



45635

# POPULAR COMMUNICATIONS

JULY 2008

## Radio To The Rescue Volunteer Communicators' Skills Are Saving Lives

- **CB Is Still A Great Way To Go, p. 16**
- **Have Fun With Your GPS—Try Geocaching, p. 21**



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 The Road • HD FM Antennas**

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WAM/FM-N/WFM  
\*Cellular blocked

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Universal Radio is pleased to offer the **Icom R75-12** receiver. With full coverage from 30 kHz to 60 MHz; all longwave, medium wave and shortwave frequencies are supported plus extended coverage to include the 6 meter amateur band. Some innovative features of the R75 include: FM Mode Detection (but not the FM broadcast band), Twin Passband Tuning, Two Level Preamp, 99 Alphanumeric Memories, four Scan Modes, Noise Blanker, Selectable AGC (FAST/SLOW/OFF), Clock-Timer, Squelch, Attenuator and backlit LCD display. Tuning may be selected at 1 Hz or 10 Hz steps plus there is a 1 MHz quick tuning step plus tuning Lock. The front-firing speaker provides solid, clear audio. The back panel has a Record Output jack and Tape Recorder Activation jack. The supplied 2.1 kHz SSB filter is suitable for utility, amateur, or broadcast SSB. However, two optional CW/SSB filter positions are available (one per I.F.). The formerly optional **UT-106 DSP board** is now included and factory installed! A great value.

Order #0012 **Call for price.**

## ICOM® PCR1500 R1500



The **Icom PCR1500** wideband computer receiver connects externally to your PC via a USB cable. This provides compatibility with many computer models, even laptops. Incredible coverage is yours with reception from 10 kHz to 3300 MHz (less cellular gaps). Modes of reception include AM, FM-Wide, FM-Narrow, SSB and CW. (CW and SSB up to 1300 MHz only). The PCR1500 comes with an AC adapter, whip antenna, USB cable and Windows™ CD. #1501 **\$479.95**

The **Icom R1500** is similar to the above, but also includes a controller head for additional operation independent of a PC. #1500 **\$579.95**

## ICOM® PCR2500 R2500



The **Icom PCR2500** wideband computer receiver uses a similar form-factor to the PCR1500, but has several enhancements, including two powerful features: **dual watch** (the radio can receive two signals simultaneously) and **diversity reception** (two antennas can be connected at the same time and employed to provide stable reception). The optional UT-118 Digital Unit provides D-STAR® digital voice reception and the optional UT-121 supports APCO25 digital voice decoding. The R2500 is shown above. #2501 **\$709.95**

The **Icom R2500** is similar to the PCR2500, but includes a controller head for additional operation independent of a PC. #2500 **\$879.95**

**FREE**

**ICOM Bonito CS 4.5 Software included!**

A \$69.00 value Included **FREE** with your R1500/R2500, PCR1500/2500 purchase for a limited time.

**Special Note:** Prices shown for the R1500/PCR1500 and R2500/PCR2500 reflect the \$20 Icom limited time mail-in rebate.



### R5

The **R5** covers 150 kHz to 1309.995 MHz (less cellular gaps) in: AM, FM Narrow and FM wide. 1200 memories store: frequency, mode, step size, duplex direction and offset, CTCSS tone, tone

squelch and skip settings. Other features include: attenuator, LCD lamp, AM ferrite bar antenna, auto power off, CTCSS decode, weather function and battery save. A great value at under \$200.00. **Call or visit website for price.**



### R20

The **Icom R20** covers an incredible 150 kHz to 3304.999 MHz (less cellular) with 1250 alphanumeric memories, bandscope and SSB/CW. It has: two VFOs, dual watch, voice scan control, NB, large two line LCD and CTCSS/DTCS/

DTMF. A built-in **IC audio recorder** can record up to 4 hours of reception! With charger, Li-ion battery, belt clip and strap. **Call for price.**

### R8500

The **Icom R8500** is a full coverage wide band communications receiver that tunes from 100 kHz to



1999.99 MHz in AM, LSB, USB, CW, FM-N and FM-W modes. Available to government customers only. #0663 **\$1699.95**



The **Icom R9500** clearly raises the bar for professional receivers. Covering 5 kHz to 3335 MHz, this instrument represents the state-of-the-art in receiver technology! Visit the Universal website for complete details.

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- Returns subject to a 15% restocking fee.
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### On The Cover

A tremendous amount of training goes into being ready to save lives at a moment's notice. Here Mountain Wave members Steve Hewlett (near front of vehicle), Sara Joy Brown (middle), and Mike Fulk (near back of vehicle) prepare to deploy communication and interoperability equipment for a training exercise at Multnomah Falls in Oregon's Columbia River Gorge. Learn more about the important work this non-profit volunteer organization does in "Life-Support—Mountain Wave Emergency Communications," by Roy Stevenson, starting on page 10. (Photo by Mountain Wave Command Officer Russell Gubele)

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10



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21

# Tap into secret Shortwave Signals

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

MFJ-462B  
\$199<sup>95</sup>



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, Tanjung Press in Serbia, Iraqi News in Iraq -- all on RTTY.

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

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.

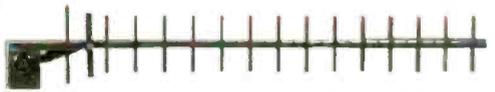
It's easy to read -- front-mounted 2 line 16 character LCD display has contrast adjustment.

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. 5/8"Wx2 1/8"Hx5 1/4"D inches.

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



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

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MFJ-5606SR, \$24.95. Cable connects

MFJ-1800/WiFi antennas to computer.

Reverse-SMA male to N-male, 6 ft. RG-174.

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

## Super Active Antenna

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

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

Switch two receivers and auxiliary or active antenna. 6x3x5 in. Remote has

MFJ-1024 \$159<sup>95</sup> 54" whip, 50 feet coax. 3x2x4 inches. 12 VDC or 110 VAC with MFJ-1312, \$15.95.

## 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."

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. 3 1/2"x1 1/4"x4 in.

## Eliminate power line noise!



MFJ-1026  
\$199<sup>95</sup>

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

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.

## 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 Shortwave Headphones



MFJ-392B  
\$24<sup>95</sup>

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.

## 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 Shortwave Speaker

This MFJ ClearTone™ restores the broadcast quality sound of short-wave 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<sup>95</sup>

## 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<sup>95</sup>  
Ship Code A

## MFJ Antenna Switches

MFJ-1704 \$74<sup>95</sup> MFJ-1702C \$34<sup>95</sup>

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 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. 4 1/2"Wx1Dx2H inches.

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by Edith Lennon, N2ZRW, Editor

# Radio Rescue's Reach: From Sea-Level To Mountain Tops And All Points Between

**P**retty much since its inception radio has been saving lives. It's almost hard to believe that Nikola Tesla's radio patent applications of 1897 predated what was likely the first use of radio in the aid of a ship in distress by only two years, when the *East Goodwin Lightship* transmitted a distress signal for the merchant vessel *Elbe* after it ran aground off the English coast.

The story of people using radio to help others in need stretches unbroken from then to the present, as is demonstrated so inspiringly by the subject of our cover story, West Mountain Emergency Communications Search and Rescue. The technology has certainly changed greatly since those early years, since the *Elbe* incident and since the *Carpathia* heard that infamous ..... in 1912, but the dedication to saving lives has not, and West Mountain continues that tradition. Rather than racing to save a sinking ocean liner guided by relatively primitive tools, however, West Mountain uses state-of-the-art communications equipment to aid lost and injured hikers, snowboarders, climbers, and others who find themselves in distress in a large area centered around Oregon's Mount Hood.

The comparison of West Mountain to the *Carpathia* may be an unfair one in light of the non-profit, volunteer organization's high success rate—the *Carpathia* arrived too late to save over 1,500 who perished when the *Titanic* went down. A more apt comparison is with the *Baltic*—a less heralded rescue ship that saved all hands when two steamships collided in heavy fog in 1909. After the rescue the captain of the *Baltic* made a prophetic comment in his journal: "I see no reason to think that we have reached the climax of invention for safety devices in navigation. There is always something new. Who would have thought ten years ago of wireless messages to be used in saving life at sea? Nobody

dreamed of it; and it is quite possible to conceive that other discoveries may be made of equal benefit to navigation."

But seas and mountains aren't the only environments where radio aids travelers. Summertime means a huge increase in road travel, and our CB radio feature shows just how relevant the one-time "fad" 11 meter band still is. There's a lot more to CB than trying to outsmart "Smoky": often the first news about road conditions and requests for assistance on highways come from CB operators—and they still know where the cheap gas is!

Let's also not forget that communications technology is a lot of fun. And if you haven't tried that GPS of yours outside your vehicle, you're missing out on a great way to enjoy technology in the great outdoors. Check out "Got A GPS? Then Go Geocaching" in this issue for an introduction to this terrific hobby that's one part treasure hunt and one part "Da Vinci Code" sleuthing and code breaking.

## Announcements

The radio community at large received very sad news recently of the passing of L.B. Cebik, W4RNL. This antenna expert was a gifted educator and author who mentored many during his too-short life. This month Kirk Kleinschmidt, NTØZ, reflects on his work and legacy in a sidebar to his "Ham Discoveries" column.

While another goodbye must be said this month, this one is not sad—only fond and bitter-sweet. This issue marks the last "Homeland Security" column by Rich Arland, W3OSS. Rich has served the readers of *Pop'Comm* well and faithfully for over six years. I know readers will miss his insights—I will, too. But I'm happy to report that I won't let him off the hook for features, so keep looking for that byline. We'll introduce Mitch Gill, NA7US, his extremely capable successor, next time.

*Popular Communications* invites your comments, questions, criticisms, compliments, article submissions—in a word, your thoughts. Write to me at [editor@popular-communications.com](mailto:editor@popular-communications.com).

## POPULAR COMMUNICATIONS

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## News, Trends, And Short Takes

### Senator Urges FCC To Block XM-Sirius Deal

A senior Democratic senator has urged U.S. communications regulators to block Sirius Satellite Radio's purchase of rival XM Satellite Radio, saying the deal would lead to higher prices for customers. North Dakota Senator Byron Dorgan, a high-ranking member of the Senate Commerce Committee, wrote to the chairman of the FCC saying the agency should not follow the illogical decision of the Justice Department, which last month granted the deal antitrust approval.

"This merger is contrary to the public interest. I hope that the FCC will stand up for competition in the public interest and deny this merger," Dorgan said in the letter to FCC Chairman Kevin Martin.

Antitrust authorities at the Justice Department approved the combination after concluding it would not harm consumers. The department said satellite radio companies face stiff competition from traditional AM/FM radio, high-definition radio, MP3 players, and audio delivered by mobile phones.

With the Justice Department's approval in hand, analysts have said XM and Sirius are unlikely to face outright opposition from the FCC, although the agency could impose conditions on the deal designed to protect consumers and preserve competition. Under U.S. law, the FCC is tasked with looking beyond competition issues and determining whether a communications deal is in the overall public interest.

### XM, Sirius Not Talking Of Merger In Canada

Ironically, while XM and Sirius are on the brink of merging in the United States, their Canadian counterparts are holding firm as rivals, even if it's only for a bit longer.

The head of XM Canada's parent company, Canadian Satellite Radio Holdings, Inc, told analysts that the U.S. Department of Justice's recent approval of the merger there brings the two American companies "one step closer" to consolidating. However, until final clearance from the FCC is granted in the United States, XM Canada is not changing its approach to competing with Sirius Canada. When asked whether the two have held talks on consolidating their operations, the company said it's too early to comment.

### FlyTunes Brings AccuRadio To iPhones

FlyTunes Inc. announced a partnership with AccuRadio.com that will bring all 320-plus channels of AccuRadio to iPhones and iPod Touch models. According to the announcement, FlyTunes will offer an AccuRadio mobile radio portal that provides a mobile-friendly user interface, targeted ad delivery, and enhanced QoS (Quality of Service) streaming.

AccuRadio, with nearly a half-million listeners per month, is among the top Internet radio broadcasters in the world. AccuRadio's channels cover a wide range of musical genres,

including rock, pop, jazz, country, classical music, and Broadway. The new service is available immediately. iPhone and iPod Touch users can listen to all of AccuRadio's channels by visiting [www accuradio.com](http://www accuradio.com).

### Dutch Broadcast Transmitter Museum

A group of former employees of Nozema Services, which was formerly responsible for the technical distribution of radio signals in the Netherlands, has set up a website called the Omroep Zender Museum (Broadcast Transmitter Museum) at [www.omroepzendermuseum.nl/](http://www.omroepzendermuseum.nl/) that publishes many photos of broadcast facilities in the Netherlands since Nozema was set up in 1935. The site also offers some audio, including the final moments of RNW shortwave transmissions in English and Dutch from Flevo. A search engine has just been added to the site, though at the moment it is only in Dutch.

### IRIN Launches Shortwave Broadcasts In Somali

The Integrated Regional Information Networks (IRIN) has launched direct broadcasts via shortwave radio of Somali news and information at 9665 kHz, 31 meter band, daily from 1730–1745 GMT. According to the HFCC (High Frequency Co-ordination Conference) registrations for A08, this transmission is from Meyerton, South Africa (beam 020 degrees and power 100 kW).

### WorldSpace Bids For L-Band Spectrum In UK

UK regulator Ofcom has published the list of approved bidders for the forthcoming L-Band spectrum (1452–1492 MHz). One bidder is WorldSpace, the Maryland-based digital satellite company. It has already bought the rights to the upper (12.5 MHz wide) block in Switzerland, Germany, and Italy, and is confident it can grab it in the UK as well.

WorldSpace's confidence is based in part on the Maastricht 2002 Plan, which allocates that top block to satellite radio across Europe. The UK, however, is not a signatory to that agreement, so is not bound by it, though anyone operating in the top block will not be protected (legally) from interference coming from WorldSpace's broadcasts, which cover most of the continent.

### WorldSpace Receives Approval For German Terrestrial Repeater Network

In related news, WorldSpace Europe has recently received approval from Germany's Federal Network Agency, the Bundesnetzagentur, to use 12.5 MHz of spectrum in the L-band

*(Continued on page 60)*

# Big Savings on Radio Scanners

# Uniden®

# SCANNERS



## Bearcat® 796DGV Trunk Tracker IV with free scanner headset

Manufacturers suggested list price \$799.95  
**CEI Special Price \$519.95**

1,000 Channels • 10 banks • CTCSS/DCS • S Meter  
 Size: 6.15" Wide x 6.91" Deep x 2.38" High

**Frequency Coverage:** 25,000-512,000 MHz., 806,000-956,000 MHz. (excluding the cellular & UHF TV band), 1,240,000-1,300,000 MHz.

When you buy your Bearcat 796DGV TrunkTracker package deal from Communications Electronics, you get more. The GV means "Great Value." With your BC796DGV scanner purchase, you also get a **free deluxe scanner headphone** designed for home or race track use. Headset features independent volume controls and 3.5 mm gold right angle plug. The 1,000 channel Bearcat 796DGV is packed with features to track Motorola Type I/II/III Hybrid, EDACS, LTR Analog Trunk Systems and Motorola APCO 25 Phase I digital scanner including 9,600 Baud C4FM and CQPSK. Also features control channel only mode to allow you to automatically trunk many systems by simply programming the control channel. S.A.M.E. weather alert, full-frequency display and backlit controls, built-in CTCSS/DCS to assign analog and digital subaudible tone codes to a specific frequency in memory, PC Control and programming with RS232C 9 pin port (cable not supplied), Beep Alert, Record function, VFO control, menu-driven design, total channel control and much more. Our CEI package deal includes telescopic antenna, AC adapter, cigarette lighter cord, DC cord, mobile mounting bracket with screws, owner's manual, trunking frequency guide and one-year limited Uniden factory warranty. For maximum scanning enjoyment, order magnetic mount antenna part number ANTMMBNC for \$29.95. For complete details, download the owners manual from the [www.usascan.com](http://www.usascan.com) web site. For fastest delivery, order on-line at [www.usascan.com](http://www.usascan.com).

## Bearcat® BCT8 Trunk Tracker III

Manufacturer suggested list price \$299.95

**CEI Special Price \$169.95**

250 Channels • 5 banks • PC Programmable  
 Size: 7.06" Wide x 6.10" Deep x 2.44" High

**Frequency Coverage:** 25,000-54,000 MHz., 108,000-174,000 MHz., 400,000-512,000 MHz., 806,000-823,987.5 MHz., 849,012.5-868,987.5 MHz., 894,012.5-956,000 MHz.

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



## Bearcat® BCD396T Trunk Tracker IV

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

APCO 25 9,600 baud compact digital ready handheld TrunkTracker IV scanner featuring Fire Tone Out Paging, Close Call and Dynamically Allocated Channel Memory (up to 2,500 channels), SAME Weather Alert, CTCSS/DCS, Alpha Tagging.  
 Size: 2.40" Wide x 1.22" Deep x 5.35" High

### Frequency Coverage:

25,000-512,000 MHz., 764,000-775,987.5 MHz., 794,000-823,987.5 MHz., 849,012.5-868,876.5 MHz., 894,012.5-956,000 MHz., 1,240,000 MHz.-1,300,000 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 BCD396T 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](http://www.usascan.com) or call 1-800-USA-SCAN.

**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](http://www.usascan.com) or call 1-800-USA-SCAN.

## Bearcat® BC246T Trunk Tracker III

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

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

### Frequency Coverage:

25,000-54,000 MHz., 108,000-174,000 MHz., 216,000-224,980 MHz., 400,000-512,000 MHz., 806,000-823,987.5 MHz., 849,012.5-868,987.5 MHz., 894,012.5-956,000 MHz., 1,240,000 MHz.-1,300,000 MHz.

The handheld BC246T TrunkTracker scanner has so many features, we recommend you visit our web site at [www.usascan.com](http://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 you have 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](http://www.usascan.com) or call 1-800-USA-SCAN.



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## Capitol Hill And FCC Actions Affecting Communications

### Public Safety Should Be Aided By Airwave Auction, House Panel Says

A block of public airwaves should be re-auctioned with the proceeds turned over to public safety officials to fund a nationwide network for emergency communications, members of a congressional panel said. According to the Associated Press, the House Energy and Commerce subcommittee on telecommunications and the Internet was looking into why a plan for using public airwaves and private money to create a nationwide emergency communications network did not attract interest in what in other ways was a successful auction of frequency spectrum. Texas' Rep. Joe Barton, ranking Republican on the House Energy and Commerce Committee, and Rep. Cliff Stearns, ranking member of the subcommittee, suggested the plan in April.

"With consensus, Congress could pass a law to use proceeds from the commercial re-auction for the public-private partnership," Barton said in the AP report.

Testimony was heard from members of the FCC and people behind the scenes in the failed negotiations to form the wireless broadband network. The auction of public airwaves raised \$19.1 billion but failed to attract a bidder to build the network.

Officials said Hurricane Katrina and the terrorist attacks of September 11, 2001, exposed cracks in the nation's emergency communications networks and the inability of police and firefighters to effectively communicate with one another.

Commission estimates on the cost of a national network run between \$6 billion and \$7 billion. It is uncertain whether the block would generate that much revenue at auction, according to FCC Commissioner Jonathan Adelstein.

### FCC Confronts Virginia Radio Amateur About Multiple Club Callsigns

A Chester, Virginia, radio amateur has been questioned by the FCC about "at least 17 club call signs in your name as trustee, all licensed to Virginia RACES clubs," documents show.

A letter to Anthony M. Amato, KR4UQ, from FCC special counsel Riley Hollingsworth said the commission had "requested information related to the club stations and have reviewed the information you provided in various responses over the past two years.

Hollingsworth wrote,

Although the number of such club licenses appears more than necessary, we have accepted your responses. You are reminded that the only types of station licenses that can be granted in the Amateur Service are shown in Section 97.5 of our rules. Moreover, Section 97.17(a) provides that only a "person" is eligible to apply for a new operator/primary station, club station or military recreation station license grant.

The letter pointed out that there are "no provisions for the licensing of not-for-profit corporations."

Additionally, the letter stated that, "in view of the fact that the above licenses are for club stations listing you as trustee, and were granted as club stations, you are responsible for the proper control of each station, and each club must at all times be composed of at least four persons, have a name, document of organization, management, and a primary purpose devoted to Amateur activities consistent with Section 97 of our rules.

"You may be periodically requested to document that these club stations comply with the above rules," said Hollingsworth in conclusion.

### Kansas Passes "Emergency Communications Preservation Act"

Radio amateurs in Kansas have succeeded in an eight-year effort to make the state the 26th to adopt a PRB-1-type law with passage of the "Kansas Emergency Communications Preservation Act."

According to Gov. Kathleen Sebelius' office, the law "prohibit[s] a city or county governing body from taking any action that precludes federally licensed amateur radio service communications, or that does not conform to federal regulations related to amateur radio antenna facilities."

According to the American Radio Relay League,

...the new law states that if a municipality takes any action that regulates the placement, screening, number or height of a station antenna structure, the action must "reasonably accommodate federally licensed amateur radio service communications; and constitute the minimum regulation practicable to carry out the legitimate purpose of the governing body." Antenna support structures constructed prior to the bill's effective date "are exempted from subsequent changes in zoning regulations...and may be repaired as required."

HB 2805 took effect July 1, 2008. It was written by Rep. Arlen Siegfried (R-15), and "passed unanimously in both the Kansas House of Representatives and Senate," the ARRL said.

The League reported,

JD Spradling, KCØNYS, of Olathe, Kansas, is chairman of the committee that led the charge to get a PRB-1 law on the books in that state. He commented: "Many local zoning boards don't give FCC regulations adequate consideration when making zoning decisions and across the country amateurs have found that state laws are a more effective tool for influencing local zoning regulations. So beginning in the 1990s, amateurs began lobbying for legislation that would place PRB-1-type language into their state laws."

"This venture has been successful because we have had a great team effort all the way through the process," Spradling said, "from all who stepped up—from our state and local representatives, to our subject matter experts and the PRB-1 Committee members from Miami County, Kansas, as well as everyone else who had been proactive in the 2008 Kansas Legislative process for your fellow hams."

## FCC Violated Administrative Procedure Act In BPL Matter, Court Rules

A U.S. Court of Appeals has sided with the American Radio Relay League on two major points in the League's battle with the FCC over governing broadband over power line (BPL) emissions and "remanded the rules to the Commission." The rulings came from a three-judge panel of the District of Columbia Circuit; seated were Judges Judith Rogers, David Tatel and Brett Kavanaugh.

"The Commission failed to satisfy the notice and comment requirements of the Administrative Procedure Act (APA) by redacting studies on which it relied in promulgating the rule and failed to provide a reasoned explanation for its choice of the extrapolation factor for measuring Access BPL emissions," Judge Rogers wrote.

ARRL President Joel Harrison, WSZN, said in reaction,

I am very pleased that the Court saw through the FCC's smoke screen and its withholding of valid engineering data that may contradict their position that the interference potential of BPL to amateur radio and public safety communications is minimal. The remand back to the FCC regarding their use of an inappropriate extrapolation factor validates the technical competence of amateur radio operators and especially of the ARRL Lab under the direction of Ed Hare, W1RFL. We are grateful for the work of our legal team and especially for the unflinching support of the ARRL membership as we fought the odds in pursuing this appeal.

Information withheld by the Commission included material under the headings "New Information Arguing for Caution on HF BPL" and "BPL Spectrum Tradeoffs," the League said. "The Court concluded that 'no precedent sanctions such a hide-and-seek application of the APA's notice and comment requirements.'"

In addition to the disclosure issue, "the Court also agreed with the ARRL that the Commission erred in not providing a reasoned justification for its choice of an extrapolation factor of 40 dB per decade for Access BPL systems and in offering 'no reasoned explanation for its dismissal of empirical data that was submitted at its invitation,'" according to the *ARRL Letter*. ■

## OUR READERS SPEAK OUT

Each month, we select representative reader letters for "Our Readers Speak Out" column. We reserve the right to condense lengthy letters for space reasons and to edit to conform to style. All letters submitted must be signed and show a return mailing address or valid e-mail address. Upon request, we will withhold a sender's name if the letter is used in "Our Readers Speak Out." Address letters to: Edith Lennon, Editor, Popular Communications, 25 Newbridge Road, Hicksville, NY 11801-2909, or send email via the Internet to editor@popular-communications.com.

### On TriSquare's FHSS Alternative...

Dear Editor:

I was pleased to see that equipment like the TriSquare TSX300 is finally becoming available in the communications area of the consumer electronics market. It seems to have features that I think will be of interest to the non-hobbyist communications equipment user. Hopefully, this will take some pressure off of the GMRS/FRS channels, and increase their usefulness to emergency communications volunteers in areas of the country where frequency congestion has become a problem, but (unencrypted) GMRS/FRS-type equipment is needed due to interoperability requirements.

I enjoyed reading Mr. Bates' article. It was informative for both technically oriented hobbyists and consumer-electronics users. When I finished reading the article, it occurred to me that maybe now, while this technology is just beginning to hit the consumer market, that some effort might be made to establish common FHSS entry codes for both an Emergency and a Calling "Channel" in these new radios. Your magazine is the perfect vehicle to be first in suggesting this idea. Please continue your excellent work in announcing new technologies and products to your readers.

Leo Halvorsen  
Via email

Dear Leo:

Thanks for your letter and for your excellent suggestion regarding common codes. It was passed along to TriSquare.  
—Editor

Dear Editor:

Based solely on the article in the March 2008 *Pop'Comm* ["An Innovative License-Free Alternative To FRS/GMRS,"] I bought a Value Pack of two of TriSquare's simpler 900 MHz transceivers. They might not be everybody's cup of tea but I love 'em!

For a little less money than two of

Motorola's better FRS radios, my TSX100s have more transmitting power, digital-quality sound, and 1,000 channels.

By the way, the TSX100s are not "one-third the price" of the TSX300s, but are really one-third cheaper. The TSX300 value pack is about \$100 on the Internet and I paid \$58 for my TSX100s from Amazon.com. The added features of the TSX300 would be wasted on me. I don't even have a scanner.

The loose fitting battery cover problem has been solved. The TSX100 interface works ok but is somewhat less than intuitive, to me anyhow. I had to carry the manual around for a week before I had all the buttons and functions memorized. The screen is small but adequate and nicely backlit. There are only seven buttons (a good thing) but you need double clicks for some functions. I don't have any idea about the extent of the transmit range because I have never exceeded it.

John Alldredge  
Mission, Texas

*Bernard Bates responds:*

John:

You're correct about the pricing: current online price quotes show that the TSX100 is about one-third less than the TSX300; it does not cost one-third as much. Thanks for pointing that out.

Readers will also be interested in knowing that since that article was published, online "street pricing" for these radios has dropped significantly—about 20 percent. The TSX300 and TSX100 "Value Packs" are now selling for about \$80 and \$60, respectively, and the individual radios by themselves sell for \$30 and \$20, respectively. This is an unprecedented value for two-way radios having this level of technological sophistication and privacy.

Incidentally, the user interface of the TSX100 is much less intuitive than that of the TSX300 because it lacks the latter's alphanumeric display, which labels the Softkeys' functions with plain words.

—Bernard Bates

# Life-Support— Mountain Wave Emergency Communications

*How One Organization's Search & Rescue Know-How Is Saving Lives In The Northwest*

by Roy Stevenson



*Mountain Wave's Com 2 rig and other emergency vehicles at a snowless Timberline Lodge on Mt. Hood after a rescue mission in 2006.*

**H**ow about this “Mission Impossible” for a communications team? Coordinate large Search & Rescue (SAR) operations spanning multiple counties with all the terrain obstacles and geographical challenges that mark the area around Mount Hood, Oregon. And do it all while facing the logistical difficulties of incompatible radio equipment and frequencies, involving up to 28 different agencies in a life or death situation where time is critical.

Sound like a challenge? You bet it is, but these are problems routinely faced and overcome by Portland's Mountain Wave Emergency Communications Search & Rescue organization. Their rescue track record is as impressive as their equipment list—and this team has communications equipment that makes most military comms specialists drool.

This non-profit volunteer agency may well lead the nation in its support of public safety agencies with its pool of highly trained experts, equipment and resources. “Mountain Wave is a unique organization,” says Russell Gubele, Mountain Wave's Command Officer. “I'm not aware of any other like it. Some public service agencies have comm units, some use amateur groups. But none that I'm aware of come with the talent we do. We bring professionals in many disciplines to a mission. Not only can we use and deploy equipment, we can fix it if it breaks, configure and program it if needed, and just make everything work! And we do it for free!” says Gubele.

Roy Stevenson is a freelance writer based in Seattle, Washington. He writes on communications, military history, travel and culture, sports, and fitness and health.

The group has achieved great distinction by providing thousands of hours of support to public service agencies and has won numerous awards for this service. They receive several requests for training material every week from agencies all over the country.

## Lives In The Balance

Mountain Wave has been involved in numerous SAR operations that have made national news, with much high drama and danger. They responded to 90 live missions in 2007 alone where lives were in danger.

In February 2007, for example, they were instrumental in rescuing three climbers who slipped from a ledge at the 8,300-foot level of Mt. Hood, about 60 miles east of Portland, Oregon. After falling 300 feet, one member of the group activated a mountain locator unit (MLU) and contacted emergency dispatchers. (These custom-built MLUs are similar to animal tracking units, developed by Mountain Wave and other groups for the U.S. Forestry Service. Mountain Wave is currently testing a new satellite-based unit that has GPS. Early testing has been good and the GPUs will replace the MLUs later this year.)

After being activated by local authorities, Mountain Wave personnel joined the effort and contacted the climbers, instructing them to huddle in their sleeping bags. Shivering, wet and cold, with their Labrador retriever, they waited for the 30-person rescue team to scramble up the mountain in hazardous whiteout conditions, including heavy snow and 70-mph winds. Mountain Wave located the lost climbers using a beam antenna and receive-



*The media interviews a missing mushroom picker after she was found in a 2008 incident. Mountain Wave's Com 2 can be seen at right.*

er from various locations to triangulate the MLU's signal. An alpine search team from another agency took a beam and receiver with them to the triangulated area and was able to pinpoint the exact location.

This emergency had a happy ending and the climbers were brought down from the mountain by the rescue teams with only minor injuries. They were bundled into a snow cat and transported to a waiting ambulance at a state campsite.

Tragically, not all SAR operations end happily. One of the most frequently climbed mountains in the world, there have been 35 climbing deaths on the often-treacherous 11,239-foot Mt. Hood due to bad planning and bad luck.

One rescue mission that went awry occurred in May 2002, when nine climbers fell into a crevasse 800 feet from the summit. Three of the climbers were killed and three critically injured. Things went from bad to worse after the Air Force Reserve Pave Hawk helicopter sent in to rescue the survivors crashed into the mountain. It tumbled down the slope, seriously injuring one of the five crewmen, and underscored the hazards facing rescuers every day on SAR missions. Fortunately, such bravery does not go unnoticed: "We received several awards for this mission, including an Oregon State Emergency Medical Services Unit Citation," says Gubele.

Even when an outcome is grim, however, the communications technology Mountain Wave uses helps tremendously in the overall effort involved. For instance, when a party of three climbers got split up into two groups in December 2006, one of

the climbers used his cell phone to tell his family they were in trouble. Despite a severe snowstorm the rescuers eventually found his body in a snow cave, where he'd succumbed to hypothermia.

"The mission ran for several days. We tracked the cell phone to within 20 feet. We received the Clackamas County Public Service Award for our work on this mission," says Gubele. While unable to provide details about the technology involved in that mission because of legal and privacy issues, Gubele says that Mountain Wave has strict protocols concerning the use of the technology at its disposal. "Working with the cellular companies and their engineers, we have developed tools, equipment, and procedures to pinpoint the location of cell phones. Some cell phones have GPSs that can be used to help determine the location, others can be pinged and the information used to triangulate them," he says.

### Mountain Wave's Mission And Methods

Mountain Wave provides trained experts, equipment, and resources to support local, state, and federal agencies in SAR missions, emergencies of various types, and disaster situations. With its mission of "providing communications support for search and rescue missions, ranging from tactical communications in technical rescue situations with a handful of rescuers, to large-scale systems for multi-day search operations covering large regions and hundreds of people," the

organization's success is legendary around the country. Its secondary objective is to "provide communications for natural disasters and other emergencies."

Emergencies often occur in remote areas with little or no communications infrastructure or cell coverage, and a disaster or even simple equipment failure could take out existing communications systems. This is where Mountain Wave steps in, and the organization's communications and computer capabilities are second to none. Plus they offer highly trained personnel who can assist with the Incident Command Structure (ICS) in communications, planning, and operations. Its staff includes a medical backup of trained EMTs and paramedics, field searchers, and veterans of airborne operations. Resources at its disposal include 4 X 4 vehicles and equipment to search remote areas, set up communications equipment in remote areas, and transport people (see "Mountain Wave's Vehicles").

Mountain Wave supports an alphabet soup of agencies in both Washington and Oregon, including state and local public safety agencies, numerous county sheriff's departments, and medical teams. Its members are all volunteers, motivated simply by the desire to use their skills to help other people. In fact, they spend hundreds of dollars of their own money for equipment, fueling their vehicles, and training themselves. Because of the training required, it takes a year or more to become a member. "They're current and former public safety workers, police, fire, paramedics, EMTs, 911 dispatchers, physicians, nurses, communications and computer experts, software engineers, business leaders, pilots, military personnel, and teachers to name a few," says Gubele.

Without a doubt, a major element of Mountain Wave's high-proficiency rate is that well-trained team of 40 individuals, almost all of whom hold amateur radio licenses. There are 20 people in its Comms Unit and 20 in its 4 X 4 Unit. Certified with the state of Oregon for SAR, its members are registered emergency service workers with Clackamas County and the state of Oregon. An in-house SAR training program includes communications, use of field equipment, and dispatching.

"Our teams train often and rigorously," says Gubele. "We always train as if the missions were real. We stay on top of cutting-edge technology and adapt it to the SAR environment. This often means we have to build our own interfaces and

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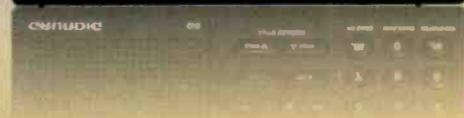


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- 1000 station memories (each band 100 memories, 500 customizable)

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write custom software.” They boast several networks of amateur and commercial radio repeaters in case the public safety radio systems become unavailable.

Mountain Wave’s crew includes experienced 911 dispatchers, radio technicians, SAR field personnel, experienced mountaineers, paramedics, EMTs, and experts in airborne operations. The alpine field personnel all graduate from the American Alpine Institute’s Advanced Ice Climbing Course, many even teaching climbing and mountaineering.

Emergency simulations are held several times each year with organizations like Portland Mountain Rescue, the 304th Rescue Squadron, the Clackamas Sheriff’s Department, the U.S. Forestry Service, and the American Medical Response Reach and Treat team. They provide valuable practice for real situations and offer another benefit: “We have also been a leader in promoting and facilitating interoperability between agencies,” says Gubele. One simulation in April 2006, involved “missing” climbers with mountain locator units at an 8,500-foot elevation on Mt. Hood. In this exercise a simulated avalanche swept away a rescue team. A second team had to locate this team before turning their attention back to the original “lost” climbers. All were located alive by using the avalanche beacon signals of the buried team, then later the others were found in a snow cave using MLUs.

## The Communications Network Behind The Scenes

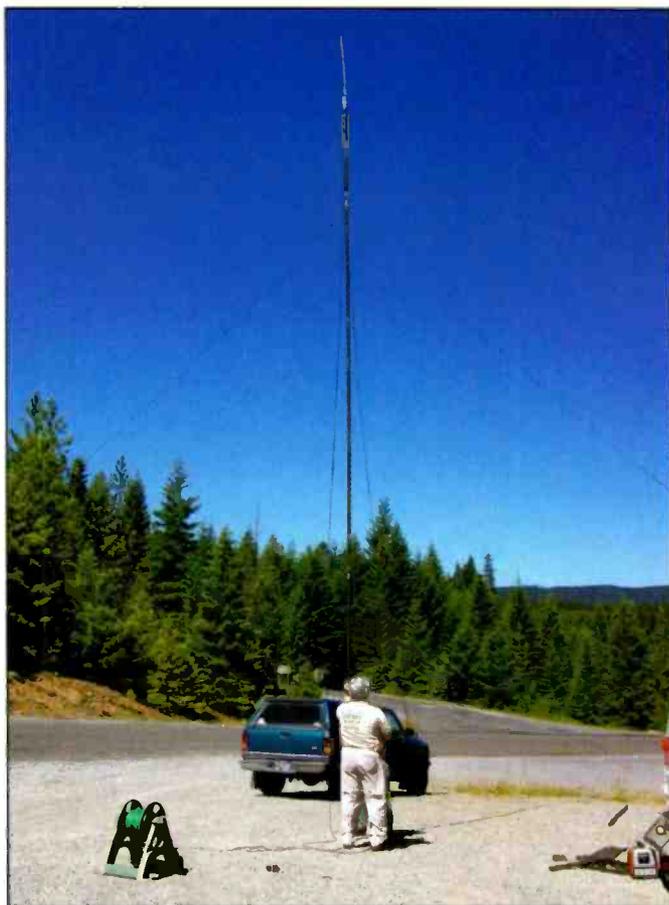
By working alongside the rescuers and ground search squads as part of the overall team, Mountain Wave’s field teams free up the other personnel to get on with the technical rescue and medical aid.

Its staff members are experts at establishing radio relays in remote locations, such as canyons, that are typically out of radio “view.” When an EMS or search team drops into a canyon, Mountain Wave maintains the comm link to base. It also establishes radio direction finding (RDF) communications, coordinates with aircraft for medical evacuations, helps locate signals from MLUs, and even sets up landing zones (LZs) for helicopter loading and unloading.

Mountain Wave uses field deployable “tactical bridges,” consisting of several radios in a case with controllers. These allow them to patch together radios on different bands so everyone can



Mountain Wave’s Todd Eliason and Russell Gubele working in Com 2 on a mission on Mt. Hood in 2000.



Former (now retired) Clackamas County Sheriff Lieutenant Robert Lowe assists Mountain Wave by steadying a radio mast while guy wires are put in place. The 2007 mission was at Timothy Lake, Oregon, for two elderly people missing.

talk to each other (an aircraft radio to a UHF radio for example). The bridges’ radios and controllers are linked to a server, and software on the server allows Mountain Wave to stream the radio functions and RX TX audio to a radio control panel on a laptop. This way they can operate on many radios and frequencies from anywhere with an Internet connection. The group’s genius for innovation and invention has led to its designing and building tracker units from sundry components that are used to track searchers and plot their GPS location on a topographical map.

Mountain Wave field personnel can reach into roadless areas by mountain bike to provide relay teams, deliver supplies, and clear trails. They boast a cache of portable radio equipment (VHF, UHF, and 800 MHz) with Nextel phone service, mobile and cross-band repeaters, magnetic mount mobile antennas, and five portable tall mast systems.

Several years ago the group installed a VHF 5/8-wave antenna and a UHF six-element beam at Timberline Lodge on Mt. Hood to use on SAR missions. “It was very difficult accomplishing this,” Gubele says, “as Timberline Lodge is a national historic building that you need permission to touch. We were successful in receiving permission and installing the antennas.”

## Common Emergencies— Uncommon Responders

As recently as January 2008, two lost men on Mt. Hood were guided and located by Mountain Wave’s technology. Overdue

## Mountain Wave's Vehicles



Mountain Wave's Com 1 and Com 2 at their base at the Portland Airport.

Mountain Waves' vehicles make the Bat mobile look archaic. Several four-wheel drive communication vehicles are equipped with powerful radios on multiple frequencies, five radio antenna masts, auxiliary power for the computers, and audible and visible attractors for lost persons.

### Com 1

A modified 1989 4 x 4 Chevy Suburban acts as a remote mobile relay and is packed with comm equipment. Here's a breakdown:

- 2 Motorola Spectra VHF
- 1 Motorola GM 300 VHF
- 1 Motorola GM 300 UHF
- 1 Motorola Spectra 800 MHz
- 1 Motorola MTS 2000 800 MHz
- 1 Kenwood 741 2M 440 220
- 1 Yaesu 8900 2M 440 6M 10M
- 1 ICOM Aircraft
- 1 ICOM 706 M2G HF
- 1 PRC military radio
- 1 Midland HF marine radio
- 1 Cobra 40 ch. CB
- 6 King VHF portables for loan

- 2 King UHF portables for loan
- Front and back Nextel phones
- 4 Nextel cell phones for loan

And it's got some serious juice to power that equipment: a dual-battery system, plus shore power, with 110-volt plugs in the vehicle so equipment can be used from power provided by a generator or other source, and 70 amp 12 VDC power supply.

There's also a brushbar, 9,000-pound winch, warning lights, scene lights and custom Yakima rack. Mounted cabinetry in the rear holds tire chains, a spare alternator, toolboxes, manuals, maps, flares, LZ marker panels and smoke canisters to signal helicopters and show wind direction for setting up LZs. "Go bags" contain batteries, antennas, and radios.

### Com 2

Mountain Wave's Com 2, a converted Ford Ambulance, is a mobile dispatch center that complements the sheriff's mobile command post. Its communications technology includes two 911-dis-

patch positions, computers, and the following radios on all frequencies:

- 3 Motorola Spectra VHF
- 1 Motorola Spectra UHF
- 1 Motorola GM 300 VHF
- 1 Motorola GM 300 UHF
- 2 Motorola Spectra 800 MHz
- 1 Motorola MTS 2000 800 MHz
- 1 ICOM VHF P25 trunking
- 1 ICOM UHF P25 trunking
- 1 Tait UHF MPT trunking
- 2 Yaesu 8900 2M 440 6M 10M
- 1 ICOM Aircraft
- 1 ICOM 706 M2G HF
- 1 ICOM UHF VHF D-Star radio
- 1 PRC military radio
- 1 Midland HF marine radio
- 1 Uniden 996 trunking scanner
- 1 Cobra 40 ch. CB
- 8 King VHF portables for loan
- 4 King UHF portables for loan
- Front and back Nextel cell phones
- 4 Nextel cell phones for loan
- 2 pairs Motorola FRS radios
- 2 radio masts

The dispatching positions include the above radios within reach of both operators, who also have their own flat panel color monitor, PC, wireless keyboard, and mouse. Their rigs include flush-mounted VHF, UHF, and 800 MHz radios with whiteboards for notes, for air band, military, scanner and amateur frequencies.

By coordinating this mix of comms equipment, the Mountain Wavers are able to link up searchers and rescuers on the ground, aircrew if needed, and EMTs with the served agencies involved, municipalities, and hospitals. While Mountain Wave personnel are not the primary coordinators of the rescue missions, they are the "voice" of SAR operations, and their expertise is often the deciding factor in locating lost or injured mountaineers.

from their climb and lost in a whiteout, they were contacted on their cell phone. They were in a snow cave, but the Sheriff had no idea where they were.

Gubele explains how Mountain Wave saved the day in that instance. "Because we were monitoring their cell phone, we knew when it popped back into service and we called them. They were surprised when their phone rang! We also knew

within a mile where they were based on our cell tracking."

By good fortune they'd stumbled across a geocache, a box used in a kind of backcountry treasure hunt that contained their GPS location. This enabled the searchers to zero in on them and bring them back safely.

Such emergencies are all-too commonplace. In 2006 the Clackamas County

Sheriff's Search and Rescue team was activated 117 times, with Mountain Wave involved in many of those searches. It's difficult to assess how many lives the Mountain Wave team has saved through its expertise, but it's safe to say that there are a lot of people alive today thanks to this dedicated group.

Find out more about Mountain Wave by visiting its website at [www.mwave.org](http://www.mwave.org).

# Ready To Roll With CB Radio

## ***Soaring Gas Prices Making Road Travel Painful? Turn To An Old Friend. Communications On 11 Meters Is Still A Great Way To Go!***

by Jeffrey Reed

**A**nyone who believes Citizens Band Radio has gone the way of the Dodo bird should think again. In fact, CB (11 meter 26.965–27.405 MHz communications) is alive and well, and most likely “living” in your neighborhood.

With apologies to Burt Reynolds, don’t go organizing a convoy to avoid Smokey Bear anytime soon. Unlike the 1970s CB craze, which fueled movies like *Smokey and the Bandit* and hundreds of CB-themed songs—which in turn saw the CB phenomenon positively explode—today’s CB culture breeds a more mature mode of communicating.

Sure, there will always be those who disregard on-air etiquette, not to mention rules and regulations of the FCC (and north of the border Industry Canada, formerly the Department of Communications, or DOC). But perhaps a spinoff of today’s wired 24/7 society, CB radio is making a comeback among the general population.

And this summer, in particular, with its soaring gas prices reminiscent of the 1970s, there’s sure to be a lot of CB chatter as truckers and other drivers communicate with each other looking for cheaper gas. Déjà vu all over again.

Truckers—these days referred to as professional drivers—are still by far the largest population to embrace CB radio, and long-distance haulers are sophisticated professionals indeed, with truck cabs housing everything from laptops, satellite GPS, and yes, the old reliable CB transceivers. But average Joes like you and me also find CB radio to be an inexpensive (although at times limiting) method for quickly obtaining information like bad weather and traffic warnings, plus travel directions. And it’s still a great way for business operators and family members to keep in touch within city borders.

### **CB: A Brief History**

The FCC issued the first license for CB radio—or Class “D” 27 MHz band—in early 1948 to Al Gross. He communicated with license 19W0001 of the Citizens Radio Service. By the 1960s, truckers, small business operators, and radio hobbyists were using CB transceivers on a daily basis. Then, it hit, just like a winter snowstorm.

Jeffrey Reed is a leading Canadian freelance journalist and a life-long communications hobbyist.



*CB is definitely alive and well...and keeping motorists the same. Case in point: Here’s CB hero 9-year-old Matthew (Matty) Lovo showing how he used the CB in his dad’s big rig to save lives. Matty followed instructions from other drivers to halt the rig—and its 52 tons of lumber—last fall on busy US 30 in Oregon when his dad collapsed at the wheel. (Photo by Allen Geizler)*

When the U.S. government imposed a 55 mph speed limit following the oil crisis of 1973 and the concurrent gas shortages, much media coverage was given to truck drivers who, in fact, were communicating via CB radios. Thus, the CB craze was born. Drivers communicated to locate gas and to warn others of speed traps.

Add to the mix C.W. McCall’s 1976 song, “Convoy,” which spurred a movie by that same title in 1978, and you had a communications phenomenon that would not be surpassed until the Internet was born. CB was so popular, you could walk to the corner store, purchase a mobile CB transceiver and antenna for as little as \$75, and after a quick installation join in on the fun—if you could get a word in edgewise.

The original 23 channels clogged, the FCC allowed 40 channels in 1977, and that’s where it remains today. Higher-end CBs boast both AM and SSB—upper and lower single sideband modes offering 12 watts of power—and thus provide 120 separate channels. Under normal atmospheric conditions, and using properly installed antennas and lawful 4-watt AM transceivers, two home, or base, CB operators can talk over a dis-



*Cobra's innovative CB offering: the Cobra 29 LTD BT, complete with Bluetooth wireless technology. (Photo courtesy Cobra Electronics)*

tance of about 20 to 40 miles (mobile-to-mobile and base-to-mobile distances are less, and walkie-talkie communications lesser still).

Yet despite the fact CB communications is obviously limited compared to the Internet or cell phones, it is a cheaper mode of communicating and it does serve a purpose. For a 10-year span, from the mid-1970s to the mid-1980s, talking to your neighbor or friend across town via CB was as common as emailing your loved ones across the country is today. But before you could say "BlackBerry," the CB band of almost 30 years ago had become out of control, so much so that both the FCC, and later the DOC, delicensed what it labeled the General Radio Service (GRS) band.

## CB Remains Important, Continues Growth

It's nearly impossible to estimate how many CB radios are now in use across the United States and Canada, let alone the rest of the world—including in the UK where CB use is reportedly on the rise. Today, we have FRS, GMRS, MURS, and 900 MHz FHSS alternatives, not to mention 10 meter radios, and all other radios used by ham radio operators. But nowhere else is there such a unique and useful mode of communicating as CB radio.

Case in point: This past winter, a vicious winter storm caused havoc along Highway 401 southwest of Toronto, Ontario. A 75-vehicle pileup during a whiteout stemming from Lake Huron caused panic on one of the busiest stretches of highway in North



*Two strong offerings from Galaxy: the DX2547 base unit and the sharp-looking mobile DX939, which when used with a power supply makes a great base unit. The DX2547 is one of the few base units available today. (Photos courtesy Galaxy Radios)*

America. What was the first point of contact for motorists heading in that direction? CB radio.

"Quite honestly, I am a ham radio operator, but if a storm comes along, I turn on the CB and slip down to Channel 19. I want to hear what the truckers are saying. They don't steer you wrong," says Ralph Gray of Durham Radio, a Toronto-area radio superstore that counts professional drivers as its biggest CB clientele.

Gray says that, like everything else, CB radio popularity "follows a cycle. People are getting back into CB, although not like the 1970s. But just when you think it's dying off, out come some new products."

The latest CB product comes from arguably the leader in CB radio manufacturing, Cobra Electronics. In February, Cobra released the 29 LTD BT, the first-ever CB radio with Bluetooth wireless technology. Telephone calls are synched with the CB radio. A noise-canceling microphone allows calls to be heard loud and clear, even over a noisy engine. Incoming audio is routed through the radio's speaker. And, you can answer and terminate calls with the push of a button on the mic and use auto redial, allowing you to stay focused on the road.

Gray calls Cobra the "industry leader." In fact, the Cobra 29 LTD Classic, and its big brother, the Cobra 148 GTL with SSB, are mobile radios that remain two of the most popular CB radios of all time.

Ramon Sandoval, Cobra's CB radio product manager, says the 29 LTD Classic is Cobra's "most popular, best selling model. It's the number one choice of the professional driver, who is the biggest user of CB Radio today."

According to Sandoval, "Modern technology will allow you to communicate with people all over the world, but CB radio is mainstream America. CB is alive and well."

Ray Anderson, a technician with San Diego, California-based Galaxy Amateur and CB Radios, agrees with Sandoval that the Midwestern U.S., and parts of the Southern U.S., are the most popular areas for CB use. And, Anderson agrees with the niche cornered by CB communications.

"We thought CB would die off, but it hasn't. For truck drivers, it's a tool of the trade. For you and me, it's a hobby. It's like having a cell phone, but everybody knows what channel to be on, so it is unique. All you need is a cigarette lighter plug, a magnet mount antenna, and you have instant communications."

Galaxy makes one of the few base CB units on today's market: the Galaxy DX2547, a full-featured AM-SSB radio with large frequency display. The company's best seller is the DX959

full-featured AM-SSB mobile radio with five-digit frequency display. Galaxy's newest radio, the DX939, is an AM mobile radio boasting NightView, with a StarLite faceplate and glow-in-the-dark green and blue lettering.

## How To Join In On CB Chat

Joining in on CB communications is a relatively simple operation. While no license is required, you still must abide by the rules of the FCC, and Canadians by the rules of Industry Canada. Visit [http://wireless.fcc.gov/services/index.htm?job=service\\_home&id=cb](http://wireless.fcc.gov/services/index.htm?job=service_home&id=cb), and <http://www.ic.gc.ca/epic/site/smt-gst.nsf/en/sf01378e.html> for all you need to know regarding 27 MHz rules and regulations on both sides of the 49th parallel.

Purchasing a CB today is just as easy as it was in the CB heyday of the 1970s, thanks to the Internet (see "Helpful Resources

To Get You Started On CB"). And if you don't have Web access, while it's unlikely that your neighborhood 7-11 sells CB radios along with Slurpees, there are radio superstores and other brick and mortar retailers, too. Another common carrier of CBs, antennas, and accessories is the travel center. Think of it as a truck stop on steroids. Centers like the Flying J Travel Plazas carry a number of CB models and accessories, not to mention a variety of vehicle and travel necessities.

## Handheld CBs

The simplest way to jump right in is to purchase a walkie-talkie—or handheld—CB unit. One of my first CB radios was a RadioShack TRC-180 2 watt, three-channel walkie-talkie that required transmit and receive crystals. I'll never forget making contact for the first time with a truck driver in the early 1970s—

## Helpful Resources To Get You Started On CB

### *CB Manufacturers On The Internet*

Cobra Electronics [www.cobra.com](http://www.cobra.com)  
Galaxy Amateur and CB Radios [www.galaxyradios.com](http://www.galaxyradios.com)  
Midland Radio Corporation [www.midlandradio.com](http://www.midlandradio.com)  
President Electronics [www.president-electronics.com](http://www.president-electronics.com)  
RadioShack [www.radioshack.com](http://www.radioshack.com)  
Ranger Communications [www.rangerusa.com](http://www.rangerusa.com)  
Uniden Electronics [www.uniden.com](http://www.uniden.com)

### *CB Radio Information Sources*

Here are some sources of CB radios and accessories, some also with information on 10 meter radios:

Advanced Specialty Electronics [www.advancedspecialties.net](http://www.advancedspecialties.net)—New Jersey-based CB, amateur, and scanner dealer  
Bob's CB Shop [www.hobsch.com](http://www.hobsch.com)—Pennsylvania-based retailer, CB and 10 meter radios, accessories  
CB City [www.cbcity.com](http://www.cbcity.com)—Texas-based CB and antenna superstore  
CB Radio Magazine [www.cbradiomagazine.com](http://www.cbradiomagazine.com)—Online CB radio magazine  
CB Radios Plus [www.cbradioplus.com](http://www.cbradioplus.com)—Florida-based CB, 10 meter and communications super retailer  
CB Tricks [www.cbtricks.com](http://www.cbtricks.com)—Source of technical information, founded in 1998  
CB World [www.wearecb.com](http://www.wearecb.com)—Oregon-based online retailer of CB radios, accessories and communications equipment  
Durham Radio [www.durhamradio.com](http://www.durhamradio.com)—Toronto, Ont. Canada area radio superstore  
eBay [www.ebay.com](http://www.ebay.com)—Lists about 1,700 items under CB radio (all categories)  
Flying J Travel Plazas [www.flyingj.com](http://www.flyingj.com)—Boasts 220 state-of-the-art travel plazas across the U.S. and Canada  
GI Joe's Radio Electronics [www.gijoesradioelectronics.com](http://www.gijoesradioelectronics.com)—Kentucky-based CB and electronics retailer  
Premiere Electronics [www.premiere-electronics.net](http://www.premiere-electronics.net)—Minnesota-based radio superstore  
Radio Pro Shop <http://radioproshop.com>—Pennsylvania-based two-way radios, accessories retailer  
Radioworld [www.radioworld.ca](http://www.radioworld.ca)—Canada's largest radio specialty store  
The Quack Shack [www.thequackshack.com](http://www.thequackshack.com)—Washington-based CB shop  
Walcott CB [www.walcottcb.com](http://www.walcottcb.com)—CB Radio superstore

### *CB Rules, Regulations, Service Clubs*

Federal Communications Commission [http://wireless.fcc.gov/services/index.htm?job=service\\_home&id=cb](http://wireless.fcc.gov/services/index.htm?job=service_home&id=cb)—FCC's CB rules, regulations  
Industry Canada [www.ic.gc.ca](http://www.ic.gc.ca)—Industry Canada, Canadian lead department for Radio, Spectrum and Telecommunications  
REACT International [www.reactintl.org](http://www.reactintl.org)—Official REACT website

### *Other CB-Related Websites*

Big Time Operators CB Radio Club [www.btoclub.com](http://www.btoclub.com)—Indiana-based online CB club, with numerous CB links  
The DX Zone [www.dxzone.com](http://www.dxzone.com)—Comprehensive source of communications-related information  
CB Radio Forum [www.cbradioforum.com](http://www.cbradioforum.com)—Forum powered by I Stop Electronics (requires registration)  
Ham and CB Radio Web Ring <http://www.geocities.com/Area51/Station/6668/join.html>  
Woody's CB Gazette [www.cbgazette.com](http://www.cbgazette.com)—Numerous useful CB references  
World Wide Radio Forum [www.worldwidedx.com](http://www.worldwidedx.com)—Extensive CB and communications forum

## REACT Turns 46

Any discussion of CB radio isn't complete without mentioning REACT (Radio Emergency Associated Communications Teams), celebrating its 46th anniversary this year. REACT may not be as prevalent as it was during the CB heyday, but it has made a comeback in recent years, just like CB Radio itself. Today, in addition to CB Channel 9, FRS Channel 1 and GMRS 462.675 MHz (both by gentleman's agreement) act as emergency frequencies.

Headquartered in Suitland, Maryland, REACT International's mission statement reads as follows: "We will provide public service communications to individuals, organizations, and government agencies to save lives, prevent injuries, and give assistance wherever and whenever needed. We will strive to establish a monitoring network of trained volunteer citizen-based communicators using any and all available means to deliver the message."

For more information on REACT, visit [www.reactintl.org](http://www.reactintl.org). And, of course, read the *Pop'Comm's* "REACT In Action" column elsewhere in this issue.

I've been hooked on CB ever since. Later, I used 40-channel walkie-talkies including the massive but pretty TRC-209 and the more modern, slim-lined TRC-216.

It's tough to find low-powered walkie-talkies today, now that kids prefer transceivers like FRS radios or, better yet, cell phones! However, there are still a number of full-power, 4 watt, 40-channel CB walkie-talkies on the market, including Midland Radio Corporation's duo with BNC antenna connectors: the 75-785 with LED channel display, and the 75-822 with built-in 10-channel NOAA weather, plus dual function as a mobile unit. Today, top handheld units cost between \$50 and \$150.

For more convenient use with older walkie-talkies with telescopic antennas, you can screw on a rubber ducky antenna over the built-in antenna. However, reception and in particular transmission

power will suffer greatly. Fully extend the antenna outdoors, or simply connect to a mobile antenna while on the road, or to a base antenna while at home or at work.

## Mobile Units

By far, mobile CB radios outnumber all others—after all, it was the trucker who popularized CBs in the first place. How much you spend depends on how many bells and whistles you desire. Uniden Electronics, today better known for its line of Bearcat scanners, is also a well-known name within the CB circle. Its PC78ELITE 40-channel AM mobile CB, part of the Bearcat Pro Series, boasts a cornucopia of features, including an ergonomic pistol grip mic, enhanced night vision display, backlit control knobs, seven weather channels, and an analog S/R/F/SWR meter.



Uniden's PC78ELITE 40-channel AM mobile CB, is part of the Bearcat Pro Series and offers pistol grip mic, enhanced night vision display, backlit control knobs, seven weather channels, and an analog S/R/F/SWR meter. (Photo courtesy Uniden Corporation)

Installing a mobile CB isn't difficult; in fact, modern motorists probably complain more about the size of a mobile CB in relation to today's more compact vehicle interiors (truckers don't have that problem). Connect your CB to the 12 volt power system of your vehicle and to an external mounted antenna. Expect to pay between \$75 for a basic mobile and magnet mount antenna, and \$300-plus for a top-of-the-line mobile AM-SSB unit with quality antenna.

## Base Units

From the time I traded in my 2 watt walkie-talkie for a mobile base, I've never operated a CB from my vehicle. Like numerous other CB enthusiasts, I operate a base unit, using a mobile CB with a power supply: a 120 VAC-to-12 VDC converter. My Pyramid 5 amp constant, 7 amp surge power supply packs plenty of punch for my Cobra 148 GTL AM-SSB radio. I've added a handheld power mic to the mix, and even with my relatively small antenna, I'm able to converse with folks across town and out-of-town, including passing truckers who travel Highway 401 between Detroit, Michigan, and Montreal, Quebec.

Since the early days of CB, a base unit has been heralded as the most prized possession of a CB operator. Alas, there aren't many base units available today. In addition to Galaxy's offerings, there are



### WorldPack II

Hands free transport for your mobile radio and power supply.



### Worldpouch for FT-817

Sleek 2-part fanny pack—maximum room for accessories.

### RadioBox

Padded, quality constructed, professional carry case for your late model mobile radio and gear.



### BagBattery

12V, 8 amp hour gel cell battery in tough, weatherproof padded bag.

831-427-8197 • KC6QLB  
[www.powerportstore.com](http://www.powerportstore.com)

some nice units still on the market manufactured by companies including Ranger Communications. Base units are priced from about \$300 to \$600.

I mentioned my small antenna. I use a 39-inch Workman B100 groundless CB antenna, pole-mounted just 25 feet in the air outside a home office window, with 40 feet of quality RG-8X coax cable. Tuned with my Pyramid antenna matcher, the SWR reading is excellent at just above the 1:1 reading. It's a simple yet effective setup.

Of course, there are a myriad of base antenna possibilities, one of the most popular being the Solarcon Antron A-99, a halfwave over a quarterwave variable mutual transconductance tuned antenna. The entire antenna radiates, and with its three sections is easy to erect.

Don't forget the importance of good-quality coax cable. Again, there are many types from which to choose, including RG-213, RG-8U and RG-8U foam, RG-8X, RG-58U, and RG-59U. As with anything, you get what you pay

for with coax. Ask your CB specialist what coax best suits your individual installation. Expect to pay about \$80 for 75 feet of RG-213, which is 50 Ohm impedance, has 96 percent shielding, and includes PL-259 connectors soldered at both ends.

My original base station antenna and coax combination worked wonders, and consisted only of a 9-foot fiberglass marine whip with heavy-duty spring coil attached at the side of the roof's peak, and 50 feet of RG-58U coax cable.

## CB: It's A Different World

Today's CB radio community bares a bit of a resemblance to its predecessor of the 1970s and '80s. Oh sure, you'll still hear handles and 10-code jargon, but a growing segment of the general population—in addition to professional drivers—simply use CB radios to communicate just as they would via cell phone.

According to Steve Parsons of Radioworld, a large specialty radio store in Canada, "[CB] popularity is strongest with people who spend a lot of time on the highway, including truckers, vacationers, and motor home users. Another significant user group is the off-road Jeep driving community. Other enthusiasts include motorcyclists and specialty car clubs."

Since 1996, RoadTrip America ([www.roadtripamerica.com](http://www.roadtripamerica.com)) has been a premier Internet site for North American road trip information. The website applauds CB Radio. According to RoadTrip America, "These relatively low-tech devices are enjoying a resurgence of popularity among professional truck drivers and road trip enthusiasts for some very good reasons. They're relatively inexpensive to buy and free to use. They work well, and they provide communication under circumstances where other forms of technology still don't do a very reliable job."

Then there's this news from the UK. A charity group, left a legacy by a CB enthusiast, issued 20 pensioners with CB radios. Because this older group was not comfortable using the Internet, and found cell phones to be expensive, CB radio helped fight loneliness among the seniors living alone in remote areas.

In many ways our 24/7 wired society may be much more sophisticated than the society of 30 years ago. However, here's a big 10-4 to CB radio being here to stay. ■

For 45 years  
our volunteers have  
endured long hours  
and tough  
working conditions  
for no pay.



And 9 out of 10  
would do it again.

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[www.REACTintl.org](http://www.REACTintl.org)

# Got A GPS? Then Go Geocaching

*Enjoy Your Hobby And Get Some Fresh Air Right In Your Own Backyard—And Bring The Kids*

by Alfred J. Oxton, K1OIQ



*A geocacher rummaging through the geocache known as "Ajo Surprise" in Ajo, Arizona. (Photo by Betty Prange)*

**F**inding a geocache is like a high-tech treasure hunt. Someone has hidden a cache near you and published the coordinates; your mission, should you choose to accept it, is to find that cache, log it, and get on to the next one. Put your ZIP code into the search page at <http://www.geocaching.com/seek> and set the radius to 10 miles to see what's nearby. Then let the detective/tracker in you take over. The only high-

tech part you need is a handheld Global Positioning System (GPS) device. Sound like fun? It is!

For those of you who've never heard of geocaching, this is what it's all about (from the Geocache FAQ page at [www.geocaching.com/faq/](http://www.geocaching.com/faq/)):

Geocaching is an entertaining adventure game for GPS users. Participating in a cache hunt is a good way to take advantage of the wonderful features and capability of a GPS unit. The basic idea is to have individuals and organizations set up caches all over the world and share the locations of these caches on the Internet. GPS users can then use the location coordinates to find the caches. Once found, a cache may provide the visitor with a wide variety of rewards. All the

In addition to geocaching and innumerable other interests, Alfred J. Oxton, K1OIQ, is involved in the *Escapees Residence Vehicle Club*, a support group for folks who live full time on the road, and the Old Antarctic Explorers Association.

visitor is asked to do is if they get something they should try to leave something for the cache.

Most geocaches are housed in boxes about the size of an ammo can or a cookie tin; some are smaller, such as a magnetic key holder or an Altoids tin. Some are cleverly disguised but none are buried. The larger caches contain a log-book and a handful of trinkets—patches, coins, marbles, hatpins, and such—things to trade. Kids love them. In fact, kids seem to have a knack of finding the stash, perhaps because they are closer to the ground!

## Location, Location, Location

The GPS system that will get you there consists of a collection of satellites that, to make a long story extremely short, tell your GPS device where it is located in terms of latitude, longitude, and altitude. Also contained in the data stream is time of day, time of sunset, and, if you remembered to press the right buttons to start with, the way back to your car. Batteries not included. When geocaching, always bring extra batteries and extra water.

About the size of a cellphone, the GPS will have lots of buttons and menus and a view screen. The receiver will typically hear 8 to 12 satellites at a time, and four good signals are required to fix your location in three-dimensional space. The extras provide redundancy for when you move about. Occasionally, the signal from a cellphone may interfere with GPS reception. Other things that interfere are thick, wet foliage, the roof or your car, and putting the GPS in your pocket.

The displays of the older low-end models are rather course, but they serve the purpose of getting you within 10 or 15 feet of your target. High-end models have much finer quality screens, in color even, with detailed maps and heaps of memory. One icon on the screen indicates your present position while another indicates your target, the cache whose coordinates you have entered. As you walk along on the ground the screen updates to indicate your progress towards the cache. As you get closer, you can zoom in for greater accuracy and detail. Think of the game this way: Your tax dollars at work.

A useable GPS can be had for as little as \$20 to \$50 at a flea market or a pawnshop, or you can spend several hundred dollars for current top-of-the-line models. But whichever GPS you use to get



A typical cookie tin cache container. (Photo by the author)

close to your quarry, you still have to apply a bit of detective thinking—"now if I were a geocache where would I hide?"—and a bit of route finding.

## The Game's Afoot

Each geocache has a page on the site [www.geocaching.com](http://www.geocaching.com) that presents the cache location coordinates and describes some of what to expect. Some of these pages include a clue to help you when

you're really close but still can't quite find it. One cache I went hunting for along a main road had me really stymied. Each pass pointed to the narrow median in the busy thoroughfare; I just knew it wouldn't be there, the median is not a safe location, but I went looking on foot anyhow. Under the bushes! Everywhere. Finally, I looked at the clue:

Urer vf n pyhr:  
tebhaq  
6 Srrg



This old Garmin 45XL (1996 model) GPS, found in a flea market for \$50, works great. I replaced it with a Garmin 48XL (1999 model) found in another flea market for \$5 that works even better. (Photo by the author)



Young geocachers Denali and Jacob at Camelback Mountain find a cache and a travel bug. (Photo by the author)

Oh yes. The clues are encrypted with a simple letter transposition code so you don't accidentally read it. The key is given on each geocache page so you can figure it out in the field. You do this often enough and you begin to be able to read the code pretty quickly. But even after I decrypted this clue I was still stymied—until a golf cart came off the nearby course and...\*

When viewing a cache page you'll see a click option to decrypt the clue for your chosen cache, and the page can be printed with the deciphered clue. Take a moment to visit <http://tinyurl.com/4h5h4y> to see how a cache page is presented. Unless you're logged in you won't see all the detail, but there should be enough info there for you to get the idea.

Another memorable cache was hidden right out in the open on the side of an historic train station in Deming, New Mexico. Couldn't miss it! It was the only box on the wall with a padlock—one of those combination locks that require you to line up the right four digits. Now what was the year of that big fire?

Some geocaches are neither large nor small but virtual. Something to see, a historic marker to read, a question to answer. Other caches are called multi-cache because they involve two, three, or four intermediate steps. The coordinates of the first part are the only ones published so you have to find the first part to learn the coordinates for the next part.

### What Then?

When you find a cache you can write in the log and trade a trinket, but be sure to put the cache back so it will be there for the next person. Geocoins and Travel Bugs are two of the special items that you're likely to find in a cache; both have an owner and are serially numbered and thus trackable at the [www.geocaching.com/track/site](http://www.geocaching.com/track/site). Geocoins are specially minted commemorative coins, and Travel Bugs are tracked by the serial number on the dog tag attached to them. Small stuffed toys and Match Box cars are typical Travel Bugs. These things you're welcome to take or trade, but not to keep. The idea of a traveling trackable item is that you make an entry on the item's log page and then move it along to a different cache.

\* Figure it out? If you're losing sleep over it and give up, you can find the solution on the geocache site.

Another thing you can do with a GPS is known as Benchmark Hunting. Benchmarks are survey markers set by the U.S. Coast and Geodetic Survey, and you can find info on these and similar markers at [www.geocaching.com/mark/Default.aspx](http://www.geocaching.com/mark/Default.aspx). Benchmarks are all over the place: on hilltops, the ends of bridges, and the corners of large buildings, in the middle of forests, and along roads of all sorts. There is no cache container or logbook involved (all logging of finds is done only on the website); the treasure is the marker itself. Typically they're disks about three and a half inches in diameter—the old ones are brass, newer ones are made of aluminum.

The rewards in Benchmark Hunting are a bit more ethereal; some benchmarks have not been seen for years, so rediscovering one and logging it can be a real contribution to the database of the National Geodetic Survey. It can also be useful knowledge to learn unequivocally that a benchmark is missing, especially if you can photograph the mark site and show that the metal disk or landmark has been lost or destroyed. Start your hunt for these at [www.geocaching.com/mark/](http://www.geocaching.com/mark/) where you'll find another place for your ZIP code.

### Caching In On The Fun

Once you learn how the game is played you can even hide your own cache and then read the log entries of everyone else who comes to find it. Or you can host a party, a potluck dinner or a picnic—an Event Cache! The only directions you give are the coordinates.

Get started at [www.geocaching.com/about/](http://www.geocaching.com/about/) where you will find the FAQs, Guides, and a Glossary of Geocaching terms. It's fun, it's easy, and it's a great summer pastime to share with loved ones of all ages. ■

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## Wilson Cellular Signal Amplifier Kit

**E**ver find yourself frustrated with your cellphone coverage? What if you could increase your signal strength over 10 times? Under certain conditions, a Cellular Signal Amplifier Kit from Wilson Electronics will do just that for you.

Wilson's Cellular Signal Amplifier works with all cellular (800 MHz) and PCS (1900 MHz) phones and will be a valued tool for mobile phone (and laptop) users who spend a lot of time on the road, and especially for those who live or travel in rural areas, through uneven terrain, or otherwise find themselves in fringe coverage areas.

Wilson's signal boosters are available in several complete plug-and-play kits for mobile wireless use (other kit types are also available). In one version (Wilson part # 811214), the Cradle Plus antenna is paired with the SignalBoost Amplifier for one cell phone user. In another (Wilson part # 801213), the Cradle Plus is paired with the company's Dual-Band Mobile Wireless Amplifier, which accommodates multiple cell phone users. Both kits include a magnet-mount outside antenna, cradle mounting brackets, and installation instructions.

The Wilson Cellular Signal Amplifier Kit installs very quickly. It's simply a matter of putting the mag-mount antenna on top of your vehicle, placing the amplifier under the seat or in the trunk, attaching the phone cradle/antenna to a convenient spot on your dash, and plugging it into the cigarette lighter. A breeze.

### How It Works

I'm usually talking about antennas, and it's nice that the Wilson kits give me a chance to talk about *three* antennas and the cell phone network.

The first antenna involved here is typically a small Inverted F-type built into your cell phone. Sometimes a few inches of extension antenna is added in there. Your cell phone and the cell site are constantly exchanging signal reports, and your cell phone is running only as much power as it absolutely has to in order to get a usable signal into the cell site. More power would jam other cell sites, possibly overload the cell, and certainly use up your battery faster.



The complete Wilson Cellular Signal Amplifier Kit (#801213).



*Using the vent clip for super easy on-dash installation.*



*The magnet-mounted external cellular antenna.*

As you drive into a weak signal area, the cell phone increases power, but today's new tiny cell phones seem to have every accessory except an electric tooth brush—and a proper antenna. The phone quickly switches to its maximum power, but at the pipsqueak power levels the new phones use, you lose your connection. Typically when you lose a call, it was the cell site that couldn't hear you anymore.

Now, how about that signal strength increase we mentioned? Here's where the Wilson Cellular Signal Amplifier comes in.

The second antenna is in the cradle that holds the cell phone. This antenna in the cradle couples both the incoming and outgoing signals between the amplifier and your cell phone. The amplifier has a total system gain of about 10 dB for about 10 times the power of a typical cell phone. The term system gain allows for losses in the cradle and the coax, and the logic circuits in the amp use just enough gain to do the job.

The third antenna is a vertical collinear array up on top of your car. Just getting your antenna outside of that wheeled metal box and a few feet higher gives you about 10 times as much signal as that little Inverted F inside the phone when it's used inside a vehicle.

Ten times the power and 10 times the signal with an outside antenna—that enables you to be up to 10 times farther from the cell site and still stay connected.

Let's go back for a moment to where the cell site and the cell phone are trading signal reports. Most of the time the amplifier is doing little work and the cell phone is commanded to its lowest power levels. Running at these low power levels gives you much longer battery life. But drive through that low area and you have lots of reserve signal.

### **Added Value**

And the Wilson Mobile Wireless Cellular Signal Amplifier is not limited to just cell phones. If you do a lot of work in the field and have one of those Cell Network Internet Cards in your laptop, you simply put the cradle near the PCMCIA card in your computer and you'll be able to get email in areas you never did

before. Even your passenger can take advantage of the Wilson Mobile Wireless Cellular Signal amplifier simply by setting his or her phone near the Cradle and its internal antenna.

### **A Nitpick**

I do take issue with the claim that an amplifier can improve voice quality, however. Your voice is digitized and sent as a data packet. The other end either gets this data packet, like an MP3 file, or it doesn't. There is nothing along the path that can change the audio quality of that original data packet—with one exception. When your cell phone gets a bad data packet, rather than leave a blank spot, the computer fills in that bad slot with the last good packet. That is, it fills in the gap with the last good syllable. Ever notice that as your phone is about to lose the signal, these repeats sound a bit like the other person is stuttering? The Wilson Cradle Plus, amplifier, and external antenna can really help with that stuttering.

### **An Easy Call**

That minor point aside, the value of the Wilson system in boosting a cellular signal under certain circumstances is unquestionable. Of course, if you live in a fabulous coverage area, you won't notice a difference, but if you've ever wanted to throw your phone out the window, it may just save your sanity (and the price of a new phone).

Suggested retail prices for the kits range from \$249 for the SignalBoost Amplifier Kit (#811214) to \$459 for the Dual-band Mobile Wireless Amplifier Kit (#801213). They're sold by wireless dealers and RadioShack franchise stores throughout the United States. Customers can find retail and online dealers of Wilson products listed on the "Dealer Locator" section of the company's website at [www.wilsonelectronics.com](http://www.wilsonelectronics.com). You can also call Wilson at 800-204-4104. ■

# HD FM Antennas

This month we cover a topic suggested by Rich in an email about difficulties in the Chicago area concerning picking up HD FM signals versus the standard analog stereo FM signals. As you can see in **Photo A**, I'm enjoying some Light Jazz on HD FM as I write this column although none of the local analog stations have Light Jazz programming at this time.

In **Photo B** you see the network of six filters, three circulators, and a high-power hybrid transformer that combines three 30,000 watt analog FM transmitters and three 300 watt HD trans-

mitters on to the same antenna at 1840 feet in **Photo C**. The filters on the right are passing the 107.5 MHz HD signal I'm listening to at this time. There's some very slick engineering in this filter network. Both signals go out as circular polarized, but the analog signals are rotating one way, and the HD signals are rotating the other way.

The problem is a classic case of broadcast standards being set by engineers who don't seem to know which end of a soldering iron is hot. The digital signals are squeezed in between the FM signal and the FM stereo sidebands. These sidebands were added 40 years ago to permit an FM receiver to hear the FM signal, or decode the L-R L+R sidebands to give either mono or stereo FM.

Now an OFDM (Orthogonal Frequency Division Multiplexing) digital signal is added between these FM stereo sidebands. Some engineer calculated that the OFDM signals were 100 times better than FM, so the FCC only allows the FM stations to put out 1 percent as much power on the digital signal as the analog signal. This means the typical FM station running 30,000 watts out on stereo only gets to run 300 watts on its HD signal. Someone should have taken his or her 12-digit calculator away and then be sent out in the field for some field trials. Different consulting groups actually making field strength measurements



Photo A. The author's favorite local HD FM station.



Photo B. Combining network for three analog and three digital FM transmitters.

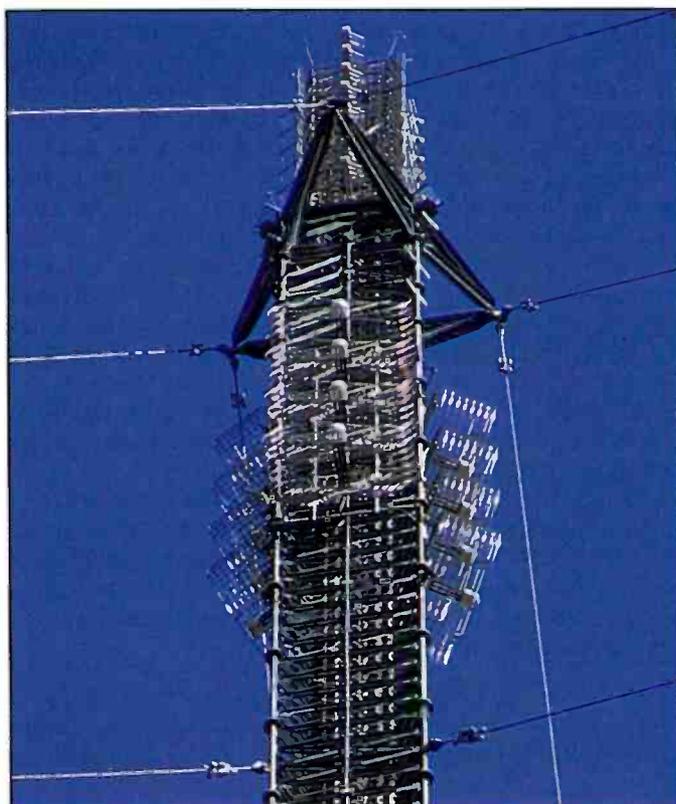


Photo C. In the top section you see is the circular polarized broadcast antennas for the six combined transmitters (see text).

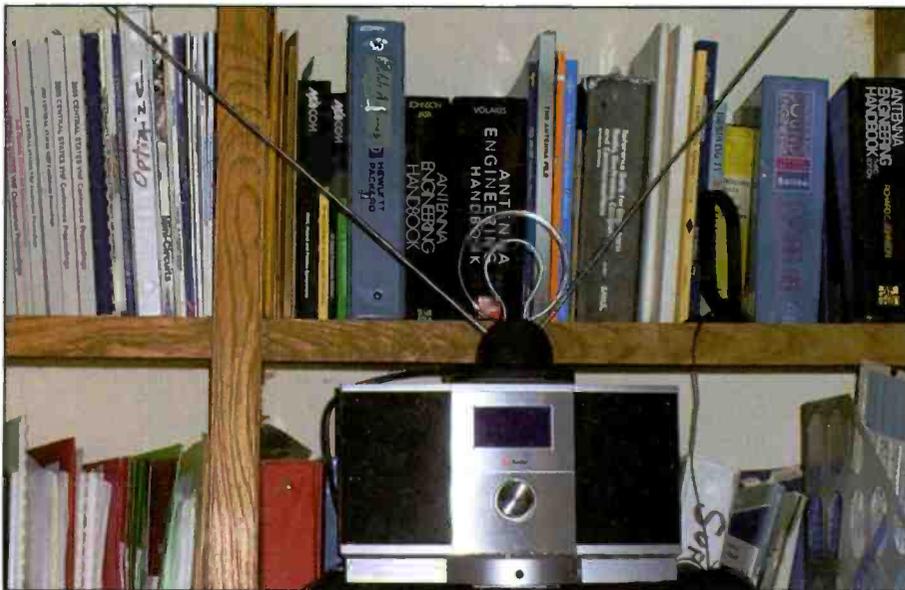


Photo D. The "Dollar Store" improvement for HD FM reception.



Photo E. FM band splitters to take the FM signal off an outdoor TV antenna.

say the HD signals need to be four to 10 times stronger to give the same coverage as the FM analog signal.

### What This Means To You

This means you're going to need to help things along at your end. Every home HD radio I've seen has provisions for an external FM radio antenna. The easiest improvement is the basic set of "Rabbit Ears." I got a set at a local Dollar store for, you guessed it, \$1. At 100 MHz the radio waves are about 10 feet long. So a half wave antenna is right at five feet. So for best FM reception you want the "ears" pulled pretty much all

the way out like I show in **Photo D**. As with a television antenna, you can move the elements around as necessary for best signal reception.

Most outdoor TV antennas work pretty well with FM broadcasts. TV antennas have to be designed to pull in TV Channel 6, which is 82–88 MHz. So again they work well at 88–108 MHz. The easiest approach is to just use a two-way band splitter on the TV antenna. A band splitter filters off just the FM band with virtually no loss to the TV signals.

I'm afraid the black on black lettering didn't photograph well, but the first two band splitters in **Photo E** have separate screw connections for the 88–108 MHz FM signals. The simple two-way splitter

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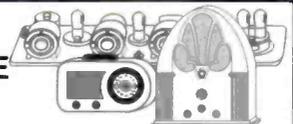
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on the right is another way to get FM signals from your outdoor TV antenna.

## Next Time

In **Photo F** you see my prototype HD television antenna alongside a "Silver Sensor" UHF TV antenna. This one still has a dip in its response at about Channel 35, but I'm still tweaking the design. For just a few dollars you can build this HD TV antenna that works better than all the other unamplified indoor HD antennas on the market.

Unfortunately, the channel assignment system for HD channels doesn't tell you where the HD channel really is. While you may be looking at TV Channel 6, the HD channel running the same program digitally can be anywhere from Channel 2 to Channel 58, but 95-plus percent of the HD signals are on UHF. Your homebrew HD UHF TV antenna can be mounted on a base and placed on the TV set or a nearby book shelf. You can also mount it inside the attic. Or, with a coat of paint, you can even mount your new HDTV antenna outside.

So while you're shopping for one of those HD converters you can buy with your government coupon, make sure you

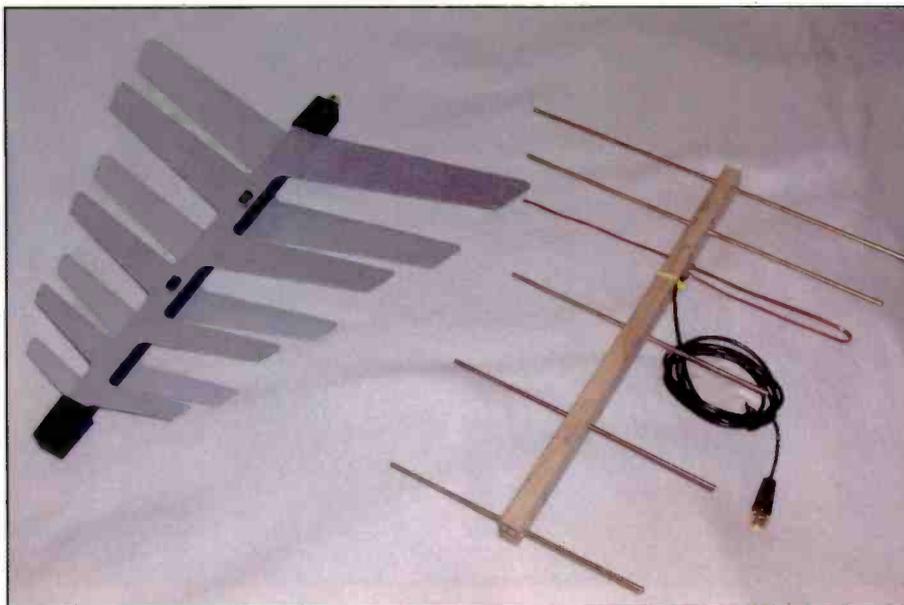


Photo F. Next issue's topic: the homebrew antenna for HD TV reception.

get one with an antenna bypass switch. Not all the analog channels will be going off the air, and many of the converters will not switch the TV antenna back to the TV set when you turn off the converter. That switch, the same one that's on most VCRs, costs an extra \$7, but is well worth it.

Again we welcome your questions, suggested construction projects, and possible topics for future columns. Drop me an email at [wa5vjb@cq-vhf.com](mailto:wa5vjb@cq-vhf.com) or you can visit [www.wa5vjb.com](http://www.wa5vjb.com) for other antenna projects. We look forward to hearing from you. ■

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# High-Tech Radio On The Road With RFSpace

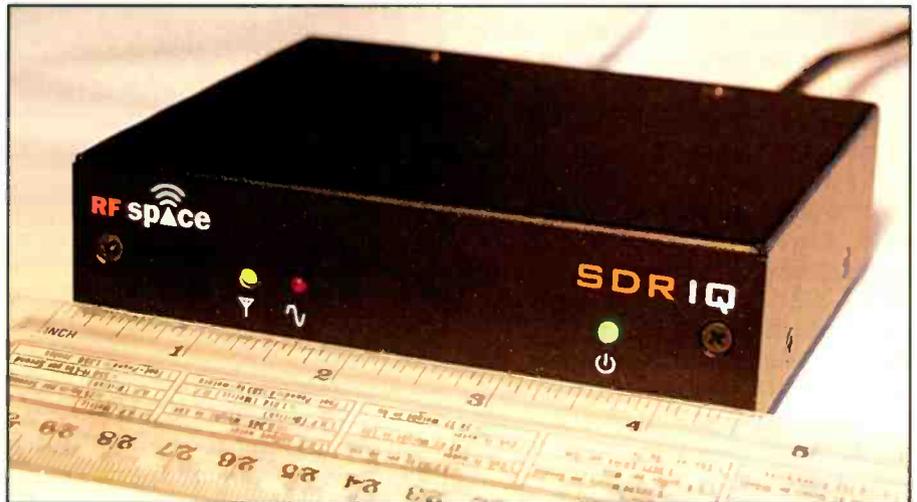
Summer is a great time to take the broadcast DX hobby outdoors. Whether it's a weekend camping trip, a day at the beach, or a family barbecue, don't forget to bring a radio for a chance to hear something different from the usual reception within the confines of your radio shack. This summer "Broadcast Technology" went on the road with the RFSpace SDR-IQ software-defined radio for the ultimate high-tech portable DX experience. While it can be a bit complicated for the uninitiated, it may also be the last receiver you'll need to buy for many years to come, so here's an in-depth look at the technology involved.

## RFSpace SDR-IQ

The RFSpace SDR-IQ software-defined radio represents a technological breakthrough on three fronts. Number one, the IQ is very affordable at just under \$500 yet with performance comparable to \$1,000 high-end communications equipment. Second, the IQ is very portable, measuring only 4.75 inches at its largest dimension and powered solely by USB connection to a computer. Last, but not least, up to 190 kHz of spectrum can be recorded for playback later with full tuning and demodulation capabilities.

A software-defined radio (SDR) requires a computer and spectrum analyzer software for operation. SpectraVue spectrum analyzer software is provided on an installation CD with the IQ, and free software upgrades are available online. SpectraVue recommends a 1 GHz Pentium II or better with a minimum of 64M memory, although more memory will be required to take full advantage of the IQ's capabilities. Software is easily loaded on a Windows XP machine using the installation wizard. Once installation is complete, operation of the IQ is almost plug-and-play. Hook up an antenna to the IQ, connect the USB cable, start up the SpectraVue software, and you'll be well underway.

The IQ software can appear rather complicated at first; after all it's nothing like a traditional receiver. Prior comput-



The RFSpace SDR-IQ provides big rig performance in a small 4.75 inch package.



The SDR-IQ rear panel with antenna, serial, and USB connectors.

er experience is almost a pre-requisite to navigate the various control screens and menu selections. After attempting operation for the first time, the instruction manual—a PDF file on the installation CD—is well worth reading to pick up a few hints to help you get started.

## IQ Specifications

The SDR-IQ is an unassuming black box without any knobs, pushbuttons, or switches; all controls are at the computer end. The front panel consists of three LEDs: a green power indicator, a yellow sampling indicator, and a red A/D clipping indicator. There are three rear panel connections: the USB computer connection, an RS-232 serial port for an

external receiver connection, and a 50 ohm antenna input BNC. A generous 10-foot shielded high-speed USB cable is provided so the IQ can be located away from potential computer-generated radiated interference.

Because the IQ is nothing like the old-fashioned knobs and pushbuttons general coverage communications receiver, specifications are different, too. The IQ can be simply described as an A/D converter that samples the analog antenna input and converts it to a digital data stream. Dynamic range will be dependant upon computer soundcard performance. A selectivity range from 200 Hz to 20 kHz is almost infinitely variable with brick-wall filter performance that can be customized for each situation. Image rejection

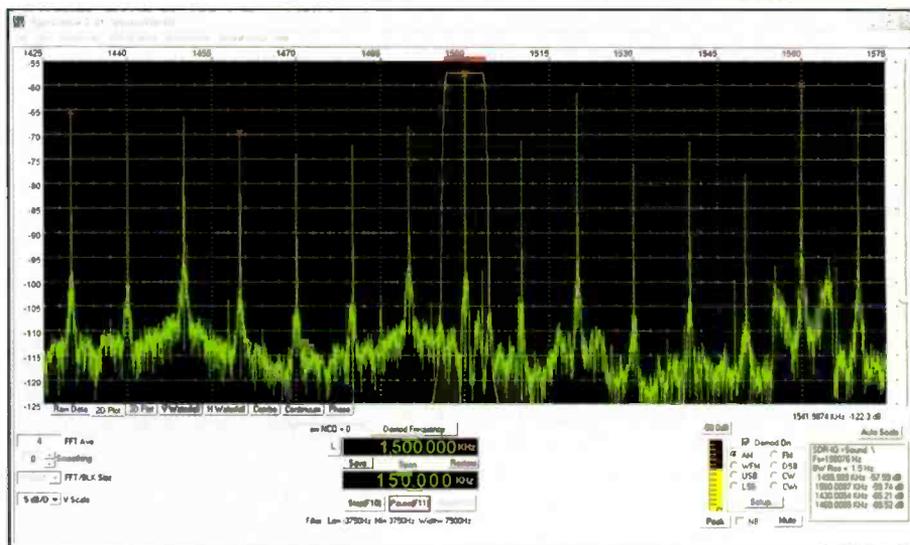
tion is greater than 80 dB, but can be problematic in high-signal areas with the 10 dB RF amplification engaged. A noise floor greater than 130 dBm has been reported by AM broadcast DXers using low-noise antennas.

IQ stand-alone frequency coverage is specified as 500 Hz to 30 MHz, limited by an A/D converter sampling rate of 66.67 MHz per the Nyquist theorem of the digitization of analog signals, which states that the sampling rate must be at least twice the highest frequency. Coverage can be expanded when interfaced as a panadapter spectrum analyzer with a wideband communications receiver or with an external downconverter. AOR, Elecraft, ICOM, Kenwood, and Yaesu receivers can be interfaced via the IQ RS-232 serial I/O. Frequency resolution is specified as accurate as 0.031 Hz. Practical frequency measurement to within +/- 1 Hz is easily attainable when calibrated against a known accurate source such as WWV or an AM broadcast signal. There are eight reception modes: AM, CW, CWr, LSB, USB, DSB, FM, and WFM.

The SpectraVue software is primarily designed for spectrum analysis and, therefore, doesn't include many features available on conventional communications receivers. Passband tuning, a notch filter, synchronous detection, and an A/B switch or memory bank are features prominently missing on the IQ. Despite the lack of synchronous detection, ECSS reception of an AM signal in the LSB and USB modes is excellent. Third-party SDR-IQ controller software available through the SDR-IQ Yahoo Group provides a 32-frequency memory bank.

## Fast Fourier Transform

The fast fourier transform (FFT) is a complex mathematical algorithm that breaks down a waveform for spectral analysis. Basically an FFT window sets the dynamic range and resolution for analysis based on various models. Six FFT window types are available in SpectraVue: Rectangle, Hamming, Hanning, Flat Top, Blackman, and Blackman-Harris. The Rectangle window has a low dynamic range for high-resolution analysis of signals of comparable strength. The Flat Top and Blackman windows have higher dynamic range but lower resolution resulting in reduced sensitivity. The Hanning and Hamming windows represent the middle-of-the-road for analysis of signals at vary-



The main SpectraVue screen displaying the 2D FFT of a 190 kHz segment of spectrum centered at 1500 kHz.

ing amplitude over a moderate frequency range, such as required in AM broadcast band DX applications with the SDR-IQ.

In reality the difference between any of the FFT window types is negligible for broadcast DX purposes, but still worth explanation since SpectraVue offers these choices without explanation in the instruction manual. There are eight FFT size selections ranging from 2048 to 262144 points. An FFT size of 4096 points is recommended for general listening, while a size of at least 32768 is needed for accurate frequency measurement. The larger the FFT the better the frequency resolution but the longer it will take to process since more data points are required between spectrum display updates. Spectrum display options include standard 2D, 3D, waterfall, and phase plots.

## Spectrum Recording

The spectrum recording capability of the SDR-IQ is its most valuable asset. The distinct advantage of recording up to a 190 kHz segment of spectrum makes any of the previously mentioned deficiencies, compared to a conventional receiver, a rather moot point. Up to 16 domestic AM broadcast frequencies can be recorded in a 190 kHz segment. That's 16 top of the hour identifications that can be captured simultaneously. Data is recorded in I/Q wave file format that can be accessed at any time by SpectraVue software.

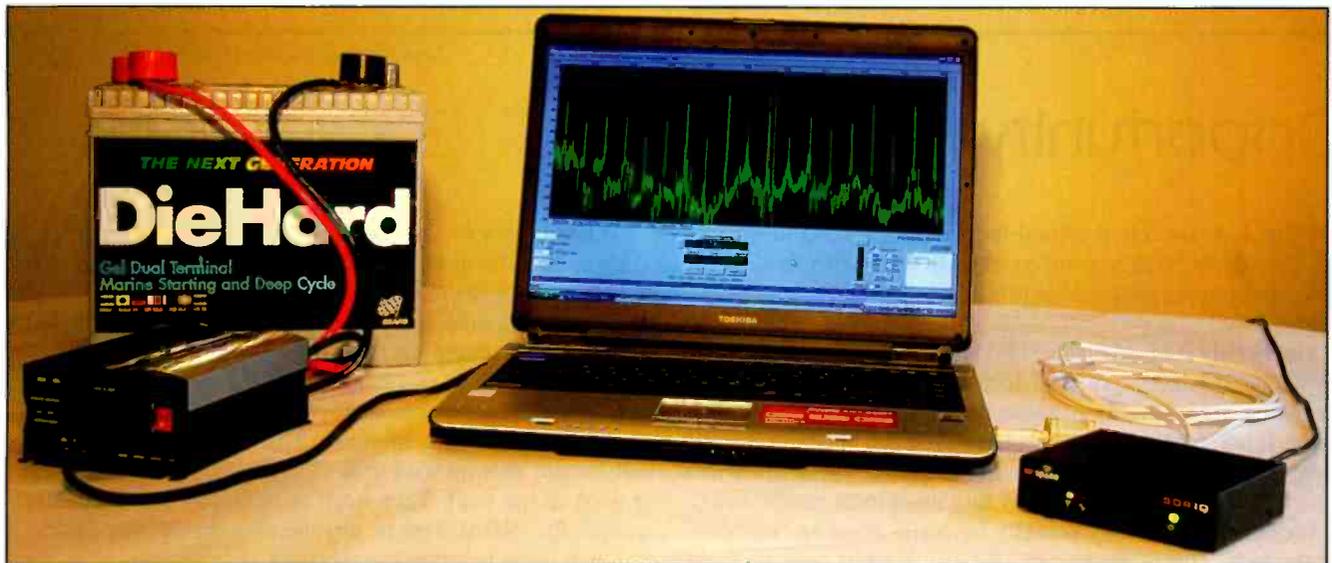
One word of caution though: Recording such a large segment of spectrum can hog memory, easily gobbling up gigabytes if unchecked. A single four-

minute recording of a 190 kHz segment requires about 180 MB of memory, which is a good place to start when first setting up the IQ to record spectrum.

SpectraVue features automated timed recording capability, perfect for overnight monitoring or recording while away from the computer. Automated recording can be set to a specific file size and length of time for a one-time recording or repeated recording every 24 hours. The same third-party controller software from the SDR-IQ Yahoo Group mentioned earlier can be used to set up multiple top of the hour recordings over any 24-hour period.

A couple more notes of caution: SpectraVue defaults to an inverted spectrum analyzer display when a new file is first selected for playback. Make sure the "Invert Spectrum" box is unchecked before playback, otherwise a mirror image of the spectrum analysis will be played, which is very confusing. Although I usually record over the same file for nightly automated recording without renaming the file, the file must still be reselected before playback or the spectrum analyzer display will retain the frequency scale from the previous recording. For example, even though I might be listening to playback of WABC on 770 kHz, the display would incorrectly indicate a completely different frequency.

These are only very minor inconveniences quickly overcome but worth mentioning so novices aren't caught by surprise as I was in the beginning. The instruction manual is extremely thorough yet it lacks introductory FFT spectrum analysis basics as well as a few of these



A Sears DieHard battery and Monster DC-to-AC converter power a laptop and SDR-IQ for decidedly high-tech remote DXpeditioning.

potential hang-ups that may catch uninitiated users off-guard.

## IQ Portability

When paired with a laptop computer, the SDR-IQ is a powerful portable DX machine. Databases, logbooks, and mapping tools can all be loaded on the laptop for immediate access, and the entire package, including a portable antenna, can fit in a briefcase. Furthermore, just imagine being able to travel to remote locations to capture segments of spectrum for later analysis at home.

There is one more caveat here, though: Laptop batteries just don't have much staying power. A typical laptop may run only a couple of hours on its rechargeable battery. Any number of options for battery power can be considered for several hours of continuous operation at a remote location without AC power, but not all are DX friendly.

For instance, laptop power adapters that plug into a car 12-volt power port are notoriously noisy, causing loud buzzing interference across the AM broadcast band. Having a cache of replacement laptop batteries on hand would be a good noise-free but expensive option, the inconvenience of battery replacement every couple hours notwithstanding. Three six-volt batteries or 12-volt and 6-volt batteries in series followed by a voltage regulator circuit to meet the typical 15-volt laptop voltage requirement would be a good noise-free solution, too, but I wanted something easier to implement and maintain.

Like laptop DC power adapters, 12 VDC-to-120 VAC converters, or invert-

ers, have a reputation for causing significant radio interference. However, I stumbled across a DC-to-AC converter that promised reduced interference for the best possible performance. The Monster Mobile Powerstation 300 provides two 120-VAC power outlets from 12-VDC input. According to Monster:

"Most inverters generate electromagnetic and radio frequency interference, resulting in 'dirty' power that can compromise the sound and picture of your connected A/V equipment, including portable radios, TVs, laptops, or DVD players. Mobile Powerstation 300 features 'Stage 1' clean power output to reduce interference, giving you better sound and picture."

Though my expectations were low, it was worth a try as the price was right (only \$20 from a discount retailer). Under normal circumstances the Monster converter would indeed be an exceptional choice, as would most types of converters on the market today, thanks to considerably improved AC sinewave approximation technology over the years. However under DX conditions, some noise was still present from the Monster converter.

There was 1 kHz-wide noise spike at 51 kHz intervals across the AM broadcast band, loudest below 800 kHz. Overall the noise wasn't too objectionable as long as it wasn't on the same frequency as a desired DX signal. As a compromise, I kept the power converter turned off, with the laptop running off its own battery during SDR-IQ spectrum recordings, and used the converter only to keep the laptop battery charged during playback of

recordings or downtime, thus providing plenty of power from a car battery for two or more nights of DXing at a remote location. This setup would also serve well during a power failure.

## Final Analysis

Overall the RFSpace SDR-IQ is an outstanding AM DX receiver in addition to being a very capable professional-grade spectrum analyzer with SpectraVue software. While there are other SDRs out there, none compare in price and portability to the SDR-IQ. For electrical engineers and technically savvy DXers, the IQ and SpectraVue offer far greater opportunities to dig deeper into spectral analysis than we covered here.

The IQ isn't for everyone though, as the mouse-click computer control via menus and screens might be a little too geeky for some. For those interested in upgrading to SDR technology with more traditional receiver ergonomics, the WiNRADiO ([www.winradio.com](http://www.winradio.com)) might be an option. The Perseus SDR ([www.microtelecom.it/perseus](http://www.microtelecom.it/perseus)) represents the next generation with double the spectrum segment recording capability, but at the expense of increased memory consumption, plus a separate external power supply is required, making it less portable.

The SDR-IQ replaced the venerated Drake R8B as my primary DX receiver. And you, too, might find it fits your needs well into the future. Visit our friends at Universal Radio ([www.universal-radio.com](http://www.universal-radio.com)) to learn more about the SDR-IQ, or go to the RFSpace website at [www.rfspace.com](http://www.rfspace.com) for additional info.

Till next time, 73 and Good DX! ■

# Opportunity Knocks

**T**he kids are out of school for the summer and love to be outdoors with you on weekends or on vacation. What great opportunities this presents to interest them in your radio hobby.

The Family Radio Service (FRS) makes it easy and inexpensive to give kids basic, practical, hands-on radio experiences. You may already have some of these compact, cost-effective FRS radios. If not, they're widely available. You can get them at retail stores or order them on the Internet (be sure to check eBay and Craig's List, too). Used ones may turn up at local garage sales.

Older FRS units may actually be really good as "trainers" for the kids. Three-, seven-, or 14-channel units pose no legal problems with the FCC. Unlicensed operation is allowed on all channels in these radios. They're cheaper to buy, too, so watch for them. It's a win-win situation.

Most, if not all, newer 22-channel GMRS/FRS "combo" radios require an FCC license to operate on most channels. The license applies to all GMRS channels in the radios (1-7 and 15-22). Only Channels 8-14 are FRS channels in these newer radios, so beware. The GMRS license fee will generally run you far more than the cost of the radios, so it's an important consideration.

Older 14-channel FRS radios will save you the hassle of having to "police" the kids to ensure that they don't operate illegally on GMRS Channels 1-7 or 15-22. These cheaper radios will serve you and the kids well. They *will* keep life simpler.

## What To Teach?

Begin by impressing upon the kids that radios are important communication links. Lives depend on these tiny FRS radios, so teach them respect for these valuable tools. What you have taught them about good telephone manners will provide a solid foundation on which you can build.

Teach them that they need to wait before they key the microphone to speak. Someone else may be using that channel already. Help them choose an easy identifier to use on the air that will help you quickly recognize them when they call. Teach them that good radio operation means they will spend most of their time monitoring. That may give them the privilege of helping someone in distress. Teach them to keep messages short so they don't block an important message by another station.

## Emergency Radio Use

Most importantly, teach them how to use their radios in an emergency. That can save their lives, or enable them to help save someone else's life. FRS radios have already saved lives, and will no doubt save more. What kids learn about using FRS correctly in an emergency is applicable to any other type of radio (including cell phones) they may use.

FRS Channel 1 is the agreed distress channel. It offers the added benefit that GMRS operators may overhear their distress calls and be able to assist. Their distress message should consist of three elements: Where, What, Who.



**Where exactly** is first. They need to be alert to their surroundings, to note trail markers, landmarks, sun position, etc., when camping, fishing or hunting. Exit numbers, mile markers, crossroads, town names, etc. are important locator aids on road trips or even to the mall. They need to broadcast those key details *repeatedly*. REACTers or anyone else monitoring their calls can then piece together the message.

Teach them that they may be unable to hear a reply, so how well they use their radios is extremely important. Distance, terrain, or weather can hamper communications. They must air good information repeatedly to help REACT monitors or other rescuers they can't hear responding.

**What is wrong** comes next. Is someone injured? Are they bleeding? The more they can broadcast about the problem, the more useful it will be to responders. You can use a game format with some "pretend" emergencies to teach the kids the critical information a distress message should contain.

**Who is calling** is the final element. The identifiers you helped the kids choose can be very helpful here. Responders will know that they have the right individual/s. It reduces the chance for confusion.

Take the opportunity to acquaint your kids with the fun and usefulness of two-way radio this summer. FRS is ideal for the purpose. You and they will be glad you did.

## Protecting People

Parks are great places for kids to play. Penobscot REACT (Maine) uses FRS radios to help ensure that their local public spaces remain safe spots for youngsters.

REACT members conduct "Neighborhood Park Watch" in co-operation with Westerville Police Department. FRS links REACTers on patrol in the park with REACT monitors on their base stations. Police can be summoned quickly if a situation develops that requires their presence.

Kids and their parents get the benefit of watchful REACT eyes; uniformed REACTers get the satisfaction of contributing to the kids' safety. REACTers enjoy a healthy stroll in the park, putting their FRS radios to work in service to the community; police can devote their time to other duties, assured that REACT eyes and ears are supporting them. Everyone wins!

## You Never Know

Cleveland County REACT (North Carolina) got a surprise SKYWARN alert this past winter. It wasn't for a tornado this time; severe ice conditions prompted the activation. Police sought their help with traffic control in this instance.

REACTers never know what awaits them when authorities call upon them for assistance. The variety appeals to them and

makes their efforts to be prepared all the more worthwhile. They often get to employ other skills in addition to their radio capabilities.

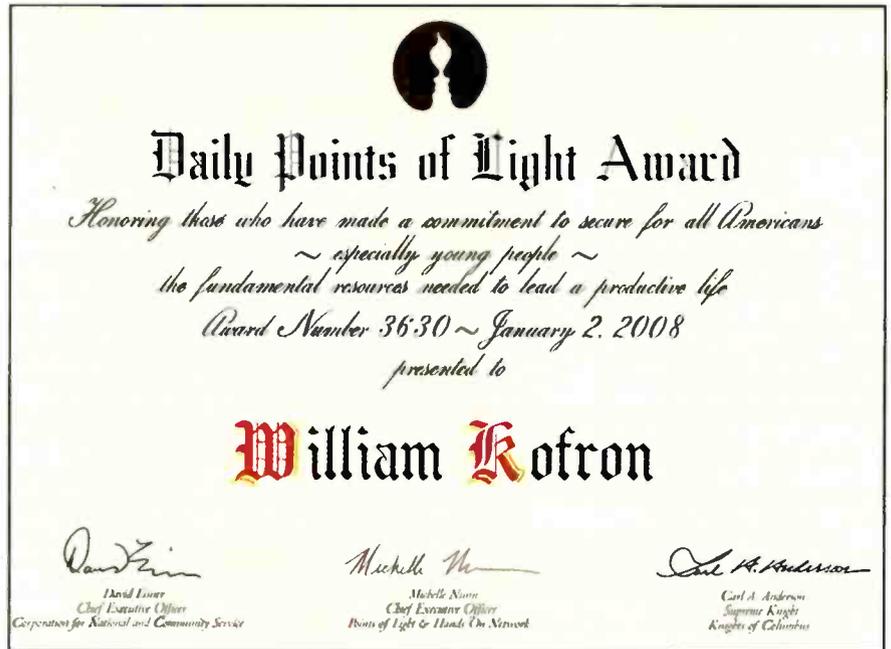
### Governor Takes Note

When the Points of Light Foundation recognized Colleton County REACT (South Carolina) member Bill Kofron for his REACT service, the Team was thrilled (see **Photo**).

Recently, South Carolina's governor learned of the award and sent a congratulatory letter on behalf of the state. Awards don't come too often to REACT volunteers, but it's nice when they do. Colleton County REACT is now thrilled all over again at the additional recognition afforded one of its own.

### Perhaps You?

Hopefully, reading these accounts of REACT volunteers making a difference in their communities has inspired you to get involved, too. It's easy. If a Team already exists, you can contact a Team member about joining. If not, you and a couple of friends can initiate a Team to serve your town.



Colleton County REACT is doubly happy these days. First, REACTer Bill Kofron received this citation from the Points of Light Foundation. Then, South Carolina's governor learned of the award and sent a congratulatory letter on behalf of the state.

Visit [www.REACTintl.org](http://www.REACTintl.org) and click on "Teams and Councils" at the left of the home page. Click on your state on the map for a list of REACT Teams in the area. For more help, email [REACT.HQ@](mailto:REACT.HQ@)

[www.REACTintl.org](http://www.REACTintl.org) or call toll free, 1-866-REACT-9-9.

Until next time, thanks for all you do in your daily radio operations to help make the work of REACT volunteers easier. ■

## Pop'Comm July 2008 Reader Survey Questions

This month we'd like to ask you a little bit about your reasons for being interested in communications. Please use the Reader Survey Card and circle all appropriate numbers. Thanks for participating.

#### Do you consider yourself in the hobby just for fun?

- Yes ..... 1
- No ..... 2

#### If not just for fun, why else are you a radio/communications enthusiast?

- To get information ..... 3
- To stay in touch with friends/family ..... 4
- To stay safe ..... 5
- To assist others ..... 6
- To be part of a community ..... 7
- Because I'm interested in the technology ..... 8

#### Do you ever use your radio gear/skills on a volunteer basis?

- Yes ..... 9
- No ..... 10



#### Would you be interested in reading more editorial material on how communications technology is used in public service?

- Yes ..... 11
- No ..... 12

#### Would you like to learn more about how you can put your gear/skills to work as a volunteer?

- Yes ..... 13
- No ..... 14

# Summer Scanning: Rails And Waves

**T**his month we have a transportation theme for “ScanTech,” namely trains and boats/ships. Of course, we’re ignoring all kinds of other things that move about and also use radio, like trucks, taxis, and bus fleets just to name a few. They’re a little harder to pin down, however, so let’s look at the more predictable ones. We’ll jump right in with the action that can be heard along the country’s railways.

## Tuning Trains

Trains have an allure for many, and in fact serve as an introduction to scanning for a lot of people. For those interested in trains, where they’re going, and what they’re doing, it doesn’t take long to find out that they use radios to do it all. “Rail fans,” as those folks are frequently called, are also big fans of scanning even if they don’t listen to anything else.

The American Association of Railroads (AAR) sets the standards for most things relating to railroad operation and safety. They have numbered the channels available to them as 2–97. Channels 2–6 are only available in Canada, but since trains do cross the border the frequencies are likely to appear in those trains as well. All the fun starts just below 160 MHz (see the “Rail Frequencies” table).

Railroads were one of the first large-scale implementers of radio systems, and as a result they have a dedicated group of frequencies for their use. That’s not terribly unusual; in fact many radio users have dedicated batches of frequencies for their

communications needs. This is particularly apparent with the aviation band 108–137 MHz, which is also in the AM mode, but there are some others as well.

In the past, there were also dedicated bands for business users, police and fire services, among others. However, the crowded, or rather overcrowded, frequency bands available for two-way radio in many areas have forced a relaxation of those rules in many areas. The firm lines of frequency allocation have been blurred considerably in an effort to shift frequencies from services where they were not being well used to services that needed them in a particular area. While this has helped relieve congestion in some areas, it’s made for some difficult searching.

One place where this has not happened, at least to any great extent, is the railroad service. Railroads have allocated VHF frequencies that have been in use for many, many years. There are always proposals to reallocate railroads to other frequencies, and enhanced communications systems, but so far, most of the communication is still on the main AAR channels.

There’s another push to move the railroads to trunked radio systems. The problem is that the railroads have a lot of territory to cover. Putting up repeaters and trunking controllers along the thousands of miles of railroad track would be a tremendous undertaking, not to mention a huge expense. Trunking systems would offer great benefits for the railroads in that they could have many virtual channels, but it really offers more benefits to the two-way radio industry, which wants that spectrum space. Perhaps some compromise solution, such as satellite-based radio



*The hobbies of scanning and “rail fanning” go hand in hand and together provide a great way to while away a pleasant summer afternoon. In this photo a Union Pacific train wends its way near Vasalia, California. (W2VU photo)*

## Rail Frequencies

Note: AAR Channels 2-6 are used in Canada only for railroad operations; 7-96 are used in the United States.

02	159.810	51	160.875
03	159.930	52	160.890
04	160.050	53	160.905
05	160.185	54	160.920
06	160.200	55	160.935
07	160.215	56	160.950
08	160.230	57	160.965
09	160.245	58	160.980
10	160.260	59	160.995
11	160.275	60	161.010
12	160.290	61	161.025
13	160.305	62	161.040
14	160.320	63	161.055
15	160.335	64	161.070
16	160.350	65	161.085
17	160.365	66	161.100
18	160.380	67	161.115
19	160.395	68	161.130
20	160.410	69	161.145
21	160.425	70	161.160
22	160.440	71	161.175
23	160.455	72	161.190
24	160.470	73	161.205
25	160.485	74	161.220
26	160.500	75	161.235
27	160.515	76	161.250
28	160.530	77	161.265
29	160.545	78	161.280
30	160.560	79	161.295
31	160.575	80	161.310
32	160.590	81	161.325
33	160.605	82	161.340
34	160.620	83	161.355
35	160.635	84	161.370
36	160.650	85	161.385
37	160.665	86	161.400
38	160.680	87	161.415
39	160.695	88	161.430
40	160.710	89	161.445
41	160.725	90	161.460
42	160.740	91	161.475
43	160.755	92	161.490
44	160.770	93	161.505
45	160.785	94	161.520
46	160.800	95	161.535
47	160.815	96	161.550
48	160.830	97	161.565
49	160.845		
50	160.860		

457.9375 and 452.9375 MHz are designated for EOT (End of Train) telemetry. Most railroads use these frequencies; however Norfolk Southern is reported to use 161.115 MHz (AAR Channel 67) for EOT devices.

or the public cellular system (which is much more likely to have continuous coverage than a private, built from scratch system), will eventually be used. But I wouldn't hold my breath, either.

There are, however, some railroad frequencies outside the official railroad band. These are used by railroad police, yard workers, and others in instances where they don't have to communicate with the trains or other people running the "operations" side of things. Most of these "out of band" allocations are really nothing more than business band channels in another part of the spectrum. You can look for these in the UHF and other VHF portions of the spectrum, particularly in large metropolitan areas where there is likely to be a lot of auxiliary operations. Like all businesses, lots of communications is being carried on cell phones, too.

One easy thing to look for is the radio alarm detectors, or RADs. These are automated systems that watch a train as it passes in an attempt to find any possible problems, and then broadcast their findings on the radio. You'll sometimes hear a count of the axles, or a report of defective wheel boxes or items hanging down from the train that shouldn't be there, and frequently the speed of the train in a mechanical, although not "robotic" voice. The crew will usually acknowledge these broadcasts as well.

If you're close enough to hear one of these detectors, it will tell you two things: one is that you're close enough to railroad operations to hear any traffic that might be passing by; the other is that there IS a train close by!

Just because you can't hear a RAD transmitter, don't despair. You may still hear plenty of activity from other railroad operations (such as a yard) close by, or just routine traffic on long-haul tracks that pass within radio range of your location. They don't talk a whole lot on the open road, so you may have to listen for a while if you don't have a major operation nearby.

Another couple of frequencies to plug in to your scanner are 457.9375 MHz and 452.9375. These are allocated nationwide frequencies for EOT (End of Train) telemetry modules. Since there are no cabooses on trains any longer, this device monitors the status of air pressure and other things at the far end of the train and transmits a signal approximately every 40 to 45 seconds, even if the train is not moving. They only transmit data, so you won't want to actually listen to these things, but their presence does indicate a train close by.

They operate at about 2 watts power, so you can hear them from as far as four miles under ideal conditions. This distance can be severely limited by a number of factors, including buildings or trees

## Marine Frequencies

6	156.300	Intership Safety	66	156.325	Port Operations
7	156.350	Commercial	67	156.375	Commercial
8	156.400	Commercial	68	156.425	Non-Commercial
9	156.450	Commercial	69	156.475	Non-Commercial
10	156.500	Commercial	70	156.525	Non-Commercial
11	156.550	Commercial	71	156.575	Non-Commercial
12	156.600	Port Operations	72	156.625	Non-Commercial
13	156.650	Navigational	73	156.675	Port Operations
14	156.700	Port Operations	74	156.725	Port Operations
15	156.750	Environmental	75	156.775	
16	156.800	Distress-Calling	76	156.825	
17	156.850	State Control	77	156.875	Oil Tankers
18	156.900	Commercial	78	156.925	Non-Commercial
19	156.950	Commercial	79	156.975	Commercial
20	157.000	Port Operations	80	157.025	Commercial
21	157.050	Coast Guard	81	157.075	Coast Guard
22	157.100	Coast Guard	82	157.125	Coast Guard
23	157.150	Coast Guard	83	157.175	Coast Guard
24	157.200	Marine Telephone	84	157.225	Marine Telephone
25	157.250	Marine Telephone	85	157.275	Marine Telephone
26	157.300	Marine Telephone	86	157.325	Marine Telephone
27	157.350	Marine Telephone	87	157.375	Marine Telephone
28	157.400	Marine Telephone	88	157.425	Commercial
65	156.275	Port Operations			



*Tugs and barges can use the radio quite a bit as they pass through any area with services for river traffic. Requesting services or arranging for repairs are common topics. (Photo by the author)*

between you and the tracks. Again, these are good indicators that a train is nearby, but once you know that you don't want them locking up your scanner, so put them by themselves in a bank that can easily be turned off.

Here's another set of nationwide frequencies for more data: 452.925/457.925 and 452.950/457.950. These are used for locomotive speed control near some yard operations. Put them in your scanner and see what you come up with!

There's one more thing to be aware of when it comes to AAR channels. The AAR channels in the table give both the channel designation and the frequency. You'll put the frequencies into your scanner, but the railroads will refer to the channels by number. Sometimes it's the number on the channels (most railroads are using synthesized radios these days, which can cover all the channels in the band), or with older equipment it could just be the channel number on that particular radio. When using the synthesized radios, the channels are referred to in pairs. The first number is the transmit channel and the second is the receive channel.

Often, these will be the same number, such as 3030, which means they're transmitting and receiving on Channel 30. We'd call this "simplex" operation. This four-digit number is often referred to as the "window" number, meaning the

number the operator sees in the window of his radio.

With 97 frequencies to monitor, you'll need at least one bank, and many railroad fans prefer a dedicated scanner for this use. I suggest you put the frequencies into your radio and see what's there before you decide how serious you want to get about monitoring them. It can be fun, and it's certainly different from listening to another license plate check!

Something else you might enjoy if you get hooked on train scanning is railroad-radio.net. This site has numerous streams from around the country of railroad scanners. There's a lot to listen here even if your area doesn't have a lot of activity!

## Maritime Monitoring

When I hear the word maritime, I immediately think of the high seas and

### Frequency Of The Month

Each month we ask our readers to let us know what they're hearing on our "Frequency Of The Month." Give it a listen and report your findings to me here at "ScanTech." We'll pick a name at random from the entries we receive and give that lucky winner a free one-year subscription, or extension, to *Pop'Comm*. Our winner this time is **Steve Rakczynski of Ludington, Michigan**, who writes in about what he heard on April's frequency, 42.00, as follows:

42.00, along with everything else on the low band, is silent around here nowadays. Back in the '70s when I got my first scanner that was the band with most of the action. 42.58 was state police base and 42.74 was state police cars statewide here in Michigan. Even the county sheriff was on 39.80 and fire was on 39.82 on low band. About nine years ago, all the police, fire, and ambulance went digital, which I have a RadioShack PRO-96 scanner to monitor the action with. There is a small amount of traffic on the high band.

Thanks, Steve! Let's pick a railroad frequency for this month since we're on the topic. Have a listen to **457.9375** and send in what you hear. As always, be sure to note the frequency on the envelope or in the subject line for correct entry! We'll enter your name (even if you don't hear anything) into the drawing for a free sub to your favorite radio magazine—as long as that's *Popular Communications*, of course. And make sure you include your complete name and address, in case your name is chosen. Send your loggings to [radioken@earthlink.net](mailto:radioken@earthlink.net), or via snail mail to Ken Reiss, 9051 Watson Rd #309, St. Louis, MO 63126.



The good news is that you don't need a sophisticated scanner to listen to rail or maritime communications. Any conventional scanner with banks is terrific. It's a great way to recycle an older handheld, like this Uniden BR-330XLT, that can't follow the newer trunking systems. (Photo by the author)

then I think there's nothing there for me. Fortunately, for me and other inland scan-nists, that couldn't be further from the truth! If you have water nearby, there's some maritime traffic for you to listen to, and if you have large bodies of water that are populated by boats of any kind, there's lots of traffic.

The maritime world also has its own band, the marine band, which is a set of VHF allocations (see the "Marine Frequencies" table). Some of the frequencies, like Channel 16, have even been standardized as to their use. Channel 16 is the calling channel and is used by recreational boaters and ship operators alike. Local operators, the coast guard, and other maritime services use other frequencies by either assignment or local agreement.

In larger ports base operators are assigned a channel (or use by agreement) and if you want or need the services of that port operator, you call on that channel, or call on 16 and someone will direct you to the correct channel. In smaller ports, it's almost a free-for-all to find an open channel.

Another great place to hear lots of radio traffic is at a lock facility on a river. Being in St. Louis right on the Mississippi, there are locks within my range. Most of the traffic consists of routine operations and is fairly predictable, until something happens that shouldn't or the river levels start approaching the limits of the lock.

On larger ships, handheld radios are often used on a quiet channel for person-to-person communications within the ship. Some of these operations are moving to FRS radios since they're so widely available and affordable, but if the crew has need for legitimate communications with other maritime users (such as talking to dock personnel during docking operations) they may well use one radio for everything. Even large handhelds don't generate much over 5 watts, so the range will be limited, but you can hear some interesting conversations if you're close enough (or on the ship).

Maritime frequencies are not as "well preserved" as the railroad channels. In many areas where there is little water-based activity, the marine channels can be reallocated to other purposes. In some cases, this is condoned by the frequency coordinator for the area and with the

blessing of the FCC, but in many cases it's just the purchase of an unlicensed marine band radio that puts traffic there. For us this means it's worth a listen, even if you don't have any water for miles. GMRS and FRS radios have reduced the need for this kind of illegal activity, but it's still out there in some areas.

My advice for the marine band would be to put the whole lot into your scanner and then see what pops up as active. Some of it you'll find interesting, and some you will not. Once you decide what's worth listening to, you can take out the rest, or the frequencies programmed in so you can check back a few times during the year. Maritime radio tends to be a very seasonal affair in many parts of the country, so what's dead today might very well be good entertainment tomorrow.

### Share Your Catches

That's it for our look at some summer scanning targets; we hope the information was useful. If you do listen in on train or boating frequencies, why not drop a line and let us know what you heard. I look forward to hearing from you.

Until next month, Good Listening! ■

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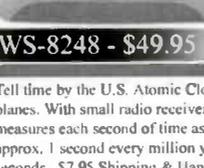
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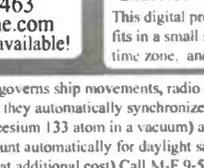
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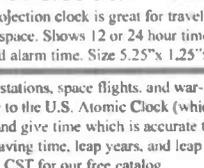
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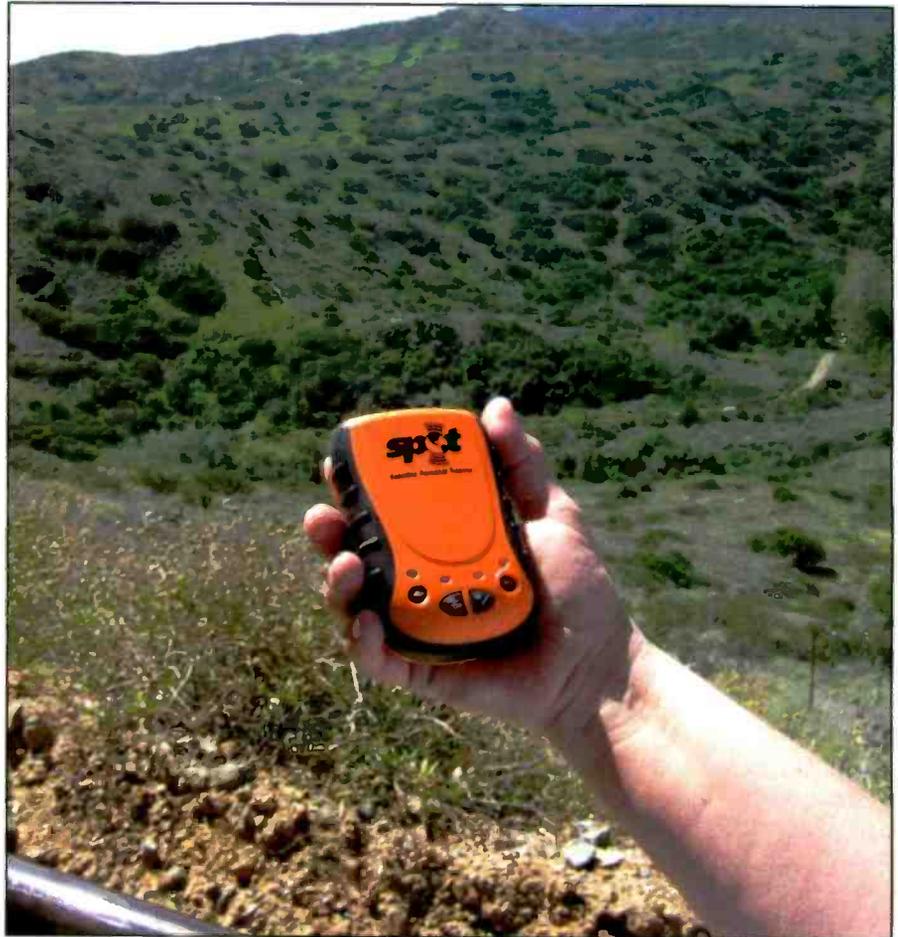
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Tell time by the U.S. Atomic Clock -The official U.S. time that governs ship movements, radio stations, space flights, and war-planes. With small radio receivers hidden inside our timepieces, they automatically synchronize to the U.S. Atomic Clock (which measures each second of time as 9,192,631,770 vibrations of a cesium 133 atom in a vacuum) and give time which is accurate to approx. 1 second every million years. Our timepieces even account automatically for daylight saving time, leap years, and leap seconds. \$7.95 Shipping & Handling via UPS. (Rush available at additional cost) Call M-F 9-5 CST for our free catalog.

# You'll Be "SPOT" On This Summer With This Inexpensive Portable Position Sender

This portable position sender from a subsidiary of Globalstar is a one-way \$150 (brand new!) transponder called SPOT, the world's first satellite messenger. It receives GPS signals at 1575 MHz and transmits your position to low Earth orbit Globalstar satellites on 1611.25 to 1618.75 MHz, digital CDMA (code division multiple access), and can be worn on your belt if you are hiking out in the clear. Basic service is \$99 per year and includes unlimited 911 Help and Check-in messages. The Internet tracking service adds \$50 per year to your aptly named, lightweight signaling device's cost.

Globalstar USA, a Vodafone Air-touch company, has been in the satellite voice and data signaling market for over 20 years and is responsible for building the gateways, interconnecting the networks with its partners, and offering satellite signaling products to work through their 48 satellite low Earth orbit "repeaters" in the sky. For over 15 years, I have worked with the Globalstar Qualcomm GSP 1600 satellite phone, with rock solid phone calls from the Arctic Circle, out hundreds of miles to sea in the Pacific, and down in Mexico. The Globalstar's "bigger equipment" services may also include high-speed Internet access, a natural for sailors at sea and RVers in remote areas with no cell phone towers in sight.



Safety fits in the palm of your hand with SPOT, a "portable satellite messenger."

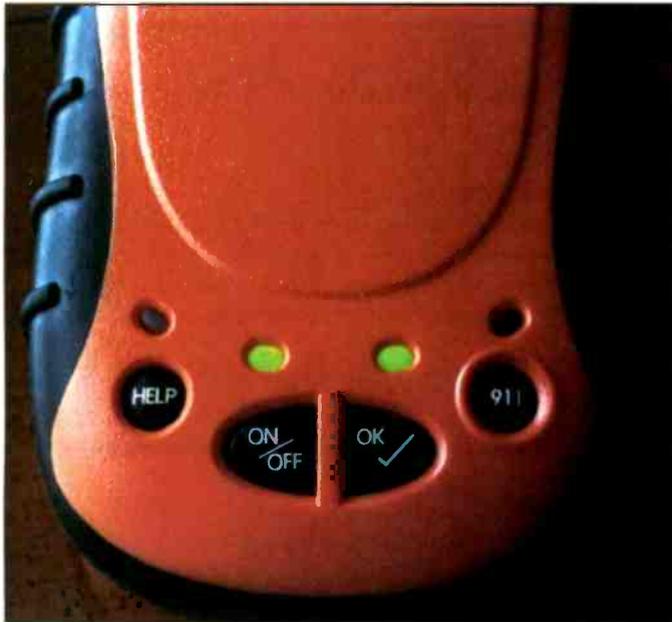
## Global Coverage Goes Portable

Tracking for distance travelers, like long-haul truckers or high seas mariners, has been a business of Globalstar's for years, but the equipment required permanent mounting to a structure and was far too bulky for, say, a cross country skier or a rowing team heading out upon the waves.

"SPOT is the world's first portable satellite messenger, using the GPS satellite system to determine location, and Globalstar satellites to relay that information to ground stations," says Derek Moore, public relations manager for SPOT, Inc.



SPOT tracking on Google Maps is useful—and fun.



*SPOT's LEDs indicate the status of GPS reception, outgoing messages, and activation of the help or 911 key.*

The ground station receiving the best signal from the little SPOT transponder instantly ties into the Internet to pass the GPS position coordinates, along with an "All OK" message, or non-emergency help message, to up to 10 designated recipients, either on email or cellular text messaging.

The email "All OK" message sends out a single way-point with your exact GPS location and pre-programmed message, allowing the recipient to view a Web link showing your exact location using Google Maps. In addition, SPOT offers a Track mode that updates the user's GPS location every 10 minutes. If you're inner-tubing down the Mississippi River, you can leave a fun electronic track of breadcrumbs displaying your down-river progress.

"SPOT uses 100 percent satellite technology, so the user can message his location and status from some of the most remote locations in the world, completely independent of cellular coverage," says Moore. "Anyone who spends time in the outdoors for work, life, or adventure can benefit from the peace of mind SPOT offers." For emergency calls, SPOT has partnered with GEOS Alliance, an international emergency response center. "GEOS offers an entire world of best-of-breed services that encompass security, safety, personal, and corporate protection and immediate help," adds Moore.

If you're ever in a life or death emergency, you simply press the 911 distress button and your position is sent directly to the international emergency response center operated by GEOS and is automatically updated every five minutes. GEOS offers a Search and Rescue (SAR) benefit for \$7.95 per year that provides up to \$100,000 of additional SAR resources with private rescue contractors world-wide, including helicopter extraction around the world and reimbursement benefits for any emergency service incurred. This is one terrific deal for less than \$8 a year! GEOS would contact the appropriate authorities responsible for SAR in your GPS position area. This could be a local township SAR team, Civil Air Patrol, US Coast Guard, park rangers, forest rangers, or the local Harbor Patrol if your position ends up in a downtown marina.

Globalstar has you completely covered from Alaska to South America and, depending on location, up to thousands of miles offshore for mutual satellite reception to you and the chain of 10 North and South America ground stations. Globalstar coverage also includes an Atlantic crossing from the East Coast to the Mediterranean, plus solid coverage in Europe and Asia. Their continuous rollout of 20-plus ground stations' coverage will provide service to most of the populated areas of the world. For sailors heading down to the South Pacific, coverage runs out halfway to Hawaii, with no coverage in the South Seas, because no earth stations are yet established in that region.

Remember, the constellation of Globalstar low earth orbit satellites must have a mutual view of both an activated SPOT unit and an associated ground station for the communications packet to pass on to the Internet. Redundancy in packet signaling minimizes lost SPOT calls to space.

## Safety Made Simple

Signing up your \$150 SPOT unit can be done online at [www.findmespot.com](http://www.findmespot.com). If you have questions, you can speak with a customer service representative at 866-0k1-SPOT. Open up the back of the battery compartment to find the ESN (electronic serial number) along with an additional authorization code. Just as soon as you have "checked in" and signed up for the appropriate tracking plan, you are ready to hike out with SPOT.

Initial turn on of a new SPOT messenger takes about four minutes to first access our GPS satellite constellation signals, with GPS satellites in mid-earth orbit. SPOT's light emitting diodes (LEDs) will show you the status of GPS reception, outgoing messages, and activation of the help or 911 key.

SPOTCHECKIN allows you to signal your position as a single way-point, letting others know where you are and that you're okay. SPOTCASTING "Tracking" is a premium upgrade service that automatically sends out your location every 10 minutes, so friends and family can track your progress.

SPOT is small enough to wear on a belt or drop snugly into a pocket—BUT DON'T! Your body is a great attenuator of signals at 1.5 GHz. It would be better to tuck SPOT into your backpack, with the upside facing out. As long as the backpack fabric is dry, there should be little attenuation of incoming and outgoing microwave signals. SPOT operates best with a clear view of the sky.

In an emergency or help situation, I recommend physically holding SPOT, upside UP facing the open sky, to make absolutely sure your priority message gets through on the first packet. Elevation is not important—there is no difference in letting SPOT sit on a rock aimed toward the sky or climbing to the top of a hill. Trees and dense foliage—especially if it has just rained or snowed—should be avoided for signaling.

Try to get the SPOT unit "in the clear" for the best reception of the GPS signals and the best line-of-sight to the Globalstar satellite system "somewhere" in the sky, but not necessarily always overhead. If more than one satellite picks up your signal, that's all the better. Ground stations will do all the work to extract the information and beam it onto the Internet.

You can find general information on SPOT by visiting [www.findmespot.com](http://www.findmespot.com). For more information on global search and rescue, check out GEOS Alliance's website at [www.geosalliance.com](http://www.geosalliance.com). You can also find some informative marine reviews at [www.equipped.org](http://www.equipped.org). ■

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

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

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

UTC	Freq.	Station/Country	Notes	UTC	Freq.	Station/Country	Notes
0000	13650	Radio Japan-NHK		0400	7100	Voice of the Broad Masses, Eritrea	Tigrinya
0000	6240	Radio PMR, Pridnestovye (Moldova)		0400	9840	Voice of Russia	
0000	6185	Int'l Radio of Serbia		0400	4775	Trans World Radio, Swaziland	
0000	7440	Radio Ukraine Int'l		0400	4828	Radio Zimbabwe	
0030	12120	Radio Thailand		0400	3200	Trans World Radio, Swaziland	
0030	9390	Radio Tirana, Albania		0400	5950	Voice of the Tigrey Revolution, Ethiopia	Amharic
0100	4985	Radio Brazil Central	PP	0430	4905	Radio National Tchadienne, Chad	FF
0100	4885	Radio Clube do Para, Brazil	PP	0430	6240	Voice of Russia, via Moldova	
0100	3310	Radio Mosoj Chaski, Bolivia	SS	0430	3220	Radio Sondergrense, South Africa	Afrikaans
0100	11710	Radio Nacional, Argentina	SS	0430	3255	BBC, via South Africa	
0100	4717	Radio Yura, Bolivia	SS	0500	4052.5	Radio Verdad, Guatemala	SS/EE
0100	7115	Int'l Radio of Serbia		0500	4777	RTV Gabonaise, Gabon	FF
0100	4747	Radio Huanta 2000, Peru	SS	0500	6250	Radio Nacional, Malabo, Equatorial Guinea	SS
0100	11815	Radio Brazil Central, Brazil	PP	0500	3279	La Voz del Napo, Ecuador	SS
0130	9495	VOIRI, Iran		0500	9599v	Radio UNAM, Mexico	SS
0200	4780	Radio Cultural Coatan, Guatemala	SS	0500	3340	Radio Misiones Int'l, Honduras	SS
0200	3250	Radio Luz y Vida, Honduras	SS	0500	7255	Voice of Nigeria	
0200	6973	Galei Zahal, Israel	HH	0500	7200	Republic of Sudan Radio	AA
0200	5015	Radio Altura, Peru	SS	0500	7275	RT Tunisienne, Tunisia	AA
0200	4834v	Radio Maranon, Peru	SS	0530	5030	Radio Burkina, Burkina Faso	FF
0200	7270	Radio Cairo, Egypt		0530	4770	Radio Nigeria	
0230	4800	Radio Buenas Nuevas, Guatemala	SS	0530	5915	Radio Zambia	vern.
0230	6175	Voice of Vietnam, via Canada		0600	7125	RTV Guineenne	FF
0300	4915	Radio Difusora Macapa, Brazil	PP	0600	5995	RT Malienne, Mali	FF
0300	5205	Radio Rebelde, Cuba	SS	0600	6165	Voice of Croatia	EE, Croatian
0300	5910	Marfil Estereo, Colombia	SS	0600	6060	Radio Havana Cuba	SS
0300	7110	Radio Ethiopia	Amharic	0630	11725	Radio New Zealand	
0300	3220	HCJB, Ecuador	SS/QQ	0630	7180	Radio Romania Int'l	
0300	5010	RTV Malagasy, Madagascar	Malagasy	0700	6155	Radio Austria Int'l	GG
0300	4790	Radio Vision, Peru	SS	0700	4760	ELWA, Liberia	
0300	7390	Channel Africa, South Africa		0700	5920	Kamchatka Radio, Russia	RR
0300	4976	Radio Uganda		0700	7145	Radio New Zealand	
0300	9780	Republic of Yemen Radio	AA	0730	6185	Radio Educacion, Mexico	SS
0300	6110	Radio Fana, Ethiopia	Amharic	0800	6070	CVC-La Voz, Chile	SS
0300	7305	Vatican Radio		0800	9635	RTV Malienne, Mali	
0300	7325	Voice of Turkey, via Canada		0800	9690	Voice of Nigeria	
0330	7400	Radio Bulgaria		0830	7245	Radio Maurtanie, Mauritania	AA
0330	4965	The Voice-Africa, Zambia		1030	5020	SIBS, Solomon Islands	
0330	3345	Channel Africa, South Africa		1100	6020	Radio Australia	
0400	4930	Voice of America, Botswana Relay		1100	3925	Radio Nikkei, Japan	JJ
0400	9635	Radio Okapi, Congo (Dem Rep), via South Africa	FF	1130	4605	RRI, Serui, Indonesia	II
0400	4950	Radio Nacional, Angola	PP	1130	4970	RRI, FakFak, Indonesia	II
0400	4780	Radio Djibouti	FF	1130	9525	Voice of Indonesia	CC

UTC	Freq.	Station/Country	Notes	UTC	Freq.	Station/Country	Notes
1130	9615	Radio Veritas Asia, Philippines	Mandarin	1800	9400	Radio Bulgaria	FF
1130	3290	Radio Central, Papua New Guinea		1800	15315	Radio Nederland, Bonaire Relay	
1200	6160	CKZN, Canada		1800	17830	BBC, Ascension Is. Relay	
1200	4900	Voice of the Strait, China	Amoy	1800	15120	Voice of Nigeria	
1200	5925	China Peoples Broadcasting Station, China	CC	1800	9870	BSKSA Saudi Arabia	AA
1200	11895	BBC Relay, Thailand		1800	11735	Radio Tanzania, Zanzibar	EE/Swahili
1200	11785	Radio Free Asia, via Northern. Marianas	CC	1800	12035	SW Radio Africa (to Zimbabwe)	
1200	3235	Radio West New Britain, Papua New Guinea		1830	9580	Africa No. One, Gabon	FF
1200	3335	Radio East Sepik, Papua New Guinea		1830	17825	RDP Int'l, Portugal	PP
1230	5930	Murmansk Radio, Russia	RR	1830	9640	Radio Romania Int'l	
1300	7485	Trans World Radio, Guam	CC	1900	17790	Radio Canada Int'l	FF
1300	9990	Radio Liberty, via Sri Lanka	Pashto	1900	15630	Voice of Greece	Greek
1300	7160	Radio Thailand	CC	1900	11930	Radio Marti, USA to Cuba	SS
1300	15440	China Radio Int'l, via Chile		1900	9720	Trans World Radio, USA, via South Africa	FF
1300	15450	Voice of Turkey		1900	13590	CVC Int'l, Zambia	
1300	5050	Voice of the Strait, China	CC	1930	9855	Radio Kuwait	AA
1300	9335	Voice of Korea, North Korea		1930	9630	Radio Exterior de Espana, Spain	SS
1300	9450	Polskie Radio, Poland, via Germany		1930	17755	Radio Nacional, Venezuela	SS
1330	15540	China Radio International, via Chile		2000	11815	RT Algerienne, Algeria, via England	AA
1330	6350	Armed Forces Radio, Hawaii	SSB	2000	9550	Far East BC Assn., England, via Rwanda	AA
1330	7570	Voice of Korea		2000	11655	Radio Nederland, Madagascar Relay	
1330	7260	Voice of Russia	RR	2000	13735	Voice of America Relay, Sao Tome	FF
1330	15105	Radio Romania Int'l		2000	11665	Radio Taiwan Int'l, via Florida	
1330	15240	Radio Sweden Int'l		2000	11620	All India Radio	
1330	9930	KWHR, Hawaii		2000	9440	WBCQ, Maine	
1330	11960	HCJB, Ecuador	SS	2030	11990	Radio Kuwait	
1400	9625	CBC Northern Quebec Service		2030	9970	RTBF Int'l, Belgium	FF
1400	17895	VOA Relay, Botswana		2030	9845	IBRA Radio, Sweden, via Germany	various
1400	13580	Radio Prague, Czech Republic		2100	11690	Deutsche Welle, Germany, Rwanda Relay	
1400	6150	KNLS, Alaska		2100	12085	Radio Damascus, Syria	
1400	17725	Radio Jamahiriya/Voice of Africa, Libya		2100	9335	Radio Farda, USA to Iran	Farsi
1400	11705	Radio Japan-NHK, via Canada		2130	7390	Radio Belarus	
1400	12065	Voice of Turkey		2130	9445	All India Radio	
1400	6020	Shiokaze, via Japan	KK	2199	9830	Radio Jordan	AA
1400	6130	Lao National Radio, Laos		2200	7345	Radio Prague, Czech Republic	FF
1400	9805	Radio Thailand		2200	7811	Armed Forces Radio, Florida	SSB
1400	13855	Voice of Russia	AA	2200	6100	Radio Republica, USA, to Cuba via England	SS
1430	15140	Radio Sultanate of Oman		2230	11780	Radio Nacional Amazonia, Brazil	PP
1430	15480	Democratic Voice of Burma	BB	2230	9760	Cyprus Broadcasting Corp.	GG; wknds
1500	9825	Miraya FM, Sudan, via IRRS		2230	7210	China Radio Int'l, via Albania	SS
1500	17770	Channel Africa, South Africa		2230	15525	HCJB Global, Australia	CC
1500	9905	Radio Free Asia, Palau	Mandarin	2230	17795	Radio Australia	
1530	13640	Radio Tirana, Albania		2230	17995	Radio Australia	
1530	17680	CVC-La Voz, Chile	SS	2230	7450	RS Makedonias, Greece	Greek
1530	15420	BBC, Seychelles Relay	Somali	2230	9575	Radio Medi Un, Morocco	AA
1600	9840	Sudan Radio Service, USA, via Russia	PP	2230	17850	Radio Exterior de Espana, Spain, Costa Rica Relay	SS
1600	17880	China Radio Int'l, via Mali	AA	2230	7275	KBS World Radio, South Korea	Mandarin
1600	11690	Adventist World Radio, Guam		2230	6300	La Voz de la RASD, Algeria, to Morocco	SS/AA
1600	12080	Deutsche Welle, Germany, Portugal Relay	RR	2300	15345	Radio Nacional, Argentina	SS
1600	11615	Radio France Int'l	RR	2300	17605	Radio Japan-NHK	JJ
1600	15475	Africa No. One, Gabon	FF	2300	5960	Voice of Turkey	
1600	15605	Radio France Int'l		2300	12020	Voice of Vietnam	VV
1630	9715	Deutsche Welle, Germany, Sri Lanka Relay	RR	2330	9550	Radio Havana Cuba	SS
1630	17510	Radio Farda (to Iran)	Farsi	2330	7285	Voice of Croatia	
1700	11755	BBC, via South Africa		2330	5010	Radio Cristal Int'l, Dominican Republic	SS
1700	11625	Vatican Radio	FF	2330	7325	Radio Vilnius, Lithuania	
1700	15205	BSKSA, Saudi Arabia	AA				
1730	11610	Voice of the People (to Zimbabwe, via Madagascar)					

## New, Interesting, And Useful Communications Products

### TOUGHSAT Mobile Satellite Internet System

Ground Control has augmented its series of self-acquiring Mobile Satellite Antennas with the TOUGHSAT .98mMSST, a rugged, high-performance mobile satellite dish. Designed for durability and usability, the .98m MSST TOUGHSAT will meet the exacting requirements of mobile communications. Whether the application is disaster relief, enterprise, or search & rescue, the .98m MSST TOUGHSAT can provide “a communications hub in truly adverse conditions,” according to the company. Inexpensive monthly fees also make it appropriate for RVers.

Features of the TOUGHSAT .98m MSST include: ability to locate and lock on to any linear polarized KU satellite independent of satellite gateway/modem; operational in wind speeds up to 75 mph and in temperatures of -20° to 140° Fahrenheit at 100 percent humidity; seek time and lock-on time in 3.5 minutes; accuracy within 0.1 degree; one button operation, little or no training required to operate; no software downloads on external computer; autostow safety feature if vehicle moves or goes off signal; and modular design—field serviceable, all parts can be replaced on-site.

The TOUGHSAT .98m MSST is lightweight at 125 pounds with a stowed height of 13 inches. It can be installed on a wide variety of vehicles to meet a broad range of applications. While TOUGHSAT currently utilizes the Galileo Express and Enterprise Service Network, Ground Control’s Premium Satellite Service, with the option of a 3 or 4 watt transmitter, the .98m MSST can also achieve a high level of performance utilizing a broad selection of global service providers due to multi-platform capability.

For pricing and additional information, visit [www.groundcontrol.com/prod\\_mss98.htm](http://www.groundcontrol.com/prod_mss98.htm).



Ground Control’s TOUGHSAT .98m MSST rugged mobile satellite dish provides a communications hub for EmComm workers and RVers alike and stows to height of less than 12 inches.



NewerTech offers an accessory line of products that enhance iPhone functionality and convenience, including the Speaker Dock & Hands-Free Mic.

### NewerTech iPhone Accessory Line

Newer Technology, a developer of PC, Macintosh, and iPod performance upgrades and accessories, offers an accessory line of products that enhance iPhone functionality and convenience.

The company’s iPhone Speaker Dock & Hands-Free Mic, features twin 2-watt speakers and a freestanding microphone, delivering extra speaker volume and a more powerful microphone for improved iPhone speakerphone voice quality and music playback. Additionally, while an iPhone is docked, the NewerTech iPhone Speaker Dock & Mic charges and controls it with built-in volume and call start/end touch buttons. (Retail price \$34.99.)

The NewerTech Hands-Free Mic & Earbud offers hands-free iPhone communication. A shirt clamp securely attaches the black 39-inch-long cable to prevent cord dangle. (Retail price \$19.99.)

iPhone owners who also own high-quality headphones with the standard 3.5mm connector can use the 27.6-inch NewerTech iPhone Mic Extender Cable to plug into the iPhone’s recessed jack for hands-free talk. An On/Off switch provides music pause, call answer/end, and music resume operation. (Retail price \$14.99.)

NewerTech Bass Response Earbuds utilize insert-passive noise reduction to reduce noise an average of 42dB while boosting audio up to 10dB at higher frequencies. They offer a fre-

quency response of 10–20,000 Hz and a sensitivity of 105dB (+/- 3dB). (Retail price \$19.99.)

The iPhone Headphone Jack Adapter solves the incompatibility issue between 1/8-inch (3.5mm) headphone connectors and the iPhone's recessed headphone jack so existing headphones can be used without any modification or loss of sound. (Retail price \$7.99.)

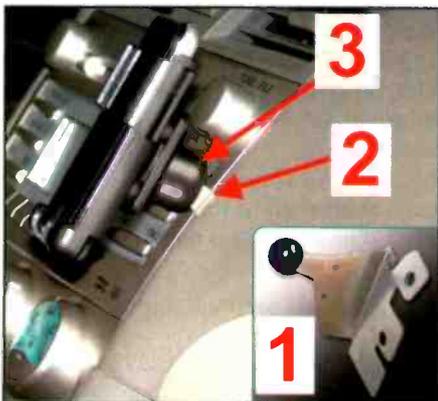
The NewerTech iPhone and iPod Auto Charger is compatible with any car's standard 12V power/accessory outlet and charges an iPhone or iPod while driving. It works in both domestic and foreign vehicles and comes with a 43-inch long black cable for iPhone or iPod use while charging. (Retail price \$12.99.)

For more information on the NewerTech iPhone Accessory line, visit [www.newertech.com/products/iphoneacc.php](http://www.newertech.com/products/iphoneacc.php).

### VSM G3 Dash Mount

Pro.Fit International has announced its G3 VSM (Vehicle Specific Mount). The G3 is a small bracket that will mount a wide variety of electronic devices to the dashboard of a vehicle. It attaches to the dash behind the vehicle's trim for secure installations without requiring or causing holes, marks, or other damage to dash trim.

The heavy gauge steel bracket mounts behind the trim pieces and extends just beyond the front of the dash with only a small molded ball visible, to which an A-Plate is attached. The design lets you move, remove, or reposition your electronics. For added flexibility in positioning your device, a Pro.Fit J-Stem can be placed between the A-Plate's socket and the G3's ball, providing two articulating joints. The A-Plate can be used to mount remote-mount radio heads, equipment



The Pro.Fit G3 VSM: (1) inset photo of the G3 before installation; (2) exposed portion of the G3 after installation behind dash trim; (3) A-Plate, with attached electronic device.

display screens, hands-free microphones, and the other electronics. Items mounted on the A-Frame can easily be removed from the G3's ball mount for secure storage or to switch to another mounted device.

The A-Plate has an industry-standard AMP mounting hole spacing and application-specific adapters to mate with a variety of consumer electronics, including MP3 players, cell phones, GPS units, satellite radios, and PDAs.

For pricing and additional information, visit [www.pro-fit-intl.com/G3%20Index](http://www.pro-fit-intl.com/G3%20Index).

### La Fresh Tech Pack

For summer travel, keep your gear gleaming with La Fresh Tech Pack, a compact mini travel zip-up bag that contains individual towelettes to safely clean all of your tech devices. The towelettes can be used for glasses, screens, lenses, scopes, cameras, PDAs, cell phones, laptops, gaming devices, etc., and are pre-moistened so you don't need to apply a separate liquid cleaner.

The La Fresh Tech Pack includes four wet/dry screen cleaning towelette packets, three lens cleaning towelette packets, as well as three anti-bacterial towelette packets. All towelettes are biodegradable, and the Tech Pack meets the TSA regulations to be carried onboard a plane.

The MSRP for the La Fresh Tech Pack is \$9.99. For more information, visit [www.lafreshgroup.com](http://www.lafreshgroup.com).



The La Fresh Tech Pack's biodegradable towelettes safely and conveniently clean tech devices like LCD screens, lenses, scopes, cameras, PDAs, cell phones, laptops, gaming devices—and eyeglasses.

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## The Unworldly BBC, A Mesoamerican Mystery, And Mucho More

**I**t wasn't only the Caribbean the BBC trashed when it ended service to that area. The smoke from that bombshell hadn't dispersed before the World Service shot itself in the foot again! They announced a significant cut in services to East and Southeast Asia, dising those people as well. BBC *World Service*?

Something strange is afoot in Costa Rica. A mystery station has been testing since the beginning of the year. As of early April it was still going (on 5954 for about an hour from around 2230) and still hadn't given any clues. (Usually such goings-on have run their course after a few weeks.) Oddly, we know the location; it's Guapiles, about 60 miles north and east of San Jose. And, thanks to an engineer who was involved in the early stages, we even know the transmitter make (Elcor) and the power (40 kW). All that's missing is the name of the company or organization that owns the facility. Time was that 5954 was the home of Radio Casino, which was active for a long time from Limon, on Costa Rica's east coast. While it's fun to speculate, the reality is that by the time this reaches you all our questions will likely have been answered and the whole thing will have achieved full yawn status.

As mentioned last month, Israel's IBA had planned to close all shortwave at the end of March, then decided to spare the Farsi service, which is seen as a reliable source in information-starved Iran. Many in Israel are severely upset at the silencing of Israel's international radio.

It appears that U.S. shortwaver KAIJ in Dallas is kaput. Apparently they were recently in the process of pulling down the antenna, and the station's future, while not definitely doomed, is very much in doubt. Also done for is KTBN in Salt Lake City (originally KUSW), which relied largely on a cable TV audience to bring in the bucks.

The Voice of the Wilderness is another in the growing list of broadcasts aimed at North Korea. Based in South Korea and broadcast from Taiwan, this one uses 9940 and is noted around 1300. So far, not a lot is known about this broadcast or the organization running it.

Papua New Guinea's National Broadcasting Corporation (NBC) says it intends to kill off its regional shortwave stations in favor of AM and FM. That should work well in PNG's rugged terrain! You have time to act, though. NBC says the stations won't be gone until 2015.

Radio Ethiopia has instituted a new service, Radio Oromia, which initially is using 6030 from 0400 to 0600 plus a couple of useless-to-us time segments I won't bother using ink on.

The Overcomer Ministry's Brother Stair, in some quarters more accurately nicknamed "Brother Scare," is now also using the Pori, Finland, site. He's on 9595 at 1500 to 1700 and 6060 from 1900 to 2100.

The past month or so has seen a number of announcements of new stations planned for the future, whether immediate, distant or "maybe." On the list are new ones in Jji, Nigeria; Bentiu, in what is known as Unity State, in southern Sudan; and a new transmitter for Radio Hargeysa, Somalia, which will use 10120

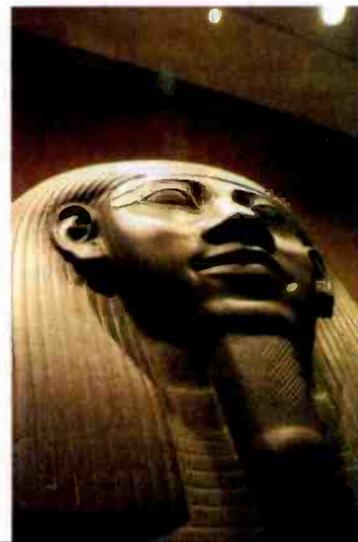
Dear Mr. Richard,

Thank you very much for your reception report.

Your name has been added to our "listeners' club", and i gave your address to the QSL cards' department to send you a card as soon as possible.

Any time if you decided to visit Cairo, tell me before it to meet you.

Your friend,  
Marwan Khattab



*A QSL for the Radio Wadi el Nile service of Egyptian Radio. This guy could stare down your mother-in-law! (Thanks Richard D'Angelo)*

(that's what it says!). WHRI is adding a sixth transmitter to its Cyprus Creek facility, which is to be used for Caribbean coverage. And there's word that WRNO is moving closer to reality. Keep a watch on 7505 and 15590, if you believe in leprechauns, trolls, the tooth fairy, and such.

### Reader Logs

Remember, your shortwave broadcast station logs are always welcome. But *please* be sure to double or triple space between the items, list each logging according to the station's 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. (I hereby give up pleading for your shack photo!)

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, 6150 opening under Radio Singapore at 1500. (Barton, AZ)

**ALBANIA**—Radio Tirana, 9915-Shijak at 2103 and 13640-Shijak at 1546. (Charlton, ON)

**ALGERIA**—RT Algerienne, 11815 via Rampisham in AA at 2038. (Charhon, ON)

**ANGOLA**—Radio Nacional, Mulenvos, 4950 poor in PP at 0219. (Ronda, OK) 0400 with time signal and news in EE. (Parker, PA) 0420 with Afro-pops. (Wood, TN)

## Help Wanted

The "Global Information Guide" consistently presents more shortwave broadcast loggings than any other monthly SW publication! (501 shortwave broadcast loggings were processed this month!\*) Why not join your fellow SWLs, let us know what you're hearing, and also become eligible for our monthly shortwave book prize! Send your logs to Gerry Dexter, "Global Information Guide," 213 Forest St., Lake Geneva, WI 53147. Or e-mail them to [gdex@genevaonline.com](mailto:gdex@genevaonline.com) (please see the column text for basic formatting tips.) Come join the party—we look forward to hearing from you!

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

**ARGENTINA**—Radio Nacional, 15345 in SS at 2359. (MacKenzie, CA)

**ASCENSION**—BBC South Atlantic Relay, 6005 with World Service at 0412. (D'Angelo, PA) 0410. Also 17830 at 1952 and 17885 in AA at 1945. (MacKenzie, CA) 7160 at 0313 noting that schedules are at BBC.com. (Brossell, WI) 15400 at 2006 and 17830 at 1549. (Charlton) 1855 with news items. (Wood, TN)

**AUSTRALIA**—Radio Australia, 6020 on Japanese whaling at 1100. (Linonis, PA) 6080 with 1400 s/on, //11955. Also 9475 in

## A Guide To "GIG-Speak"

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

*	— (before or after a time) time the station came on or left the air	LSB	— lower sideband
(l)	— (after a frequency) lower sideband	LV	— La Voz, La Voix (the voice)
(p)	— presumed	MW	— mediumwave (AM band)
(t)	— tentative	NBC	— National Broadcasting Corporation (Papua New Guinea)
(u)	— (after a frequency) upper sideband	OA	— Peru/ Peruvian
v	— variable time or frequency	OC or O/C	— open carrier
//	— in parallel	PBS	— People's Broadcasting Station
AA	— Arabic	PP	— Portuguese
ABC	— Australian Broadcasting Corporation	PSA	— public service announcement
AFN	— Armed Forces Network	QQ	— Quechua
AFRTS	— Armed Forces Radio TV Service	QRM	— man-made interference
AIR	— All India Radio	QRN	— noise (static)
Alt	— alternate	QSL	— verification
AM	— amplitude modulation, AM band	RCI	— Radio Canada International
Anmt(s)	— announcement(s)	Rdf.	— Radiodifusora, Radiodiffusion
Anncr	— announcer	REE	— Radio Exterior de Espana
AWR	— Adventist World RadioBC broadcast(er)	RFA	— Radio Free Asia
BSKSA	— Broadcasting Service of Kingdom of Saudi Arabia	RFE/RL	— Radio Free Europe/Radio liberty
CA	— Central America	RNZI	— Radio New Zealand International
CC	— Chinese	RR	— Russian
Co-chan	— co-channel (same frequency)	RRI	— Radio Republik Indonesia
comml(s)	— commercial(s)	RTBF	— RTV Belge de la Communate Françoise
CP	— Bolivia, Bolivian	Relay	— transmitter site owned/operated by the broadcaster or privately operated for that broadcaster
CRI	— China Radio International	relay	— transmitter site rented or time exchanged.
DD	— Dutch	SA	— South America
DJ	— disc jockey	SEA	— Southeast Asia
DS	— domestic service	SCI	— Song of the Coconut Islands (transition melody used by Indonesian stations)
DW	— Deutsche Welle/Voice of Germany	s/off	— sign off
EE	— English	s/on	— sign on
ECNA	— East Coast of North America	SIBC	— Solomon Is. Broadcasting corp.
f/by	— followed by	sked	— schedule
FEBA	— Far East Broadcasting Association	SLBC	— Sri Lanka Broadcasting Corporation
FEBC	— Far East Broadcasting Company	SS	— Spanish
FF	— French	SSB	— single sideband
freq.	— frequency	SWL	— shortwave listener
GBC	— Ghana Broadcasting Corp	TC	— time check
GG	— German	TOH	— top of the hour
GMT	— Greenwich Mean Time (UTC)	TT	— Turkish
HH	— Hebrew, Hungarian, Hindi	TWR	— Trans World Radio
HOA	— Horn of Africa	Unid	— unidentified
ID	— station identification	USB	— upper sideband
II	— Italian, Indonesian	UTC	— Coordinated Universal Time (as GMT)
Int/Intl	— international	UTE, ute	— utility station
Irr.	— irregular use	Vern	— vernacular (local) language
IRRS	— Italian Radio Relay Service	via	— same as "relay"
IS	— interval signal	VOA	— Voice of America
JJ	— Japanese	VOIRI	— Voice of Islamic Republic of Iran
KK	— Korean	WCNA	— West Coast of North America
		ZBC	— Zimbabwe Broadcasting Corporation



Subject: saludos  
 Date: 2/13/2008 7:09:40 P.M. Eastern Standard Time  
 From: [leoncio@comunicarve@hotmail.com](mailto:leoncio@comunicarve@hotmail.com)  
 Reply To: [leoncio@comunicarve@hotmail.com](mailto:leoncio@comunicarve@hotmail.com)  
 CC:  
 BCC:  
 Sent on:  
 Sent from the Internet (Details)

Señor: Richard A. D'Angelo

Pastor Leoncio Paco Gerente Administrativo de Radio Manantial 960 am radio Manantial 4985 khz de Huancayo y radio manantial 94.9 FM huancavelica Perú, te saluda gracias por su comunicado, con todo amor y cariño hemos recibido su carta, y leemos en una reunión de 25 pastores, te saludan los 25 Pastores y te decimos muchas bendiciones. Dios te cuede, gracias estimado amigo en Cristo Jesus.  
[www.radiomanantial.tk](http://www.radiomanantial.tk)



Pastor Evangelista Leoncio Paco Conce

Manager Pastor Leoncio Paco Conce at the microphone of Radio Manantial, Huncayo, Peru, 4985. (Thanks Richard D'Angelo)

Mandarin at 1400. (Yhonicki, ON) 7240-Shepparton at 1410. (Brossell, WI) 11880-Shepparton at 1710 and 13690-Shepparton at 0005. (MacKenzie, DC) 17785-Shepparton, at 2245. (Charlton, ON)

ABC Northern Territories Service: VL8T, Tennant Creek, weak with sports commentary at 1045. (Alexander, PA) VL8K, 2485 poor at 1227 with sports news. (Ronda, OK) VL8A, Alice Springs, 4835 as early as 2150, but weak. (Alexander, PA)

HCJB-Australia, 15425-Darwin at 1405. (Ng, Malaysia) 15525 in CC at 2255. (MacKenzie, CA)

**AUSTRIA**—Radio Austria Intl, 6155-Moosbrunn in GG to Europe at 0712. (Parker, PA)

**BANGLADESH**—Bangladesh Betar, 7250 from 1228 s/on. Poor, with weak modulation. (Alexander, PA)

**BELARUS**—Radio Belarus, 7360 heard at 2136 with news, ID, commentary, just threshold level on //7390. (Alexander, PA)

**BOLIVIA**—Radio Mosoj Chaski, Cochabamba, 3310 in SS with guitar, flutes at 0015. (Ronda, OK)

Radio Tacana, Tumpasa, 4780 at 2330 in SS with slow talk. Taken out by Guatemala's 0000 s/on. (Parker, PA)

Radio Yura, Yura, 4717 at 0050 with SS rustics and pops. (Alexander, PA)

**BONAIRE**—Radio Nederland Relay, 6165 in SS at 0356, EE and DD at 0400. Also 17895 in DD at 2127. (MacKenzie, CA) 6165 to NA at 0030 and 17810 at 1925. (Parker, PA) 15315 at 1908 with various features. (Linonis, PA) 15315 in DD at 2231 and 17810 at 1959. (Charlton, ON)

**BOTSWANA**—VOA Relay, Mopeng Hill, 4930 at 0340. (Parker, PA) 0400 and 17895 at 1442. (Ronda, OK) 4930 at 0422, //4960-Sao Tome. (Wood, TN) 9885 at 0427. (MacKenzie, CA) 12080 at 1934 in FF and 17895 at 1555. (Charlton, ON)

## GIG-a-Bits

I have a couple of "must-mentions" this month...

First is a salute to Brian Anderson, recipient of the William P. Eddings Award as the North American Shortwave Association's 2008 Member of the Year! Congrats, Brian!

And extra special thanks this month go to Sharon for cutting log submissions into hundreds of strips while hubby—that's me—was into month number two of nursing a broken wrist. (One-handed keyboard entry is a real kick!)

**BRAZIL**—(All in PP—gld) Radio Anhanguera, Goiania, 4915 with Brazilian music and many call-ins. (Wood, TN)

Radio Clube. Marila, 3235 at 0440 with M anncr and bells or xylophones. (Parker, PA)

Radio Clube do Para, Belem, 4885 heard at 0102 with apparent sports event coverage. (Parker, PA)

Radio Brazil Central, Goiania, 4985 heard at 0136. (Ronda, OK) 0250 with US and Brazilian pops. (Parker, PA) 11815 at 0110. (D'Angelo, PA)

Radio Clube Paranaense, Curitiba, 6040 at 0830 with mostly US pops. (Alexander, PA)

Radio Aparecida. Aparecida, 5035 at 0120 with possible religious talk, also weak on //9630, 11855. (Alexander, PA) 9630 with soccer at 1943. (Charlton, ON)

Radio Capixaba, Vitoria, 4935 at 0315 with evangelist-type speaker. (Parker, PA)

Radio Cultura Ondas Tropicais, Manaus, 4845.2 at 0015 with pops. (Parker, PA)

Radio Imaculada Conceicao, Campo Grande, 4754.8 at 0217 with M anncr, vocals. Only partly readable due to huge static crashes. (Parker, PA)

Radio Difusora, Parana, 4815 heard at 0205 with slow music and canned bits. (Parker, PA)

Radio Nacional Amazonas, Brasilia, 11780 heard at 2142. (Charlton, OM)

Radio Alvorada, Londrina, 4865 with religious talk and call-ins. (Parker, PA)

Radio Difusora, Macapa, 4915 at 0315 with usual M reverb anncr and EZL music. (Parker, PA)

**BULGARIA**—Radio Bulgaria, 7400 at 0058 opening in EE. (Linonis, PA) at 0345. (MacKenzie, CA) 9400-Plovdiv in FF at 1814. (Charlton, ON)

**BURKINA FASO**—Radio Burkina, 5030 at 0528 s/on with NA and FF anmts. (Alexander, PA)

**CHAD**—RN Tchadienne, N'djamena, 4905 at 0429 s/on with 10 seconds of NA, 50 seconds of silence, then opening anmts in FF and local Afro-pop. Also at 2205. (Alexander, PA) \*O431 with anthem, pgm preview and into Afro-pop. (Wood, TN) 0450 with M in FF, lively songs. (Ronda, OK)

**CANADA**—Radio Canada Intl, 6250 (spur) at 0105 in SS leapfrogging over 6175 Vietnam via Sackville. (Alexander, PA) 7195 via South Korea in CC at 2238. (Brossell, WI) 9635 via Xi'an at 1500. (Ng, Malaysia) 9610 in AA at 2020, 11895 in FF at 2047 and 13650 in FF at 1905. (Charlton, ON) 13730 in SS at 2337, 17765 in PP at 2145 and 17790 in FF at 1956. (Charlton, ON) 17790 in FF to West Africa at 1945. (Parker, PA)

CBC Northern Quebec Service, 9625 at 1415. (Charlton, ON)

CKZU, Vancouver, 6160 relaying CBU-960 at 1312. (Ronda, OK)

**CHINA**—China Radio Intl, 7120-Shijiazhuang in RR at 1304, 7170 via Mali at 2306, 7210 via Albania in SS at 2245, 7215-Xi'an in JJ at 1328, 15540 via Chile at 1334 and 17880 via Mali in AA at 1653. (Brossell, WI) 7250-Urumqi in SS at 2316. (Ronda, OH) 13580 in CC at 0028. (MacKenzie, CA) 13630 via Mali at 2012 and 13740



## KJES International Shortwave Radio Station

### Confirming Reception Report



*Sunset at KJES radio station in Vado, New Mexico*

Name: *Richard D'Angelo*  
 Date: *Dec 20, 2007 and Dec 18, 2007*  
 Time: *1637* to *1703* U.T.C.  
*1437* to *1503* U.T.C.  
 Frequency: *11715* kHz

QSL

*Thank You for your detailed report!!*

*Good Bless!!*

KJES  
 The Lord's Ranch  
 230 High Valley Rd.  
 Vado, NM 88072  
 Phone: 505-333-2090  
 Fax: 505-233-3019  
 Email: kjes@fnah.net

*You can just make out the towers of KJES near Vado, New Mexico, in this QSL they sent to Rich D'Angelo.*

via Cuba at 1428. (Charlton, ON) 13655-Xi'an in CC heard at 0140. (Ng, Malaysia)

CPBS/CNR: Xinjiang PBS, 4330-Urumqi in Kazak at 0131. (Parker, PA) 7155 in CC at 1325. (Brossell, WI) CPBS-Beijing, 4460 in Mandarin at 1140. (Ronda, OK) 5925-Beijing in CC at 1247. (Brossell, WI)

Voice of the Strait, Fuzhou, 4900 Amoy Channel at 1243. (Strawman, IA) 1251 in Amoy. (Ronda, OK)

China Huayi Broadcasting Corp., Fuzhou, 4830 in Mandarin from 1200 s/on, W with news. (Schiefelbein, MO)

Firedrake music jammer, 7140 against VOA-Thailand monitored at 2242. (Brossell, WI) 9905 vs. RFA-Palau at 1733. (MacKenzie, CA)

**CHILE**—CVC-La Voz, 6070 in SS at 0802. (Parker, PA) 17680 in SS at 1547. (MacKenzie, CA)

Radio Parinacota, Putre, 6010 at 0703 with SS anncr; long talk with frequent mtns of Chile and Santiago. (Parker, PA) (*First US reception that I know of!*—gld)

**COLOMBIA**—La Voz del Guaviare, SJ Guaviare, 6035 at 0225 with SS anmts and local music to NA at 0304 and off at 0306. (Alexander, PA)

Marfil Estero, Puerto Lleras, 5910 in SS at 0325 with EE sermon and translations. (Alexander, PA) 0605 in heavy QRM. (Parker, PA)

La Voz de su Concencia, Puerto Llamas, 6010 with SS anmts and music at 0415. (MacKenzie, CA)

**CONGO**—Radio Okapi, via Meyerton, 9635 with FF and vernacular talk from 0400, also 11890 from 1600-1700. (Alexander, PA) 11890 via Meyerton in FF at 1649. (Brossell, WI)

**CROATIA**—Croatian Radio/Voice of Croatia, 3985 via Germany at 0202 with M/W in Croatian. 0340-46 in SS. (Parker, PA) 2315 with "Croatia Today" pgm. Better on //7285. (Alexander, PA) 7285 at 2315. (Fraser, ME)

**CUBA**—Radio Havana Cuba, 9550 in SS at 2323. (Charlton, ON) 13760 in FF at 2328. (MacKenzie, CA)

Radio Rebelde, 5025 in SS at 0303. (Parker, PA)

**CYPRUS**—Cyprus Broadcasting Corp., 9760 at 2215 s/on in Greek anmts and music to 2245 close. //7210. (Alexander, PA)

**CZECH REPUBLIC**—Radio Prague, 6200 at 0200 opening EE. (Linonis, PA) 7345 at 0123, closing EE at 0127. (Wood, TN) 9430 closing at 2135. (MacKenzie, CA) 9435 at 2245. (Paradis, ME) 9955 via WRMI at 2310. (Schiefelbein, MO) 13580 at 1410. (Fraser, ME) 1412. (Charlton, ON)

**DJIBOUTI**—Radio Djibouti, 4780 at 0304 after Coatan signs off. Koran, HoA music. Weak but improving. (Alexander, PA)

**DOMINICAN REPUBLIC**—Radio Cristal Intl/Radio Pueblo (t) 5009.8 monitored at 2320 to 0000. SS anmts, LA music. Somewhat low modulation. (Alexander, PA)

**ECUADOR**—La Voz del Napo, Tena, 3279 at 0455 with music, ID at 0500. (Wood, TN) 0500 in SS with classical music, excerpts from a Mass. (Parker, PA)

HCJB, 3220 with Andean flutes and vocals at 1135. (Ronda, OK) 9735DRM at 0133. (Schiefelbein, MO)

**EGYPT**—Egyptian Radio/Radio Cairo, 6290-Abis at 0221 with Koran. Seemed from a scratchy recording. (Ronda, OK) 2302 with AA songs. (Brossell, WI)

Radio Wadi el Nile, 9250 in AA at 2215, local music and Koran to close at 2300. (Alexander, PA)

**ENGLAND**—BBC, 3255 via South Africa at 0320. (D'Angelo, PA) 0500; also 3380 via South Africa at 0402 with pgm info and 7165 Cyprus Relay in Farsi at 0412. (Ronda, OK) 5875-Rampisham at 0525 and 6160 at 0743. (Parker, PA) 5975 Thailand Relay at 1220. (Barton, AZ) 2235 via French Guiana. (Fraser, ME) 6190 via Meyerton at 0344 and 11755 via Meyerton at 1715. (MacKenzie, CA) 7330 via Vladivostok in CC at 1330 and 11755 via Meyerton at 1750. (Brossell, WI) 9735 Cyprus Relay in RR at 1937. (Charlton, ON) 11895 Thailand Relay at 1215. (Linonis, PA)

Far East Broadcasting Assn, 9550 via Rwanda in AA at 2002. (Charlton, ON) 12125 via South Africa in GG at 1655. (Brossell, WI)

**EQUATORIAL GUINEA**—Radio Nacional, Malabo, 6250 from 0503 sign on with NA and into Afro-pops. (Alexander, PA)

**ERITREA**—Voice of the Broad Masses, 7100-Asmara at 0410 with man in Tigrinya. (Alexander, PA)

**ETHIOPIA**—Radio Ethiopia, Gedja, 5990 at 0354 with HoA music, Amharic anmts. (Ronda, OK) 7110 at 0259 sign on in Amharic with gongs, talk. HoA music. (Alexander, PA) 0427. (Wood, TN)

Voice of the Tigray Revolution, Mekele, 5950 at 0350 with HoA music. Amharic talk. Stronger than co-channel Taiwan. (Alexander, PA)

Radio Fana, 7210 heard at 0257 sign on, into HoA music. (Alexander, PA)

**FRANCE**—Radio France Intl, 5925-Issoudun in FF to West Africa at 0620. (Parker, PA) 11615 with EE news at 1605. (Ng, Malaysia) 13695 in FF at 1605. (MacKenzie, CA)

**GABON**—RTV Gabonaise, 4777, at 0458 sign on with FF anmts, local tribal music, news at 0500. (Alexander, PA) 0507 with FF talk, possible call-ins. (Wood, TN)

Africa No. One, 9580 in FF at 1928 and 17630 in FF at 1543. (Charlton, ON) 9580 at 2019. (Linonis, PA) 15475 at 1625 with pops, M/W FF anncrs. (D'Angelo, PA)

**GREECE**—Voice of Greece, 9420 in GG at 2200 with traditional music. (Paradis, ME) 15630 at 1905 with Greek vocals. (Ronda, OK) RS Makedonias, 7450 with Greek songs at 2227. (Brossell, WI)

**GERMANY**—Deutsche Welle, 5945 via Portugal at 0627 in EE. Into Hausa at 0630. (Parker, PA) 9690 Rwanda Relay at 2012. 9715 Sri Lanka Relay in RR at 1635, 11690 via South Africa at 1925, 11725 Rwanda in GG at 1927, 12035-Wooferton in FF at 1709 and 12070-Wooferton in GG at 1932. (Charlton, ON) 11690. Rwanda in listed Hausa at 1822. Also 12080 Portugal at 1651 in RR with GG sound bites. (Brossell, WI) 2100 with "Newslink" pgm. (Paradis, ME)

**GUATEMALA**—Radio Buenas Nuevas, San Sebastian, 4800 in SS with talk at 0050. (Parker, PA) 0400 to 0430 close. (Alexander, PA) 0418. (Wood, TN)

Radio Cultural Coatan, 4780 in SS at 0050 with M reverb, ID and children singing. (Parker, PA)

Radio Verdad, Chiquimula, 4052.5 at 0010 with M in SS and religious music. (Parker, PA) 0500 with EE preacher. (Wood, TN)

**GUAM**—Adventist World Radio/ KSDA. at 1530 open and into religious programming. (Alexander, PA) 1600 with “Wavescan” pgm. (Ng, Malaysia) 11960 in JJ at 2113. (Ronda, OK)

Trans World Radio/KTWR. 7485 in CC at 1334. (Brossell, WI)

**HAWAII**—AFRTS/AFN, 6350-Pearl Harbor with NPR pgm at 1302 with NPR news. (Ronda, OK) 1345. (Brossell, WI)

**HONDURAS**—HRMI/Radio Misiones Intl, Camayaguela, 3340 at 0240 with EZL to 0300 ID. (D’Angelo, PA) 0352 with EE gospel songs. (Ronda, OK) 0445 with call-ins. (Parker, PA) 0503 with EE preacher and SS translations (Wood, TN)

Radio Luz y Vida, San Luis, 3250 at 0209 with SS anncr over pop ballads. (Wood, TN) 0244 with SS religious pgm. Off at 0356. (D’Angelo, PA) SS religious programming at 0345 to 0355 close. (Alexander, PA)

**INDIA**—All India Radio: 4830-New Delhi in Hindi at 1240. (Ronda, OK) 4840-Mumbai at 0235. Just a trace of audio. 4920-Chennai in Hindi at 0105. (Parker, PA) 5010-Thiruvananthapuram, long Hindu 2-person talk. (Strawman, IA) 9445-Bangaluru at 2045 sign on with news. (Paradis, ME) 2132 sub-continental music. (Wood, TN) 15075-Bangaluru with Tamil songs at 0235 and 17510 in EE on domestic violence. (Ng, Malaysia)

**INDONESIA**—Voice of Indonesia, 9525 at 1125 with local music. Listed for Mandarin. Into JJ at 1200. (Alexander, PA)

Radio Republic Indonesia: 3325-Palangkaraya, at 1238, sustained vocal with flute and strings. (Schiefelbein, MO) 3905-Merauke (p) with II talk, EZL. (Ronda, OK) 3987-Manokwari, 1235 weak with pops and ARO splatter. (Strawman, IA) 4605-Serui, 1145 with soft, slow vocals. And 4970-FakFak with soft vocals at 1252. (Ronda, OK)

**IRAN**—VOIRI, 3985-Kalamabad in Farsi at 0005. (Parker, PA) 6055 via Lithuania from 2029 open with anthem and into SS, 7575 via Lithuania with EE news at 1945. Close at 2029. 6067-Sirjan with AA talk at 2125. (Alexander, PA) 7160 at 0130 s/on with ID, prayers, talk on oil production. (Wood, TN) 17580 at 1230 in Malay, ID, Koran. (Ng, Malaysia)

**ISRAEL**—Galei Zahal, 6973 with M DJ and Israeli/Western pop/rock. (Schiefelbein, MO)

**JAPAN**—Radio Japan/NHK World, 6120 via Canada at 1200. (Linonis, PA) 11705 via Canada on Asian values and democracy.

### This Month's Winner

To show our appreciation for your loggings and support of this column, each month we select one “Global Information Guide” contributor to receive a free book. Readers are invited to send in loggings, photos, copies of QSL cards, and monitoring room photos to me at *Popular Communications*, “Global Information Guide,” 25 Newbridge Road, Hicksville, NY 11801, or by e-mail to popularcom@aol.com. The e-mail’s subject line should indicate that it’s for the “Global Information Guide” column. So come on, send your contribution in today!

This month’s prizewinner is **Richard Parker of Pennsburg, Pennsylvania**, who receives a membership in the North American Shortwave Association, North America’s premier shortwave broadcast DX club. That includes a one-year subscription to the monthly *NASWA Journal*, the weekly email Flashsheet, and access to the NASWA website ([www.naswa.net](http://www.naswa.net)). Membership in NASWA is \$29 per year. Sample bulletin \$3 from Bill Oliver, 45 Wildflower Rd., Levittown, PA 19057. If you are not a member, you should be! Please mention *Pop’Comm* and the “Global Information Guide” when writing.



*Colombian Marfil Estereo sent this very nice QSL to Bob Combs, New Mexico.*

(Charlton, ON) 13650 at 0015. 17810 in Indonesian at 2305 and 17605 via Bonaire in JJ at 2314. (MacKenzie, CA) 15355 via Gabon in JJ at 1757. 17870 via Ascension in FF at 1237. (Brossell, WI)

Radio Nikkei, 3925 in JJ at 1100. (Alexander, PA)

**JORDAN**—Radio Jordan 9830, poor in AA at 2100. (Ronda, OK) 11810 in AA at 0750. (Ng, Malaysia)

**KUWAIT**—Radio Kuwait, 9855-Kabd in AA and 11990-Kabd in EE with American pops at 1847. (Charlton, ON) 11990 at 2044 with pops and news in EE. Mention of North American service. Closed at 2100. (Wood, TN) 2047. (Linonis, PA)

**LIBERIA**—ELWA, Monrovia, 2200 with EE religious talk, NA and close at 2301. (Alexander, PA)

**LIBYA**—Radio Jamahiriya/Voice of Africa, 17725-Sabratha, at 1423 with EE. Afro-pops, ID, news from the Great Jamahiriyyah. (Schiefelbein, MO) 1535 with ID and vocals. (Charlton, ON) 21695 at 1515 at good level with //17725 poor. By 1600 s/off the reverse was true. (Alexander, PA)

**LITHUANIA**—Radio Vilnius, 7325 with EE service at 2337. Also 9875 at 0036 to 0100 close. Appears to be irregular. (Alexander, PA)

**MADAGASCAR**—RTV Malagasy, 5010, 0305 with lots of talk, several IDs. Fading to poor by 0325. (Ronda, OK) 0307 in Malagasy. (Brossell, WI) 0326 with local vocals, news at 0332. (D’Angelo, PA) 2345 to past 0045 with wide music variety. (Alexander, PA)

**MALAYSIA**—Radio Malaysia, 6050 in presumed Malay at 1100 with traditional music. (Linonis, PA)

**MALI**—RTV Malienne, Bamako, 9635 with abrupt sign on monitored at 0803. Vernacular talk, local music. (Alexander, PA)

**MAURITANIA**—Radio Mauritanie, 4845 in FF and AA at 0632. (Wood, TN) 2335 with AA talk, ID at 0101. (Parker, PA) 7245 with abrupt sign on at 0833 with AA talk, ME music. (Alexander, PA)

**MEXICO**—Radio UNAM, Mexico City, 9599v at 2250 with classical music, IDs and into SS talk. Use ECSS-LSB to avoid Vatican. (Alexander, PA) 0520 in SS with classical music, full ID at 0600. (Wood, TN)

Radio Educacion, Mexico City, 6185 in SS heard with two male anners. (MacKenzie, CA)

**MOROCCO**—Radio Medi-Un, 9575 at 2230 in AA with traditional music. (Brossell, WI)

**MYANMAR**—Radio Myanmar, 9730 with EE ID by W monitored at 0700. (Ng, Malaysia)

**NETHERLANDS**—Radio Nederland, 5955 Portugal Relay in DD to Europe at 0642 and 6120-Nauen in DD at 0645-0657 close. (Parker, PA) 7120 Madagascar Relay at 2000 with ID, news. Poor. (Paradis, ME) 11655 Madagascar at 2022, 11805 via Meyerton at 1917. (Charlton, ON) 11655 Madagascar in DD at 2120. (MacKenzie, CA)

The Mighty KBC, 6040 new frequency via Lithuania at 0150. Poor with QRM from Brazil on 6039. Also 6055 at 2200 with pops, IDs, jingles. (Alexander, PA)

**NEW ZEALAND**—Radio New Zealand, 5950 at 1420 with inter-

view pgm. (Barton, AZ) 15720 with news at 0302. (Ng, Malaysia) 11675 at 2158. (MacKenzie, Ca)

**NIGER**—La Voix du Sahel, 9705 at 2127 with FF ballads, pops, talk, local drums. Off at 2158. (Alexander, PA)

**NIGERIA**—Voice of Nigeria, 7255 in Hausa at 2225. (Brossell, WI) 15120-Ikorodu in EE at 1743. (Charlton, ON)

Radio Nigeria, Kaduna, 4770 at 0447 with Afro-pop and DJ chatter. (Ronda, OK) 0532 with older American pop. (Wood, TN)

**NORTH KOREA**—Voice of Korea, 7570 with news at 1340. (Brossell, WI) 9990 in AA at 1730 and 13650 in CC at 0021. (MacKenzie, CA) 15100 at 0220. (Ng, Malaysia)

Korean Central Broadcasting Station, 11710 in KK at 1720. (MacKenzie, CA)

**OMAN**—Radio Sultanate of Oman, 15140 at 1427 with pops, news, more pops. (Alexander, PA) 15355 with news by woman past 0400. (Ng, Malaysia)

**OPPOSITION**—SW Radio Africa (to Zimbabwe) 12035, via England or Norway from 1800 with "Road to Democracy" pgm. 1859 close. (Schiefelbein, MO)

Radio Free Asia, 11785 via Northern Marianas at 1215 in CC. (Linonis, PA) 15430 via Saipan in CC at 2355 and 15565 via Vladivostok in VV at 2342. (MacKenzie, CA) 15665 via Tinian in CC at 0316. (Ng, Malaysia)

Radio Marti, 5980 at 1200. (Linonis, PA) 11930-Greenville in SS at 1909. (Charlton, ON)

Radio Liberty, 9990 via Sri Lanka in listed Pasto at 1307. (Brossell, WI) 15285 via Thailand in RR monitored at 0740. (Ng, Malaysia)

Radio Voice of the People, (to Zimbabwe) 11610 via Madagascar at 0400 sign on with annctm and short anthem. (Ronda, OK) 1700 sign on with vernacular and EE IDs. Short breaks of African music. Difficult to understand due to thick accent. Off at 1755. Also 12035 NF believed via Norway at 1800 with political talk, contact info. Afro-pops. (Alexander, PA) 1745 with EE ID and anti gov't talk. (Brossell, WI)

Radio Farda, 6115 via Morocco with ME music, Farsi ID at 0200,



KVOH shortwave from California. (Thanks Bob Combs, New Mexico)

more music. (D'Angelo, PA) 9335 in Farsi at 2100. (Paradis, ME) 17510 via Morocco in listed Farsi at 1649. (Brossell, WI)

**PAPUA NEW GUINEA**—Radio Central, Port Moresby (Papua), 3290 at 1139 with W presenting island tunes. Off at 1200. (Schiefelbein, MO)

Radio Manus, Lorengau, (Admiralty Is.), 3315 with man and island music at 1210, some ads. May have been a network relay rather than a local broadcast. (Schiefelbein, MO)

Radio East New Britain, Rabaul (New Britain), 3385 at 1127 with a discussion. (Ronda, OK)

Radio East Sepik, Wewak (New Guinea), at 1240 with choral music and instl. Peaked at about 1245. (Ronda, OK)

Radio West New Britain, Kimbe (New Britain), 3235 at 1202 with

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*Here's a bit of history...RCI's 1988 special QSL commemorating the International Year of Canadian Music.*

mix of pops and island-inspired music. talks in presumed Tok Pisin. NA at 1300 sign off. (Schiefelbein, MO)

Wantok Radio Light, Port Moresby (Papua), 7325 at 1227 with EE M preacher, short music bridge, pgm info and off at 1231. (Ronda, OK) 1231 to past 1345 pgm of mostly talk, then mostly western-sounding songs. (Schiefelbein, MO)

**PERU**—Radio Altura, Cerro de Pasco, 5014.3 heard at 0410 with SS annts, OA music, abrupt 0500 close. (Alexander, PA)

Radio Madre de Dios, Puerto Maldonado, 4950 (p) at 0250 with M/W anncrs, slow religious songs. (Parker, PA)

Radio Marañon, Jaen, 4834.9 in SS with slow pops and canned IDs to 0300 off. (Parker, PA)

Radio del Pacifico, Lima, 4974.7 heard at 0202 with slow pops, SS anncr. (Parker, PA)

Radio Frecuencia, Celendin, 4485.9 at 0140 with SS, M/W vocals. (Parker, PA)

Radio Vision, Chiclayo, 4790.2 at 0155 with SS preacher. (Parker, PA) 0342 with excited SS preacher, into another religious service at 0402. (D'Angelo, PA)

**PHILIPPINES**—Radio Veritas Asia, 9615 at 1140 in listed Mandarin and short EE segment from 1144-1149 when back to Mandarin. EE ID at 1155 and off. (Alexander, PA)

**PIRATE**—WTCR, 6925u, at 0120 and 0150 variously, jazz-rock, blues-rock. (Hassig, IL) 2359 with 20th Century fanfare, "your source for music for the 1900s." Mostly rock. (Zeller, OH)

WBNY, 6925u at 2320 and \*2337-2350\* with Peter Cottontail song, children singing, Commander Bunny attempts to hypnotize listeners by getting them to stare at their radio dial, several other "bits," mentions of the Rodent Revolution. Belfast address. (Zeller, OH)

The Next Commander Bunny Station, 6925u, monitored at 1953 to 1955\* and \*2041-2045\* with an apparently fake Commander Bunny. ID'd during both broadcasts but no address. (Zeller, OH)

Wolverine Radio, 6925u at 0145 with various rock/pop things; one from a Swiss group. (Wood, TN)

Radio for the Common Man, 6925u at 0131-0136\*, used Copeland's "Fanfare." Announced as a test, no address given. (Zeller, OH)

The Crystal Ship, 3430 at variously at 0010, 0015 and 0140 with host John Poet, anti-war comments, political attacks, rock "the official voice of the Blue States republic" slogan. Reports to tessshort-wave@yahoo.com. Said 150 watts. (Alexander, PA; Zeller, OH) 6700 at 2336 with choral music, f/by a block of Jefferson Brown numbers. (Wood, TN)

Radio Azetca, 6925u, at 0307, 1539, 1701, and 2042 with Bram Stoker and many features and parodies, "Rocky and Bullwinkle" theme in a re-run of an old pgm. Also "The Story Lady" feature and "Ask Dr. Radio" features. Belfast address. (Zeller, OH)

Radio Appalachia, 6924.9 at 2130 with various bits: President Reagan talking with the press, C&W numbers. (Hassig, IL)

Relaxation Radio, 6925u, 2320 with EZL tunes with computer-generated ID. This 20-minute pgm subsequently noted a number of times. (Schiefelbein, MO) 2355 with jazz guitar. (Hassig, IL) \*2253 following Radio Foxtrot best, opening with "Goodnight Sweetheart." (D'Angelo, PA)

Radio Foxtrot, 6925u, \*2210 and 2245 with two brief pgms featuring oldies rock, "Dueling Banjos" used as IS. (Zeller, OH) 2248-2252 frequent IDs over instls. (D'Angelo, PA)

Black Shop Radio, 6925u, \*0140 after the "Common Man" with similar signal suggesting it could have been the same transmitter. (Zeller, OH)

Maple Leaf Radio, 6925u at \*0148 with Canadian National anthem, Canadian music. No address. Off at 0205. (Zeller, OH)

WNKR, 6925u at 2222. Said they were back in the UK so this was apparently from a NA relay. Also at \*2305 in AM anned to be coming from NA. Pgm of rock and jingle IDs for West North Kent Radio. (Zeller, OH)

Captain Morgan, 6925u, at 2043, "You're in the pirate mode with Captain Morgan." Said reports to the ACE website would be QSL'd. (Zeller, OH) 2105 with rock, talk about QSLs; transmission break at 2125. (D'Angelo, PA)

"Pirate Numbers Station," 6925u at \*0057 but unlike similar parodies this one played it straight and ran a series of 3-digit numbers by W in EE. At close a man said "Get straight with God." (Zeller, OH)

WB2DBH ham radio parody, 6925u M calling CQ with the call spelled out phonetically. Also some SS numbers. WB2DBH is an actual call, listed to a ham in Rochester, NY. (Zeller, OH)

Kracker Radio Intl, 6925u at 1750. Some Three Stooges bits, cameos by several operators, some Commander Bunny bits. (Zeller, OH)

Special Ed (t) 6925u at \*2310 with lengthy nonsensical remarks and clips from old TV themes. (Zeller, OH)

Undercover Radio, 6925u at \*2333 with Dr. Benway and his travel adventures. Anned as a 2007 New Year pgm. (Zeller, OH)

East Coast Radio, 6925u, \*2214 with rock and pgm of IDs and jingles from US comml stations. Address: eastcoastradio@hotmail.com (Zeller, OH)

Tangerine Radio, 6925.6u at 2333 with Raunchy Rick and his "anti-religion" pgm. This station dates back to 1984. (Zeller, OH)

WSUB, 6925u at 2306 with rock and comedy sketches, some from the "National Lampoon Radio Hour," "the pirate station that you don't want to touch." (Zeller, OH)

WSTD, 6925u at 2336 opening with group vocals, ID, various short bits. (Zeller, OH)

Spider Radio (Euro) 6925u (t) 2130 with pops, DJ chatter, weak in noise. (Alexander, PA)

Playback Intl, 6882 (Euro) at 2130 and 2305 various rock numbers and DJ. (Alexander, PA)

Radio Barretina (Spain) 6311.1 relaying Radio l'Arboc with pops and DJ. (Alexander, PA)

**PORTUGAL**—RDP Intl, 11620 at 1902 with futbol P-b-P. (Charlton, ON) 17825 at 1848 in PP with classical guitar. (Wood, TN)

**PRIDNESTROVYE (Moldova)**—Radio PMR 6240 at 2305 s/on and into EE news. Into FF at 2315. And in GG at 0039. Also 7370 \*1800 opening with news about Moldova. (Alexander, PA)

**ROMANIA**—Radio Romania Intl, 9595 in FF at 2915. (Linonis, PA) 9640 at 1844 with local folk songs. (Charlton, ON) 15105 at 1354 "Romania Without Limits." (Fraser, ME)

**RUSSIA**—Voice of Russia, 6240 via Moldova at 0445-0500\* (Wood, TN) 7260-Vladivostok in RR at 1330, 7295-Novosibirsk in CC at 1330, 9640-Novosibirsk in RR at 1215 and 12115 via Tajikistan with news at 1636. (Brossell, WI) 7350 via Vatican at 0350, 9840-Petropavlovsk at 0434 and 12030-Petropavlovsk at 0412. (MacKenzie, CA)

Russian Intl Radio, 7250 in RR at 0317. (Brossell, WI)

Murmansk Radio, 5930 with opera in RR at 1248. (Brossell, WI)

**RWANDA**—Radio Rwanda, Kigali, 6055 at 2040 with vernacular, Afro-pops, call-ins. Abrupt close at 2100. (Alexander, PA)

**SAO TOME**—VOA Relay, 4960 at 0421. (Wood, TN) 6080 at 0525. (Ronda, OK) 9780 at \*1959 and into FF. (D'Angelo, PA) 2113

## In Times Past...

And now for some nostalgia. Here's a blast from the past.

**SODRE.** Radio Electrra, CXA19 Montevideo, Uruguay, 11900 in SS at 2315 on 1/19/53, with 20 kW. (Dexter, IA)

in FF. (Charlton, ON) 13735 in FF heard at 2008. (MacKenzie, CA)

**SAUDI ARABIA**—BSKSA, 9870-Riyadh in AA at 1805. (Charlton, ON)

**SEYCHELLES**—BBC Relay, 17830 at 1549. (Charlton, ON)

**SOUTH AFRICA**—Channel Africa, 3345 at 0357 with ID and Afro-pops pgm. (Wood, TN) 6160 at 0713 with news. Also 7390 \*0300 to East Africa. (Parker, PA) 0320. (Brossell, WI) 0447 in FF. (MacKenzie, CA) 15235 in FF at 1712 and 17770 at 1525. (Charlton, ON)

Radio Sondergrense, 3320 in Afrikaans at 0210. (Parker, PA) 0221. (Wood, TN) 0309. (Brossell, WI) 0438. (MacKenzie, CA) 9650 heard at 1604. (Charlton, ON)

**SOUTH KOREA**—KBS World Radio, 7275 in listed Mandarin monitored at 2245. (Brossell, WI)

**SPAIN**—Radio Exterior de Espana, 3350 Costa Rica Relay, 0456 in SS. (Parker, PA) 6055 in SS at 0405, 12035 in AA at 2018, 17850 Costa Rica at 1650. (MacKenzie, CA) 9630 in SS at 1944, 17595 in SS at 1456 and 17850 Costa Rica in SS at 2002. (Charlton, ON) 11815 Costa Rica at 1215. (Linonis, PA)

**SRI LANKA**—SLBC, 15475 at 0220 with 60s songs. (Ng, Malaysia)

**SUDAN**—Republic of Sudan Radio, 7200 heard at 0517 with pop and ME music items. (Wood, TN)

Miraya 101 FM, 9825 via IRRS 1458 open with time pips, ID, African music, news. Poor. (Alexander, PA)

**SURINAME**—Radio Apinte, 4991 at 0410 but very weak, traces of a pop tune. (Parker, PA)

**SWAZILAND**—TWR, 3200 with religious songs. //3240. Also 3240 at 0320 in listed Nda and 4775 heard at 0358 in EE, then GG. (Ronda, OK) 4775 at 0340 in GG. (Parker, PA) 0425. (MacKenzie, CA) 0407. (Wood, TN) 0432. (D'Angelo, PA)

**SWEDEN**—7420 with EE news heard at 1332. (Brossell, WI) 11550 at 0200 with "Network Europe." (Ng, Malaysia) 15240 at 1350. (Fraser, ME)

IBRA Radio, 9845 via Wertachtal, 2022 with religious talks in unid African lang. Off at 2045 after ID and address anmts. (D'Angelo, PA)

**SYRIA**—Radio Damascus, 12085 at 2101, ending EE at 2107 but then had another EE segment. (D'Angelo, PA)

**TAIWAN**—Radio Taiwan Intl, 5745 via Okeechobee in FF to Europe at 0501. (Parker, PA) 11665 via Florida in FF at 2012 and 11850

via Issoudun at 1715. (Charlton, ON) 15245 in CC at 0003. (MacKenzie, CA)

**TANZANIA**—Radio Tanzania, 11735-Dole, (Zanzibar), at 1755 with Swahili talk, local music, drums, to Spice FM news at 1800. (Alexander, PA) 1800 with Spice FM news in EE. (Brossell, WI) In presumed Swahili heard at 2010. (Charlton, ON)

**THAILAND**—Radio Thailand, 7160 in CC at 1320. (Brossell, WI) 12095 at 0040 in EE. (MacKenzie, CA) 0055 ending EE best, and into Thai at 0102. (Alexander, PA)

**TURKEY**—Voice of Turkey, 5960 in EE at 2310. (Parker, PA) 12035 at 1345 with "Blue Voyage" series. (Fraser, ME) Closing at 1423 with IS. (Yohnicki, ON) 12065 at 1408. (Charlton, ON)

**TUNISIA**—RT Tunisienne, 7190 in AA at 2237. (Brossell, WI) 7275 in AA at 0514. (Parker, PA)

**UGANDA**—Radio Uganda, 4975.9 at 0246 with Afro-pop, lots of drumming. (Ronda, OK)

**UNITED STATES**—Adventist World Radio, 9655 via South Africa at 2015. (Charlton, ON)

Trans World Radio, 6105 via Wertachtal at 0804. (Parker, PA)

9720 via South Africa in FF at 1914. (Charlton, ON)

Family Radio, 15260 via South Africa in PP at 1655. (Brossell, WI)

Voice of America, 9650 Morocco Relay at 1854. (Charlton, ON) 12150 Sri Lanka Relay at 1425. (Ng, Malaysia) 13615 Morocco at 1630. (Barton, AZ; Brossell, WI) 15205 Philippines Relay in Indonesian at 0007. (MacKenzie, CA) 15580 Morocco at 1910. (Ronda, OK)

**UZBEKISTAN**—CVC, 9480 via Tashkent heard at 0102. (Alexander, PA)

**VATICAN**—Vatican Radio, 4005 in II at 0035 with M/W prayers. (Parker, PA) 7360 in FF at 0450. (MacKenzie, CA) 9755 at 2017 with ID, news, 11625 at 2005 and 13765 at 1542. (Charlton, ON) 1700 s/on and into FF. (Linonis, PA) 15515DRM at 1305. (Schiefelbein, MO)

**VENEZUELA**—Radio Nacional, 11670 via Cuba in SS at 1532 and 17750 via Cuba in SS at 1521. (Charlton, ON) 17755 via Cuba in SS heard at 1945. (Parker, PA)

**VIETNAM**—Voice of Vietnam, 7150 via England in VV at 2221. (Brossell, WI) 12020 in VV at 2305. (MacKenzie, CA)

**YEMEN**—Republic of Yemen Radio, 9780 with EE pgmng at 1805; Euro-pops, news at 1830. Into AA at 1900. (Alexander, PA) 1950 AA anner hosting ME music. (D'Angelo, PA)

**ZAMBIA**—Radio Zambia, 5915 monitored at 0535 with two men in local lang. (Ronda, OK)

CVC, The Voice, 4965 at 0310 with easy pop and religious talk, 13590 at 1700 open with flute and drums, seemed to be a TV feed. (D'Angelo, PA) 4965 at 0330. (Parker, PA) 9430 at 0500 s/on with "Scope" pgm, many

"CVC" IDs and contact info. Off at 0559. Also 13590 at 1706 sign on with news in progress and 13650 at 1610 with "The Planet" pgm. Off at 1706 for switch to 13590. (Alexander, PA) 13590 at 1804 with "The Edge." (Brossell, WI) 1921. (Ronda, OK)

**ZIMBABWE**—ZBC/Radio Zimbabwe, 3396 with high-life music at 0311. (Brossell, WI) 4828 monitored at 0220. (Parker, PA) 0243 with continuous light pop vocals. (D'Angelo, PA) 0355 with traditional African choral music. (Ronda, OK)

And, once again, order is restored! An ocean of thanks to everyone who checked in this time: Robert Charlton, Windsor, ON; Jack Linonis, Heritage, PA; Robert Fraser, Belfast, ME; William Hassig, Mt. Prospect, IL; Jim Ronda, Tulsa, OK; Brian Alexander, Mechanicsburg, PA; Rich D'Angelo, Wyomissing, PA; George Zeller, Cleveland, OH; Peter Ng, Malaysia; Joe Wood, Greenback, TN; Stewart MacKenzie, Huntington Beach, CA; Dave Balint, Wooster, OH; Rick Barton, Phoenix, AZ; Mark Schiefelbein, Springfield, MO; Robert Brossell, Pewaukee, WI; Michael Yohnicki, London, ON; Richard Parker, Pennsburg, PA; Jerry Strawman, Des Moines, and Ray Paradis, Pittsfield, ME. Thanks to each one of you!

Until next month—good listening! ■

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# A Look At Ionospheric Propagation

**E**arth's atmosphere is a mixture of gases held to the surface of the Earth by gravity. These gases vary in density and composition as the altitude increases above the surface. As the atmosphere extends outward from Earth, it becomes thinner and blends with particles of interplanetary space.

The first 60 miles of Earth's atmosphere consists of a homogeneous mixture of various gases. This region is called the homosphere. Above the homosphere lies the heterosphere, where the gases are no longer uniformly mixed. Relatively more heavy gas molecules, such as molecular nitrogen ( $N_2$ ) and molecular oxygen ( $O_2$ ), are found near the bottom of this region, and relatively more of the lighter gases, such as hydrogen and helium, are found near the top.

The atmosphere is also divided into four regions according to temperature trends: the troposphere, the stratosphere, the mesosphere, and the thermosphere (see **Figure 1**). The lowest region is the troposphere and it extends from the Earth's surface up to about six miles. The gases in this region are heavier than those in higher altitudes, and include  $O_2$  and  $N_2$ . The highest mountains reach into this region, and the high altitude jet stream is found there. Weather is confined to this lower region and it

contains 90 percent of the Earth's atmosphere and 99 percent of the water vapor.

The atmosphere above the troposphere is called the stratosphere, starting at about six miles out. Gas composition changes slightly as the altitude increases and the air thins. Incoming solar radiation at wavelengths below 240 nanometers is able to create ozone, a molecule of oxygen consisting of three oxygen atoms ( $O_3$ ), in this layer. This gas reaches a peak density of a few parts per million at an altitude of about 16 miles.

At an altitude above 50 miles, the gas is so thin that free electrons can exist for short periods of time before they are captured by a nearby positive ion. The existence of charged particles at this altitude and above marks the beginning of the ionosphere, a region having the properties of a gas and of plasma.

Atoms in the ionosphere absorb the incoming solar radiation, causing them to become highly excited. When an atom becomes energized, an electron may break away from its orbit, and free electrons and positively charged ions are produced. At the highest levels of the Earth's outer atmosphere, solar radiation is very strong, but there are few atoms to interact with, so ionization is minimal. As the altitude decreases, more gas atoms

## The Ap Index And Understanding Propagation Terminology

The Ap index, or Planetary A index, is a 24-hour averaging of the Planetary K index. The Planetary K index is an averaging of worldwide readings of Earth's geomagnetic field. High indices ( $K_p > 5$  or  $Ap > 20$ ) mean stormy conditions with an active geomagnetic field. The more active, the more unstable propagation is, with possible periods of total propagation fade-out. Especially around the higher latitudes and at the polar regions, where the geomagnetic field is weak, propagation may disappear completely. Extreme high indices may result in aurora propagation, with strongly degraded long-distance propagation at all latitudes. Low indices result in relatively good propagation, especially noticeable around the higher latitudes, when trans-polar paths may open up. Maximum K-index is 9, and the A-index can exceed well over 100 during very severe storm conditions, with no maximum.

Classification of A indices is as follows:

A0-A7 = quiet	A30-A49 = minor storm
A8-A15 = unsettled	A50-A99 = major storm
A16-A29 = active	A100-A400 = severe storm

**Solar Flux Index (SFI):** This flux number is obtained from the amount of radiation on the 10.7-cm band (2800 MHz). It is closely related to the amount of ultraviolet radiation, which is needed to create the ionosphere. Solar Flux readings are more descriptive of daily conditions than the Sunspot Number. The higher the Solar Flux (and, therefore, the higher the Sunspot Number), the stronger the ionosphere becomes, supporting refraction of higher frequencies.

**Ionosphere:** A collection of ionized particles and electrons in the uppermost portion of the Earth's atmosphere, which is formed by the interaction of the solar wind with the very thin air particles that have escaped Earth's gravity. These ions are responsible for the reflection or bending of radio waves occurring between certain critical frequencies, with these critical frequencies varying with the degree of

ionization. As a result, radio waves having frequencies higher than the Lowest Usable Frequency (LUF) but lower than the Maximum Usable Frequency (MUF) are propagated over long distances.

**Smoothed Sunspot Number (SSN):** Sunspots are magnetic regions on the sun with magnetic field strengths thousands of times stronger than the Earth's magnetic field. Sunspots appear as dark spots on the surface of the sun. Temperatures in the dark centers of sunspots drop to about 3700° K (compared to 5700° K for the surrounding photosphere). This difference in temperatures makes the spots appear darker than elsewhere. Sunspots typically last for several days, although very large ones may last for several weeks. They are seen to rotate around the sun, since they are on the surface, and the sun rotates fully every 27.5 days.

Sunspots usually occur in a group, with two sets of spots. One set will have positive, or north, magnetic field while the other set will have negative, or south, magnetic field. The field is strongest in the darker parts of the sunspots (called the "umbra"). The field is weaker and more horizontal in the lighter part (the "penumbra").

Galileo made the first European observations of sunspots in 1610. The Chinese and many other early civilizations have records of sunspots. Daily observations were started at the Zurich Observatory in 1749; continuous observations were begun in 1849.

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 10 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. Monthly averages (updated monthly) of the Sunspot Numbers show that the number of sunspots visible on the sun wax and wane with an approximate 11-year cycle.

For more information, see <http://prop.hfradio.org>.

are present so the ionization process increases. At the same time, however, an opposing process called recombination begins to take place in which a free electron is "captured" by a positive ion if it moves close enough to it. As the gas density increases at lower altitudes, the recombination process accelerates since the gas molecules and ions are closer together.

Because the composition of the atmosphere changes with height, the ion production rate also changes and this leads to the formation of several distinct ionization regions, known as the *D*, *E*, and *F* regions. The breakdown between regions is based on which wavelengths of solar radiation are absorbed in that region most frequently.

The *D* region is the lowest in altitude, though it absorbs the most energetic radiation, known as hard x-rays. The *D* region doesn't have a definite starting and stopping point, but includes the ionization that occurs below about 56 miles. This region absorbs high frequency (HF) waves between 3 and 30 MHz or wavelengths between 100 meters and 10 meters. It refracts frequencies in the range of 3 to 30 kHz, very low frequencies (VLF). The *D* region is a daytime layer due to the density of the gases. Absorption of ultra-violet and visible light radiation creates more negative ions than electrons during the day. At night these ions quickly recombine with other ionic particles, allowing distant AM radio reception to occur.

The *F* region is the largest part of the ionosphere, as well as the highest, and is the primary refractor of high (or shortwave) frequencies. It extends from about 65 miles up through the end of our atmosphere. Since particle densities decrease as you travel away from Earth it's difficult to say exactly where our atmosphere ends. Since it is such a large region the *F* layer is divided into two main sections: the daytime layer, *F*<sub>1</sub>, and the denser *F*<sub>2</sub> layer which exists both during the day and night. Recently, a third layer, *F*<sub>3</sub>, has been identified, but more research is being done to understand its characteristics.

The *F* region "reflectivity" is directly influenced by solar activity. During years of peak solar activity, the *F* region will have a much higher ionization density, allowing for higher frequencies and sharper angles of waves to be reflected. TV DXers and 6 meter amateur radio operators look forward to solar cycle peaks, as it is during those years that the *F* region can bring distant DX on frequencies of up to 50 or 60 MHz.

In between the *D* and *F* regions lies the *E* region of the ionosphere that extends from about 56 miles to about 65 miles. The region's height varies, and, along with electron (ionization) density, depends on solar zenith angle and solar activity. During daylight hours, electron density (a measure of the ionization level) increases, while at night, when the supply of x-rays from the sun is cut off, ionization levels drop. These ionization densities are expected under normal conditions, absent of a propagation mode known as sporadic-E (*E*<sub>s</sub>).

*E*<sub>s</sub> is the term given to the mode of propagation where clouds of highly dense ionization develop in the *E* layer of the ionosphere (see Figure 2). These clouds might be very small, but regardless of their size, they seem to drift and move about, making the propagation off of these clouds short and unpredictable. It's well documented that *E*<sub>s</sub> occurs most often in the summer, with a secondary peak in the winter. These peaks are centered very close to the solstices. The winter peak seems to be about five to eight times less than that of the summer *E*<sub>s</sub> peak.

Ten-meter operators know *E*<sub>s</sub> propagation as the summertime "short skip." These "clouds" appear unpredictably, but they are most common over North America during the daylight hours

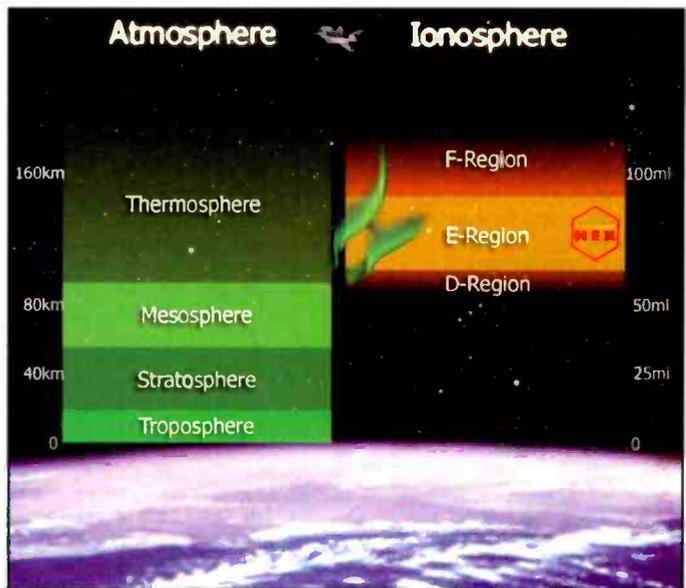


Figure 1. A side-by-side graphic (not to scale) illustrating the atmospheric and ionospheric layers. The *E* region (also known as the *E* layer) is where sporadic-E and aurora propagation occurs, due to highly dense patches of ionized gases that reflect radio waves. (Source: HEX, Horizontal E-region eXperiment)

of late spring and summer. *E*<sub>s</sub> events may last for just a few minutes to several hours, and usually provide an opening to a very small area of the country at any one time.

During periods of intense and widespread *E*<sub>s</sub> ionization, two-hop openings considerably beyond 1,400 miles should be possible on 6 meters. Short-skip openings between about 1,200 and 1,400 miles may also be possible on 2 meters.

Scientists are still pursuing the multiple causes of *E*<sub>s</sub>. As far back as 1959, 10 distinct types of *E*<sub>s</sub> and at least nine different theories of causation were offered. The classification of distinct types has been retained, but since the 1960s the wind shear theory has become one of the most accepted explanations.

Wind shearing occurs when the wind blows at different directions and speeds as you increase with height. Simply, the wind shear theory holds that gaseous ions in the *E* layer are accumulated and concentrated into small, thin, patchy sheets by the combined actions of high-altitude winds and the earth's magnetic field. The resulting clouds may attain the required ion density to serve as a reflecting medium for VHF radio waves. Although most research has confirmed a close association between wind shear and *E*<sub>s</sub>, not all aspects of the *E*<sub>s</sub> phenomenon can be explained by it, including its diurnal and seasonal variations.

How can we know when a *E*<sub>s</sub> opening is occurring? Several email reflectors have been created to provide an alerting service using e-mail. One is found at [www.gooddx.net/](http://www.gooddx.net/) and another at [www.vhfdx.net/sendspots/](http://www.vhfdx.net/sendspots/). These *E*<sub>s</sub> alerting services rely on live reports of current activity on VHF. When you begin hearing an opening, you send out details so that everyone on the distribution will be alerted that something is happening. They, in turn, join in on the opening, making for a high level of participation. Of course, the greater number of operators on the air, the more we learn the extent and intensity of the opening. The bottom-line is that you cannot work *E*<sub>s</sub> if you are not on the air when it occurs.

Optimum Working Frequencies (MHz) - For July 2008- Flux = 65, Created by NW7US

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

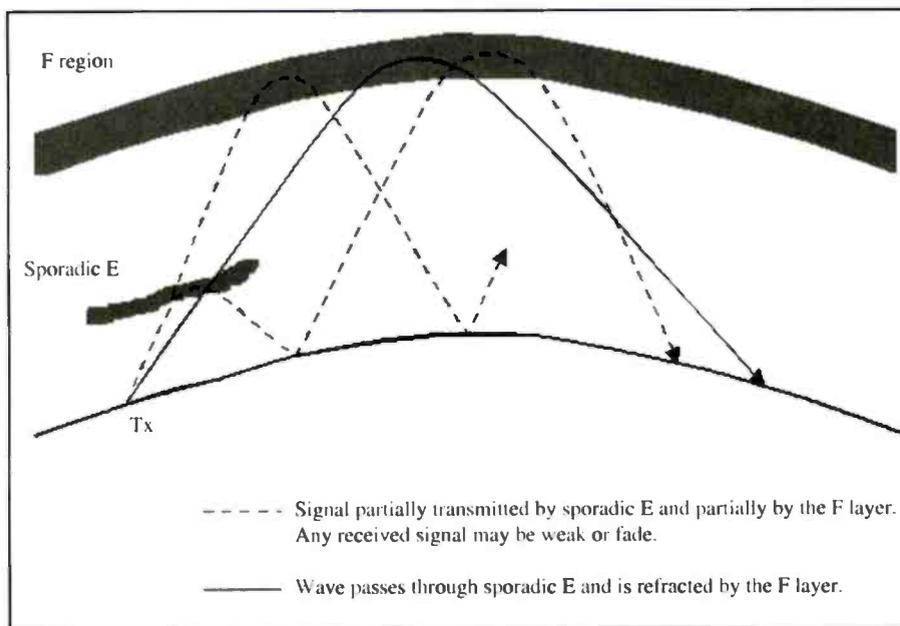


Figure 2. Ray-traced signal paths of a low-VHF signal by propagation involving a dense E-region ionospheric cloud (sporadic-E propagation). Sometimes, a combination of E- and F-region propagation will occur, enabling the radio wave to travel much farther than would be possible if only propagated off the E-region ionospheric cloud. (Source: IPS, Ionospheric Prediction Service, Australia)

Speaking of being on the air, check out PropNET on 6 meters. This network of stations monitors the current propagation occurring on a given band, such as 6 meters, in an active way. Rather than just listening for stations, each station sends a beacon that allows the other participating stations to “catch” the beacon and then report the reception in real-time to a map that plots all of the paths that have been “caught.” By participating, you add to the working, real-time knowledge of the band’s conditions. Not able to transmit? You don’t have to be an amateur radio operator to participate in PropNET; you can be a “reporting receiving station.” PropNET is located at <http://propnet.org>.

In addition to live reporting, there’s a very powerful resource available on the Internet. Check out <http://superdarn.jhuapl.edu/>. SuperDARN (Super Dual Auroral Radar Network) is an international radar network for studying the Earth’s upper atmosphere and ionosphere. Using the SuperDARN real-time data 24-hour overview, you can view the day’s ionization activity at the northern polar region. You may also view live radar displays of the same area. These graphs help identify  $E_s$  clouds existing in the higher latitudes. One use for this would be the detection of a variation of  $E_s$ , known as auroral- $E$ , the creation of dense E-layer patches by aurora activity.

For a great introduction on mid-latitude  $E_s$  propagation, visit the AM-FM DX Resource website [www.amfmdx.net/propagation/Es.html](http://www.amfmdx.net/propagation/Es.html).

## Current Solar Cycle 23 Progress

The Dominion Radio Astrophysical Observatory at Penticton, BC, Canada, reports a 10.7-cm observed monthly mean solar flux of 72.9 for March 2008. The 12-month smoothed 10.7-cm flux centered on September 2007 is 71.5. The predicted smoothed 10.7-cm solar flux for July 2008 is about 63, with a range from a high of 82 to a low of 60.

The Royal Observatory of Belgium reports that the monthly mean observed sunspot number for March 2008 is 9.3, a nice bump up from February’s 2.1, and October 2007’s 0.9. The lowest daily sunspot value during March, recorded on March 1–2, 4–5, 7–9, 11–14, and 18–23 was zero (0). The highest daily sunspot count was 36 on March 26. The 12-month running smoothed sunspot number centered on September 2007 is 9.9. A smoothed sunspot count of 6 is expected for July 2008, but can be anywhere from a high of 17, down to zero.

The observed monthly mean planetary A-Index ( $A_p$ ) for March 2008 is 10, show-

ing a steady monthly rise since January. The 12-month smoothed  $A_p$  index centered on September 2007 is 7.8. Expect the overall geomagnetic activity to be active during most of July, with several possibly stormy periods.

## HF Propagation

Solar activity is expected to be at about the same level as we observed last year at this time. This results in low maximum usable frequencies. Even so, expect fair openings into most areas of the world throughout the day on 22, 19, and 16 meters. Through the summer, you can expect propagation between north and south regions during the daylight hours. Nineteen and 16 meters will be the strong daytime bands, with 19 remaining a popular band throughout the year. Reception of stations located in tropical or equatorial areas may be possible well into the

## Possible $E_s$ Distances

Here’s a general guide to the distances possible with single-hop, double-hop, and multi-hop  $E_s$  propagation.

**45–70 MHz single-hop  $E_s$**   
 Minimum range 300–400 miles  
 Optimum range 900–1,300 miles  
 Maximum range 1,350–1,500 miles

**45–70 MHz double-hop  $E_s$**   
 Minimum range 1,750–1,900 miles  
 Optimum range 2,000–2,600 miles  
 Maximum range 2,750–3,100 miles

**45–70 MHz triple-hop  $E_s$**   
 Optimum range 3,000–4,000 miles  
 Maximum range 4,300 miles

**45–70 MHz multi-hop  $E_s$**   
 Maximum distance record: ~ 7,750 miles (12,500 km) – 48.2597 chE2 Iran received via multi-hop  $E_s$ , by N5HV New Mexico N5JHV.

**88–108 MHz single-hop  $E_s$**   
 Minimum range 350–500 miles  
 Optimum range 900–1,300 miles  
 Maximum range 1,350–1,500 miles

**88–108 MHz double-hop  $E_s$**   
 Optimum range 2,000–2,500 miles  
 Maximum range 2,700–3,100 miles

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## **INFOCENTRAL** (frompage 6)

(1479.5–1492 MHz) on a nationwide basis for the operation of a terrestrial repeater network in Germany. The repeaters will work in conjunction with WorldSpace's existing satellite network to provide German consumers with a subscription-based satellite radio service in automobiles. This authorization from the Bundesnetzagentur makes Germany the third European nation to enable satellite radio in automobiles.

### **IBA Ends Most Of Its Shortwave Transmissions After 60 Years**

The Israel Broadcasting Authority has, after some 60 years, ended shortwave broadcasting on March 31, 2008, except for Persian to Iran. The IBA said that its decision was made as a cost-cutting measure. Emergency financial provision to continue one daily broadcast to Iran in Persian was made by the government. Most other Kol Israel broadcasts may now be heard only via the Internet; however the transmissions in English via WRN continue. This includes Sirius Satellite Radio in the United States, Sky Digital in the UK, and Canal Satellite in France. The remaining shortwave Persian transmission is 1400–1530 UTC (Fri/Sat 1400–1500 UTC) on 13850 and 11605kHz.

A new site ([www.intkolisrael.com](http://www.intkolisrael.com)) has been set up for a live Internet audio and on-demand streaming of each day's programming. There is also a new website ([www.iba.org.il/reka/](http://www.iba.org.il/reka/)) for the domestic Reka Network, with news in English.

### **Lao National Radio External Service Available Online**

The external service of state broadcaster Lao National Radio has now made its English and Lao programs available on its website at [www.lnr.org.la](http://www.lnr.org.la).

The broadcaster has had some audio content available on its website for some time, but it consisted of only specific news items in English, Lao, Hmong, and French. While this remains the case for the latter two languages, the entire English and Lao programs for the current and previous few days are now available on demand. ■

hours of darkness. For distances between 800 to several thousand miles, expect exceptionally strong signals. Multi-hop signals will be observed.

Twenty-five and 22 meters will remain open from just before sunrise to a few hours past sunset. From late afternoon to well into darkness, expect these bands to offer worldwide coverage.

Thirty-one meters is a year-round power band with outstanding domestic and international paths, around the clock. During periods of low geomagnetic activity this summer, this band may offer long distance DX all through the night.

Forty-one and 49 meters offer domestic propagation during daylight hours and somewhat during the night. The tropical bands (60, 75, 90, and 120 meters) are not noticeably affected by the solar flux, but are degraded during geomagnetic storminess. Through the summer, expect these bands to be more challenging, though less this year than last.

Overall, daytime bands will open just before sunlight, and last a few hours after dark. Look higher in frequency during the day, as these frequencies will be less affected by any solar storms occurring, and more broadcasters have transmissions in these upper bands.

## **VHF Conditions**

The summertime  $E_s$  season for the Northern Hemisphere will be quite active through July. Usually these  $E_s$  openings are single-hop events with paths up to 1,500 miles, but July's  $E_s$  events, like June's, are often double-hop. Look for HF openings on the higher frequencies, as well as on low-VHF, throughout the day. Don't forget to check during the night hours, too.

## **I'd Like To Hear From You**

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

Until next month, 73 de NW7US,  
Tomas Hood.

## Model Mobile EmComm Designs... And An Announcement

**T**he Scamp Project is still a work in progress. Sometimes I doubt I'll ever get things organized correctly. That's why I adopted a modular approach to equipping the Scamp. While the use of a large GI ammo can has certain advantages, weight is NOT one of them. Nonetheless, I plan on sticking with the ammo can concept until something a lot better comes along.

In this instance the 20mm ammo can contains one 20 A/Hr gelled electrolyte battery, 120 VAC charger, ICOM IC-706MKII HF/VHF multi-mode 100 watt transceiver, an ICOM IC-2800 2 meter FM transceiver, a small RadioShack mobile CB set, along with a handheld VHF/UHF scanner, SWR/power meter and LED lighting for nighttime work. That's a lot of stuff to go into even a large ammo can! However, with persistence and a lot of double-sided sticky tape, I prevailed. The entire commo suite works very well, but there's still some optimization planned to file off some rough edges.

The ammo can/commo suite can be transported from the house to the Scamp in a matter of seconds and, once deployed, can be on the air within five minutes for VHF FM and slightly longer for HF, due to the need for erecting the HF antenna system.

Speaking of antennas, there are a number of ways to go with this, and I have opted for the K.I.S.S. system: near vertical incident skywave (NVIS) dipoles for HF (80 and 40 meters) and a simple VHF omni antenna for the high bands. You can build or buy either or both of these antennas. There is also a Ringo Ranger high gain, omni antenna that stays in the truck but can be erected on a fiberglass mast (check Fair Radio Sales, [www.fairradio.com](http://www.fairradio.com)) if more gain is needed on VHF. I also pack along a four-element Arrow Beam ([www.arrowantennas.com](http://www.arrowantennas.com)) in the event that we need directivity and gain due to terrain or difficult conditions.

NVIS is the latest craze for EmComm. It seems that the civilian disaster mitigators are finally finding out what the mil-

itary comm folks have known for decades: lower frequency HF signals using antennas erected only a few feet off the ground offer very reliable communications out to about 300 miles. NVIS nets definitely take the load off of the VHF

FM nets, which is why NVIS is finding a niche in today's EmComm world.

NVIS dipoles are nothing special. The simplest method of employing a NVIS antenna is to start with a half wavelength dipole antenna and erect it at an extreme-



*These are "before" and "after" shots of Frank, KLØSW's Bug-Out-Box (BOB). Frank's BOB features a large rechargeable (sealed lead-acid) gelled-electrolyte 20 A/hr battery which is recharged by the A&A Electronics "smart charger." The VHF unit sits above the HF transceiver in the BOB. Deployment is pretty straightforward and Frank can be on the air quickly once he arrives on station.*



Ralph Fellows, W5FTV, took a "plain vanilla" 5 x 8-foot utility trailer from a "big-box" home improvement store and completely insulated it on the inside (those long summer days get pretty hot inside that trailer!), added a deep cycle battery bank, DC-to-AC power inverters, air conditioning, lots and lots of radio gear along with a small Honda generator, and solar panels for back up power. He still has some rough edges to smooth out, but on the whole Ralph's idea is a solid one and his commo trailer provides continuous coverage over all the ham bands, along with emergency services frequencies and air band (air-to-air and air-to-ground transmissions).



ly low height (10 to 12 feet) above ground. The idea is to "squirt" your RF energy almost vertically, thereby keeping your coverage area limited out to about 300 miles. This type of setup allows reliable HF communications to cover areas outside the normal direct/groundwave, which is essentially line of sight and your first ionospheric skip-zone. Your NVIS signals are radiated almost vertically into the *F* layer of the ionosphere where they are bent back down toward the ground. So you can readily see how important NVIS is to EmComm planners and disaster mitigators.

To get the RF from the back of the radio set to the antenna I use RG-8X coaxial cable. This is a 50 ohm cable and, if you shop around, you can often find a "marine grade" RG-8X that has an extra

rugged outer vinyl covering that's ideal for EmComm applications. This cable is right at home at HF and can be pressed into service for VHF, with acceptable line losses, if the coaxial runs are short (under 30 to 50 feet). Above 150 MHz, however, RG-8X has a lot of attenuation per foot and you should probably think about using 9913, LMR-4 or other coaxial cable rated for the VHF/UHF region.

### BOVs/BOTs & BOBs

Several months ago I challenged the readers of this column to fabricate a portable/mobile EmComm station and send me pictures and details about their creations. We received several entries to the Bug-Out Vehicle/Bug-Out Trailer and Bug-Out Boxes challenge of assembling

a truly portable emergency radio communications system. These ranged from a simple metal and/or plastic box with a small 2 meter transceiver and a gelled electrolyte battery for power to a towable utility trailer completely redone inside to provide multiple radio operating positions, storage for various supplies, an on-board battery power system, air conditioning and a whole lot more!

So, without further ado, let's dive right in and take a look at some of these mobile/portable EmComm systems.

*Frank Henrickson, KLØSW, Soldotna, Alaska*

Frank sent a series of photos to me regarding his BOB portable emergency radio station. Frank's ideas were similar to mine (using an ammo can), however,



Mark Mantia, WN8ATM, has been one busy guy. In addition to designing, fabricating, and marketing a special stand for the venerable Yaesu FT-817 multi-mode transceiver (see text), he also found time to develop and fabricate some really nice-looking and extremely functional EmComm BOBs that will help the ARES/RACES EmComm volunteer better function as an emergency communicator.

he fabricated a “rack system” that’s inserted into the ammo can. His gear is attached to the rack, which can be removed for easy access to the gear and the battery pack. Speaking of gear, Frank has the following: ICOM ICV-8000 2 meter FM transceiver, Kenwood TS-50 HF transceiver, HF/VHF SWR bridge, 20 A/hr gelled electrolyte battery, and an A&A battery charger. Frank lives on the Kenai Peninsula Borough in Soldotna, Alaska, which is quite an interesting place—area: 25,600 square miles; population: 48,452 (doing the math, that’s fewer than two people per square mile!); shoreline: 1299 miles; lowest point: sea level; highest point: 10,489 feet (nose-bleed city!). There are also three active volcanoes in the borough. Not that there’s a potential for anything to happen...

Frank, thanks for sharing your project, and I hope you never have to use it in a real-world disaster.

*Bob Hawkins, KI4HEE, Conway, South Carolina*

Now here’s a guy after my own heart. Bob has a 1983 13-foot BOT Scamp trailer (just like mine) to which he has added a microwave oven, air conditioning, hardwood floor (not a bad idea, actually) and a full suite of comm gear. His station is also computer controlled via an IBM laptop and RS-232 cable.

“My 1983 13-footer is my radio and computer shack here in the backyard,

and has served me well for two field days, and so far, no hurricane bug-outs...yet.” says Bob. “However, if the need arises, I can have it ready to hit the road within six hours, fully stocked, ready to give shelter and worldwide communications.

It travels like a dream, sets up in a moment, and is comfy cozy all day long.” Well done, Bob. It’s a fine example of what we’ve been talking about regarding “Turtles” in several previous “HOME-SEC” columns.



Bob Hawkins, KI4HEE, is a man after my own heart. Bob’s Bug-Out-Trailer (BOT) is a 13-foot Scamp travel/camping trailer just like mine. That’s where the similarities end, though! Bob has taken the time to trick-out his Scamp, turning it into a rolling communications facility. He added an air conditioner and a microwave oven, extra battery banks, DC-to-AC inverters, a 3000 watt gas generator, and computer equipment, just for starters.



Bob Hawkins uses an old laptop computer to control his radios via Ham Radio Deluxe software (it's free!). Basically, he's using cutting-edge technology on his mobile comm trailer. Sharp, Bob, very, very sharp.

Finally, Bob doesn't leave his Scamp sitting in the yard. He takes it to the ARRL Field Day and gets hands-on training setting up and tearing down in the bush.

Ralph Fellows, II, W5FTV, Deer Park, Texas

Converting something the size of a Scamp is one thing—taking a bare-bones, 5 x 8-foot utility trailer, completely insulating it, outfitting it with battery power, generator power, a bunch of comm gear, six photovoltaic (solar) panels, antennas and masts, and a whole lot more is a massive undertaking. But that's exactly what Ralph managed to do! Ralph and I were stationed together in the USAF about 30 years ago. Ralph always impressed me with his "gusto" and eternal optimism. Well, he didn't let me down this time, either! Check out the photos of this BOT/command post conversion to a 5 x 8-foot utility trailer (similar to the ones at the Big-Box home improvement centers). Ralph sent me a CD with all the pix and a narrative about converting the trailer. Unfortunately, I don't have column space to share all of that with you, but as you can imagine, Ralph's project was a monumental undertaking that paid off, big-time, a few weeks ago when he rolled it out during an emergency exercise. Notice that when everything is packed into place inside the BOT, there's room to sleep at

least two adults on the floor using air mattresses and sleeping bags! Thanks for sharing, Ralph.

Mark Mantia, WN8ATM, Dayton, Ohio

Mark and I met entirely by accident (or Devine Intervention, take your pick). I had just procured a new FT-817 and while corresponding with other 817 owners on the Yahoo FT-817 group, I met Mark. Mark, who works for R.L. Drake (yes, they're still in business but they don't make amateur radio gear anymore), designed and fabricated a great little stand for the Yaesu FT-817 HF/VHF/UHF multi-mode ham transceiver. Mark's stand puts the radio at the proper tilted angle so one can easily read the tiny LCD display. Additionally, Mark's invention has room internally for two of the Hi-Cap batteries available as after-market accessories from Batteries America ([www.batteriesamerica.com](http://www.batteriesamerica.com)) or W4RT ([www.w4rt.com](http://www.w4rt.com)). A recent upgrade to the stand is the inclusion of a power conditioning circuit that offers over/under voltage protection, reverse polarity protection and DC power filtration to prevent line "spikes" from damaging your radio gear.

In addition to all this (Mark is a busy guy), Mark offers several portable EmComm station rack systems. He makes the racks, you supply the gear. Great stuff, Mark. Keep up the good

work! If you're interested, you can email him at [wa8atm@netzero.net](mailto:wa8atm@netzero.net).

## Break Time

This is a topic I hate to write about, so I'll make it brief and to the point. Starting with the August issue, there will be a new "Homeland Security" columnist: Mitch Gill, NA7US, from Ravensdale, Washington.

I've written the "HOMSEC" column for *Pop'Comm* for the last six and a half years, and it's been a blast!

This column has been enlightening, at times challenging, but always interesting for me to research and write. I've met, either in person or via the Internet, some really great people who have graciously agreed to share their stories, pictures, and projects with me. Without these folks and the incoming feedback from the readers of this column I would have run out of things to say several years ago. Thank you, all.

My main reason for stepping down is that I feel I'm getting "stale," and I want to be sure the readers of the "HOMSEC" column get accurate and timely information about Homeland Security and our part in the grand scheme of things. I know, positively, that the "new management" of this column will take it to new heights! Mitch is highly qualified to write this column. He'll introduce himself next month, but rest assured, my faithful readers, you're in extremely capable hands.

Finally, I would like to thank Dick Ross, K2MGA, my publisher, and Edith Lennon, N2ZRW, my editor, for allowing me the privilege of writing for the magazine originally edited by my longtime "Radio Hero" Tom Kneitel. It has truly been an honor.

In closing let me once again thank all of you and leave you with this final thought: "Preparedness is NOT optional."—Vy 73, Rich Arland, W3OSS

P.S. Look for me on the HF QRP frequencies: 3.560, 7.030, 10.106, and 14.060 MHz, using CW. I hope to work some of you in the near future. ■

*Editor's Note: I personally will miss Rich's monthly contributions tremendously. In fact, I would not have "allowed" his departure if I hadn't extracted a solemn promise of numerous features to come—promptly. Thanks so much for everything, Rich. It's been both an honor and a real pleasure. Now, you owe me a feature!*

# Radio Fun And Going Back In Time

**Q.** What is the latest widget you've heard about coming out of Whiz-Bang Corners?

**A.** While this isn't exactly radio, it's fascinating—and timely. The Israelis have a new gizmo on the market that can shoot a laser beam at a suspected suicide bomber or IED (improvised explosive device) and explode any munitions before you get too close to it. It appears to be very successful in field trials. The suicide bombers seem to like it as well. At least, none have ever complained about it.

**Q.** I've always wondered if "James Bond" got punched in the eye by the "bad guys" would it mess up all of his retinal scan security passes so he couldn't get back inside Headquarters?

**A.** Again, not exactly radio, but since you asked...that would depend on how hard and how often he got hit. Boxers often have one or both eyes swollen closed. If that happened to "Bond," he would have to wait for the swelling to go down, but he'd be okay. If, however, he got hit badly enough to tear his retina (the thin film of nerve tissue at the back of the eyeball) he would need medical attention to tack down the loose tissue with a laser beam. If done within about a week there would be very little trouble. If it took more a week he might have to go through registration again because there might be small differences in the retina that the computer would pick up.

The ophthalmologist who told me all this also mentioned that the "bad guy"

trick of taking a person's eye out and showing it to the scanner wouldn't work either. The human eyeball is about the size and shape of a large olive. It has a small amount of possible rotation but not as much as a degree or two. If the "right guy" was standing on his head or lying down when he looked into the scanner, the computer wouldn't recognize his retinal scan. Technology's not perfect, which in this instance is good news for the "good guys."

**Q.** When was the first time radio was used to aid fishermen?

**A.** Finally, we're back on subject! Okay, most of the fish finders, temperature detectors, and other aids to fishermen came out of our World War II anti-submarine technology that had been refined and redesigned to locate fish instead of U-boats. That, however, was not the first effort.

Back about 1906, the Fisheries Company was one of the largest fishing fleets off the Atlantic coast. Fisheries had the biggest share of the menhaden catch off the Atlantic coast. Menhaden are not used for human food but find their way into feed for poultry, hatchery-raised fish, and fertilizer. They also provide bait for striped bass, spanish and king marlin, among others. Found from Florida to Nova Scotia, menhaden are also called mossbunks, fat backs or peanut bunkers and can grow to about a pound. They feed on plankton and their schools have been reported as covering up to 40 miles.

The Fisheries Company had 40 steam-powered ships working from Maine to Charleston, South Carolina, with factories at several ports along the coast. What made the Fisheries operation so successful was that the company used wireless telegraphy to coordinate its efforts by communicating between ships and shore stations on the movement of the fish as the schools traveled around in the Atlantic. When one coastal steamship spotted a school of fish it could pass the information to all Fisheries stations ashore or on ships. This made their fishing efforts more productive than any other firm's.

**Q.** When an aircraft takes off from an aircraft carrier both are moving in different directions and will probably lose sight of each other. How does the aircraft find the carrier if both are maintaining radio silence?

**A.** Well, if you call the Navy they'll be real reluctant to pass on the details about their current system. I have found out something about Navigational Aid ZB, however, which was top secret during World War II.

First off, Navy and Marine Corps pilots were very well trained in over-water navigation. But they did get some help from their friends. Homing was done on lower bands that were the most common on radios in Naval aircraft: 195 to 560 Kc and 560 to 1600 Kc. An audio signal modulated an RF carrier signal on the lower two bands, say 1000 Kc. This signal was then used to modulate a UHF signal on the aircraft radios' 1.6 to 4.5 Mc or 4.5 to 9.05 Mc bands, usually around the 2.34 to 2.58 Mc range.

While the enemy could easily pick up the UHF signal, its modulation, being in the lower frequencies, was not so easy to detect. Coded signals representing homing coordinates were also changed daily. Add to that some tricky antenna design in the planes and on the carriers and the Japanese never did figure it out completely.

If you still want to find out how it's done today see your Navy or Marine Corps recruiter, and you'll need a security clearance. Or you can check this column in 60 years. ■



# A Trip Down Nostalgia Lane: Finding My First Real Receiver!

The second part of the signal generator topic we first visited in May is being pushed a column or two into the future. This is partially due to my realizing that I lacked a good project receiver to illustrate how to set up and perform IF and RF stage alignment. But, luckily, a recent trade with a local ham has provided me with the ideal candidate for those upcoming features: a Lafayette KT-200 communications receiver. By chance, this is a very special receiver!

When I was an aspiring radio amateur back in the early 1960s I'd spend hours pouring over the Allied, Heathkit, and Lafayette Radio catalogs, and I dreamed about how I'd someday own the ultimate ham station. The reality was that I was a young teenager with funds that were pretty much no more than loose pocket change. Yet, after a summer vacation's worth of mowing neighborhood lawns and doing other odd jobs, I finally had saved enough money to buy my dream radio. Yep, the Lafayette KT-200, and the original catalog ad is shown in Figure 1.

That simple radio served me well for a few years, but it wasn't too long before I traded the Lafayette in at the local ham store for a more substantial receiver.

## Through Rose-Colored Glasses

Many of us enjoy reminiscing about the "good old days"—those days of the past when it never rained, doctors made house calls, and everyone lived in a kinder, gentler world. Alas, a wiser, older gentleman once told me—and quite correctly I might add—that living "in the today" is actually the real good days. I suppose the same holds true for many things from our past; whether it's our first car, first date, or even our first radio!

Now that my past has caught up to me, I sadly admit that the dream receiver of my youth left a lot to be desired! The ham bands were poorly marked; the entire 80 meter band covered a scant half-inch or so of the main dial. The receiver drifted and the tuning rate was too fast. It lacked a product detector, and the IF was also too wide for CW work on the novice bands. Back then, the novice class license was good for one year and non-renewable, and the HF operating privileges were only for the CW mode and on very small (as little as 50 kHz wide) portions



Photo A. Placing a Hallicrafters S-38 atop the later Lafayette HE-10 is a good way to show the obvious outward physical similarities between the two receivers. Despite the similarity, the HE-10 was far more advanced: it featured a transformer power supply, an S-Meter, a tuned RF stage, and two IF stages. The partially assembled KT-200 kit cost \$64.50.

Figure 1. Here's a scan of the original Lafayette Radio catalog ad for the assembled HE-10, and the KT-200 kit version, Lafayette communication receiver.

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**LAFAYETTE Professional**  
**QUALITY**  
**AMATEUR COMMUNICATIONS**  
**RECEIVER**

**NEW!**

**SUPERHETERODYNE CIRCUIT UTILIZING 8 TUBES & RECTIFIER TUBE**



**RECEIVER SPEAKER MATE**  
**HE-11**  
**7.95**

**HE-30 WIRED**  
**99.95**  
 NO MONEY DOWN

**KT-320 SEMI-KIT**  
**79.95**

**FEATURE FOR FEATURE, SIGNAL FOR SIGNAL MATCHES RECEIVERS SELLING FOR ALMOST TWICE THE PRICE**

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- ANTENNA TRIMMER FOR OPTIMUM PERFORMANCE ON ALL BANDS
- CALIBRATED ELECTRICAL BANDSPREAD ON AMATEUR BANDS TO TUNE IN METERS
- B-100 LOGGING SCALE FOR SWR'S
- EFFECTIVE AUTOMATIC NOISE LIMITER
- STABLE SELECTOR ON FRONT PANEL
- AVC, OSCILLATOR AND BFO FOR CLEAR CW AND SSB RECEPTION
- BUILT-IN EDGEWISE S-METER

Page 228 LAFAYETTE'S EXCLUSIVE NAME EQUIPMENT IS AVAILABLE ON LAFAYETTE'S EASY PAYMENT PLAN—SEE PAGE 223

Figure 2. Within a few years the popular HE-10 was replaced with the more modern design of the Lafayette HE-30. The HE-30 offered some improvements, notably a Q-Multiplier, and accurate, calibrated amateur band log tuning scales. However, it was basically the same single-conversion design impeded by many of the faults that plagued the HE-10 predecessor. Nonetheless, they are handsome-looking sets and are still fun band cruisers for casual SWL or BCB monitoring.

on the 80, 40 and 15 meter amateur bands. Alas, the poor selectivity, lack of dial calibration and drift was a poor match for the needs of new hams. In fairness the set was sensitive, and it did a fair job as a "band cruiser" for general SWL listening.

I'm dedicating this column to folks, like myself, who owe their start in the hobby to these entry-level receivers. Their popularity is increasing as past owners become interested in rebuilding their original stations.

These receivers are pretty common on the used market but unfortunately the matching model HE-11 speaker is rare, and thus expensive when found. The HE-48 speaker (intended for use with the later HE-30/KT-220 receivers) is also a close match and may be easier to locate. For a vintage communications receiver I think the set is fairly handsome; the case is painted in a wrinkled gray finish that is durable and looks good. The lettering is embossed into the panel, so it doesn't wear in the same way that many silk-screened panels do.

## The Lafayette KT-200

The Lafayette KT-200 bears a strong physical resemblance to the early Hallicrafters S-38 receiver, and because of the half moon dials at first glance they look almost identical. Since there's a customer's S38 on my bench, I was able to group the two radios for a comparison in **Photo A**. The similarity ends

there. Where the S-38 sets were either five- or six-tube AC/DC receivers, the KT-200 is a nine-tube transformer powered set.

Two versions were sold in the United States. The KT-200 was a partial kit that had all the major components mounted, leaving the builder with the task of installing the resistors, capacitors, and some incidental wiring. For a few dollars more, the set was also offered fully assembled as the model HE-10. The radios were sold between 1959 and 1963; the KT-200 kit was sold for \$64.50, and the assembled HE-10 cost was \$79.95. That may seem cheap today, but back in 1959 it was a fair bit of change.

Trio, which is now Kenwood Radio, made the sets with the Lafayette brand name. Trio sold the same radio as the Trio 9R-4J in Europe, and also under the Jennen, Otra or Globe-Trotter names overseas. The Trio-branded sets used the same S-meters as the North American sets, except they were mounted on the inside of the front-panel, making the European versions fairly easy to identify from a distance.

The Trio HE-30 receiver (KT-320 kit version), which superseded the HE-10 a few years later, sported a more modern slide rule dial and featured calibrated tuning scales for the amateur bands. It also exchanged the BFO stage for a more advanced Q-multiplier circuit; but alas it was still basically the same nine-tube, single-conversion design dressed up in a fancier case. The catalog page for the HE-30 is shown in **Figure 2**.

## Technical Specifications

The radio covers 550 kHz to 31 MHz in four bands. The set features a BFO, accessory jack on the rear apron (for use with an external Q-multiplier for example.) S-meter, IF gain control, tuned RF amplifier, two IF stages, separate logging scale and tuning, flywheel tuning, noise limiter, and a transformer-type power supply.

The set uses eight miniature glass tubes and an octal glass rectifier. The local oscillator is a 6BE6 and, surprisingly, a separate 6BE6 is used for the mixer. Three 6BD6 tubes are used: one for the RF stage and two more for the two IF stages. A 6AV6 tube is used for the detector and first audio stage; a second 6AV6 is used for the BFO and noise limiter. The rectifier can be either a 5Y3 or 5CG4. The tubes are interchangeable, although the 5CG4 is an indirectly heated cathode and gives a more desirable slower B-plus voltage rise time at turn on. Although the 5CG4 is more common in the Trio-branded sets, my HE-10 had the original 5CG4 factory installed in the 5Y3 socket.

Here's an important tip for would-be restorers: The schematic for the 9R-4J and HE-10 is incorrect. Note that the lead going to the first filter capacitor should be going to filament pin 8, not to pin 2 as shown in the schematics. That is because the cathode of the 5CG4 is connected to pin 8. My set was wired correctly, however. The audio output stage uses a 6AR5 tube, which is more popular in Japan than the 6AQ5. A 6AQ5 can be substituted, provided pin seven on the socket is not grounded.

## Restoration

Unless your piece of nostalgia is a kit that was poorly assembled, or a radio that has undergone substantial modifications or suffered years of neglect, restoration is relatively simple and straightforward. I'd suggest spending a few extra dollars for a set that's in good cosmetic condition; finding the correct replace-

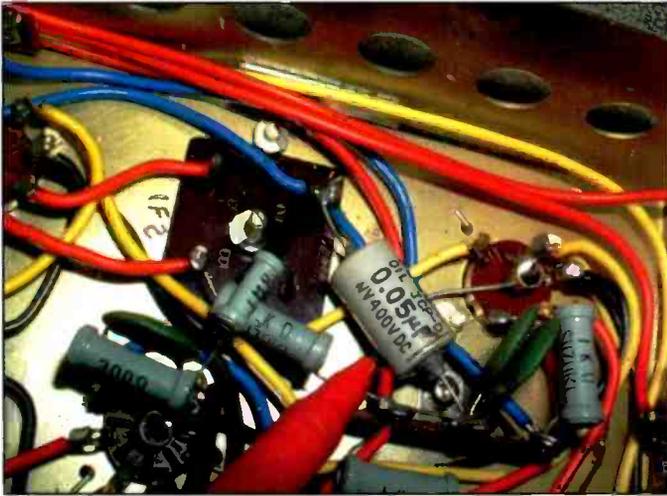


Photo B. The red pen tip is towards a .05  $\mu$ Fd at 400 volts tubular capacitor. This is a wax paper capacitor in a metal can, and it should be replaced as a matter of course. Some versions may have used wax paper capacitors that were housed in a white ceramic tube; these are also very failure prone with age.



Photo C. This is how the restored chassis appears. Since so few components need to be changed, the original factory look is easily maintained.

ments for missing knobs or cabinet parts will cost the difference in the long run!

And unless you're an accomplished airbrush touch-up artist, I'd suggest looking for a cabinet free of dings, rust, or other cosmetic defects. The chassis should be free of corrosion or signs of rodent infestation. Avoid sets with chassis pitting that pene-

trates the plating to the bare chassis. Condition is everything. Poor examples can be had for \$20 or \$30 dollars, while pristine examples with the matching speaker and shipping boxes command hundreds of dollars.

Electrically, only a few capacitors need attention. Most of the capacitors are reliable disc ceramic types, and the resistors are good quality film types. There are a few wax paper capacitors that need to be replaced. These include C12 (.05  $\mu$ Fd at 400 VDC), C16 (.01  $\mu$ Fd at 400 VDC) and C20 (.005  $\mu$ Fd at 400 VDC.) A typical example of these capacitors is shown in **Photo B**. These are the capacitors shown with a circle around them in the schematic. They can be either enclosed in a thin white ceramic or metal cylindrical shell.

Replace these capacitors with devices with a 630-volt rating. Capacitor C20 is subjected to high transient voltages, so going even higher in voltage is reasonable if you're the cautious type. Capacitor C19, the bypass capacitor on the cathode of the 6AR5, should also be replaced. This is a 10  $\mu$ Fd electrolytic with a 50 VDC rating. Check the resistance for the 2000 ohm, 10 watt power resistor (R21) as well, as they often fail open in these sets. I also opted to replace the filter capacitors with replacements mounted under the chassis. I left the old can-style capacitor disconnected and in place for aesthetics; I may rebuild the old capacitor at a later date. A chassis bottom view of the restored set is shown in **Photo C**.

The insulators for the panel lamps should be checked. If the material has hardened and cracked, they can be replaced with similarly sized rubber grommets, which are available at most hardware stores. A similar problem might exist on the tuning capacitor mounts and those also should be checked.

## Tune In Again For More

Next month we'll get back to our signal generator discussion when the HE-10 alignment is undertaken. I'll offer a few more tips regarding the cosmetic touchup work I plan to do in the future as well.

Until then, keep those soldering irons warm and those old tubes glowing!

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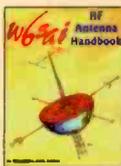
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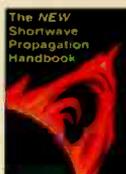
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# “Mini Linis” Are More Portable, Powerful Than Ever!

If you're expecting a column about miniature linear amplifiers, you will no doubt be disappointed. Snap! The Mini Linis I'm talking about are miniature ham radio-oriented Linux distributions that are specially tweaked for hams!

Although there's nothing new about hams fooling around with Linux (they've done so from the OS's very beginning), there is plenty of new developments when it comes to “Ham Linux” versions of our favorite free operating systems.

With each new release, “desktop Linux”—versions designed to be used by typical users on everyday desktop PCs—gets easier, faster, and more hassle free. The various versions of Ubuntu Linux, for example, seem to be the flavor of the month for Linux beginners and Windows refugees. When you throw in the fact that Ubuntu is absolutely free (a motivator that drives many a ham), the convergence is too hard to resist.

Plus, now that Apple's OS X is essentially Unix under the hood (Unix and BSD, which are very “Linux like”), Microsoft OSs, from Windows 95 through Vista, are the only modern OSs that *don't* have Linux-style underpinnings. (Actually, there is a

lot of Unix/Linux code in Windows, but it's hidden internally among millions of lines of “spaghetti code,” and not frequently acknowledged.)

If the thought of experimenting with Linux in your ham shack has piqued your interest, but you're not yet ready to throw in the towel when it comes to your tried and true OS, several ham-oriented miniature Linux distributions will likely help bridge the gap.

## W9YA's Portable Operating Environment

Developed by Linux hacker Bob Finch, W9YA, of Albuquerque, New Mexico, the W9YA Portable Operating Environment (POE) is a complete Linux operating system, bursting with tons of everyday software for web browsing, word processing, etc., plus mountains of ham software, including log-books, digital operating suites, and much more.

The POE is just that—the whole works fits on a 2 GB “thumb drive” that plugs into your (or someone else's) PC's USB2 port.

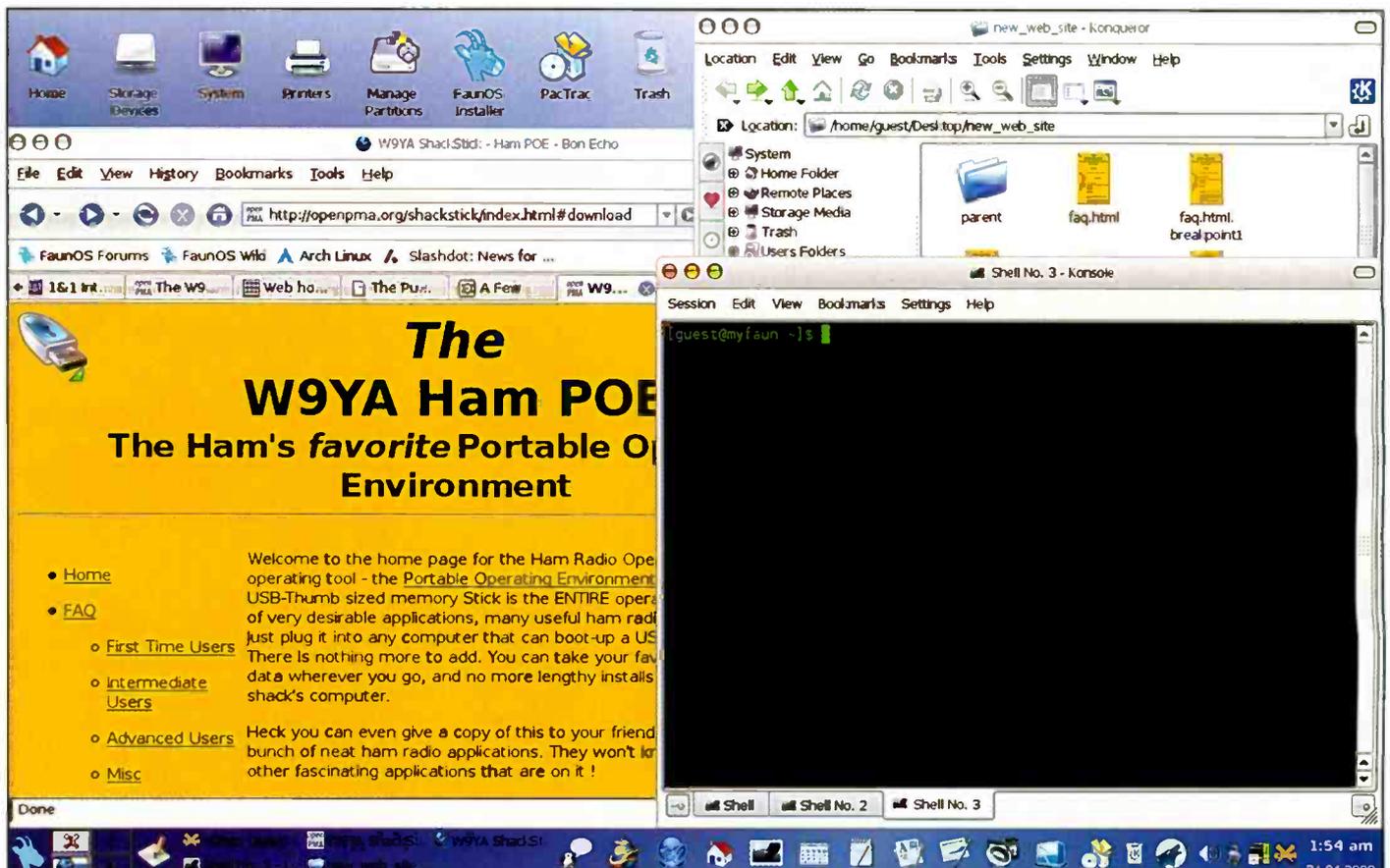


Figure 1. W9YA's Portable Operating Environment in action. Bob's POE, dubbed “the Shackstick,” is big, bold, and beautiful, and works best on modern PC hardware and a chunky USB flash drive.

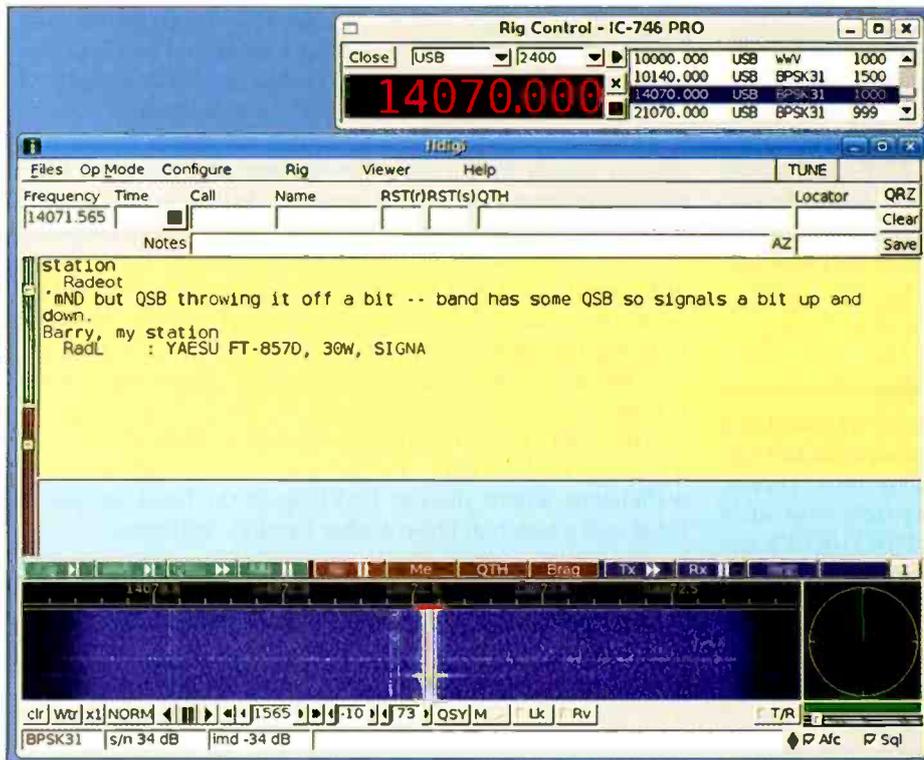
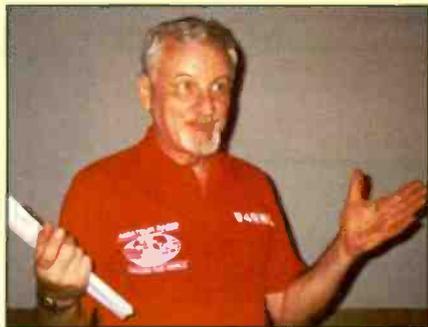


Figure 2. This is fldigi running on W1HKJ's Ubuntu 7.10 install with a rigCAT interface to an IC-746 Pro transceiver.

When the computer boots up, instead of starting the internal operating system (probably some flavor of Windows), the PC boots up to the Linux POE on the thumb drive! There's no need to install anything on the host PC. Thumb drive out: boot to internal hard drive; thumb drive in: boot to your custom-tweaked ham radio operating system with your favorite software, logs, databases, etc., already set up and working, just as you left it that last time it was booted!

The requirements are minimal: a USB flash drive with at least 2 GB of storage; a computer with at least 512 MB RAM; and at least a Pentium II-class CPU that can boot from a CD or the USB "stick" itself. You download the POE's image file from the Internet and transfer it to your thumb drive, then simply reboot (to the USB drive). Once you're up and running you can choose to continue using the USB "stick" as is for as long as you like, you can add or subtract software, or you can optionally install the entire contents of the USB "stick" to a hard drive or even a larger USB "stick." Whatever works for you.

## L.B. Cebik, W4RNL—Antenna Guru, Gifted Teacher, Elmer To Thousands—Becomes Silent Key



W4RNL in action at the East Tennessee DX Association. Cebik, a member of the ETDXA, can be seen among his fellow members at [www.ETDXA.org/etdx%20members.htm](http://www.ETDXA.org/etdx%20members.htm).

One of amateur radio's most gifted and prolific antenna educators, L.B. Cebik, W4RNL, of Knoxville, Tennessee, became a Silent Key in April at age 68, ending a 50-plus-year ham career and an era of "eureka" moments for the rest of us. Websites and ham radio mailing lists the world over were awash with people expressing their condolences and sharing stories about Cebik and how he helped them in various ways over the years.

Cebik was a rare expert who could argue the nitty-gritty with the best scientific minds and theoreticians, yet still managed to translate all of his immense knowledge of complex antenna, modeling, network, and feed line topics into bite-size, understandable pieces for hams of all technical skill levels. He did so with elegance, patience, and humor. A teacher for more than 30 years, Cebik was retired, but served as Professor Emeritus of Philosophy at the University of Tennessee in Knoxville.

To call L.B. prolific is an understatement. When it comes to cranking out mountains of insightful, useful information, he's in a league with Isaac Asimov and Arthur C. Clarke, each of whom has published thousands of articles and papers and dozens of books. Over the years Cebik's work has appeared in every major ham radio magazine (several no longer published), plus a large collection of smaller, more focused journals and outlets, including a huge treasure trove on the Internet (which is still accessible). In a bulletin on L.B.'s passing, long-time ARRL editor Larry Wolfgang, WR1B, said Cebik

"was probably the most widely published and most widely read author of Amateur Radio antenna articles ever to write on the subject." Amen.

So, whether you're a long-time fan or this is your first introduction to L.B. and his legacy, click on over to [www.cebik.com](http://www.cebik.com) to see for yourself. You could spend days at his site—as I have—taking it all in. Many times I became locked in a "just one more page and I'll wash the dishes" internal struggle! If you're fascinated with antennas but don't know a Smith Chart from a bar graph, the site's a real page turner! And thanks to the folks at AntenneX, the company that hosted L.B.'s website for more than 10 years (and published many of his books), Cebik's large and priceless collection of articles, projects, and papers will remain available. A Web search for "W4RNL" or "Cebik" will lead to much more information.

The revered man's passing aside, if anyone could manage to propagate a radio signal from The Great Beyond, it would be L.B. Cebik, W4RNL!

—NT0Z

W9YA's POE, shown in **Figure 1**, is based on the highly successful and stable Arch linux operating system distribution (<http://archlinux.org>), the Faunos live-operating system distribution ([www.faunos.com](http://www.faunos.com)), and the Larch "do-it-yourself live CD" shell scripting project (<http://larch.berlios.de/doc>).

To get your copy of Bob's ultra-handly POE, nicknamed "shackstick," point your browser to [www.bfst.de/shackstick](http://www.bfst.de/shackstick). As this is being written, Bob is looking for additional mirror sites, so by the time you start searching, the POE may be available elsewhere.

## Fldigi

By itself, fldigi isn't an operating system *per se*, but it is a popular and powerful ham radio digital communication and logging suite for Linux and BSD. Developed by Dave Freese, W1HKJ—a Linux geek from Day One and a programmer since 1966—fldigi integrates rig-control software, PSK31/RTTY and a slew of digital mode variants, and a digital-mode logbook in a stable, convenient package for your favorite free OS.

As you can see in **Figure 2**, fldigi has all the bells and whistles: a functional waterfall display, a rig-control dock, and an integrated, interactive log. Every conventional digital mode is fully

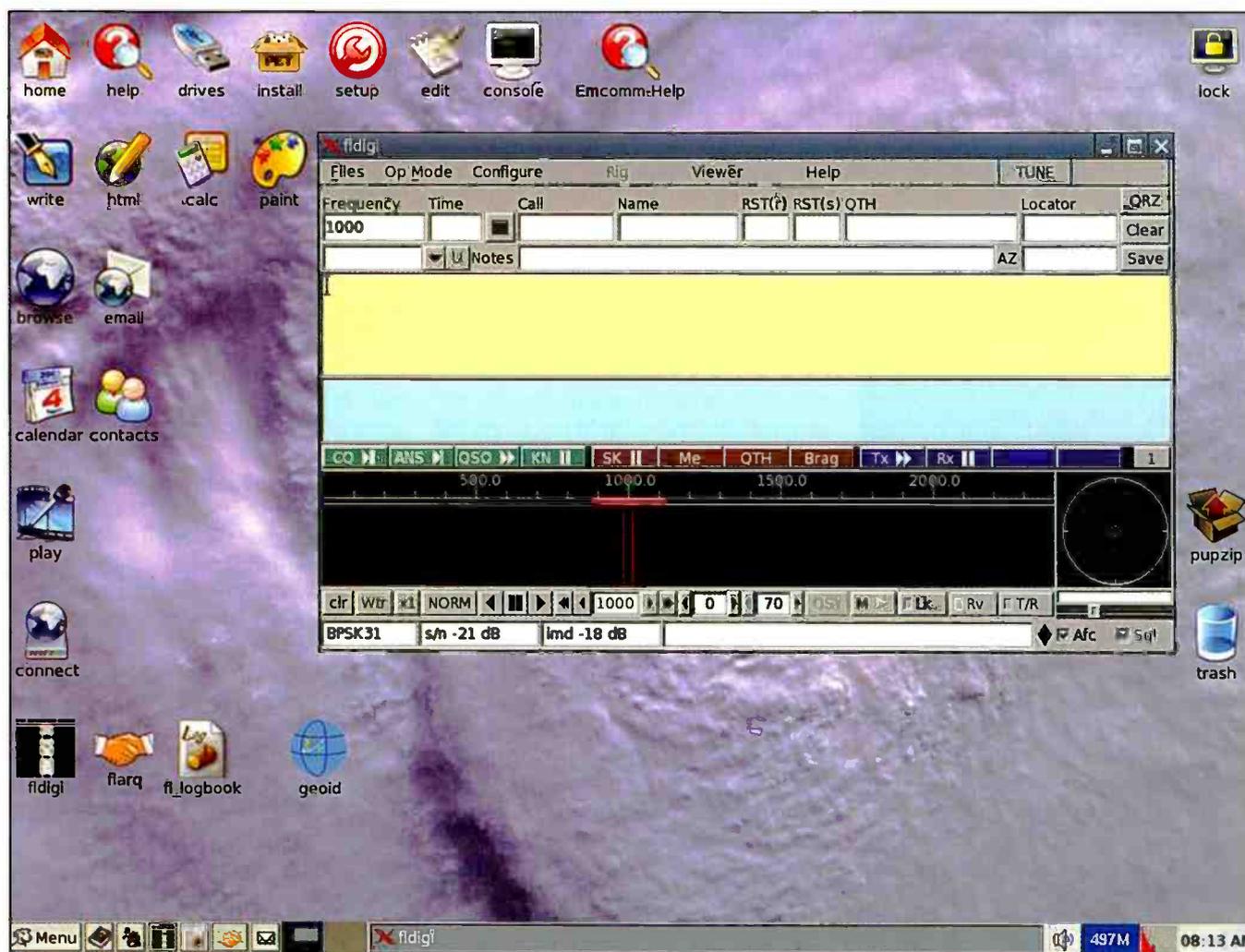
supported (CW, PSK, and RTTY), but this amazingly versatile program doesn't stop there—even for a moment! Fldigi can also handle multiple Domino and Feld modes, as well as a gaggle of MFSK/MT-63 variants, OLIVIA, and a whole bunch of Throb.

Fldigi is an official Ubuntu package and can be installed in Ubuntu simply by checking the appropriate box in the OS's package management system (easier to do than to talk about!). It has also been tested in a variety of Linux distros including Debian, Mandriva, Mandrake, SuSE, and Puppy Linux (more on Puppy later). Again, because Apple's OS X has a lot of Unix under the hood, fldigi can be made to work on modern Macs. Building the packages for OS X requires more geeky know-how, but anyone interested enough can find help online to make it work.

This candy store of digital goodness is a free download from a variety of locations. To get your copy, start at <http://w1hkj.com>, where you can find links to the latest version of fldigi and a bunch of Dave's other free ham software.

## Puppy Linux To The Rescue

Developed from scratch by Barry Kauler and now a *bona fide* worldwide celebrity, Puppy Linux is a Live CD Linux dis-



**Figure 3.** This is EMCpup, a full-featured ham radio digital communication suite that ships with its own OS, a tweaked version of Puppy Linux v 3.x. The OS and all of the software barely break 100 MB!

tribution that is microscopically tiny and purposefully easy to use (not always a consideration with previous Linux distros!). Puppy Linux—the entire OS and all applications—runs in RAM, allowing the boot medium to be removed after the OS starts, and making the system *very fast*, even on old, junker PCs. That old Pentium I PC sitting in the corner? A rocket sled when running Puppy. A modern enthusiast PC running Puppy? Think Cray Supercomputer! It's "giggle like a little kid" fast!

A rich assortment of software for everyday tasks (word processing, spreadsheets, Web browser, email and chat clients and multimedia playback, among others) is included, and the whole shebang weighs in at between 50 and 120 MB (yes, megabytes! not a typo). Check it out at [www.puppylinux.com](http://www.puppylinux.com).

As of this writing, the latest version is 3.01, released on October 15, 2007. Because it's so small, Puppy Linux can boot from a USB flash drive, a CD or DVD (an internal hard drive is optional, as Puppy can actually save new data to the CD or DVD from which it was booted, as long as the boot drive can write to the disk in question!), ZIP drives or LS-120 Superdisks, an internal hard drive, a computer network, or even an OS emulator.

Puppy Linux supports a staggering array of hardware and will likely amaze you when you run it from a CD for the first time. Puppy doesn't have trouble recognizing much of anything! And despite its full-featured nature, it's easy to add software to Puppy using one of several built-in package managers ("automatic software finders and installers").

Which leads us to fldigi which, as mentioned above, works fine in Puppy Linux.

You might wonder why—if fldigi works so well in Puppy Linux...and Puppy Linux is the pinnacle of niftiness—doesn't someone integrate fldigi and a bunch of other useful ham radio software into a custom version of Puppy Linux just for hams?

Why, indeed! Apparently, fldigi author Dave Freese, W1HKJ, thought the same thing when he created Digipup, a Puppy-based operating system configured with three of his most popular free software offerings for amateur radio: Fldigi, which does a great job on digital sound card modes like PSK, RTTY, MFSK, and others; Fl\_logbook, a small, fast, efficient logging program to record your contacts; and geoid, which com-

putes the bearing and distance between sites using either latitude and longitude or Maidenhead grid locators. All for free, of course!

Digipup is still available from [www.w1hkj.com/flpuppy.html](http://www.w1hkj.com/flpuppy.html) (as long as it remains available), but Digipup seems to have given birth to an even more complete and better-maintained version called EMCpup (at press time the updated version was 3.01.3.2), shown in **Figure 3**. I'm embarrassed to say that I haven't been able to figure out what the EMC stands for. Extremely Mobile Code? Electro Magnetic Communication? Whatever it is, EMCpup picks up where Digipup left off. The new package includes the latest version of Puppy Linux (version 3.x) and a bunch of Dave's newest and most updated ham programs including fldigi, flarq, fl\_logbook, geoid, and slypheed. It's available from [www.w1hkj.com](http://www.w1hkj.com) and elsewhere.

The programs and OSs mentioned here are almost certainly the easiest way to check out ham radio software in a

Linux environment. Once you've gotten your feet wet, you can check out a wide range of other ham/Linux stuff at [www.dxzone.com/catalog/Software/Linux](http://www.dxzone.com/catalog/Software/Linux) and <http://radio.linux.org.au>.

## More To Come (I Hope)

If I ever have the time I'd love to check these Linux goodies out in depth. I run various flavors of desktop Linux in my home office, and I'm amazed at how easy and powerful Linux has become. Much of the Internet and corporate America's servers run Linux and, if Microsoft isn't careful, Linux will gain even more ground on Vista, which hasn't been received well as a whole.

But that's fodder for another discussion! As usual, send your QSL cards, comments, and questions to me at [kirk@cloudnet.com](mailto:kirk@cloudnet.com) or via snail mail to "Ham Discoveries," *Popular Communications*, 25 Newbridge Rd., Hicksville, NY 11801. ■

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## More Traffic Targets On Aeronautical Radio

**T**ower, ground, clearance delivery, Air Traffic Control... what else is there to listen to in aviation radio? In a word, plenty. In addition to the basics, passenger and freight airlines have dedicated frequencies that they use for communicating with aircraft in flight.

Commonly referred to as “company frequencies,” these are standard VHF aviation frequencies, but with a slight difference. The company frequencies can be quite interesting to listen to, since, rather than being used for navigation, they’re used to convey in-flight updates and other information. Quite often, in-flight information regarding passenger situations, medical emergencies, and supply requests are handled on these channels. In addition to in-flight information, company frequencies can be used for ramp operations at airports, pre-flight de-icing, and various other company operations.

Company frequencies differ slightly from navigation frequencies, as they are licensed to Aviation Spectrum Resources, rather than being licensed to the individual airlines or the FAA.

Aviation Spectrum Resources is a subsidiary of Aeronautical Radio, Incorporated, better known as ARINC. ARINC was chartered by the predecessor of the FCC to serve as a single point of contact for licensing and maintenance of aviation radio ground stations, other than those owned and operated by the FAA. Owned for many years by a combination of various airlines and aviation companies, ARINC is now owned by the Carlyle Group investment firm.

ARINC has been a pioneer in many aspects of aviation communications and has been responsible for developing a number of standards, including the standard shelves and cabinets used for mounting aircraft radios, which greatly speed up the repair and replacement process, as well as the Aircraft Communications Addressing and Reporting System (ACARS) data-communications system.

Aviation Spectrum Resources today retains the responsibility for coordinating, licensing, and setting installation and maintenance standards for aviation radios, as well as ensuring that those radios are maintained and operated in accordance with FCC and FAA regulations.

### There’s Data, Too...

One of the more interesting facets of ARINC operations involves data communications through ACARS.

ACARS is a relatively simple data system used for reporting aircraft status and activity, commonly known as “OOOI” (Out, Off, On, In). The ACARS installation in commercial airliners allows the crew to report significant events during each flight: “Out” the gate; “Off” the ground; “On” the ground; and “In” the gate. The system also makes regular position reports during flight, as well as provides information regarding fuel and aircraft mechanical status.

ACARS can be monitored at home using simple free software available on the Internet, a simple, basic VHF air-capable scanner, and a computer with a sound card. With aircraft trans-



An ARINC ground station radio; this one happens to be owned by US Airways. (Photos by the author)

### A Sampling Of Aviation Frequencies

#### Common Airline Frequencies

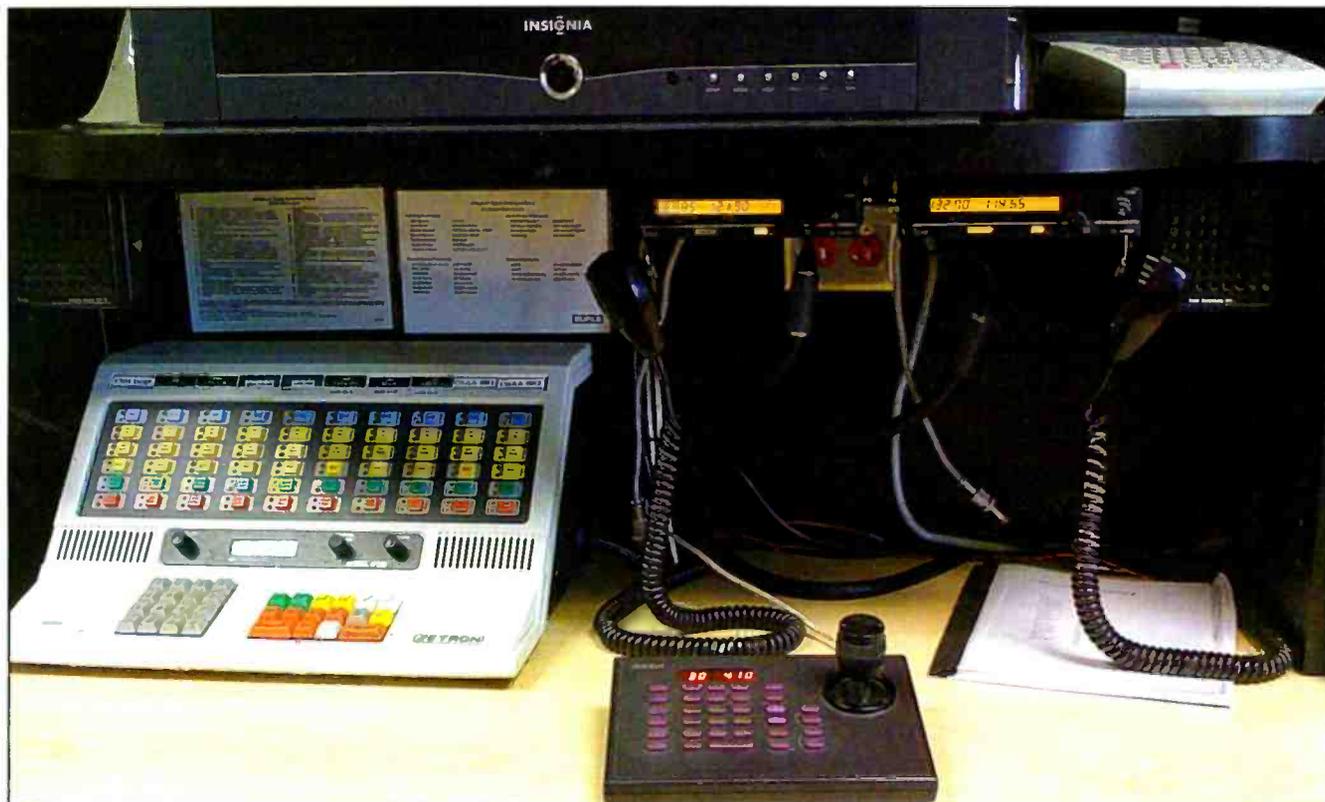
128.8500	DHL en route
129.2000	American
129.3000	United Airlines
129.4250	United Parcel Service
130.5250	Continental
131.0750	United/United Express
131.5000	America West/Midwest Connect
131.8500	Delta/Delta Connection
131.9250	Federal Express

#### U.S. ACARS Frequencies

129.1250	ACARS data (U.S. alternate)
130.0250	ACARS data (FedEx, others)
130.4500	ACARS data
131.1250	ACARS data
131.5500	ACARS data (U.S. primary)
136.8000	ACARS data
136.8500	ACARS data
131.4750	ACARS data (U.S. alternate)

#### A Few HF Frequencies

05550 kHz USB	NY Radio
05574 kHz USB	San Francisco Radio
05598 kHz USB	NY Radio
05649 kHz USB	Gander Radio
06622 kHz USB	Gander Radio
08831 kHz USB	Gander Radio
08843 kHz USB	San Francisco Radio
08891 kHz USB	Gander Radio
08918 kHz USB	NY Radio
11330 kHz USB	NY Radio



*The Snow Operations Desk at an international airport. The console on the left is used for access to airport operations channels, while the two ICOM aviation radios mounted under the shelf are used for monitoring Tower, Ground, and De-Icing frequencies.*

mitting status reports from three miles altitude, nearly anyone can hear some ACARS activity.

One nifty feature of ACARS is that the software allows you to create your own map, upon which the software will then plot and track aircraft positions. These show as small dots or tiny airplanes with track lines extending behind them as they move across the display.

ACARS can be quite interesting to play with and can provide lots of entertainment on a rainy afternoon.

### **But Wait, There's More!**

VHF is line of sight, and once an aircraft is well out over the ocean, coverage from ground-based VHF stations is non-existent. So what do airliners do when they're over the ocean? Use high frequency, that's what.

Another service provided by ARINC is flight-following using HF radio frequencies. Once out of range of ground-based radar and VHF radio coverage, international flights establish contact with one of several stations as determined by the route they are taking. These routes include North and South Atlantic, Caribbean, North and South Pacific, and Asia.

ARINC's North American-based communication centers are located in New York and San Francisco. These centers, in addition to having transmitter and receiver facilities in those cities, also control transmission facilities in Hawaii, Guam, and Alaska. Other facilities providing a similar service are at Gander, Newfoundland, Canada ("Gander Radio"); Shannon, Republic of Ireland ("Shanwick Radio"); and Santa Maria, Azores (a Portuguese island territory), as well as other stations in South American, the Caribbean, and Asia. These facilities are usually

run by their respective governments but provide the same over-water flight-following services as New York and San Francisco.

There are also military HF radio systems that provide similar services; the United States runs the HF-GCS (High Frequency-Global Communications System), which is a popular target. Look for lots of information about HF-GCS in a future "Military Radio Monitoring" column from Mark Meece.

Using a simple portable shortwave receiver (with sideband capability or a BFO) and a long piece of wire, you can copy transmissions between international flights and these ground stations. These can be quite interesting to monitor as well. In addition to flight status, urgent messages can be passed to and from crew or passengers and flight requirements relayed to the airport the flight is to arrive at. As with any other type of HF monitoring, the better the antenna and receiver combination, the better your results will be. My own home shortwave monitoring setup consists of Drake SPR-4 and R-8 receivers; the R-8 is usually used for surfing the HF frequencies, while the SPR-4 is generally set to the 11175 kHz HF-GCS daytime primary frequency.

Thanks to Doug Bell in Canada, we've got a listing of some common HF frequencies used by aircraft. Doug uses a Sony ICF-2010 receiver and wire antenna and regularly logs quite a bit of traffic from HF aviation frequencies. See the sidebar for these loggings.

### **Not Just Your Father's Frequencies**

So you see there's a lot more to monitor in the aviation world than just Takeoff, Approach, and Landing. Dust off that old computer, fire up that seldom-used HF receiver, and give it a try! Let us know what you hear. ■

# Military Broadcasting: Then And Now, Bringing GIs A Touch Of Home

Anyone who's served overseas in the U.S. military can attest to the value of anything that can boost morale in a dangerous and stressful environment. And from World War II to Iraq, broadcasting has played its part. In the 1940s it may have been an hour of listening to Bob Hope; in Iraq today, perhaps it's an NFL game on TV in an NCO club.

Entertainment isn't the only thing military broadcasting brings to the table, either. Just as GIs in the jungles of the Pacific were prodded by radio broadcasts to take medicines, our soldiers in Iraq today learn about health issues like AIDS through the Armed Forces Radio and Television System (AFRTS).

## Early Service For The Services

Not a lot of people outside the armed forces have ever heard of the AFRTS. It was officially started by the War Department in 1942 as Armed Forces Radio, but this radio service for soldiers was not exactly a War Department idea. General George C. Marshall had been thinking about it as a means of educating and informing American troops, believing that the men and women in uniform needed to know why they were fighting and that radio was the best medium. Apparently the troops agreed: While the army was *thinking* about a radio service, soldiers in the field made it a reality by setting up—sometimes illegally—radio stations in Panama and then Alaska. A transmitter was set up and they began broadcasting music and entertainment and, of course, command information as well.

The Panama Canal radio station, which began broadcasting in 1940, was an immediate hit with soldiers and civilians alike. It had to look to the United States for programming, and many entertainers and agencies, like Jack Benny and NBC, stepped up to the plate. Following the Japanese attack on Pearl Harbor in 1941, this station was closed down, but reopened in 1943 as part of the Armed Forces Radio Services. The stations in Sitka (see **Photo A**) and Kodiak, Alaska, also opened in response to soldiers' need for recreation in spare time. KODK in Kodiak worked without interruptions despite many technical and logistical problems. It went on the air in October 1941 and was a great success.

Even these early stations aren't the earliest examples of military broadcasting that I'm aware of. That distinction goes to the shortwave transmissions beamed to the Philippines by KGEL in San Francisco, beginning in 1939 when it was the only source of news and information coming from America. The U.S. military set up a transmitter at Baatan and began rebroadcasting KGEL's programs. Dubbed "The Voice of Freedom," this transmitter was eventually moved to Corregidor. Unfortunately, it was then used solely for propaganda purposes, but "Voice of Freedom" was still a step in the right direction.

When the attack on Pearl Harbor resulted in the nation's entry into the war, the presence of American soldiers in remote areas of the world forced the War Department to take action to educate, entertain, and inform the troops in the field, and finally on May 26, 1942, the order creating the Armed Forces Radio Service (AFRS) was issued.



Photo A. KSKA, in Sitka, Alaska, a forerunner of today's AFRTS. (Department of Defense photo)

At first, AFRS had no transmitters of its own and had to borrow shortwave transmitters. It sought established stations outside the United States to carry AFRS programs, negotiating with foreign governments and commercial stations for such privileges. They also used what came to be known as "B kits" or "Buddy Kits," 16-inch turntables delivered with transcriptions of music and programs procured from commercial networks in the United States, as well as from various individual entertainers who continued to provide free programs.

AFRS grew into a viable professional radio network, spread throughout the world. At the height of World War II there were about 300 radio stations in the AFRS. Once the war ended, operations were scaled back, and by 1949, the number of stations had declined to about 60. The focus of the programming shifted to helping troops adjust to civilian life back in America. By 1950, AFRS had stopped producing its own programs.

## A Political Chill In The Air

As we know, this didn't last long, thanks to the Cold War between the United States and the Soviet Union, which at times flared up into proxy hot wars in places like Korea and Vietnam. In Korea, AFRS returned with the American soldiers. The Seoul station was located in the Banto Hotel (the old American Embassy Hotel). When the Chinese entered Seoul in December 1950, the crew moved to a mobile unit that was just completed and retreated to Taegu, Korea. There, in the mobile unit was the

birth of AFRS Kilroy. In the spring of 1951, additional mobile units were sent to Pusan, Seoul, and Chunchon. By May 1951, the situation had stabilized and the Seoul station was reestablished. With the large number of American soldiers stationed in Korea, many other stations were also started.

## Birth Of TV And AFRTS

With the coming of commercial TV, the nature of the media dictated that television focus on game shows and similar entertainment, while radio centered on news and music. The military's TV broadcasting began on an experimental basis at Limestone AFB in Maine. The results were quite encouraging, as TV proved to help boost the morale of the personnel and their families stationed there. Before long, TV became part of military broadcasting, and AFRS became Armed Forces Radio and Television Service (AFRTS) in 1954.

As the American military presence in Vietnam increased, AFRTS opened radio and, later on, TV stations there. One of

its purposes was, of course, to counter Radio Hanoi propaganda. Armed Forces Vietnam Network served around 500,000 at one time. Many of the programs AFRTS broadcast were produced internally, and a number of local disc jockeys helped make hour-long music programs for broadcast. The programs were uncensored, even including anti-war songs. AFRTS began to pull out of Vietnam in 1971. The last station to close was in Saigon in 1973.

Starting in 1968, AFRTS began to use satellites to transmit live news and sports broadcasts. In 1972, color TV took the place of black and white, and by 1982, AFRTS began using a worldwide satellite network, SATNET, to broadcast around the clock. When U.S. Marines were sent to maintain peace in war-torn Lebanon, AFRTS dispatched a mobile broadcasting unit to serve them, but the terrorist attack on Marine base in Lebanon in 1983 took AFRTS out of service.

Also during the 1980s, three mobile broadcasting stations were dispatched to support the large number of American soldiers stationed in Honduras. In 1989 when the U.S. invaded

## Glossary Of Utility Terms And Acronyms

**AFB**—Air Force Base

**ALE**—Automatic Link Establishment, a link control system that includes automatic scanning, selective calling, sounding, and channel selection, without human intervention using processor control.

**AM**—Amplitude Modulation

**ANDVT**—Advanced Narrowband Digital Voice Terminal, a secure voice mode used by the military.

**ATC**—Air Traffic Control

**CAMSLANT**—Communications Area Master Station Atlantic, the U.S. Coast Guard's primary HF radio station for the Atlantic region, located at Portsmouth, Virginia.

**CAMSPAC**—Communications Area Master Station Pacific, the U.S. Coast Guard's primary HF radio station for the Pacific region, located at Pt. Reyes, California.

**COMMSTA**—Communications Station, for example: COMMSTA Kodiak, a communications station of the U.S. Coast Guard, located at Kodiak, Alaska.

**CGAS**—Coast Guard Air Station

**Cut Numbers**—The use of letters in place of numbers when sending a long string of numbers, for brevity's sake. This is often done by "numbers" stations, such as sending one long dash instead of five normal dashes to indicate a zero, or the letter N instead of the number nine, etc.

**CW**—Continuous Wave (Morse code)

**DE**—The Morse code operating prosign DE, meaning "from," as in DE NMN, meaning from station NMN

**D-Layer Absorption**—A phenomenon where the sun's rays ionize the D layer of the atmosphere causing it to absorb, rather than propagate (reflect/bounce), radio signals at certain frequencies.

**Duplex**—A means of radio communication where a station can both transmit and receive at the same time.

**EAM**—Emergency Action Message, coded instructions commonly sent by U.S. military stations. Despite the name, they usually aren't emergency traffic at all.

**EHF**—Extremely High Frequency (30-300 GHz)

**FAX**—Facsimile, a transmission mode used to send maps, charts, and other non-textual material.

**FEMA**—Federal Emergency Management Agency, a part of the Department of Homeland Security.

**FM**—Frequency Modulation

**Ham Station**—A licensed station operating in the Amateur Radio Service under the control of an operator who is licensed to operate the station.

**HF**—High Frequency (3-30 MHz)

**LINK-11**—Also called TADIL-A for TActical DIgital Link, a secure digital data mode used by the military. Utilizes a 16-tone data modem to allow assets to share digital information, such as radar data.

**M/V**—Merchant Vessel

**NAS**—Naval Air Station

**Propagation**—The means by which radio signals get from one place to another; some forms are quite simple (such as line of sight) while others are much more complex (such as EME, or earth-moon-earth).

**QRM**—Man-made interference to radio signals

**QRN**—Natural interference to radio signals, such as the static crashes often heard due to thunderstorms

**QSO**—A contact between two or more stations

**QSY**—Change frequency.

**QTH**—Location

**RTTY**—Radio TeLeTYpe

**SELCAL**—SElective CALling, a method for activating a radio or data terminal at one station without disturbing other stations that are monitoring the same frequency.

**Simplex**—A means of radio communication where a station may transmit or receive at any given time, but not do both at the same time.

**SITOR**—Simplex Teletype Over Radio, a transmission mode used to transmit text messages over radio. There are two SITOR modes: SITOR-A (also called AMTOR) uses Automatic Repeat Request (ARQ); SITOR-B uses Forward Error Correction (FEC).

**SWL**—Shortwave Listener, a person who enjoys listening to shortwave radio stations.

**UHF**—Ultra-High Frequency (300-3000 MHz)

**USAF**—United States Air Force

**USB**—Upper Sideband

**USCG**—United States Coast Guard

**USMC**—United States Marine Corps

**USN**—United States Navy

**UTC**—Coordinated Universal Time, formerly known as Greenwich Mean Time, and also commonly referred to as ZULU time and abbreviated as in 1200Z.

**UTE**—Utility Station

**Utility Station**—Stations transmitting material that is not intended for reception by the general public and is not originating from an amateur (ham) station.

**VHF**—Very High Frequency (30-300 MHz)

**VOLMET**—Station that transmits aeronautical weather information. Comes from a French term that literally means, "flying weather."



Photo B. A modern AFRTS control room. (Department of Defense photo)

Panama, its ruler Manuel Noriega sought refuge in the Vatican Embassy. To drive him out, music was played outside the compound at an ear-splitting volume. The records, with tunes like "I Fought the Law" and "Nowhere to Run," came from AFRTS.

In 1990, when Iraq invaded and occupied Kuwait, thousands of American soldiers were sent to the Middle East. Mobile broadcast stations were sent to Dhahran and Riyadh, both in Saudi Arabia, and there eventually emerged the Armed Forces Desert Network with its headquarters in Kuwait. The stations were fed live news via satellite. Somalia, Haiti, Bosnia, Hungary, Macedonia, Croatia, and Kosovo are some of the other places where American military personnel were stationed and received AFRTS broadcasts.

Today, satellites employing digital compression technology send radio and TV signals to more than 400 outlets in over 150 countries. The Direct To Sailor (DTS) program helps send broadcasts to U.S. Navy ships at sea, and the single-channel SATNET has been replaced by three global satellite transponders that send live radio and television programs to ships at sea. **Photo B** shows a typical AFRTS broadcast control room of modern design—quite a difference from the service's origins as shown in Photo A. **Photo C** shows a modern U.S. Navy DTS control room.

Despite the advances in technology, however, shortwave radio remains one of the means of transmitting audio to ships without DTS capability. Shortwave also serves as a backup to DTS and is an option for land-based listeners in remote locations who do not have access to AFRTS local or SATNET services. As of now there are four locations from which

AFRTS audio is transmitted on shortwave. These are Diego Garcia (12759.0 kHz daytime, 4319.0 kHz nighttime), Guam (13362.0 daytime, 5765.0 kHz nighttime), Pearl Harbor (10320.0 kHz daytime, 6350.0 kHz nighttime), and Key West, Florida (12132.0, 7811.0, and 5446.5 kHz day and night). These transmissions are in the upper sideband (USB) mode, and are intended to operate 24/7, but are of course subject to disruption due to maintenance, as well as the usual effects of propagation and other atmospheric conditions.

### Readers Logs (And A Bit More)

This month, reader Spencer Sholly, KB5WQW, checked in with some loggings and a nifty shot (**Photo D**) of his listening post in Killeen, Texas. Spencer describes himself as a "cliff-dweller," aka a resident of a metropolitan apartment building, and his photo shows you a perfect example of how many cliff-dwellers deal with the issue of available space for radio use in apartments. Namely, if you can't spare a room or space for a large desk to keep radios on, you allocate a small table or two, set up your equipment there, and begin enjoying the hobby in spite of the location. Or perhaps *because* of the location—on VHF and UHF, location is everything, and if you're on the upper floors of an apartment building, the elevation above ground level works in your favor on those bands.

As you gaze at the photo of Spencer's station, give yourself 10 extra bonus points if you recognized the large HF receiver, as I did: That's the Sears version of the famous Yaesu FRG-7, which also sold in Europe under the Sommerkamp

label and uses Dr. Trevor Lloyd Wadley's triple-conversion loop (as first used in the RACAL RA-17), making it a *very* stable receiver indeed. This is why we *love* shack photos here! Spencer, many thanks!

We also welcome submissions of logs, story ideas, and sundry other neat stuff pertinent to utility station monitoring. Just send them to me at the email address that appears at the beginning of this column. Of course, with loggings it's best to use the standard logging format that we've used for over 20 years now, several good examples of which follow.

And now on with those logs, which this month come to us from Al Stern, Satellite Beach, FL (ALS); Steven Jones, Lexington, KY (SJ/KY); Glenn Valenta, Lakewood, CO (GV/CO); Mark Cleary, Charleston, SC (MC/SC); Spencer Sholly, Killeen, TX (SH/TX); Gordon Tuzinsky, Sterling Heights, MI (GT/MI); Kenneth Weindl, Southern Germany (KW/DE); and a few from your columnist, John Kasupski, Tonawanda, NY (JK/NY).

**518.0:** NMN with notices to mariners, in NAVTEX from 0148-0200Z. (GT/MI)

**2182.0:** British Coast Guard and RAF coast stations coordinating rescue with aircraft and ship in distress, in USB monitored at 2200Z. (KW/DE)

**2582.0:** ZBM, Bermuda Radio, St. Georges Harbour, Bermuda w/live male voice Maritime Safety Information BC in a very proper British accent, s/off w/ID "This is Bermuda Radio," in USB at 0445Z. (SJ/KY)

**2598.0:** VCG, Canadian CG, Riviere-au-Renard, Gaspé Peninsula, Quebec w/WX OBS in computer-generated male voice in English, s/off w/"This Is Riviere-au-Renard Radio, Out," in USB at 0448-0455Z. (SJ/KY)

**2872.0:** Gander Radio and Shanwick Radio working various airliners (Lufthansa flight, SPEEDBIRD 445, etc.) in USB from 0236 to 0330Z; same two stations heard again a few weeks later in USB monitored at 0420-0421Z. (ALS)

**2899.0:** Shanwick Radio wkg "Canforce 4119" for POSREP in USB at 0239Z; Gander and Shanwick wkg various airliners in USB at 0352Z; Santa Maria wkg airliners in USB heard at 0423Z. (ALS)

**2962.0:** Santa Maria ATC, Azores working AIR FRANCE 130 and LUFTHANSA 535 w/position updates, good signal, in USB at 0519Z. (SJ/KY)

**3016.0:** Santa Maria wkg Delta 100 in USB at 0138Z. (ALS)

**3131.0:** Unid stn sending what sounds like 75/850 RTTY but cannot decode, possibly NATO encrypted, in RTTY at 0656Z. (JK/NY)

**3137.0:** 255146 (C-17A, 535 AS/15 AW) sounding in ALE USB at 0521Z. (MC/SC)

**3320.5:** NNN0GBS and others in USN/USMC MARS net in USB at 0120Z. (MC/SC)



## Navy DTS Control Room

Photo C. A U.S. Navy Direct-To-Sailor (DTS) control room. (Department of Defense photo)

**3330.0:** CHU, Canadian Time Station, in USB at 0520Z. (SS/TX)

**3384.0:** Link-11 data transmission at 2347Z. (MC/SC)

**3413.0:** VOLMET station with WX reports for Hamburg, Frankfurt, in USB at 0201Z. (ALS) (This was surely Shannon VOLMET.—jk)

**3455.0:** DHL445 w/NY ARINC with status report then QSY 2887.0, in USB heard at 0331Z. (GV/CO)

**3455.0:** 0151Z New York Radio wkg numerous airliners (Air Transat 501, Martinair 636, N666TR, Speedbird 208, Air Transat 516, Air Transat 563, United 873, Sunwing 411) in USB from 0151Z to 0401Z; New York wkg JetBlue 739 who gives for position report at BURTT, then requests phone patch to Medlink and is handed off to 6640.0, in USB heard at 0732Z. (ALS)

**3476.0:** Gander Radio working several unheard A/C in USB at 0349Z. (GV/CO)

**3485.0:** NEW YORK VOLMET broadcast in USB at 2306Z. (MC/SC)

**3924.0:** Unid YL/SS number station, 5-number groups, in AM at 0440Z. (SS/TX)

**4003.0:** AAM4TN and AAA4TN in USA MARS Tennessee Net in LSB monitored at 0013Z. (MC/SC)

**4012.0:** AAT9CV and others in MARS net, informal, discussing email exchange software, in USB at 0400Z. (GV/CO)

**4021.5:** TIZ244 (1-244th AVN, LA ARNG) sounding in ALE USB. Also on 5778.5 and 4790 kHz, in USB ALE at 1140Z. (MC/SC)

**4026.9:** AAR4FW, AAV4TY, and AAT4BC in USA MARS Region 4 Net, in USB at 2353Z. (MC/SC)

**4038.5:** NNN01CX and others in USN/USMC MARS Net, in USB at 2348Z. (MC/SC)

**4045.0:** Caribbean WX Net, in USB at 1112Z. (MC/SC)

**4112.85:** "FL" low power beacon in CW at 0955Z. (SJ/KY)

**4170.5:** IDR, Italian Navy, Rome, Italy w/idle frequency marker "///IDR3I(0)/IDR2I(0)/IDR5I(0)/" and occasional traffic WAIT, UNREADABLE, RECEIVED, in ITA2 75/850 RTTY at 0020Z. (SJ/KY)

**4200.0:** Unid. OM and YL in extended simplex QSO in Spanish, possibly political in content, mentioned "embargo," Caracas, "Colombiano" and Washington, in USB at 0437-0500Z. (SJ/KY)

**4207.5:** NMN, USCG CAMSLANT, Chesapeake, VA w/idle frequency marker keyed up via remote operation on wrong frequency, booming signal strength, in CW and SITOR-A at 0003Z. (SJ/KY)

**4207.7:** NMG, USCG, New Orleans, LA w/24 and 48-hour wind/wave forecast charts, operated remotely on wrong frequency, parallel to standard 4317.9 kHz, in FAX at 0035-0055. (SJ/KY)

**4209.5:** TAH, Istanbul R., Turkey w/ "DENIZCILERE" Navigation Notices, ID as "ISTANBUL TURK RADIYO," coordinates and light buoy info, regular 4216.0 kHz CW/SITOR-A idle frequency marker transmitter silent and apparently switched to this frequency for the BC, followed by idle marker here, in SITOR-B then CW/SITOR-A from 0215-0310Z. (SJ/KY)

**4316.0:** NMN CAMSLANT with "Iron Mike" high seas WX broadcast in USB at 1118Z. (MC/SC) (Note that this is actually NMG being remoted from NMN—jk)

**4316.0:** Automated Maritime WX (NMN), gave phone number of 1-800-742-5819 for comment submission, in USB at 0415Z. (SS/TX) (See note above.—jk)

**4322.0** MGJ, Royal Navy, Faslane, Scotland, GB w/idle watch frequency marker "02C 02K 03F 04B 04H 06G 08A 12B 12E 16A MGJ" in ITA2 75/850 RTTY monitored at 2350Z. (SJ/KY)

**4356.0:** Unid. stations w/several Advanced Narrowband Digital Voice Terminal transmissions, in ANDVT at 2315. (SJ/KY)

**4369.0:** WLO with automated maritime WX and t/c for vessel *Richmond II* in USB at 0525Z. (SS/TX)

**4372.0:** Q0B, female calling any station in English, 3JS male responded, both on top of strong carrier on frequency, in USB plus occasional tones and data bursts at 2344Z. (SJ/KY)

**4469.0:** HEAD CAP 210, FLORIDA CAP 251, and FLORIDA CAP 740 in Civil Air Patrol Florida Net, in USB at 1146Z. (MC/SC)

**4500.0:** AFA2BT, AFA2QB, West Virginia, AFA2PN in USAF MARS "2SI Net" in USB at 0030Z. (MC/SC)

**4530.0:** Link-11 data transmission at 1304Z. (MC/SC)

**4585.0:** SAND LAPPER 12 in South Carolina CAP net in USB at 0003Z. (MC/SC)

**4593.5:** AFA1NF and AFA1BQ in USAF MARS "ISI Net" in USB at 0000Z. (MC/SC)

**4620.0:** Link-11 data transmission at 1353Z. (MC/SC)

**4721.0:** 160025 (C-5M) sounding in ALE USB at 1550Z. (MC/SC)

**4772.0:** Link-11 data transmission at 0124Z. (MC/SC)

**4865.0:** Link-11 data transmission at 0028Z. (MC/SC)

**4924.5:** HQ703N (National Guard Bureau HQ) c/g 1050NN (Indiana National Guard) in ALE USB followed by HF modem transmission at 1111Z. (MC/SC)

**5071.0:** Link-11 data transmission at 0151Z. (MC/SC)

**5150.0:** Navy MARS net, NNN0ENS (Net Control), NNN0AOF, NNN0FWN, in USB at 1440Z. (SS/TX)

**5171.0:** Link-11 data transmission at 0124Z. (MC/SC)

**5344.0:** Encrypted RTTY, possibly KG84, fair sig w/some QSB, in RTTY at 0214Z. (JK/NY)

**5520.0:** New York Radio advising unid a/c to contact Shanwick on freq 5598.0 upon reaching position 40 West, in USB at 0307Z. (ALS)

**5550.0:** New York Radio working various airliners (American 56, Cubana 400, Sunwing 411, Delta 121, Speedbird 208, Martinair 640, others) in USB from 0135Z-0326Z. (ALS)

**5574.0:** San Francisco Radio wkg various flights in USB at 0751Z. (ALS)

**5598.0:** New York Radio working flight for SELCAL check, in USB at 0136Z. (ALS)

**5616.0:** Gander Radio handing off a flight to Shanwick's 3016.0 freq. in USB at 0256Z; Shanwick working various aircraft (US Air 706, Continental 126, REACH 0837, Northwest 50) in USB from 0658Z to 0717Z. (ALS)

**5732.0:** 29C reporting to PANTHER they are on scene with cruise ship, in USB at 2354Z. (MC/SC)

**5732.0:** CG 2301 (HC-144A, ATC

Mobile) position report to CAMSLANT in USB at 0137Z. (MC/SC)

**5732.0:** LGV (USCGC LEGARE WMEC 912) sounding in ALE USB at 1321Z. (MC/SC)

**5778.5:** R26604 (UH-60L) clg T1Z244 (1-244th AVN, LA ARNG) in ALE USB at 2031Z. (MC/SC)

**6254.0:** Link-11 data transmission at 0205Z. (MC/SC)

**6316.0:** Final transmissions of NMN. USCG CAMSLANT, Chesapeake, VA as the Coast Guard begins to shut down its AMVER and OBS operations, in CW and SITOR-A at 0746Z. (SJ/KY)

**6535.0:** Dakar ATC, Senegal, female controller working several aircraft in USB at 0135-0158Z. P4-FSH, BOEING 777SP operated by Ernest Angley Ministries calling Abidjan ATC, Ivory Coast in USB at 0143Z. (SJ/KY)

**6555.0:** Unid (presumed boaters) with overlapping chit-chat and many colorful metaphors, in USB at 0559Z. (GV/CO)

**6586.0:** New York Radio working various aircraft for routing changes, POSREPS, SELCAL checks, etc. in USB from 0142Z-0023Z. (ALS)

**6604.0:** NEW YORK VOLMET broadcast in USB at 2308Z. (MC/SC)

**6604.0:** New York VOLMET with aviation WX for Indianapolis, St. Louis, Atlantic City, in USB at 0238Z; Gander Volmet with WX at Edmonton, Calgary, etc. in USB at 1025Z. (ALS)

**6628.0:** New York Radio working Lufthansa 535 and handing off to Santa Maria on 2962.0, in USB at 0302Z. (ALS)

**6640.0:** New York Radio w/kg Jet Blue 739 for phone patch to Medlink: reports en route from JFK IAP to PSE in Ponce, Puerto Rico, with an ETA of 1000Z; female passenger w/anxiety problem: they administer Xanax, in USB heard at 0735Z. (ALS)

**6649.0:** DAKAR OAC w/kg KHALIB792, in USB at 0243Z. (GV/CO)

**6679.0:** Auckland Volmet w/good levels in USB at 0552Z. (GV/CO)

**6721.0:** 523543 (KC-135R, 459 ARW) sounding in ALE USB at 1543Z. (MC/SC)

**6754.0:** Trenton VOLMET broadcast in USB at 2345Z. (MC/SC)

**6760.0:** Link-11 data transmission at 2234Z. (MC/SC)

**6910.0:** R503 clg T1Z285 (1-285th AVN, AZ ARNG) in ALE USB at 1745Z. (MC/SC)

**6911.5:** HAF (Hunter AAF) clg 835746 (MH-47G, 3-160 SOAR) in ALE USB at 1824Z. (MC/SC)

**6942.0:** Link-11 data transmission at 1437Z. (MC/SC)

**6947.0:** Link-11 data transmission at 2031Z. (MC/SC)

**7394.0:** Link-11 data transmission at 1333Z. (MC/SC)

**7527.0:** Multiple unid. MARS stations in digital net on DSH freq, in MFSK-16 at 0050Z. (JK/NY)

**7535.0:** VMW, Wiluna Meteo, Western



*Photo D. Spencer Sholly, KB5WQW, of Killeen, Texas, kindly shares this shack photo with us. Recognize the HF RCVR at left? (KB5WQW photo)*

Australia w/500 hPa (*hectopascals, a measurement unit for pressure—ed.*) prognosis chart for South Pole region, parallel 10555.0 kHz slightly weaker, nothing heard on 5755.0, 15615.0 and 18060.0 parallel frequencies, decent signal for a 1 kW TX over 10,000 miles away, in FAX at 2231-2245Z. (SJ/KY)

**7650.0:** T1Z137 (1-137th AVN, OH ARNG) clg R491 in ALE USB at 2316Z. (MC/SC)

**7690.0:** Link-11 data transmission at 2202Z. (MC/SC)

**8020.0:** Two unid. males in casual simplex QSO in Arabic, USB at 0530Z. (SJ/KY)

**8047.0:** HQ703N (National Guard Bureau) clg LAC62NG (62nd WMD-CST, LA ARNG) in ALE USB at 1921Z. (MC/SC)

**8089.7:** Egyptian Embassy in Washington, D.C. w/extended traffic in ATU-80 Arabic, included mention of a named female w/address and phone number, date of birth and dates for visa issuance and expiration, message signed by Ambassador Nabil Fahami, in SITOR-A from 2040-2102Z. (SJ/KY)

**8094.0:** Unid. station using keyer for handset traffic, irregular speed w/lots of AR and cut numbers, doesn't sound like the Cubans, in CW at 1920-1934Z. (SJ/KY)

**8137.0:** Two YL, 1 OM, in casual simplex QSO in EE, presumed yachts, in USB at 2143Z. (SJ/KY)

**8143.5:** Unid. w/machine-sent full letters and numbers, very weak, in CW at 2220. (SJ/KY)

**8152.0:** Presumed yachts *TUMBLEWEED*, *SAINT JUDE* and *SEA LANGUAGE* in casual simplex net QSO in EE re: computer software problems, mentioned XNet email service, one vessel gave position near Dominica, in USB w/good signals at 2235Z;

*DESTINY*, *WINDRIDER*, *BRAVEHEART*, *SAINT JUDE*, *MON AMI* and *DAQUIRI* another day in casual simplex net in USB at 2144Z. (SJ/KY)

**8156.0:** Bahamas SDF base passing instructions to vessel to patrol two areas, in USB at 1620Z. (MC/SC)

**8177.0:** Link-11 data transmission at 1700Z. (MC/SC)

**8294.0:** Two unid. OM in extended casual simplex QSO in Russian, laughing, one mentioned "security alarm" in English, good signals, in USB at 0040Z. (SJ/KY)

**8294.0:** Maritime vessel identifying as *LIBERTY* in QSO with another vessel (unid.) in EE, with QRM from Spanish fishermen, in USB at 0236Z. (GV/CO)

**8310.0:** Link-11 data transmission at 1944Z. (MC/SC)

**8337.6:** SHARK 26 (USCGC DEPENDABLE WMEC 626) in comms with aircraft in USB at 2358Z. (MC/SC)

**8379.0:** HBFF, *ST-CERGUE*, 39,384-ton Switzerland-registered container ship w/AMVER/SP heard 5 days after Panama Canal transit for departure this time from Kingston, Jamaica, included 3 route legs passing south of Cayman Islands and around western tip of Cuba, arrive in Mobile, AL, in 2 days, in SITOR-A at 0601Z; V7IM5, *BALDER*, 48,184-ton Marshall Islands-registered self-discharging bulk carrier w/open text test msg in SITOR-A at 1320Z. PJSM, *MARONI*, 38,565-ton Netherlands Antilles-registered oil products tanker w/unlisted MMSI 306764000 and callsign in SITOR-A at 2014Z. (SJ/KY)

**8380.5:** Unid. vessel w/SELCAL MCQV (4620) for 9VG, Singapore R. in SITOR-A at 0300Z. (SJ/KY)

**8386.0:** 3FVN4, *CENTURY HIGHWAY NO. 5*, 15,380-ton Panama-registered vehicles carrier w/AMVER/PR and abbreviated ID "CENT," 300 miles west of Costa Rica and en route to Irago Pilot Station, Japan, at 21.0 knots, vessel heard several months ago and caught on Panama Canal webcam initiating transit toward the Atlantic but headed to Japan this time to arrive in 17 days, in SITOR-A at 0210Z. (SJ/KY)

**8388.0:** C6RX7, *OVERSEAS SAKURA* (former *SAKURA I*), 296,000-ton Bahamas-registered very large crude carrier w/AMVER/PR 350 miles SSE of New Orleans and sailing NNW toward SW Pass, LA, arrive in 2 days, unlisted MMSI 311225000 and abbreviated ID "SKUR," in SITOR-A at 1900Z. (SJ/KY)

**8414.5:** NMN, USCG CAMSLANT, Chesapeake, VA, keyed up on wrong frequency, this frequency is used only for GMDSS DSC traffic, regular watch frequency 8428.0 kHz breaking up and transmitting only "HL," in CW/SITOR-A at 2045Z. (SJ/KY)

**8424.0:** SVO4, Olympia R., Athens, Greece w/Hellenic National Meteorological Service WX OBS in English from 2130 in SITOR-B until 2140 s/off w/Olympia Radio ID and then into standard CW/SITOR-A idle marker. (SJ/KY)

**8425.5:** NMO, USCG, Honolulu, Hawaii, keyed up via remote operation on wrong frequency, regular transmit frequency 8429.5

kHz silent, in CW+SITOR-A at 0445Z. Same the next night at 0340Z. (SJ/KY)

**8484.5:** HEB, Berne R., Switzerland w/idle frequency marker, occasional ID of "CQ DE HEB," in CW/PACTOR-3 at 2102Z. (SJ/KY)

**8495.0:** Two unid. OM in casual simplex QSO in Russian, excellent signals for both, in USB at 2250Z. (SJ/KY)

**8843.0:** San Francisco Radio working Hawaiian Airlines flight for POSREP in USB at 0409Z. (ALS)

**8891.0:** Gander Radio working UNITED 9942, extreme long path echo as strong as shortpath signal, in USB at 0214Z. (GV/CO)

**8912.0:** CAMSLANT wkg JULIET 42 (MH-60J, CGAS Clearwater) in USB at 1705Z. (MC/SC)

**8918.0:** New York Radio wkg Iberia 6123 in USB at 1919Z. (ALS)

**8933.0:** Aircraft N455DS asking New York Radio for a radio check, said location was Georgia, in USB at 0330Z. (GV/CO)

**8971.0:** RED TALON 711 (P-3C) clg/wkg FIDDLE, in USB followed by ANDVT at 1430Z. (MC/SC)

**8983.0:** CG 2121 (HU-25, ATC Mobile) declaring emergency for gear problem, will circle and burn fuel before landing at Purdue University Airport, in USB at 1659Z. (MC/SC)

**8983.0:** USCG "CAMSLANT-Chesapeake" wkg CG-2127 (HU-25A Falcon, ATC

Mobile) reports on approach at HOME-PLATE (ATC-Mobile), rjsts guard secured, in USB at 2006Z. (ALS)

**8983.0:** USCG "CAMSLANT-Chesapeake" wkg CG-2112 (HU-25C+, CGAS Cape Cod) for POSREP in USB at 1707Z: CAMSLANT wkg CG-1701 (HC-130H7, CGAS Clearwater, Florida), assumes guard, secondary freq 5696, in USB at 1610Z: CAMSLANT CG-2133 (HU-25C+, CGAS Cape Cod) for POSREP in USB at 1709Z. (ALS)

**8992.0:** Andrews HF-GCS with a SKYKING "Foxtrot" in USB at 0151Z. (GV/CO)

**9005.0:** Link-11 data transmission at 0205Z. (MC/SC)

**9025.0:** One or more unid. stations w/on and off unmodulated carrier ranging from weak to very strong in signal strength, on for 1 second each time at several second intervals, same on 9050.0 kHz, starting at 2126Z, both stopped at 2140Z. (SJ/KY)

**9056.7:** Egyptian embassy or consulate w/brief traffic, another shortly afterwards on 9123.7 kHz, in SITOR-A at 2304Z. (SJ/KY)

**9123.7:** Egyptian embassies or consulates w/two stations transmitting at the same time, duplexing on a single frequency, in SITOR-A at 2307-2336Z. (SJ/KY)

**9259.0:** Link-11 data transmission at 1352Z. (MC/SC)

**9353.0:** Possible Cuban ENIGMA M8a w/cut numbers, weak signal, in CW at 1410Z. (SJ/KY)



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**10051.0:** NEW YORK VOLMET broadcast, in USB at 2308Z. (MC/SC)

**10100.8:** DDK9 (Marine Weather Service, Hamburg, Germany) w/clear text WX observations for the North and Baltic Seas in English, parallel to about equal DDH9 on 11039.0 kHz, in ITA2 50/425 RTTY at 2040Z. (SJ/KY)

**10188.0:** Link-11 data transmission at 2203Z. (MC/SC)

**10993.6:** ANDVT followed by SHARK 13 (USCGC MOHAWK WMEC 913) requesting aircraft 08 remain in orbit over TOI, in USB at 1802Z. (MC/SC)

**11175.0:** SKULL 25 (B-52H) p/p via McClellan HF-GCS to BLUE OPS at Barksdale AFB, in USB at 1553Z. (MC/SC)

**11175.0:** HF-GCS station PUERTO RICO wkg TUFF 01 (Barksdale AFB 2BW B-52H) for radio check in USB at 1820Z; PUERTO RICO wkg OMNI 03 for radio check in USB at 1619Z; PUERTO RICO wkg acft for phone patch to DSN number for Hilda TACC (Scott AFB) re: maintenance problems: cargo has been loaded, reqsts departure to McGuire AFB, in USB at 1955Z. (ALS)

**11175.0:** PUERTO RICO wkg ASCOT 7064 (RAF AWACS E-3) for phone patch to US Metro station for WX at LPLA (Lajes, Azores), LPAZ (Santa Maria IAP, Azores, Portugal), GCLP (Gran Canaria, Canary Islands), GVNP (Praia IAP, Cape Verde), and SBRF (Guararapes, Brazil), in USB heard at 1152Z. (ALS)

**11175.0:** HF-GCS station OFFUTT wkg AIRCRAFT 4633 for radio check in USB at 1825Z; OFFUTT wkg REACH 001, OFFUTT hears acft well, but is not heard by REACH 001, in USB at 1530Z; OFFUTT wkg "Aircraft 289" for phone patch to DSN number at Brunswick NAS, poss ID'd as an Echo 6 (E-6), tail #289, in USB at 1558Z. (ALS)

**11175.0:** Unid. HF-GCS station wkg REACH 171, over South America, in USB at 0122Z. (ALS)

**11175.0:** HF-GCS station MMCCLELLAN wkg TUFF 12 (B-52H, Barksdale AFB 2BW) for radio check in USB at 1753Z; FIVE STAR (non-static USN TACAMO call sign) via MCCLELLAN, p/p to "RECEIVERS" (Offutt AFB GEP controller alias) for order-wire coordination, in USB at 1832Z. (ALS)

**11175.0:** CABINET (U.S. MIL) w/28-char, EAM in USB at 1845Z. (ALS)

**11175.0:** REACH 459 responds to another acft's rqst for radio check; 459 says they are in Martinsburg, WV, and also have been unable to get a radio check on 11175, in USB at 1755Z. (ALS)

**11175.0:** HF-GCS station ANDREWS wkg HOIST 92 (KC-10A, McGuire AFB 305AMW) for p/p Hilda Metro (Scott AFB); rqsts WX for McGuire at 1920Z; Andrews QSYs comms to freq 13200, in USB at 1801Z; ANDREWS wkg REACH 7043 (self-ID as C-5B #87-0043) for phone patch to DSN number for Ft. Worth NAS Base Ops, reports ETA of 2040Z, in USB at 1821Z; ANDREWS w/28-char, EAM in USB at 1547Z. (ALS)

**11232.0:** "Trenton Military" wkg PELICAN 712 (probable USN P-3—jk) for p/p to DSN number at Jacksonville NAS TSC, in USB at 1818Z; "Trenton Military" wkg PEACH 88 (JSTARS E-8C, Robins AFB GA-ANG 116ACW) for phone patch to "Peachtree Ops" at Robins AFB; passes formatted message, Peachtree informs: "Tanker can give you up to 12k pound fuel if required." In USB at 1533Z. (ALS)

**11253.0:** RAF VOLMET reciting WX for various locations, in USB heard at 1725Z. (ALS)

**11282.0:** San Francisco ARINC working WESTERN 923, many other AC also heard, in USB at 0119Z. (GV/CO)

**11330.0:** New York Radio wkg American 976 for POSREP in USB at 1805Z; New York wkg American 1416 for POSREP in USB at 1809Z. (ALS)

**11387.0:** Sydney (Australia) VOLMET, WX for Melbourne, etc., in USB at 1030Z. (ALS)

**11740.0:** Link-11 data transmission at 2212Z. (MC/SC)

**12133.5:** AFRTN with good levels, heterodyne on signal from unid. source, in USB at 0105Z. (GV/CO)

**12353.0:** WBN7618, *EXPLORER*, U.S.-registered towing vessel w/standard traffic for Vicky at WPE, Crowley Maritime, Jacksonville, FL, in USB at 1711Z. (SJ/KY)

**12479.0:** KIRH, *HORIZON TRADER*, 31,495-ton U.S.-registered container ship w/callsign in SITOR-A at 1510Z; CBAB, ALAMO, 25,438-ton Chile-registered bulk carrier w/AMVER/PR, off Colombia coast 50 miles WNW from Baranquilla and en route to Puerto Cabello, Venezuela, arrive in 2 days, in SITOR-A at 1630Z; vessel heard again this frequency w/AMVER/PR 11 days later 25 miles ESE of the Cayman Islands and en route on course 299 around Cuba at 13 knots toward Tampa Bay, FL, arrive in 2 days, in SITOR-A at 1613Z; VRY14, *GENCO PIONEER*, 29,952-ton Hong Kong-registered bulk carrier w/MMSI and abbreviated ID "GPNR" twice in SITOR-A at 1835Z; HBFS, *GENERAL GUIBAN*, 73,035-ton Switzerland-registered bulk carrier w/AMVER/PR and abbreviated ID "GGU1," 210 miles ENE of Norfolk, VA en route to Nordenham, Germany, to arrive in 11 days, in SITOR-A at 1845Z; HBFF, *ST-CERGUE*, 39,384-ton Switzerland-registered container ship w/AMVER/PR for arrival at Balboa, Panama to initiate canal transit toward the Atlantic, vessel Master sent email QSL for report 13 months ago, heard again 5 days later on 8379.0 kHz, in SITOR-A at 1900Z. (SJ/KY)

**12482.0:** PJVV, *YACHT EXPRESS*, 12,500-ton Netherlands Antilles-registered semi-submersible heavy lift cargo ship w/callsign and TEST request in SITOR-A at 2020Z. (SJ/KY)

**12486.5:** 3EIH7, *CORONA LIONS*, 85,600-ton Panama-registered bulk carrier w/AMVER/PR, position data garbled but destination was Matsuura, Japan, online info showed departure from Vancouver, BC,

Canada, a day earlier w/load of coal, in SITOR-A at 1930Z; H9GC, *AQUA BLUE*, 13,324-ton Panama-registered Ro-Ro cargo ship w/weak AMVER/PR to NMO, USCG Honolulu, only caught vessel name, in SITOR-A at 2217Z. (SJ/KY)

**12490.0:** 3ENZ7, *F.D. JACQUES GRAUBART*, 76,588-ton Panama-registered bulk carrier w/AMVER/PR, course and speed data entered on wrong lines, 900 miles east of Wilmington, NC, en route to Cape Henry, VA, arrive in 3 days, in SITOR-A at 1515Z; A8HG5, *CHEMTRANS SKY*, 63,381-ton Liberia-registered crude oil tanker w/open text GMDSS equipment test request, abbreviated ID "CSKY" and unlisted MMSI 636090885, in SITOR-A at 1547Z; A8IR3, *HELLESPONT PROSPERIT*, 73,630-ton Liberia-registered Panamax-class oil products tanker w/AMVER/PR, MMSI and abbreviated ID "PROS," just off the southern tip of Greenland en route to Amsterdam, Netherlands, in SITOR-A at 1618Z; HPNV, *HUGO N*, 46,486-ton Panama-registered LPG tanker w/BBXX format WX OBS, MMSI and callsign, 25 miles south of Key West, FL, in SITOR-A at 1642Z. (SJ/KY)

**12510.5:** H9YP, *LONG BEACH BRIDGE*, 67,164-ton Panama-registered container ship w/SELCAL QVXY (2017) for XSQ, Guangzhou R., China on paired frequency 12613.0 kHz, repeated MMSI and abbreviated ID "LGBB" several times, coast station not heard, in SITOR-A at 2254Z. (SJ/KY)

**12590.5:** KLB, Seattle Marine R., Marysville, WA w/fair idle frequency marker heard for first time in CW/SITOR-A at 2315Z. (SJ/KY)

**13200.0:** HF-GCS station ANDREWS calling HOIST 92 (KC-10A, McGuire AFB 305AMW) after QSY from 11175; HOIST 92 does not respond, in USB at 1809Z. (ALS)

**13206.0:** Link-11 data transmission at 1706Z. (MC/SC)

**13225.5:** Unid. strong carrier w/minimal fading from 1902 to s/off w/out modulation at 1953Z. (SJ/KY)

**13342.0:** Stockholm R. ATC, Sweden working unid. aircraft for position, strong British accent, in USB at 1646Z. (SJ/KY)

**13927.0:** SENTRY 50 (E-3 AWACS) morale p/p via AFN2AC, Miami, in USB at 1706Z. (MC/SC)

**13927.0:** USAF MARS Operator AFAIEN (Shelbyville, IN) wkg DARK 11 (Dyess AFB B-1B) for p/p to DSN number for Dyess Base Ops; asks for WX at Dyess, in USB at 2001Z. (ALS)

**13927.0:** USAF MARS Operator AFA4DD wkg TEAL 25 (WC-130, Keesler AFB 53WRS) for p/p to DSN number for Keesler AFB "Teal Ops"; reports inbound St Croix, Virgin Islands (TISX); rqsts phone number and freq to contact Ops at St Croix; is passed freq 123.0 and a cell phone number, in USB at 1911Z. (ALS)

**13927.0:** USAF MARS Operator wkg ROCCO 73 (KC-135, McGuire AFB) for p/p to PEACHTREE (Robins AFB), passes ETA

1735 Local, then obtains phone patches to DSN number for Dyess Base Ops and a commercial number in 325 area code, in USB at 1925Z. (ALS)

**13927.0:** USAF MARS Operator AFA1QW (Greenwood, IN) wkg GATOR 59 (T-43A, Randolph AFB 12FTW) for p/p to DSN number for Randolph AFB "Gator Ops"; gets landing conditions, in USB at 1655Z; AFA1QW wkg REACH 5156 for p/p to unid base, passes ETA 1836Z, needs Customs, verifies 123.5 base freq, in USB at 1717Z. (ALS)

**13927.0:** USAF MARS Operator AFA6PF (Los Angeles) wkg PACK 91 (Pease KC-135R) for p/p to Copper Operations, Sky Harbor Airport, AZ, reports inbound with three crew and two crew chiefs; advises "We are bringing 63-8038 and we will be picking up one of your acft there" (sounds like a plane swap), in USB at 1748Z. (ALS)

**13927.0:** USAF MARS Operator AFA6PF (Los Angeles) wkg DAWG 05 (C-130, GA-ANG 165AW, Savannah IAP) for pp/p to Savannah Ops, passes ETA, in USB at 1810Z. (ALS)

**13927.0:** USAF MARS Operator AFA3HS (Leawood KS) wkg DAWG 05 (C-130, GA-ANG 165AW, Savannah IAP, GA) for p/p with CP, which advises DAWG 05's freq 225.75 given to AFRCC to pass along to the Coast Guard, in USB at 1558Z; AFA3HS wkg REACH 9025 (C-5A, Memphis, TN ANG 164AW) for two M&W phone patches, in USB at 1541Z. (ALS)

**13927.0:** USAF MARS Operator AGA2PA (Patrick AFB) wkg SKIER 95 (LC-130H #92-1095, NY-ANG 109AG, 139AS) for phone patch to DSN number for "Skier Ops" at Stratton ANGB, NY, reports inbound with 40 pax with 1746Z ETA, in USB at 1617Z. (ALS)

**13927.0:** USAF MARS Operator AFA2XZ (Salt Springs, FL) wkg REACH 5143 (March JARB 452AMW C-17A #05-5143) for two M&W phone patches, in USB at 2128Z. (ALS)

**14300.0:** 6Y5RP, Jamaica in Intercontinental Traffic Network, in USB at 1530Z. (MC/SC)

**15016.0:** XPH, USAF, Thule AFB, Greenland, male w/alphanumeric EAM, parallel to 11175.0 and 13200.0 kHz, in USB at 1810Z. (SJ/KY)

**15920.0:** CFH, Canadian Forces in Halifax, Nova Scotia w/modified watch frequency marker "NAWS DE CFH ZKR F1 2822 3394 4158 6254 8303 12377 AR," two usual frequencies in the 16 and 22 MHz maritime bands dropped, booming signal strength, in ITA2 75/850 RTTY at 1720Z. (SJ/KY)

**16809.0:** IAR, Rome R., Italy w/weak idle frequency marker on unlisted frequency, regular marker on 16820.0 kHz also active and a bit stronger, in CW/SITOR-A at 1943Z. (SJ/KY)

**19700.0:** Two unid. males in casual simplex QSO in Portuguese, USB heard at 2205Z. (SJ/KY)

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## A 26-Year-Old SOS?

No, I haven't been sleeping on watch. At least, not for 26 years—I don't think even Rip Van Winkle slept that long, did he? But my thoughts as I write this stem from a column from a few months back that dealt with some not-so-old-time radio—some of the wonderful memories I stirred up from the mid-'60s in New York City while I stood late-night gangway watches on the US Coast Guard Cutter *Mackinac* and later on the *Dallas*.

That column stirred more of you to write than any other I've written over the past decade or so (and thanks for all the great emails!), so I will take that to mean that a lot of you enjoy "Old-Time Radio," whether "Old-Time" means going all the way back to Baby Snooks, or back just about a half-century to Jean Shepherd.

Shepherd was an icon to radio—in some ways, no less than Marconi or Maxim. Here was a man who continuously annoyed station management by playing his kazoo and nose-flute along with whatever music accompanied the commercials aired during his show, and he seemed to always make a mockery ("...speaking of mockery, this is WOR AM and FM in New York...") of absolutely every station ID.

And when "Shep" went home from doing radio, he did some more radio. He was K2ORS on the amateur bands and not only enjoyed working friends and strangers on the ham bands, he also did quite a bit of PR for amateur radio at events like the Dayton HamVention.

It's certainly no secret that I love radio, and that includes the very old Old-Time Radio and the more recent "Old-Time Radio" that includes Jean Shepherd and his contemporaries, most of whom are all pretty much history with the possible exception of Bob Grant.

Now that talk radio is about 98 percent politics and 2 percent sports, there is no place (at least no place I've found so far) where I can hear the kind of late night talk radio that covered the waterfront while I spent time in New York City. Probably a half-dozen great minds annoyed the living day-lights out of station management at some of the best AM broadcast stations in New York with topics that kept a person's mind wide awake into the wee hours of each morning—ranging from the serious to the absolutely silly.

Just as you can find dedicated people producing shows which re-broadcast the true Old-Time Radio from Phil Harris and Jack Benny, "The Great Gildersleve" and "The Shadow," so can you find (if you look *really hard*) a lone voice replaying just a bit of that brilliant talk from the New York AM broadcast band in the '60s. That voice is Max Schmid (say *Shmeed!*), and you've got to either stay up really late or get up really early to hear him replay some of the great Jean Shepherd shows at 5:15 a.m. each Tuesday morning on WBAI-FM, 99.5 in New York. Those of you who, like me, live in Cowfield County or beyond, can find Max (and Jean) on the Web.

I was once given a CD-ROM with about 50 hours of Jean Shepherd's WOR programs in MP3 format, and if that CD had

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***"I ended up with about 600 hours of Jean Shepherd broadcasts on DVD-ROM. It's still not enough, but it's a start."***

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grooves, I'd have long since worn them out. Since I've heard them so often they're just about memorized, I went seeking more. A little Googling led me to websites selling lots of just what I'm looking for, and most of it for very reasonable prices, too. A person could spend all day and all night browsing the offerings of "Air Checks" and other recordings from the very earliest days of broadcast radio to the much more recent shows. I ended up with about 600 hours of Jean Shepherd broadcasts on DVD-ROM. It's still not enough, but it's a start.

Among all the emails I received about that column was one from a very special person—the former Chief Radioman from the USCGC *Dallas*, who will maintain some anonymity by being called "Chief Bob." Yes, he is the same Chief Radioman who tolerated my antics (and those of a handful of other radiomen) during my tour of duty on that ship. Along with some reminiscences and catching up, he recently sent me an audio file of an SOS (yes, Virginia, there really are such things—at least there were before CW was given its last rites in maritime operation) and the follow-up communication from an event back in the '80s. It's an extremely rare bit of communication history.

Within two days of the first time I ever sat a radio watch aboard a Coast Guard ship, I copied my first SOS. Our Skipper took us into the eye of hurricane Inez in the straits of Florida to help a ship that had lost all power. In all the hundreds of hours I stood watch in the Coast Guard since then, I never worked another SOS, so I can tell you that getting this audio file to listen to a few times on some quiet late nights will be a really big deal for me. Thanks, Chief.

And for all of you to whom an SOS in static-backed CW is not exactly music to your ears, if you can't find a local station playing some Old-Time Radio, then you can likely find a few dozen of them online to listen to. "Streaming" doesn't do so well on my dial-up connection, but you can download them for later, or find a good source of recorded shows like I have.

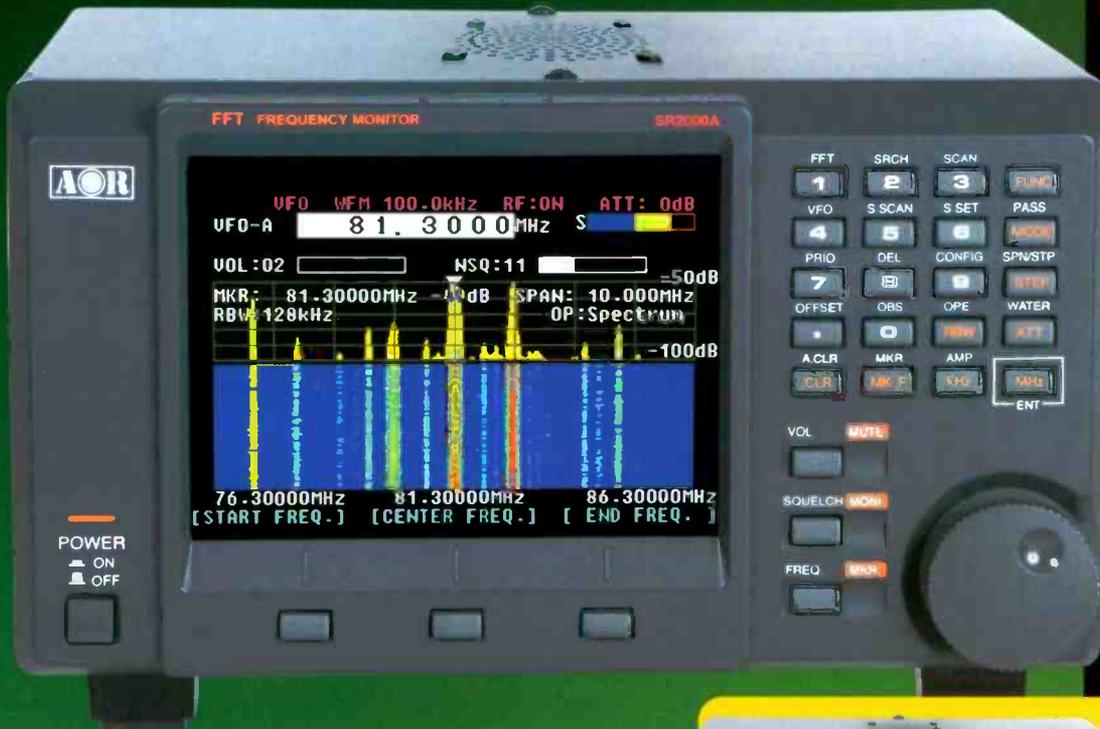
Meanwhile, I keep tuning around the bands, hoping against hope that I can someday hear a *real* Old-Time show bouncing back to Earth after traveling so many light-years into space and back home again, but something tells me that the free-space loss will have swallowed all but maybe Gildersleeve's famous laugh. ■

*Editor's Note: You can write to Bill at [chrodod@earthlink.net](mailto:chrodod@earthlink.net). He tells me that the Cowfield County Home for the Silly now has a WiFi hotspot in the ping pong room.*

# Watch What Happens!

The SR2000A is an ultra-fast spectrum display monitor that lets you SEE received signals in FULL COLOR

## AOR SR2000A Frequency Monitor



- Frequency coverage: 25MHz ~ 3GHz (no gaps)\*
- Ultra-stable, high-sensitivity triple-conversion receiver
- External video output (composite video)
- AM/NFM/WFM/SFM/TV receive modes
- Displays up to 40MHz of spectrum bandwidth (20MHz or 40MHz selectable)\*\*
- P25 decoding function available with optional P25-8600
- Waterfall (time) display function
- 1000 memory settings (100ch x 10 memory banks)
- Average or peak value readings

Using the power of FFT (Fast Fourier Transform) algorithms with a powerful receiver covering 25MHz ~ 3GHz\*, the SR2000A features a color monitor that displays up to 40MHz spectrum

bandwidth or video display of NTSC, PAL or SECAM signals.

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.



- Video display function (NTSC/PAL/SECAM auto select)\*\*\*
- 5 inch TFT color LCD display
- Versatile color display uses state of the art digital signal processing

- High speed FFT search quickly captures new signal transmissions
- Easy menu-driven operation
- PC control through RS232C serial port or USB interface



Authority on Radio Communications

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info@aorusa.com http://www.aorusa.com

\*Government version. Cellular blocked for US consumer version.

\*\*No audio is available when the frequency span is set to 20MHz or 40MHz.

\*\*\*No audio available while displaying video signal on the LCD. If both video and audio need to be monitored simultaneously, an optional (external) TV2000 is required.

# Expanding your world of possibilities!



## IC-R9500 Icom's Ultimate Wide Band Receiver

We've raised the bar with our super performance, multiple function wide band "measuring" receiver. The IC-R9500 has normal and wide spectrum scope functions. With five roofing filters before the first amp, two independent 32 bit floating point DSP processors, and 7-inch wide color TFT LCD, this is something to get excited about!

### Features:

- 0.005 - 3335.000 MHz\*
- USB, LSB, CW, FSK, FM, WFM, AM
- 1020 Alphanumeric Memories
- P25 (Option UT-122)
- Five Roofing Filters
- Dual DSP
- Digital IF Filter
- Multi-function Spectrum Scope
- 7-inch TFT LCD Display
- Noise Blanker
- Noise Reduction
- Multi-scan Functions
- Voice Synthesizer
- Digital Voice Recorder
- USB Connector
- Receive Assist Functions



**IC-R20**  
ADVANCED  
WIDE-BAND RECEIVER

0.150 - 3304.0 MHz\*  
AM, FM, WFM, SSB, CW  
1000 Memory Channels  
Dual Watch Receiver  
4 Hour Digital Recorder



**IC-R5**  
COMPACT  
WIDE-BAND RECEIVER

0.5 - 1300.0 MHz\*  
AM, FM, WFM  
1250 Memory Channels  
CTCSS/DTCS Decode  
Weather Alert



**IC-R1500**  
MOBILE OR PC CONTROLLED WIDE BAND RECEIVERS

0.01 - 3299.99 MHz\*  
AM, FM, WFM, USB, LSB, CW  
1000 Memory Channels  
Fast Scan  
Optional DSP (UT-102)  
PCR Software Included



**IC-R2500**  
MOBILE OR PC CONTROLLED WIDE BAND RECEIVERS

0.01 - 3299.99 MHz\*  
AM, FM, WFM, SSB, CW (Main)  
AM, FM and WFM (Sub)  
1000 Memory Channels  
D-STAR Compatible (Option UT-118)  
P25 (Option UT-122)



**IC-R75**  
WIDE-BAND RECEIVER

0.03 - 60.0 MHz\*  
Triple Conversion  
Twin Passband Tuning  
Digital Signal Processing (DSP)