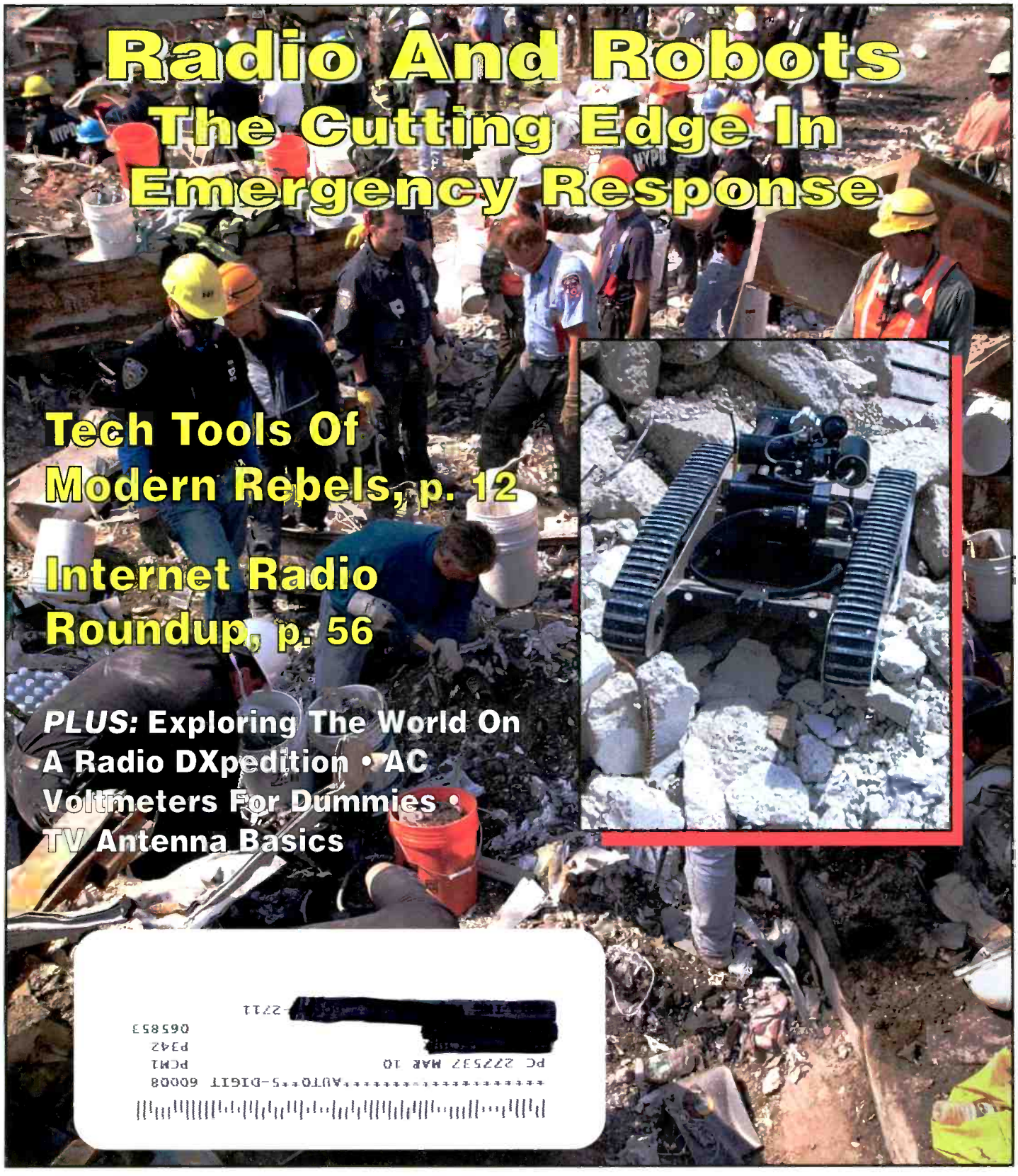
POPULAR COMMUNICATIONS

NOVEMBER 2009

Shortwave Listening • Scanning • AM & FM • Radio History

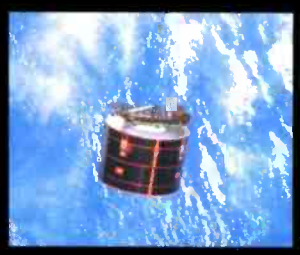


Radio And Robots

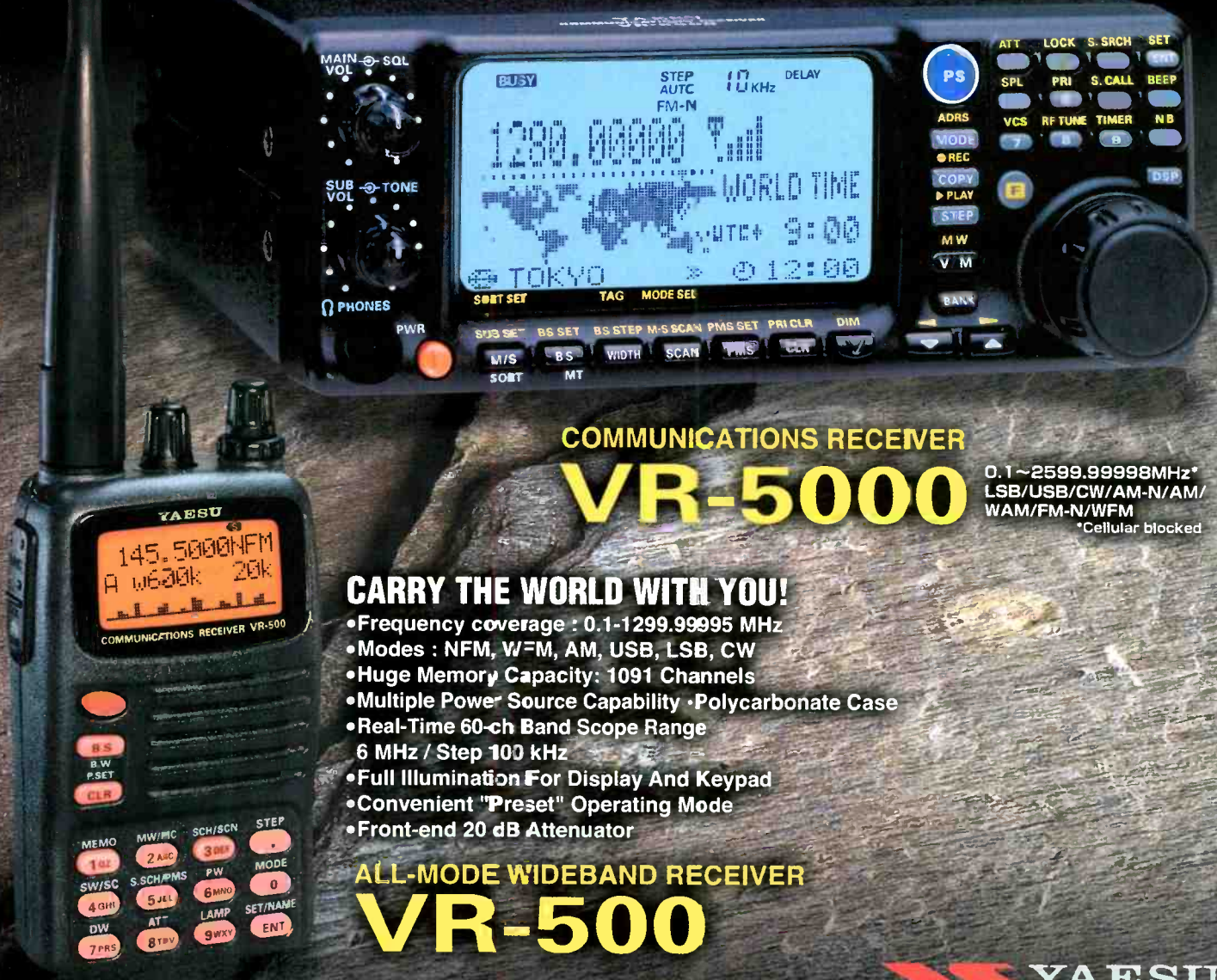
The Cutting Edge In Emergency Response

THE PROFESSIONAL STANDARD






- Continuous Frequency Coverage: 100 kHz ~ 2.6 GHz / LSB, USB, CW, AM-Narrow, AM, Wide AM, FM-Narrow, and Wide FM (cellular frequencies are blocked)
- 2000 Memory Channels / 100 Memory Groups
- Dual Receive
- Digital Signal Processing / Bandpass Filter,Noise Reduction, Notch Filter, Narrow CW Peak Filter (Optional DSP-1 requires)
- Real-Time Spectrum Scope
- World Clock with UTC/Local Settings
- Preset Shortwave Broadcast Station Memory Bank
- Extensive Scanning Capability/Smart Search™



COMMUNICATIONS RECEIVER
VR-5000

0.1~2599.99998MHz*
LSB/USB/CW/AM-N/AM/
WAM/FM-N/WFM
*Cellular blocked

CARRY THE WORLD WITH YOU!

- Frequency coverage : 0.1-1299.99995 MHz
- Modes : NFM, WFM, AM, USB, LSB, CW
- Huge Memory Capacity: 1091 Channels
- Multiple Power Source Capability ·Polycarbonate Case
- Real-Time 60-ch Band Scope Range 6 MHz / Step 100 kHz
- Full Illumination For Display And Keypad
- Convenient "Preset" Operating Mode
- Front-end 20 dB Attenuator

ALL-MODE WIDEBAND RECEIVER
VR-500

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http://www.vertexstandard.com

Specifications subject to change without notice. Some accessories and/or options may be standard in certain areas. Frequency coverage may differ in some countries. Check with your local Yaesu Dealer for specific details.

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GRUNDIG G4000A SUPER SPECIAL

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

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

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

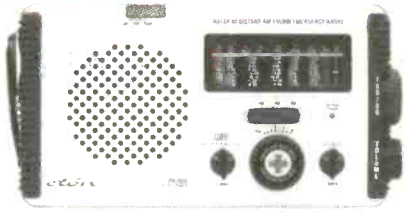
AN200 and FR350 are also sold separately.

GRUNDIG G4000A

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

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

etón FR350



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

FR350 White	*Order #1350*	**$58.98**
FR350 Blue	*Order #4912*	**$58.98**
FR350 Red	*Order #4909*	**$58.98**
FR350 Black	*Order #4910*	**$58.98**
FR350 Orange	*Order #4911*	**$58.98**
FR350 Camo.	*Order #4913*	**$58.98**

GRUNDIG Satellit 750

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

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

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

GRUNDIG AN200

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

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

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6830 Americana Pkwy.
Reynoldsburg, Ohio
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VOLUME 28, NUMBER 3

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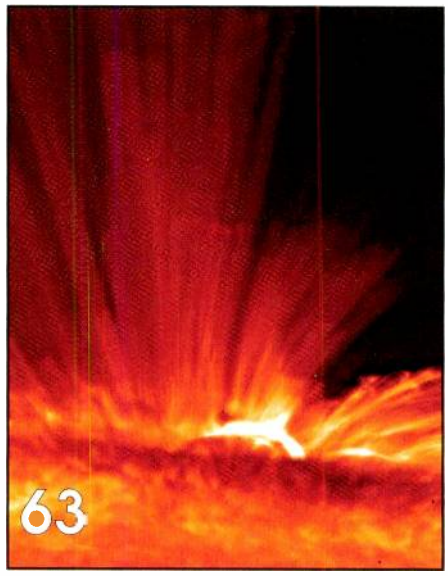


FEATURES

FEATURED COLUMNS

ON THE COVER

Innovators in the field of radio-controlled robotics are creating powerful new tools to stand in for human responders in dangerous situation-slike search and rescue, including the first known use of S&R robots: the aftermath of the World Trade Center disaster of 9/11. See "Robots. Radios, And Rescue," by Don Rotolo, N2IRZ, starting on page 20, for more. (Cover Photo: A "bucket brigade" at the site of the World Trade Center clears debris to search for survivors after the 9/11 attacks, U.S. Navy photo by Photographer's Mate 2nd Class Jim Watson; Inset: Mesa Robotics' Matilda II Search and Rescue Robot, courtesy Mesa Robotics)

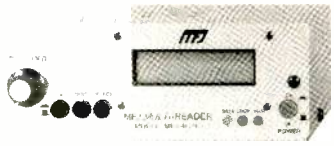
COLUMNS

DEPARTMENTS

Tap into secret Shortwave Signals

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

MFJ-462B **$199.95**



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

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

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

Eavesdrop on the World

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

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

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

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

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

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

High Performance Modem

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

Easy to use, tune and read

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

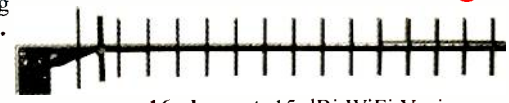
It's easy to tune -- a precision tuning indicator makes tuning your receiver easy for best copy.

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

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

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

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



MFJ-1800 **$29.95**

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

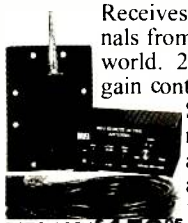
N-female connector. Tripod screw-mount. Wall and desk/shelf mounts. Use vertically/horizontally. 18Wx2¾Hx1¼D inches. 2.9 ounces.

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

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

Super Active Antenna

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



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

MFJ-1024 **$159.95**

Indoor Active Antenna

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

MFJ-1020C **$99.95**

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

Compact Active Antenna

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

MFJ-1022 **$69.95**

Eliminate power line noise!

MFJ-1026 **$199.95**

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

MFJ Antenna Matcher

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

MFJ-959C **$119.95**

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

High-Gain Preselector

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

MFJ-1045C **$89.95**

Dual Tunable Audio Filter

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

MFJ-752C **$119.95**

MFJ Shortwave Headphones

MFJ-392B **$24.95**

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

High-Q Passive Preselector

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

MFJ-956 **$69.95**

Super Passive Preselector

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

MFJ-1046 **$119.95**

MFJ Shortwave Speaker

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

MFJ-281 **$12.95**

MFJ All Band Doublet

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

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

MFJ Antenna Switches

MFJ-1704 **$79.95**

MFJ-1702C **$39.95**

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

Morse Code Reader

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

MFJ-461 **$89.95**

MFJ 24/12 Hour Station Clock

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

Dealer/Catalog/Manuals

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EDITORIAL STAFF

Edith Lennon, N2ZRW, Editor
(E-mail: editor@popular-communications.com)
Richard S. Moseson, W2VU, Editorial Director
(E-mail: w2vu@popular-communications.com)

CONTRIBUTING EDITORS

Peter J. Bertini, K1ZJH, Restoration/Electronics
Kent Britain, WA5VJB, Antennas And Accessories
Bruce A. Conti, AM/FM Broadcasts
Rob de Santos, Trends In Technology
Gerry L. Dexter, Shortwave Broadcast
Richard Fisher KI6SN, Capitol Hill News
Mitch Gill, NA7US, Homeland Security
Tomas Hood, NW7US, Propagation
Shannon Huniwell, Classic Radio
John Kasupski, KC2HMZ, UtilityComm/EmComm
Kirk Kleinschmidt, NTØZ, Amateur Radio
Mark Meece, N8ICW, Military Monitoring
D. Prabakaran, News
Bill Price, N3AVY, Humor/Communications
Ken Reiss, Technical/Scanning
Dan Srebnick, K2DLS, Computers And Radio
Bob Sturtevant, AD7IL, Puzzles And Trivia
Tom Swisher, WA8PYR, Civil Aviation
Jason Togyer, KB3CNM, Cartoons
Gordon West, WB6NOA, General Radio Comm.

BUSINESS STAFF

Richard A. Ross, K2MGA, Publisher
Arnold Sposato,N2IQO, Advertising Manager
Emily Leary, Sales Coordinator
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Doris Watts, Accounting Department

CIRCULATION STAFF

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Cheryl DiLorenzo, Customer Service Manager
Ann Marie Auer, Customer Service

PRODUCTION STAFF

Elizabeth Ryan, Art Director
Barbara McGowan, Associate Art Director
Dorothy Kehrwieder, Production Director
Emily Leary, Production Manager/Webmaster
Hal Keith, Technical Illustrator
Larry Mulvehill, WB2ZPI, Photographer

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

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EDITORIAL
Tuning In

It's A Small World After All... But Just How Small Can It Get?

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

A wise man once said, "There are 10 kinds of people in the world: those who understand binary and those who don't." And to understand binary you must understand transistors, the nifty components that are the on/off switches—the 1s and 0s in the binary language—that make computing possible. It stands to reason that if you want to make a better computer, you first have to make a better transistor. For decades now, better has, in part, meant smaller. But are we close to reaching the actual physical limits of how small we can make, and how densely we can pack, transistors? Have we, in the words of Oscar Hammerstein, "gone about as fer as we can go"?

Since the mid-1950s when transistors were introduced, scientists and engineers have been making smaller transistors more or less following Moore's Law (named after Gordon Moore, the co-founder of Intel, from his seminal 1965 article in *Electronics*), which states that transistor density will double every two years. But at a recent conference held at Stanford University on the future of scaling, experts expressed their belief that the end is indeed nigh. An article in the *New York Times* by John Markoff also maintained that many computer scientists today believe that "...the shrinking of the transistor has approached fundamental physical limits." So, the question now is, what's next?

What a short, strange trip it's been for this cultural catalyst. First developed at Bell Labs in the late 1940s the early transistor was about the size of your hand. By 1954 the first transistor radio, the Regency TR1, was already being marketed by Texas Instruments. This five-inch-tall radio comprised a grand total of four transistors and gave us real mobility for the first time. The original Intel microprocessor (Intel 4004), introduced in 1971, had 2,300 transistors; the 1993 Intel Pentium chip contained 3,100,000 transistors, and the yet-to-be-released 8-Core Xeon Nehalem-EX chip will pack the equivalent of 2.3 billion (2,300,000,000) transistors.

Not only has the number of transistors risen dramatically, the real estate they occupy has become vastly smaller. A typical Intel Core 2 chip (820 million transistors) is approximately 100 sq. mm, and the transistors on this silicon chip are separated by 45 nanometers. (To help you wrap your head around that, by way of comparison the period at the end of this sentence is 500,000 nanometers in diameter.) The manufacturing techniques used to produce such transistors sound like yesterday's science fiction, and involve scraping away individual molecules. As the *Times* article stated, "Increasingly, transistor manufacturers grapple with subatomic effects, like the tendency for electrons to 'leak' across material boundaries."

For most of us, this simply translates into smaller, more portable devices that are more powerful while requiring less power. It also means that they wind up in the hands of ever more people and serve in ever more applications, as you'll see in both of this month's feature articles. But for scientists, the earlier question remains, what's next? What if we've reached the end of "small"?

"...sooner or later, new materials and new manufacturing processes will be necessary to keep making computer technology ever cheaper," the *Times* report continued. "In the long term, new switches might be based on magnetic, quantum or even nanomechanical switching principles. One possibility would be to use changes in the spin of an individual electron to represent a 1 or a 0."

Technological changes drive cultural changes. The transistor radio, like that humble Regency TR1, arguably provided the fuel for the Rock 'n' Roll explosion in the mid-50s; the cell phone and digital camera have made "citizen journalists" of their owners. When the next hurdles in transistor scaling are overcome—when computing power is etched in argon?—what will the transistor look like, what will our world look like?

SEE More and HEAR More!

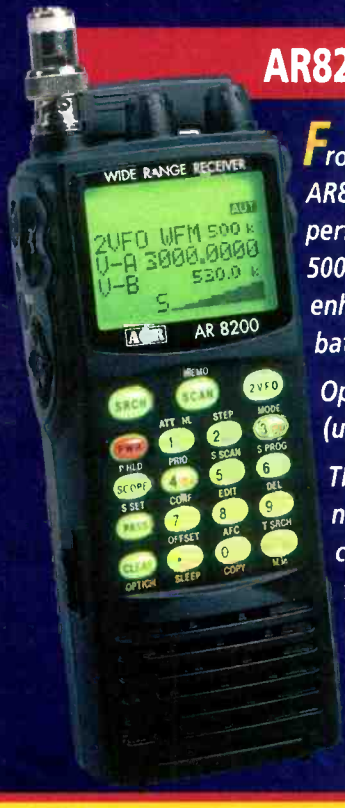
With the SR2000A and AR8200MkIII from AOR

SR2000A Color Frequency Monitor

The SR200CA 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.

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Authority on Radio Communications

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The Weirder Side Of Wireless

by Staff

With Mumbled Directions Home

If, like a rolling stone, you find yourself skittering clueless down an unknown road, it just may be because Bob Dylan is guiding you home. According to a report in the *Washington Post*, among other sources, Dylan said on his BBC satellite radio program, Theme Time Radio Hour, that two carmakers have expressed an interest in borrowing (I guess "renting" is a better choice) the famous raspy-mumbly voice. Rumor has it he's negotiating with two car manufacturers to be the voice of their in-car navigation systems.

Personally, I've always only been able to understand about every third word of the once-counterculture figure, and am not sure I'd want to put in the effort required to decipher his instructions for high-speed merging. Dylan didn't put such anxiety to rest by giving a teaser of his guiding ability on his radio show, previewing his would-be GPS vocals with, "Left at the next street. No, right. You know what? Just go straight." Subsequent reports from a number of sources have said that Dylan meant it as a joke. We'll see. Be on the lookout for cars having trouble with high-speed merges.

Madonna Needs To Watch Her Language

A Bulgarian radio station was fined for running a pre-recorded message from Madonna, inviting fans to her concert in Sofia, Bulgaria's capital. The problem was not with her music, clothing, or controversial projects and behavior, but that she used English to record the message. Bulgaria's Council for Electronic Media slapped Darik Radio with a large fine for airing Madonna's English invitation, according to the Bulgarian daily, 24 Chasa and The Sofia Echo website. Apparently chapter 12 article 1 of the Radio and Television Act states that all advertisements in foreign languages are forbidden, so the commission ordered Darik Radio to pay a penalty in the range of 2000 to 15000 leva (approximately US $1,445–10,838). A repeat of the offending broadcast would have doubled the fine. The 10-second message from Madonna to her fans in Bulgaria said: "Hello Bulgaria, this is Madonna and I expect to see you at the August 29 show in Sofia in Vassil Levsli Stadium."

The Sofia Echo stated that a spokesperson for Sofia Music Enterprises, the Bulgarian organizers of Madonna's concert, said "this is normal procedure and it is used in all countries. Any time Madonna has a concert in a country, she records a message for her fans, and it is always in English. There is no way that an exception will be made just for us." Konstantin Vulkov, program manager of Darik Radio said the station "apologizes that Madonna is not proficient in Bulgarian," according to The Sofia Echo report.

It's Just eMotion

From the *RFID Journal* comes news that the neutral nation of Switzerland is looking for non-neutral responses from visitors to its Kunstmuseum St. Gallen museum in eastern Switzerland. A recent experiment paired RFID location-sensing technology with wireless biometric sensors to determine how museum visitors emotionally responded to the artwork, according to the *RFID Journal* report. The goal of the experiment, called "eMotion: Mapping Museum Experience," was to see how "the perception of 'art' can be measured." Visitors who volunteered to take part in the experiment, conducted by a team of researchers from the Institute for Research in Art and Design and the University of Applied Science Northwestern Switzerland, were outfitted with a special glove containing an ultra-wideband (UWB) RFID tag that broadcasted the wearer's location four times per second via a 6–8.5 GHz RF signal and also contained sensors that tracked pulse and electrical conductivity of the wearer's skin. The electrical conductivity information was used as a proxy measure for cognitive stimulation, while the heart-rate data served as an indicator of emotional excitement. After making their way through the exhibit, visitors were offered the chance to review results that merged their location and biometric data and were asked whether the recorded response matched their own perceptions, the report stated. Opinions on the accuracy of the data were, not surprisingly, "mixed." Back to the e-drawing board?

San Francisco Pirate The Cat's Meow

Ever marching to their own drummers, officials of the City by the Bay recently honored unlicensed Pirate Cat Radio—a cafe and pirate radio studio that stands proudly in the Mission District—with a certificate praising it for its "trailblazing efforts towards freeing the airwaves from corporate control, providing the community with training in radio broadcast skills, empowering voices ignored by traditional media outlets, and contributing to the advancement of the city's coffee culture through the unique creations of the baristas of the Pirate Cat Radio Café." Supervisor Ross Mirkarimi visited the cafe and radio studio to present a certificate of highest recommendation for outstanding service to San Francisco.

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Bearcat® BCD396T Trunk Tracker IV

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

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

Frequency Coverage:

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

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

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

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

Frequency Coverage:

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

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

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News, Trends, And Short Takes

by D. Prabakaran

RFI Signs Mobile Broadcast Deal For Five U.S. Cities

Radio France International has signed an agreement with mobile phone broadcaster AudioNow to broadcast its French programs on the telephone network, 24 hours a day, in five US cities. Listeners in Boston, Chicago, San Francisco, Miami, and New York will be able to hear RFI on their cellphones by calling the following phone numbers (only local charges will apply): 617-963-1545 (Boston), 312-646-7684 (Chicago), 415-200-0603 (San Francisco), 786-228-5543 (Miami), and in New York City (number not provided at press time).

(Source: RFI)

BBC Russian Launches Online Archive Of Key Historical Radio Moments

The website of the BBC Russian service (bbcrussian.com) launched an archive of significant historical radio programs from the past 45 years. Among the voices featured in the audio archive are Alexander Kerensky, Prime Minister during the 1917 Russian Revolution; Nobel Laureates for Literature Alexander Solzhenitsyn and Joseph Brodsky; one of Russia's great poets Anna Akhmatova; and Stalin's daughter Svetlana Alliluyeva. It also features former British Prime Minister Margaret Thatcher, and former Beatle Paul McCartney, both of whom took part in live phone-ins with audiences in the USSR in the Eighties. The archive can be accessed through the radio page at www.bbcrussian.com

(Source: BBC World Service)

Taliban Launch New Propaganda Mouthpiece In Southern Afghanistan

Taliban insurgents fighting Afghan and international troops based in Afghanistan have established their propaganda mouthpiece in the southern Ghazni province, locals said. The FM transmitter, according to locals, airs programs from 7 p.m. until 9 p.m. (1430–1630 UTC) local time and often broadcasts Taliban anti-government propaganda in Pashtu. It has identified itself as Da Shariat Ghag Radio, or Radio voice of Sharia (Islamic Laws) and has been airing programs on Taliban anti-government activities, according to one local. Da Shariat Ghag Radio was the official mouthpiece of Taliban regime before its collapse in late 2001. Taliban purported spokesman Zabihullah Mujahid told media from an undisclosed location via telephone that militants have established four radio stations in the country.

(Source: Xinhua)

4,500 Thai Radio Stations Register To Go Legal

More than 4,500 community radio stations in Thailand have registered under a National Telecommunications Commission (NTC) scheme to become legal broadcasters, according to *Bangkok Post* report. About 95 percent of the country's community radio stations have signed up for the 300-day trial license. Stations that did not register by the next deadline but continued to operate would be considered illegal. While the commission could not shut down stations that failed to register, it could take action against them for illegal broadcasting. Community stations that have registered under the scheme can broadcast for 300, days but their program content must not incite political unrest and violence, offend the monarchy, or disrupt social morals.

(Source: Asia-Pacific Broadcasting Union)

CRI English Service Now Available On Mobile Telephones

A China Radio International (CRI) English service is now available on Mobile telephone sets all over the world. The service, CRImobile, is accessed by typing http://m.cri.cn. During Beijing Olympics in August 2008, CRImobile, a mobile version of CRIENGLISH.com was put into trial operation, providing Olympic news, exclusive reports, as well as practical travel information on Beijing.

(Source :APP)

Capitol Hill And FCC Actions Affecting Communications

by Richard Fisher, KI6SN

FCC Takes Plunge Into Social Networking And Blogging

In an effort to achieve an "open and participatory process," the Federal Communications Commission took a technological leap in mid-August when it created its identity on the social networking site Twitter and started an Internet blog focusing on the National Broadband Plan.

Twitter allows users to post text-based messages of up to 140 characters displayed on the originator's profile page and delivered to site subscribers. In its infancy, the Commission's Twitter page had already attracted almost 2,000 followers. The site can be found at http://twitter.com/fccdotgov.

The FCC has also started an Internet blog called "Blogband," focusing on the National Broadband Plan. It can be accessed at http://blog.broadband.gov/. "Like our unprecedented two-dozen public workshops and the (scheduled) public hearings, Blogband is part of the FCC's commitment to an open and participatory process," FCC Chairman Julius Genachowski said in Blogband's inaugural posting. The information "will keep people up-to-date about the work the FCC is doing and the progress we're making. But we want it to be a two-way conversation."

Genachowski pointed out that in the Commission's opinion, the "National Broadband Plan is one of the most important initiatives that the FCC has ever undertaken...What better time to start blogging than now?...we need as many people involved as possible."

Comments to the blog are monitored during business hours and reviewed before being posted, the FCC said.

Radio Amateur Vanity Callsign Fees Increased

Amateur radio operators who request callsigns from the FCC's vanity pool are paying $13.40 for the privilege following a rate hike that took effect September 10. In August, the Commission announced it would increase the vanity fee from $12.30 to $13.40—a hike of $1.10. It was the second consecutive year for rate increases in the program.

"The FCC is authorized by the Communications Act of 1934, As Amended, to collect vanity call sign fees to recover the costs associated with that program," according to a news release posted on the Web by the American Radio Relay League. "The vanity call sign regulatory fee is payable not only when applying for a new vanity call sign, but also upon renewing a vanity call sign for a new 10 year term.

"The notice in the August 11, 2009 Federal Register, entitled 'Assessment and Collection of Regulatory Fees for Fiscal Year 2009,' includes regulatory fees; these fees are expected to recover a total of $341,875,000 during FY2009, encompassing all the services the FCC regulates," the ARRL reported.

New Orleans TV Station Allowed To Return To UHF Channel

In the face of ongoing problems with the VHF channel it was assigned in the transition to digital television, New Orleans' WVUE-TV has been authorized to return to the UHF channel it had held prior to its Digital TV switch. According to a report by John Eggerton on *Broadcasting and Cable* magazine's website, "WVUE had requested the change after saying it had received thousands of calls from viewers who said they could not receive the station's digital signal." The station was assigned to VHF Channel 8 in the digital transition, moving from UHF Channel 29.

"The FCC has allowed some stations to boost power," Eggerton wrote, "but in the case of WLS Chicago, even that was not enough to solve the problem, and the FCC [subsequently] also tentatively granted it a move to a UHF channel. WVUE says it does not have that powering-up option since a power boost could cause interference to an adjacent-channel station in Baton Rouge, LA."

Eggerton said the FCC "also allows stations to work out power adjustments among themselves then present them to the commission, but WVUE owner Louisiana Media said that moving to its pre-transition channel would ensure that 'all of the station's former analog and pre-transition digital viewers will once again receive service from the station.'

"The FCC has proposed allowing the move, and [gave] interested parties 25 days to weigh in, just as it has with WLS and other channel moves as it continues what it calls a mop-up operation following the June 12 transition to digital," the report said.

Sunspots Anyone?

by Rob de Santos
commhorizons@gmail.com

"But what if the sunspots don't return? Or at least, they return in such small numbers we never have a normal 'peak' to the solar cycle, then what?"

Back in the early '80s, the singer/songwriter Sting wrote lyrics, "There's a little black spot on the sun today. It's the same old thing as yesterday." Has it been a while since *you* had that experience? For many readers I suspect it's your private kingdom of pain under current solar conditions.

One of the facts of life for every shortwave listener and ham of my generation concerns the sunspot cycle: Once you had any experience in the hobby, you just knew that as sunspots increase, the propagation improves (or changes), and as they wane, reception worsens, and then the cycle repeats. *Except when it doesn't.* Few readers of this magazine will not be aware of how slow the upside of this new solar cycle seems to be.

But what if the sunspots don't return? Or at least, they return in such small numbers we never have a normal "peak" to the solar cycle, then what? The implications for the communications business are significant and not just in a hobby sense. Sunspot levels affect far more than just the reception of Radio Australia in my bedroom. Let's consider just a few of the ways that might change communications:

Satellite lifetimes: Orbits don't decay as quickly when solar activity is lower, and the risk of damage to sensitive electronics is reduced when there are fewer solar storms. This would mean satellites wouldn't have to be replaced as quickly and it would reduce the decay rate of their orbits. This would affect everything from television relays to the lifetime of amateur radio's "OSCAR" satellites.

Weather. This is a big gray area. We know that the sun impacts our terrestrial weather and longer-term climatic conditions. The problem is we don't know just how much. Past periods with low sunspot numbers over decades corresponded to cooler worldwide temperatures. It's hard to say how, when combined with "global warming" this would change communications habits around the globe.

Interest in hobby communications. What would happen to shortwave broadcasting and ham activity if we had decades of poor propagation? Would broadcasters cut back still further? Would the number of hams decline or activity shift to VHF or UHF almost exclusively? What would manufacturers do?

Changes to propagation. Lower solar activity causes changes in the upper atmosphere as well. We don't know if that would permanently extend the propagation conditions typical at the poles farther out and, correspondingly, reduce the region where mid-latitude and tropical propagation is the norm.

Military communications. We're in the era of "networked warfare" where the name of the game is to link every soldier and every military vehicle with every other. Use of HF communications continues, but has declined. It would be reasonable to think it will decline further if HF became more unreliable.

I'm sure there are more, but that's a good start. One thing you can say for certain is that, as communications aficionados, we would be in uncharted territory. If solar activity were to remain low for an extended period, we'd see changes in communications that would be both subtle and long term. Many changes would be the result of our adjustment to the new "norm" of low solar activity and occur without our conscious awareness.

I'm sure your iPod would continue to work and your car radio continue to get the local stations blasting away two channels on either side of their carrier, but DXing as my generation knew it would be something consigned to history. For most people, though, life would go on as usual and they'd be unaware of what is (*or isn't*) taking place on the sun. (Coincidentally, just as I was finishing this article, press reports appeared on a new study suggesting that we're entering an extended period of low sunspot activity, with the possibility of no sunspots after 2015. While this study has yet to be confirmed by other experts, it might just be it is time to take this all a bit more seriously.)

What do you think would change in communications if solar activity remains low? How will you alter your hobby activities? Drop me a line and let me know what you think.

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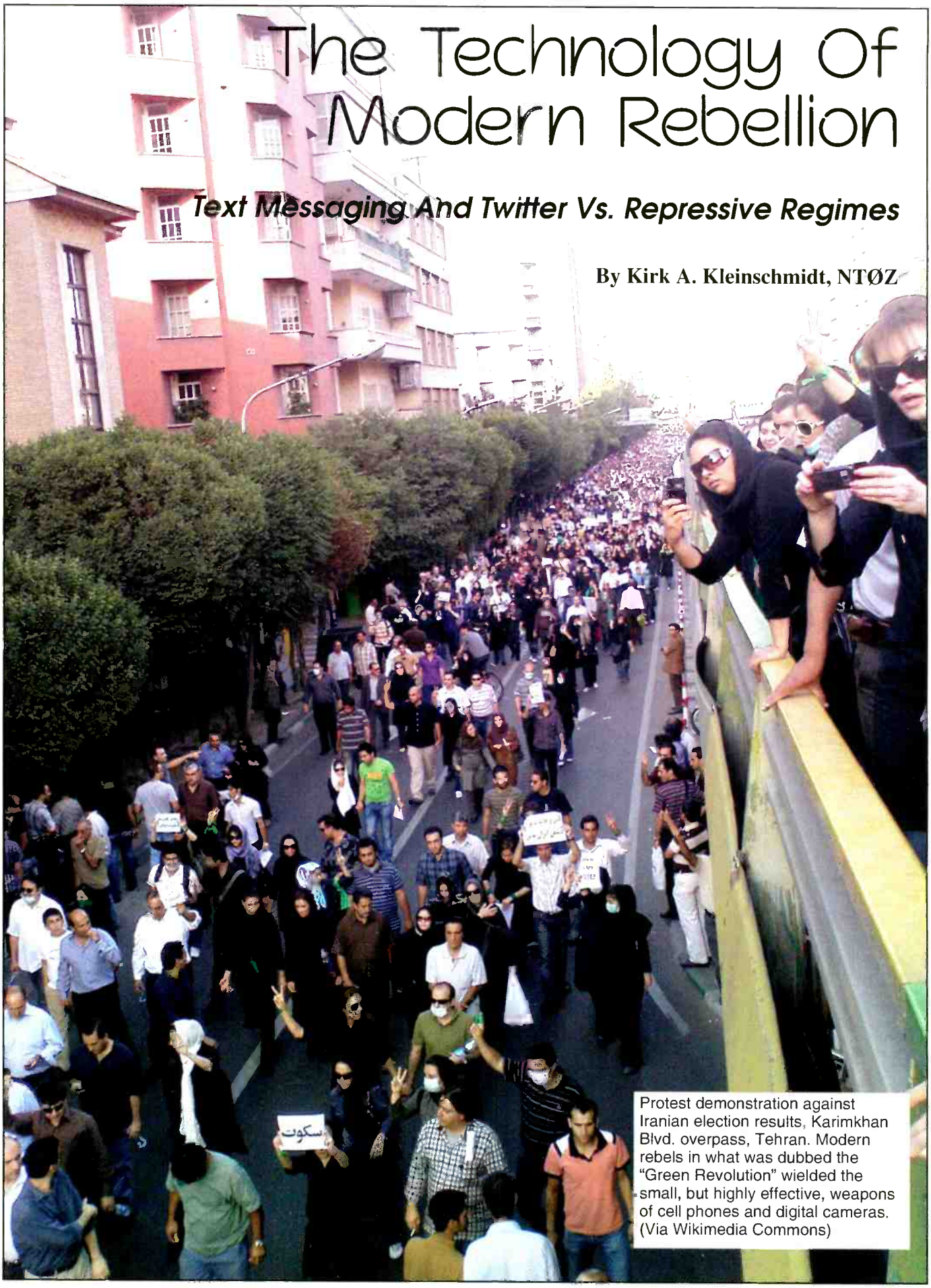
By Kirk A. Kleinschmidt, NTØZ



Protest demonstration against Iranian election results, Karimkhan Blvd. overpass, Tehran. Modern rebels in what was dubbed the "Green Revolution" wielded the small, but highly effective, weapons of cell phones and digital cameras. (Via Wikimedia Commons)

As everyday people in ordinary neighborhoods, across the 50 states and from continent to continent, strive to better themselves, raise their children, and go about their daily lives, the world they live has been growing ever smaller. Over the past 100 years the relentless march of technology—radio, electronics, computers, the Internet, and telecommunications—familiar to *Pop'Comm* readers, has been a blessing to society as a whole, but a curse to individuals, corporations, and governments with "things to hide" or opposing issues to suppress.

From celebrities frolicking on a secluded South Pacific beach (snap!—the paparazzo's digital photo is uploaded to a Hollywood tell-all Internet tabloid via cell phone or sat phone and, in less than three minutes, is online for everyone to see); to cell phone video of the hanging of former Iraqi dictator Saddam Hussein (which even the U.S. wanted to suppress) and the murder, on June 20, 2009, allegedly by Iranian government agents, of 26-year-old Neda Agha-Soltani, a young Iranian woman who was shot dead as she stepped out of her car in Tehran near the site of an anti-government protest (the graphic and unedited cell phone video of Soltani's last moments spread like wildfire on the Internet and global TV news shows and became a rallying event for Iranians protesting the questionable election victory of President Mahmoud Ahmadinejad); it's almost impossible to suppress information and events in the modern era of entrenched interconnectedness.

Upheaval In Iran

Although this article primarily focuses on the tools and techniques used by the citizens and the government of Iran during the events associated with the country's contested presidential election in the summer of 2009, the discussion is relevant to many events in many other countries, including Iraq, Afghanistan, Myanmar, China, and even the U.S. and other "developed" nations—and it will likely become even more relevant in the near future.

Although Iranian citizens enjoy certain "democracy-like" freedoms and educational opportunities not necessarily enjoyed by other Islamic republics in the region, Iranian citizens—especially an ever-more-strident youthful demographic—had grown increasingly unhappy with the country's elected and theocratic leaders.

This general unrest came to a head in the summer of 2009 when, from mid-June through early August, tens of thousands of people (probably more) protested in the streets of Tehran and several other major Iranian cities in support of opposition candidate Mir-Hossein Mousavi.

Amid widespread protests and allegations of massive voter fraud, Ayatollah Ali Khamenei, Iran's religious leader and behind-the-scenes political power broker, declared that President Mahmoud Ahmadinejad had won a decisive reelection victory and that the election's dramatic result was a "divine assessment."

Outside Iran's inner political circle the divine assessment seemed all too profane. Many citizens and all of the opposition presidential candidates, including Mousavi, claimed that the election was manipulated and that the results were rigged. Although foreign election monitors were generally not allowed to keep an eye on things inside Iran, most outside observers side with the Iranian opposition in noting "electoral irregularities." The protests that followed have been called "The Green Revolution" (playing on Mousavi's green campaign colors) and "The Persian Awakening."

A member of the Kurdistan Workers' Party (PKK), a rebel group active in that troubled region, stands sentry, resting his more "traditional" weapon on his shoulder. High-tech devices are rapidly entering global frays. (Photo by James Gordon, Manhattan, New York City, via Wikimedia Commons)

Some analysts suggest that the "election" was actually a coup that marked the end of the country's Islamic Republic (ushered into power in the late 1970s during the Iranian Hostage Crisis) and the beginning of the Abadgaran Regime, an alliance of certain non-cleric, ultra-conservative individuals and organizations of which President Ahmadinejad, the former mayor of Tehran, is a notable member. Iranian dissidents characterize the Abadgaran as a promoter of a uniquely Iranian brand of Fascism, Nazism, or neoconservatism. President Ahmadinejad is widely known to have expressed powerful anti-Semitic beliefs.

Against this background, the citizens of Iran who were fighting for fair and free elections (and against the government's perceived wrongdoings) used the tools of the modern revolutionary: the Internet (the World Wide Web, email, and twitter), and the cell phone (voice calls, text messaging, email, and video (the last two via the Internet) to organize their efforts and to get vital information to the outside world, often bypassing the many government controls designed to stop them.

The Grassroots Rebels' Toolkit

Cell phones and the Internet, the primary coordinating tools of anyone protesting anything nowadays, both started their society-changing rise to prominence in the early 1990s. Perhaps because the Internet's roots are here in the U.S., the early years of the 'net were dominated by domestic users. In those days, high-speed (broadband) connections were reserved for universities and large corporations, but millions of Americans logged on via affordable, if slow, telephone modem accounts. Users in the rest of the world generally lagged behind.

In some countries cost was a major concern, while in others it was an almost total lack of infrastructure (stringing conventional telephone wires through the trackless jungles of Brazil, for example, wouldn't be cost effective at all). As time and tech-

Kirk Kleinschmidt, NTØZ, is *Popular Communications* "Ham Discoveries" columnist.

"As you might expect, Iranian authorities didn't just stand by as thousands of angry citizens used newfangled technology to foment rebellion in the streets...they clamped down on Web access, text messaging, and cell phone traffic using hardware and software developed by Nokia and Siemens..."

nology moved forward, however, the rest of the world has closed the "access gap" significantly. The Internet is still somewhat U.S.-centric, but the far-flung corners of the globe are much better represented.

Some countries, such as South Korea, have zoomed ahead of the U.S. According to Internet giant Akamai Data, in 2008, 94 percent of South Korean households had high-speed 'net connections with an average speed of 15 Mbit/s, compared to the U.S. at 63 percent with an average speed of 3.9 Mbit/s. According to the OpenNet Initiative, Internet usage in Iran has grown by about 50 percent a year for the past eight years, with about 35 percent of the population using the 'net. That's noticeably higher than the Middle East average of 24 percent. Access speed, however, is painfully slow on average, and may be as slow as 128 kbit/s.

When it comes to cell phones, the U.S. has had a significantly different experience than most other countries. With a huge installed infrastructure supporting landline telephones, the "need" to adopt and accommodate cell phone technology wasn't critical in the service's early days. And because of government-mandated competition, the domestic cell phone market became a fragmented patchwork of competing carriers and competing technologies. In fact, with a mishmash of CDMA, TDMA, and GSM technologies, it's still that way!

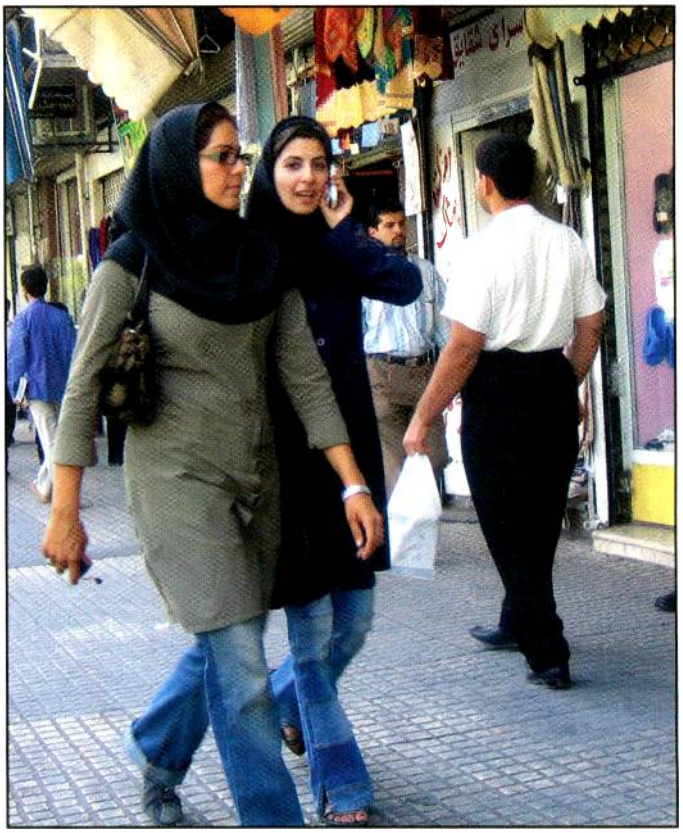
The rest of the world, by and large, saw the cell phone as a way to leapfrog infrastructure issues and largely got behind a single technology: GSM. According to GSM World, GSM-standard phones account for only about 8 percent of the U.S. cell phone market, but the percentage worldwide is a staggering 80 percent.

Using a nearly universal technology makes cell phone adoption easier—along with monitoring by the government, as we'll see later—and many countries that lacked landline infrastructure bypassed it altogether and adopted wireless technology. It's been far easier to build and deploy wireless telephone technology in developing countries, many of which now have more cell phone users than landlines—like Iran, which has 20-plus million cell phone users, about 38 percent of the population.

SMS, Twitter, And The Internet

In addition to plain old voice calls via cell phone, the primary tools used by Iranian protesters incorporate some form of digital text transmission, either by cell phone alone (SMS), by cell phones linked to the Internet (Twitter), or by Internet services such as Twitter and various instant messaging services. The great advantage of these systems over voice calls is the "one-to-many" function. Whether you're inviting 200 people to a wedding reception or trying to round up 200 people to protest some government action, writing a single message that automatically gets sent to 200 (or 200,000) targeted recipients is infinitely faster—and probably safer—than making 200 voice calls one at a time.

Detailed descriptions of these services abound on the Internet. For now, though, let's take a cursory look.



With its citizens enthusiastic adopters of the technology, about 38 percent of Iran's population dials up on cell phones—more than the number who use landlines. (Via Wiki Commons)

SMS

What everyday cell phone users call text messaging, or simply texting, the phone company calls Short Message Service, or SMS. Actually, depending on the particular cell phone carrier, not all text messages are sent via SMS protocols (originally part of the GSM standards, but later widely adopted), but the moniker has been almost universally accepted as an abbreviation for "text messaging." In some countries SMS is a noun and a verb!

According to Wikipedia, SMS is the most widely used data application on the planet, with 2.4 billion active users worldwide (75 percent of all cell phone users)! In addition to user-to-user messaging (the most common), SMS is now being used to broadcast alert or emergency messages—and advertisements—to groups of subscribers. This broadcast capability could theoretically be useful for protesters of any stripe, but in reality, it's probably much more useful to governments for transmitting information—or disinformation—to the cell phone-using public. I'm not aware of repressive regimes using the SMS broadcast function to "spoof" the opposition, but when it happens, don't be surprised...

Most average users send short text messages to linked Internet sites/services, such as Twitter, which then send them to dozens, hundreds, or thousands of subscribers, or "followers," as they're called on Twitter.

Twitter

Created only recently, in 2006, Twitter (www.twitter.com) is a free social networking and micro-blogging service that enables

Iranian presidential election 2009 protests, Oslo, Norway. Protesters worldwide carried signs blazoned with images of violence, captured in amateur photographs and video, against the demonstrators. The sign carried by the woman in the front, center, displays an image from the video of Neda Agha-Soltani's last moments. (Photo by Kjetil Ree via Wiki Commons)

its users to send and read text messages of up to 140 characters, known as *tweets*. Tweets, which can be sent via cell phone or via the Internet, are displayed on the author's Twitter profile page and delivered to the author's subscribers, known as "followers." Senders can allow open access to their tweets or restrict delivery to followers or selected groups of followers.

This is a powerful one-to-many feature, especially when you consider that you can also receive tweets on your cell phone via SMS/text messaging! If you want company for dinner, for example, you can send a quick tweet from your cell phone: "BURGER KING AT 6 PM. MEET ME IF YOU ARE HUNGRY." Your message will quickly be posted on your Twitter page and sent to your followers (people subscribed to your "Twitter feed") via SMS and various Internet-based instant messaging (IM) services, such as Yahoo Messenger and MSN Messenger. If a couple of your followers are free and in the area (remember, tweets can be global), they may decide to join you for dinner. Some may just show up, while others may send you a tweet or a text message letting you know that they'll be showing up!

Celebrities use Twitter to communicate *en masse* with their fans, teens use it to keep their friends up to date on every little detail of their lives, and anti-government protesters use it to instantly coordinate huge rallies. The real-time synergy between text messaging, instant messaging, and the Internet is much more powerful than any one component alone.

In a few short years Twitter has surged in popularity worldwide and is sometimes referred to as the "SMS of the Internet." Twitter is ranked as one of the 50 most popular websites worldwide and the third most popular social network. It's making inroads publicly, and within the news, too.

Twitter was extensively used by candidates in the 2008 U.S. presidential campaign, especially by now-President Barack Obama. Iranian protesters used Twitter as a rallying tool and as a method of communication with the outside world after the government blocked several other modes of communication. According to articles in the *Wall Street Journal* and the *Washington Post*, on June 15 Twitter rescheduled a planned 90-minute maintenance outage after the U.S. State Department asked Twitter executives to delay the shutdown because of concerns about the service's role as a primary communication medium by the protesters in Iran. The *Sydney Morning Herald* (Australia) reported that Twitter was also used to organize "Denial of Service" (DOS) attacks against Iranian government websites.

The Empire Strikes Back

As you might expect, Iranian authorities didn't just stand by as thousands of angry citizens used newfangled technology to foment rebellion in the streets. According to the OpenNet Initiative, they clamped down on Web access, text messaging, and cell phone traffic using hardware and software developed by Nokia and Siemens—one a major cell phone maker and the other a major U.S. military contractor! Who knew?

BBC Technology Correspondent Rory Cellan-Jones has reported that Nokia Siemens Network, a joint venture between the two telecom giants, has confirmed that it sold Iran the technology it needed to monitor, control, and read telephone calls (and more). The system allows authorities to monitor any communication on the network, including voice, Web, text and IM, and rather than simply blocking suspect traffic, the Nokia-Siemens system can "look inside" digital data to see what's being transmitted.

According to Cellan-Jones' report, a Nokia-Siemens' spokesperson characterized the system as conforming to similar systems used by authorities for "lawful intercepts" worldwide. He went on to say that Western governments, including the UK, don't allow carriers to build networks without this mass intercept functionality. He's exactly right—although we all hope that there's a vast gulf that separates the use of these systems in their respective countries! With a repressive regime, all intercepts are presumed to be "lawful."

OpenNet says Iran's Internet and cell phone filtering and monitoring systems are among the most draconian anywhere

An SMS text message in Chinese. (Via Wiki Commons)

and on par with China's. To keep the people in the dark, only a limited number of service providers have been licensed to operate in Iran, and every service provider rigidly adheres to standards that require them to block users from accessing undesirable websites and services. The "banned URL" list can be centrally updated, and when a user tries to access a forbidden Web address—something subversive such as CNN or the BBC—a "blocked page" warning pops up instead of what was requested. The government's "Internet policing" is greatly helped by the fact that it runs all of the country's Web traffic through a single bank of computers that act like a giant firewall.

Essentially, the Iranian government controls the cell phone and Internet providers throughout the country, and can record, retain, and intercept any and all unencrypted traffic. The forums on dissident websites are filled with postings from concerned individuals trying to help those inside the country maintain their anonymity in the face of the government's crackdown.

Many of the posts assert that:

• The government will eventually crack down on "problem individuals" who continue to use SMS, Twitter, and other "subversive" technologies after they have identified these people by pretending, for a short period, that Iranians can freely access communication technologies.

• Individuals should assume that any and all communications—in and out—are being monitored and that any non-approved communication will eventually be used against them.

• All SMS messages are retained for weeks after they're sent, allowing authorities to follow up at their leisure.

• Simply removing a cell phone's SIM card is not sufficient to prevent its user from being identified by authorities. If a cell phone ID intercept places an individual at or near the scene of a protest or demonstration, that person may be subject to later capture, imprisonment, and punishment.

Fighting The Good Fight

In the face of such extreme monitoring and censorship, using the Internet or text messaging in Iran while maintaining anonymity is a tall order. During the 2009 election protests, most participants simply used whatever services were available at the time, with little thought about their ultimate security. There is safety in numbers, to be sure, and the government can't arrest everyone. But as the dissidents point out in their posts, key players may be subject to future arrest based on archived telecomm intercepts.

Proxy Servers

The primary method for anonymous Internet access in Iran (and just about everywhere else) is through the use of proxy servers. As mentioned, traffic to and from unapproved Internet addresses is easily blocked inside Iran, but traffic from addresses not on the government's "black list" is in the clear. So, if an Iranian Web user can find a company or individual outside the country that is willing to forward his or her traffic to and from the rest of the Internet, the government's filtering system sees only traffic to and from the Iranian user and the non-blacklisted external site—and not the traffic that has been forwarded by the proxy to who knows where. This proxy forwarding system, once set up, is automatic. Most proxy servers strip off any identifying Web addresses or address fragments that could trigger the end user's Internet filter.

During the election protests, hundreds of individuals and organizations set up proxy servers for use by Iranian protesters. A simple proxy server, however, isn't an ultimate solution. The proxy only works as long as its address stays off the black list. If it's discovered it will be filtered along with the rest of the undesirable Web addresses, and the Iranian using the proxy will likely be "discovered," too. Playing "proxy hopscotch" is still a dangerous "spy vs. spy" contest.

The Tor Router Network

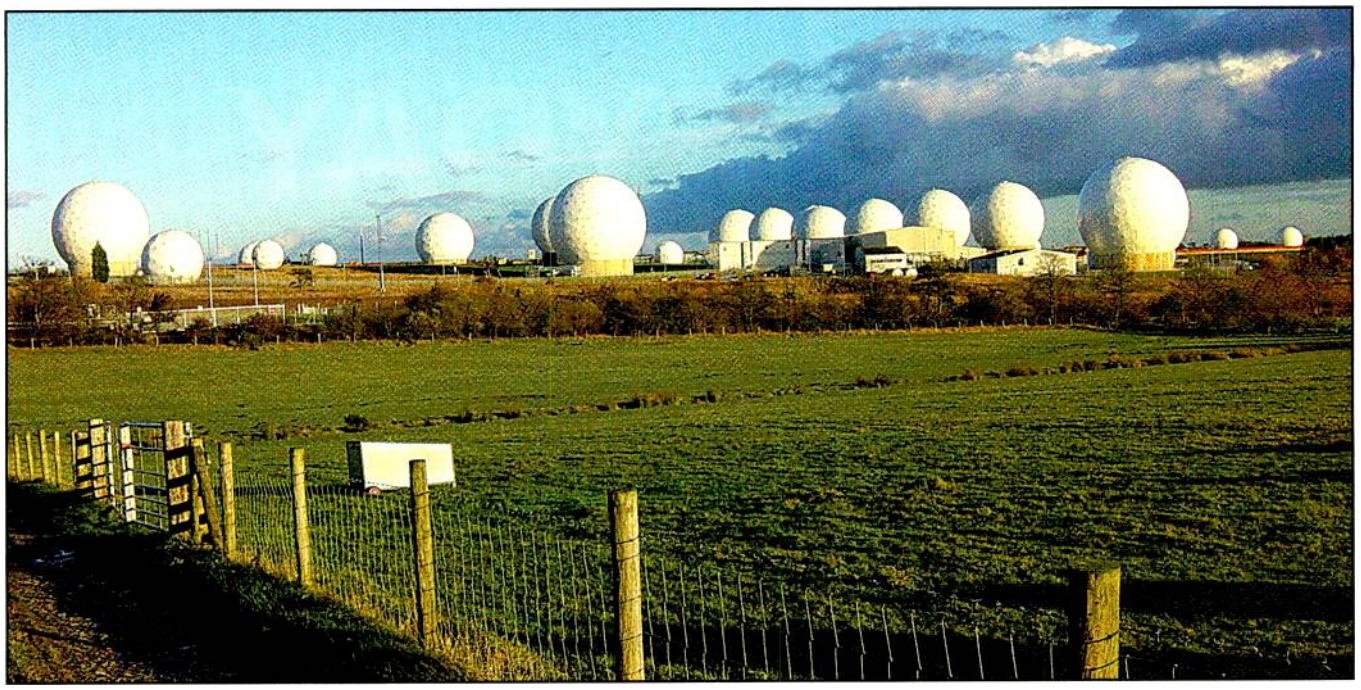
The Tor Network is a sophisticated—yet completely free—global system aimed at enabling its users to communicate anonymously on the Internet. Tor, a second-generation implementation of an "onion router" (which has so many layers that the origin of Internet packets passing through it can't be determined on the Internet as a whole), enables users to create a special, high-security proxy server to shield their connection between their PCs and the onion router system.

Once inside the global Tor network, Internet traffic is sent from router to router, with the Tor software periodically re-negotiating a "virtual circuit" through the Tor network. The traffic ultimately reaches an exit node, at which point the packet—minus any identifying/incriminating Web address information—is forwarded to its original destination. When viewed from the destination, the traffic appears to originate at the Tor exit node, somewhere else in the world (and not in Iran, or wherever).

The global Tor system uses strong encryption in a multi-layered manner (hence the onion routing analogy) to ensure that forwarded data packets can't be traced backward through the "layers of the onion," but the system can't protect against the most sophisticated Internet monitoring systems, such as those used by the U.S. government. In that case, Web traffic that *originated from the U.S.*, passed through the global Tor system, and *exited the Tor system in the U.S.*, could theoretically be monitored—if the U.S. government was sufficiently interested in doing so and was willing to allocate the necessary resources. And that's a big if! If you're outside the U.S. or you specify Tor exit nodes that are outside the U.S., the chances of someone intercepting your Internet traffic are astronomically small.

Although not perfect, the Tor network has been and still is a private communication mainstay for dissidents, journalists working in repressive countries, privacy-loving individuals...and probably criminals, terrorists, and drug cartels to a certain extent!

Originally sponsored by the U.S. Naval Research Laboratory and the Electronic Frontier Foundation (EFF), Tor software is now developed by the Tor



These Radomes, believed to be part of Echelon, populate the surveillance base at Menwith Hill, Yorkshire, England. (Photo by Matt Crypto, Wikimedia Commons, November 2005)

Project, a non-profit research/education organization based in the U.S.

Encryption

Whether you're communicating on an open channel or through an onion router, if an intercepting party can't figure out what the heck you're saying, you have a pretty good chance of keeping your communication secret. Inside Iran (or elsewhere) you could still be investigated for encrypting your data, however, so encryption alone isn't a guarantee of anonymity. For example, if an Internet monitor notices that someone is passing lots of encrypted "gibberish data" back and forth, they may not be able to decode the contents of the messages, but they can be inspired to see who is sending it and why! Still, even if the mere act of sending encrypted data might arouse suspicion, the fact that the contents can't be deciphered (or immediately deciphered) may still be critical. That's why most sensitive data sent between governments, corporations, militaries, etc., is encrypted.

Using two or more systems, such as sending encrypted data through the Tor system, or speaking in unusual languages, as the Navaho Wind Talkers did for the U.S. military in World War II, is recommended for maximum effect.

Encryption is a complicated topic at best, but for a look at a relatively easy way to encrypt your private Internet data (email and otherwise), point your browser to www.pgp.com, the home of Pretty Good Privacy, a pioneer of "public-private key" data security tools suitable for governments, corporations and average PC users.

Communication Privacy In Western Countries

If you're a resident of a "developed Western democracy," the kind of government controls that exist in Iran, China, Myanmar, and elsewhere could never be used at home, right? Wrong!

Just because they haven't been widely used, doesn't mean that they won't someday be used. The automated data and communication interception abilities of the U.S. government are second to none, although the UK, certain European countries, and Australia aren't far behind.

If you were to poke around any of the major network nodes that comprise the backbone of the U.S. telecomm and Internet system, you might see AT&T, Sprint, WorldCom, or Level 3 Communications on the sign in front of the building, but the back room has already been penetrated by the National Security Agency (NSA)—with permission, of course.

Through various legal, quasi-legal, and undoubtedly illegal methods, the NSA and, to a somewhat lesser extent, the FBI, can intercept any voice, SMS, email, IM, or Internet traffic it desires, inside the U.S. and elsewhere.

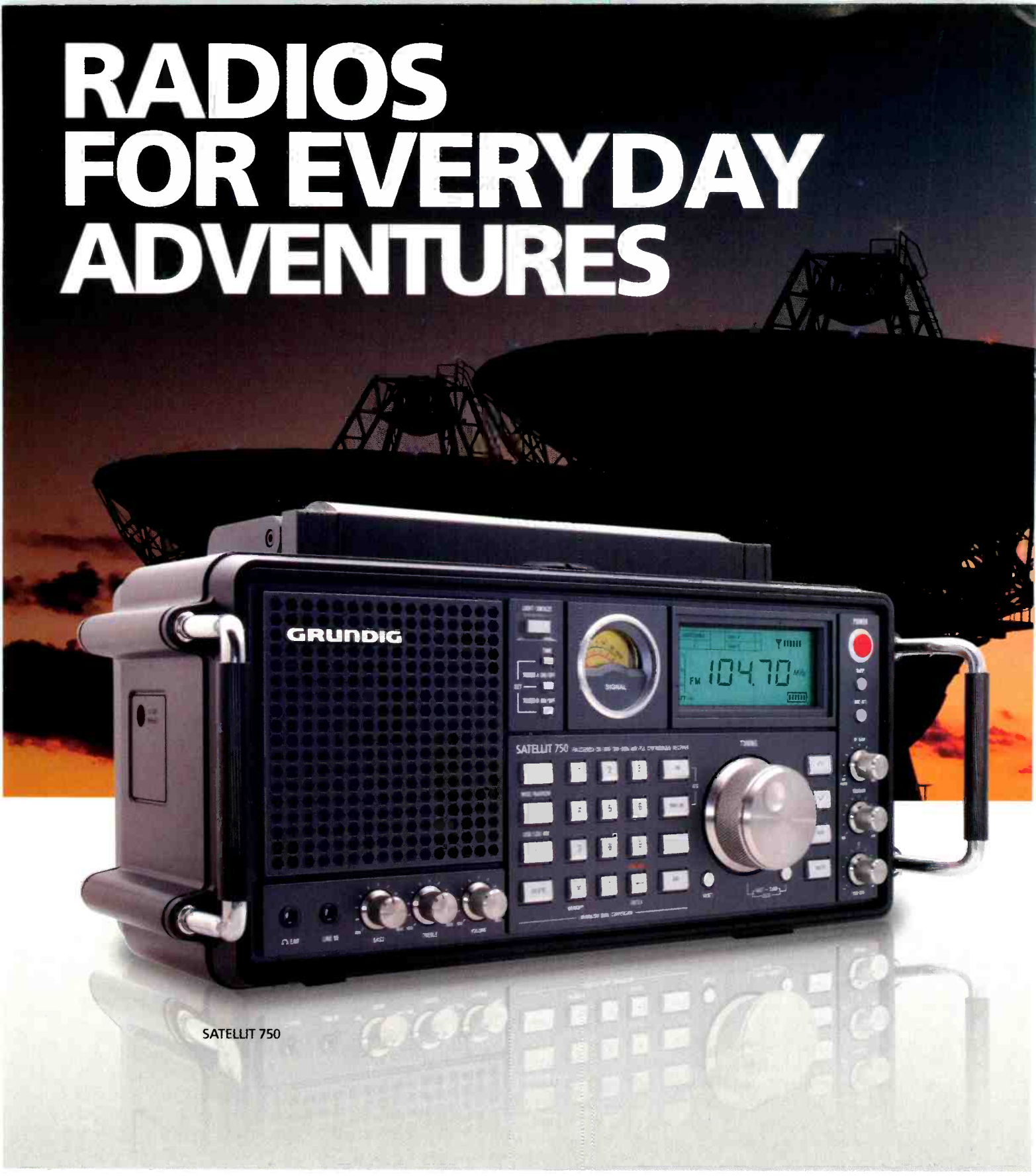
If you want to be scared out of your socks, read *Chatter: Dispatches from the Secret World of Global Eavesdropping*, by Patrick Radden Keefe, a personalized investigation into government-sponsored eavesdropping over the last 50 years, with an emphasis on the Echelon project run by the U.S., UK, Canada, and Australia.

Need to get around pesky things like laws, constitutions, supreme courts, etc., that prohibit the NSA from spying domestically on its own citizens? No problem! We'll spy on the UK, who spies on Australia, who spies on the U.S.—and then pool our data. Keefe isn't the first writer to describe the Echelon system but, as Keefe himself says in the book, whatever Echelon *was*, it's something else *now*...something even more pervasive...and we don't yet know its name.

Don't kid yourself: The President of the United States (and his "agents") has much greater capabilities than Iran's hard-line leaders when it comes to monitoring citizens' communications and shutting them off at a moment's notice. Exactly how those capabilities are used has yet to be determined.

Stayed tuned. ■

RADIOS FOR EVERYDAY ADVENTURES



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Robots, Radios, And Rescue

Where Public Safety And A Technological Frontier Meet

by Don Rotolo, N2IRZ

We've all seen it on TV: the police have a hazardous mission, and they don't want to risk an officer's life to defuse the bomb, confront the rifle-toting crazy, or enter the collapsed building. So, they send in the robots to do the dirty work. And, of course, the robots are radio controlled.

Even a very basic workaday robot can easily cost as much as a luxury car, often reaching into six figures, so not every police agency will have one. But the cost of repairing a damaged robot is far less than the medical cost of repairing a human being. And, unlike humans, if destroyed, robots can be replaced. So in they go.

These modern marvels are equipped with video cameras, versatile drive systems, and sensors of all types, and are able to go into inhospitable environments of all types. But, they all have a weakness: Radio. Too often, the radio links are lost.

Bi-directional radio links must be used to control these robots and to retrieve sound, video, and other feedback—after all, a tether cable might get tangled, damaged, or broken. But, the radio waves are subject to interference, multipath distortion, fading, and the other problems of propagation we're all familiar with.

These robots are not very intelligent, instead relying upon a specially trained "handler" who operates the robot by remote control. Some models do have limited intelligence; for example, they may being able to sense when a particular maneuver will jeopardize or damage them and can signal their operators to alert them to that fact. The operator can choose to ignore that message—sometimes the job simply has to get done and possible damage to the robot is acceptable. It really all boils down to the device's reliance upon the operator.

Two days after the 9/11 terrorists attacks the fires still burn amid the rubble and debris of the World Trade Center in New York City. According to the Center for Robot Assisted Search & Rescue, combing the rubble in the aftermath of the disaster is the first known actual use of robots for urban search and rescue. (DoD photo)

Don Rotolo, N2IRZ, is an electrical engineer, amateur radio operator, and robotics enthusiast. He also writes the "Digital Connection" column for *Pop'Comm*'s sister magazine, *CQ*.

A Real Challenge In The Real World: The Radio Link

I recently had a conversation with Lt. R. Daniel Owens, Jr. of the Anderson, South Carolina, Police Department's bomb disposal unit (www.andersonpd.com/bombsquad.html) about the value of these robots and the training required to use one effectively. He told me that the city uses its robot more often than one might expect, more than once a week. Operators also train constantly, until the robot becomes an extension of the officer controlling it. It takes several months of hard work to become proficient, and quite a bit more time until you're "real good at

A Danish bomb robot, known as a rullemarie, enters a transport vehicle after completing its mission. The robot is remote-controlled from the vehicle and can be equipped with different kind of tools depending on the situation. (Photo via Wiki Commons)

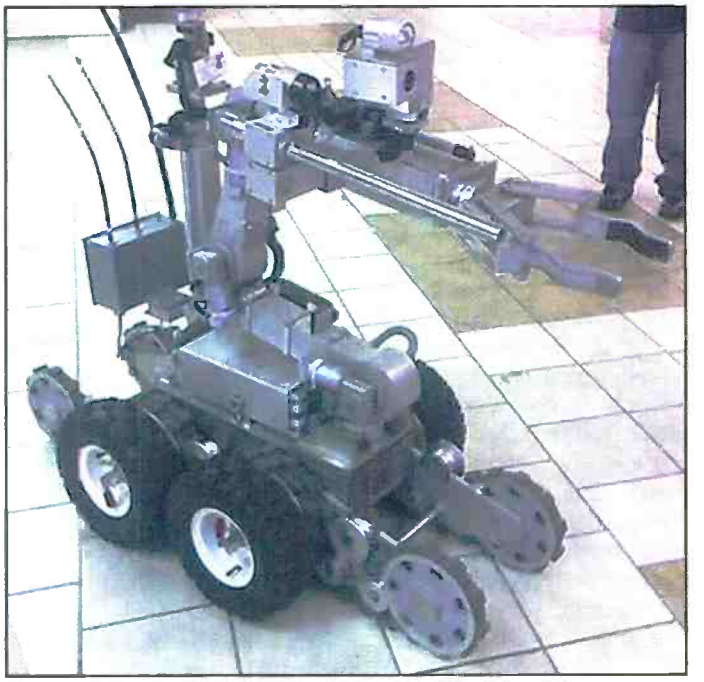
it." The department's bomb disposal unit was the first in South Carolina to be certified by the FBI, in 1998, and it has responded to situations over much of South Carolina and parts of Georgia as well.

Such robots can work in so-called "tethered mode," where the robot is connected to the operator's console by a wire or fiber-optic cable, but most missions call for the robot to be deployed in "untethered mode," controlled by a range of radio signals. A wire or fiber-optic tether can limit mobility and is somewhat fragile (especially in typical search & rescue environments), while radio offers an unencumbered link to wherever the robot manages to find itself.

Or does it? As anyone who has some experience with radio signals can tell you, they don't always work. Sure, the local 50-kW FM radio station is rock-solid to your car when you're close enough to the transmitter, but that's because they're using an awful lot of power, through mostly open air, and have essentially a guaranteed monopoly on that frequency for a certain geographic region. But what happens when your signal is limited to a few watts, has to travel through a metal structure, and is subject to interference both unintentional and intentional?

I live in northern New Jersey, and if I could get above the 75-foot-tall trees I could see the Empire State Building and, once upon a time, the World Trade Center. Just over eight years ago I stood in the parking lot at work and watched in puzzlement as the huge building belched smoke and flames from the top and then suddenly disappeared, replaced several seconds later by a thick cloud of debris. I couldn't imagine what had happened. Of course, that was the South Tower collapsing.

What's that got to do with this article? Well, some 343 firefighters died that day, in part because their radios did not receive



A versatile robot used by the City of Anderson, South Carolina, for bomb disposal, hazardous tasks, and other special operations. It climbs stairs, runs for several hours on its batteries, can be fitted with a variety of manipulators and weapons, and has a range of about 3,000 feet line of sight. Note the antennas for different frequency bands, which improve communications by offering several paths for control signals. (Photo courtesy Anderson Police Department)

The Sago coal mine in Sago, West Virginia. A violent explosion rocked the mine on January 2, 2006, trapping 13 miners for nearly two days; only one survived. (Photo courtesy Sandia National Laboratories)

ANDROS Wolverine V2 used by the Mine Safety and Health Administration during the Sago mine response. (Mine Safety and Health Administration photo)

the orders to evacuate the building. The point is, regardless of the amount of money spent on a system, radio signals can not be considered 100 percent reliable. And, whether the radios are carrying a critical order to evacuate a building on the brink of collapse, or just a video signal back from a robot exploring a dark alley, the failure of a radio signal to reach its intended receiver has consequences.

According to CRASAR (the Center for Robot Assisted Search & Rescue, www.crasar.org), the first known actual use of robots for urban search and rescue was at the World Trade Center disaster. In the aftermath of the towers' collapse, as stated in *The Springer Handbook of Robotics*, "the density of the rubble significantly interfered with wireless networks," and one robot was actually lost because of the loss of the radio link. This isn't surprising, given the jumble of metal and amount of radio that was in use at the site. The robot's control signals simply couldn't reliably penetrate the rubble, and by the time operators learned of the problem, it was too late. Similar reports of radios not working when they were needed most are heard all the time.

Dr. Robin Murphy, the director of CRASAR, led a CRASAR team that was among the first at Ground Zero with man-packable robots, driving there since all air traffic was grounded. Their first team member arrived late afternoon, and the robots they fielded were working by the early morning hours of the next day, the delays due to getting clearance to enter the site. It was one of their robots—a Foster-Miller Solem—that was lost, a costly lesson that highlighted the need for more research on better radio links. In the 2006 Sago Mine disaster, communications difficulties with the robots they used further highlighted the need for improvements. It's widely acknowledged that wireless communications remain a major problem, and Dr. Murphy and her team are at the forefront of rescue robotics research.

And research they do. In the classic scientific method, they analyze robot performance every chance they get, publish the "lessons learned," and help others analyze how to overcome weak spots identified. According to the Center's website, "The CRASAR response team is the only rescue robot response team in the world; no other team has purchased robots for search and rescue."

As is typical within academia, members also participate in rescue robotics meetings. Sponsored by the Institute for Electric and Electronic Engineers

Mesa Robotics' Matilda II Search and Rescue Robot is shown maneuvering through extreme rubble during the DHS/NIST-sponsored Response Robot Evaluation Exercise at Texas A&M's "Disaster City" training facility. (Photo courtesy Mesa Robotics)

The briefcase operator control unit for Mesa Robotics' Matilda II. Note the video display screen and multiple joysticks, as well as the wide array of switches and indicators that allow complete control of the robot. More recent versions use the 900-MHz band for control, and 1.8 or 2.4 GHz for the video feeds. (Photo courtesy Mesa Robotics)

(IEEE), the annual IEEE Workshop on Safety Security and Rescue Robotics is the foremost conference and idea exchange for research in rescue robotics, and Dr. Murphy and CRASAR are well-known contributors. With rescue robotics still in its infancy, these workshops are very popular with not only the research crowd, but also with those people who actually *use* these robots.

(On a side note, Dr. Murphy was profiled in February's IEEE *Spectrum* magazine, in the article "Dream Jobs 2009." It seems that she does her research by actually conducting search & rescue! Now who wouldn't dream about a job like that?)

Researching Radio Waves

With the highly visible results from the Trade Center's Ground Zero and later disasters as a driving force, researchers from NIST (National Institute of Standards and Technology, an agency of the U.S. Government) are conducting tests to improve the performance of emergency service radio equipment, particularly that used to control robots. Researchers select places known for their difficult propagation issues, such as underground mines, petroleum refineries (with their mazes of metal pipes), tunnels, and collapsed buildings. The idea is to standardize rescue robots for use in the United States. They are active in the RoboCup Rescue and AAAI mobile robot competitions, which offer them exposure to (and cooperation from) lots of robot enthusiasts (more on that in a moment).

According to a 2008 report on CNN.com, NIST's work in an old silica mine in California yielded an interesting result: As you travel deeper into the mine, reception gets worse (no surprise there), but they also found that there were "sweet spots" for radio reception, places where reception was excellent even further into the mine. Almost everyone has experienced similar sweet spots; say, when a weak FM radio station fades in and out as your car creeps toward a stop light, or when you wave a cell phone or walkie-talkie around in the air trying to find a better signal.

Those of you who study propagation can probably guess that the cause of these sweet spots experienced in the mine was most likely multipath propagation, where the radio signals bounce around and either subtract from each other (causing a signal null or loss) or add to each other (causing a signal increase or "sweet spot").

The proposed solution is ingenious in its simplicity: Add a few small radio repeaters to the robot and, when the signal level increases after a decrease (indicating a sweet spot), drop one of the repeaters and leave it behind, so it can relay signals between the surface and the robot by using the sweet spot. This can be repeated for as many times as the robot has repeaters, if necessary. The repeaters can be small—about the size of a box of cereal—and can usually be retrieved by the robot on its way out.

The solution doesn't depend upon the operator, either, since the robot can be programmed to decide on its own when to drop a repeater. Of course, the operator can always drop one manually. Because the operator is already under tremendous stress from the mission, automating the communications path is one

less thing to worry about, which contributes to an easier-to-operate robot.

Better Radios And Communications

The radios themselves are also being re-thought. We're not talking about off-the-shelf radios, but rather custom-built control panels—"Operator Interfaces" in the industry lingo—that happen to have radios in them. These rugged portable controllers are small computers that use multiple inputs from the operator to control the robot, and display multiple outputs from the robot to the operator, using multiple radio links. Scanner enthusiasts won't get much from these, however, since they're primarily digital control signals that are about as interesting to listen to as, say, remote-control airplane signals on 72 MHz.

You *Can* Try This At Home: Building Radio-Controlled Robots

Several years ago, an engineer named Dean Kamen (who has since invented the Segway, after his success with a wearable insulin pump and prosthetic arm) created an organization called FIRST: For Inspiration and Recognition of Science and Technology (www.usfirst.org). The idea was to give high school age students a nearly impossible task, with insufficient resources, little time, and devious rules to see what they came up with. A key ingredient was having engineers, technicians, and scientists from local industry spend time with these students, teaching them not only how to fabricate things, but also the principles behind what they were doing.

FIRST uses robots to inspire high school students into studying science and technology. The students get a different "game" each year, introduced to over 1,600 teams worldwide, at the same moment, via telecast from FIRST headquarters in New Hampshire. From that time, the students have just six weeks to design, build, program, test, debug, and practice driving a 120-pound robot designed to accomplish whatever that year's game was to be. In 2008, teams had to race around a basketball court-sized field, like NASCAR racers, while moving and throwing a 40-inch diameter ball over an "overpass" along the track. In 2009, the robots were equipped with a small trailer, and the task was to get as many 10-inch balls into an opponent's trailer as possible—while on a surface that behaved like an ice rink. Remember, it has to be built in six weeks.

Oh, yes, and it's remote controlled. With a half-dozen robots zipping around such a field, wired tethers would tangle in seconds, and humans on the field would risk life and limb against these robots. So radios are used to keep everyone safe behind reinforced Operator Control Positions. Until the 2009 season, off-the-shelf 900-MHz data radios were used, but now 802.11 network radios are used, which support much faster data rates.

Teams have to consider the radio aspect—keeping antennas away from metal, for example—but interference isn't a severe problem, since the playing conditions are well controlled. In working with a local team, my experience as an amateur radio operator comes in handy as we discuss maintaining a robust radio link.

This is not an inexpensive endeavor, with typical expenditures on par with a good football team. However, most teams have several sponsors, both large and small, whose donations keep it running. Regional tournaments are held in sports arenas, such as pro basketball and ice hockey venues, with several thousand spectators being the norm. Teams compete for three days to determine the winners, who are then eligible to compete at the international championship in Atlanta, Georgia. Not only are the winners on the field invited to the championship, but also teams that show good engineering practices, exceptional community service and involvement, and even teams who, as rookies, really demonstrated their inspiration.

I'm an engineering mentor for FIRST Robotics Competition Team 1676, the Pascack Pi-o-neers (www.team1676.com). I've been doing this for five years now, and my sixth season will be starting this coming January. The mentors (parents and people from area businesses) don't build the robot. We're there to help kids understand the ideas and techniques they'll need, so they can build a robot. We don't design it, either, but teach the process of designing.

You see, *it's not about the robot.* Instead, it's about using a robot to teach kids the value of science and to develop engineering, science and robotics skills in today's students, who will become tomorrow's workers. After all, they're the ones who will invent the machine that saves the life of at least one person reading this article today. I figure I want to improve those odds for myself, so I volunteer to help.

Students and a mentor work on their robot at the 2006 FIRST New Jersey regional competition. This robot was designed to collect and shoot 8-inch foam basketballs at a target 10 feet in the air.

You'd be surprised how many students decide that they like this stuff and go off to college to study it. Enthusiastically, I might add, because they have first-hand experience of what cool stuff they'll be able to do when they get out.

Like designing and building rescue robots.

Shameless Plug

FIRST Robotics teams always need money, of course, but something of far greater value, which is much harder to come by, is something only *you* can provide: Mentoring. People who know something about anything, and are willing to spend even just two or hours telling high school kids about it, are the essential element. These are no ordinary students either, but some of the smartest, nicest, and most grateful kids you'll ever meet. Much of what they need to learn—like writing, fundraising, designing T-shirts and banners, team organization, budgeting, photography, animation, computers—has nothing to do with building a robot. If you know something about anything, you can be a valuable team resource. To find a FIRST team near you, visit www.usfirst.org, and click on the Community/Get Involved link.

The radio frequencies being used are also changing. Instead of sticking to the public-service frequencies around 450 MHz or the unlicensed frequencies around 900 MHz, radio researchers are looking into different frequencies that penetrate various materials well. The idea of frequency diversity is to not rely upon a single frequency for control, but several different frequency bands that have different characteristics, increasing the odds for control signals to get through. The receivers on the robot decide which one has the best signal.

Other changes to increase signal robustness include better digital signal methods and techniques like Forward Error Correction (FEC) that are being used for control, and avoiding heavily used frequencies like the 2.4-GHz band used for 802.11 wireless computer networks.

All these methods and adaptations, when combined, show tremendous promise for increasing the reliability, versatility, and usefulness of remote-controlled robots.

Robots Among Us

There are several robot models in general use today. The Talon family of robots, from Foster-Miller (www.foster-miller.com) and the ANDROS fleet of robots from Remotec (a division of Northrup-Grumman; www.is.northropgrumman.com) are leaders in the industry. A quick Google search will reveal several other suppliers, such as Mesa Robotics (www.mesa-robotics.com). You might not be able to afford one, but if you want one, they're available. And they are out there.

Since about the mid-1980s robots were no longer uncommon in law enforcement, mostly acting as remote manipulators with no real intelligence. Later, by about the mid-1990s, robots provided sensor feedback and limited error detection to help avoid damaging the robot. Modern robots, built in the last few years, have even more intelligence, and even the ability to operate autonomously (without operator control) under certain conditions. A simple example would be the task of climbing a staircase: The robot's sensors can guide it up the staircase without it's bashing into the walls.

We're presently in little danger of a robotic uprising though, since the robot is still controlled by a computer, following a very rigid set of programmed instructions. The radio links are fail-safe, in that the robot just stops when it loses the link. And, they run on batteries, so eventually they'll stop chasing us.

The Future Of Robotics

Which brings us to the ongoing development of these robots. Of course, sophisticated machines such as this don't just appear from thin air. Engineers, programmers, machinists, scientists, and technologists of all types collaborate to create and improve the capabilities of these machines.

In addition to industry, the most obvious places for cutting-edge developments are colleges and universities. Carnegie-Mellon and Stanford both have developed robots that can walk up a vertical wall. Boston Dynamics, a spin-off of MIT, developed (among many) the Big Dog robot. About the size of, yes, a big dog, this gasoline-powered, four-legged, vaguely insect-like robot can walk fast over rough terrain and even get its balance on an icy surface after being pushed by one of its builders. (Go to www.youtube.com and search for Big Dog Robot—you'll be amazed at its capabilities.)

You can also check out those robot competitions I mentioned earlier to see some pioneering work and innovative thinking. The people building these robots are all quite accomplished, but at some point before that they were just kids in high school. And that's another place to look for creativity.

When I was in high school, the most exciting thing was shop class where I got to use serious and dangerous tools, like power saws, drills, and metal foundries to make things. Today, shop class (as anyone who grew up in the 1970s or earlier knew it) is all but gone, replaced by "TE," or Technology Education.

TE isn't a bad thing: It's a blended learning approach that emphasizes the understanding of concepts and fundamental principles as opposed to the use of tools and techniques for fabrication. The idea here is to prepare kids for what the future likely holds for them, to be conversant in technology, and we can play a part (see sidebar). That's how they learn what it means to be an engineer, a scientist, a programmer, and a technician, an innovator.

And that's where the future of robotics really lies. ■

The Possible Passing Of *Passport*, But Some Happier News, Too

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

"That elusive station Radio Peace, which serves the southern Sudan and Darfur areas, is due to make a frequency change to 4740 from the current (or now former) 4750. This will eliminate interference with another low-powered station in Uganda."

Ill winds continue to batter the shortwave world! The latest blast is a bad one indeed. If you're at all aware of what's going on from day to day or week to week in the hobby then you've already heard the painful news that *Passport to World Band Radio* may not bring out a 2010 edition and may, in fact, have issued its last with the 2009 edition. The rather vague statement from the publisher, Lawrence Magne, does not say specifically what the problem or problems are, and I won't even make a guess. Suffice it to say that we are all much hampered by this: It's a great, great loss. I wish Mr. Magne and his team the very best and hope a solution to the problem can be found.

That elusive station Radio Peace, which serves the southern Sudan and Darfur areas, is due to make a frequency change to 4740 from the current (or now former) 4750. This will eliminate interference with another low-powered station in Uganda. The Radio Peace transmitter will also get a tune up. So we can hope that will make Radio Peace a more frequent visitor. The station is scheduled from 0230 to about 0415 with just 1 kW.

There is word that shortwave from the Congo (Republic) is back! South African DXer Vashek Korinek has spotted Radio Congo on its former 6115 frequency, but so far not at an hour (1745) that would be any good for reception here. It used to sign on in the 0400–0430 period, which would be the optimum time to hear this one—if they do go back to their old schedule, and there's no guarantee on that!

Also from Africa comes the news that Trans World Radio intends to have a shortwave relay active in Malawi before next year. There's no word yet on a frequency or schedule. Frankly, I wonder if it can make its self-imposed deadline. But, regardless, it will be good to see some action out of this long-dormant SW country!

There continues to be activity and/or other station changes in Brazil. Radio Inconfidencia, which uses 6010, has increased power to 25 kW and plans to restart transmissions on its old frequency of 15190 as well. Also, Radio Difusora Acreana has been reactivated on 4885 with a religious program format.

Another reactivation is Radio Santa Ana, in the Bolivian town of the same name, back on its former 4451 spot.

And from Rumor Mill department comes word that Syria plans to install a new transmitter at its Adra shortwave site. This is supposed to happen sometime next year; if it does, it should improve the strength and readability of transmissions from Radio Damascus.

Along the same lines, Algeria plans to install an "international center for shortwave broadcasting." Radio Algerienne has been using some out-of-country sites for the past year or so, and a proposed new center may have something to do with that. (Can you spell speculation?)

The Bible Voice Network makes a concerted effort to reach Europe, Africa, and Asia.

Reader Logs

Remember, your shortwave broadcast station logs are always welcome. But *please* be sure to double or triple space between the items (not individual lines of copy), list each logging according to its home country, and include your last name and state abbreviation after each. Also needed are spare QSLs or good copies you don't need returned, station schedules, brochures, pennants, station photos, and anything else you think would be of interest. And how about sending a photo of you at your listening post? You are due!

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.

ALASKA—KNLS, Anchor Point, 7355 at 0930 with RR religious pgm. (Patterson, Philippines) 7370 in RR at *1100 sign on. (Ng, Malaysia)

ALBANIA—Radio Tirana, 6110 monitored at 0300–0330 in (p) Albanian. (Linonis, PA) 7425 at 0352 with comments on economic conditions in Albania and the rest of Europe. (MacKenzie, CA) 13640 heard at 1010 discussing foreign affairs. (Maxant, WV)

Help Wanted

We believe the "Global Information Guide" offers more logs than any other monthly SW publication (*459 shortwave broadcast station logs were processed this month!). Why not join the fun and add your name to the list of "GIG" reporters? Send your logs to "Global Information Guide," 213 Forest St., Lake Geneva, WI 53147. Or you can email them to gdex@wi.rr.com. Please note that attachment files do not always go through. See the column text for formatting tips.

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

ANGUILLA—Caribbean Beacon/ University Network, 6090 at 0039 with preaching. (MacKenzie, CA) 0145 with Melissa Scott. (Badman, NY) 0300 with a sermon. (Linonis, PA) 11775 monitored at 1710 with Melissa Scott. (Maxant, WV)

ARGENTINA—Radiodifusion Argentina al Exterior, 15345 at 2148 with SS talk, time pips at 2200 accurate with atomic clock. (Strawman, IA) 2256 in SS. (MacKenzie, CA)

ASCENSION IS.—BBC South Atlantic Relay, English Bay, 12095 at 2130 with world service news. (Strawman, IA)

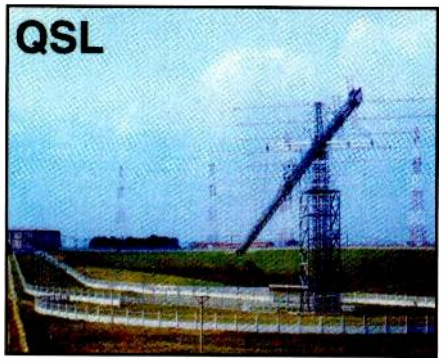
AUSTRALIA—Radio Australia, 5995-Brandon with news at 1200 and 11825-

A Guide To "GIG-Speak"

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

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

The Voice of Kaos pirate is well named for these whacky times. (Thanks Rich D'Angelo, Pennsylvania)



It looks like antenna work was in progress at Vatican Radio's Santa Maria da Galeria site. (Thanks Paul Gager, Austria)

Darwin in CC at 1334. (Brossell, WI) 5995-Shepparton with ABC newscast at 1405, 7240-Shepparton with an interview about energy sources at 1448, 15240 at 0432 with rugby play-by-play, 15560-Shepparton at 2240 on events in Iraq and 17795-Shepparton at 0039 with pops and comments on immigration problems. (MacKenzie, CA) 9660 at 0745 with soccer commentary, 15240 at 0015 with Australian weather, 15560 at 2345 on HIV in India, 17715 at 0110 with movie review and 21725 at 0105 with news and sports. (Maxant, WV) 9765-Darwin in II at 2250. (Patterson, Philippines) 11660-Darwin at 2150 on Asian economic growth, 15415 at 0440 discussing news and 15560-Shepparton at 2207 with EE news. (Strawman, IA) 11660 at 2134 with sports, 15240//17795 at 0158 and 15515 at *0200 sign on. (Yohnicki, ON) 11945-Shepparton with news at 0900 and 13690 with weather at 0010. (Ng, Malaysia) 12080 at 0420, //15240 and 15515 with news and comments. (Padazopulos, NJ)

Northern Territories SW Service: VL8K, Katherine, 2485 at 1245 on Darwinism. (Brossell, WI)

HCJB Australia, 9680 at 1605 with pgm preview and 11750 at 0805 warning of a typhoon approaching Taiwan. (Maxant, WV)

CVC International, 13635-Darwin at 1255. (Patterson, Philippines) 15250 in II at 0050. (Ng, Malaysia)

AUSTRIA—Radio Austria International, 13675 in GG at 1647. (Brossell, WI) 13775 at 1515 in GG mentioning Obama. (Maxant, WV)

BONAIRE—Radio Nederland Relay, 6165 in SS at 0332 with comments and pops, also 6190 in DD at 0324. Off by 0330 and 15540 in DD at 1105. (Mackenzie, CA)

BOLIVIA—(All in SS) Radio Mosoj Chaski, Cochabamba, 3310 at 0930, a regular here. (Wilkner, FL)

Radio San Miguel, Riberalta, 4699.3, a regular at 1000 most days, 2300–0030 seems always there. (Wilkner, FL)

Radio Yura, Yura, 4716.6 noted 1000–1100, usually weak. (Wilkner, FL)

Radio Tacana, Tumupasa, 4781.7 heard weak between 2330 and 0000. (Wilkner, FL)

Radio Lipez, Uyuni, with man talking around 1015. (Wilkner, FL)

Radio Logos, Santa Cruz, (t) 4865 at 2340 with deep fades. (Wilkner, FL)

Radio San Jose, SJ de Chiquitos, 5580.2 at 2340. (Wilkner, FL)

Radio Pio XII, Siglo, *1100, seemingly a regular sign on time now. (Wilkner, FL)

Radio Kawsachun Coca, Lauca, 6075, normally heard around 1020–1040. (Wilkner, FL)

BRAZIL—(All in PP) Radio Educadora de Limeira, 2380 weak at 0910. (Wilkner, PA)

Radio Educadora 6 de Agosto, Xapuri, 3255 at 1000. (Wilkner, FL)

Radio Difurosa do Amazonas, Manaus, 4805 at 1000 with ID, long talk. (Wilkner, FL)

Radio Cancao Nova, Cachoeira Paulista, 4825, tentative at 0925. (Wilkner, FL)

Radio Clube do Para, Belem, 4885 at 0345 with pops and vocals. (Strawman, IA) 0402 with dance music. (Wood, TN) 2345 with ID. (Wilkner, FL)

Radio Anhanguera, Araguaina, 4905 with a vocal heard at 2340. (Wilkner, FL)

Radio Nacional Amazonia, Brasilia, 11780 with group vocal at 0320. (MacKenzie, CA)

BULGARIA—Radio Bulgaria, 7400 at 2030 with (p) news in GG. (Brossell, WI) 2135 with Bulgarian music. (Patterson, Philippines) 9700 at 0215 with a news magazine show. (Shoom, ON) 2330 with Bulgarian boy's choir. (Maxant, WV)

CANADA—Radio Canada International, 6100 at 2345 with an interview and 9515 with mailbag program. (Maxant, WV) 9525 via South Korea in Mandarin at 2240. (Patterson, Philippines) 11990 in SS at 0041. (Yohnicki, ON) 13725 in SS at 0015, 15455 in SS at 2208 and 17735 in FF at 2105. (MacKenzie, CA)

CFRX, Toronto, 6070 at 2320 with traffic report. (Maxant, WV)

CKZN, St. John's (Newfoundland), at 2315 discussing recent elections. (Maxant, WV)

CHU, Ottawa, 3330 at 2345 with time signals. Also 7850 at 2347 and 14670 at 2350. (Maxant, WV)

CHAD—Radio National Tchadienne, 6165 at *0428 sign on with IS, orchestral anthem, man with ID and opening FF anmts, highlife music hosted by a M. (D'Angelo, PA)

CHILE—CVC-La Voz, Santiago, 11665 in SS from 2258 sign on. (D'Angelo, PA) 15140 with religious songs in SS at 1312. (Brossell, WI) 17680 in SS at 2107. (MacKenzie, CA)

CHINA—China Radio International, 5955 at 1357, 5965 in JJ at 1401, 6080 via Canada at 0425, 9560 via Canada in SS at 0343, 9570 via Albania in CC at 0228, 9665 via Brazil in SS at 0343, 9690 via Spain at 0333, 9790 via Cuba at 0328, 11840 via Canada at 2306, 11930 via Canada in CC at 0018. (MacKenzie, CA) 7140-Shijiazhuang in RR at 1221, 9645-Beijing at 1237 and 11640 via Mali in AA at 1916. (Brossell, WI) 9690 via Spain with news at 0302. (Shoom, ON) 15210-Kashi in Hindi at 0330. (Patterson, Philippines) 15785-Xi'an with *Frontline* pgm at 0130. (Ng, Malaysia)

China National Radio/CPBS: Voice of the Strait, Fuzhou, in CC at 1241, Voice of Pujiang, Shanghai, 5075 in CC at 1245, 7245-Beijing in CC at 1225. (Brossell, WI) 5030 in Mandarin at 1158. (Strawman, IA) 5945-Beijing in CC at 1450. (Ng, Malaysia) 6110 in CC at 1420, //6175 and 7210. (MacKenzie, CA)

COLOMBIA—Marfil Estereo, 5910 at 0045 with SS in what was possibly an interview pgm. (Linonis, PA) 0415 in SS and LA music. (Wood, TN)

CROATIA—Voice of Croatia/ Hrvatski Radio, 3985.1 at 0251 with continuous local vocals to 0300, time signal, fanfare and W with news in Croatian. (D'Angelo, PA) 7345 with world news at 0305. (Brossell, WI) 9925 via Germany with EE news at 0203. (Shoom, ON) 0300 with IS, ID and into Croatian. (Linonis, PA) 2340 in Croatian at 2340. (MacKenzie, CA)

CUBA—Radio Havana Cuba, 6140 in SS at 0140 and 11760 in SS at 0205. (Badman, NY) 12040 in SS at 1455. (Yohnicki, ON) 13790 in EE at 2258 and 17660 in SS at 2112. (MacKenzie, CA) 15360 in SS at 1240. (Patterson, Philippines)

Radio Rebelde, 5025 in SS monitored at 0046. (Yohnicki, ON) 2325 in SS. (Maxant, WV)

CZECH REPUBLIC—Radio Prague, 6080 via Canada at 0359 on annual film awards, 7345 at 0312 on Saudi Arabia, 9870 at 0312 with music and comment and 11665 via Ascension in SS at 0025. (MacKenzie, CA) 7345 with *From the Archives* at 0013. (Fraser, ME) 9410-Litomysl in Czech at 2130. (Patterson, Philippines) 9440 with mailbag show at 0010. (Maxant, WV) 9870 with news, weather and features. (D'Angelo, PA)

DJIBOUTI—Radio Djibouti, 4780 at 0304 with Koran, AA talk, HOA music, ID at 0331. (D'Angelo, PA)

ECUADOR—HCJB Global, 9745 in SS at 0319, 9780 in GG at 0317, 11625 in SS at 0032, 11920 in PP at 2305 and 12040 in GG at 2305. (MacKenzie, CA) 9750 in SS at 0230 and 11625 in SS at 0155. (Badman, NY)

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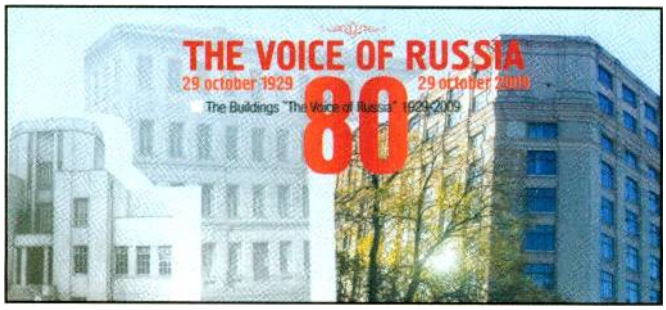
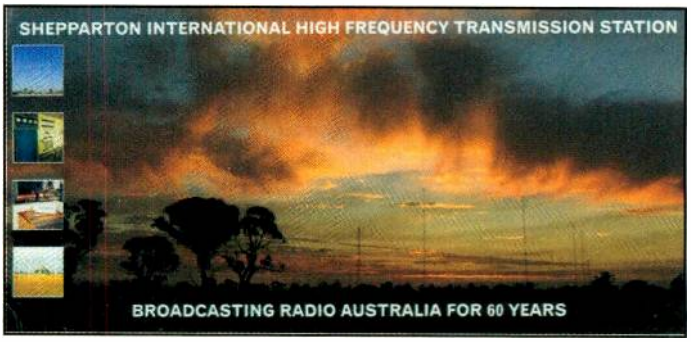


These two buildings have housed The Voice of Russia wearing this and other guises over the past eight decades. (Thanks Paul Gager, Austria)



Most Radio Australia broadcasts come via the Shepparton transmission site. (Thanks Peter Ng, Malaysia)

La Voz del Napo, Tena, 3280 at 0948 with interesting percussion-oriented music. (Wilkner, FL)

EGYPT—Radio Cairo, 11590 with language lessons at 0005. (Maxant, WV)

ENGLAND—BBC, 5875 with an interview at 1340, 9410 on tennis at 0452. (MacKenzie, CA) 9605 Thailand Relay in CC at 1318 and 9740 Singapore Relay with an interview at 1243. (Brossell, WI) 15420 under WBCQ at 1655. (Maxant, WV) 15575 Cyprus Relay on opera monitored at 1255. (Patterson, Philippines)

Bible Voice Network, 9730 via Germany in AA at 1716. (Brossell, WI)

EQUATORIAL GUINEA—Radio Nacional, Bata, 5005 at *0504 sign on with Afro-pops and folk, some U.S. rhythm and blues, SS talk, //6250 again at their *0539. (Alexander, PA)

Radio Nacional, Malabo, 6250 sign on at 0539 with SS talk, "Radio Malabo" IDs, Afro-pops. (Alexander, PA)

Radio Africa, 15190 with brokered religious pgm including C/W-style things. (Strawman, IA)

ETHIOPIA—Radio Ethiopia, 7110 at 0308 with HOA music. (Brossell, WI) 0328 with HOA vocal, brief instl, M with ID and news in Amharic, //9704.2 fair. (D'Angelo, PA) 0331 with rock and funk, local anmts. (Strawman, IA) 2040–2101* with HOA talk in (l) Amharic, anthem at sign off, //9704.2. (Alexander, PA)

Voice of the Tigray Revolution, 5980 at *0256 with IS, opening ID and anmts in Amharic at 0300. No sign of them on 5950. (D'Angelo, PA)

FRANCE—Radio France International, 9805-Issoudun at 0416 with EE and short news items, headlines summary at 0428, ID and closedown anmts, 0430*. (D'Angelo, PA) 15300-Issoudun in FF at 1235. (Patterson, Philippines)

GERMANY—Deutsche Welle, 5955 Sri Lanka Relay in GG at 2350 and 15650 Sri Lanka Relay in GG at 0940. (Ng, Malaysia) 6075 in GG at 0305, 9480 in GG at 0445, 9825 in GG at 0326 and 11605 Rwanda Relay in GG at 2008. (MacKenzie, CA) 7245 Rwanda Relay in EE at 0430. (Wood, TN) 9545 via Ascension in SS at 0230. (Linonis, PA) 9825 Portugal Relay in GG at 0325. (Shoom, ON) 15410 Rwanda Relay in FF at 1245. (Patterson, Philippines)

GREECE—Voice of Greece, 9420 in Greek at 0005. (Ng, Malaysia) 0215 in Greek. (Linonis, PA) 0347 in Greek. (MacKenzie, CA) 1250. (Maxant, WV)

RS Makedonias, 7450 in Greek at 2230. (Brossell, WI)

GUAM—KSDA/Adventist World Radio, 9720 in CC at 1240. (Brossell, WI) 15275 on Germany. (Maxant, WV) 15300-Facpi Point in Mandarin at 0020. (Patterson, Philippines) 15510 in CC at 1020. (Ng, Malaysia) 15540 with EE religious talk at 1140. (Ng, Malaysia)

KTWR/Trans World Radio, 15200-Merzio in Bengali at 0900. (Patterson, Philippines)

GUATEMALA—Radio Buenas Nuevas, San Sebastian, 4800 in SS heard at 0410. (Brossell, WI)

HONDURAS—Radio Luz y Vida, San Luis, 3250 (p) seemed an EE religious pgm at 0340 but too much noise to copy details. (Strawman, IA) 0349 man with religious SS talk and music. Lost or sign off at 0354. (D'Angelo, PA) 1110 M/W in EE and SS. (Wilkner, FL)

Radio Misiones International, Comayaguela, 3340 at 0357 with inspirational vocals and M in SS. (D'Angelo, PA) 0407 with talks in SS. (Brossell, WI) 0615 with contemporary Christian music, several EE IDs for "Radio M-I" and a San Bernardino, CA, address for reports. (Alexander, PA)

IRAN—Islamic Republic of Iran Broadcasting, 9495 at *0100 on U.S. "occupation" of Iraq. (Linonis, PA) 9895 in AA at 0417. (MacKenzie, CA) 15150-Kalamabad in AA with domestic music at 1225. (Patterson, Philippines)

INDIA—All India Radio, 9870-Bangaluru at 0043 in the Vividh Bharati service with flutes, local vocals and M in Hindi. (D'Angelo, PA) 1645 in Hindi, 11620 at 1955 on India-Iran trade and 11935 at 1755 with local vocals. (Maxant, WV) 11620 on racial tensions between India and Australia. (Ng, Malaysia) 15150-Delhi/Khampur in Tamil at 1210. Tamil programming but Hindi music. (Patterson, Philippines)

INDONESIA—Voice of Indonesia, 9525 monitored at 1210 with II news. (Strawman, IA) 1230 with (p) news in II. (Brossell, WI)

ISRAEL—Galei Zahal, 15785 at 2150 in HH with local pops, //6973. (Alexander, PA)

ITALY—Italian Radio Relay Service, 5990 via Slovakia at *0430 with fanfare, religious EE pgm. (D'Angelo, PA)

JAPAN—NHK World Radio Japan, 5960 via Canada at 0432 in JJ and off by 0455, 6190 in KK at 1430, 9535 in JJ at 1510, 11665 in JJ at 2317, 11935 in JJ at 0312 and 15265 in JJ at 2240. (MacKenzie, CA) 1935 in JJ at 0220. (Badman, NY) 11945 in JJ at 1727. (Brossell, WI) 15325-Yamata in JJ at 0340. (Patterson, Philippines)

Radio Nikkei, 3925 with talk in JJ by two W at 1202. (Strawman, IA) 1335 in JJ and 6055 in JJ heard at 1410. (MacKenzie, CA)

JORDAN—Radio Jordan, 9830 in AA at 1908. (Brossell, WI) 11810 in AA at 1220. (Patterson, Philippines)

KUWAIT—Radio Kuwait, 11990 at 2040 with U.S. pops. (Maxant, WV)

LIBYA—Radio Jamahiriya/Voice of Africa, 21695 at 1540 on school lessons. (Maxant, WV)

MADAGASCAR—Radio Madagaskara, 5010 at 0300 sign on with ID, presumed news in Malagasy. (Brossell, WI) 0327 with vocals and M with ID and (p) news in Malagasy. (D'Angelo, PA) 0335 with vocals. T-storm static was at a level equal to the signal. (Strawman, IA)

MALAYSIA—RT Malaysia, 7295-Kujang at 0915 relaying local FM programming from Kuala Lumpur at 0915. (Patterson, Philippines)

MEXICO—Radio Mil, Mexico City, 6010 at 1249 with songs and anmts in SS. (Brossell, WI)

Radio Transcontinental/XERTA, Mexico City, 4800 in SS at 1126 with very quick ID between music numbers. (Wilkner, FL)

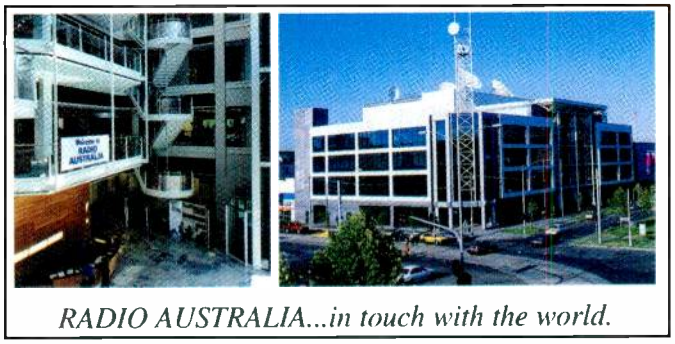
XEQM, Merida, 6104.8 with M/W SS ancrs, music at 0935. (Wilkner, FL)

Radio Educacion, Mexico City, 6185 in SS at 0005. (Maxant, WV)

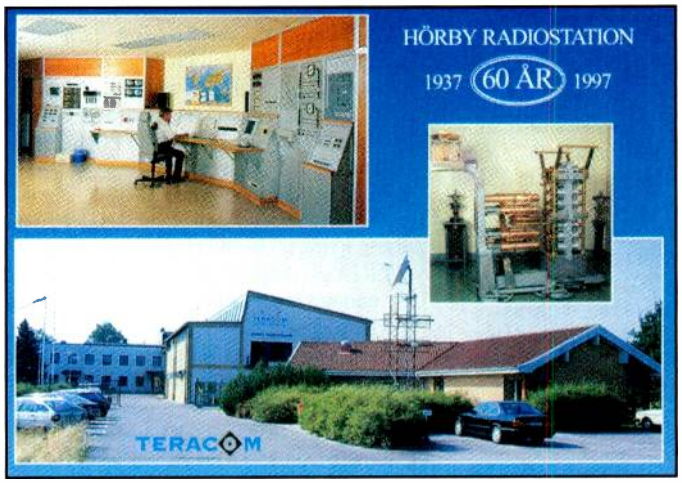
MOROCCO—RTV Marocaine, 15345 with news in AA at 1701. (Brossell, WI)

Radio Medi Un, 9575, with continuous ME vocals before an audience, ID at 0400 and M with news in AA. (D'Angelo, PA) 2140 in AA. (Patterson, Philippines)

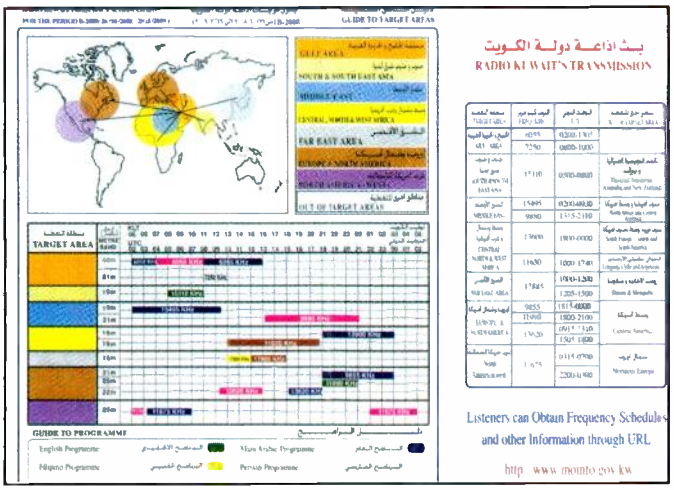
NETHERLANDS—Radio Nederland, 9450 via Portugal with news in SS at 0005 and 13570 on civil war battlefields. (Maxant, WV)



And the Radio Australia broadcasts originate (or come through) this building. (Thanks Peter Ng, Malaysia)



Radio Sweden's transmitter site at Horby, Sweden. (Thanks Paul Gager, Austria)



About all the info you need to listen to Radio Kuwait.

11805 via South Africa at 1925 with contact info and sign off at 1930. (Brossell, WI) 11920 via Singapore in II at 1245. (Patterson, Philippines) 15335 via Germany with *Network Europe* at 1910. (Fraser, ME)

NEW ZEALAND—Radio New Zealand International, 6170 at 0800 with news. (Padazopulos, NJ) 0812 with M hosting pop request pgm. (D'Angelo, PA) 0745 with vocals, 15720 reporting snow on the south island. (Maxant, WV) 0050. (Patterson, Philippines) 2157 with pop vocals, time pips, W with comments and news. (MacKenzie, CA) 2213 with M/W and news. (Strawman, IA) 2300 with news and election results. (Yohnicki, ON)

NIGERIA—Voice of Nigeria, 15120 at 1635 with strong carrier, very weak audio. (Maxant, WV)

NORTH KOREA—Voice of Korea, 9650-Kujang in JJ at 2245. (Patterson, Philippines) 9975 in KK at 0905. (Ng, Malaysia) 11710 at 1239 with operatic vocals, mixing with presumed Taiwan. (Strawman, IA) 1308 with their version of news. (Strawman, IA) 13760 on their relationship with South American countries. Also 15245 with M/W talk. (Maxant, WV)

Korean Central Broadcasting Station, 11680 in KK at 0835. (Ng, Malaysia) 11710 in KK with M/W comments at 1725. (MacKenzie, CA)

NORTHERN MARIANAS—KFBS-Marpi, Saipan, 11580 in Mandarin at 1210. (Patterson, Philippines)

OMAN—Radio Sultanate of Oman, 17630 in AA with vocals at 2118. Suddenly off at 2125. (MacKenzie, CA)

OPPOSITION—Voice of Peace and Democracy (to Eritrea), 7165-Ethiopia at *0355 sign on with HOA music, several IDs, talk in (l) Tigrinya, then covered by a noise jammer at 0418. Good on //9599.7. (Alexander, PA) 9559.7 monitored at 0412 with two men in (p) Tigrinya. (D'Angelo, PA)

Voice of the People (to Zimbabwe), 9895 via Madagascar at 0400 with talks in EE, Shona and a third Zimbabwean language. Sign on was preceded by at least 15 minutes of open carrier. (Shoom, ON)

PAKISTAN—Radio Pakistan, 15100-Islamabad in Urdu at 0650. (Patterson, Philippines)

PALAU—KHBN//High Adventure Ministries, 15700-Medorn at 0720 airing (p) World Harvest Radio programming. (Patterson, Philippines)

PAPUA NEW GUINEA—Radio Northern, Popondetta (New Guinea), 3345 at 1030 with music. (Wilkner, FL)

PERU—(All in SS) Ondas del Huallaga, Huanuco, 3330 at 1015 with CHU notched, best in LSB. (Wilkner, FL)

Radio Huanta 2000, Huanta, 4746.9 in SS at 2335. (Wilkner, FL)

Radio Vision, Chiclayo, 4790 seems an irregular schedule. Off at 1000, other days 0930. (Wilkner, FL)

La Voz de la Selva, Iquitos, 4824.5 sign on and into echo effect at 0914. (Wilkner, FL)

Radio Sicuani, Sicuani, 4826.5 at 2340. (Wilkner, FL)

Radio Maranon, Jaen, 4835.4 at 1020 with rooster crow, modern, almost hip-hop numbers. (Wilkner, FL)

Radio La Hora, Cusco, 4857 at 2336 with two M and sports, presumed carrier off at 0009. (Wilkner, FL)

Radio Madre de Dios (p), Puerto Maldonado, 4949.9, carrier on at 1059 but very weak. (Wilkner, FL)

Radio Cultural Amuata, Huanta, 4955 at 1015. (Wilkner, FL)

Radio Libertad, Junin, 5039 at *1023 with ID at sign on, some transmitter drift. (Wilkner, FL)

Radio Bolivar, Ciudad Bolivar, 5460.1 noted from 2330–0000. (Wilkner, FL)

Radio Twantinsuyo, Cusco, 6173.9 at 0050 with OA music, weak but in the clear. (Wilkner, FL)

PHILIPPINES—Radio Veritas Asia, 9670 at 2330 with EE ID and into VV. (Ng, Malaysia)

Far East Broadcasting Co., 15380 opening in II at 0900, QRM from CPBS. (Ng, Malaysia)

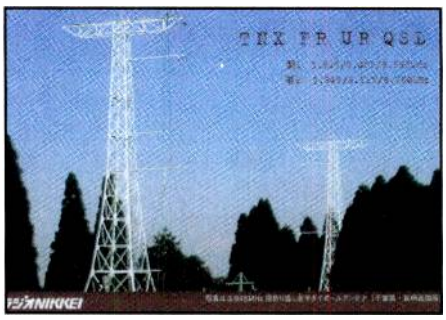
PIRATES—MAC, 6850am at 0109 with Elvis and ID "You are listening to MAC, the station that Paul Star never listens to." (Balint, OH) 6925am at 0038, 0055, 0110, 0115 with "Paul Star Show" and oldies featuring "Ultraman" as the DJ and some Elvis, some C/W, Christmas comedy, Chipmunks. (Hassig, IL)

Voice of Kaos, 6925u at 0302 with rock, frequent IDs, Gmail address. Closed at 0325 with the "Get Smart" TV theme. (D'Angelo, PA)

Voice of the Robots, 6925u at 0104 with heavy metal, '70s and '80s things. Mentioned "This is the Voice of the Robots, you are powerless to stop us, you will bow down before us" and email address. (Hassig, IL) 0119 with rock, mechanical-sounding ID and address voiceofthe-robots@gmail.com. 0126* (D'Angelo, PA) *0245 with robot-related rock, IDs intentionally garbled in a robot-like voice. (Zeller, OH)

Dead Cat Radio, 6925u at *0040, 0110 and *0223 with "cover" versions of rock oldies, sign on with "Felix the Cat" theme, meowing SFX at close. (Zeller, OH) 0110 with '60s stuff, cat meows. (Hassig,

Part of the antenna system at WMLK, Bethel, Pennsylvania. (Thanks Charles Maxant, West Virginia)



More towers! These belong to Radio Nikkei, the "other" station in Japan. (Thanks Peter Ng, Malaysia)

IL) 0140 with Linda Ronstadt songs, off at 0207*. (Balint, OH)

Radio Gaga, 6925u at 0025, 0112 and *2319 with various pop/rock numbers, some SSTV. Closed monitored at 0042, 0124, 2332. (Balint, OH) *2319–2332* with an SSTV broadcast, "Hercules" theme. (Zeller, OH)

Radio Free Euphoria, 6925u at 0145 with parody ads, and Captain??? (Hassig, IL) 0158 with Captain Ganja, canned IDs and some parodies. (D'Angelo, PA)

Outhouse Radio, 6925u at 0011 and 2118 with old instl and rock oldies, some TV themes, closing at 0043* and 2150* (Zeller, OH) 0107 and 0154 with "punk" and unidentified selections. (Hassig, IL)

XXP, 6925u at 0120 and 0135 with classic rock, address asradiostationxxp@gmail.com. (Hassig, IL)

Wolverine Radio, 6925u at *0156 and *0236 with pop and rock items, standup comedy sketches. No address. SSTV at close. (Hassig, IL)

Barnyard Radio, 6925u at 0143 on the plight of the American Indian. (Hassig, IL) 0147 with "down with America" stuff. (Balint, OH)

The Crystal Ship, 6825.9am at 0125 with rock, slogan as "Voice of the Blue States Republic," tcsshortwave@yahoo. com for reports. Also 6875.8am with rock and ID. (Zeller, OH) 6876 at 0140 with either the Soviet national anthem or the Internationale sung in English, plus rock things. (Hassig, IL)

Radio Casablanca, 6940am at 0120 with things from the big band era, Sinatra, "This is Radio Casablanca, send your reception reports to radiocasablanca@ gmail.com." (Balint, OH)

YRTK (Your Right To Know), 6930lsb at 2039 with old pop/rock, toilet "humor." Off at 2059. (Balint, OH)

KUSA, 6925u monitored at 0030 with rock, ID and address KUSAnorthamerica @gmail.com. Faded out before sign off. (Zeller, OH)

Over the Horizon Radio, 6924.5u at 2210 rock things I've never heard before. A weak and short broadcast. (Hassig, IL)

The Voice of the Otter (?) 6925u monitored at 0057 with rock, Moody Blues. (Hassig, IL)

Long Range Radio, 6925u at 0216 with rock things by Warren. Off at 0231. (Balint, OH)

Radio Mushroom, 6925u with rock. Trouble copying the address, but clear ID at 0138 close. (Zeller, OH)

Liquid Radio (?) 6925am at 0130 with dance music. (Hassig, IL)

PORTUGAL—Radio Difusora Portugal, 15295 with PP talk, and vocal. (Maxant, WV) 15560 at 1650 with sports coverage in PP. (Brossell, WI)

ROMANIA—Radio Romania International, 5975 in SS at 0248 with opera, W ancr. (MacKenzie, CA) 6150 from 0315–0330. (Linonis, PA) 9580 with news and commentary, 9690 on local elections. (Maxant, WV) 11735 on swine flu at 1712. (Fraser, ME) 11870 in Romanian at 1643. (Brossell, WI) 15195-Galbeni in Romanian at 1230. (Paterson, Philippines)

RUSSIA—Voice of Russia, 6115-Khabarovsk, opening in (l) Mandarin at 1259 and 12030-Moscow in FF at 1932. (Brossell, WI) 6170-Khabarovsk in RR at 1423, 7325 at 0355 with classical piano and 7285 in RR with vocals at 1645. (MacKenzie, CA) 9665 with *Christian Message from Moscow* at 0045–0100. (Linonis, PA) 9735 French Guiana in SS with *Cronica* at 0225, 9880-Krasnodar in SS with news magazine pgm at 0240 (Shoom, ON) 9890 at 2330 on motorcycle sports accidents. (Maxant, WV) 9890 with news at 0000. (Ng, Malaysia)

SAO TOME—Voice of America Relay, 4960 at 0407 on civil wars in Africa. (Wood, TN)

SAUDI ARABIA—Broadcasting Service of the Kingdom, 15120 at 1220 with call to prayer and Koran reading. (Paterson, Philippines) 21600 with Koran at 1250. (Ng, Malaysia)

SERBIA—International Radio of Serbia, 9675 at 0035 on passports between Serbia and Italy. (Maxant, WV) 0030–0100 with news commentary, IS, ID to 0100* close. (Linonis, PA)

SLOVAKIA—Radio Slovakia International, 7345 in GG at 1904. (Brossell, WI) 9440 in EE from 0100–0120. (Linonis, PA)

SOUTH AFRICA—Channel Africa, 6120 at 0346 with a speech. (MacKenzie, CA) 9625 at 0802 with old U.S. pops. (Maxant, WV) 15325 at 1654 with highlife music to 1700 ID. (Brossell, WI)

SPAIN—Radio Exterior de Espana, 6055 in SS at 0404, 6125 Costa Rica Relay in SS at 0336, 9620 in SS at 0335, 9630 Costa Rica in SS at 0348, 11815 Costa Rica in SS at 1656, 15110 in SS at 2212, 15130 Costa Rica in SS at 2245 and 17850 Costa Rica in SS at 2123. (MacKenzie, CA) 11910 in SS at 1235. (Ng, Malaysia)

SRI LANKA—Sri Lanka Broadcasting Corp., 11905-Ekala in Tamil at 1235. (Patterson, Philippines)

SUDAN—Sudan Radio TV, *0218 to 0429* with brief Koran recitation, into AA talk, Koran again, AA talk monitored at 0239, variety of local HOA music. (Alexander, PA) 0305 in AA with (p) news. (Strawman, IA) 0406–0431 two M with news in AA, f/by discussions. (D'Angelo, PA)

SWEDEN—Radio Sweden, 6010 via Canada at 0254, two W with comments, two M with comments on Swedish language. (MacKenzie, CA) 0330 with *News and Views*. (Patterson, IL) 0510 in Swedish. (Maxant, WV) 11550 via Madagascar in Swedish at 0220. (Ng, Malaysia) 13600 (direct) at 15440 on patient safety. (Fraser, ME)

SWAZILAND—Trans World Radio, 4775 at 0458, barely audible with traditional southern hymns. (Wood, TN)

SYRIA—Radio Damascus, 12085 at 2109, enough audio to be almost listenable. (Strawman, IA)

TAIWAN—Radio Taiwan International, 5950 via Florida at 0300–0315 with weather for various Asian cities. (Linonis, PA) 0345 with U.S. pops. (Maxant, WV) 11605 with JJ talk at 0820 and 15320 with *We've Got Mail* pgm at 0315. (Ng, Malaysia) 15320-Paochung with *Instant Noodles* pgm at 0355. (Patterson, Philippines)

Sound of Hope, 7280 in CC at 1231. (Brossell, WI)

TUNISIA—RTV Tunisienne, 7275-Sfax at 0440 with ID, soft instls and more modern ME pops. (Wood, TN) 9720 in AA at 1943. (Brossell, WI)

TURKEY—Voice of Turkey, 5975 at 0310 with *Review of the Turkish Press* and a discussion on Iran's election. (Linonis, PA) 7205 in GG at 1102. (Brossell, WI) 7325 with Turkish music at 0315 and comment on a Turkish festival. (MacKenzie, CA) 7325 at 0430. (Patterson, IL) 15450 at 1245 with an ID. (Badman, NY)

UGANDA—Radio Uganda, 4976 at 0320 with melodic percussion music to 0330. (Shoom, ON)

UKRAINE—Radio Ukraine International, 7440 at 0030 discussing medicinal flowers. (Brossell, WI) 0307 with talks in UU. (Brossell, WI) *2358 sign on with light instls to TOH when IS and W ancr opening. (D'Angelo, PA)

UNITED STATES—Voice of America, 5890 Northern Marianas Relay in KK at 1350, 9545 Philippines Relay in CC at 0345 and 9885 at 0425 mentioning Niger. (MacKenzie, CA) 6060 Philippines in VV at 2305. (Ng, Malaysia) 7360 Philippines in KK at 2029, 9510 on world recession at 1226, 11785 Thailand Relay in CC with EE sound bites and 11990 Northern Marianas in CC at 1222. (Brossell, WI) 9760 Philippines with *Earth*

and Sky pgm at 1412. (Strawman, IA) 9885 to Africa with *Press Conference USA*, off at 0500. (Shoom, ON) 9885-Greenville in EE/SS at 1235. (Fraser, ME) 13705 Thailand Relay in II at 0020. (Ng, Malaysia) 15590 at 1250. (Badman, NY)

WYFR/Family Radio, 9465 via Irkutsk in (I) Korean at 1225. (Brossell, WI) 9615 via Russia with *Open Forum* at 1435. (Ng, Malaysia) 13695 at 1715. (Fraser, ME)

Radio Farda, 7280 at 0310 with U.S. pops and 7580 via Sri Lanka in Farsi at 2030. (Brossell, WI) 15475 in Farsi at 0820, off at 0830. (Ng, Malaysia) 15600 via Sri Lanka in Farsi at 0710. (Patterson, Philippines)

Radio Free Asia, 17835 via Saipan in Burmese at 0036. (MacKenzie, CA)

WBCQ, Monticello, 7415 at 0045, 15420 at *1655. (Maxant, WV) 7415 at 0310. (MacKenzie, CA)

Radio Free Afghanistan, 15680 via Sulaibiyah, Kuwait in Pashto at 0910. (Patterson, Philippines)

WHRI, 9825-Cypress Creek, at 0454. (Shoom, ON)

WWCR, Nashville, 7465 at 2205. (Fraser, ME) 15825 monitored at 1513. (Yohnicki, ON)

WEWN, Birmingham, 11520 at 0225. (Badman, NY) 11520 at 0305 and 15610 at 2335. (Maxant, WV) 11530 at 1205. (Patterson, Philippines)

WRMI, Miami, 9955 at 0100-0130 with the *Happy Station* pgm. (Linonis, PA) 0259 with Radio Prague relay. (Shoom, ON) (*now discontinued—gld*) 0750 closing feature and into *Wavescan*. (Maxant, WV) 1920. (Brossell, WI)

WRNO, New Orleans, 7505 at 0335. (Maxant, WV)

AFN/AFRTS-5446.5u-Key West at 0422. (Wood, TN) 0015, and 7811u-Key

West at 0015 and 12133.5u-Key West at 0020. (Maxant, WV)

WWRB, Manchester, 3185 at 0512. (MacKenzie, CA) 7405 in SS at 1233. (Fraser, ME)

VATICAN—Vatican Radio, 6040 at 0400 with Bible quotes. (Patterson, IL) 7305 in SS at 0318. (MacKenzie, CA) 11625 in listed Hausa heard at 1636. (Brossell, WI)

VENEZUELA—Radio Nacional, 6060 at 1100–1200 with EE news at 1102–1112. Also 13680//15250 at 2300–0000 with first half hour mostly in EE. All via Cuba. (Fraser, ME) 13680 in SS at 2344 and 9735 in SS at 0325. (MacKenzie, CA)

VIETNAM—Voice of Vietnam, 6175 via Canada at 0325 in SS/EE. (MacKenzie, CA) 0430 with a current affairs pgm. (Patterson, Philippines)

ZAMBIA—The Voice-Africa, 4965 at 0410 with religious songs and a sermon. (Brossell, WI) 13590 in EE at 1503, but weak. (Yohnicki, ON)

ZIMBABWE—Zimbabwe Broadcasting Corp., 4828 at 2320 with music fading in and out. (Wilkner, FL)

And, once again, order is restored! Thanks and high fives to everyone, and a warm welcome to the newbies who checked in this time. The gang this month was Peter Ng, Jahor Bahru, Malaysia; Stewart MacKenzie, Huntington Beach, CA; Jack Linonis, Hermitage, PA; Lee Badman, Jordan, NY; T.C. Patterson, Cebu, Philippines; George Zeller, Cleveland, OH; Rich D'Angelo, Wyomissing, PA; Jerry Strawman, Des Moines, IA; Robert Wilkner, Pompano Beach, FL; William Hassig, Mt. Prospect, IL; Michael Yohnicki, London, ON; Charles Maxant, Hinton, WV; Bruce Patterson, Chenoa, IL; Dave Balint, Wooster, OH; Robert Brossell, Pewaukee, WI; Robert Fraser, Belfast, ME; Brian Alexander, Mechanicsburg, PA; Joe Wood, Greenback, TN; Greg Shoom, Toronto, ON; and Fotios Padzapulos, NJ.

Thanks again to each of you—and until next month, good listening!

In Times Past...

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

Venezuela—Radio Bocono, Bocono, 5010 at 0123 on November 20, 1965 with its SS domestic programming. (Dexter, WI)

Exploring The World On A Radio DXpedition

by Bruce A. Conti
BAConti@aol.com

"The Maritime Provinces of Canada have long been a favorite destination of North American DXpeditioners. Saltwater path exposure to Africa, Europe, and South America fills the radio dial with exotic signals on any given night."

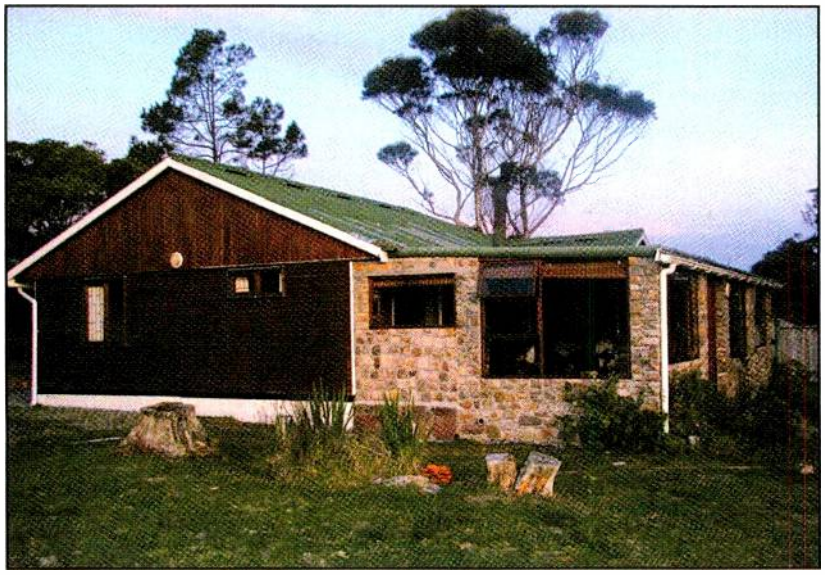
Since the famed 1991 Newfoundland DXpedition celebrating the 90-year anniversary of the historic first Marconi transatlantic wireless communication, the DXpedition has become an integral part of AM broadcast band (or mediumwave) long-distance listening (DXing).

Here in the Northern Hemisphere, November is considered one of the best months for DXpeditions, so we dedicate this month to all who have braved carrying suspicious radio gear through airport security, erecting antennas over rough terrain in foul weather, and explaining the CIA-like activity to innkeepers, curious passers by, and sometimes local law enforcement.

Such are the risks we DXpeditioners take to catch an elusive signal, add a country to the log-book, or receive signals that could never be heard at home. Five representative DXpeditions out of many solo and group sessions held over the past year have been chosen to try to capture the DXcitement. Narratives of the DXpeditioners are followed by selected logs. All times are UTC.

Cape Point, South Africa

Many a DXer has dreamed of a South African radio safari. The southern tip of Africa is an outstanding region for DXpeditioning due to Atlantic and Indian Ocean saltwater paths. Fortunately for those of us unable to make the long journey to such an exotic locale, we can still enjoy the experience through DXers lucky enough to live in this radio active part of the world. The following report and logs come from South African resident Graham Bell who describes a solo DXpedition:



The rustic DXpedition cottage at Cape Point, South Africa.

I spent a couple of nights at Elands Cottage in the Cape Point Reserve, south of Cape Town. It's a comfortable cottage with lots of space around (for antennas). I put out two Beverage-On-Ground (BOG) antennas, one of 250-m at 310 degrees and another of 320-m at 320 degrees. I also had a shorter 80-m longwire pointing to magnetic north. Though the two BOG antennas were on a very similar bearing but of differing lengths, I can't say either one was systematically better than the other (front, back or null). What I found was that it was useful to have the option to switch from one to the other to fine tune the incoming signal. In some cases they gave very different results. I used both my Drake R8 and NRD-545. The Drake hasn't had many outings in recent years so it was a good chance to be reminded of what a good receiver it is, especially in the quiet conditions we enjoy in these parts. Highlights were a fair signal from XEPE San Diego, two Philippines stations and "local" stations Emissora Provincial de Bengo, Angola and Radio Benue, Makurdi, Nigeria. The AM dial used to be peppered with Angolans, Cameroonians, and Nigerians but there aren't many left. These two came in with really fine signals and audio with interesting local programming, especially Makurdi.

590 LS4 Radio Continental, Capital Federal, Argentina, at 0557 Spanish panel discussion, IDs; good signal.

594 Federal Radio Corp. of Nigeria, Kaduna, Nigeria, at 1920 chants parallel 6089.84 kHz; good.

729 5RN Adelaide, Australia, at 1530 heard with ABC news; good.

801 AIR Jabalpur, India, at 1734 news in English; fair.

820 Radio Paradise, St Kitts & Nevis, at 0305 U.S. preacher; fair.

850 WEEI Boston, Massachusetts, at 0548 mentioned website, "WEEI dot com," fair.

891 5AN Adelaide, Australia, at 1603 *Country Hour* program; peaking over Lesotho.

The full moon rising over the Fish Hoek, South Africa, DXpedition site was like a beacon toward Australia.

918 Radio Benue, Makurdi, Nigeria, at 1930 local beer ads, classified news, interviews in English; very good.

930 CX20 Radio Montecarlo, Montevideo, Uruguay, at 1959 IDs in Spanish, trumpets into news; fair.

990 6RPH Perth, Australia, at 1615 tennis coverage; fair.

1040 ZYK537 Radio Capital, São Paulo, Brazil, at 0621 ID in Portuguese and a Bob Dylan song; good.

1044 AIR Mumbai A, India, at 1702 ragas parallel 4810 kHz; fair.

1070 LR1 Radio El Mundo, Capital Federal, Argentina, at 0620 heard ID in Spanish; fair.

1116 6MM Mandurah, Australia, at 1705 pop music; good.

1125 5MU Murray Bridge, Australia, at 1552 songs by The Bee Gees and Roxy Music; fair.

1134 Emissora Provincial do Bengo, Caxito, Angola, at 2058 full local ID in Portuguese, drums, trumpets, then Radio Nacional network news on the hour.

1180 ZYJ463 Radio Mundial, Rio de Janeiro, Brazil, at 0613 ID in Portuguese, "Radio Mundial AM 1180," good.

1380 CB138 Radio Corporación, Santiago, Chile, at 0603 ID and time check in Spanish; good.

1450 Radio El Sol, Capital Federal, Argentina, at 0344 U.S. pop songs, Spanish ID; good.

1512 DYAB Cebu City, Philippines, at 1602 callsign ID and "midnight approaches," fair.

1530 DZME Quezon City, Philippines, at 1604 sign-off with license numbers in English and anthem; fair.

1540 ZNS1 Nassau, Bahamas, at 0149 gospel program with the Hillside Missionary Choir; strong.

1550 ZYK590 Radio Guarujá AM, Brazil, at 0615 ID in Portuguese; good.

1700 XEPE Tecate, Mexico, at 0504 baseball program, *Home of the Padres* ID; fair under KVNS Texas.

Fish Hoek, South Africa

Fish Hoek is further north on the Atlantic coast of South Africa yet trans-Indian Ocean DX is still possible, enhanced by minimal land blockage and a great circle bearing that follows the curvature of the Earth around the Cape. Local DXpeditioner Gary Deacon shares his experiences, the DXpedition location and set-up, and radio catches:

The second quarter of 2009 proved to be an excellent season for MW reception from Australia with 104 stations heard including 13 South African firsts. Highlights included the reception and first time positive identification of 5LN Port Lincoln on 1485 kHz (200 watts) over a distance of 6200 miles, and 5LC Leigh Creek (200 watts) over 6502 miles. Perhaps the most remarkable reception occurred when 2RN Wilcannia (100 watts) or 4HU Hughenden (50 watts) also made it through on 1485 kHz, while 2WA Wilcannia (100 watts) or 5WM Woomera (50 watts) occupied 1584 kHz.

Vacant land opposite my DX location forms part of the Silvermine Nature Reserve. By good fortune the reserve includes a green wetland corridor aligned towards Australia. I set up a 220-meter BOG antenna just under 1 kilometer from the False Bay coast directed at 120 degrees towards Perth. I parked my car adjacent to the DX location and listened with an inductively coupled Sony SRF-M37V ultralight receiver. I simply wrapped a few turns of the near end of the BOG around the radio. The SRF-M37V has turned out to be an impressive performer in the Cape Peninsula/South Africa RF environment with very few local AM stations.

540 4QL Longreach, Australia, at 1740 with *Overnights* program, "ABC Western Queensland" ID; poor with fair peaks.

693 5SY Streaky Bay, Australia, at 1832 promo, "ABC South Australia and Broken Hill," and *Overnights* with Trevor Chappell; fair.

693 6WR Kununurra, Australia, at 1809, "The best of country music on 98.9 FM," part of the National Indigenous Radio Service, a satellite network of over 120 community radio stations across Australia.

774 3LO Melbourne, Australia, at 1935 with weather, "774 ABC" ID, traffic for Melbourne, and time check, "24 to 7."

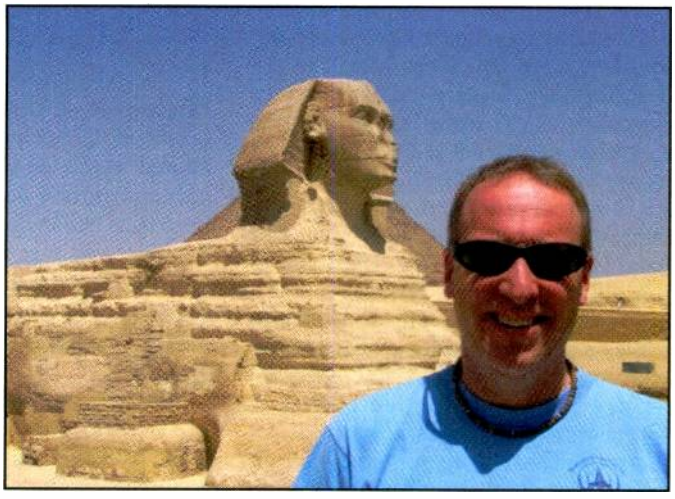
801 5RM Beri, Australia, at 1830, "...the best songs of all time, this is 5RM," and pop music with ads in between; poor.

891 5AN Adelaide, Australia, at 2101 with news; very good peak over co-channel Radio Lesotho.

972 5PB Adelaide, Australia, at 2029 traffic report and "Newsradio" ID; logged as a South African first.

1026 4MK Mackay, Australia, at 1738 with ad and 4MK ID; poor. A return to their original AM frequency from FM, and logged as a South African first.

1062 4TI Thursday Island, Australia, at 1713 with *Overnights*; mixing with 5MW on the same network delayed one second. The most distant Australian station from Fish Hoek.



Broadcast DXer Steve Wood says the Sphinx was far more impressive than the radio reception while he was vacationing in Egypt.

1116 6MM Mandurah, Australia, at 1647 with ad for "Imago Shop 5, 16 Sholl Street, Mandurah," followed by "6 Double M" ID and pop music; good with huge peaks.

1242 5AU Port Augusta, Australia, at 1948, "Music we've lived, music we've loved, music that defines us on 5AU," and pop music; very good.

1323 5DN Adelaide, Australia, at 1811 Elvis Presley "Wooden Heart," then ID, "Adelaide's Cruise 1323," followed by Doris Day "Que Sera Sera."

1395 5AA Adelaide, Australia, at 1931, "1395 Adelaide's 5 Double A," time check and four day weather forecast; very good.

1467 3ML Mildura, Australia, at 1940, "The Easy Mix 1467" and "Holding Back the Years" by Simply Red; fair.

1512 6BAY Morawa, Australia, at 1715, "Classic gold, today's hits, the Spirit 98.1 Geraldton," and pop music; fair with good peaks.

1593 3RG Melbourne, Australia, at 1752 with sign-on in Italian and English, "You are listening to Radio Rai Italia, a Rai International Channel broadcast...via satellite and on the Internet www.international.rai.it." A South African first.

1602 5LC Leigh Creek, Australia, at 1812, "ABC South Australia and Broken Hill," then at 1905 weather for South Australia including Adelaide. A South African first.

Cairo, Egypt

No matter where your travels may lead, it's always good to bring along a radio for at least some casual DXing. Such was the case for vacationing DXer Steve Wood, who shares his radio activity with us here:

I just flew in from Cairo and boy are my arms tired! My vacation to Egypt was everything I expected. The monuments, the temples, the tombs, and the pyramids were as spectacular as you could imagine and more so. Unfortunately the radio listening was not anywhere near what the country itself was. I was disappointed with the performance of my Eton E-100. I know some have praised this receiver but my experience has been different. I found it very susceptible to noise and images, especially on shortwave. While on a cruise ship along the Nile it suffered interference from engine noise and the bug zappers on the top pool deck. Reception in the cabin was non existent. This made listening very limited. In Cairo the hotel was at a main bridge over the Nile which lead into a major highway that our tiny balcony looked out over. Cairo traffic is the loudest I've ever heard and this made listening on the balcony nearly impossible. These factors along with the go-go nature of our tours did not make for much listening time. That being said I do have a few loggings to pass along.

603 IRIB Zahadan, Iran, at 1615 call to prayer, recitations in Farsi; very good signal.

702 ERTU Aswan, Egypt, at 2226 *Meeting Point* interview program in English with an Islamic scholar on the Prophet's wife and her roll in development of Islam; good.

1431 Radio Sawa, Arta, Djibouti, at 2234 a DJ in Arabic with pop music; good.

1494 Radio Jordan, Al Karanah, Jordan, at 1835 Arabic vocals; very good.

1584 ERTU Edfu, Egypt, at 1845 a call-in show in Arabic; good.

Rockport, Massachusetts

Closer to home, the Boston Area DXers held another successful summer DXpedition to Granite Pier in Rockport overlooking the open Atlantic. This is an annual event demonstrating the latest gear and the how-to's of transatlantic AM broadcast band reception. Most noteworthy this year was the use of broadband terminated loop antennas by all DXers. Participant Gary Thorburn, KD1TE, checks in with us as follows:

It was very exciting for me. This was my first trip to the Pier with a SuperLoop, which could be nulled off the backside, offering a cardioid reception pattern. With Boston and New York City generally behind the antenna, the DX to the east was much better than with the bi-directional tuned loop I had used previously. The SuperLoop belongs to the same family of terminated, untuned, single-loop vertical plane wire antennas as the Delta, Flag, and Pennant. An example of how well the null on my loop was working could be heard by tuning to 590 kHz. This, of course, brought in WEZE Boston, but being off the back of the antenna, it was attenuated to the point that co-channel VOCM St. John's, Newfoundland, was audible at about the same volume level as WEZE. Many transatlantic signals were armchair copy at times (or would have been if I remembered to bring Babelfish headphones to translate).

783 Radio Mauritanie, Nouakchott, Mauritania, at 0030 African vocals; good.

819 ERTU Batra, Egypt, at 0031 typical Middle Eastern string music; fair.

837 France Info, Limoges, France, at 0030 fanfare with ID into news by a woman in French; good.

899.52 ZYJ454 Radio Tamoio, Rio de Janeiro, Brazil, at 0030 het against 900 kHz; poor tropical DX conditions overall.

909 BBC Radio 5 synchros, United Kingdom, at 0028 good with synchro echo; telephone news/talk, "...this is Five Live," and news in brief.

1116 SER synchros, Spain, at 0100 fair, over unidentified music; "Cadena Ser, servicios informativos."

1134 Glas Hrvatske, Zadar, Croatia, at 0010 noted at almost local-like strength over co-channel Spain.

1170 Radio Sawa, Al Dhabiya, United Arab Emirates, at 0059 over/under WWVA and an unidentified signal (perhaps Iran); emotive contemporary Middle Eastern vocal.

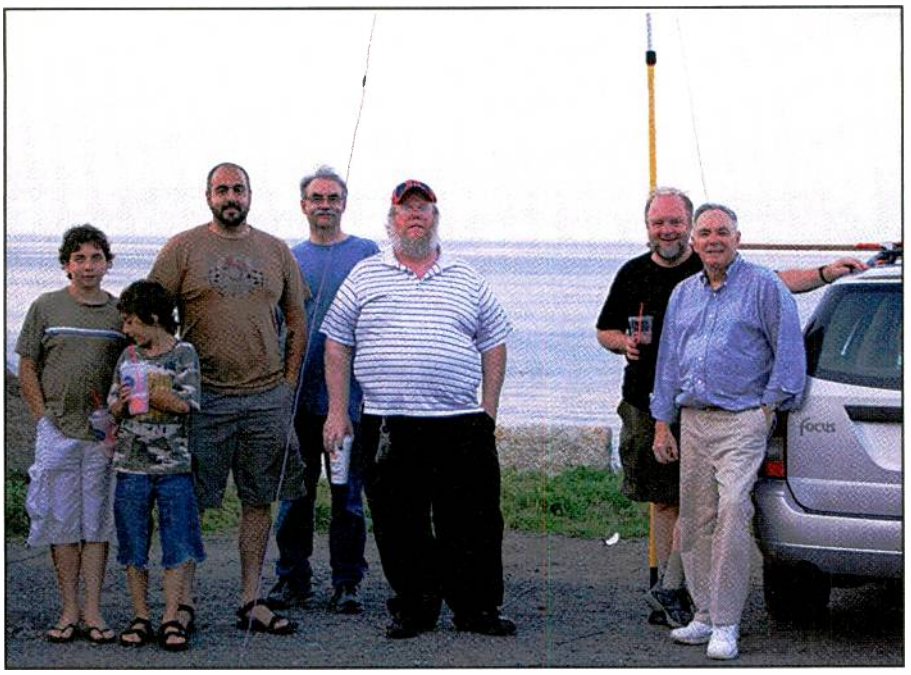
1179 SER synchros, Canary Islands

This Month in Broadcast History

75 Years Ago (1934)—The first Detroit Lions Thanksgiving Day football game was broadcast nationwide on 94 NBC network radio stations (www.detroitlions.com). Radio station KYW Chicago was testing a new transmitter in Philadelphia where KYW was later relocated. "Santa Claus Is Coming to Town" was heard in public for the first time, sung by Eddie Cantor during his weekly national radio show.

50 Years Ago (1959)—"The 100 Best Tunes in the World" as compiled through research by presenter Alan Keith premiered on BBC radio. The program ran for 44 years, consisting primarily of classical and opera selections, the most popular being "Au fond du temple saint" from "The Pearl Fishers" by Georges Bizet.

25 Years Ago (1984)—The RTÉ FM3 Classical Music network, predecessor to the present-day RTÉ Lyric FM, commenced broadcasting in Ireland. The CBS Evening News ran a piece about pirate radio in England including the popular Laser 558 broadcasting from international waters.



Beneath a 23-foot Delta antenna on Granite Pier, Rockport are Tom Howell, Jr. KB1RBS, Jake Howell, KB1RBR, Tom Howell, Sr. K1NKA, Mark Connelly, WA1ION, Bill Poulin, WZ1L, Gary Thorburn, KD1TE, and Chris Black N1CP.

and Spain, at 0100 good with synchro echo, over an unidentified signal; "Cadena Ser, servicios informativos" parallel 1116 kHz.

1188 Radio Payam, Tehran, Iran, at 0100 Koranic vocal, then signature three ascending chimes into news. Thanks to Chuck Hutton, Sylvain Naud, and Mauno Ritola of RealDX for help with ID.

1206 France Info, Bordeaux, France, at 0012 an orchestra instrumental, then a woman in French; good.

1215 Absolute Radio synchros, United Kingdom, at 0014 good, over co-channel Spain; pop/rock music including Blondie "Heart of Glass."

1220 ZYJ458 Radio Globo, Rio de Janeiro, Brazil, heard at 0037 good to excellent during a brief opening; sports commentary in Portuguese with usual reverb and whistles.

1305 RNE5 synchros, Spain, heard at 0200 good with synchro echo; "Radio Nacional de España, Informativos," parallel 1314 kHz.

1341 BBC Radio Ulster, Lisnagarvey, Northern Ireland, at 0200 "This is Five Live," into news; good.

1377 France Info, Lille, France, at 0200 fanfare into *Le Journal* news; good.

1404 France Info synchros, France, at 0158 orchestra instrumental, then fanfare into news, parallel 1377 kHz.

1422 Deutschlandfunk, Heusweiler, Germany, at 0145 classical instrumentals; good.

1557 France Info, Fontbonne, France, at 0130 fanfare, woman with news in French; excellent signal.

Priest Pond, Prince Edward Island

The Maritime Provinces of Canada have long been a favorite destination of North American DXpeditioners. Salt-water path exposure to Africa, Europe, and South America fills the radio dial with exotic signals on any given night. Yet rare signals from the west are also possible as evidenced by the following catches of DXpeditioners Chris Black and Brent Taylor. First we hear from Chris:

I spent three very enjoyable days at the north shore Priest Pond cottages on Prince Edward Island with fellow DXers Brent Taylor (who organized the event), Niel Wolfish, Phil Rafuse and Goeff Rivett. It was definitely the most fun you can have with your clothes on! For the first night, Brent and Niel set up a Ewe antenna while I ran about 400 feet (of a 1000-ft spool) in an easterly direction along the bluff and just dropped the spool. I ran about 30 feet of coax out to a magnetic longwire balun with no ground and connected the wire. It was getting dark and I didn't have time to set up a portable Flag and we wanted to start DXing. The plan was to DX transatlantic signals from a couple hours before sunset

The Prince Edward Island DXpedition team: Chris Black, Phil Rafuse, Brent Taylor, Niel Wolfish, and Geoff Rivett.

until too tired to go any more and then get up about 4 a.m. to try for the west. I actually got KNX one early morning on the back end of my makeshift wire. The next day I set up my portable 20 x 65-ft Flag with a 16:1 transformer at the east end and a fixed 850 ohm resister on the back. The flag basically just kicked butt and left the Ewe in the dust. I was getting Saudi "arm-chair" at 1900 UTC on the Flag while Niel was only getting hets on the Ewe. Though we did have some Asian hets, we never achieved the Holy Grail of India, Thailand, or Japan, just a lot of good across-the-band DX, much of which was new for me.

Regarding Asian hets, Brent Taylor adds:

In the early morning between 1007 and 1012 UTC we noted carriers on 747, 585.5, 1071, 1521, and 1512 kHz. They were not strong enough to extract any audio, but clearly this was not Europe as all of the darkness path was to our west. We tried in vain for signs of carriers on 1575 and 1566 kHz also. It seems likely that we had China and Japan way back there somewhere.

550 KFYR Bismarck, North Dakota, at 0953 Bismarck weather, "K-Fire 550" ID; good.

550 YVKE Caracas, Venezuela, at 2253 mixing with WGR Buffalo; same Chávez speech as on 750 RCR Caracas, but behind by a couple of seconds.

570 HIMS Radio Cristal, Santo Domingo, Dominican Republic, at 2321 "Radio Cristal, Santo Domingo" ID heard twice; over co-channel Radio Reloj Cuba.

630 RTT Tunis, Tunisia, at 0105 roughly equal with co-channel WPRO; typical North African/Arabic fare. At 2243 strong with talk in Arabic and music on a stringed instrument.

702 RMC Col de la Madone, France, at 2144 relay of China Radio International in French; fair mixing with an unidentified Mid-Eastern music station.

720 KNR Simiutaq, Greenland, at 2157 Inuit-type talk and time pips at 2200, music stinger with what sounded like a news break, then religious programming with native language version of the hymn "What a Friend We Have in Jesus" at 2205. Amazingly clear signal on top of WGN Chicago for a long time.

873 AFN Power Network, Oberursel-Weißkirchen, Germany, at 2245 CCR "Fortunate Son" followed by Sister Sledge "We Are Family," then "Armed Forces" ID in American English at 2249 and additional "AFN Radio" mention at 2251; excellent signal.

1026 Jigawa Broadcasting Corp., Dutse, Nigeria, at 2234 presumed with flute and other high-pitched African sounding instrument, man in African sounding language; good over SER Spain. At 2246 a man in an African language speaking very quickly.

1070 KNX Los Angeles, California, at 0815 "KNX News Radio" ID, weather in Hollywood, talk about fires jumping freeways; fair under CHOK.

1152 Gold Plymouth 1152 AM, Plumer Barracks, England, at 0103 oldies music and "1152 AM Plymouth" ID; good.

1152 Clyde 2, Dechmont Hill, Scotland, at 2102 a Scottish-accented woman reading news, including story of a major fire in Glasgow. "Clyde 2" ID and jingle at end of news into request hour and "Little Lies" by Fleetwood Mac.

1278 France Bleu, Sélestat, France, at 2219 parallel to 864, 1404, and 1494 kHz with "Le Freak" by Chic.

1287 Galei Zahal, Ramle, Israel, at 2328 parallel 6973 kHz with a man in Hebrew, then Israeli music; good, over co-channel SER Spain.

1341 BBC Radio Ulster, Lisnagarvey, Northern Ireland, at 2047 songs by Aretha Franklin and Bob Dylan, ID and BBC news at 2100; very good, mixing with an unidentified Slavic language station, presumed Hungary.

1368 Manx Radio, Foxdale, Isle of Man, at 2116 a plumbing spot, then a PSA for condom use, "Manx Radio" ID and jingle; good.

1521 BSKSA Duba, Saudi Arabia, at 1943 good with talk parallel to both 9555 and 9870 kHz. No 1520 domestic stations audible yet.

1700 XEPE Tecate, Mexico, at 1032 "San Diego 1700 AM" ID and the Dennis Miller Show. At 1130 "San Diego 1700 AM" ID and station promos for the Michael Reagan show.

The Ears Have It

A DXpedition is a good proving ground for antennas, and the antennas of choice for these DXpeditioners were the Beverage-On-Ground (BOG) and the terminated broadband loop, both of which produce a unidirectional beam. The BOG antenna is the same as the classic Beverage wave-guide antenna except that it lies on the ground rather than being supported a few feet above ground. Simply roll out a few hundred feet of insulated wire in a straight line toward the desired direction of reception, terminate the end to ground, and you have a BOG antenna. For more information about the terminated broadband loop antenna family, see last month's issue of *Popular Communications*, where it was described in greater detail, or view construction diagrams online at ¡BAMLog! (www.bamlog.com).

For Your Own DXpedition...

If after reading this you decide to attempt your first DXpedition, it's always a good idea to test-drive your setup before making a long-distance trip to a remote location. Also create a checklist so you don't forget anything. Nothing could be worse than arriving on location only to find that an antenna connector isn't working properly or an essential piece of gear was left behind. Be prepared with a backup radio just in case your primary receiver bites the dust. Even a modest "ultralight" portable for backup will prevent your trip from being a total loss. Have a couple extra copies of this magazine handy to help explain that people really do this. Last but not least, have fun exploring the world on a radio DXpedition, and then share your experience with all of us here at *Popular Communications*.

Until next time, 73 and Good DX! ■

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

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

UTC	Freq.	Station/Country	Notes
0000	11620	All India Radio	
0000	15250	CVC, Australia	
0000	15240	Radio Australia	
0000	11590	Radio Cairo, Egypt	
0000	4409	Radio Eco, Bolivia	SS
0000	17835	Radio Free Asia, USA	Burmese
0000	7440	Radio Ukraine International	
0000	4717	Radio Yura, Bolivia	SS
0000	15295	RDP International, Portugal	PP
0000	11905	Seri Lanka Broadcasting Corp.	EE, others
0000	9665	Voice of Russia	
0000	7415	WBCQ, Maine	
0000	4451	Radio santa Ana, Bolivia	SS
0030	7375	Croatian Radio/Voice of Croatia, via Germany	
0030	9675	International Radio of Serbia	
0030	5025	Radio Rebelde, Cuba	SS
0100	6070	CFRX, Canada	
0100	9495	Islamic Republic of Iran Broadcasting	
0100	5910	Marfil Estereo, Colombia	SS
0100	6140	Radio Havana Cuba	SS
0100	11780	Radio Nacional Amazonia, Brazil	PP
0100	9440	Radio Slovakia International	
0100	7270	Voice of Russia, via Armenia	
0100	6973u	Galei Zahal, Israel	HH
0200	5090	Caribbean Beacon, Anguilla	
0200	4905	Radio Anhanguera, Brazil	PP
0200	4800	Radio Buenas Nuevas, Guatemala	SS
0200	5860	Radio Farda, USA, via Kuwait	Farsi
0200	11760	Radio Havana Cuba	SS
0200	3250	Radio Luz Vida, Honduras	SS
0200	3320	Radio Sondergrense, South Africa	Afrikaans
0200	6020	Radio Victoria, Peru	SS
0200	4790	Radio Vision, Peru	SS
0200	9420	Voice of Greece	Greek
0200	9735	Voice of Russia, via French Guinea	SS
0200	9955	WRMI, Florida	
0200	7505	WRNO, Louisiana	
0200	15275	Radio Thailand	
0300	6120	Channel Africa, South Africa	
0300	9570	China Radio International, via Albania	CC
0300	9825	Deutsch Welle, Germany, Portugal Relay	GG
0300	9780	HCJB Global, Ecuador	GG
0300	15325	NHK Radio Japan	JJ
0300	6165	Radio Chad	FF
0300	4780	Radio Djibouti	AA
0300	7110	Radio Ethiopia	Amharic
0300	6055	Radio Exterior de Espana, Spain	SS
0300	7280	Radio Farda, USA, via Germany	Farsi
0300	13790	Radio Havana Cuba	SS
0300	7200	Radio Omdurman, Sudan	AA
0300	7345	Radio Prague, Czech Republic	
0300	9870	Radio Prague, Czech Republic	
0300	6150	Radio Romania International	
0300	5950	Radio Taiwan International, via Florida	
0300	6110	Radio Tirana, Albania	Albanian
0300	4976	Radio Uganda	
0300	7305	Vatican Radio	SS
0300	5980	Voice of the Tigray Revolution, Ethiopia	Amharic
0300	5975	Voice of Turkey	
0300	4828	Zimbabwe Broadcasting Corp.	
0300	15355	Radio Sultanate of Oman	AA
0330	9690	China Radio International	
0330	5010	Radio Madigasikara, Madagascar	Malagasy
0330	6165	Radio Nederland Relay, Bonaire	SS
0330	7425	RadioTirana, Albania	
0330	3240	Trans World Radio, Swaziland	various
0330	6175	Voice of Vietnam, via Canada	
0400	7811	Armed Forces RadioTV, Florida	usb
0400	6030	CFVP, Canada	
0400	4965	The Voice-Africa, Zambia	
0400	7245	Deutsche Welle, Germany, Rwanda Relay	
0400	9480	Deutsche Welle, Germany, Rwanda Relay	GG
0400	9895	Islamic Republic of Iran Broadcasting	AA
0400	9805	Radio France International	
0400	4960	Voice of America Relay, Sao Tome	
0400	7165	Voice of Peace and Democracy, Ethiopia	Tigrinya
0400	9895	Voice of the People, via Madagascar	EE,others
0400	7325	Voice of Turkey, via Canada	
0400	15285	Broadcasting Service of the Kingdom, Saudi Arabia	AA
0430	13840	Radio Dabanga, Sudan, via Madagascar	AA
0430	7275	RT Tunisienne, Tunisia	AA
0430	4775	Trans World Radio, Swaziland	GG, others

UTC	Freq.	Station/Country	Notes
0500	4985	Radio Brazil Central	PP
0500	5005	Radio Nacional, Equatorial Guinea	SS
0500	4950	Radio Nacional, Angola	PP
0500	6250	Radio Nacional, Equatorial Guinea	SS
0500	6010	Radio Sweden, via Canada	Swedish
0500	4800	Radio Transcontinental, Mexico	SS
0500	9825	WHRI, South Carolina	
0500	3185	WWRB, Tennessee	
0600	6010	La Voz de su Concencia, Colombia	SS
0600	6185	Radio Educacion, Mexico	SS
0600	4845	Radio Mauritanie, Mauritania	AA
0600	3340	Radio Misiones International, Honduras	SS
0700	6010	Radio Incondfidencia, Brazil	PP
0700	9541v	Solomon Islands Broadcasrting Corp.	
0800	11750	HCJB, Australia	
0800	6170	Radio New Zealand International	
0800	11605	Radio Taiwan International	JJ
0800	9635	Radio TV du Mali	
0800	9690	Voice of Nigeria	
0900	15380	Far East Broadcasting Co., Philippines	II
0900	7295	Radio TV Malaysia	FM relay
0900	15200	Trans World Radio, Guam	Bangla
0930	3280	La Voz del Napo, Ecuador	SS
1000	3220	HCJB Global, Ecuador	QQ
1000	4955	Radio Cultural Amuata, Peru	SS
1000	4805	Radio Difusora do Amazonas Brazil	PP
1000	5040	Radio Liberatad, Peru	SS
1000	3310	Radio Mosoj Chaska, Bolivia	SS
1030	1100	Radio Northern, Papua New Guinea	Tok Pisin
1100	7370	KNLS, Alaska	RR
1100	11680	Korea Central Broadcasting Station. Korea	KK
1100	15560	Radio Australia	
1100	15455	Radio Canada International	SS
1100	6010	Radio Mil, Mexico	SS
1100	15540	Radio Nederland, Bonaire Relay	DD
1100	4451.5	Radio Santa Ana, Bolivia	SS
1200	9720	Adventist World Radio, Guam	CC
1200	9740	BBC, Singapore Relay	
1200	7245	China National Radio	EE/CC
1200	15150	Islamic Republic of Iran Broadcasting	AA
1200	11580	KFBS, Northern Marianas	Mandarin
1200	15700	Radio Bulgaria	BB
1200	13640	Radio France International	
1200	7405	Radio Marti, USA	SS
1200	3925	Radio Nikkei,Japan	JJ
1200	7280	Sound of Hope,USA, via Taiwan	CC
1200	2485	VL8K, Australia	
1200	11990	Voice of America Relay, Northern Marianas	CC
1200	11785	Voice of America Relay, Thailand	
1200	9525	Voice of Indonesia	various
1200	4900	Voice of the Strait, China	CC
1200	6105	XEQM, Mexico	SS
1230	3335	Radio East Sepik, Papua New Guinea	Pidgin
1300	10320	Armed Forces Radio TV, Hawaii	usb
1300	15140	CVC-La Voz, Chile	SS
1300	5890	Voice of America, Northern Marianas Relay	KK
1300	11710	Voice of Korea, North Korea	
1300	9320	Radio Free Asia, Northern Marianas relay	BB
1330	7145	Lao National Radio	
1330	9835	RS Makedonias, Greece	GFreek
1400	5995	Radio Australia	
1400	5910	Shiokaze, Japan	KK
1400	9760	Voice of America Relay, Philippines	
1500	13590	Christian Voice, Zambia	
1500	9535	NHK Radio japan	JJ
1500	13775	Radio Austria International	GG
1500	21695	Voice of Africa, Libya	
1500	13760	Voice of Korea, North Korea	
1500	9335	Voice of Korea, North Korea	
1500	15825	WWCR, Tennessee	
1530	15275	KSDA-Adventist World Radio, Guam	GG
1530	13600	Radio Sweden	
1600	9870	All India Radio	Hindi
1600	15235	Channel Africa, South Africa	
1600	9680	CVC-La Voz, Australia	
1600	13675	Radio Austria International	GG
1600	15560	RDP International, Portugal	PP
1600	15120	Voice of Nigeria	
1630	11625	Vatican Radio	Hausa
1700	9730	Bible Voice Network, England, via Germany	AA
1700	11735	Radio Romania International	
1700	15345	RTV Marocainie, Morocco	AA
1730	15215	Voice of Africa, Libya	
1900	9870	Broadcasting Service of the Kingdom, Saudi Arabia	AA
1900	11640	China Radio International	AA
1900	9830	Radio Jordan	AA
1900	11805	Radio Nederland, via South Africa	
1900	7345	Radio Slovakia International	GG
1900	11735	Radio Tanzania, Zanzibar	Swahili
1900	9720	RT Tunisienne, Tunisia	AA
2000	11605	Deutsch Welle, Germany, Rwanda Relay	GG
2000	11990	Radio Kuwait	
2000	9690	Radio Romania International	
2000	7450	RS Makedonias, Greece	Greek
2030	7400	Radio Bulgaria	GG
2030	7580	Radio Farda, USA, via Sri Lanka	Farsi
2100	12095	BBC Relay, Ascension Island	
2100	17680	CVC-La Voz, Chile	SS
2100	15190	Radio Africa, Equatorial Guinea	
2100	17725	Radio Canada International	FF
2100	12085	Radio Damascus, Syria	
2100	17850	Radio Exterior de Espana, Costa Rica Relay	SS
2100	15110	Radio Exterior de Espana, Spain	SS
2100	9575	Radio Medi Un, Morocco	AA
2100	17630	Radio Sultanate of Oman	AA
2100	15685u	Galei Zahal, Israel	HH
2200	15345	Radio Argentina al Exterior	SS
2200	9580	Africa No. One, Gabon	FF
2300	14670	CHU, Canada	TS
2300	11665	CVC La Voz, Chile	SS
2300	11665	NHK Radio Japan	JJ
2300	13680	Radio Nacional Venezuela, via Cuba	SS
2300	15720	Radio New Zealand International	
2300	9670	Radio Veritas Asia, Philippines	VV
2300	9890	Voice of Russia	
2330	9680	Gospel for Asia, Germany	various
2330	4885	Radio Clube do Para, Brazil	PP

New, Interesting, And Useful Communications Products

by Staff

MFJ Enters Scanner Market With Two New Offerings

MFJ has entered the scanner market with two new product introductions: the MFJ-8310 Base Scanner, which receives NOAA, police/fire/ham repeaters; and the MFJ-8322 Analog Trunking Scanner, a handheld model that also tunes 800-MHz public service bands and analog Motorola (type I, II and hybrid), EDACS Wide and LTR trunked systems.

The MFJ-8310 scanner monitors 2-meter, 70-cm, 10-meter and 6-meter repeaters plus repeater inputs and local simplex frequencies, NOAA weather broadcasts, weather alerts, SKYWARN, VHF and UHF business bands, commercial aircraft, marine band, FRS/GMRS frequencies and more. During severe weather, its one-touch weather button takes the place of expensive single-purpose weather radio; another one-touch button monitors SKYWARN trained weather observers (requires one-time programming). It features a BNC antenna connection; backlit LCD and 3-inch speaker; front panel on/off switch with separate volume and squelch controls; and 3.5-mm headset jack for private listening. It includes pull-up BNC antenna and 120 VAC-to-9 VDC adapter.

The MFJ-8322 triple-trunking handheld analog scanner searches and tunes local transmitters in roughly 3/4 of a second, and lets you lock out undesired frequencies and search again.

The MFJ-8322 is a triple-trunking handheld scanner with alpha display that lets you easily program talkgroup IDs. Covering all the UHF and VHF bands, it offers the same features as the MFJ-8310 base scanner and adds the 222–225 MHz ham band, military aircraft frequencies, and the 1240–1300 MHz ham band. It stores up to 1,000 frequencies, a maximum of 10 trunked systems and up to 1,500 total TIDs. A Spectrum Sweeper mode offers remarkable sensitivity and rapidly searches for local transmitters of unknown frequency, finding, tuning, and monitoring a nearby transmission in roughly 3/4 of a second, or you can lock out undesired frequencies and search again.

Other features include PC programming capability (the MFJ-5432 Scanner USB cable connects the scanner to your PC; $29.95) and BNC antenna connector. It also comes with a flex antenna and AC adapter charger (requires four AA Alkaline or NiMH batteries; NiMH charge automatically to full charge in the scanner when the adapter/charger is attached), on/off/volume control and squelch control, and 3.5-mm headset jack.

The MFJ-8322 retails for $199.95; the MFJ-8310 for $99.95. For additional information, to order, get a free catalog, or for your nearest dealer, contact MFJ Enterprises, 300 Industrial Park Road, Starkville, MS 39759; Phone: 800-647-1800; Web: www.mfjenterprises.com.

C. Crane CCRadio-2 AM-FM-Weather-Ham Receiver

The CCRadio-2 is the first AM/FM radio that also provides direct access to the 2-meter ham radio band. During an emergency, the 2-meter ham band works when other communication is out, but not many people can access the information found there. With the CCRadio-2 anyone can now tune in vital updates from first-responders and local authorities and get critical news that can help save lives.

The CCRadio-2 is an enhancement of the original CCRadio. In addition to the 2-meter ham band, the radio also features C. Crane's patented Twin-Coil Ferrite AM Antenna built into the radio for the strongest AM reception possible on a

The CCRadio-2 is the first AM/FM radio that also provides direct access to the 2-meter ham radio band for news in the event of an emergency.

portable AM/FM radio. The CCRadio-2 is also designed to give listeners the optimal listening experience for news and information broadcasts. When scanning for a radio signal, the CCRadio-2 evaluates the signal for several seconds and then locks in on the strongest signal possible. This feature makes it easier to tune in weak AM radio stations.

A four-band receiver, the CCRadio-2 covers AM (520–1710 kHz) and FM (87.5–108 MHz) broadcast bands, the U.S. weather band (162.400–162.550 MHz), and the 2-meter FM amateur band (144–148 MHz) with five memories per band. On the 2-meter FM band the CCRadioplus can act like a simple radio scanner and search through the five memories for ham operator communications. The sensitivity (squelch) can be adjusted for best results.

Available in black mica or titanium, the CCRadio-2 features a bright, clear LCD display with a full backlight and three levels of adjustable brightness plus a battery saving "off" setting. Other features include adjustable bass and treble, clock, alarm, sleep timer, auto scan, stereo headphone jack, line-input jack, and line-output jack.

For more information on the CCRadio-2, which retails for $159.95, visit www.ccrane.com.

Sony ICF-C8WM AM/FM Clock Radio With Cell Phone Dock And Charging Station

The new Sony ICF-C8WM spruces up the traditional LCD bedside clock radio by adding the convenience of a cell phone dock and charging station. A large digital clock occupies the center of its round face, and a compatible Walkman MP3 Player or Sony Ericsson Walkman Phone can be plugged into a slide-out connector on the right-hand side of the device. Replacing a separate charger and cable, it easily charges your phone or MP3 player while also letting you wake up to music stored on the handset. If you have both a phone and Walkman docked, you can choose which one you want to use for music.

Other features include display with three brightness levels, sleep timer, snooze timer, dual alarm, digital tuning with 30 station presets, internal battery power backup, and wireless remote commander with full menu control of music functions for Walkman MP3 player or Sony Ericsson Walkman Phone.

The AM/FM clock radio retails for $99.99. For more information, visit www.sonystyle.ca.

The Sony ICF-C8WM AM/FM Clock Radio adds a slide-out cell phone dock and charging station for convenient gadget charging as well as a digital music source.

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2010/11 calendar from CQ

15-Month Calendar (January 2010 through March 2011)

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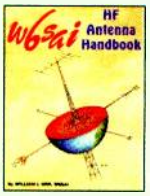
by Bill Orr, W6SAI



One of ham radio's most respected authors, W6SAI was known for his easy-to-understand, down-to-earth, writing style. In keeping with this tradition, this book is a thoroughly readable text for any antenna enthusiast, jam-packed with dozens of inexpensive, practical antenna projects that work!

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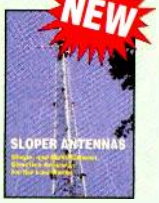
Sloper Antennas

By Juergen A. Weigl, OE5CWL



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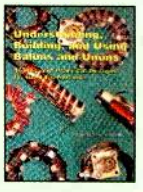

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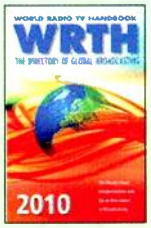

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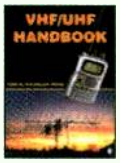

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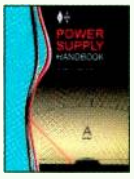

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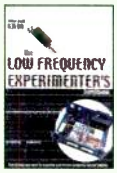

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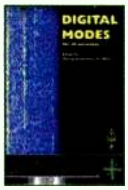

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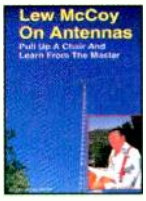

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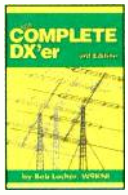

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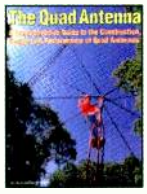
by Bob Haviland, W4MB



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TV Antenna Basics

by Kent Britain, WA5VJB
wa5vjb@cq-amateur-radio.com

"My idea was to have an outside TV antenna light enough to mount on the same mount as a satellite TV dish, then have an electronics package that took some power from the dish and used the same coax to send local channels down to the TV set."

I've often enjoyed reading the TV channel history of a city just by looking at the rooftops as I drove though the neighborhoods. By understanding the different antenna designs, like the one in **Photo A**, you can tell what channels the people wanted to watch over the decades. Well, so much for history...now onto modern times, like why a good understanding of TV antennas is handy when you need to put one up. Let's take it from the beginning, with television frequency ranges, as follows:

VHF Lo	TV Ch 2–6	54–88 MHz
VHF Hi	TV Ch 7–13	170–216 MHz
UHF	TV Ch 14–83	470–890 MHz (1940–1982)
UHF	TV Ch 14–69	470–806 MHz (1980–2009)
UHF	TV Ch 14–51	470–696 MHz (Present)

We start with the three main U.S. Bands for TV transmitters. TV Channels 2 to 6, 7 to 13 and 14 to 51. On most antennas there are elements designed to resonate in each of these three frequency bands. The antenna can then be used just about anywhere to watch any channel.

Let's take a look at the conical, sometimes called bi-conical, TV antenna in **Figure 1**. When hams used them they were called "wonder bar" antennas, and if you see one of these in the air, you'll know that it's been there for half a century. They're pretty good on VHF Lo, and the short

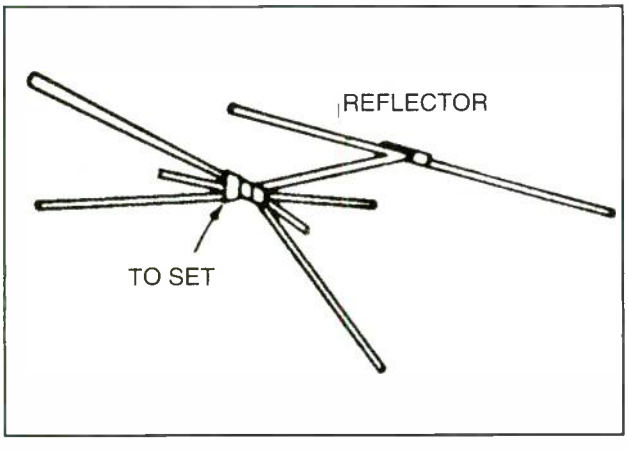


Figure 1. A 1940s-era conical or "wonder bar" TV antenna.

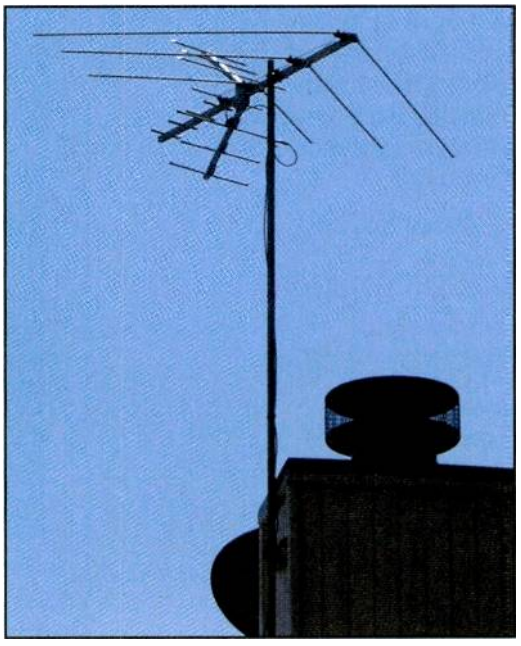


Photo A. Outdoor TV antennas.

elements in the middle are for VHF Hi. When these were first designed, the UHF band wasn't even around. My first ham 6-meter antenna was one of these, but I extended each element about 6 inches. Hey, I worked eight states on 6-meter AM with it! It also worked well on TV Channel 1, but more on that at the end of the column.

Now we move on to the typical herringbone TV antenna in **Photo B**. About 40 years ago it was discovered that if you swept the log periodic antenna elements forward at about a 30-degree angle, the log periodic worked well on its third harmonic. So if the log periodic on the left in this figure were designed to cover 50–100 MHz, then the log periodic on the right would work on 50–100 MHz and 150–300 MHz. The third harmonic of 56–88 MHz is 168–264 MHz and covers the 170–216 MHz VHF Hi band nicely. A swept forward log periodic, therefore, can easily cover both VHF Lo and VHF Hi at the same time, and that's why so many outdoor TV antennas use this basic design. On the front you see the UHF elements which we'll cover a bit more in a moment.

Three elements in the herringbone log periodic is about the smallest you can make work on

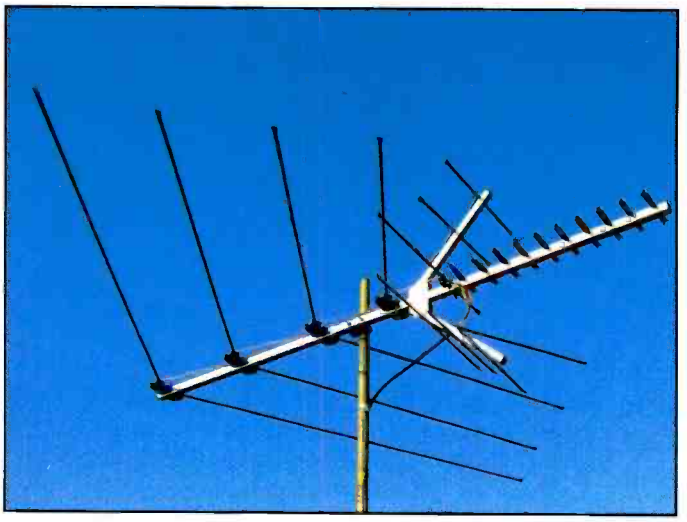


Photo B. Herringbone elements for TV Channels 2–13.

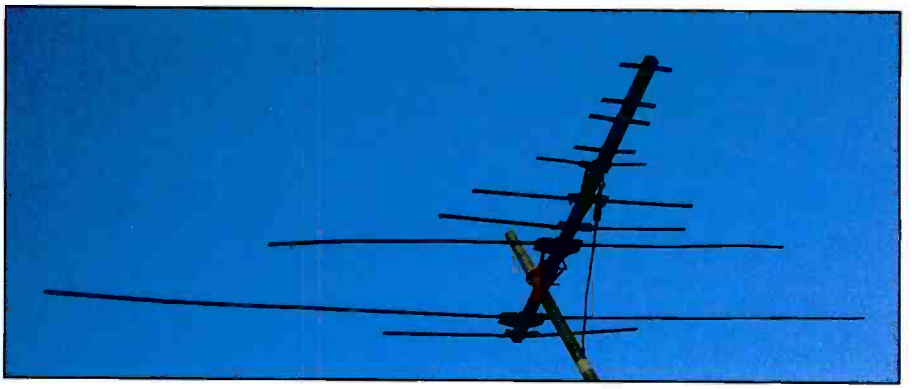


Photo C. Lightweight outdoor TV antenna.

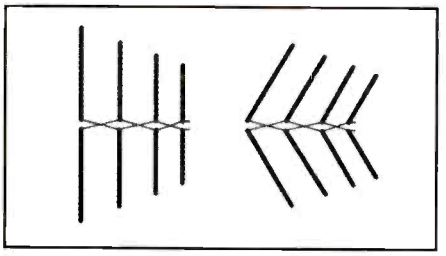


Figure 2. A log periodic (left) and a herringbone log periodic (right).

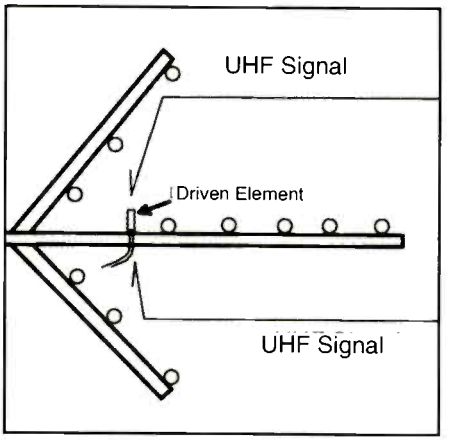


Figure 3. UHF corner reflector antenna.

both VHF Lo and VHF Hi. But there is no upper limit on this antenna: As you add more elements, gain and size goes up. About a dozen VHF Lo elements is the practical limit and that would be nearly 30 feet long. (One of those "round-to-it" projects on my work bench is a 140–170 MHz herringbone log periodic to cover 140–170 MHz and 420–500 MHz for both the scanner and ham crowds in one antenna.)

I'm kind of proud on of the TV antenna in **Photo C** since it is my design. This one has had a hard life, but I kind of straightened out most of the elements. My idea was to have an outside TV antenna light enough to mount on the same mount as a satellite TV dish, then have an electronics package that took some power from the dish and used the same coax to send local channels down to the TV set. The two long elements are a simple log periodic for VHF Lo. But see the shorter element close to the Log Periodic elements in **Photo D**? Because they're so close, the VHF Hi signals they catch are coupled to the VHF Lo elements. These parasitic elements then form the VHF Hi antenna. Out front I have a six-element

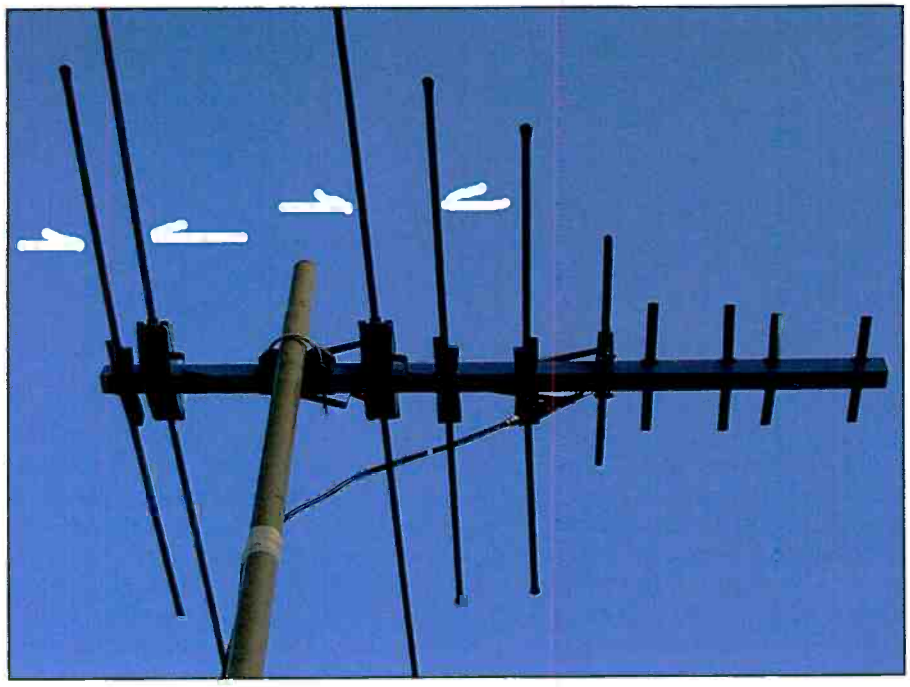


Photo D. Close coupled elements.

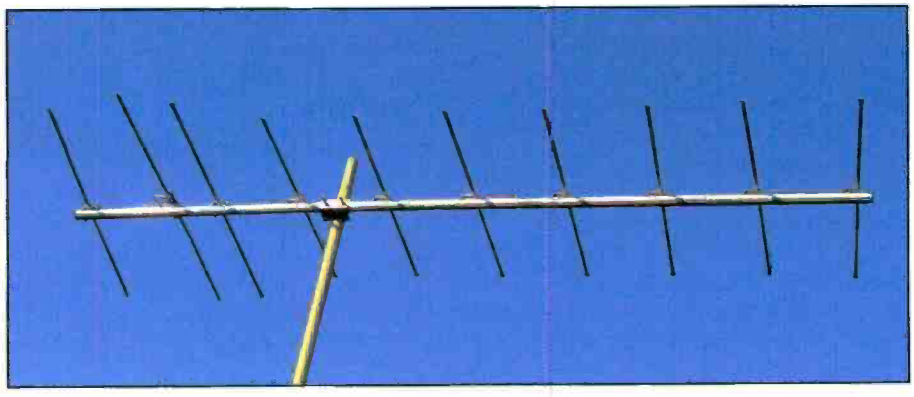


Photo E. Single channel or "area special" Yagi antenna.

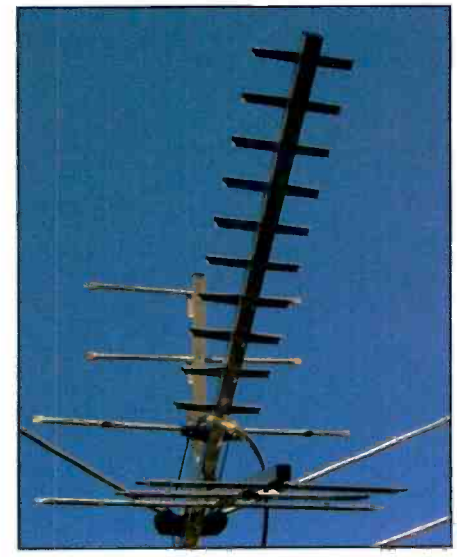


Photo F. UHF section of the antenna.

UHF Yagi. You may note a bit of a family resemblance to the HDTV Cheap Yagi we published last year. Yes, I did use this design as a springboard for the HDTV antenna.

Next up is the Yagi-style TV antenna shown in **Photo E**. Usually Yagis are only good for one or two TV channels and are sometimes referred to as "area specials" since they tend to be sold only in certain areas with a highly desired TV channel about 50 to 75 miles away. The one pictured here is one of the three Yagis I had in the air so my father could watch the Dallas Cowboys from a station 110 miles away. Pulling in football games from outside the blackout area was my apprenticeship in high performance TV antennas. That was always the deal with my father: When we moved, the football antennas had to go up before my ham antennas.

A pair of Yagis like this one can give good TV reception at about twice the distance of a general purpose log periodic, but again for only one or two VHF channels.

UHF Antennas

There are far too many UHF TV antenna designs to cover in just one column, much less in *part* of one column, so I'll just stick to one of the more common ones, as seen in **Photo F**.

The most common UHF TV antenna design is a Yagi with a corner reflector. The corner reflector acts a bit like a small dish and reflects the signals on the UHF driven element, as shown in **Figure 3**. It's always nice to have the aluminum tubing do double duty, so the corner reflector elements are often the right length to also serve as a Yagi director for the VHF Hi elements. That way, while the UHF corner reflector acts like a mirror on the UHF frequencies to focus the UHF waves on the UHF elements it is also acting like a lens to help focus the VHF Hi waves onto the VHF Hi elements.

A few directors out in front of the corner reflector give a few more dB gain. The directors have to be short to work at the upper end of the UHF TV band, but then they are too short to be of any help at the lower end. So the long chain of directors helps out on channels in the 50s and 60s, but does nothing at Channel 14. But then again the coax has a lot more loss at 800 MHz than it has a 470 MHz, so this high channel gain is still helpful.

Back To Channel 1

Channel 1 actually moved around a bit toward the end of the 1930s, residing at 44.5 MHz in some cities and at 50–56 MHz in the New York area. The pre-war electronic televisions first used 180 scan lines and then 441 scan lines with AM audio. After the war the FCC standardized on 525 scan lines and FM audio. The ham radio 5-meter band, which had been at 56 MHz, was moved to its current 50–54 MHz 6-meter band, sort of trading the hams' Channel 1 for the new Channel 2.

So if you ever find an old TV set in your aunt's attic with a CH1 position on the tuner, it is probably pre-World War II. That's another way to be able to peek into TV's past. ■

Internet Radio Roundup: A Sampling From The WiFi Scene

by Dan Srebnick, K2DLS
k2dls@arrl.net

"If you like to listen online, you'll love an Internet radio appliance. If you don't listen online because it's too much trouble to turn on the computer, a WiFi radio is for you."

Ever since Real Audio hit the scene in 1995, I've been intrigued by online "DX" possibilities. I started out listening to a lot of Dutch domestic stations that simulcast on the Internet (the Dutch were early adopters of Internet radio). The World Radio Network (wrn.org) offered the opportunity to listen to international broadcasters such as Radio Nederland and the BBC. Early listening sessions consisted of 16 kpbs streams over a 28.8 kbps dialup. Windows 3.1 crashed a lot, making online listening sometimes as much of a challenge as "real DX."

A lot has changed. Today, broadband Internet connections are common in many households. Windows is stable, and Mac OS/X and Linux all offer media players to tune into Internet media content. But the biggest change over the past couple of years is that a computer is not needed to listen to radio via the Internet. Today, we have "WiFi radio."

WiFi radio first came on the scene about three years ago. A WiFi radio is a dedicated appliance for receiving Internet radio and media content. It connects to the Internet using an 802.11-type wireless connection or a hardwired Ethernet cable. It has a radio-like human interface, generally consisting of a small text display—the "dial"—and some knobs and buttons. Some have remote controls and one-touch memories to recall favorite stations. Some have internal speakers and others allow one to connect to a good quality stereo or surround sound amplifier.

Photo A. This battery-operated portable from Grace has a whip antenna for FM reception and supports vTuner.

The major differentiator between the different models of WiFi radio are the chipsets. The chipset includes firmware that provides the radio's operating system. The operating system determines the "personality" of the device, defines its features and how you interact with it. While it sounds a lot like a computer, the similarity ends here as there is no keyboard, mouse, or hard disk involved.

A WiFi Sampler

The major WiFi radio platforms fall into the following categories:

Reciva (www.reciva.com)—Supports Real Audio, MP3, WMA, AAC, AU, WAV, and AIFF formats. Originally, only Reciva supported Real Audio, used by popular stations such as BBC Radios 1 and 4. These radios run the Barracuda chipset.

vTuner (www.vtuner.com)—Real Audio support is reported to have been recently added to some models, making vTuner a capable rival to Reciva. Also supports MP3, WMA, AAC, AU, WAV, and AIFF.

Many different manufacturers offer Reciva- and vTuner-based radios. Logitech (www.logitech.com) and Phoenix (www.com-one.biz) also have proprietary offerings with full feature sets, and Phoenix seems to have recently added Real Audio, so choose carefully. Each vendor has a website that allows the listener to create lists of their favorite stations and, in some cases, playlists. Let's take a look at some of the available choices.

Grace

Grace was one of the early adopters of the Reciva chipset. Their next generation line of Recivas, which includes the GDI-IR2000, supports Sirius and Pandora. Sirius subscribers should note that this feature works over the

Photo B. The stylish Logitech Squeezebox comes with RCA audio outputs for your amplifier and a two-year limited warranty.

Photo C. The R227 from Sanyo features the Reciva chipset and FM, too.

Internet, not via satellite, and requires an additional monthly subscription of $2.95 (much cheaper than adding a second radio). Pandora (www.pandora.com) is a music genome project that allows the listener to create a personal Internet radio station just by specifying a single artist that you enjoy listening to. The Pandora system then presents music by the specified artist and similar artists and styles for your enjoyment. Your Pandora station can be made available on your Facebook page if desired.

Grace has also ventured into the vTuner market with the Grace Digital Traveler Portable Wireless Internet Radio (GDI-IRP600), another one of the six models in the current Grace lineup. It is a battery-powered portable that also receives FM. The Traveler Portable (**Photo A**) also features a remote control and a built-in whip antenna.

Another Grace model, the Duet Dock, is Reciva-based and supports iPod docking as the name suggests. MSRPs for the Grace lineup run from $179 to $249 for the various models, but will be found for less at your favorite electronic discounters. See www.gracedigitalaudio.com for more information on models and features. The Grace radios have a one-year warranty with proof of purchase.

Logitech

The company better known for computer accessories like mice also has a nice entry into the Internet radio arena. The Logitech Squeezebox (**Photo B**) comes in several different versions, with and without display screens. It supports Sirius satellite radio (Internet subscription required as with the Grace), and the Pandora, Rhapsody, Live 365, and Shoutcast services. The display is very readable and the remote control functions nicely.

The Squeezebox may have the best multiplatform support of all. In addition to Windows (2000 or higher) and Mac OS, there is full support for Linux, Solaris, and BSD. The Squeeze Network is used to manage the radio, and the Slim Server gives you access to your local media content as well. The model pictured has analog, coaxial, and optical outputs. The analog outputs are RCA connectors for easy connection to almost any amplifier. The Squeezebox supports both WiFi and wired Ethernet. The typical dis-

Photo D. The Acoustic Research 600i Infinite Radio also features an iPod dock for your listening pleasure.

Photo E. The Aluratek looks like an Internet-age clock radio because it is. Note the USB port on the front panel to connect your MP3 player.

count price is around $250. The Logitech Squeezebox (www.logitechsqueezebox.com) has a two-year warranty.

Sanyo

Sanyo (http://us.sanyo.com) has an entry for around $150, the R227 (**Photo C**). It is Reciva based, has both WiFi and wired Ethernet networking, and an audio input jack for your iPod or MP3 device. It comes with a remote control and eight presets. Output power is 2 watts per channel. Standard FM reception and an alarm clock are also included. The warranty period seems to be only 90 days on this one.

Acoustic Research

Acoustic Research (AR) is owned by Audiovox, which also sells its Internet radios under the RCA Infinite Radio label. There are two models: the ARIR200 and the ARIR600i. The 200 sells for around $100, and the 600i, which adds iPod docking, for about $80 more (**Photo D**). Both radios can record up to 10 hours of Internet radio content in internal memory and offer access to the free Slacker music service. Slacker offers 100 predefined "genre" radio stations and the ability to create your own custom station. The AR models come with prepaid access to the Weatherbug service, putting local weather information right at your fingertips. An alarm clock and AM/FM capability round out these models. AR offers a one-year limited warranty. See www.arinfiniteradio.com/ariradio for more on these radios.

Aluratek

Aluratek (http://aluratek.com) offers an Internet radio/alarm clock (**Photo E**) with WiFi that makes use of the vTuner service, giving access to over 11,000 stations. It has an integrated stereo amplifier with 2 watts per channel and RCA out jacks for external speakers. It has a USB port to attach your personal media player, although I could not get this function to work on the model that I tried with various types of media players. Formats supported include WMA, WAV, and MP3, but there's no Real Audio on this model. The radio comes with a one-year limited warranty.

Phoenix

A French entry, the Phoenix Com-One, goes it own way in terms of software. CODECS supported include MP3, WMA, RM, AAC, and MP3. Playlist formats supported include M3U, PLS, ASX, and RAM. As with Squeezebox, vTuner, and Reciva, content can be selected by geography or content type. This $150 offering provides eight presets and the seemingly standard 2-watt per channel amplifier. It will run on two rechargeable AA batteries for portability. Radios can be managed via the Phoenix website mentioned earlier in the column.

Hack It Up

Hardware and software hackers can have some fun with Internet radio, too. The Sharpfin project covers mods to Reciva-based radios. Most efforts revolve around the ability to add software features design for one radio to another. The Reciva radios are all Linux based, so enabling a telnet and webserver on the radio opens the capability of modifying internal configurations and installing new software. It is also possible to turn your Reciva radio into a useless brick, so tread cautiously. Information about the Sharpfin project can be found at the wiki page http://sharpfin.zevv.nl/index.php/Main_Page.

As an example, Sharpfin has put together a "libreciva" collection, a library of software interfaces to all the Barracuda

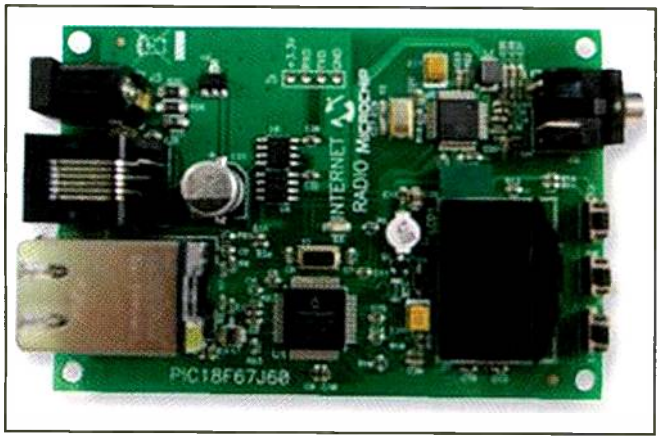


Photo F. Farnell in the UK offers this Internet radio microchip board. Just add power, a case, controls, and speakers!

Photo G. While your Blackberry won't have the antenna or the radio dial, Mobiola xPlayer will turn its WiFi capabilities into an Internet radio.

chipset's hardware. This could be of use to someone who wanted to write custom software code to run on his or her radio. Remember, at the heart of it all, the Internet radios featured here are computers.

I recently "Sharpfinned" my Acoustic Energy AE-1. This was one of the first WiFi radios on the market. AE stopped offering updates some time ago and I wanted to see what features I could add to the radio. I have not yet figured out if there is a way to add Sirius capability, but I have updated to a recent firmware and added station search and history menus options that were not there before. Over a period of several days I went from not really knowing what I was doing to figuring out some of the subtle nuances of the upgrade project. Documentation is a bit sketchy, so I repeat my warning about treading cautiously.

If you want to try to "roll your own" hardware, Farnell in the UK has an Internet radio board available for experimenters. Take a look at http://uk.farnell. com and search for Part #DM183033 (**Photo F**).

In Your Pocket

Your Blackberry, G1, iPhone, iTouch, or other smartphone may also be the WiFi equivalent of your old transistor radio—and you never knew it. Software like Mobiola xPlayer (**Photo G**) or FlyCast can be installed on your phone/email/ PDA and you can rock away to stations all over the world. Make sure that your device really is using WiFi, however, or you may find that you have used up your mobile minutes in an unintended fashion.

Google or Microsoft's new Bing is your friend; just search for Mobiola xPlayer or FlyCast and you can check for supported devices. While there is a registration fee for xPlayer, FlyCast is a free service.

Old Favorites, New Delivery

The radios mentioned in this column are just a sampling. Sangean, C. Crane, and others also offer equally capable Internet radios at reasonable prices, and there are more coming on the market all the time. Do some research to find the one that has the features that are important to you.

WiFi radio may be the fastest growing segment of radio listenership in the world, more so than satellite, DRM, FM, or IBOC. As shortwave becomes more of a niche, remember that many of us started listening to shortwave in search of diversity, opinions, and information from far away lands. We also sought unusual music and entertainment that was not available on television or local radio. All of that is yours at low cost with great reception on WiFi radio. If you like to listen online, you'll love an Internet radio appliance. If you don't listen online because it's too much trouble to turn on the computer, a WiFi radio is for you. All your old favorites can be heard via WiFi—are you listening?

Mailbag

Robbie Spain, KD7CJO, wrote in response to the column on electronic QSLs. He mentioned that he is one of the fair number of both MW and SW listeners who are getting fair responses to email QSL reports. Good job Robbie. Have you received any good electronic QSLs recently? Let us know.

73 de K2DLS

Lessons Learned From The "October Surprise"—Simple Preparedness Steps *You* Can Take

by John Kasupski, KC2HMZ
kc2hmz@verizon.net

"Like most disasters, the October Surprise happened unexpectedly; and yet, it shouldn't have come as a surprise at all."

This month I'm going to do a bit of reminiscing about a severe winter weather event that took place in Buffalo, New York, roughly three years ago, in October 2006, with an eye toward relating what can be learned from the standpoint of EmComm and preparedness.

Even if you don't live in an area that is prone to winter storms, the lessons from one disaster are as good as the lessons from the next. While you may not get serious snow or ice, chances are (unfortunately) good that there's some sort of natural or man-made disaster you might be subjected to. The results are often similar regardless of the nature of the event: disruption of food and water supplies and communications; interruption of utility service; travel difficult or impossible...the list goes on. How do you prepare for it?

The so-called "October Surprise" of 2006 was an unusual early-season lake effect snowstorm that hit Buffalo and the surrounding area in the U.S. and Canada. It began in the afternoon on October 12, and didn't end until the morning

Photo A. A typical Buffalo street on the morning of October 14, 2006. (Via Wikimedia Commons)

Photo B. Trees and wires were downed in the Buffalo suburb of Tonawanda during the October Surprise. (Photo by Rebecca Brady, KC2IRK)

of the next day. It became known as the October surprise because in Buffalo autumn weather is typically just beginning then. The leaves on the trees were just beginning to turn brilliant colors and boats were still moving along the Erie Canal and the Niagara River. Snow blowers were still stored in garages, their fuel tanks empty. The water temperature in Lake Erie was 62 degrees Fahrenheit. The lake effect storms capable of producing feet—not inches—of snow in just a few hours were still (we thought!) several weeks away at least.

A Surprise That Shouldn't Have Been

Like most disasters, the October Surprise happened unexpectedly; and yet, it shouldn't have come as a surprise at all. The first concerns of a possible "Lake Effect Snow Event" were raised on October 6 as medium- and long-range numerical weather models began to indicate conditions would be potentially favorable for lake effect precipitation, resulting in mixed snow-rain conditions. The long-term forecast from the Buffalo office of the National Weather Service indicated possible lake effect snows, but predicted that accumulations would be minimal.

By October 11, the Buffalo NWS and associated weather offices in the U.S and Canada began issuing special advisories for the possibility of lake effect snows, which mentioned that since the leaves were still on the trees, the combination of snow and wet leaves on trees could cause branches or trees to fall, bringing down power lines and resulting in widespread power outages. That's exactly what happened, starting the following afternoon.

The first notable ground accumulations started to occur just before 5 p.m., and by 8 p.m., reports of downed trees and power lines and other damage began to flood the NWS offices (see **Photos A** and **B**). Schools were closed for a week. Telephone lines were still down weeks later. Thirteen people died. The damage was the worst of any storm in Buffalo's history.

Important Lessons From The October Surprise

For many people in the Buffalo area, the first inkling of trouble didn't even come from the NWS. Those who don't regularly listen to NOAA Weather Radio broadcasts got their first clue from the sounds of huge trees cracking and splitting in the night. So there's lesson number one, and it can be conveyed in two words: situational awareness.

What can you do to prepare? Get a radio that can receive NOAA Weather Radio broadcasts, such as the one in **Photo C**, and listen—actually listen—to it a couple of times every day (the forecast you hear in the evening can be entirely different from the one in the morning).

I was supposed to go to work on Friday morning and attempted to do so, but the farthest I could get was three blocks away from home. Each and every street was blocked with snow, ice, and downed trees, and power lines. By the time I returned home, the power was out. It stayed out until Monday afternoon. Needless to say, I was glad I had on hand sufficient alternative sources of light and heat, and plenty of food that did not require cooking.

I subsequently spent 20 hours at a Red Cross shelter in a suburban high school, providing communications via ham radio between the shelter and the emergency management department's EOC and helping to care for between 50 and 60 people who didn't have any alternative

sources of light, heat, and food. Before any of us who are emergency communicators can do that, we must first avoid becoming a victim of the disaster ourselves. There's lesson number two, and it can also be conveyed in just two words: basic preparedness.

There are four things you need to survive: food, water, a regulated temperature, and a breathable atmosphere. Every source of disaster preparedness information available places a lot of emphasis on the first two, but the lack of the last two will kill you even faster than not having food or water. How do you prepare? By learning about your requirements in all four of these areas and doing everything you can to make sure you'll have what you need to survive when—not *if*—disaster strikes.

The Federal Emergency Management Agency admittedly got a lot of bad press in the aftermath of Hurricane Katrina—some of which was undeserved and some of which was not—but FEMA does offer an excellent information on individual, family, and community preparedness in the form of a publication titled *Are You Ready?* (**Photo D**). If you have Internet access you can download it from www.fema.gov/pdf/areyouready/areyouready_full.pdf.

If you don't have Internet access, you can get it in print form through the FEMA publications warehouse, which you can reach by telephone at 1-800-480-2520, assuming you call before a disaster takes out your telephone service!

Another good source of basic information for those of you with Internet access can be found at http://72hours.org/index.html. There you'll find a website provided by the City and County of San Francisco, California. Prominent near the top of the page, are the words "Make a Plan, Build a Kit, Get Involved." Those eight words should be a mantra for individuals, families, and communities wishing to survive disasters and to recover from them as quickly as possible.

These two sources tell you about a variety of things you can do to prepare, in much greater detail than I have space to do in this column. Follow their advice: the life you save may be your own. ■

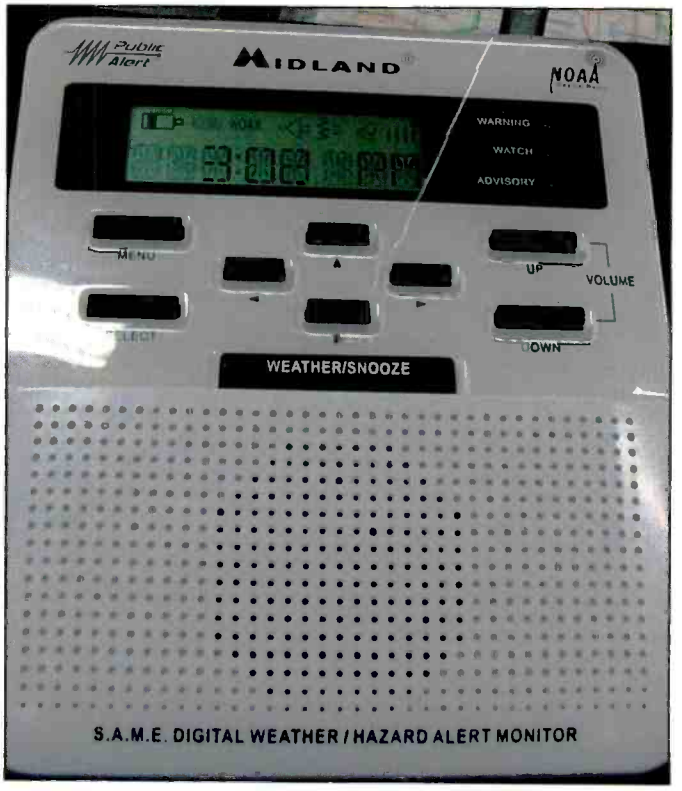


Photo C. NOAA weather radio receivers are an invaluable source of info on severe weather events. (NOAA photo)

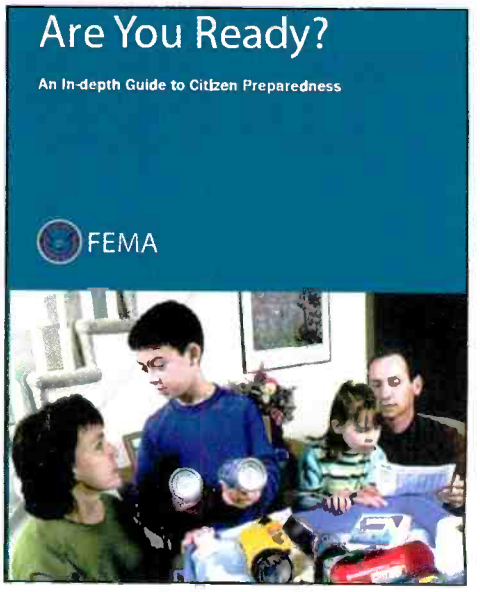


Photo D. Consider this FEMA publication required reading!

A Sunspot Puzzle

by Tomas Hood,
NW7US, nw7us@arrl.net

"When the brightness reaches the same level in the sunspot as the brightness of the rest of the solar disc, we will no longer be able to see these weak sunspots—they will simply vanish. A simple linear extrapolation of those data suggests that sunspots might completely vanish by 2015!"

Something is unusual about the current sunspot cycle. The current solar minimum has been unusually long, and with more than 700 days without sunspots through August 2009, the number of spotless days has not been equaled since 1933 (see http://users.telenet.be/j.janssens/Spotless/Spotless.html). The solar wind is reported to be in a uniquely low energy state since space measurements began nearly 40 years ago. This solar minimum has become a real puzzle to solar scientists who are working diligently to understand what exactly is happening with our sun.

There's an obvious interest in a lack of sunspots from the perspective of radio hobbyists because solar activity as measured by sunspot counts correlates to the strength of the ionosphere. Without an energized ionosphere, shortwave signals won't reach around the world. There are other reasons, too, for an interest in this uniquely quiet solar minimum.

For instance, does this solar minimum resemble the lack of solar activity observed during the period from 1645 to 1715, when the sun entered a period of low activity now known as the Maunder Minimum? That was a period of several 11-year periods during which the sun displayed few, if any, sunspots. Models of the sun's irradiance suggest that the solar energy input to the Earth decreased during that time and that this change in solar activity could explain the low temperatures recorded in Europe during the Little Ice Age. Is this happening again?

About Those Spots

Sunspots are magnetic regions on the sun with magnetic field strengths thousands of times stronger than the Earth's magnetic field. Plasma flows in the sun's magnetic field lines (**Figure 1**), and sunspots appear as dark spots on its surface.

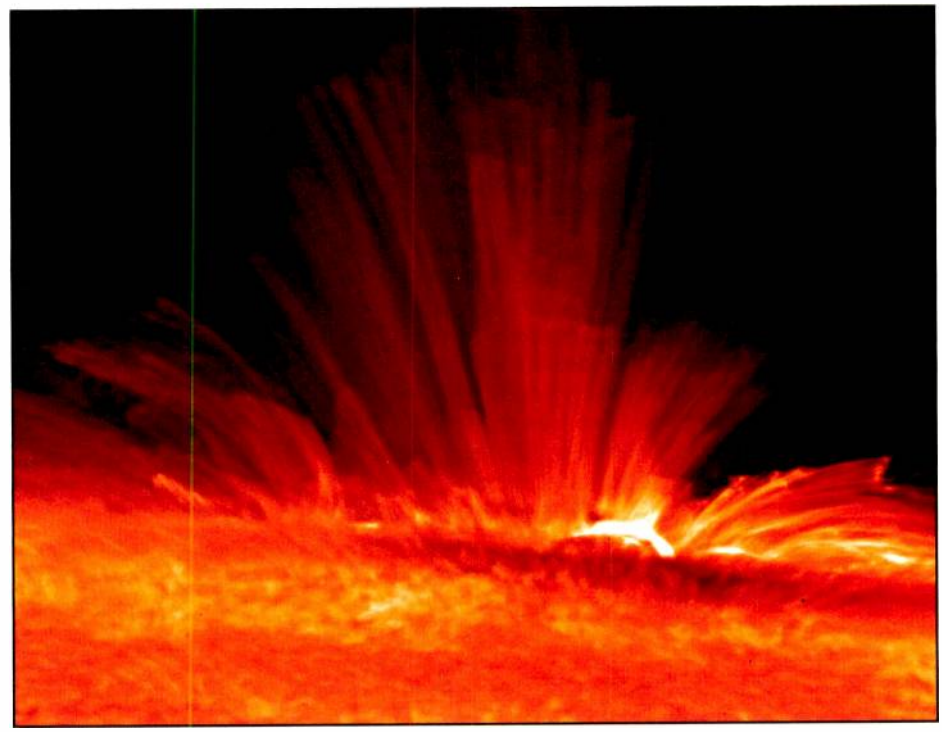


Figure 1. Solar magnetic field lines are seen punching through sunspots in this dramatic photo of solar plasma riding these intense magnetic structures. (Source: NASA/SOHO)

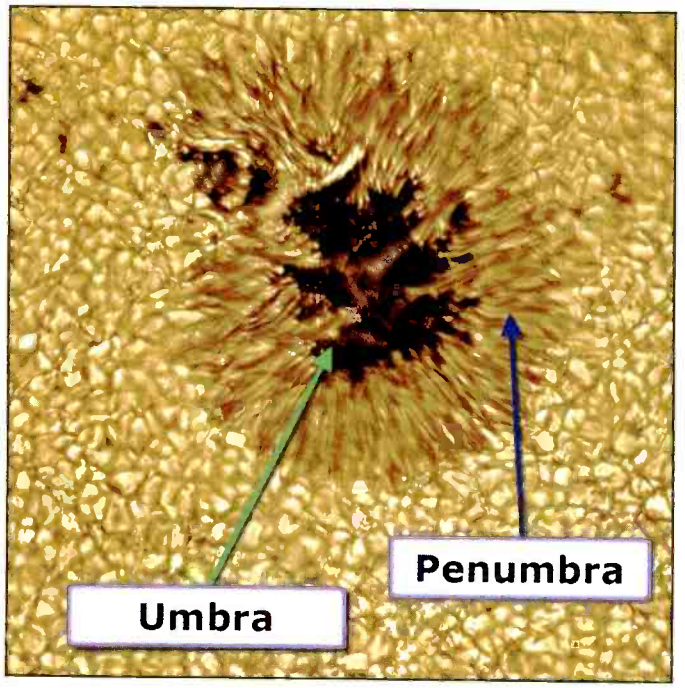


Figure 2. The anatomy of a sunspot showing the darker (cooler) center, the "umbra," and the outer "penumbra." Will these clearly defined sunspot characteristics visually disappear by 2015? (Source: NASA/SOHO)

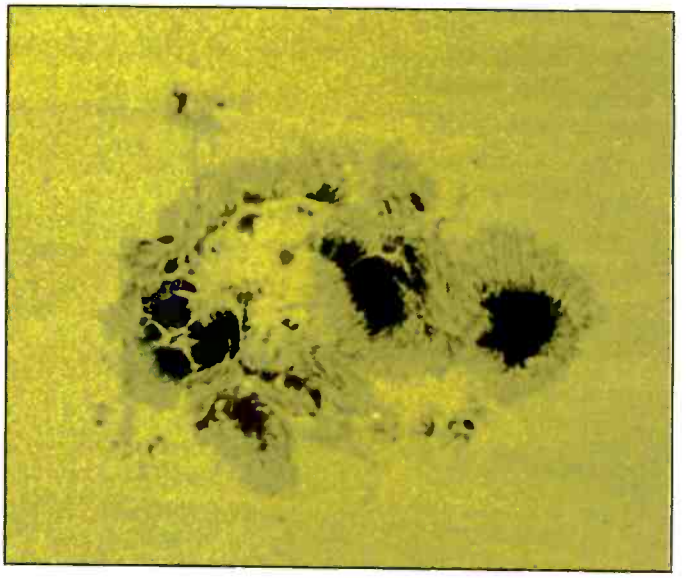


Figure 3a. An image of a sunspot from near the maximum of the last solar cycle, Cycle 23, taken at the McMath-Pierce telescope, Kitt Peak, Arizona, on October 24, 2003. The sunspots clearly show a dark central umbra surrounded by a brighter, filamentary penumbra. The magnetic fields seen here range from 1797 to 3422 Gauss. (Source: M. Penn, U.S. National Solar Observatory)

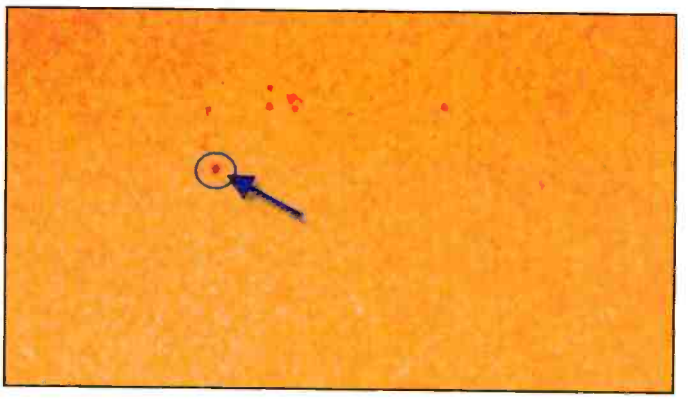


Figure 3b. An image of a pore—a tiny sunspot with no penumbral structure—taken from the MDI instrument on the SOHO spacecraft, January 11, 2009. This is an example of what we observe today at solar minimum, with the larger pore having a magnetic field of 1969 Gauss. Presently, the solar surface is mostly devoid of spots. Both images (Figures 3a and 3b) have the same spatial scale and are roughly 250,000 kilometers across. (Source: M. Penn, U.S. National Solar Observatory)

Temperatures in the dark centers of sunspots, the "umbra," drop to about 3700 K, compared to 5700 K for the surrounding photosphere. It's this difference in temperatures that makes the spots appear darker than elsewhere.

Sunspots usually form in groups containing two sets of spots. One set will have a positive or north magnetic field while the other set will have a negative or south magnetic field. The magnetic field is strongest in the darker parts of the sunspot; the field is weaker and more horizontal in the lighter part, the "penumbra" (**Figure 2**).

Since the time of Galileo Galilea, who made the first European observations of sunspots in 1610, observers and scientists have discovered a great deal about the sun and its influence on the Earth and our atmosphere. The Chinese and many other early civilizations were the first to discover sunspots. Daily sunspot observations were started at the Zurich Observatory in 1749, and by 1849 continuous sunspot observations were recorded. Over time, cycles in solar activity were revealed. The sun's sunspot activity has a cycle that lasts for an approximate 11-year period. The cycle starts with very quiet solar activity with very few sunspots, then peaks about three to five years later with a very high number of daily sunspots, and then decreases in sunspot activity until the end of the solar cycle.

In 1848, the Swiss astronomer Johann Rudolph Wolf introduced a daily measurement of sunspot number. His method, which is still used today, counts the total number of spots visible on the face of the sun and the number of groups into which they cluster, because neither quantity alone satisfactorily measures sunspot activity.

The sunspot number is calculated by first counting the number of sunspot groups and then the number of individual sunspots. The "sunspot number" is then given by the sum of the number of individual sunspots and ten times the number of groups. Since most sunspot groups have, on average, about 10 spots, this formula for counting sunspots gives reliable numbers, even when the observing conditions are less than ideal and small spots are hard to see.

Because one observer may have difficulty in accurately counting the day's sunspot number (it might be a cloudy day, after all), observations are made at various locations around the world. In addition, images are taken by spacecraft far above our atmosphere.

To compensate for the many limitations of observing the sun at various places, each daily international number is computed

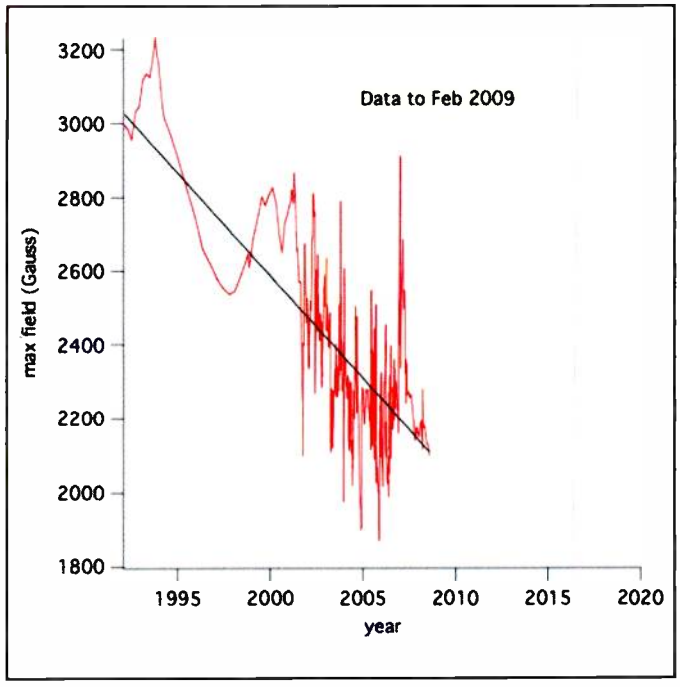


Figure 4. The maximum sunspot field strength plotted versus time, during the period from 1992 to February 2009; a 12-point running mean is shown, and a linear fit to the data is plotted. Apart from a few measurements, the linear trend has been seen to continue throughout this solar minimum. (Source: M. Penn, U.S. National Solar Observatory)

as a weighted average of measurements made from a network of cooperating observatories.

Is Solar Cycle 24 Different From Past Cycles?

The sunspots we're seeing in 2009 belong to the new Solar Cycle 24. However, many of the new-cycle spots appear weaker than the new spots seen at the start of recent past solar cycles. This might indicate that something else is happening in the sun (**Figures 3a** and **3b**).

Startling research indicates just that: There is evidence that another cycle of some sort is at work, independent of the 22-year magnetic solar cycles. (In actuality, the 11-year average sunspot cycle is half of a 22-year magnetic solar cycle. During the first 11 years of this 22-year cycle, the sun's magnetic poles are opposite in polarity from that of the next 11 years. The sun actually flips its magnetic poles from cycle to cycle!).

In 1990, a time of maximum sunspot activity in cycle 22, physicist S. K. Solanki and his students from Zurich took advantage of the new infrared capability at the now McMath-Pierce Solar Telescope on Kitt Peak in Arizona. They made observations of sunspots, mapping magnetic fields, along with other spectral data. These observations continued through the minimum of Cycle 22. In 1998 the observing runs were made more systematic by measuring all sunspots visible on the disk during the run. The work has continued through Cycle 23 up to the present (2009).

Out of these observations a startling trend has emerged. In 2005, scientists led by Matthew Penn from the U.S. National Solar Observatory (NSO) closely examined these solar measurements made over the previous 13 years. The observations show that the vigor of sunspots, in terms of magnetic strength and area, is decreasing with time, independent of the sunspot cycle. **Figure 4** shows the decrease in field strength now found with respect to time (1992–2009), which shows a linear trend independent of the solar cycle. The mean infrared intensity of sunspot umbrae is also increasing with time. Sunspots during this solar minimum are weaker than they were during the last solar cycle minimum.

In simple terms, the sunspots observed since the 1990s have been increasing in brightness, while decreasing in magnetic field strength. When the brightness reaches the same level in the sunspot as the brightness of the rest of the solar disc, we will no longer be able to see these weak sunspots—they will simply vanish. A simple linear extrapolation of those data suggests that sunspots might completely vanish by 2015 (**Figure 5**)!

Indicators of the current solar cycle suggest that sunspots should return in earnest within the next year (2010). We've even seen a very large Cycle 24 sunspot during the 2009 summer. We've also seen a parade of small sunspots, some only the size of pores. This gives us hope that the new cycle is increasing in energy, even if very slowly. But only time will tell if the trend seen in this research will continue through the life of Cycle 24. At the close of Cycle 24, will sunspots vanish altogether? Whether this is an omen of long-term sunspot decline, analogous to the Maunder Minimum, remains to be seen. Stay tuned to this column as the story unfolds!

HF Propagation

Paths on 31 through 19 meters are becoming ever more reliable between North America and Europe in the morning and between North America and Asia during the late afternoon hours. The strongest openings occur for a few hours after sunrise and during the sunset hours. Thirty-one and 25 meters will often remain open into many areas late into the night and will open early in the morning, especially when part of the propagation path moves through sunlit regions. Twenty-two and 19 may still offer nighttime paths, though these will become less reliable later in November.

Nineteen, 22 and 25 meters compete with 16 for the good daytime DX during November. They will open for DX just before sunrise and should remain open from all directions throughout the day, with a peak in the afternoon. Nighttime conditions will favor openings from the south and tropical areas. Since the Southern Hemisphere has long daylight hours, DX paths on these bands from stations in the south will be common.

The all-season bands, 31 and 25 meters, are crowded and signals are usually very strong and steady. Twenty-five meters is expected to be an excellent band for medium distance (500 to 1,500 miles) reception during the daylight hours. Longer distance reception (up to 2,000 to 3,000 miles) should be possible for an hour or two after local sunrise, and again during the late afternoon and early evening. Heavy congestion will occur here since many international and domestic broadcasters make use of 25 meters. Thirty-one meters, the backbone of worldwide shortwave broadcasting, will provide medium-distance daytime reception ranging between 400 and 1,200 miles. During November, reception up to 2,500 miles is possible during the hours of darkness, and until two to three hours after local sunrise. Thirty-one meters, too, is highly congested, making reception of weak exotic signals a bit more of a challenge.

Thirteen and 16 meters will be open during a fair number of days through November when flux levels remain above 100.

Optimum Working Frequencies (MHz) - For November 2009- Flux = 72, 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	17	14	11	11	10	10	9	9	9	9	9	8	8	8	15	17	19	20	20	20	21	20	20	19
NORTHERN SOUTH AMERICA	25	22	17	14	14	13	13	12	12	12	11	11	11	11	19	23	25	26	27	28	28	28	27	26
CENTRAL SOUTH AMERICA	24	21	15	14	14	13	13	12	12	12	12	11	11	11	20	23	25	26	27	28	28	28	27	26
SOUTHERN SOUTH AMERICA	26	24	21	15	14	14	13	13	12	12	12	12	11	11	16	22	24	25	26	27	28	28	28	27
WESTERN EUROPE	8	8	8	8	8	8	8	8	8	8	8	8	8	8	9	12	14	13	12	11	9	9	8	8
EASTERN EUROPE	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	10	12	11	9	9	8	8	8	8
EASTERN NORTH AMERICA	19	16	12	12	11	11	10	10	10	10	10	10	9	9	16	19	21	21	22	22	22	22	21	20
CENTRAL NORTH AMERICA	11	10	8	7	6	6	6	6	6	5	5	5	5	5	5	9	11	11	12	12	12	12	12	12
WESTERN NORTH AMERICA	6	6	5	4	3	3	3	3	3	3	2	2	2	2	2	3	5	6	6	6	6	6	6	6
SOUTHERN NORTH AMERICA	19	17	14	11	11	10	10	9	9	9	9	9	9	9	12	17	18	20	20	21	21	21	21	20
HAWAII	18	17	17	15	13	10	9	9	8	8	8	8	8	8	7	7	7	14	16	17	18	18	18	18
NORTHERN AFRICA	8	8	8	8	8	8	8	8	8	8	8	8	8	8	11	13	14	15	15	12	10	9	9	9
CENTRAL AFRICA	10	10	9	9	9	8	8	8	8	8	8	8	8	8	10	13	14	15	15	12	12	11	11	11
SOUTH AFRICA	17	14	11	11	11	10	10	10	10	9	9	9	9	9	16	18	19	20	21	21	21	20	20	19
MIDDLE EAST	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	11	13	10	10	9	9	9	8	8
JAPAN	17	16	16	15	13	10	9	9	9	8	8	8	8	8	8	8	8	8	8	8	8	13	15	17
CENTRAL ASIA	17	16	16	15	13	10	9	9	9	8	8	8	8	8	8	8	8	10	10	10	10	10	15	17
INDIA	7	12	11	9	9	8	8	8	8	8	8	8	7	7	7	7	8	8	8	7	7	7	7	7
THAILAND	16	16	15	14	12	9	9	9	9	8	8	8	8	8	8	8	8	10	10	10	10	10	10	13
AUSTRALIA	24	25	25	24	21	15	14	13	13	13	12	12	12	11	11	11	11	15	14	14	16	19	21	22
CHINA	15	15	15	13	11	9	9	9	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	13
SOUTH PACIFIC	26	27	25	23	19	15	14	13	13	12	12	12	12	11	11	11	15	15	17	19	21	23	24	25

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	19	13	13	12	11	11	11	10	10	10	10	10	9	18	20	22	23	24	24	24	24	23	22	21
NORTHERN SOUTH AMERICA	22	18	15	14	13	13	12	12	11	11	11	10	10	17	21	23	24	25	26	26	26	26	25	23
CENTRAL SOUTH AMERICA	22	16	15	14	14	13	13	12	12	12	12	11	11	21	23	25	26	27	27	28	28	28	27	25
SOUTHERN SOUTH AMERICA	25	21	17	16	15	14	14	13	13	12	12	12	12	17	21	23	24	25	26	27	28	28	28	27
WESTERN EUROPE	8	8	8	8	8	8	8	8	8	8	8	8	8	12	14	15	15	15	14	13	10	9	9	8
EASTERN EUROPE	8	8	8	8	8	8	8	8	8	8	8	8	8	10	11	11	11	10	9	8	8	8	8	8
EASTERN NORTH AMERICA	13	9	9	8	8	8	7	7	7	7	7	7	7	11	14	15	16	16	17	17	16	16	15	15
CENTRAL NORTH AMERICA	6	5	4	4	3	3	3	3	3	3	3	3	3	3	5	6	7	7	7	7	7	7	7	7
WESTERN NORTH AMERICA	11	10	9	7	6	6	6	6	6	5	5	5	5	5	5	9	11	12	12	12	13	13	12	12
SOUTHERN NORTH AMERICA	13	11	8	8	7	7	7	7	6	6	6	6	6	6	11	13	14	14	15	15	15	15	15	14
HAWAII	20	19	17	14	11	11	10	10	10	9	9	9	9	9	9	9	12	17	19	21	21	21	21	21
NORTHERN AFRICA	10	9	9	9	9	8	8	8	8	8	8	8	10	14	15	16	17	17	17	16	12	12	11	11
CENTRAL AFRICA	10	9	9	9	9	8	8	8	8	8	8	8	9	14	15	16	17	17	17	13	12	11	11	11
SOUTH AFRICA	17	14	14	13	13	12	12	12	12	11	11	11	17	22	24	26	27	27	27	27	27	25	22	21
MIDDLE EAST	8	8	8	8	8	8	8	8	8	8	8	8	8	12	14	15	15	13	10	9	9	9	9	8
JAPAN	16	15	13	10	9	9	9	8	8	8	8	8	8	8	8	8	8	8	8	8	8	13	15	16
CENTRAL ASIA	15	14	13	10	9	9	9	8	8	8	8	8	8	8	8	8	10	10	10	10	10	10	14	16
INDIA	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
THAILAND	15	13	11	9	9	9	8	8	8	8	8	8	8	8	8	10	11	11	10	10	10	10	10	10
AUSTRALIA	24	25	23	18	15	14	13	13	12	12	12	12	11	11	11	16	16	15	14	14	17	19	21	23
CHINA	14	13	11	9	9	9	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	11
SOUTH PACIFIC	27	25	22	16	15	14	13	13	12	12	12	12	11	11	11	16	15	15	18	20	22	23	25	26

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	14	11	11	10	10	9	9	9	8	8	8	8	13	16	18	19	19	20	20	20	19	19	18	16
NORTHERN SOUTH AMERICA	19	16	15	14	13	12	12	11	11	10	10	10	14	17	20	21	22	23	24	24	23	23	22	21
CENTRAL SOUTH AMERICA	20	18	17	16	15	14	14	13	12	12	12	15	20	22	23	25	26	27	27	28	28	27	26	24
SOUTHERN SOUTH AMERICA	23	20	19	17	16	15	14	14	13	13	12	12	18	20	22	23	25	26	26	27	28	28	28	26
WESTERN EUROPE	8	8	8	8	7	7	7	7	7	7	7	11	14	15	16	16	16	15	14	13	11	9	9	8
EASTERN EUROPE	8	8	8	8	8	8	8	7	8	8	8	9	13	13	13	13	13	12	11	9	9	8	8	8
EASTERN NORTH AMERICA	5	4	4	4	3	3	3	3	3	3	3	3	5	6	7	8	8	8	8	8	8	8	7	7
CENTRAL NORTH AMERICA	13	10	9	9	8	8	8	8	7	7	7	7	7	12	14	16	17	17	17	17	17	17	16	15
WESTERN NORTH AMERICA	19	16	12	12	11	11	10	10	10	10	10	10	9	9	17	19	21	22	22	23	23	22	22	21
SOUTHERN NORTH AMERICA	15	11	10	9	9	9	8	8	8	8	8	8	8	13	16	17	18	19	19	19	19	18	18	17
HAWAII	20	17	13	12	11	11	11	10	10	10	10	10	10	9	10	10	14	19	21	23	23	23	22	21
NORTHERN AFRICA	11	10	10	10	10	10	10	9	10	9	9	17	19	21	22	22	23	22	20	18	13	12	11	11
CENTRAL AFRICA	11	11	10	10	10	10	10	10	10	10	9	17	20	21	22	23	22	21	18	14	13	12	12	11
SOUTH AFRICA	15	14	14	13	13	12	12	12	12	11	11	21	24	26	27	27	28	28	28	28	27	25	23	17
MIDDLE EAST	10	9	9	9	8	8	8	8	8	8	8	13	15	16	17	18	18	18	13	12	11	11	11	10
JAPAN	13	10	9	9	9	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	11	14	15
CENTRAL ASIA	12	10	9	9	9	8	8	8	8	8	8	8	8	11	11	11	10	10	10	10	10	10	9	14
INDIA	8	8	8	8	8	8	8	8	8	8	8	8	11	14	15	13	10	9	9	9	8	8	8	8
THAILAND	10	9	9	9	8	8	8	8	8	8	8	8	9	13	12	11	11	11	10	10	10	10	10	10
AUSTRALIA	24	21	15	14	14	13	13	12	12	12	12	11	11	11	18	17	16	15	14	14	17	19	21	23
CHINA	10	9	9	9	8	8	8	8	8	8	8	8	8	9	9	8	8	8	8	8	8	8	8	8
SOUTH PACIFIC	24	21	17	16	15	14	13	13	12	12	12	12	11	17	17	16	15	17	19	21	23	25	26	26

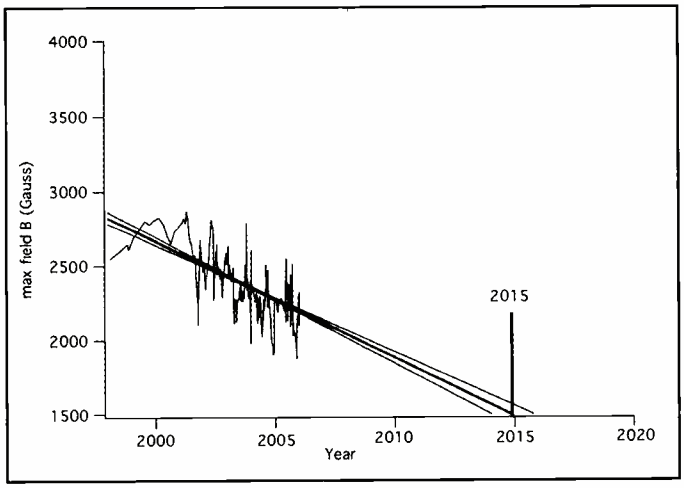


Figure 5a. A linear fit to observed magnetic fields extrapolated to the minimum value observed for umbral magnetic fields; below a field strength of 1500G as measured with the Fe I 1564.8nm line no photospheric darkening is observed. (Source: M. Penn, U.S. National Solar Observatory)

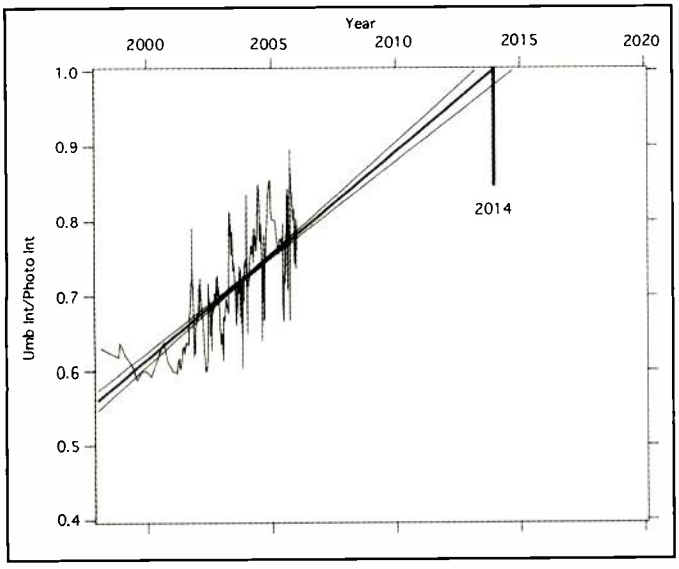


Figure 5b. A linear fit to the observed umbral contrast values, extrapolated to show that by 2014 the average umbrae would have the same brightness as the quiet sun. (Source: M. Penn, U.S. National Solar Observatory)

Paths from Europe and the South Pacific as well as from Asia, at least during days of higher solar flux levels, are common, especially on 16 meters. Look for best conditions from Europe and the northeast before noon and from the rest of the world during the afternoon hours. Reception from the South Pacific, Australia, New Zealand, and the Far East should be possible well into the early evening. At this stage in the solar cycle, the 10.7-cm flux levels are too low to sustain band openings at these frequencies for long, if at all.

Seventy-five through 120 meters is coming alive, though. Signals below 120 meters are improving, too. Throughout November, expect an improvement in nighttime DX conditions on these bands. Since the night is longer, and there is the seasonal decrease in static "noise" levels, expect good long-range DX on the low bands, starting with signals from closer locations right after sunset, and then extending to areas farther away as the night develops. Europe should be possible in the late evening. DX paths will move farther west through the night. By morning openings from Asia should be common.

Meteor Showers And VHF Conditions

One of the largest yearly meteor showers occurs during November. Appearing to radiate out of the constellation of Leo, this shower is known to create intense meteor bursts. Large, spectacular visuals might occur only 10 to 20 times per hour during the peak. Remember, though, that when we're talking about meteor scatter radio propagation, we count any meteor-formed plasma clouds that will support VHF radio signals.

Astronomers from Caltech and NASA say a strong shower of Leonid meteors is coming in 2009. Their prediction follows an outburst on November 17, 2008, that broke several years of "Leonid quiet" and heralds even more intense activity this November.

"On Nov. 17, 2009, we expect the Leonids to produce upwards of 500 meteors per hour," says Bill Cooke of the NASA Marshall Space Flight Center. "That's a very strong display."

Forecasters define a meteor storm as 1,000 or more meteors per hour. That would make the 2009 Leonids "a half-storm," says Jeremie Vaubaillon of Caltech.

On November 17, 2008, Earth passed through a stream of debris from comet 55P/Tempel-Tuttle. The gritty, dusty debris stream was laid down by the Leonids' parent comet more than 500 years ago in 1466. Almost no one expected the old stream to produce a very strong shower, but it did. Observers in Asia and Europe counted as many as 100 meteors per hour.

Vaubaillon predicted the crossing with one-hour precision. "I have a computer program that calculates the orbits of Leonid debris streams," he explains. "It does a good job anticipating encounters even with very old streams like this one."

The 2008 outburst proved that the 1466 stream is rich in meteor-producing debris, setting the stage for an even better display in 2009. On November 17, 2009, Earth will pass through the 1466 stream again, but this time closer to the center. Based on the number of meteors observed in 2008, Vaubaillon estimated the 500 or greater Leonids-per-hour peak; it should last a few hours, centered on 21:43 UT.

"Our own independent model of the debris stream agrees," says Cooke. "We predict a sub-storm level outburst on Nov. 17, 2009, peaking sometime between 21:34 and 21:44 UT."

Working Meteor Scatter

Meteors are particles (debris from a passing comet) ranging in size from a speck of dust to a small pebble. Some move slowly and some move fast. When you view a meteor, you typically see a streak that persists for a little while after the meteor vanishes. This streak is called the "train" and is basically a trail of glowing plasma left in the wake of the meteor.

The Leonids enter Earth's atmosphere traveling at speeds of over 158,000 miles per hour. Besides being fast, this shower usually contains a large number of very bright meteors. The trains of these bright meteors can last from several seconds to several minutes. It's typical for these trains to be created in the *E* layer of the ionosphere.

Meteor scatter propagation is a mode where radio signals are refracted off these trains of ionized plasma. Because the height of these plasma trains is in the *E* layer of the ionosphere, the range of a meteor scatter contact is between 500 and 1,300 miles. The

frequencies that are best refracted are between 30 and 100 MHz. However, with the development of new software and techniques, frequencies up to 440 MHz have been used to make successful radio contacts off these meteor trains.

Lower VHF frequencies are more stable, and last longer, off these ionized trails. A 6-meter contact may last from a second to well over a minute. The lower the frequency, the longer the specific "opening" made by a single meteor train. Conversely, a meteor's ionized train that supports a 60-second long refraction on 6 meters might only support a 1-second refraction of a 2-meter signal. Special high-speed digital modulation modes are used on these higher frequencies to take advantage of the limited available time, like high-speed CW, in the neighborhood of hundreds of words per minute.

Current Solar Cycle Progress

The Royal Observatory of Belgium reports that the monthly mean observed sunspot number for July 2009 is 3.5, up from June's 2.6. The lowest daily sunspot value recorded was zero (0) on July 1–3, 11–22, 24–29, and July 31. The highest daily sunspot count was 16 on July 4–6. The 12-month running smoothed sunspot number centered on January 2009 is 1.8. A smoothed sunspot count of 13, give or take 9 points, is expected for November 2009. An interesting modification of the observed sunspot number for March 2009 now puts that month as the lowest in the minimum between Cycle 23 and 24, at 0.7. We still have to wait for the smoothed sunspot numbers to pass through December and March to see where the statistical end of Cycle 23 will actually occur.

The Dominion Radio Astrophysical Observatory at Penticton, BC, Canada, reports a 10.7-cm observed monthly mean solar flux of 68.3 for July 2009. The 12-month smoothed 10.7-cm flux centered on January 2009 is 68.7. The predicted smoothed 10.7-cm solar flux for November 2009 is 72, give or take about 8 points.

The observed monthly mean planetary A-Index (A) for July 2009 is 5. The 12-month smoothed A index centered on January is 4.8. Expect the overall geomagnetic activity to vary between quiet to active during most days in November.

I'd Like To Hear From You

Be sure to listen to the "NW7US Space Weather and Radio Propagation Podcast" at http://podcast.hfradio.org. You'll find my recent interview with M. Penn of the National Solar Observatory, Tucson Arizona, about the disappearing sunspots discussed in episode 4 of the podcast. An archive of podcast episodes is also found at the podcast website.

If you're on Facebook, check out the Radio Propagation and Space Weather Group at http://tinyurl.com/fb-spacewx. As usual, I invite you to visit my online propagation resource at http://propagation.hfradio.org/, where you can get the latest space data, forecasts, and more, all in an organized manner.

In the meantime, drop me an email or send me a letter if you have questions or topics you would like to see me explore in this column. As always, I'd love to hear any feedback you might have on what I've written. Until next month,

—73, de Tomas, NW7US

"Looking" At Broadcast History: A Cornucopia Of The Visual Side Of The Radio Hobby

by Shannon Huniwell
melodyfm@yahoo.com

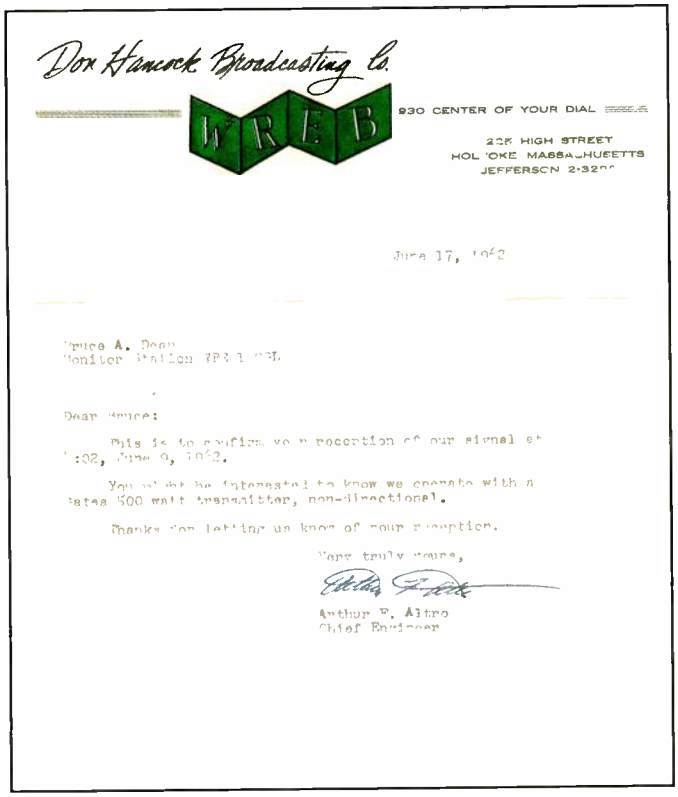
When my neighbor Melissa heard the news on her kitchen radio, time rushed backwards. She quickly connected the story's dots and suddenly saw herself in Seattle's North City School again. A memory crystallized.

Standing there clear as day in her mind's eye, Melissa's fourth grade teacher, Mrs. Aguayo, had just explained to the class that they'd be putting messages in soda bottles, and a friend with a boat would toss them onto waves of Puget Sound. Mrs. Aguayo said some could travel to distant shores and predicted that a few might even be found by curious people who'd be happy to respond to the enclosed letter offering a snapshot of the sender if the finder notified the school by mail.

That 1987 science project related to geography lessons and an elementary study of ocean currents netted one response—21 years and 1,735 miles later. "Merle Brandell and his black lab, Slapsey, were beach-combing along the Bering Sea," the announcer broadcasting Associated Press news copy (from March 23, 2008) informed his audience, "when he spied a plastic bottle...along the shore of his tiny remote western Alaskan fishing village." Inside the weathered container was the typed form letter signed by a classmate Melissa couldn't picture.

According to the AP, Brandell wrote to Seattle's Shoreline School District and a helpful official there tracked down the girl who'd sent the message, "now a 30-year-old accountant...who lives in Seattle. 'I don't remember the project,' she told reporters. 'It was so long ago. Elementary school is kind of foggy.'"

Melissa's recollections of the bottle-message project are vivid compared to those of the young woman quoted on the radio. Like my Dad, Melissa's father is a longtime DXer. Consequently, he had instilled in her a love of sending away for free stuff from radio stations. "Envisioning the lit-



Don Hancock Broadcasting Co.

WREB

930 CENTER OF YOUR DIAL

225 HIGH STREET
HOL'OKE MASSACHUSETTS
JEFFERSON 2-3205

June 17, 1962

Bruce A. Dean
Monitor Station WPE1 CGL

Dear Bruce:

This is to confirm your reception of our signal at 1:02, June 9, 1962.

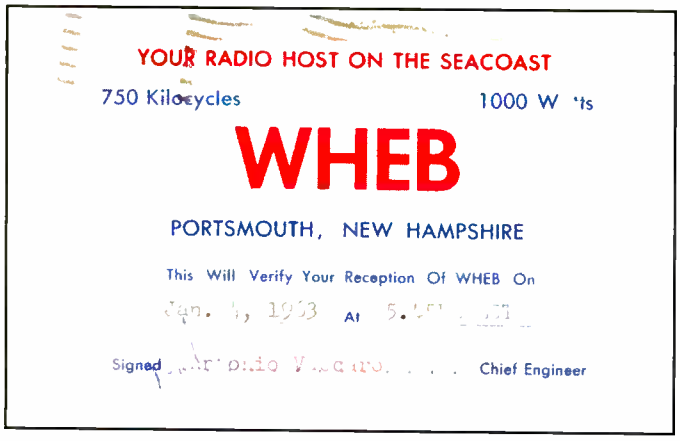
You will be interested to know we operate with a 5000 watt transmitter, non-directional.

Thanks for letting us know of your reception.

Very truly yours,

Arthur P. Altro
Chief Engineer

A 500-watt sunrise-to-sunset operation in Holyoke, Massachusetts, the thriving little city 10 miles north of Springfield, WHEB debuted in 1950. Just before springtime 1961, the local AM was acquired by Donald T. Hancock, whose John Hancock is stylized across the top of the stationery used to QSL Bruce Dean. Representative of hundreds of decent daytimers that employed a staff of six to a dozen radio professionals and served their communities well, WREB sounded to locals like it would be an important part of their hometown forever. The station succumbed to the rise of FM and a declining Main Street trade, however, and went dark in the 1990s. Even though brief, this document is a now rare piece of Bay State broadcast history. Note that WREB's Chief Engineer addresses Bruce Dean as WPE1CGL. That was Dean's registered monitoring station callsign. His dad netted the call WPE1DXY, both IDs from an "official service" which conferred such nomenclature to DXers enthusiastic enough to mail a fee.



"Your Host on the Seacoast," WHEB radiated its kilowatt from New Hampshire's modest run of oceanfront. Begun in 1932, it was considered to be a daytime AM, but had a bit more leeway than traditional sun-up/sundown facilities in that it didn't have to say goodnight until darkness fell in Atlanta, Georgia, home of 50,000-watt WSB, the primary eastern occupant of 750 kHz. After adding an FM sister in 1964, WHEB's ownership then had a truly fulltime signal in Portsmouth. Emphasis on the AM side faded in the 1980s, eventually causing WHEB 750 to sunset for the last time on January 31, 1991. When Knight Broadcasting of New Hampshire returned WHEB's license to the FCC, the firm explained it did so in order to satisfy local zoning officials who wouldn't allow WHEB-FM to build a taller tower unless the AM stick was permanently removed.

tle plastic bottle sailing my letter to some exotic port of call," she said, smiling, "I guess was kind of like taking a fun chance that something even more interesting might come my way."

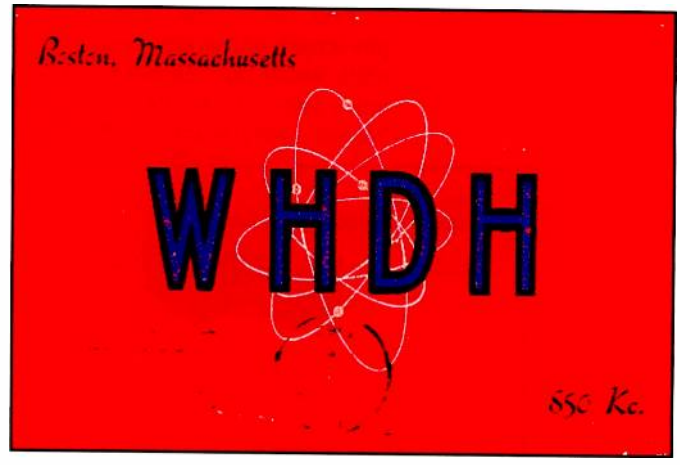
Her experience in the DXing hobby taught her the truth of the maxim that you have to give in order to receive. "It was always a thrill to hop off the school bus in the afternoon, run to our mailbox, and see what resulted from reception reports Dad had helped me fire off a few weeks earlier," Melissa remembered. "My wish was to get a little visual piece of the station I'd heard sail through the air. Whenever the return address sported a station logo, I felt like I'd won the lottery!"

Like my neighbor, Bruce Dean, N1BD, a Boston-area *Pop'Comm* subscriber is a devotee of radio memorabilia, and he really hit a jackpot of AM/FM memories this past winter. A radio buff since the latter days of the Eisenhower administration, he got the broadcast bug from his father who manned a Hallicrafters model S-20-R. That general coverage receiver pulled signals from a 12-foot whip linked at the base with a long-wire antenna.

In the early 1960s, Dean amassed the then-princely sum of $29.95, spending it at his local Lafayette Radio Electronics outlet on a Japanese-built Vanguard brand six-transistor portable. For young readers noting that one can now get a Chinese made AM/FM Walkman-type radio at a dollar store, Dean offers that decent-quality solid-state shirt pocket radios with more than a couple semiconductors "were costly because they were a hot new item in 1962."

With that new battery-powered set conveniently poised to travel, and his dad's reliable tube rig at the ready indoors, he spent many enjoyable hours at the dials. A growing stack of *Radio-TV Experimenter* magazines gave Dean access to station listings in *White's Radio Log*, his document of choice, along

On Christmas Eve 1961, Bruce Dean decided to add a WMEX Boston QSL to his collection. At the time, this legendary top-40/personality Bean Town station ran 5 kW, 10 times less than it would a few years later. Even at 50,000 watts, though, significant portions of its signal were directed out to sea. Consequently, not every radio in Greater Boston tuned WMEX clearly. WHIM-EX, as it was pronounced by Kennedy-era DJs, spent a year or so with the additional alias, Color Radio. That handle was coined by a Los Angeles radio programmer who used it successfully for listeners to better picture Hollywood-based KFWB. He then "syndicated" the Color Radio term to other operators of contemporary formatted stations who wanted listeners to associate their stations with high-energy pizzazz.



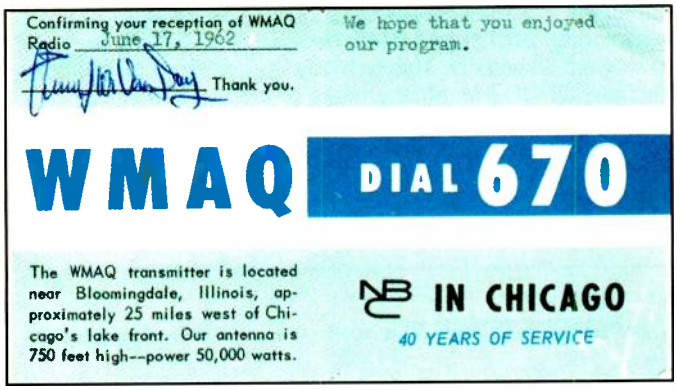
In one of those frenzied call letter/frequency/ownership swap-a-roos of the 1990s, the original WHDH 850 became WEEI, letters from another famous Boston AM (long at 590 kHz) and then morphed into sports radio programming. My father tells me that a Red Sox nut friend of his often complained that "because WHDH 850 broadcast the Red Sox, Boston was the only place in New England where a Sox fan couldn't hear a Red Sox game on radio." When I protested that this was probably a bit of an exaggeration, Dad pointed to the bright orange "atomic" glow of the WHDH QSL and quipped that one could probably see the card further than one could pick up WHDH's signal. In fact, the station's 50 kW have long been directionalized (especially at night) over the Atlantic, Cape Cod, Maine, and Nova Scotia—much to the disadvantage of many folks west of Boston. There's a reason for this "keep-away": Regulators didn't want Boston's 850 to interfere, even slightly, with non-directional KOA 850 in Denver.

with commercials, jingles, and "any other indications of stations' whereabouts," to help connect call letters to content pulsing through the ether. Once the young New England DXer made the identification, he'd send off a reception report and hope for a QSL that might help him better picture the station whose signal he'd managed to snag.

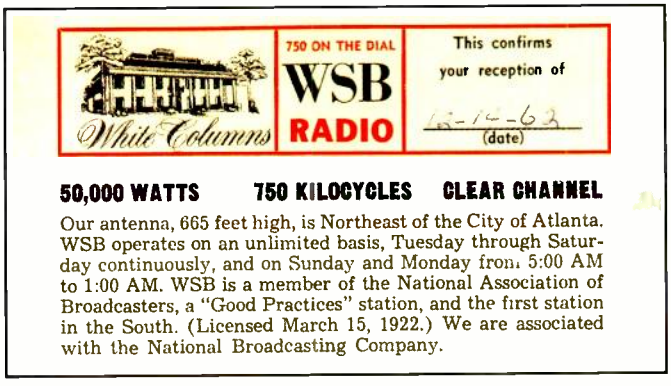
What was Dean's find that I hinted at before? To be sure, it was bittersweet, but it's a tribute to parents who encouraged their son to pursue the radio hobby.

Dean told me that his widowed mother passed away last year. "In the process of cleaning out her home," he said, "I came across an envelope stuffed with about three dozen forgotten vintage QSL cards and letters." He graciously offered to share them with us as a visual reminder of how radio "looked" nearly a half century ago.

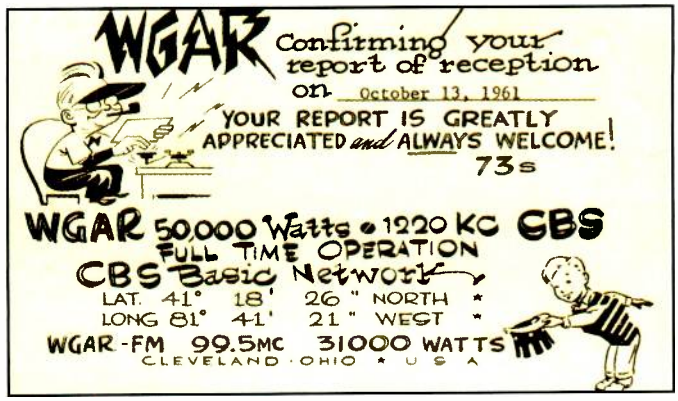
My guess is that like Merle Brandell, the beachcomber who retrieved the grade school message in a bottle, Dean—and thousands of other radio QSL collectors through the decades—love the act of searching. "It's kind of a sport," Brandell admitted to



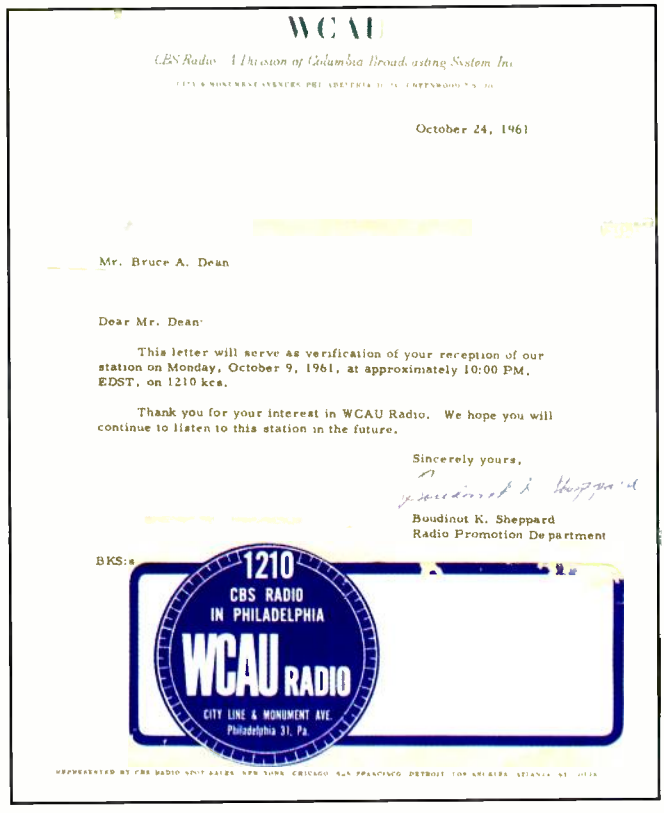
Apparently popular with the engineering-types who helped design their station's verification cards, tower height seemed to be an impressive statistic. Here, WMAQ technical staff was sure to note that the Chicago flamethrower possessed a 750-foot stick. Check out that vintage NBC logo that announced the 50,000-watt AM as being owned and operated by the world's then-most-famous and experienced broadcast company.



Atlanta's WSB waved its signal from a 665-foot tower. Just as visually significant, though, was its "White Columns," the beautiful studio building as charming as any mansion depicted in *Gone with the Wind*. Note that this 1962 QSL lists WSB as operating round-the-clock Tuesday through Saturday, with a reduced 5 a.m. to 1 a.m. schedule on Sundays and Mondays. Such down time gave engineers the opportunity to perform safe transmitter maintenance. DXers loved those quiet hours when they could try for some less common occupant of a clear channel; in this case, 750 kHz.



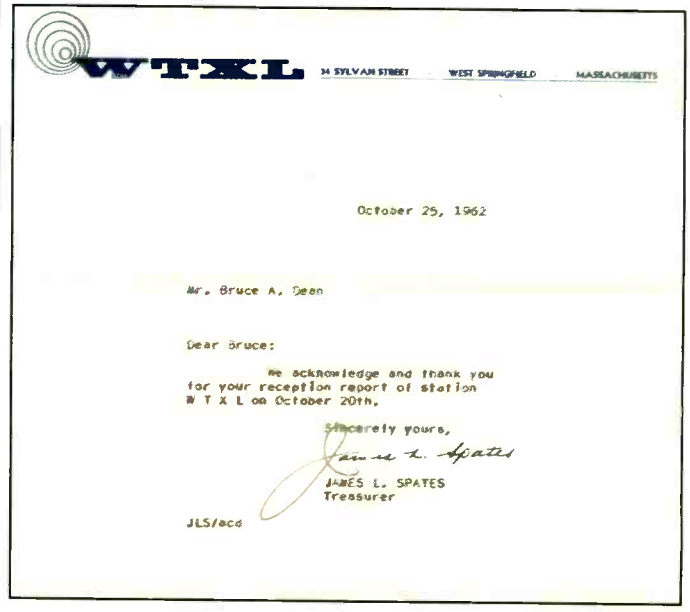
Though this now-vintage "veri" came to Bruce Dean in late 1961. Even then he must have thought that the scene made WGAR look rather archaic—an eyeshade-bedecked telegraph operator certainly didn't reflect WGAR's top-40 music format. The term "CBS Basic Network," also harkened back to what is often called "radio's golden network age." No matter how outdated the Cleveland card might've seemed, however, no radio buff could resist being greeted with "73s."



Today dubbed WPHT, Philadelphia's Talker, the original 1210 WCAU was a cornerstone in the formation of the Columbia Broadcasting System. It was one of the first Philly stations to abandon the high-rent district of downtown Philadelphia and move to a spot at City Line & Monument Avenue, inches outside of the City of Brotherly Love and the municipality's related wage taxes. The sprawling CBS-built studio facility (housing WCAU AM-FM-TV) from which this letter was mailed had one tiny window in what was once the main radio on-air booth. During the early 1960s, a prominent announcer there successfully argued to management that he needed to be able to see outside if they expected him to talk about the weather accurately. Throughout the northeast, regardless of meteorological conditions, the old WCAU is still an easy nighttime catch on 1210 kHz.

AM 1500 K. C.
50,000 Watts
FM 96.3 Meg.
20,000 Watts
Operated by
Post-Newsweek Stations
WTOP RADIO
a division of
the Washington Post
Company

No wonder WTOP had such a colorful photo on its QSL...When Bruce Dean received this card showing WTOP's nicely stylized suburban Washington, D.C. transmitter building and three towers, it was owned (along with a Channel 9 TV and an FM companion at 96.3 MHz) by an outfit with printing presses and a lot of talented photographers: the Post-Newsweek organization. Incidentally, Washington Post stockholders decided to give away their FM to Howard University. This formerly underutilized outlet then became WHUR-FM. Most eastern broadcast band DXers might not consider WTOP much of a capture, but remember that Dean tuned this 50-kW signal at 1500 kHz while "local" WMEX was cranking away just 10 kHz up the dial. Then again, WMEX had plenty of nulls in its infamously directional footprint.



WTXL 34 SYLVAN STREET WEST SPRINGFIELD MASSACHUSETTS

October 25, 1962

Mr. Bruce A. Dean

Dear Bruce:

We acknowledge and thank you for your reception report of station W T X L on October 20th.

Sincerely yours,

JAMES L. SPATES
Treasurer

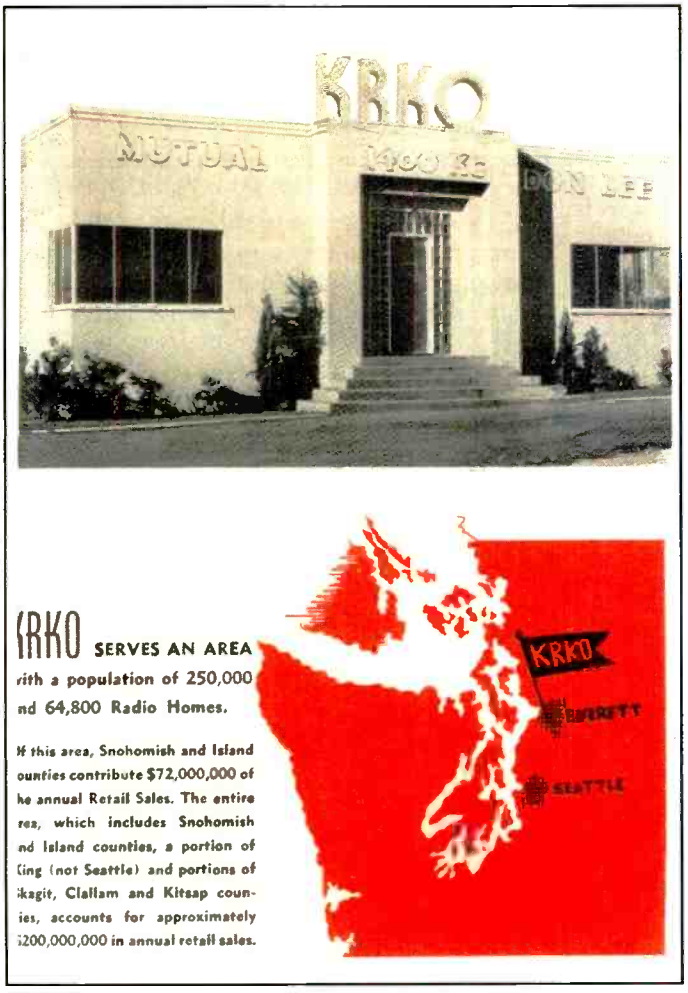
JLS/ecd

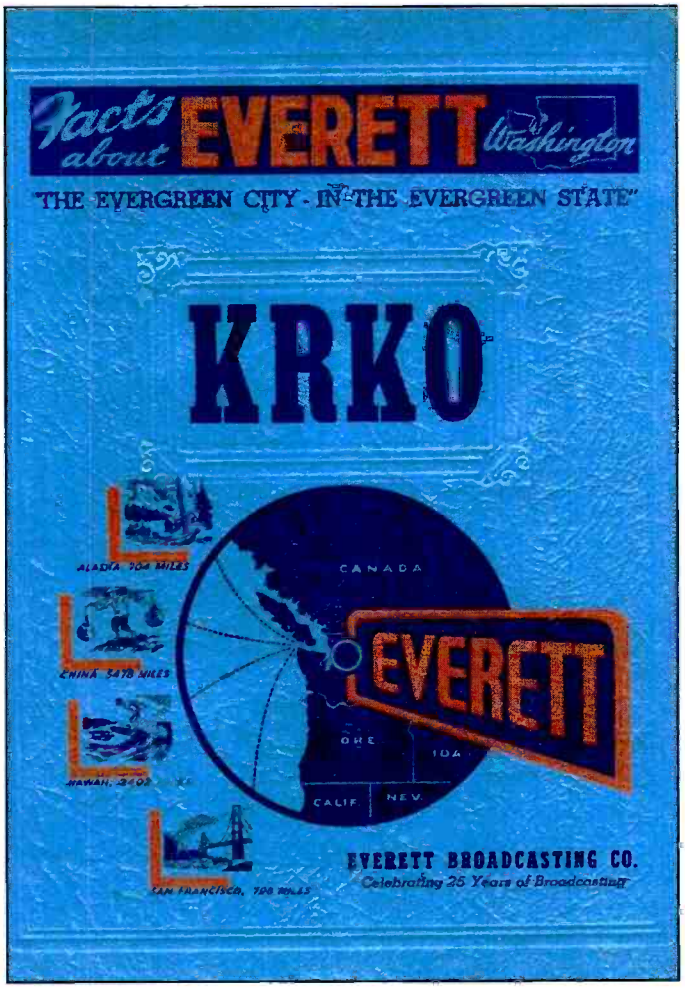
Broadcasting magazine's 1963 Yearbook lists WTXL West Springfield, Massachusetts, as having 1-kW day and 250-watts at night—with a directional antenna during daylight hours, a transmission pattern atypical of most "local" licenses. Regardless of when Bruce Dean heard this little AM from the other side of his state, it represented an honorable catch. That's because there were several other Class IV "local" stations in Dean's general vicinity also transmitting on 1490 kHz. One would have to be a true radio nut to recall such an arcane distinction, but circa 1970, WTXL took a notable, but ultimately inconsequential, bite out of Springfield, Massachusetts (and northern Hartford, Connecticut suburban) ratings when it did an admirable job of pumping high-energy "Drake" top-30 hits format out of its modest tower.

the AP. "It keeps us occupied. It's one of the pleasures of living here." Dean might echo that being happily occupied by distant AM and FM radio listening has made many a life more pleasurable. And, as a result of Dean's searching, we have the following visual record of his long-ago broadcast band endeavors. Enjoy!

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

When Bruce Dean pulled WGBS into his dad's Hallicrafters, the 50-kW days/10-kW nights station on 710 kHz had just secured an FCC OK to run 50,000 watts full time. The Miami AM originally aired in 1939 and was bought by George B. Storer five years later. That's when he used his initials for call letters and began building a coast-to-coast broadcast empire via AM, FM, and television licenses. For the publicity photo used on this colorful QSL, Storer officials parked a pair of 1958 Chevy station wagons under a float-equipped whirlybird to show off the potential news gathering speed and versatility of his Florida-based full-service radio operation.





Taken from an old station brochure my father thinks he got while visiting the transmitter shack of some Seattle area station other than KRKO 1380 Everett, Washington, the images provide a visual representation of KRKO's home and coverage. Eventually being FCC authorized to use 5000 watts fulltime and employ a directional array only after sunset, KRKO could be heard throughout much of Washington State's biggest media market. It was among the earliest radio facilities in America, debuting during 1920. Sharp-eyed readers will note that when the KRKO information was compiled for its 25th Anniversary brochure, the station still transmitted on its old 1400 kHz (with just 250 watts) local dial position. Through the 1950s, most print-related radio station publicity offered at least one exterior shot of the studio building and/or transmitter site, views that would seem irrelevant to many broadcast executives authorizing such promotional materials today.

AC Voltmeters For Dummies

by Peter J. Bertini
radioconnection@juno.com

"Can we make accurate readings of an AC voltage that is reduced by the use of a series diode for a resistive load, such as tube filaments? Yes, we can."

I once commented that a diode wired in series in an AC circuit would reduce the power by one half, not the voltage. That is counter intuitive to what you would think at first, but it makes sense once you consider that the duty cycle—and thus the power—has been reduced by 50 percent. That works out to about 0.707 times the RMS voltage, or 81.3 volts for a 115 VAC line voltage.

I was surprised to receive several very adamant admonishments insisting that I was wrong. The truth is that anyone using a typical True RMS voltmeter, which is an AC coupled device, would be misled by a reading that is actually closer to one half the applied voltage than the times 0.707 calculation that is correct for half power. This is most unfortunate, and I believe in doing test bench experiments to verify that things are as they appear. But I found it even odder that the few who complained never bothered to run the math using the power formulas to prove their point, one way or the other.

I believe that when well-intended experiments lead to erroneous conclusions, it is time to act! But I'm getting ahead of myself...

Let's begin by discussing the ins-and-outs of AC voltmeters. There are plenty of reference books that delve into the mathematics; but I'd rather take a few editorial liberties to keep things simple for those folks who are not engineers or technicians.

Photo A. My Heathkit IM-13 vacuum tube voltmeter has served me well since I built it from a kit in the 1960s while I was still in junior high school!

Remember that an AC waveform is dynamic and is constantly changing amplitude with time. To determine the power contained in that waveform, the voltage is averaged to a corresponding reading that represents the same *energy* that would be delivered by a steady-state DC voltage. That AC voltage is the root mean square (RMS) voltage. We should be pretty much agreement that we need accurate AC voltage readings to use the power formulas or Ohms Law.

Averaging Type AC Voltmeters

Vintage, inexpensive shop meters were simple devices, and they assumed that the voltages being measured would most likely be a pure sinewave that was related to the AC line voltage. The AC voltage being measured is rectified in the meter and is really displayed as a DC voltage. The AC meter scales indicate the average of the AC voltage being measured. If the voltage is a sinewave, then the average is the correct RMS voltage; if not, all bets are off.

Often manufacturers included an additional scale for peak AC voltage. There was no magic there; those scales were simply 1.414 times higher than the AC meter scale. If you need to calculate the peak voltage of true sinewave AC voltage, which is the peak voltage at the peak of the waveform crest, simply multiply the RMS reading by 1.414 to find the answer.

I'd bet many readers own a bench meter similar to the basic Heathkit model IM-13 vacuum tube voltmeter shown in **Photo A**. I built the kit in junior high school and it has served me well. It's an averaging-type AC meter, with the inherent limitations mentioned above. It is also very representative of the sort of meter used in radio shops since the 1930s.

AC-Only VTVM

The Heathkit IM-21 meter shown in **Photo B** is a basic AC-only vacuum tube voltmeter (AC VTVM) and is also a voltage-averaging instrument. It's also accurate over a wider audio frequency range since it was designed for audio service work. It can measure AC voltages down to

Photo B. Heathkit's model IM-21 AC vacuum tube voltmeter was designed for measuring very low-level AC voltage and has a greater frequency range than most general purpose VTVMs.

Photo C. By the 1980s, True RMS meters were becoming practical and affordable. It's hard to believe, but I've owned this meter since they were first introduced! While it can handle complex AC waveforms, it will not accurately calculate the RMS voltage if a DC component is present.

0.01 volts (10 mV) full scale, which is considerably more sensitive than the 1.5-volt (1500 mV) range on the IM-11. These meters aren't worth much: the illustrated IM-21 sold for around $7 on an Internet auction site. The IM-13, as well as other similar vintage service-grade VTVMs, is also cheap and readily available. Modern digital meters have supplanted them, but they still are adequate for servicing vintage electronic gear.

Voltage Scales And dB Readings

A first glance, it may seem extremely odd to see meter scales based on full-scale readings that end in 1 and 3. Why not a 5, which would offer meter ranges and a scale midway between the full-scale ranges ending in the digit 1? The answer is simple: At *approximately* one-third voltage, the relative dB change is 10 dB. A 10 times change in voltage corresponds to 20 dB. The IM-21 is a good example of a meter with scales that have both 10 dB and voltage decade steps that allow both 20-dB and 10-dB resolution by including both scales. Doing so allows easily manipulation of both voltages and power ratios. The meter scale also has a dB scale for making comparative dB level measurements.

RMS And True RMS Meters

Here's where it starts to get tricky. Many meters claim to be RMS meters, but until recently very few had the computing power to accurately calculate the RMS voltage for a waveform that deviates from a pure sinusoidal waveform. The Fluke 8060A meter shown in **Photo C** is a True RMS voltmeter. These newer meters will accurately calculate and display the correct RMS voltage for distorted or complex AC waveforms.

Again, always refer to the operating manual to learn the instrument's limitations. What they will not do, since they are still AC coupled devices, is accurately calculate a complex asymmetrical waveform that has a DC component. Being AC coupled, the meter never sees the DC component!

This brings us back to the start of this column. Can we make accurate readings of an AC voltage that is reduced by the use of a series diode for a resistive load, such as tube filaments? Yes, we can.

If you have access to a True RMS meter, such as the Fluke model 8060A, start by making two voltage measurements at the point where the voltage is supplied to the resistive load. Take a measurement for AC voltage, and then take another for the DC voltage. The correct RMS voltage is obtained from these two readings by algebraic addition with a basic calculator. Simply square each voltage, add them together, and then take the square root of the result—you now have the True RMS voltage for the complex waveform.

True RMS Meters

For those with deeper pockets, there are high-quality lab-grade (read expensive!) meters that use the heat energy derived from an applied voltage to accurately calculate the RMS power contained in a complex AC waveform, or for a DC voltage, or for a waveform that is a combination of both. Voltages or small signals with DC offsets, noise, and harmonic energy don't faze them!

The HP-3403C meter uses a thermopile comprised of 30 small thermocouples to accurately measure heat energy of AC, DC, or combined AC/DC voltages, up to 100 MHz! These meters cost many thousands of dollars when

new, but I purchased my HP-3403C, shown in **Photo D**, surplus for under $50.

Let's be honest, few of us have a real need for one, but it is nice to be able to prove that things work as they as they should. The older HP equipment is generally very reliable, but when this meter dies I suspect it would be easier to junk it and find a replacement than to attempt to fix it!

High Frequency AC Meters

I could go on forever about various AC voltage-measuring devices, so I'll cover two more pieces of once-exotic lab equipment before calling it quits. **Photo E** shows two special meters for measuring very low-level RF voltages and very low RF power levels. One is an older Boonton Electronic model 92 RF Millivoltmeter, and the other is a Boonton Electronics model 42A Microwattmeter. Again, these devices are flooding the surplus markets and are extremely cheap. The later models, with digital displays, are also long obsolete and can be found for modest prices.

The only caveats I'll offer are to make sure the RF probe is with the RF Millivoltmeter and that the serial numbers match (they are individually hand calibrated and matched to the instrument). Ditto for the Microwattmeter: make sure that the delicate power heads and probe cables are included and not blown. Both instruments use an internal mechanical chopper to convert the AC signals to a DC level, and in time these choppers can become noisy or erratic.

There is a 50-ohm termination available for the Millivoltmeter probe that will permit making dBm power measurements, so in some regards there is a bit of duplication in having both instruments. Both meters are good examples of the decade steps and dual-voltage scales to accommodate both 20- and 10-dB power steps. You will see the same 10- and 20-dB step arrangement on the RF output level step-attenuators used for many lab-grade signal generators as well.

Photo D. As American factories close and as the government sheds surplus equipment at auction, expensive lab-grade digital meters like this HP-3403C are becoming very affordable. The meter uses a heat measuring thermopile to calculate the RMS energy contained in AC, DC, or combined AC/DC waveforms. A must-have for the hard-core nerd, but overkill for most of our needs.

So, what do I use these two relatively exotic pieces of test equipment for? Either unit is great for checking the output level calibration for my signal generators, or for verifying that my step attenuators haven't been damaged and are still accurate. I also use them for troubleshooting modern solid-state ham gear and for evaluating some of my homebrew equipment designs. For instance, using a power attenuator with the

Photo E. These two Boonton meters were designed for low-level RF voltage and power measurements. Once again, they're extremely common on the surplus market and sell for very modest prices.

42A Microwattmeter permits accurate QRP transmitter power measurements.

Again, few readers will have a real need for either unit. For me, though, the price was right and I couldn't refuse! After all, isn't that how we end up with cellars full of junk!

In conclusion, I'll confess the most often-used AC measuring device in my shop is my faithful Tektronix model 465 oscilloscope. But that, my friends, is a subject for another column! Until next time, keep those soldering irons warm and those old tubes glowing! ■

Alumilite's Super Casting Kit: Mold And Cast Replacement Parts In Minutes

Although there are a number of suppliers for replica vintage knobs, there will always be the occasional damaged or missing knob or other small part for which no replacement is available. If a good sample of the needed knob is available, there's a way to make exact replacements in your home workshop. You'll have to make a good mold impression of the part to be replicated, and then cast the part using a two-part resin material. The task may at first seem formidable, but fortunately everything you'll need is found in the Super Casting Kit available from the Alumilite Corporation.*

Everything Needed Is In The Kit

While Alumilite sells the individual materials used to make molds and castings, its Super Casting Kit, shown in **Photo F**, includes everything you need to be successful in one very convenient package. You get measuring cups and stir sticks, 28 ounces of super casting urethane plastic, one pound of silicone mold making rubber, mold release, one pound of modeling clay, and a *How To* manual. A peek at the casting kit's contents can viewed in **Photo G**. Whew—that is a lot material for the $79 asking price!

One drawback, however, is the limited shelf life for the chemicals once they're opened and exposed to the air. You should plan on using the kit within a reasonable time after purchasing it, and on using the materials within a year of opening the containers.

There's also a smaller, inexpensive Mini Casting Kit starter package for beginners. All the materials can be individually purchased online, by telephone, or via mail order on an *a la carte* basis as needed. A well-written and illustrated manual accompanies the kit, and there's more help available if needed. Technical assistance is given via an 800 number, on the company's website, and through an online user forum the folks at Alumilite support.

There is a learning curve involved. For example, there might be more than one way to make a particular mold, and deciding which is the most efficient for any project requires some forethought. But rest assured, the fine folks at Alumilite and other users in their forum are always there for support.

Some amazing examples of what can be molded and cast are shown on the factory website, from ceramic teddy bears to vintage automobile steering wheels! The casting resin can be machined, sanded, and painted as needed. No dangerous or hazardous materials are involved.

I had hoped to find some time to show a few knobs and other items that I'd made myself, but the time never seems to materialize! I will do so in a future column. I need to make replica knobs for the damaged Lafayette HE-30 receiver I showed last year, and I'd like to make a few replica vintage components with modern components hidden inside. This would be a great way to make vintage dogbone resistors for restoring early 1930s radios. You simply hide a modern metal oxide resistor in the mold, and pour in the plastic resin. Once the replica resistor casting has hardened, it can be painted using the Body-End-Dot color code scheme to make a perfectly detailed replica! As an option, Alumilite also can supply dyes that can be added to the casting mix.

* Alumilite Corporation, 315 East North St., Kalamazoo, MI 49007; Phone: (269) 488-4000; Support: (800) 447-9344; Email: world@alumilite.com; Web: www.alumilite.com.

Photo F. Alumilite's Super Casting Kit is all that's needed to make molds and castings to reproduce vintage parts, such as knobs, bezels, or components.

Photo G. Here's a peek inside of the Super Casting Kit. Everything you need to get started is here. The three vials of dye seen to the right are not included in the kit.

Decoding MIL-STD-188-110A With MultiPSK In Test Stages

by John Kasupski,
KC2HMZ,
kc2hmz@verizon.net

"The addition of MIL-STD-188-110A to MultiPSK makes this program an affordable and cost-effective alternative for digital decoding, especially since the program also already supports ALE decoding."

Users of the popular multimode digital communications program MultiPSK received some good news this August when the author, Patrick Lindecker, F6CTE, announced that he's working on adding the ability to send and receive MIL-STD-188-110A, also known by its NATO designation STANAG 4539 and the civilian government designation FED-STD-1052, to the professional version of the program. Lindecker also released a test version of the program with the new function included.

MIL-STD-188 (Military Standard 188) is a series of telecommunications standards in use by U.S. military forces and government stations as well as those of several allied countries, and is also reportedly being used by the Chinese military. When first developed, MIL-STD-188 covered technical standards for tactical and long-haul communications, but subsequent revisions produced three series of subdivided documents, one of which is the current MIL-STD-188-100.

Lindecker also provided some insight on the structure of the waveform to the hobby radio community. "Each frame contains a synchronization preamble phase where the sub-mode is defined, a data phase where the unknown data is transmitted (mixed with known data to follow the transmission characteristics), an 'End of Message' phase, and a final flushing phase (to finish de-interleaving and de-convolution operations)," he told the Utility DXers Forum in announcing the test version of MultiPSK with the new "110A" function. "The software automatically decodes the speed (75, 150, 600, 1200, 2400, or 4800 bps) and the interleaver (short or long), in different character formats."

Lindecker told *Pop'Comm* "at the moment it is just a test version. I'm beaconing 75 bps 110A just now." He added that he hoped to have the "official" MultiPSK v4.15 ready in early September, with the 110A function included.

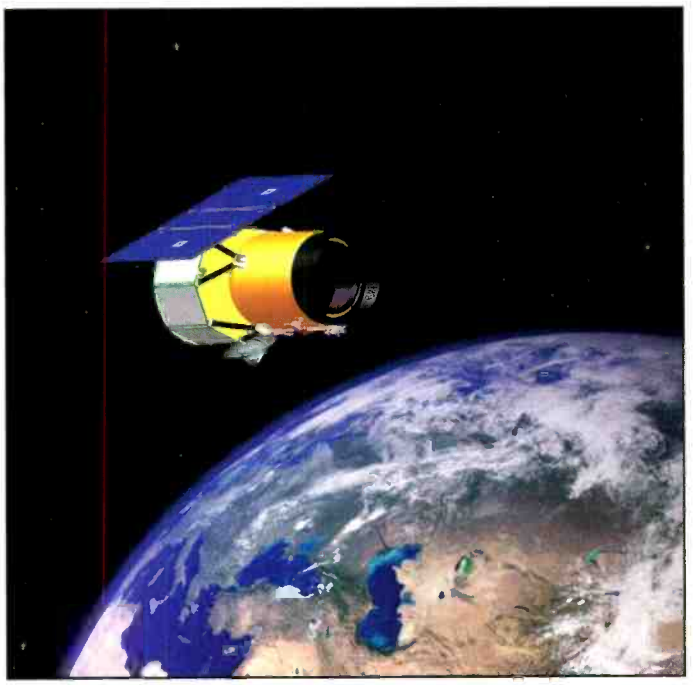
Now, of course, military and government stations do not produce MIL-STD-188-100 using software packages such as MultiPSK—they do so using radios that are designed to operate using the protocols specified by the standards, such as the Harris AN/PRC-152 (**Photo A**). For the curious—or those who just hate acronyms—the A and N stand for Army and Navy; PRC stands for Portable Radio Communications. However, such radios, as well as hardware-based packages sold for ham and hobby use, are priced well beyond the means of the average utility listener. The addition of MIL-STD-188-110A to MultiPSK makes this program an affordable and cost-effective alternative for digital decoding, especially since the program also already supports ALE decoding.

Photo A. Harris AN/PRC-152 portable radio, capable of MIL-STD-188-110A operation.

It's important to note this since MultiPSK exists in two forms: a free version and a professional version. The capability to decode 110A will only be available in the professional version, currently priced at 30 Euros or $45.00 U.S. That's still a lot less expensive than the available alter-

Photo B. The Solar Dynamics Observatory in a clean room at NASA's Goddard Space Flight Center in Greenbelt, Maryland. (NASA photo)

Photo C. Artist's concept of Wide-field Infrared Survey Explorer. (Via Wikimedia Commons)



natives, especially with Skysweeper having been discontinued in June.

Upcoming NASA Launches

It's been a while since we updated you on upcoming NASA mission launches. There's one launch scheduled for this month and two for December. Those of you who enjoy listening to NASA comms during these launches will want to make a note of them.

The STS-129 mission of the space shuttle *Atlantis* is tentatively scheduled for November 12. The current NASA launch schedule shows a launch time of 4:22 p.m. EST from launch pad 39A at the Kennedy Space Center. *Atlantis* will deliver components to the International Space Station for the station's robotic arm.

On December 4, the launch of the Solar Dynamics Observatory (SDO; **Photo B**) is scheduled aboard an Atlas V from launch Complex 41 at the Cape Canaveral Air Force station. This mission represents the first Space Weather Research Network mission in NASA's Living With a Star (LWS) program. The primary mission is scheduled to last 63 months, with expendables expected to last for 10 years. The equipment aboard SDO includes ultraviolet, extreme ultraviolet, helioseismic, and magnetic imaging instruments that will collect scientific data on the sun.

Finally, on December 7 a Delta II 7320 is slated to launch from Vandenberg AFB in California with WISE (Wide-field Infrared Survey Explorer) aboard (**Photo C**). WISE will scan the entire sky in infrared light in search of nearby cool stars, planetary construction zones and the brightest galaxies in the universe. According to information available on NASA's website, WISE will survey the entire sky in the mid-infrared spectrum with far greater sensitivity than any previous mission or program ever has. NASA says that the WISE survey will gather over a million images, from which hundreds of millions of astronomical objects will be cataloged.

Reader Logs

This month we're officially and finally caught up with log submissions that got backed up earlier in the year when I was on vacation. The fine gentlemen who submitted logs this month are Al Stern, Satellite Beach, FL (ALS); Mark Cleary, Charleston, SC (MC/SC); and Glenn Valenta, Lakewood, CO (GV/CO). To join the list of contributors, simply email your loggings to me at the address shown near the beginning of this column. While logs are preferred in the standard format (several examples of which appear below), I'm not really that picky as long as all the pertinent information (time, mode, frequency) is included with the logging.

Incidentally, in August, hams around the world observed the annual International Lighthouse/Lightship Weekend, in which the objective is to work as many Lighthouses (such as the one in Buffalo Harbor, manned for this event by the guys from the Western New York DX Association, WNYDXA; see **Photo D**) and Lightships as possible. While we normally don't concern ourselves with loggings of ham stations except during emer-

Photo D. The Buffalo, New York harbor main lighthouse seen through a periscope located in the 6"/50 triple turret onboard the USS *Little Rock* (CG-4). (Via Wikimedia Commons)

gency communications, many of the lighthouses and lightships are historic objects and are utility related. Therefore, your loggings of them are welcomed.

4100.0: Several unid stations in a net, Asian speech; one net control station w/others responding, in USB at 0635Z. (GV/CO)

4102.3: Pirate wind speed beacon W, indicating gusty winds, in CW at 0631Z. (GV/CO)

4149.0: WBN 3016 (Tug *DEFENDER*) in comms with WPE Jacksonville in USB at 1245Z. (MC/SC)

4900.6: SHARK 69 (USCGC *ALLIGATOR*, WPB 87369) clg SECTOR ST. PETE in USB at 1325Z. (MC/SC)

4983.0: Unid Spanish-speaking stations in QSO, informal, both sides heard, in USB at 0626Z. (GV/CO)

6761.0: STEEL 64 (KC-135T) clg GRITS 18 (C-17A) in USB at 2334Z. (MC/SC)

7527.0: RESCUE 1502 (HC-130, CGAS Clearwater) p/p to Sector Miami in USB at 1329Z; IKL (USCGC *TAMPA*, WMEC 902) clg CSR (USCGC *PEA ISLAND*, WPB 1347) in ALE USB at 1258Z. (MC/SC)

7790.0: Angeles Verdes, Mexico M-net, SS/YL with ID but could not copy in bad condx, in USB at 2135Z. (GV/CO)

7850.0: CHU, Canada Time Signal, weak but readable, in USB at 2139Z. (GV/CO)

8156.0: CORAL HARBOUR BASE, C6SH, C6NU, and C6R2066 (Royal Bahamas Defence Forces) in QSO in USB at 1143Z. (MC/SC)

8230.0: Unid Spanish-speaking marine mobile stations with a lot of numbers being mentioned, boat noises in background, in USB at 0639Z. (GV/CO)

8301.6: SECTOR SAN JUAN wkg SWORDFISH 17 (HU-25) in USB at 2216Z. (MC/SC)

8312.5: XLS, Japanese navy "slot machine" station, idling, in MPSK at 0634Z. (GV/CO)

8828.0: ZKAK, Auckland/New Zealand VOLMET, finishes and Honolulu VOLMET starts up, in USB at -626Z. (GV/CO)

8840.0: Unid Gulf Coast fishermen w/heavy southern EE dialect discussing fishing, broken hose, dragging river in Galveston; in USB at 0257Z. (GV/CO)

8843.0: San Francisco Radio working United 32 in USB at 0316Z. (GV/CO)

8912.0: DOLPHIN 76 (MH-65C) position report to Sector Key West in USB at 1244Z. (MC/SC)

8957.0: Shannon VOLMET, YL/EE aviation WX, weak with QRM from TADIRAN burst, in USB at 0237Z. (GV/CO)

8971.0: FIDDLE wkg RED TALON 711 (P-3C) in USB at 1350Z. (MC/SC)

8971.0: Cape Radio with test count, followed by ALE sounding, in USB at 1320Z; FIGHTING TIGER 71L (P-3C, NAS Jacksonville VP-8) wkg FIDDLE (NAS Jacksonville TSC); they go green (encrypted), in USB then ANDVT at 1544Z; FIDDLE wkg AIRCRAFT 586, they go green, in USB then ANDVT at 1550Z. (ALS).

8971.0: FIDDLE wkg CARDFILE 715 (P-3C) who passes "Spare Group" mission status msg; FIDDLE requests posrep, CARDFILE 715 passes coded coordinates; very noisy transmissions, in USB at 2040Z; FIDDLE wkg RED TALON 711 (P-3C) who passes encoded coordinates; they go green, in USB then ANDVT at 1342Z. (ALS)

8983.0: USCG CAMSPAC working RESCUE 1713, ops normal, they QSY to 5659 due to condx, both heard here very well; in USB at 0129Z. (GV/CO)

8983.0: CGAS SAVANNAH radio check with CAMSLANT in USB at 1739Z; SWORDFISH 28 position report to CAMSLANT in USB at 2136Z. (MC/SC)

8983.0: USCG CAMSLANT wkg CG RESCUE 2006 (en route to St. John's) in USB at 0037Z; CAMSLANT wkg CG RESCUE 2006, now landing in Bermuda, in USB at 0042Z. (ALS)

8992.0: Puerto Rico HF-GCS with a test count for other unid station, in USB at 0208Z; Andrews HF-GCS with test count for other unid station, in USB at 0221Z. (GV/CO)

9018.0: REACH 1012 clg REACH 1010 in USB at 1643Z. (MC/SC)

9023.0: SANCTIFIED (U.S. MIL) and Andrews HFGCS coordinating exchange of data transmissions, in USB at 2327Z. (MC/SC)

9034.0: NOJ (USCG COMMSTA Kodiak) calling 700 (CG 1700) in ALE USB at 0330Z; NOJ calling J13 (MH-60J, CGAS Kodiak) in ALE USB at 0433Z. (MC/SC)

10242.0: CG 1707 (HC-130) with ALE initiated p/p to CLEARWATER AIR in ALE and USB at 0102Z. (MC/SC)

11175.0: ANDREWS HF-GCS wkg TUFF 11 (B-52H, Barksdale AFB); TUFF 11 reports "Operations Normal" and also responds to an unheard aircraft requesting a radio check, in USB at 1757Z; ANDREWS wkg WAVEHEAT; they QSY to 11220.0 kHz, in USB at 2320Z. (ALS)

11175.0: OFFUTT HF-GCS wkg "Air Transport 530" (USAF Contractor DC-8 flight, en route from Antigua to Ascension Island); ANDREWS attempts patch but reports that Ascension CP is not available at this time, in USB at 2340Z. (ALS)

11175.0: PUERTO RICO HF-GCS wkg GOLD 61 (Coronet Mission tanker) for attempted phone patches to Bangor Ops, Bangor IAP, ME) regarding status of MAZDA 11 (receiver acft); no answer at either number, in USB at 0520Z. (ALS)

11175.0: "Lima Lima" (P-3C, NAS Jacksonville VP-30) calling MAINSAIL with no joy, in USB at 1606Z; LAJES HF-GCS wkg REACH 4188 (KC-10A #84-0188, McGuire AFB 305AMW) for phone patch to Metro re arrival WX, in USB at 1028Z; ANDREWS recites EAM of 123 characters in USB at 1110Z. (ALS)

11175.0: AIRCRAFT 8044 (probably NJ-ANG KC-135E 58-0044, McGuire AFB 108ARW) calling any station; no joy, in USB at 1550Z; ANDREWS wkg MESSHALL for DSN phone patch to MacDill AFB; interrupted by several Andrews EAMs, in USB at 1602Z. (ALS)

11175.0: ANDREWS wkg DIXIE 12 (KC-135R, AL-ANG, 117ARW, Birmingham AL); requests current traffic; is passed a short coded message, in USB at 1625Z; ANDREWS wkg "Lima Lima 80" (P-3C, NAS Jacksonville VP-30) for DSN phone patch to NAS Jacksonville, in USB at 1628Z. (ALS)

11220.0: ANDREWS HF-GCS wkg WAVEHEAT after QSY from 11175 kHz; they QSY to 11460 kHz; in USB at 2323Z. (ALS)

11232.0: CG 2006 (HC-130J) p/p via TRENTON MILITARY to International Ice Patrol with iceberg reports in USB at 1728Z. (MC/SC)

11232.0: REACH 316 p/p via TRENTON MILITARY to QUARTERBACK CP at Selfridge ANGB in USB at 1357Z; RED TALON 711 (P-3C) p/p via TRENTON MILITARY to TSC Jacksonville in USB at 1343Z. (MC/SC)

11282.0: San Francisco ARINC working various airliners, voice and SELCAL, in USB at 0211Z. (GV/CO)

11436.0: CAMSLANT conducting radio checks with Sector Charleston, Sector Jacksonville, Sector Key West, CGAS Elizabeth City, and CGAS Clearwater in USB at 1317Z. (MC/SC)

11460.0: ANDREWS HF-GCS wkg WAVEHEAT after QSY from 11220 kHz; they go green (encrypted), in USB at 2328Z. (ALS)

11485.0: WGY9441 (FEMA Aux Station) clg 010CDCNHQ (CDC) in ALE USB at 1318Z. (MC/SC)

11494.0: PANTHER (OPBAT Svc Ctr, Nassau) wkg "34C" (CG 6034, MH-60J, CGAS Clearwater FL) in USB at 2045Z; PANTHER wkg "34C" again for "ops normal" report in USB at 2103Z. (ALS)

12222.0: NOVEMBER 03 (HC-144A, ATC Mobile) requests guard from CAMSLANT in USB at 1159Z. (MC/SC)

12350.0: Unid QSO in Hindi w/one EE phrase: "Juliet Sierra building 5th floor" in USB at -147Z. (GV/CO)

12353.0: Tug *ADVENTURER* (WBN 3015) wkg WPE, Jacksonville in USB at 1348Z. (MC/SC)

12770.5: Unid 2 OM in QSO, Asian speech, one giving instructions to another responding "Yeah" in LSB at 134Z. (GV/CO)

13200.0: Andrews HF-GCS and another station w/brief test counts in USB at 0130Z. (GV/CO)

13215.0: 490434 (KC-10A, 305 AMW) clg PLA (Lajes HFGCS) in ALE USB at 1238Z. (MC/SC)

13488.0: OH5 (Ohio state EOC) clg 010CDCNHQ (CDC) in ALE USB at 1641Z. (MC/SC)

13927.0: USAF MARS Operator AFA7HS (Leawood, KS) wkg REACH 436 (over North Atlantic) for DSN phone patch, ETA 1645Z, will then file flight plan to leave ASAP; in USB at 1430Z. (ALS)

13927.0: USAF MARS Operator AFN4AC (Miami, FL) wkg REACH 436 (over North Atlantic) for DSN phone patches to Tinker AFB 465ARS, then Sooner Ops; will be in the blocks at home station at 1415 Local, in USB at 1430Z. (ALS)

13927.0: USAF MARS Operator AFA5QW (Greenwood, IN) wkg HAZARD 77 (C-130, Dyess AFB) for M & W phone patch to a Texas area code; "will be overhead in 15 minutes." In USB at 2020Z. (ALS)

13927.0: USAF MARS Operator wkg DEUCE 11 (Probably B-52H, Barksdale AFB 2BW) for phone patch, considering a divert, will reach Barksdale with 15k pounds of fuel; Requests WX for Tinker AFB at 2200Z, in USB at 1722Z. (ALS)

13927.0: USAF MARS Operator AFA9PF (Los Angeles) wkg HAWK 53 (B-1B Bomber, Dyess AFB 7BW) for phone patch re ETA for air refueling; rqsts tanker info, mentions HAWK 51 also, in USB at 1745Z. (ALS)

13927.0: AFA5RF wkg TORCH 55 (over West Virginia) for DSN phone patch to IL-ANG, Peoria, IL; Departed 1735Z; ETA KPIA (Greater Peoria IAP) 2000Z; in USB at 1804Z; USAF MARS Operator AFA1RE (Maine) wkg DARK 41 (B-1B, Dyess AFB, 7BW) in USB at 1819Z. (ALS)

13927.0: DERBY 80 (C-130H) morale p/p via USAF MARS operator AFA7HS (Kansas) in USB at 2115Z; SENTRY 40 (E-3 AWACS) p/p via USAF MARS operator AFA5RS (Indiana) to Tinker AFB Metro in USB at 1940Z. (MC/SC)

14368.0: Unid 2 OM in QSO, Asian language, both heard, in USB at 0112Z. (GV/CO)

16450.0: Unid 2 OM/SS in QSO, both heard, in USB at 0100Z. (GV/CO)

16535.0: Unid 2 OM in QSO in what could be Pidgin language such as Sarnami, in USB at 2120Z. (GV/CO)

16808.0: WLO, marine shore station at Mobile, AL, idling in SITOR-A with CW marker at 2118Z. (GV/CO)

16811.0: CBV, Valparaiso, Chile, marine shore station, idling, in SITOR-A with CW marker at 0055Z. (GV/CO)

18003.0: E30353 (E-3 AWACS) clg ADW (Andrews HFGCS) in ALE USB at 1721Z. (MC/SC)

22383.0: WLO, Mobile, AL; marine shore station, idling, in SITOR-A with CW marker at 2206Z. (GV/CO)

25870.0: KLC636, Studio to Transmitter link for commercial FM broadcast station KLDE (104.9 FM in Eldorado, TX), playing "Disco Kid" in FM at 0254Z. (GV/CO)

25910.0: Studio to Transmitter link for commercial AM broadcast station WBAP (820AM in Dallas/Fort Worth, TX); political talk, local news report and traffic, in FM at 0234Z. (GV/CO)

25990.0: Studio to Transmitter link for commercial FM broadcast station KSCS (96.3 FM in Dallas/Ft.Worth, TX), in FM at 0242Z. (GV/CO)

Trivia And Toons

by R.B. Sturtevant, AD7IL

Q. After World War II the Japanese took over most of the electronics manufacturing in the world. What were their wartime electronics like? Did this give them the springboard to take off in the field?

A. No it definitely didn't. Their wartime electronics industry was way behind ours. The most advanced area of Japanese electronics was sonar, and it seems they got a lot of help from the Germans. They also never got around to putting the technology to the utmost advantage by developing attack capabilities using their sonar. They had no airborne radar in production at the end of the war, and their ground radar didn't show up until 1942, even then it was a copy of German, British, and American designs. Their radio and radio direction finding equipment lagged behind as well.

Japanese training methods were also quite conventional and handicapped by the lack of technical background and electronics knowledge among the general populace. Later, faced with shorter training courses toward the end of the war, technical staff had to specialize in just one piece of equipment rather than several. Even their wire was judged substandard, probably a supply problem brought on by lack of supplies due to shipping problems.

How did the Japanese gain such a predominance after the war? They closely observed the American GIs and their electronics, learning everything they could. The man who would later head Sony Corporation was running a fix-it shop in Tokyo when a GI brought in a tape recorder for repair. The repairman had never seen one but took the job anyway. When he got inside he said "I can build one of these things"—and the rest is history.

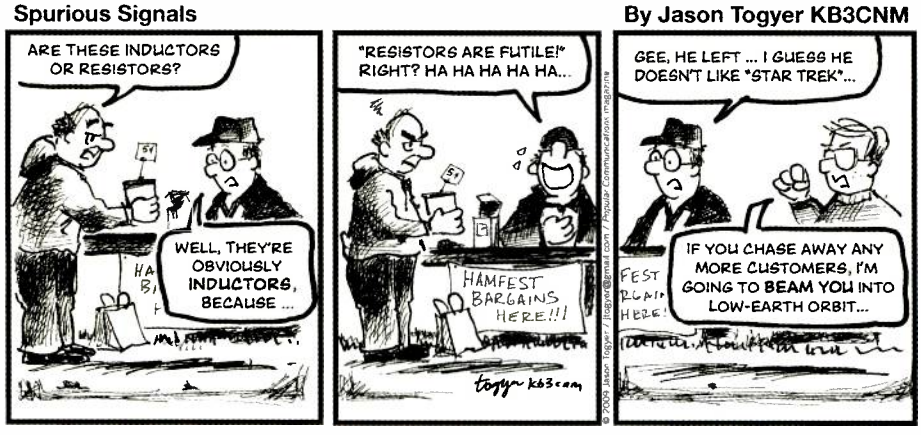
Q. What was, or is, Echelon and who ran the program?

A. Echelon is a program developed by the National Security Agency, the branch of the Defense Department tasked with ensuring the security of America's communications and breaking into the communications of other nations. Echelon is, specifically, a computer-based system designed to capture satellite, cellular, microwave, and fiber optic message traffic (yes, that means they can and might be listening to you). The traffic is then run through a filtering program that looks for key words and phrases. If detected, these key words and phrases might indicate traffic of sufficient interest to be reviewed by human listeners to determine if further follow up investigation is needed. Gathering information in this way has been judged legal as of the last time I heard. In some places, of course, legality does not have a high level of concern. What can be done technically will be done practically, but it just won't go to court. Just remember NSA's other translation: No Such Agency!

Q. When will the average ham radio operator be able to get his or her hands on a *Star Trek*-type communicator?

A. From my own observations, judging by their size and power, the communicators popularized by the original *Star Trek* series contain technology not currently approved by the FCC. However, since this particular Star Trek is suppose to begin in about 2300 (plus or minus a few Star Dates) we should probably be about there when a real *Enterprise* does take off. We'd expect the communicator to work between ships, ship to planet surface, and anywhere on the planet's surface to anywhere else on the planet. No static is found on most planets and the existence of an ionosphere on all planets is assumed.

When can you have one? Actor William Shatner (who played Captain James Kirk on the 1966 to 1969 series) also played the part of attorney Denny Crane on ABC's *Boston Legal*. In the January 10, 2006, episode Crane/Shatner opened his cell phone to the sharp chirping sound of *Star Trek* fame. Maybe he's still got his. Check with your cell phone company for availability.



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Radio vs. Gardening: Bill Slam-dunks A Zucchini

by Bill Price, N3AVY
chrodoc@gmail.com

I'm sure there are people who look at radio amateurs and shortwave listeners and wonder what could possibly be the attraction. I know there are hobbies that leave me wondering the same thing. Probably the worst of all is gardening. How in the name of Hiram Percy Maxim could anyone *enjoy* doing the kind of work we typically hire illegal aliens to do for us because it's a job that no American *wants* to do?

They may laugh at us for spinning a dial and listening to static and beeps and foreign languages and hams who talk like ducks, but it *has* to be better than driving to some place and spending money for a dozen clumps of dirt in plastic containers with some wisps of weed-like things sticking up from the dirt, then driving home and crawling in the dirt, digging and rearranging the mud and neatly arranging these little weeds in rows in the dirt, and pouring little bags of expensive dirt over them, then going into the house and washing up and watching television for a week until you can go out and notice that something has happened to your little weeds.

"It might be said that listening to shortwave radio has no 'payoff,' but to me, if it helps keep down the surplus zucchini stockpile, that, I say, is enough in itself."

Imagine if we had to turn on our radios and tune a station then go and wait and watch television for a week to see if any sounds came out of the speaker!

Gardeners sometimes have it even worse! Sometimes they start with *seeds*! They dig and turn and churn and hoe and hum and loosen up all that mud, then stick some seeds into the ground, then go into the house and wash up and smear some foul-smelling menthol muscle rub all over their aching bodies and watch television for a week until they can go out and notice that some tiny green stem is sticking out of the ground where they planted their seeds. Zowie! What fun! These little green things don't even send QSL cards!

I realize that we in the radio hobbies have sunspots, which sometimes limit our activity on some bands, and at some distances, but in general, there's never been a time when we can't find some interesting signals on some bands at any hour of the day or night.

Compare that to the gardener's timetable. In winter, they read seed catalogs and kill plants on the windowsills. In spring, they order seeds and begin to slop around in the dirt, get sore backs and knees, then go inside and wash up, and smear some foul-smelling menthol muscle rub all over their aching bodies and watch television for a week until they go out and notice that some tiny green stem is sticking out of the ground. Later on, some flowers bloom. They look at them, or maybe cut them and bring them into the house. Be still my heart. Then their flowers die. Our radios are still humming along.

If our gardener friends are of the vegetable growing variety, they toil through a good part of the summer, only to find half of their crop made really ugly and unusable by beetles and birds and caterpillars and other disgusting creatures. They get a few malformed tomatoes, a handful of string beans, a reasonable yield of cucumbers, and seven hundred pounds of zucchinis!

I have more than once opined that zucchini is a vegetable put on Earth to test one's friends. If you have ever planted zucchini and one day found that you have seven hundred pounds of the things threatening to take over your entire property, you quickly realize that you must pick them, wash the mud off, put them in some sort of bags, and fill the car with them, then head off to visit everyone you've ever met—even casually—to offer them the bounty of your harvest. This is where the test comes in.

The truly gracious people will accept them, while others will turn off their lights and hide until you go away. Note that we of the radio fraternity never have to go from door to door peddling bags of signals to our friends. No reams of teletype copy, no plastic storage bags filled with dits and dahs, no foil-wrapped packets of static.

The neighbors who willfully accept the zucchini will likely use them to test their garbage disposal. Some will say they can't wait to make zucchini bread, then set them on the back porch and go away on vacation. Probably the best use of all is for the neighbor kids to find them and have an all-out zucchini battle in the backyard.

It might be said that listening to shortwave radio has no "payoff," but to me, if it helps keep down the surplus zucchini stockpile, that, I say, is enough in itself.

Bill is presently working on a zucchini-powered receiver that he hopes may prevent the needless destruction of thousands of pounds of zucchini each year. His home was recently removed from the Cowfield County Garden Club walking tour—Ed.

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