor remains to be seen.

With technology comes changes, and propagation prediction, monitoring, and notification systems have sprung up all over the Internet. When the signals are flying in your geographic region the websites will alert you via email or cell phone text messages!

Some conventional operating awards, such as worked all states (WAS), worked all continents (WAC), and DXCC, are mostly unattainable by Magic Band beginners, so VHF ops have their own awards that can be pursued by just about anyone. Specifically, working "grid squares" is a primary pursuit.

In a nutshell, the planet has been arbitrarily divided into thousands of grid squares based on small increments of latitude and longitude. The U.S., for example, contains several hundred contiguous grid squares. Confirm contacts with hams in 100 of these little squares and you qualify for the ARRL's VHF/UHF Century Club award (VUCC).

The designators for each grid square have two letters and two numbers. When I lived in Connecticut I was in grid square FN31. In central Minnesota it was EN25. Now, on the south end of Rochester, Minnesota, I'm in EN33 (barely!). When you hear 6-meter ops frantically exchanging grid squares during *E*- or *F*-skip QSOs, you'll know why. Grid square maps of the world and of the U.S. are available from www.arrl.org/locate/locate.html.

Speaking of grid squares, VHF contesting is a ton of fun, and it's a lot different than operating in contests at HF. Because the equipment is so portable, contest operators frequently travel to hilltops and mountaintops. Some stations even remain mobile! These Rover stations travel from grid square to grid square to "activate" various remote regions.

Dive Into Six

I've barely scratched the surface in this month's column, so I encourage you to check out the Resources box below. Working the Magic Band means dipping your toe into the crazy end of the pool! Come on in—the water's fine! ■

Resources

6 Meters in General

www.smirk.org
<http://ac6v.com>

6-Meter Links

www.qsl.net/n3db/Linkpage.html

Worldwide Beacon List

www.keele.ac.uk/depts/por/50.htm

VHF Propagation

www.anarc.org/wtfda/propagation.htm

Tropo Forecast Maps (amazing!)

www.dxinfocentre.com/tropo.html

Grid Square Map of U.S.

www.k0nr.com/Files/usgridsq.pdf

Grid Finder from Google Maps

<http://f6fy.free.fr/qthLocator/fullScreen.php>

Tropospheric Propagation And VHF DX

by Tomas Hood,
NW7US, nw7us@arrl.net

DPropagation on VHF and higher frequencies is typically thought of as “line of sight.” But is it possible to receive these signals beyond the horizon?

Most propagation on VHF and above occurs in the troposphere. There are a number of well-documented modes of tropospheric propagation. The most common is line of sight, which can, depending on the height of the transmitting and receiving antennas, extend to about 25 miles. When you hear police, fire, or amateur communications from your local area, you’re hearing typical line-of-sight tropospheric propagation—the propagation of the radio signal through the lower level of our atmosphere.

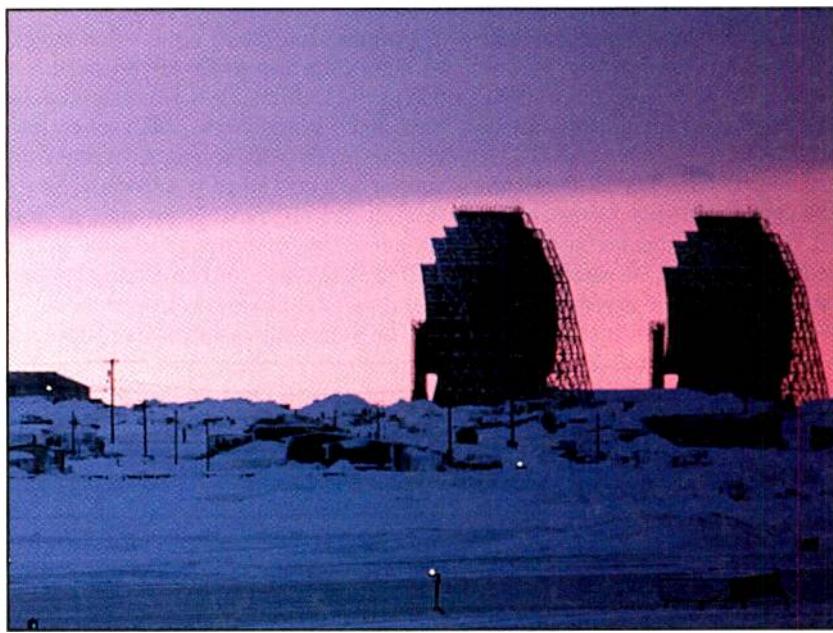
Diffraction, where radio waves are somewhat bent back toward Earth, is a mode that allows the VHF/UHF signal to follow the curve of the Earth out beyond the horizon, to about 70 miles. Knife-

edge diffraction in mountain areas is a better-known but special case of diffraction. Another propagation mode that extends the reach of a radio signal to about 70 miles is refraction, where radio waves are bent towards the Earth due to the changing density, temperature, and humidity of the atmosphere. This slight bending of radio waves is similar to the bending you see when you dip a pencil into a glass of water. The refractive index of water is different from the refractive index of air. The object appears to bend once it enters the water because of the differences in the speed of the light waves through the different densities of each medium. Diffraction and refraction of radio waves combined extends the line-of-sight range, but signals will experience a lot of fading.

Troposcatter is yet another VHF/UHF mode of propagation. This mode can extend the range of the signal to up to hundreds of miles, but it requires higher power and high-gain antennas to ensure reliable communication. It relies on the scattering of the radio signal off many small disturbances and areas of differing refractive indexes.

While serving in the United States Army as a Signal Corps communications soldier, I had the opportunity to work with microwave communications using this troposcatter method of propagation. Using two diversity receivers, and over 1000 watts, we would create a microwave radio link between two very distant locations. The transmitted microwave signal would be “shot” in a very high-gain, somewhat narrow beam slightly above the ground plane, but not at too high of an angle, in the hope that the radio waves would be scattered by temperature and humidity gradients, forward toward the distant station. The receiver would then “vote” between two receiving dish antennas for the maximum signal.

It required a lot of patience and the use of an HF working channel to iron out the fine tuning because finding the “scattered” signal, and then maximizing it for a reliable circuit, could be like looking for a needle in a haystack. Once we had locked in the circuit, however, it would be most-



White Alice troposcatter communication antennas designed for troposcatter propagation. The station is one of 30 under U.S. Air Force control. (Photo by Tech. SGT. Donald L. Wetterman, U.S. Air Force)

ly reliable. If we had major changes in weather, however, we would have to work on keeping alive the connection.

DXing troposcatter is not an easy task for VHF weak signal hobbyists. To maximize the signal, you would need to use high-gain antenna systems, perhaps with diversity feeds and a voting receiver, and you would have to have them pointed at the scatter region. Nevertheless, there are often times when the VHF DXer will hear troposcatter-mode signals from DX stations.

There are also rare tropospheric modes of propagation, like temperature inversion propagation and tropospheric ducting. Temperature inversion propagation can extend the signal out to about 150 miles or so. When temperature and humidity suddenly increase at greater heights, it could cause radio waves to be reflected back to Earth. Ducting via the troposphere can propagate signals great distances, say from Hawaii to California. In tropospheric ducting, radio waves are trapped in a type of natural wave-guide between an inversion layer and the ground or between two inversion layers. Ducting causes very little signal loss and often signals are only heard at each end of the wave-guide.

The Troposphere

The troposphere is the lowest layer of our atmosphere, bounded below by the Earth's surface and above by the tropopause. It extends from the Earth's surface to a height of slightly over seven miles. Most weather phenomena occur in this region.

The troposphere is pretty much divided into two layers: the lower troposphere that extends up to about two miles above ground, and the middle and upper troposphere from two miles up to the tropopause at eight to 12 miles above ground.

The lower layer of the troposphere can contain ducts created by inversion layers, and it is the most common location for convective cells formed from solar warming of the ground and the atmosphere immediately above it. This contains most of our everyday weather, and is by far the most active layer, in which changes in the radio refractive index are greatest.

The higher layer of the troposphere has less turbulence so is less useful in scatter propagation. Any ducts which form in the upper layer of the troposphere cannot normally be used for radio wave propagation except from aerial antennas, as the radio

waves enter the ducts at too great an angle to be retained within them, but simply pass through.

Under perfect conditions, the troposphere is characterized by a steady decrease in both temperature and pressure as height is increased. However, the many changes in weather phenomena cause variations in humidity and an uneven heating of the Earth's surface. As a result, the air in the troposphere is in constant motion, causing small turbulences to be formed.

These turbulences, or eddies, are most intense near the Earth's surface and gradually diminish with height. They have a refractive quality that permits the refracting or scattering of radio waves with short wavelengths. This scattering is what provides enhanced communications at VHF and higher frequencies.

In the relationship between frequency and wavelength, wavelength decreases as frequency increases and vice versa. Radio waves of frequencies below 30 MHz have wavelengths longer than the size of normal weather eddies. HF radio waves are, therefore, affected very little by tropospheric turbulences. On the other hand, as the frequency increases into the VHF range, the wavelengths decrease in size. If the wavelengths are small enough, they become subject to tropospheric scattering. The most usable frequency range for tropospheric scattering is from about 100 MHz to 10 GHz.

Above the tropopause, changes in temperature and water content are very small indeed, resulting in very little alteration in radio refractive index. Therefore, there can be little scatter or refraction, and no real assistance to propagation until the *E* layer and meteor trails are attained, above 60 miles or so.

In a recent article, David Dunham, WA1CUH, proposed that refraction of VHF and higher frequencies in ionized ozone or the *D* layer in the stratosphere might exist (see, "Ozone layer propagation: Pondering the possibility," *CQ VHF* January 1999, 32-38). Dunham has produced evidence that stability and low wind speeds in the troposphere and stratosphere could have resulted in very little scatter until the radio waves reached ionized ozone or the *D* layer.

Tropospheric Ducting

"Tropospheric ducting" refers to the stratification of the air within the troposphere. When layers form within this region of air, the refractive index between

each layer causes a refraction of VHF and UHF radio waves. If the layers form in just the right way and at the right height, a natural wave-guide is created. A tropospheric duct develops.

As with most matters of propagation, it's not always possible to determine whether tropospheric propagation is ducting or non-ducting. Ducting usually has characteristics like sporadic-*E* (*Es*) propagation in that the distant station will be noticeably stronger than closer stations that are not accessible by the duct. Tropospheric ducting results in surprisingly strong signals for the distance. Ducting is typically very geographically selective, and normally stations working a duct are quite close together, at both ends of the duct.

Tropospheric ducting requires low-angle entry into the duct. If your takeoff angle is high you're not likely to be able to use the duct, as the radio waves will shoot straight out of the upper side of the duct. Ducting also uses only the lowest part of the troposphere. Ducts are most common below one mile, and very rarely accessible above two miles. If you have a mountain in the way, then look for something beyond simple ducting. Ducting is most likely to occur over water, during high-pressure, anticyclonic conditions, when the air is relatively still. It is unusual at longer wavelengths, because the ducts have to be larger to be effective. You'll be very lucky to observe any tropospheric ducts on low VHF, like 6 meters.

Another important issue when trying to determine the mode of propagation across the VHF bands is whether it could have been ionospheric, such as by *Es*. Generally, *Es* will be much stronger on similar bearings when you listen to lower frequencies. If there is no sign of any enhancement of propagation on lower VHF frequencies, you can usually be confident that the mode was tropospheric.

The summer season in the Northern Hemisphere is when most tropospheric ducting occurs. On a normal spring day, air pressure, temperature, and water vapor in the air decrease with increasing height. The weather is relatively cool and breezy. Signals on VHF and above are from local sources, and reception is "normal." But late in the summer, the weather is much hotter, with slow-moving high-pressure systems spanning several states causing stagnant air masses. You can see a brown haze in a layer in the air above, containing smoke and smog that has

become trapped in a stalled air mass. This is a good visual cue that stratification has occurred, and the chances of your working tropospheric ducting are high.

Some amazing stories are told of oil rigs and cities over 75 miles away that actually can be seen during these hot summer periods. This is well beyond normal line of sight. What's more incredible is that these objects are seen upside down! Light is being ducted far beyond the horizon, trapped between the boundaries of the stratified layers. If the radio wave is small enough (the frequency is high enough), they, too, can be ducted far into the distance.

Tropospheric ducting forms each year between Hawaii and the U.S. West Coast, and from San Francisco to Los Angeles, Denver to Dallas, Texas to Florida, the Great Lakes to the eastern seaboard, from the Great Lakes to Texas, Nova Scotia to Miami, and from the Midwest to the Southeast.

The most common region for high-pressure systems, where ducting is most likely to develop, is between 30 and 45 degrees latitude above and below the

equator. Most of the geographic U.S., as well as vast areas in the Pacific and Atlantic regions where regular summertime high pressure systems occur, favors tropospheric ducting. If the local weather forecast map shows mean-sea-level atmospheric pressure in millibars, look for tropospheric possibilities when a stalled high-pressure cell in your area reaches 1025 millibars over the path you're interested in. Of course, it's most likely to occur when this high-pressure cell develops over moist air. This is why the path between Hawaii and the West Coast has made possible communications on VHF with as little as 5 watts over a path of 2,500 miles.

Advanced visual and infrared weather maps can be a real aid in detecting the undisturbed low clouds between the West Coast and Hawaii or farther during periods of intense subsidence-inversion band openings. This condition occurs also over the Atlantic. There is a great resource on the Internet that provides a look into current conditions. Bill Hepburn has created forecast maps and presents them at www.dxinfocentre.com/tropo.html,

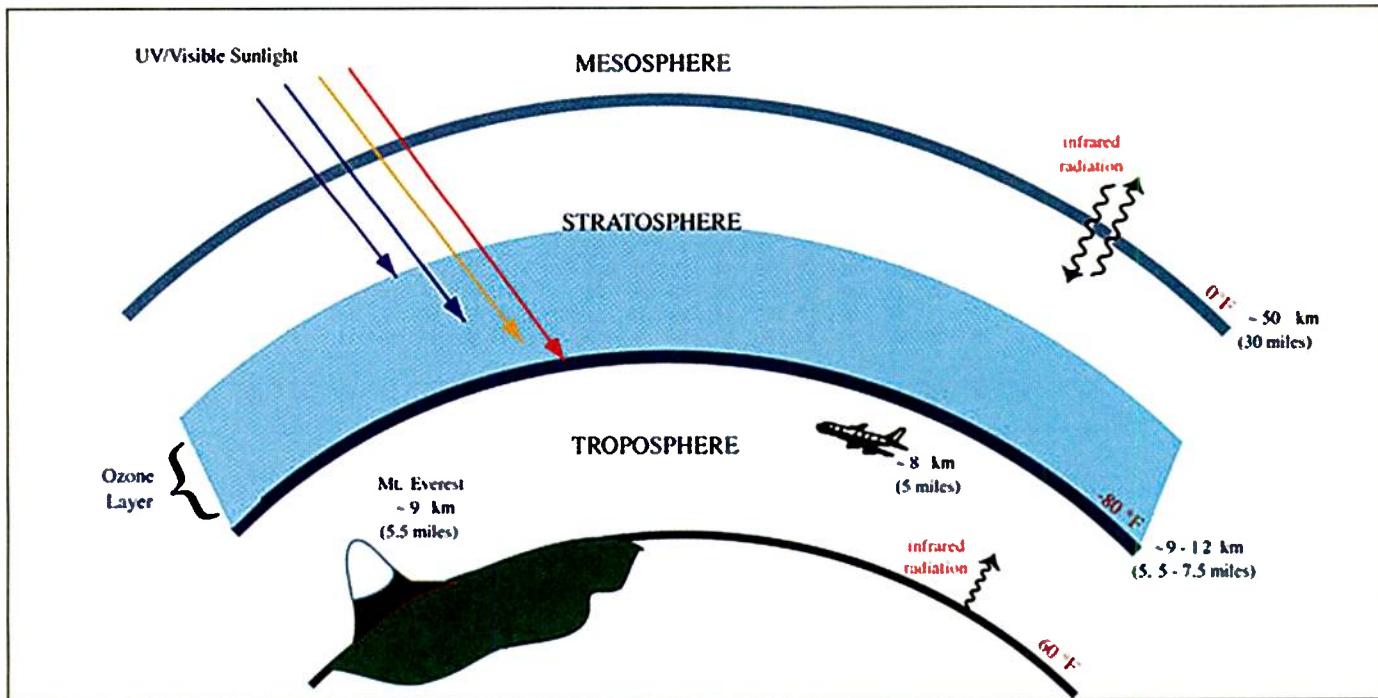
which includes maps for the Pacific, Atlantic, and other regions.

If you know that conditions are favorable for tropospheric ducting in your area, try tuning around the 162 MHz weather channels to see if you can hear stations way beyond your normal line-of-sight reception. It's possible to hear stations from over 800 miles away. Amateur radio repeaters are another source of DX that you might hear from the other end of the duct.

These openings can last for several days, and signals will remain stable and strong for long periods during the opening. The duct may, however, move slowly, causing you to hear one signal well for a few hours, to then have it fade out and another station take its place, from another area altogether.

Current Solar Cycle Progress

The Royal Observatory of Belgium reports that the monthly mean observed sunspot number for February 2009 is 1.4. That's only a tenth of a point lower than

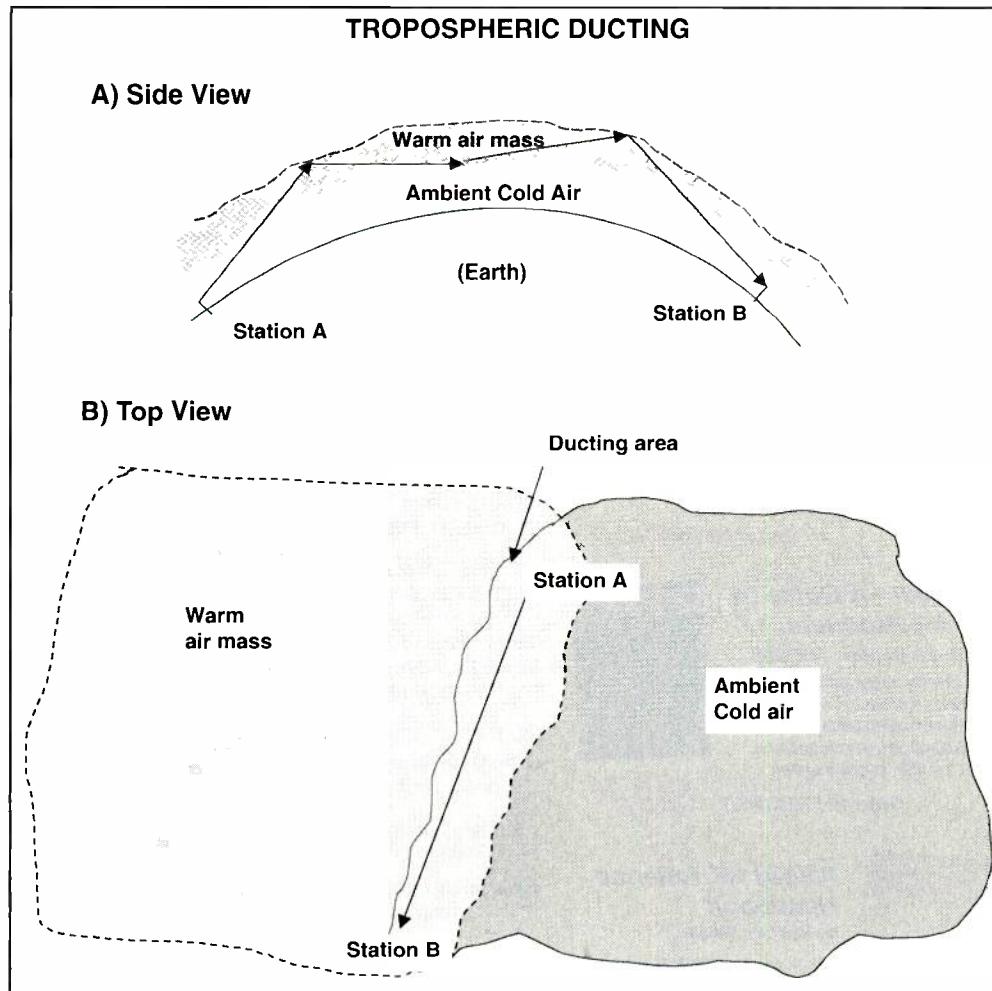


The Earth's atmosphere has layers, which are actually characterized by how the temperature of the atmosphere changes with altitude. The troposphere begins at the Earth's surface, which acts as a source of heat resulting from absorption of visible sunlight. The temperature decreases with height in the troposphere, and so the air is well mixed in this region (*Greek: tropos, a turning*). Weather phenomena such as thunderstorms and clouds occur in this layer, as does most of the commercial airline traffic at present (exceptions include the higher-flying supersonic aircraft, such as the Concorde). Near about 9 to 12 kilometers (16 to 17 kilometers in the tropics) a new region called the stratosphere begins. The stratosphere is heated from above (absorption of solar ultraviolet radiation by oxygen and ozone) and temperature increases with altitude. In this region there is much slower mixing (*Latin: stratum, layer*). The "ozone layer" resides in the stratosphere. At about 50 kilometers (30 miles), temperature begins to decrease with altitude again and the mesosphere begins (*Greek: middle*). (Source: NOAA)

Optimum Working Frequencies (MHz) - For June 2009- Flux = 73, Created by NW7US

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

A typical tropo path can occur on the VHF bands through the formation of a duct between a warm air mass and a cool air mass. The warm air mass rides above the cold air mass during the collision of the two fronts, creating tropo ducting. This allows long-range contacts to be made between two stations, as shown. (Source: "VHF Propagation, A Practical Guide for Radio Amateurs," by Ken Neubeck and Gordon West, CQ Communications, Inc., Page 14)



January. The lowest daily sunspot value of zero (0) was recorded on February 1–10, 14–23, and 26–28. The highest daily sunspot count was 8, recorded on February 11, 24, and 25. The 12-month running smoothed sunspot number centered on August 2008 is 2.6. The forecast for June 2009 calls for a smoothed sunspot count of 8 to 15.

The Dominion Radio Astrophysical Observatory at Penticton, BC, Canada, reports a 10.7-cm observed monthly mean solar flux of 70.1 for February 2009, slightly higher than January. The 12-month smoothed 10.7-cm flux centered on August 2008 is 6.2. The newly released predicted smoothed 10.7-cm solar flux for June 2009 is 73.

The observed monthly mean planetary A-Index (A_p) for February 2009 is 4. The 12-month smoothed A_p index centered on August 2008 is 6.2. Expect the overall geomagnetic activity to be varying greatly between quiet to minor storm levels during June.

HF Propagation

June is a month of typical summertime radio propagation on the shortwave (HF) bands. Solar absorption is expected to be at seasonally high levels, resulting in generally weaker signals during the hours of daylight compared to reception during the winter and spring months. Nighttime usable frequencies to most parts of the world are higher than at any other time of year, while

the daytime usable frequencies are generally lower than those during winter.

At the highest end of the HF spectrum, propagation events from DX locations east and west are rare. North and South paths will be hot, especially around sunrise and sunset. Nineteen and 16 meters will be the most reliable daytime DX band, while 19 and 22 may offer some nighttime openings on periods with higher flux levels.

Twenty-five and 31 meters will be fairly good in the evenings and mornings. At night, those paths that remain open will be marginal. The most reliable band for both daytime and nighttime should be a toss-up between these two bands.

Forty-one and 49 meters should offer good DX conditions during the night despite higher static. Look for Europe and Africa as early as sunset. After midnight, start looking south and west for the Pacific, South America, and Asia. Short-skip should be possible out to about 750 miles during the daytime.

Expect some openings on 75 and 90, similar to how 40 meters will be acting. Fairly frequent short-skip openings up to 1,000 miles are possible during darkness, but expect very few daytime openings with all the static and absorption. Mediumwave and 120 meter propagation is rough in the summer due to the high static and higher overall absorption caused by the short nights and higher D -layer ionization.

Watch for solar coronal holes to cause degradation of HF propagation. These coronal holes spew out huge clouds of solar

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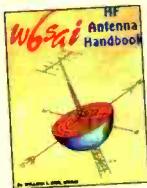
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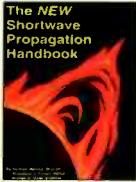


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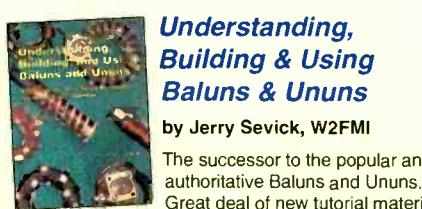
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plasma toward Earth. This creates geomagnetic disturbances that cause the ionosphere to lose its ability to refract HF radio waves. At least one week of poor propagation is expected during June, because of coronal hole activity.

Thunderstorm noise and other natural static noise increases considerably during June and the summer months, masking exotic DX signals. This can make catching weak DX signals a true challenge.

VHF Conditions

The summertime *Es* season for the Northern Hemisphere begins in force in May, with June seeing strong and frequent *Es* openings. Within the normal *E*-layer region of the ionosphere, regions of abnormally intense ionization are formed. Through June, you can expect to see 20 to 24 days with some *Es* activity. Usually these openings are single-hop events with paths up to 1,000 miles, but double-hop is possible during June. Look for *Es* on lower VHF frequencies throughout the day but especially in the afternoon.

A seasonal decline in trans-equatorial (TE) propagation occurs by June, though an occasional opening may still be possible on the low VHF bands toward South America from the southern tier states and the Caribbean area. The best time to check for 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. It might be possible to catch a tropospheric ducting event. Watch for high-pressure weather systems, where ducting is most likely to develop.

I'd Like To Hear From You

Be sure to check out the latest conditions, as well as the educational resources about propagation, which I have put together for you at <http://prop.hfradio.org/>. I also provide a WAP/WML resource for wireless devices. If you want the latest propagation information like the solar flux, A_p reading, and so forth using a cell phone or other WAP device, check out <http://wap.hfradio.org/>, the wireless version of my propagation site.

Please don't hesitate to write and let me know about any interesting propagation that you have noticed. Do you have questions about propagation? I look forward to hearing from you. Until next time, happy signal hunting!

73 de NW7US, Tomas Hood

The List Lovers' Guide To An Obscure Power-Tune Portable And Some Vintage Radio Directories

by Shannon Huniwell
melodyfm@yahoo.com

Admittedly, what follows is a melancholy way to start a saga about an odd transistor radio and AM/FM logbooks, but I thought it best to get the sad part behind us quickly. Through a brief email, *Pop'Comm* reader Will Miller got me trying to count up all the *White's Radio Log* genre of listings that were readily available as promotional freebies or easy to find in even the most rudimentary drug-store magazine rack. There's no particular sadness in that challenge, but a subtle tone in Will's note got me thinking that his request had a wistful side—something that had more to do with a lost relationship than with finding radio call letters.

Anyway, in a series of subsequent emails, I decided to gently press buttons, and soon uncovered a story that had begun during the fall of 1966



When my Dad found out that WYXI played a role in this month's column, he summarily produced this snapshot from his box of station stuff. He doesn't remember the circumstances surrounding the WYXI photo, but figures he clicked it around 1985 while on some southbound sales trip. According to WYXI's website, the building was vacated about a year later and "burned by the Athens Fire Department as a training exercise."

"I don't really know how the two oldest—and most basic—station guide documents got to me, but my father thinks they might have been wedged into the works of a late 1920s Stromberg Carlson receiver that a never-identified, well-meaning someone parked on our back porch one August."

in an 8th grade Tennessee homeroom. Will told me that the Good Lord used the alphabet to get him in proximity to the most beautiful girl he'd ever seen. She was Wendy Miller, a sandy blonde lass assigned to a desk in the fifth row, directly in front of his. Will said that it was fortunate that she faced away from him, because he instantly fell in love with her and couldn't think of a lucid thing to say whenever he got a glimpse of her big green eyes and button nose.

By spring 1967, he still hadn't been able to manage more than a few words to her, but sensed his feelings might not be one-sided. A nosy kid taking attendance for the homeroom teacher interrupted the roll call after checking off Wendy Miller and Will Miller. "Hey," he wondered, "are you two related?" Seemingly without thinking about it, Wendy softly drawled, "Not at this point." While her reply didn't mean anything to anyone else, Will hid those four words in his heart, and he mustered the courage to tap her on the shoulder and attempt conversation a few times after that. The next fall, she asked him to the 9th grade Sadie Hawkins dance. Cutting to the chase, I'll tell you they were married three months after their high school graduation and moved into a little place originally designed as a roadside tourist cabin.

The radio piece of the tale entered when Wendy, aiming to show Will appreciation for his diligent devotion as a husband, community college student, full-time employee at a gas station, and part-timer at a small department store, spent most of her mad money on a very unusual 10-trans-

sistor Channel Master "Signal Seeker" AM portable and a subscription to *Communications World* magazine. Will listened to a day-timer in nearby Athens, Tennessee, and whenever they happened to drive past it, he'd share with Wendy his dream of going into broadcasting at a local station. Her gift was intended as encouragement for him to pursue that dream.

The story took a tragic turn before Will ever knocked on a station's door or, for that matter, got to use the Channel Master more than a few times. A week before her 20th birthday, Wendy was killed by a speeding Chevy Vega driven by some guy high on something. Will's life went into freefall. He admits it wasn't until nearly three years after the tragedy that a bit of light entered the tunnel.

Years later still, while looking through boxes he'd hastily packed after Wendy's funeral and his move a couple of months later to a job in the Atlanta area, Will found the Channel Master and a stack of *Communications World* publications. The radio was wrapped in Wendy's favorite sweater. Memories flooded Will's entire being. Somewhere in those recollections, he felt such closeness with his first love that he resolved to rekindle a relationship with Wendy's long-ago gift. Almost immediately, Will drove to a nearby convenience store and bought a blister pack of double-A batteries. He used them to enliven the radio after its long sleep, and he now reports having spent many enjoyable hours with the unique Channel Master, first listening to the most easily received Atlanta stations and then DXing the AM band. "All these years later," Will told me, "the experience somehow still includes a little bit of that button-nosed girl in the junior high homeroom."

The Radio With A Spring-Loaded Tuner

Marty and Sue Bunis' *Collector's Guide To Transistor Radios* cites the Channel Master Signal Seeker model #6459 as a "horizontal, 10 transistors, plastic with metal trim, left front round dial, left top manual thumbwheel tuning knob, right top automatic tuning knob, right front perforated grill area."

As mid-1960s transistor radios go, the #6459 is an uncommon example. Reportedly one of the "on-the-go" radio period's three auto-tuning portables (along with Panasonic's RF-880 RadarMatic wind-up and the Electra AM500 Dial-O-Matic), this Channel Master had a clockwork mechanism that, when wound, powered a dial/variable capacitor connected to a signal sensitivity circuit capable of going from 540 to 1600 kHz—and back again—after just three or four twists of the fold-out key. A signal strength switch could be set on "L" or "DX" for sticking on just local stations or hitting anything that enlivened a spot on the dial, respectively. The #6459 has an earphone jack plus, according to some sources, a plug for a long wire antenna, though Will's model is not fitted with that. He reports, though, that the radio's pulling power is quite respectable through its internal AM antenna, and that its reception is comparable to a Jimmy Carter-era GE Super Radio or Realistic TRFL Long Range AM receiver.

Sometime around mid-March 1977, Will bought a left-over Yamaha RD200C and planned to take the motorcycle into the Georgia countryside and points north for a little camping. It was the first real vacation he'd considered since leaving Tennessee three years earlier. Athens was on his tentative venue, but near the state line, he turned east. Will says he still wasn't ready for the final closure of visiting Wendy's grave. He did, however, bring along the Channel Master radio and one of the magazines she'd given him.



While four penlight batteries power the electronics in this Channel Master portable, a spring-loaded clock mechanism drives the automatic tuner. That feature is operated by a button on the top-right. Depressing and rotating the manual thumbwheel (top-left) serves to fine tune the capacitor, or bypass the spring system altogether. My Dad knows a broadcast consultant who once bought out his local appliance store's entire stock of #6459 Channel Master *Signal Seeker* sets.

At a modest lakeside campground near the North Carolina border, Will was far enough from big city signals (such as hot RF from Atlanta's mighty WSB 750) for toggling the sensitivity to "DX" and bagging a lot of unfamiliar AM action. The *White's Radio Log* section of that *Communications World* really came in handy and soon became an integral part of his AM distance listening sessions.

Will prompted this article as he reminisced about faithfully renewing his *Communications World* subscription, only to be left wondering what happened to the pulpy treasure that disappeared sometime during the early '80s. I was able to solve that mystery to the extent of confirming that the 1981 *Communications World* edition was owner Davis Publications radio swan song.

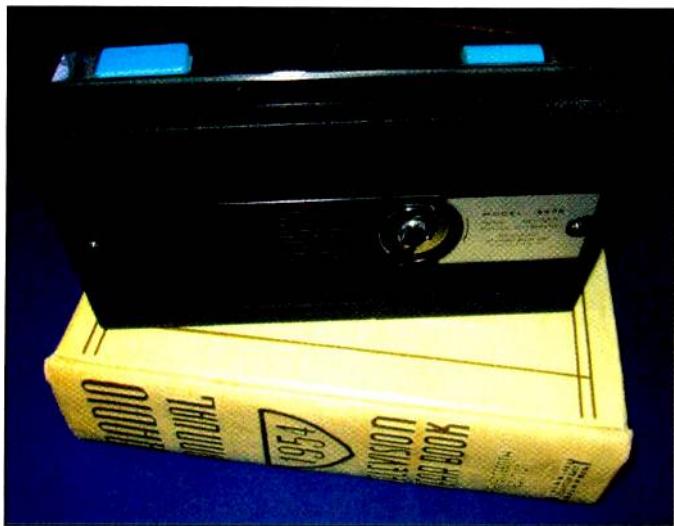
Logging The Radio Logs

Will seemed amazed when I told him that I had a "modern" (post-*Communications World*-era) *White's Radio Log* on my shelf. This led to a suggestion that I reveal the roster of broadcast station listings in my collection. So, just for the fun of it (and maybe as the start of a more serious annotated bibliography), the following is an overview of my library.

Oldest Of The Pack

I don't really know how the two oldest—and most basic—station guide documents got to me, but my father thinks they might have been wedged into the works of a late 1920s Stromberg Carlson receiver that a never-identified, well-meaning someone parked on our back porch one August. That reckless abandonment occurred when we were away on a family vacation. While ushering us from the driveway to the house, upon our midnight return, Dad literally tripped over the boxy radio—an apparent "gift" from somebody who either knew my father liked vintage radios, or who figured our house was closer than the dump...or both.

In any event, the thing must have spent years in a damp basement: its veneer was peeling in every direction, wooden



There's the silver key for winding the Channel Master *Signal Seeker*'s tuner drive. An arrow on the label points to the proper winding direction. The tag also notes that Channel Master's unusual model #6459 was manufactured exclusively for Channel Master Corp. by Sanyo Electric Co., Ltd., a firm that would soon become a brand Americans would recognize for quality when it—along with Sony and Panasonic—began overwhelming the consumer electronics marketplace in the late 1960s.

supports were cracked, tubes were either missing or broken, and the metal capacitor cans were rustier than a junk 1952 Plymouth in the woods. Dad says he tried to salvage that AM hulk a time or two and then eventually wheel barrowed the sad set from our garage to a hole where a tree had uprooted in a windstorm. There, the pioneer radio served as fill until it further decomposed, necessitating a couple extra loads of dirt to level its backyard gravesite.

My father vaguely remembers harvesting—during one of his earlier restoration attempts—some cardstock literature from the Stromberg-Carlson's remains, though he remembered it as being the owner's manual. My guess is that the pair of mid-1920s logs in question is somehow related to that tale. Both are approximately 9 x 10 inches, with a single fold and thus four printed pages. The first was a promotional product of the maker of Buck Radio Tubes from the Universal Electric Lamp Company of Newark, New Jersey. A cover advertisement showed a frustrated ram fruitlessly attempting to “buck” a Buck tube. In fact, the major thrust of the Buck Radio Log message is that any of Buck's tubes cost only “\$1.00 or One Buck.” The pamphlet also noted that Buck Radio Tubes “will solve your radio troubles...give real enjoyment, volume, distance, and tone quality, [and will] not kick in a million.”

Inside, a troubleshooting section theorized that “no reception” was likely caused by a dead battery. “Renew or charge,” suggested the copywriter. Admittedly, the remainder of the hints were more technical and useful to those confounded by dusty condensers, choked detector tubes, whistles and hums, and what to do when a “neighbor's set tuned to the same station is oscillating.”

Buck did, however, reserve enough space for listing about 125 radio stations, their city-of-license, wavelength and kilocycle position. Fill-in-the-blank boxes were included for DXers to note where their particular receiver's first, second, and third dials were set to snag each logged station. Whoever owned this

guide, way back when, must have had a two-dial radio (Dad can't say how many that Stromberg-Carlson featured) and, after twisting the pointers to 55 and 59, penciled-in those digits for obscure WCX Detroit at 580 kilocycles. Though the roster—presumably from 1923 or 1924—is conspicuously missing pioneering outlets such as WDRC in Connecticut, it is scribbled with notations about stations heard that had just come on the air. Examples include jottings for WBAP Texas, WFBM Indianapolis, KRLD Dallas, WSUI Iowa City, KOIL Council Bluff, and one simply reading, “Syracuse: dials 12 & 14.”

The second cardstock directory survived the decades without any doodlings. A freebie from Utica Radio Supply at 122 Lafayette Street (Hotel Majestic Building) in Utica, New York, it was published by M. Cornfield via the Saunders-Chopp Printing Company at 65 West Houston Street in New York City. Cornfield no doubt cranked these out for a plethora of radio suppliers like Utica Radio, which sold RCA Radiola, Atwater-Kent, Freshman Masterpiece, Sonora, “and other standard sets.”

Similar to the Buck booklet, this one chronicles some 125 stations, but adds power output and station ownership. There's also a column listing how far each station is in “miles from New York City.” That's another hint that the publication is generic, as Utica is at least a full day's Model T Ford drive from the Big Apple.

White's Radio Log

For a mere \$2.50 at a northwestern Connecticut antique bookshop, I became the proud owner of a fall 1925 installment of *White's Radio Log*. My Dad, who spotted me the funds to buy this booklet during a long-ago father/daughter “antiquing adventure,” had mined it from a stack of mildewed brochures on one of the store's rustic shelves, and was convinced that I “might really need” the dog-eared thing for some future school report (who'd have guessed that, 30 years later, I'd be consulting it for a *Pop'Comm* article?). Actually, I don't think we ended up paying the shop owner anywhere near his asking price, as the sound of a little girl disappointedly lamenting that the original cover was clearly labeled “10 cents,” must have tugged on the old guy's heart strings.

Although that Fall 1925 item is the oldest I have of *White's*, publisher C. DeWitt White at 1311 Smith Street Providence, Rhode Island, had already done seven previous editions. Compared to the aforementioned promotional log cards, his information on the fledgling broadcast scene was encyclopedic. Included in his *White's Air Line Mileage Book and Triple-List of Radio Broadcasting Stations* was 32 pages of crammed content, including an alphabetical (by callsign) roster of U.S. and Canadian stations. Among the smallest was 5 watt WFBD on 1280, which emanated from the Gethsemane Baptist Church of Philadelphia. There were only a few “flamethrowers” during that era but *White's* noted rare 5000 watt big guns, such as AT&T's WEAF on 610 in New York. Stations having at least 100 watts were featured in *White's* other sections, sliced and

Pages From The Past

Want to experience a vintage *White's Radio Log* first hand? Just (carefully) type this rather long Web address of the Worldwide TV-DX Association and you'll be rewarded with a look at all 32 pages of the Winter 1951 issue: www.wtfd.org/index.php?option=com_content&task=vicw&id=62&Itemid=45.

diced by city, frequency, calls (those were the triple part), and air-mileage from various US locales.

My 1931 *White's Radio Log* also boasted 32 pages, but its "Air Line Mileage, as the crow flies" aspect got nixed in favor of network program schedules. By the 1930s, *White's* was considered the *TV Guide*—to mix a metaphor—for even the most casual of the DX crowd. Consequently it could command a decent ad rate for the back cover, which was usually purchased by National Radio Institute for its Washington, D.C.-based technical school. I've got a May/June 1940 *White's* still trumpeting this back-page sponsor, though a grainy photo is on the front rather than its iconic "headphone-bedecked DX'er in a vest and bowtie." This picture shows four self-supporting towers strung with the wire array for "General Electric Company's television relay station of transmitter W2XB in the Helderberg Mountains in the vicinity of Schenectady, Albany, and Troy, New York."

The issue carried a page for TV and FM stations of the ilk of DuMont's Passaic, New Jersey, W2XVT with 50 watts of audio/video somewhere between 156,000 and 162,000 kilocycles, and the Milwaukee Journal's W9XAO at 42.6 megacycles with 1 kW of frequency modulation output. Numbers in the callsign denoted these facilities as experimental operations, the norm just before the dawn of commercial FM and TV. Incidentally, the 1940 log also contained shortwave listings and a roll of police radio stations, some of them (like KQCO, a 150 watt system at 1674 k.c., owned by the Salinas, California, cops) only a bit north of that era's AM broadcast band.

The spring 1952 *White's* in my bookcase returned the old DXer logo to its cover. Gone were the police information and program listings, which were replaced by more TV/FM content that helped reduce white space (no pun intended) amid the 32 pages of small print. Of course, that's attributable to TV DXing's quick rise—even the least techno-savvy video viewer was interested in good reception from as many stations as possible—and to true radio buffs' continued interest in frequency modulation, despite the general public's ambivalence to it.

My 1950s through 1980s *Radio-TV Experimenter* and *Communications World* magazines contain the bulk of the *White's* detail I consult for our monthly musings. If bygone readers of those publications were like me, I'd guess that the



Here's a wide range of *White's Radio Log* history on display, from a 1925 booklet and later pulpy directories, to the Davis Publications years, and finally the circa 1983 last hurrah.

inclusive *White's Radio Log* (always prominently noted on the periodicals' cover) was the deciding factor in their decision to purchase or subscribe. I often wondered how *White's* little books came to be incorporated into these bigger magazines. A detailed answer arrived as the preface in what my father speculates was the final vestige of radio and TV DXers' best-loved log.

History In Black & White's

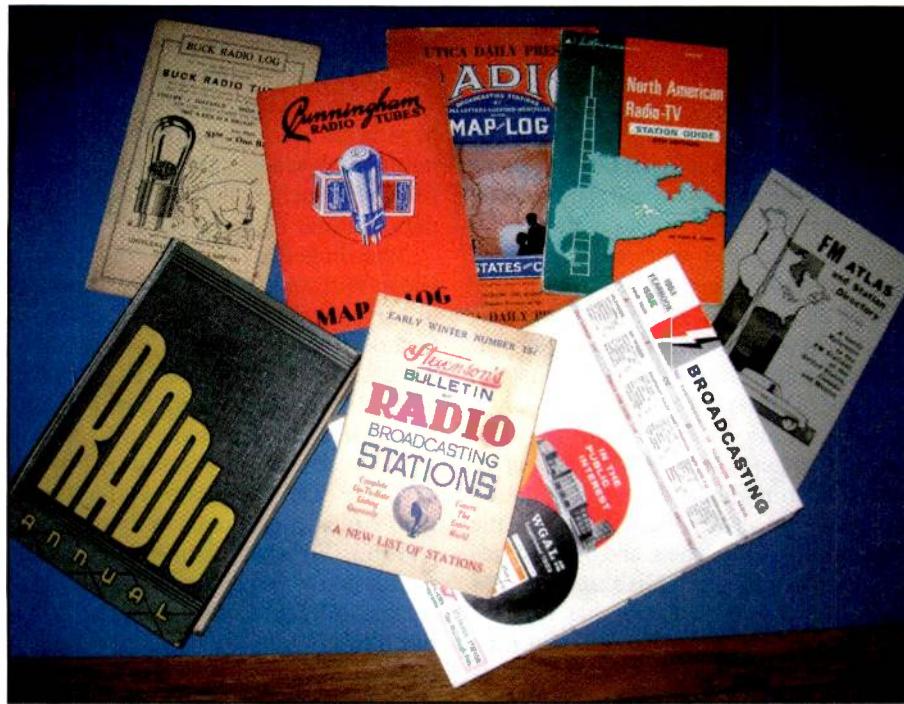
Sometime in the early '80s, not long after *Communications World*'s demise, Don Gabree, the former *Communications World* circulation director, acquired the rights to *White's* from Davis Publications. He published an updated *White's Radio Log* (as Volume 1, Number 1) and sold it for \$4.95 circa 1983. It had 136 pages of facts about American and Canadian AM/FM/TV outlets as well as noted worldwide shortwave stations. Detail in the AM broadcast area paid closer attention to day/night power configurations than did the old logs. Unlike in many of the vintage *White's*, however, FM power output was not indicated.

In short order, Gabree appointed Don Jensen, WDX9EZ, the new *White's* Communications Editor. His first assignment was to chronicle White's contribution in a piece entitled "The Legend and the Legacy." Jensen pinpointed 1924 as the date of *White's* premier issue. This one, though, dubbed the *Rhode Island Radio*

Call Book, focused on DX in the Ocean State's airwaves and was more limited in scope than his subsequent triple listings (by calls, frequency, and city-of-license).

At 33, Providence resident "Charlie" White was young enough to be caught up in the early 1920s broadcasting DX craze and savvy enough—as a publisher of city directories—to understand that enthusiasts would pay for an accurate list of stations and related stats. According to the exposé, White wholly private-branded his wares to various sponsors as "Enna Jettick Radio Log in 1929–1931, when it was sponsored by a shoe manufacturer of the same name. It was called the General Electric Radio Log in 1938–1939, promoting [GE's] sensational 1939 receivers with pushbutton tuning."

By that time, White had sold the city directory end of the business and moved his radio concern to Bronxville, a suburb of New York City, where it operated as C. DeWitt White Company, until White's death at age 76 in 1957. Jensen credits "a hard core of DX fans" with having helped to keep *White's Radio Log* a viable business after radio listening (and later TV viewing) essentially evolved into a consumer utility, no longer requiring a scientific or hobbyist approach. Shortly after his passing, White's daughter sold all rights to *White's Radio Log* to Science & Mechanics Publishing Company, a Chicago-based firm that subsequently sold the publishing rights to Davis Publications.



Wouldn't it be a joy to encounter this lot during the "buck a bag" day at some library book sale! Shown here are many of the major players in our radio log listing.

Jenson reports that Davis revived the triple-list log as a section in its *Radio-TV Experimenter* magazine. Davis wisely capitalized on the original spirit and letter of White's 1920s DX enthusiasm by conspicuously bedecking his colorfully contemporary electronics magazine fronts (now featuring in-depth articles about analog computers, portable phones, and Hi-Fi/stereo) with the White's "familiar cover logo, a drawing of a listener with headphones, tuning a 1920s receiver." In 1964, when *Radio-TV Experimenter* went from a yearly to a bimonthly publication, Davis issued only one section of the triple listing (stations by calls, frequency, or city-of-license) at a time, "with a different section presented in each issue of [Radio-TV Experimenter]. This meant that two complete and revised White's logs were published each year in the six magazine issues." Outside of the *Broadcasting Yearbook*, a province of radio/TV professionals, Davis' efforts offered the best source of radio/TV station information.

The trio listing ran from 1964 to 1969 when a plethora of new broadcast outlets (buoyed by a rush of FM and UHF-TV authorizations) caused Davis to further divide White's rosters into AM, FM, and television installments. If page count allowed, a shortwave directory was inserted as well. *Radio-TV Experimenter*

morphed into *Communications World* in 1971 and took along White's *Radio Log* as a key editorial asset. As already indicated, this magazine folded a decade later, but several of its officials attempted to keep White's active into the latter years of the 20th Century.

A List Worthy Of Further Study

Over the years, I've spent more than a "C" note on radio station directories, but have little space left in this *Pop'Comm* edition to describe them in much detail. There are 1926 and 1940 editions of *Stevenson's Bulletin Of Radio Broadcasting Stations*. Apparently introduced in 1923 by National Publishing Company of Washington, D.C., these were in direct competition to White's and even included Cuban and Mexican stations, and even police transmitters. Although printed on better-quality paper than White's, *Stevenson's* didn't last as long, likely because it didn't have White's tenacity behind it, plus the radio hobby market was shrinking (or at least branching off into pursuits other than broadcast DX) after World War II.

A winter 1928-29 Stromberg-Carlson *List of Broadcasting Stations* was the prize I uncovered at a lawn sale in a shoebox overflowing with old dress patterns and recipe books. It sure looks like a White's

private-branding job because the formatting and tone are very similar. Some kind soul also gave me a 1935 WBEN/Buffalo (NY) *Evening News Radio Guide*.

This one has 40-plus pages packed with the usual station lists, but is of special interest because of photo features of the paper's WBEN facility and the transmitter of WBEN's shortwave sister, W8XH. It surprised me to learn that the Buffalo newspaper's radio operations not only included this rare international broadcast authorization on 7.3 meters (51,400 k.c.), but also another shortwave setup, W8XD at 37,600 k.c. or 7.9 meters, both either simulcasting WBEN or covering niche events like "the arrival [to Buffalo] of, and erection of tents by the world's largest circus."

Also from a newspaper, the *Utica Daily Press' Radio Map & Log* for the U.S. and Canada, first saw daylight in 1929. Measuring 7 x 10 inches and sporting 20 pages, it was probably an insert in a Sunday edition and, though printed locally, had been composed by an outside syndicate. That is likely also the case with my 1931 *Cunningham Radio Tubes Map and Log*. Approximately the same size and scope of White's, Cunningham distributed this publication (produced by the George Cram Company of Indianapolis) strictly as a promotional tool aimed at persuading folks to buy Cunningham tubes.

Among the most utilized implements for tilling my radio/TV history garden is a modest collection of *Broadcasting Yearbooks*. There's a 1947, 1948, 1963, 1969, 1972, 1973, 1983, 1987, 1989, and a few from the 90s. Although not without an occasional confounding error, these phonebook-sized tomes outline not only a station's frequency, power, location, and call letters, but also the debut date, proposed upgrades, personnel, ownership, street address, phone numbers, and commercial sales rates. It's long been my hope to amass a complete collection...

I have, however, filled in a few missing (*Broadcasting Yearbook*) years with appropriate editions of another heavyweight publication aimed at the professional: *Radio Annual—Television Yearbook*. On my shelf are editions from 1948, 1952, 1954, 1955, 1956, 1960, and 1964. These etched hardcover books offer a lot of the same details as the *Broadcasting Yearbook*, as well as generous sections on broadcast personalities, many of whom took out ads in the hopes that some New York or Hollywood network executive would cast them in a new program.

Helping to round out my menagerie are Vane Jones *North American Radio-TV Station Guide* editions 5 (1968), 13 (1979), and 15 (1984). With a trim size of 8-1/2 x 5-1/4, the 160 to 226 pages contained all manner of station data, like FCC authorizations for time-shares and temporary power levels, and made the publication a cut above *White's Radio Log*. Indianapolis-based Howard W. Sams & Company, Inc., marketed Jones' work, which by edition 15 cost nearly \$10. Sams always placed Jones' mini bio on the back cover. "Whenever possible," the publisher indicated, Vane "is in his study, with a television set and two or three radios all operating at once. He can recite call letters and tell you the history of stations by the hour. Since the publication of his first guide in 1958, his list of followers has grown with each edition, primarily because of the personal attention he gives each entry and the hairline accuracy for which he is famous."

Noted author Bruce F. Elving, Ph.D., penned a seminal frequency modulation document called *FM Atlas & Station Directory*. The 1976 fourth edition is one of a trio (plus edition 9 from 1984 and edi-

tion 12 printed five years later) that I've got in my library. Dad picked it up for free at a Connecticut stereo shop, which used the approximately 150-page, 5-1/2 x 8-1/2 inch books as promotional gifts for customers who mentioned hearing about offers on the stereo store's commercials aired over local FM outlets.

A devoted FM enthusiast, decades prior to FM being considered "real radio," Elving founded his Adolph, Minnesota-based FM Atlas Publishing Company to produce and distribute directories that not only listed copious FM broadcast station details, but also showed each FM outlet and its frequency on state maps. My father recalls hearing about one fledgling station operator who, in the latter 1970s, used the maps to figure out where and on what frequency he might establish another FM station. Since 1972, Elving has endeavored to publish an updated *Atlas* at least every couple of years. The 20th is his most current edition.

Life Goes On...In Just One Direction

Remember Will Miller, who got me

started on this directory topic? At his request, I emailed him a snapshot of the WYXI studio house in Athens, Tennessee, that my father happened to have taken during some long-forgotten north-south venture. Dad's got a shoebox filled with such moment-in-time peeks of radio stations big and small.

I also linked my email to WYXI's website so Will could glean some of this AM's history. Essentially this includes an October 1966 debut with 500 watts daytime at 1390 kHz. A Gates BC-1E transmitter feeding a 170-foot tower did the honors from a five-acre site on Slack Road at the northeastern edge of Athens. In 1967, the FCC granted original owners 3-J's Broadcasting (named for spouses John and Julia Frew and their daughter Julie) permission to begin the broadcast day at 6 a.m., with 500-watts, regardless of sunrise time.

John Frew enjoyed a stint as DJ at Atlanta's popular top-40 outlet WQXI (dubbed "Quixie in Dixie!"), so he called WYXI (and WYXC, its sister station at Cartersville, Georgia) "Wixie." By 1978, WYXI got the ok to up sunrise-sunset power to 2,500 watts via a new McMartin BA-2.5K transmitter. 3-J's sold WYXI in late 1979, but repossessed it five years later, only to sell it again in 1986, this time to Cornerstone Broadcasting.

The new licensee moved the studios to the downtown Athens Robert E. Lee Hotel, activated an opportunity to run 62 watts at night, and in 2000 retired the McMartin as main transmitter, replacing it with a fully transistorized Energy-Onix brand RF box.

Will thanked me for the WYXI picture and mentioned that he *had* gone back to Athens and discovered that the studio house on Decatur Pike was no longer there. After WYXI's headquarters were relocated, its old home was sold and eventually burned to the ground for firefighters' practice.

In 1987, Will married a beautiful woman from Atlanta. About a month before their wedding, she gently insisted that Will take her to see where he had grown up. While there, she got him to really pour out his heart about Wendy. His fiancé knew how important it would be to get any postponed pain out of the way. He closed the story with a mention of the old Channel Master. She'd noticed that strange wind-up radio in his apartment. After their marriage and settling into a new home, Will's wife has faithfully kept it supplied with fresh batteries. ■

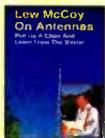
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Hill Air Force Base

by Mark Meece, N8ICW
ohioscan@gmail.com

GStretching for 160 miles from southern Idaho into central Utah are the chocolate-colored mountains known as the Wasatch Range. Considered the western edge of the Rocky Mountains, they also border the eastern shore of the Great Salt Lake. The valley of Salt Lake City lies at the feet of the range. Thirty miles to the north of Salt Lake and 15 miles south of Ogden, along Interstate 15, we find the focus of this issue's column, Hill Air Force Base.

The Ogden Air Logistics Center (OO-ALC) is the largest and host organization based at Hill; in fact it's one of the United States Air Force's largest logistics centers. The base itself covers 6,698 acres across Davis and Weber Counties, and manages another 962,076 acres across Northern Utah.

The Colorful History Of Hill

A temporary Air Corps depot was established in Salt Lake City in 1931. As time passed, top level officials decided a more permanent site was needed, and began a search of the area for a suitable location. Several sites were selected, with the site of the current base near Ogden chosen as the ideal location. In 1934 the Air Corps Material Division,

"The Ogden Air Logistics Center (OO-ALC) is the largest and host organization based at Hill; in fact it's one of the United States Air Force's largest logistics centers."

now known as the Headquarters of the Air Force Material Command (AFMC), gave its recommendation for the depot to be located at this site. In August 1935, Congress passed Public Law 26, known as the Wilcox-Wilson Bill, to provide for the addition of new permanent Air Corps stations and depots. Four years later, \$8 million for the Ogden Air Depot was approved with the supplemental Military Appropriation Act of July 1, 1939.

In December of that year, the War Department designated the facility "Hill Field" to honor Major Poyer Peter Hill, who was Chief of the Flying Branch of the Air Corps Material Division at Wright Field in Dayton, Ohio. Major Hill died in 1935 at Wright Field in the crash of an experimental Boeing Model 299, a prototype of the B-17 "Flying Fortress." The crash occurred not long after then-President Franklin D. Roosevelt signed the Wilcox-Wilson Bill into law. Near the South Gate Visitor Center, stands a monument to Major Hill.

On November 7, 1940, Ogden Air Center's first commanding officer, Colonel Morris Berman, arrived, thereby activating the base while construction was ongoing. By the fall of 1941, four 7,500-foot runways were completed; around this same time maintenance was underway on the Douglas A-20 and Lockheed Hudsons. The Hudson was the first substantial production aircraft for the fledgling Lockheed Aircraft Corporation and was used as a light bomber and coastal reconnaissance aircraft. Production on the Consolidated B-24 Liberator, which became the primary focus of the base, began on February 14, 1943, and by July 6 the maintenance goal of completing one bomber per day was reached. The B-24 remains the most-produced combat aircraft in American history.

It was during World War II that Ogden Air Depot reached its peak strength in terms of per-



The Watsatch Range as seen from the International Space Station.
(Public domain photo)

sonnel and production, serving 15,780 civilians and 6,000 military personnel. Hill Field served as a critical maintenance and supply base throughout the war, and countless battle-damaged aircraft were brought to Hill for structural repair, engine overhauls, and an endless flow of spare parts, in an incredible effort by the men and women at Hill to support the war effort and return thousands of aircraft to combat.

As the war was nearing its end, Hill Field was assigned the responsibility for long-term storage of surplus aircraft and support equipment. More than \$200 million worth of aircraft was preserved in near perfect condition by the end of 1947. As the Army Air Corp reorganized into the United States Air Force in September 1947 and "fields" were renamed as "bases," Hill Field officially became Hill Air Force Base on February 5, 1948.

Ogden Air Logistics Center/Utah Test And Training Range

The Ogden Air Logistics Center plays a major role in the global operations of the United States Air Force. The OALC has multiple operational missions to perform. Their primary mission is to provide the engineering and logistics worldwide for our largest fleet of fighter aircraft, the F-16 "Flying Falcon." Their second mission is to maintain that fleet of F-16s and C-130 "Hercules" aircraft. A third mission tasks them to provide logistics management and maintenance worldwide of our entire fleet of intercontinental ballistic missiles. Their fourth mission statement is the overhaul and repair of all landing gear, brakes, struts, and wheels on Air Force aircraft, as well as of all photographic and reconnaissance equipment. Their fifth and final mission is to provide air munitions, avionics, guided bombs, hydraulic and pneumdraulics instrumentation and software, photonics, and reconnaissance equipment, rocket motors, simulators and training equipment, and small rocket motors.

Today Hill Air Force Base uses only one runway 14/32, which is 13,508 by 200 feet. There are two fighter units that call Hill Air Force Base home: the 388th Fighter Wing and the 419th Fighter Wing. Both fly the F-16. The Air Force Material Command (AFMC) also has A-10s, C-130s, and F-16s at the ready.

The Utah Test and Training Range (UTTR) encompasses 2,624 square miles

in northwestern Utah and eastern Nevada. All within the Great Salt Lake Desert, exactly 70 miles west of Salt Lake City. It offers the largest land safety footprint for the Department of Defense. Operated and maintained by the 388th Range Squadron, it offers a variety of terrain for aircrew and weapons training. Air-to-ground, air-to-air, and ground forces exercises are conducted regularly. The largest overland contiguous block of supersonic authorized restricted airspace in the continental United States can found within the UTTR.

Hill Air Force Base and Utah Test and Training Range are part of a four site federal/military trunked radio system that also includes the Salt Lake City Federal Building. Since this system uses digital voice, you will need a digital scanner to monitor it. All information on the squadrons, frequencies and trunked radio

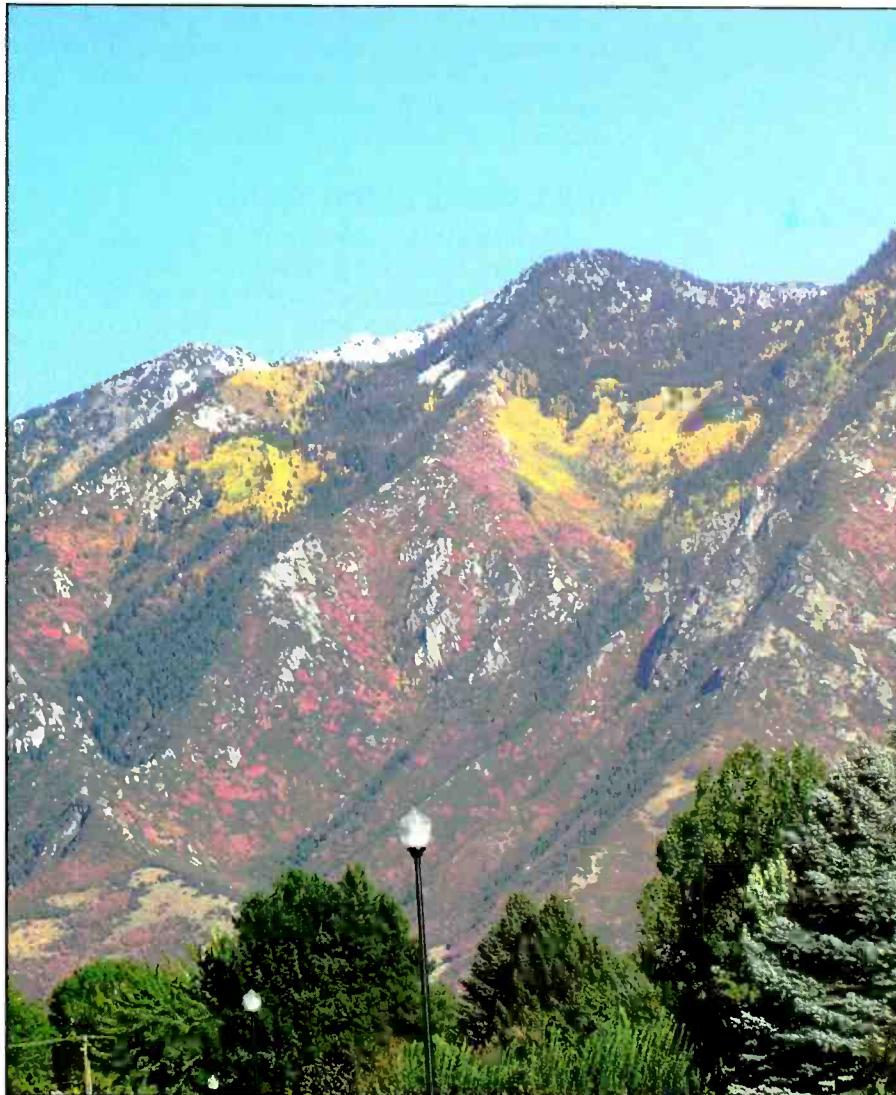
system can be found in our sidebar, "Listening In On Hill Air Force Base."

When You Visit...

While in the area make plans to check out the Hill Aerospace Museum, which welcomes around 180,000 visitors annually. It sits on 30 acres on the northwest corner of the base, just five miles south of Ogden. It's open seven days a week from 9 a.m. till 4:30 p.m. local time, admission is free, and it has a nice gift shop as well. Be sure to check out the exhibit dedicated to the base's namesake, Major Hill.

Correction

We have a correction to make from our February column on MacDill Air Force Base. Neil Friedman, N3DF, writes in to let us know that the U.S. Special Operations Command (USSOCOM) is



The Wasatch Range as seen from Sandy, Utah. (Public domain photo)



A USAF Douglas A-20G. (Public domain photo)

based at MacDill. The U.S. Southern Command (USSOUTHCOM) is, in fact, based in Miami. Thank you, Neil, for the correction.

Military Loggings

This month, regular contributor Doug Bell of Ontario, Canada, shares some of his HF military intercepts. I also include my VHF/UHF logs from southwestern Ohio. We appreciate loggings from any of our readers, whether on HF, VHF or UHF. If you would like to report, send your logs to the email address listed in the column header. Please try to follow the format you see here and we will include them in an upcoming issue.

HF

5598: USB 0210Z REACH 201 (C-17A/62nd AW, McChord AFB, WA) wkg Santa Maria Radio with a position report of 39N 040W at fl 320 w/ a EP-QS SELCAL check. (DB, ONT)

0215Z BLUE 93 (KC-135R/22nd AW, McConnell AFB, KA) wkg Santa Maria Radio with a position of 43N 030W at fl 410. (DB, ONT)

0246Z BLUE 13 (KC-135R/92nd AW, Fairchild AFB, WA) wkg Santa Maria Radio with a position of 44N 040W at fl 410. (DB, ONT)

5616: USB 2244Z CONVOY 4610 (C-130T/"Condors," VR 64, NAS Willow Grove, PA) wkg Gander Radio with a position of 40N 050W. (DB, ONT)

2245Z REACH 4062 (C-5B/436th AW, Dover AFB, DE) wkg Gander Radio with a position of 52N 030W and fl 360. (DB, ONT)

6622: USB 1333Z REACH 3124 (C-

17A/436th AW, Dover AFB, Delaware) wkg Gander Radio with a full position report and SELCAL check. (DB, ONT)

1553Z HOOK 47 (C-40C/1st AS, Andrews AFB, Maryland) wkg Gander Radio with a full position report. (DB, ONT)

1601Z RAMA 61 (B-1B/28th BW, Ellsworth AFB, SD) wkg Gander Radio with a position of 57N 040W and fl block 210-220. (DB, ONT)

1756Z REACH 531 (C-5B/60th AW, Travis AFB, CA) wkg Gander Radio with a position report. Flight instructed to contact Santa Maria for its next report at 1756Z. (DB, ONT)

6761: USB 1516Z BACKY 41 (KC-135R/77th ARS, Seymour Johnson AFB, NC) making a general call for a HF radio check with no response. (DB, ONT)

1652Z ETHYL 28 (KC-135R or KC-10A) repeatedly calling RAMA 42 (B-1B/28th BW, Ellsworth AFB, ND) with no response. (DB, ONT)

8831: USB 1236Z REACH 689 (KC-135R/108th ARS, IL-ANG) wkg Gander Radio with a position of 54N 030W at fl 380. (DB, ONT)

1416Z REACH 891 (C-17A/437th AW, Charleston AFB, SC) wkg Gander Radio with a position of 60N 040W and fl 340. (DB, ONT)

1516Z CONVOY 9764 (C-9B/"Taskmasters," VR-52, Willow Grove, PA) wkg Gander radio and receiving ATC clearance to climb to fl 360. (DB, ONT)

1542Z CANFORCE 2608 (CC-144/8 WING, 412 SQN, CFB Trenton, Ontario) wkg Gander Radio and receiving clearance to climb to fl 360. (DB, ONT)

1546Z CONVOY 4662 (C-40A/"Lonestar Express," VR-59, NAS Fort Worth, TX) wkg Gander Radio with a revised position. (DB, ONT)

1631Z ASCOT 2304 (Tristar KC1/216th

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SQN, RAF Brize Norton, UK) wkg Gander Radio with a full position report. (DB, ONT)

8864: USB 1211Z MOTOWN 4 (KC-135R/191st ARG, 171st ARS, Selfridge ANGB, MI-ANG) wkg Gander Radio with a position of 59N 040W and fl 360. Position data relayed to HILDA. (DB, ONT)

1300Z SPAR 18 (C-40C/932nd AW, Scott AFB, IL) wkg Gander Radio with a full position report and fl 380. (DB, ONT)

1305Z RAZZ 33 (E-6B/VQ-4, Tinker AFB, OK) wkg Gander Radio with a position of 52N 030W and fl 340. (DB, ONT)

1310Z GHOST 53 (C-20G/VMR-1, MCAS Cherry Point, NC) wkg Gander Radio and reporting a position of "crono" and fl 400. (DB, ONT)

1631Z HARD 41 (C-17A/62nd AW, McChord AFB WA) wkg Gander Radio with a position of 48N 050W and fl 310. (DB, ONT)

1910Z DUCE 11 (B-52H/2nd BW, Barksdale AFB, LA) wkg Gander Radio and receiving instructions to contact Shanwick Radio on 2899 kHz. (DB, ONT)

2013Z CANFORCE 4168 (CC-150/8 WING, 437 SQN, CFB Trenton, Ontario) wkg Gander Radio with a position of 61N 040W and fl 370. (DB, ONT)

8879: USB 2038Z IAF 001 (VC-707/120 SQN, IAF Tel Aviv-Ben Gurion IAP) wkg Gander Radio with a position of 54N 030W and fl 360 at 2038Z. [Flight probably carry-

Listening In On Hill Air Force Base

388th Fighter Wing	TAIL CODE	COLOR	381.300	ACC (RAYMOND 23)
4th FS - "Fighting' Fuujins"	HL	Yellow	397.900	ATIS
34th FS - "Rude Rams"	HL	Red		
421st FS - "Black Widows"	HL	Black		
419th Fighter Wing				SYSTEM: Utah Military
466th FS - "Diamondbacks"	HI	Black/Yellow		TYPE: Motorola Type II SmartZone
				SYSTEM VOICE: Analog and APCO-25 Common Air Interface
				SYS ID: 6627
				CONNECT TONE: 116.3
Hill Air Force Base - KHIF				
Aeronautical Frequencies				
32.8500	388th FW Training			
118.450	UTAH TEST AND TRAINING RANGE NORTH 1			
121.100	SALT LAKE CITY APPROACH/DEPARTURE			
121.600	HILL GROUND			
124.100	CLEARANCE DELIVERY			
127.150	HILL TOWER			
134.100	UTAH TEST AND TRAINING RANGE SOUTH 1			
134.925	ATIS			
138.025	4th FS AIR TACTICAL			
138.100	4TH FS AIR TACTICAL			
138.200	4th FS AIR TACTICAL			
138.250	4th FS AIR TACTICAL			
138.375	421ST FS AIR TACTICAL			
138.425	421ST FS AIR TACTICAL			
138.500	421ST FS AIR TACTICAL			
138.525	34TH FS AIR TACTICAL			
138.600	RANGE CONTROL			
138.725	SUPERVISOR OF FLYING			
138.875	34TH FS AIR TACTICAL			
139.225	34TH FS AIR TACTICAL			
139.300	PILOT TO DISPATCHER			
139.800	34TH FS AIR TACTICAL			
139.900	34TH FS AIR TACTICAL			
140.125	34TH FS AIR TACTICAL			
142.550	34TH FS AIR TACTICAL			
143.750	AIR TO GROUND			
226.000	UTAH TEST AND TRAINING RANGE			
229.200	UTAH TEST AND TRAINING RANGE			
233.400	CLOVER CONTROL			
238.900	AR-642B PRIMARY			
243.800	UANG Operations			
251.050	HILL TOWER			
252.100	AFRES COMMAND POST			
254.600	AERIAL REFUELING			
263.150	HILL TOWER			
266.050	PEACEKEEPER MAINTENANCE AND TESTING			
275.800	HILL GROUND			
282.375	UTAH TEST AND TRAINING RANGE NORTH 2			
283.900	AR-642A PRIMARY			
285.650	UTAH TEST AND TRAINING RANGE NORTH 3			
289.600	HILL TOWER			
305.500	AR-642 ENTRY			
307.200	SLC APPROACH			
311.000	ACC COMMAND POST PRIMARY			
316.050	UTAH TEST AND TRAINING RANGE SOUTH 2			
316.700	SLC APPROACH			
317.800	4TH FS COMMAND POST			
321.000	ACC COMMAND POST SECONDARY			
324.700	TOC WILDCAT BOMB RANGE CONTROL			
335.800	CLEARANCE DELIVERY			
342.300	METRO (WX)			
354.575	SUPERVISOR OF FLYING			
363.150	AR-642A/B EXIT			
363.500	UTAH TEST AND TRAINING RANGE SOUTH 3			
371.950	PILOT TO DISPATCHER			
374.300	AR-642 BOOM REFUELING			
				FREQUENCIES:
				Site 001 Hill Air Force Base:
			406.56250	406.96250
			408.16250	408.56250
			409.76250	410.16250c
				Site 002 Utah Test and Training Range South:
			406.76250c	407.16250
			407.96250	408.36250
				Site 003 Utah Test and Training Range North:
			408.76250	409.16250a
			409.96250a	410.36250c
				Site 004 Salt Lake City Federal Building:
			406.76250	407.16250
			407.96250a	408.36250c
				SET UP:
				BASE: 406.150
				STEP: 12.5 kHz
				OFFSET: 380
				TALKGROUP USE
			2160	HAFB RAVEN unknown range operations
			2560	HAFB Fire Dispatch (unused)
			8000	HAFB ECHO Roving Forklifts
			8016	AGE Aerospace Ground Equipment
			8032	Flight Test and Paint
			8048	ECHO Aircraft Tow Teams
			8640	388th FW Announce
			8656	388th FW Fuel Maintenance Team
			8672	SKULL 4th FS/388th FW
			8688	SPIDER 421st FS/388th FW
			8704	388th FW Sheet Metal Shop
			8720	388th FW Maintenance Operations Center
			8752	FALCON Operations Center
			8768	ZULU Operations Center
			8800	START Escort Russian Treaty Inspectors
			8960	EAGLE Operations Center
			9024	Patch 6
			9280	Civil Engineering
			9296	Snow Equipment Maintenance
			9312	Pest Control and Prevention
			9440	EOD Administration
			9456	EOD Range Explosive Ordnance Disposal
			9472	Explosive Ordnance Disposal Base
			9600	Police/Security 1
			9616	Police/Security 2
			9632	Police/Security Training
			9696	Fire Dispatch
			9760	Snow Removal
			9776	Hill Ground Control
			9792	Hill Alert
			10080	Bio Environmental
			10096	Medical Net 1
			10112	Medical Net 2

TALKGROUP	USE	TALKGROUP	USE
10128	Medical Command Center	11936	419th FW DEFENDER war games
10208	OSI	11952	419th FW MASH war games
10400	LOAD Team (for Mobility)	11984	419th FW EQUIPMENT war games
10416	MOBILITY (Rapid Deployment Team)	12064	POL Trucks
10720	Fire Crash Crew	12080	POL Trucks
10736	Fire Tactical	12160	Command Post
10784	Fire Hazmat	12352	Hill Land Mobile Radio
10800	Fire Structure	12368	Museum Security
10816	Fire Alarm Maintenance	12512	CLOVER Control
10832	Fire Training	12800	WIZARD Comm Center
10848	Bird Air Strike Hazard	12816	Marines (visiting squadrons)
10880	Base Transportation - Taxis	12832	Plating Shop
10928	Troop Buses	12960	Inspector General
11040	Telecom - Cable	12976	Base Operations Readiness Training Area 1
11056	Telecom - Fiber Optics	12992	Base Operations Readiness Training Area 2
11072	Telecom - Radio	13008	Readiness Ammunition
11088	Meteorological and Navigational	14400	Visiting Squadron 1
11120	Munitions Processing	14416	Visiting Squadron 2
11296	Eagle Range Maintenance North	14432	Visiting Squadron 3
11312	Eagle Range Maintenance South	14448	Visiting Squadron 4
11344	Eagle Range Operations South	14464	Visiting Squadron 5
11376	Eagle Range "Badger"	30096	UANG Base Security (Kilo Units)
11424	Eagle Range "Power"	30144	UANG FD/EMS Dispatch(Blue Units)
11456	Eagle Range ROMEO ALPHA	30240	UANG Lima Control
11472	Eagle Range ROMEO BRAVO	30272	UANG Maintenance Net
11808	419th FW Operations Net	30336	UANG Fuel Handlers
11824	419th FW VENOM war games	30400	UANG Utah Control (Main Arcft Handling Ch.)
11840	419th FW WEAPONS war games	30560	Federal Protective Service Dispatch
11856	419th FW DIAMOND war games	30576	Federal Protective Service 2
11872	419th FW RAT war games	30592	Federal Protective Service 3
11888	419th FW VIPER war games	48000	EG&G Logistics Contractor (Supply)
11920	419th FW LRC war games		

ing Israeli Government officials to Washington, DC for the inauguration of Barack Obama.] (DB, ONT)

8992: USB 1613Z KING 21 (HC-130H(N)/102nd RQW, NY-ANG) wkg HF-GCS Station ANDREWS with a phone patch to RES-CUE OPERATIONS with flight data passed. (DB, ONT)

1616Z OTIS 28 (KC-130J/VMGR-252, MCAS Cherry Point, NC) wkg HF-GCS Station PUERTO RICO with a phone patch and weather passed for Santa Maria, Azores. (DB, ONT)



A Maxwell B-24 Liberator in flight. (Public domain photo)

1619Z PELICAN 712 (P-3C/"Pelicans," VP-45, NAS Jacksonville, FL) wkg HF-GCS Station PUERTO RICO with a phone patch to FID-DLE. (DB, ONT) (DB, ONT)

11175: USB 1514Z SHARK 47 (C-130H/731st AS, Coronet Oak, PR-ANG) wkg HF-GCS Station PUERTO RICO with a phone patch. Technical difficulties are discussed with a 1710Z ETA passed for Pope AFB. (DB, ONT)

1650Z GASSER 44 (KC-135R/97th AMW, Altus AFB, OK) wkg HF-GCS Station LAJES with a failed phone patch. Flight reported that it was over "the great state of Kansas." (DB, ONT)

1656Z RHODY 32 (C-130J/143rd AS, RI-ANG) wkg HF-GCS Station PUERTO RICO w/ a failed phone patch.

1703Z SHADOW 96 (MC-130P/19th SOS, Hurlburt Field, FL) wkg HF-GCS Station OFFUTT with a HF radio check. (DB, ONT)

1747Z KOO 05 (C-130H/156th AS, 145th AW, NC-ANG) wkg HF-GCS Station ANDREWS with several phone patches. Discussion of a possible engine shutdown. (DB, ONT)

11232: USB 1418Z SENTRY 60 (E-3B AWACS/552nd ACW, Tinker AFB, OK) wkg TRENTON MILITARY with a phone patch to MAINTENANCE. Technical difficulties were discussed. (DB, ONT)

1920Z CANFORCE 3230 (CC-150/8 Wing, 437 SQN, CFB Trenton, Ontario) wkg TRENTON MILITARY with weather and flight data passed. (DB, ONT)

13306: USB 1658Z OTIS 01 (KC-130J/VMGR-252, MCAS, Cherry Point, NC) wkg New York Radio with a position report. (DB, ONT)

VHF/UHF

139.000: AM 1449Z SABER 21 (x4) (178TH FW/306TH Sq RNLAF) air tactical in Buckeye MOA. (MM, OH)

240.350: AM 1452Z ATOMIC 11 (306th Sq RNLAF) wkg BLUE ASH (123rd ACS, OHANG) going direct Buckeye (MOA). (MM, OH)

Seventeen Station Radio Responder Boot Camp

by Gordon West,
WB6NOA
WB6NOA@arrl.net

*"The Drill
Instructor will ask
each station to
perform a specialty
task...For example,
the high-frequency
station is asked to
make a single radio
contact, more than
500 miles away, in
one minute."*

Fall in!...with a platoon of American Red Cross Radio responders, and score some radio training techniques learned at boot camp (**Photo A**). And this is a very special kind of boot camp indeed. The radio responder Boot Camp is an annual training event for radio enthusiasts in southern California. Every kind of radio service gets front and center attention, including:

- Scanner radio
- FRS/GMRS radio systems
- Ham radio and repeaters
- Aeronautical radio and GPS
- Marine radio
- Business radio
- 27 MHz citizen band radio
- Commercial radio and community repeaters

Boot Camp Mission

Radio responders, representing their own emergency response groups, come together for immediate field deployment of their radio specialty service. Their venue is a wide open field or parking lot, clear of any overhead power pole and wire dangers. Incoming radio teams



Photo A. At the radio responder Boot Camp, an annual training event in southern California, every kind of radio service gets front and center attention. (All photos by Susan Roatch, KF6VBO)



Photo B. The ham mobile high-frequency voice station's three-element beam antenna.

approach Boot Camp on an assigned call-in frequency, taking parking instruction directly off the airwaves.

The Boot Camp net control operators will publish check-in frequencies well ahead of the event, on multiple radio systems. Hams might check in on 2 meters simplex, CERT members check in on the Family Radio Service Channel xx, and CB radio operators check in on a specific AM CB channel.

Incoming radio responders are assigned widely spaced parking locations and are instructed to begin their station setup. Each group picks a spe-



Photo C. The portable repeater used for live demos.

cialty for "show and tell." This is how it broke down recently:

Station 1 Ham mobile high frequency voice station, 3 MHz–30 MHz (**Photo B**)

Station 2 MARS high frequency digital station, packet and Winlink

Station 3 Ham Near Vertical Incidence Station high frequency (NVIS)

Station 4 Family Radio Service CERT team radio station

Station 5 Portable repeater live demo station (**Photo C**)

Station 6 Automatic Position Reporting System (APRS) and mapping live demo

Station 7 Mr. Battery portable battery recharge station

Station 8 Soldering station for Anderson connectors and PL-259s

Station 9 Ham IRLP/Echolink demo (**Photo D**)

Station 10 Satellite demo, FM easy satellites

Station 11 Night light team, illumination station

Station 12 Communications vehicle/trailer show and tell (**Photo E**)

Station 13 Ham ATV live demo

Station 14 WiFi demo station

Station 15 Slow Scan Television (SSTV) 2 meter station

Station 16 Quiet generator demo & solar station (**Photo F**)

Station 17 Scanner programming station (**Photo G**)

"Our Orange County chapter of the American Red Cross offers Boot Camp once a year," says Tom Woodard, KI6GOA, Disaster Specialist. "This one day event is a great opportunity to meet our partners in emergency response and preparedness, as well as share information and learn new radio techniques," Woodard adds smiling, knowing the Boot Camp Drill Instructor will likely introduce surprises during this one day field operation.

"Everyone arrives, in uniform, by 0800, and at 0900, the training begins!"

says Tom MacKay, W6WC, a MARS radio instructor.

Each participant, working out of his or her assigned field position, will have 10 minutes on a portable PA system to describe their specialty operation. All the other "troops" gather around, and watch this 10-minute live-radio demo.

Then the one-minute Field Test fun begins: The Drill Instructor will ask each station to perform a specialty task. No one knows in advance the nature of the specific specialty task. For example, the high-frequency station is asked to make a single radio contact, more than 500 miles away, in one minute.

The Solar Panel station must light a 12 volts incandescent bulb.

The 2 meter ham station gets 60 seconds to switch to an out-of-area 2 meter repeater channel, encoding CTCSS or DTS.

Mr. Battery is given a deeply discharged ICOM 02AT battery, needing a fast field recharge.

Next is a simulated shelter station operating 25 watts into a white fiberglass dual-band antenna, 30 feet away. The Boot Camp Drill Instructor whips out his camping ax, and the coax cable is completely severed. Can the same shelter team accomplish a no solder "hard splice" within 60 seconds before transmitting again?

The scanner team is giving a nice show-and-tell of trunk tracking the local fire department. The Boot Camp DI requests that they switch out of trunk tracking, and dial in the marine band



Photo D. The ham IRLP/Echolink demo at Station 9.



Photo E. Inside the communications vehicle/trailer show and tell station.

weather channel on 162.400 MHz, again, within 60 seconds.

"The ATV gang was seen smiling over the 30-foot path between transmitter and ATV picture decode. Their Boot Camp task, in 60 seconds or less, was to videotape the contents of a trash can 50 yards away, then run back to the transmitter, and play the recording on the air. Some huffing and puffing after that one!" says Larry Wilson, K6SCH.

Next, a steady carrier on the talk-in frequency, on purpose. Who would be first to discover the stuck microphone? (Hint: tapping on a tin can, while listening to the signal, allowed the finders to walk right up to the stuck microphone!)

Another Boot Camp challenge was to sort out 10 coaxial cable BNC connections to find the only one leading to a live antenna. Some operators were fishing for their SWR analyzers, yet others were attempting to measure antenna impedance with a simple ohm meter. In less than 45 seconds, one enterprising teenage ham dialed in his scanner to a local weather channel, and then quickly tried each of the 10 coax leads until he found the only one where the weather channel boomed in. Success!

After all the stations finish their 10-minute demo plus one minute Boot Camp challenge, we take an hour off for lunch, and then begin the "close haul inspection"



Photo F. The quiet generator demo and solar station.

for operators to mingle at different stations of their choice and get some personal one-on-one training from the experts.

At the end of the day, those stations, and those inquisitive operators remaining would likely be the ones you would want on your next real call down. Those who arrive late and pack up early either have things down cold, or may not fare well under pressure, and might be held in reserve during a call down.

Awards are issued to the remaining participants by the American Red Cross in the form of color graduation certificates. These become cherished, because only those who stay until the end are given the final "separation papers."

More Boot Camps for radio responders will turn out better radio operators in the field when the "Big One" hits. Consider a Boot Camp for your radio team soon.



Photo G. The scanner programming station.

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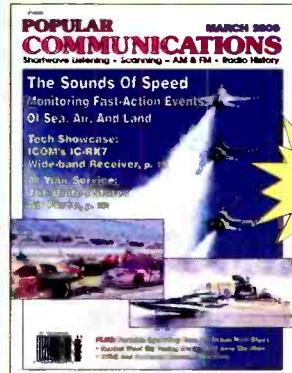
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by Bill Price, N3AVY
chrodoc@gmail.com

"When I dropped him off that night, he told me to wait a minute. He checked, and no one was home. He took me to the yard to see "the Stalag."

Okay, so Norm's not really a twin, but it's like when my smarter brother, Mycroft Price, surfaced several years ago to talk me out of a lackluster future as a private investigator. This time Beezer (of course not his real name) has surfaced after all these incognito years since he worked with Norm and me at *that place which must remain un-named*. And as much as Beezer is nothing at all like Norm, there are some profound similarities—so much so that it's like having an extra Norm around.

Beezer's job (which I shall also cleverly disguise) sends him all over the country fixing and maintaining techie stuff, so when he was near Cowfield County, he called, and we gabbed the night away reminiscing of past lunacy and catching up on things that have happened since many years ago. He's another one who's beating on me to get back on the air, although at least he wants me to get on so we can pound brass together, whereas Norm has always wanted me to compromise my principles and speak into a microphone.

Beezer watched as I was fired from *that place which must remain un-named*, which sure put a damper on our carrying-on, but we did stay in touch until I moved to Cowfield County to take my HPJIE*. He, too, drifted around a bit until he latched onto something similar (but his gig takes him traveling around the country), and it turns out that he and Norm now live within a few hours of each other. I'm sure it's just a matter of time until some outlandish antenna projects will be undertaken *without me there to supervise!*

I do get the feeling, though, that I'm going to have to string some sort of antenna and blow the dust off the rig that Norm brought for me. No microphone, though. I've got my principles. I can see it now...I'll start sneaking on to some of the CW frequencies and all of a sudden the Internet will come alive with stalkers! Tens, or maybe even *twenties* of loyal readers longing for the elusive N3AVY QSL card will cause an enormous pile-up lasting all of three or four minutes. Joe Maurus will have his grandson helping shoot a longwire over a tree in Idaho with a trusty slingshot so he can get onto HF. I may single-handedly put a spike in the amateur radio economy, all because Beezer wants someone to pound brass with. Whooda thunk it?

As we talked into the night, Beezer reminded me of one of the many reasons I became persona non grata at *that place which must remain un-named*. I'd forgotten about the time he, Norm, and I were in Dayton, riding in a rented car with the CEO of *that place* when we happened past an enormous billboard touting an (to me) overpriced brand of plastic wristwatch that people with

too much money seemed to be buying. I believe it was Norm who saw the billboard and asked, "What's a (insert brand name of overpriced plastic wristwatch here)?"

Before anyone else in the car had a chance to answer, I volunteered, "Oh, it's some overpriced piece of *#&@! plastic wristwatch that's worth about a dime and sells for thirty dollars!" at which time our CEO raised his wrist from the steering wheel and showed his, and said, "Like this one!"

Rather than be put squarely into my place, I went for the laugh, immediately chiming in, "Although some of them are very fine indeed!" as the boss made a mental note to fire me as soon as we got back to the office.

And so it went. For a while, I picked up Beezer on the way to work each day, since I passed the place he stayed. He had gotten a room in a very nice old home owned by a retired couple who seemed quite normal when he took the room.

Each morning, Beezer would get into the car and we'd ride off, with him laughing so much he couldn't talk. Eventually, he'd tell me about his landlord's latest escapade, usually with the little woodland critters that inhabited his yard.

He fed birds. Not all birds, mind you, but *certain* birds. Absolutely no pigeons. When Beezer told me about the extent of his efforts to keep the pudgy perpetrators away from his feeders, I really thought he was exaggerating. When I dropped him off that night, he told me to wait a minute. He checked, and no one was home. He took me to the yard to see "the Stalag."

The man had not just strung barbed wire around his feeder—with small enough openings to let his friends, the *smaller* birds, in for their daily seed ration. No, he had strung *razor wire*—just like they use around prisons—to keep the pigeons away. He arrived while Beezer was showing me this fortress.

"Y'like my feeder?" he asked. "That oughtta keep the fat @#*&^\$% away!"

Beezer and I both said "yup" and got away and around the corner before we started guffawing. I always enjoyed a good guffaw, and Beezer's landlord gave plenty of fodder for that. Perhaps in a future column I might relate how he drove a station wagon filled with squirrels across the river every weekend—until he found they were finding their way back—we could only assume they liked riding in the car.

Norm's coming up in a month or so for a quick visit. Hope for something newsworthy to happen.

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SR2000A Color Frequency Monitor

The SR2000A is an ultra-fast spectrum display monitor that lets you SEE received signals in FULL color.

Using the power of FFT (Fast Fourier Transform) algorithms with a sensitive receiver covering 25MHz ~ 3GHz*, the SR2000A features a color monitor that displays up to 40MHz spectrum bandwidth**, a switchable time-lapse "waterfall" display or live video in NTSC or PAL formats.

Ultra sensitive, incredibly fast, yet easy to use with a high quality internal speaker for crisp, clean audio signals. Scans 10MHz in as little as 0.2 seconds! Instantly detects, captures and displays transmitted signals. PC control through RS232C serial port or USB interface. With 12 VDC input, it's perfect for base, mobile or field use.



AR8200MkIII Handheld Receiver

From inter-agency coordination to surveillance, you can't know too much. The world-class AR8200MkIII portable receiver features a TXCO that delivers solid frequency stability and performance not found in most desktop units. With 1,000 alphanumeric memory channels, it covers 500 KHz ~ 3GHz*. Improved RF circuits combine greater sensitivity, resistance to intermod and enhanced Signal to Noise ratio. It offers increased audio frequency response and includes NiMH AA batteries that can be charged while the unit is in use.

Optional internal slot cards expand the AR8200MkIII's capabilities. Choose from Memory Expansion (up to 4,000 memories), CTCSS Squelch and Search, and Tone Eliminator.

The AR8200MkIII offers "all mode" reception that includes "super narrow" FM plus wide and narrow FM in addition to USB, LSB, CW and standard AM and FM modes. It also features true carrier reinsertion in USB and LSB modes and includes a 3KHz SSB filter. The data port can be used for computer control, memory configuration and transfer, cloning or tape recording output.

A special government version, AR8200MkIII IR features infra-red illumination (IR) of the display and operating keys. The IR illumination function is selectable, allowing operation by users wearing night vision apparatus without removing goggles and waiting for the eyes to re-adjust. Ideal for military, law enforcement and surveillance operators.



Authority on Radio
Communications

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* Government version, cellular blocked for US consumer version.

**No audio is available when the frequency span is set to 20MHz or 40MHz.
Specifications subject to change without notice or obligation.

**SEE more and HEAR
more with AOR, the
serious choice in
Advanced Technology
Receivers™.**

Take your hobby with you!



At the Track

IC-RX7 Stylish Scanner with Smart Interface

Sleek, fast, and able to hit the track even during a rainstorm, the 'RX7' is Icom's first receiver to achieve the IPX4 water resistant rating. Besides its sleek and aerodynamic design, it's what's under the hood that will really put you in the race – power and performance!



On Top of the World

IC-R5 Sport Wideband Receiver

Stay one step ahead and enjoy Mother Nature with the built-in weather radio function of the IC-R5 Sport. Made to fit in your pocket, this radio will keep you informed and give you hours of operation!



Stay on Task

IC-R20 The Pro's Scanner

Until the 'R20', the capability of monitoring two frequencies required two radios. Not anymore! There's plenty of features to tweak to your listening pleasure, and a built-in recorder (up to 4 hours) too! Monitor local public safety, listen to air traffic control, catch the play-by-play from both the local TV and radio station – and much more!

