

45635

POPULAR COMMUNICATIONS

MARCH 2008

With
Blue Angels And
Thunderbirds
Frequencies And
Schedules

Air Show Warbirds Hear Them Roar

- **The Prometheus Radio Project—
Building LPFM Stations In
Communities Like Yours, pg. 15**
- **Tech Showcase: The TriSquare
TSX300 900-MHz FHSS Handheld
Transceiver Makes Waves, pg. 20**

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**PLUS: Air Band Antennas •
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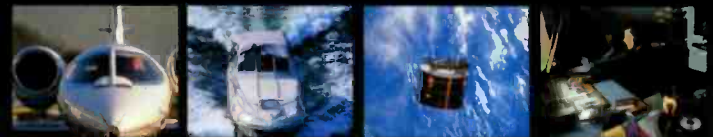
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*Cellular blocked

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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



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R20



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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



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Contents

POPULAR COMMUNICATIONS

Volume 26, Number 7

March 2008



10



15



20

Features

- 10 On With The (Air) Show!**
The Warbirds Fly High—The Mustangs, Blue Angels, And Thunderbirds Wow The Crowds Below by Tom Swisher, WA8PYR
- 15 LPFM's Rallying Cry—Low Power To The People!**
The Prometheus Radio Project Raises The Barn For Community Access by Kate Blofson, KB3PYW
- 20 An Innovative License-Free Alternative To FRS/GMRS**
The TriSquare TSX300 900-MHz FHSS Handheld Transceiver Is Positioned To Dominate The Consumer Two-Way Radio Market
 by Bernard Bates

Columns

- | | | |
|----|---|-------------------------------|
| 26 | <i>The 700 MHz Shuffle</i> | ScanTech |
| 30 | <i>Air Band Antennas</i> | The Antenna Room |
| 36 | <i>The ARTV Monitoring Center</i> | Broadcast Technology |
| 42 | <i>World News, Commentary, Music, Sports, And Drama At Your Fingertips</i> | World Band Tuning Tips |
| 46 | <i>More From Moldova And Monrovia, And Still More...</i> | Global Information Guide |
| 56 | <i>Coronal Holes As Prop Puzzle Pieces</i> | The Propagation Corner |
| 61 | <i>From Hamfests To Solar Cycles—Spring Has Sprung!</i> | Ham Discoveries |
| 64 | <i>A Systems Approach To Mobile EmComm</i> | Homeland Security |
| 68 | <i>All About Your Own Marine Shore Station License</i> | Radio Resources |
| 72 | <i>Helping Others Helps You, Too</i> | REACT In Action |
| 74 | <i>A Simple AC Current Sensitivity Multiplier: An Easy Weekend Project You Can Build!</i> | The Wireless Connection |
| 77 | <i>A Look At The High Frequency Beacon Society</i> | Utility Communications Digest |
| 84 | <i>Now That Bears Repeating</i> | The Loose Connection |

Departments

- 4 *Tuning In*—An Editorial
- 6 *InfoCentral*—News, Trends, And Short Takes
- 8 *Washington Beat*—Capitol Hill And FCC Actions Affecting Communications
- 35 *Our Readers Speak Out*—Letters
- 44 *Power Up*—Radios & High-Tech Gear
- 67 *The Pop'Comm Trivia Corner*

On The Cover

The USAF Thunderbirds soar in tight formation during a performance at the Gathering of Mustangs and Legends in Columbus, Ohio, in September 2007. The team was invited to this once-in-a-lifetime air show to celebrate the Air Force's 60th anniversary. See "On With The (Air) Show!" beginning on page 10 for tips and schedules so you, too, can catch the high-flying excitement. (Cover photo by Andrew Bershaw)

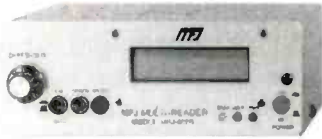
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\$199⁹⁵

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

Super Active Antenna

"World Radio TV Handbook" says MFJ-1024 is a "first-rate easy-to-operate active antenna...quiet...excellent dynamic range...good gain...low noise...broad frequency coverage."

Mount it outdoors away from electrical noise for maximum signal, minimum noise. Covers 50 KHz-30 MHz.

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

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

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 1/4x1 1/4x4 in.



MFJ-1020C
\$89⁹⁵

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.

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

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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 1/4"Wx2 1/2"Hx5 1/4"D inches.

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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.

N-female connector. Tripod screw-mount. Wall and desk/shelf mounts. Use vertically/horizontally. 18Wx2 1/4"Hx1 1/4"D inches. 2.9 ounces.

MFJ-5606SR, \$24.95. Cable connects MFJ-1800/WiFi antennas to computer.

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

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



Eliminate power line noise!



MFJ-1026
\$199⁹⁵

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.

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Dual Tunable Audio Filter

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MFJ-1045C
\$89⁹⁵



MFJ-752C
\$119⁹⁵

MFJ Shortwave Headphones



MFJ-392B
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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 loss. Air variable capacitor with vernier. 1.6-33 MHz.

MFJ-1046
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MFJ-956
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MFJ Shortwave Speaker

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



MFJ-281
\$12⁹⁵

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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
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MFJ Antenna Switches

MFJ-1704
\$74⁹⁵

MFJ-1702C
\$34⁹⁵

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-461 Morse Code Reader near your receiver's speaker. Then watch CW turn into solid text messages on LCD. Eavesdrop on Morse Code QSOs from hams all over the world!

MFJ-461
\$89⁹⁵

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.

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

Good Things Come In All Sizes

There have been some interesting radio happenings lately for those who like juxtapositions.

Just this past December the behemoth of broadcasting, the BBC World Service, celebrated its 75th Anniversary, as sister magazine CQ's editor Rich Moseson touched on in this space last month. It was sobering to reflect on the societal impact of this media giant, which circles the globe, carries audio in 33 languages, and has reached an inestimable number of ears in its time. (Ironically, in the Service's first transmission, founder Sir John Reith felt the need to dampen expectations with the words "as to programmes—don't expect too much in the early days...The programmes will neither be very interesting nor very good.")

Now, three quarters of a century later, an inheritor of the venerable "Auntie" (as the BBC is sometimes known) comes along in the form of a startup company called FlyTunes. FlyTunes unveiled at January's Consumer Electronics Show a new digital music service for our unabashedly individualistic era. The buzz was that it would let users build their own "radio stations" from tens of thousands of existing online streams.

According to a company news release, "The FlyTunes service offers users a personalized satellite *radio-like experience* [italics mine], with thousands of channels of digital music that can be enjoyed anywhere they go, regardless of wireless connection." Compatible with Apple iPhone, iPod Touch, and other portable media players—and multimedia-enabled cell phones—the company says its service offers over 100 times more channels than satellite radio and, unlike satellite, will play everywhere and will be available without fees.

"Because FlyTunes uniquely sits between the broadcasters and the listener, it offers users personalized music, which has never been possible for satellite or terrestrial broadcasters," said FlyTunes CEO Sam Abadir.

It may not be "radio," but for the portable electronic media-toting masses, it may very well "fly."

Somewhere in between the two approaches—in a size Goldilocks might deem "just right"—lies low-power FM. Hardly sporting Auntie's number of gray hairs nor extended family (the FCC created this service only in 2000 and an LPFM station's radius is only a matter of miles), it also isn't "broadcasting-for-the-one." It is, by design, community radio.

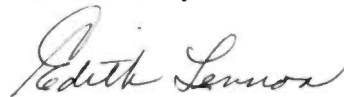
LPFM stations are available to non-commercial educational entities and public safety and transportation organizations, but are *not* available to individuals or for commercial operations. Current broadcast licensees with interests in other media (broadcast or newspapers) "need not apply." Major beneficiaries of LPFM access include schools, churches, and local municipalities.

When the service was created, it was hailed by local radio activists and bitterly opposed by existing commercial broadcast concerns. Despite the FCC mandate, with such powerful opponents it's not been an easy road for LPFM, and the fight to preserve it has been taken to Congress more than once. And there are still continual attempts to erode it.

Luckily for those who value a diversity of voices in radio, many organizations—and countless individuals—are dedicated to promoting LPFM. One such organization, the non-profit Prometheus Radio Project, is covered this month in "LPFM's Rallying Cry—Low Power To The People!" by Kate Blufson, KB3PYW, starting on page 15.

If you, too, value the diversity of voices in radio, add your voice to the effort to keep local radio thriving by contacting your Congressional representatives (see Blufson's suggestions).

Going back 75 years again to that same inaugural broadcast, Sir John Reith was decidedly more accurate than he was about the BBC's programming when he extolled radio's "almost incalculable importance in the social and economic life of the community."



Popular Communications invites your comments, questions, criticisms, compliments, article submissions—in a word, your thoughts. Write to me at editor@popular-communications.com.

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- Backlit LCD.
- Sleep Timer
- Radio Data System (RDS) function with radio text, station name and auto clock time.
- Alarm with Humane Wake System (HWS).
- Battery Life Indicator.
- AC Power Adapter (Included)
- Dimensions (W x D X H): 10 3/4" X 5 1/3" x 2 2/3"
- Weight: 2 lbs.
- Batteries: 6 x 'C'

News, Trends, And Short Takes

France Adopts Two Digital Radio Formats

French Minister of Culture Mrs. Christine Albanel signed a decree to confirm the adoption of Digital Radio Mondiale (DRM) and Terrestrial Digital Multimedia Broadcasting (T-DMB) in band III and in the L-band as the digital radio standards in France. With the adoption of both technologies, France is one of the pioneer countries in the transition to digital radio.

The adoption of DRM in France is the result of long-term experiments and discussions with, or under the scrutiny of, regulatory and governmental bodies that paved the way for the decision announced by the Minister of Culture and Communication. Both T-DMB and the DRM standard were named as driving technologies and are expected to boost the commercial launch of digital radio in France, scheduled for next year.

Early in 2008, the Conseil Supérieur de l'Audiovisuel (CSA) will invite tenders for radio stations and program editors to broadcast digital radio. The first digital radio programs are expected to be on air in France in the last quarter of 2008.

Radio Netherlands Worldwide To Participate In New European Radio Station

Radio Netherlands Worldwide and broadcasters in 12 other European Union countries will launch a new European radio station soon. The station, scheduled to start in April, will broadcast daily on existing frequencies of the participating broadcasters, and will produce programs reflecting the European point of view. Programs will also be available on a special website, which will go online in June. The station will initially broadcast in English, German, French, and Polish as the main languages, with translations into five other languages. Dutch will be introduced as a main language in 2009.

The European Radio Project (ERP) has been granted a subsidy of 5.8 million euros a year from the European Commission, but the EC will have no say in the programming.

RSF Denounces Sri Lankan Attack On LTE Radio

Sri Lanka's military air strike on the rebel Voice of Tigers radio station that killed 11 people violated international law, Reporters Without Borders (RSF) said. Sri Lankan warplanes dropped 12 bombs and virtually flattened the radio station in the north of the island, killing 11 and injuring 15, just moments before it was due to broadcast rebel leader Velupillai Prabhakaran's annual address. Voice of Tigers is operated by the Liberation Tigers of Tamil Eelam.

LTTE spokesman Rasiyah Ilantheriyan stated that the rebels managed to broadcast the pre-recorded speech to northern Sri Lanka and to Tamils overseas, who are a key funding source, using alternative arrangements.

Sri Lankan Government officials declined to comment on the RSF statement. International media rights activists have described Sri Lanka as one of the most dangerous places in the world for journalists to work due to a worsening climate of violence and censorship.

International Awards For Radio New Zealand

Radio New Zealand International has won the prestigious International Radio Station of the Year Award at the Association for International Broadcasting (AIB) Media Excellence Awards in London. The AIB represents more than 25,000 public and commercial radio and television professionals worldwide and the annual awards recognize the very best in international broadcasting. Highly commended runners-up for overall Station of the Year were the BBC World Service and the Middle East Broadcasting Networks-Radio Sawa. Radio New Zealand International also won the Most Innovative Partnership category, ahead of Radio Australia, Radio Canada, and Zonemedia Romantica.

Radio New Zealand International is a division of Radio New Zealand, broadcasting news and information on shortwave to audiences in the South Pacific. Its signal is heard by listeners in Japan, North America, the Middle East and Europe, giving New Zealand a wide international presence.

ITU Accepts ABU Spectrum Proposals For 2011 Conference

The International Telecommunication Union's 2007 WRC Conference has accepted two important broadcasting issues proposed by the Asia-Pacific Broadcasting Union (ABU) concerning international frequency spectrum management and placed these on the agenda of the next conference in 2011.

One pertains to global/regional harmonization of spectrum for wireless links employed for broadcasting ancillary services, including electronic news gathering, electronic field production, outside TV and radio productions and the use of wireless microphones in outside productions.

The second concerns organized usage of the frequency spectrum in the 21-GHz band for deploying broadcasting satellites in the satellite orbit, an important issue since satellites working on these frequencies are expected to deliver HDTV and super HDTV services direct to homes, as well as digital cinema products directly to cinemas.

World's First Hybrid DAB+ And Internet Radio Launched

Frontier Silicon has teamed up with British manufacturer REVO to deliver the world's first radio to combine DAB/DAB+ and Wi-Fi. Dubbed Blik Radio Station, and containing Frontier Silicon's Venice 6 multistandard module, it's also the first digital radio on the market to provide plug-and-play reception of both DAB and DAB+ broadcasts.

Over 6 million DAB units have shipped worldwide, largely to the UK, which has accounted for around 80 percent of these shipments. However, with the availability of DAB+, many other countries are looking to roll out DAB+ digital radio services, including Australia (which officially launches in Jan 2009), Canada, Italy, Switzerland, Czech Republic, Malta, Israel, Hungary, Kuwait, Malaysia, and New Zealand.

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CEI Special Price \$169.95

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Bearcat® BCD396T Trunk Tracker IV

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

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

Frequency Coverage:

25.0000-512.0000 MHz., 764.0000-775.9875 MHz., 794.0000-823.9875 MHz., 849.0125-868.875 MHz., 894.0125-956.000 MHz., 1240.0000 MHz.-1300.0000 MHz.

The handheld BCD396T scanner was designed for National Security/Emergency Preparedness (NS/EP) and homeland security use with new features such as **Fire Tone Out Decoder**. This feature lets you set the BCD396T to alert if your selected two-tone sequential paging tones are received. Ideal for on-call firefighters, emergency response staff and for activating individual scanners used for incident management and population attack warning. **Close Call Radio Frequency Capture** - Bearcat exclusive technology locks onto nearby radio transmissions, even if you haven't programmed anything into your scanner. Useful for intelligence agencies for use at events where you don't have advance notice or knowledge of the radio communications systems and assets you need to intercept. The BCD396T scanner is designed to track Motorola Type I, Type II, Hybrid, SMARTNET, PRIVACY PLUS, LTR and EDACS* analog trunking systems on any band. Now, follow UHF High Band, UHF 800/900 MHz trunked public safety and public service systems just as if conventional two-way communications were used. **Dynamically Allocated Channel Memory** - The BCD396T scanner's memory is

organized so that it more closely matches how radio systems actually work. Organize channels any way you want, using Uniden's exclusive dynamic memory management system. 3,000 channels are typical but **over 6,000 channels are possible** depending on the scanner features used. You can also easily determine how much memory you have used and how much memory you have left. **Preprogrammed Systems** - The BCD396T is preprogrammed with over 400 channels covering police, fire and ambulance operations in the 25 most populated counties in the United States, plus the most popular digital systems. **3 AA NiMH or Alkaline battery operation and Charger** - 3 AA battery operation - The BCD396T includes 3 premium 2,300 mAh Nickel Metal Hydride AA batteries to give you the most economical power option available. You may also operate the BCD396D using 3 AA alkaline batteries. **Unique Data Skip** - Allows your scanner to skip unwanted data transmissions and reduces unwanted birdies. **Memory Backup** - If the battery completely discharges or if power is disconnected, the frequencies programmed in the BCD396T scanner are retained in memory. **Manual Channel Access** - Go directly to any channel. **LCD Back Light** - A blue LCD light remains on when the back light key is pressed. **Autolight** - Automatically turns the blue LCD backlight on when your scanner stops on a transmission. **Battery Save** - In manual mode, the BCD396T automatically reduces its power requirements to extend the battery's charge. **Attenuator** - Reduces the signal strength to help prevent signal overload. The BCD396T also works as a conventional scanner to continuously monitor many radio conversations even though the message is switching frequencies. The BCD396T comes with AC adapter, 3 AA nickel metal hydride batteries, belt clip, flexible rubber antenna, wrist strap, SMA/BNC adapter, RS232C cable, Trunk Tracker frequency guide, owner's manual and one year limited Uniden warranty. Not compatible with AGEIS, ASTRO or ESAS systems. Order on-line at www.usascan.com or call 1-800-USA-SCAN.

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Bearcat BCD396T APCO 25 Digital scanner with Fire Tone Out.....	\$519.95
Bearcat 246T up to 2,500 ch. TrunkTracker III handheld scanner.....	\$214.95
Bearcat Sportack 230 alpha display handheld sports scanner.....	\$184.95
Bearcat 278CLT 100 channel AM/FM/SAME WX alert scanner.....	\$129.95
Bearcat 248CLT 50 channel base AM/FM/weather alert scanner.....	\$104.95
Bearcat 244CLT 30 channel base AM/FM/weather alert scanner.....	\$94.95
Bearcat 92XL 200 channel handheld scanner.....	\$105.95
Bearcat 72XL 100 channel handheld scanner.....	\$89.95
Bearcat BR330T Handheld shortwave/scanner with Fire Tone out.....	\$274.95
Bearcat BCT8 250 channel information mobile scanner.....	\$169.95
Bearcat 350C 50 channel desktop/mobile scanner.....	\$96.95
AOR AR16BQ Wide Band scanner with quick charger.....	\$199.95
AOR AR3000AB Wide Band base/mobile receiver.....	\$1,079.95
AOR AR8200 Mark IIIB Wide Band handheld scanner.....	\$594.95
AOR AR8600 Mark II Wide Band receiver.....	\$899.95
Deluxe Independent Dual Volume Control Racing Headphone.....	\$29.95
Scantac Gold For Windows Software.....	\$99.95
Scantac Gold For Windows Surveillance Edition.....	\$159.95

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

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

Frequency Coverage:

25.0000-54.0000 MHz., 108.0000-174.0000 MHz., 216.0000-224.9800 MHz., 400.0000-512.0000 MHz., 806.0000-823.9875 MHz., 849.0125-868.9875 MHz., 894.0125-956.0000 MHz., 1240.0000 MHz.-1300.0000 MHz.

The handheld BC246T TrunkTracker scanner has so many features, we recommend you visit our web site at www.usascan.com and download the free owner's manual. Popular features include **Close Call Radio Frequency Capture** - Bearcat exclusive technology locks onto nearby radio transmissions, even if you haven't programmed anything into your scanner. **Dynamically Allocated Channel Memory** - Organize channels any way you want, using Uniden's exclusive dynamic memory management system. 1,600 channels are typical but **over 2,500 channels are possible** depending on the scanner features used. You can also easily determine how much memory is used. **Preprogrammed Service Search (10)** - Makes it easy to find interesting frequencies used by public safety, news media TV broadcast audio, Amateur (ham) radio, CB radio, Family Radio Service, special low power, railroad, aircraft, marine, racing and weather frequencies. **Quick Keys** - allow you to select systems and groups by pressing a single key. **Text Tagging** - Name each system, group, channel, talk group



ID, custom search range, and S.A.M.E. group using 16 characters per name. **Memory Backup** - When power is lost or disconnected, your BC246T retains the frequencies that were programmed in memory. **Unique Data Skip** - Allows the BC246T to skip over unwanted data transmissions and birdies. **Attenuator** - You can set the BC246T attenuator to reduce the input strength of strong signals by about 18 dB. **Duplicate Frequency Alert** - Alerts you if you try to enter a duplicate name or frequency already stored in the scanner. **22 Bands** - with aircraft and 800 MHz. The BC246T comes with AC adapter, 2 AA 1,800 mAh nickel metal hydride batteries, belt clip, flexible rubber antenna, wrist strap, RS232C cable, Trunk Tracker frequency guide, owner's manual and one year limited Uniden warranty. For more fun, order our optional deluxe racing headset part #HF24RS for \$29.95. Order now at www.usascan.com or call 1-800-USA-SCAN.

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Capitol Hill And FCC Actions Affecting Communications

ARRL: Misleading, Incorrect Rumors Surround IARU Band Plan

Rumors—characterized as “misleading and incorrect”—surrounded a recently revised band plan of IARU Region 2, adopted at its triennial conference in Brazil in September, according to a report in the American Radio Relay League’s *ARRL Letter*. In reaction, League President Joel Harrison, W5ZN, issued the following statement:

During the conference, held September 10–14 in Brasilia, representatives from IARU Region 2 societies met in committees prior to a final plenary session and adopted recommendations concerning a number of items important to amateur radio in the region. These included plans to improve emergency communication, enhance education and reduce interference to national emergency nets, as well as revising the Region 2 high frequency band plan.

The band plan can be viewed on the Internet at www.iaru-r2.org/wp-content/uploads/region-2-mf-hf-bandplan-e.pdf.

The revised Region 2 band plan for 160–10 meters took effect January 1. “The band plan is based on the band plan adopted by IARU Region 2 at its conference in Davos, Switzerland, in September 2005,” the statement said.

“IARU regional band plans have been in existence for many years,” the ARRL reported. “They are developed, reviewed and approved at regional conferences of the IARU Member Societies. The band plans provide voluntary guidelines and recommendations for good operating practice that are intended to assist amateurs in making the most effective use of our limited frequency allocations. They are not restrictions and carry no regulatory authority.” The ARRL also stated:

One virtue of voluntary band plans is that they are more flexible and can be amended more easily than the FCC rules; writing them into the rules would be counterproductive. As voluntary guidelines, the band plan cannot by definition be “more severe” than regulations; however, if the band plan did not suggest an operating pattern that is a subset of the regulations, it would serve no purpose.

There is also a mistaken assumption that the new IARU Region 2 band plan is an ARRL initiative seeking regulation by bandwidth. It is not, nor is it in any way a vehicle to achieve regulation by bandwidth.

While a number of amateur radio organizations and publishers support and agree with the ARRL on the concept of regulation by bandwidth as an essential element to the orderly introduction of new digital modes into the HF bands, ARRL will not be pursuing a rulemaking until some degree of consensus can be achieved in the amateur community.

FCC Fines Radio Operator \$10,000 For Police Radio Interference

A radio operator identified in FCC documents as “John Doe” is being fined \$10,000 for willfully and repeatedly operating radio transmission equipment in Jamaica Plain, Massachusetts, “on land mobile channels reserved exclusively for use by public safety entities.”

In its written finding, the Commission said the name of the individual had been withheld “due to age.” The FCC reported that Doe held a Technician class amateur radio license.

According to the FCC, “on Oct. 22, 2007, the Boston Police Department reported by telephone to the Boston Office of the FCC’s Enforcement Bureau that it was receiving interference to its radio communications system,” the FCC statement continued:

Specifically, the Telecommunications Director for the Boston Police Department stated that, while it had been receiving interference intermittently over many weeks, it had in the past week begun receiving more interference on police radio Channel 4. Because the interference was intermittent, the Telecommunications Director advised the Boston Office that he would provide additional information so that agents would know the best time of day to try to locate the interfering signal with FCC direction finding equipment.

Three days later, the Telecommunications Director contacted the Boston Office and reported that, on October 24, police officers had arrested Doe, who admitted to operating on police radio channels.

“According to the police reports submitted to the Boston Office,” stated the FCC, “Doe admitted at the time of his arrest...to purchasing the radios in April 2007 and providing the radio vendors with Boston Police radio codes so that the radios could be programmed with those channels.”

Doe told police on October 24 that he had discovered that his transmissions were disrupting police radio communications three days prior, beginning on October 21. FCC documents revealed that at the time of the arrest, “police confiscated two radios, a Yaesu radio transceiver and a Motorola two-way handheld radio transceiver.” Doe was arrested on charges unrelated to his operation on police radio channels.

FCC Commissioner Re-nominated By President For Third Term

Jonathan S. Adelstein is headed for a third term on the FCC. It will be his second full five-year term. President George W. Bush announced his intention on the re-nomination late in 2007. First sworn in as Commissioner in 2002, Adelstein was filling the unexpired term of Gloria Tristani.

According to the *ARRL Letter*, “before joining the FCC, Adelstein served for 15 years as a staff member in the U.S. Senate. For the last seven years, he was a senior legislative aide to Senate Majority Leader Tom Daschle (D-SD), advising Daschle on telecommunications, financial services, transportation, and other key issues.

“Previously, he served as Professional Staff Member to Senate Special Committee on Aging Chairman David Pryor (D-AR), including an assignment as a special liaison to Senator Harry Reid (D-NV), and as a Legislative Assistant to Senator Donald W. Riegle, Jr., (D-MI),” according to the *ARRL Letter*.

The ARRL Letter also reported Adelstein as saying that he was “deeply honored that the President has announced his intention to nominate me to serve another term as Commissioner of the Federal Communications Commission. I would also like to express my deep appreciation to Majority Leader Harry Reid for his support and faith in me. If confirmed by the Senate, it would be a privilege to continue working to ensure that the American public has access to the best possible communication opportunities in the world.”

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On With The (Air) Show!

The Warbirds Fly High—The Mustangs, Blue Angels, And Thunderbirds Wow The Crowds Below

By Tom Swisher, WASPYR



A P-51 fighter in front of the tower at Rickenbacker International Airport during the 2007 Gathering of Mustangs and Legends in Columbus, Ohio. (Photo by Bob Williams of the Columbus Regional Airport Authority)

Held at Rickenbacker International Airport in Columbus, Ohio, from September 27–30, 2007, the recent Gathering of Mustangs and Legends was for me the ultimate air show. A once-in-a-lifetime opportunity to see many classic warbirds fly and meet the legends who flew them in combat, this past GM&L also marked the 50th birthday of the U.S. Air Force and the 55th anniversary of the founding of the Northeastern Training Center, a B-17 training base later renamed Lockbourne Air Base, and later still Rickenbacker Air Force Base.

GM&L was sponsored by Stallions 51, a company that restores and flies World War II era P-51 Mustang fighters. The event brought together over 100 of these classic fighters, other classic fighters like the P-38 Lightning and P-47 Thunderbolt, classic warbirds like B-17, B-24, B-25, and Lancaster bombers, C-47 cargo aircraft, and vintage ground vehicles like tanks, trucks, and support trailers. There were also modern aircraft like C-5, C-17, and C-130 cargo planes; a KC-135 tanker of the locally based 121st Air Refueling Wing; A-10, F-15, F-16, and F-22 fighters, and even a B-52 bomber!

Shows by various civilian and military flight teams capped the event. The real highlight of the event, though, was seeing

Tom Swisher was *Pop'Comm's* "Military Radio Monitoring" columnist for nearly two years. He now takes the helm of the "Plane Sense" column.

the planes in flight and having the honor of exchanging a few words with the pilots who flew them. It was the ultimate air show and well worth the experience.

From County Fair Barnstorming To The Military's Precision Maneuvers

At this point, you might be asking "what's an air show?" Simply put, an air show is an event where you can see airplanes, both flying and on display.

But, in reality, an air show is much more than that. Since that first powered flight at Kitty Hawk, aviators have put on shows to demonstrate their machines and their flying skills for the entertainment of others. We may take airplanes for granted today (and whine about them when they're late), but in the early days, any airplane was a great novelty, and an air show was an often-touted part of county fairs and other local events. An enterprising aviator would fly his airplane over and perform a few simple maneuvers for the crowd, usually causing great excitement. Through the 1920s, air shows would feature aircraft displays, aerobatics, and often death-defying stunts such as wing-walking and barnstorming.

As time went on and aircraft grew faster and more sophisticated, a fascination developed with aircraft racing. In 1920, the National Air Races were begun at Roosevelt Field on Long



An F-15, an F-16, an F-22, and a P-51 in formation. Notice how small the P-51 is in comparison to the other three. (Photo by Bob Williams of the Columbus Regional Airport Authority)

Island, New York. The Races featured a series of events, including cross-country and closed-course racing around pylons. During the 1920s, the Races were held in a variety of places including New York and Philadelphia. In 1929, they were moved to Cleveland and, with the exception of every third or fourth year in Los Angeles, were held in Cleveland every year until 1939, when the National Air Races became the Cleveland National Air Races and were held there annually, though with a four-year hiatus for World War II. The high-performance aircraft developed during the war gave new life to the Cleveland National Air Races, until a series of crashes in the late 1940s culminated in a particularly fiery and horrific accident.

Crashes were a fairly regular occurrence in the early days of air shows, and the National Air Races were no exception. The worst occurred in 1949, when a pilot inexperienced in the tricky-to-fly P-51 fighter lost control and flew a souped-up model named "Beguine" into a house in a Cleveland suburb, killing a young woman and her infant child as well as the pilot. The fiery crash resulted in many communities banning high-speed air-

craft flight within the air space over them, and the Cleveland National Air Races passed into history until 1964, when they were started again in Reno, Nevada, as the Reno National Air Races, where they continue today.

Luckily for flight enthusiasts air shows survived—and thrived—and are today an excellent way for the general public to learn about aviation as well as witness precision flying at its best, especially by military demonstration teams. Military flight demonstration teams were formed after World War II as a means to demonstrate the skills and equipment of the military to the public and serve as a recruiting aid, a mission made even more important with the creation of the all-volunteer military in 1973. Teams such as the U.S. Navy Blue Angels and the U.S. Air Force Thunderbirds continue to thrill crowds across the country with their high-speed, tight formation maneuvers.

Scanning Air Show Comms

An air show is an exciting way to spend a day or two, and now that you've decided (hopefully) to attend one you'll want to make some plans to make the most of your experience.

Since you're a scannist (you are, aren't you?), one of the highlights for you as a radio hobbyist is monitoring the action. Watching a demonstration team perform while listening to their comms at the same time adds a whole new dimension to the experience. Hearing the Thunderbirds' flight commander tell his team "a little more puuullllll" and watching them tighten their turn, and then the exclamation "break!" at which the flight breaks into individual elements makes the show even more exciting.

In addition to the pilots themselves, also well worth monitoring are the communications of the Air Boss. Housed in a miniature control tower on a trailer, the Air Boss runs the show and is in control of the airfield while it's taking place. Once given control of the airfield by the regular control tower, it's all his until he gives it back or there's an emergency coming in not

Table 1. Selected Air Show Frequencies

Aeroshell	123.150
Patty Wagstaff	122.750, 123.475
Red Baron Stearman Squadron	122.725, 122.775, 123.150
USAF Thunderbirds	141.850, 143.850, 235.200
USN Blue Angels	237.800, 275.350, 305.500, 346.500
USAF F-15 Eagle Team	123.150, 376.025
USAF F-16 Fighting Falcon Team	283.700, 365.700
USAF F-22 Raptor Team	238.900, 290.225
Common Air Boss Frequencies	123.150, 123.450



One of only two flyable Avro Lancaster bombers in the world on the ramp at Rickenbacker. (Photo by the author)

related to the air show, in which case the tower will reclaim control. There are also public safety and show operation frequencies to monitor, on which you can hear what's happening on the ground. (See **Table 1** for some frequencies to try.)

What You'll Need

Will all this to monitor, what scanner should you take along? While civilian demonstration teams use VHF civil air frequencies, military demonstration teams often use military UHF frequencies. So, if you have to limit yourself to one scanner it really needs to be one capable of monitoring the military air frequencies between 225 and 380 MHz. Two scanners are better; you can use one to monitor the VHF air channels, including that used by the Air Boss, and the other for monitoring the military frequencies. You could also dedicate the military scanner to monitoring the VHF and UHF frequencies used by what-

ever military team is performing, and the other solely for the civilian side. How you choose to go in this respect is entirely up to your own personal preference.

If you're in a stationary location close to the show where you can see and hear the action (like the lucky folks who live near an air show venue), you can also use your computer to run control and logging software for your computer-capable scanner. This will allow you to better see active frequencies as well as control the radio and log what the scanner catches; some programs even record the audio from transmissions and key the audio files to a log file (see "At Work At An Air Show").

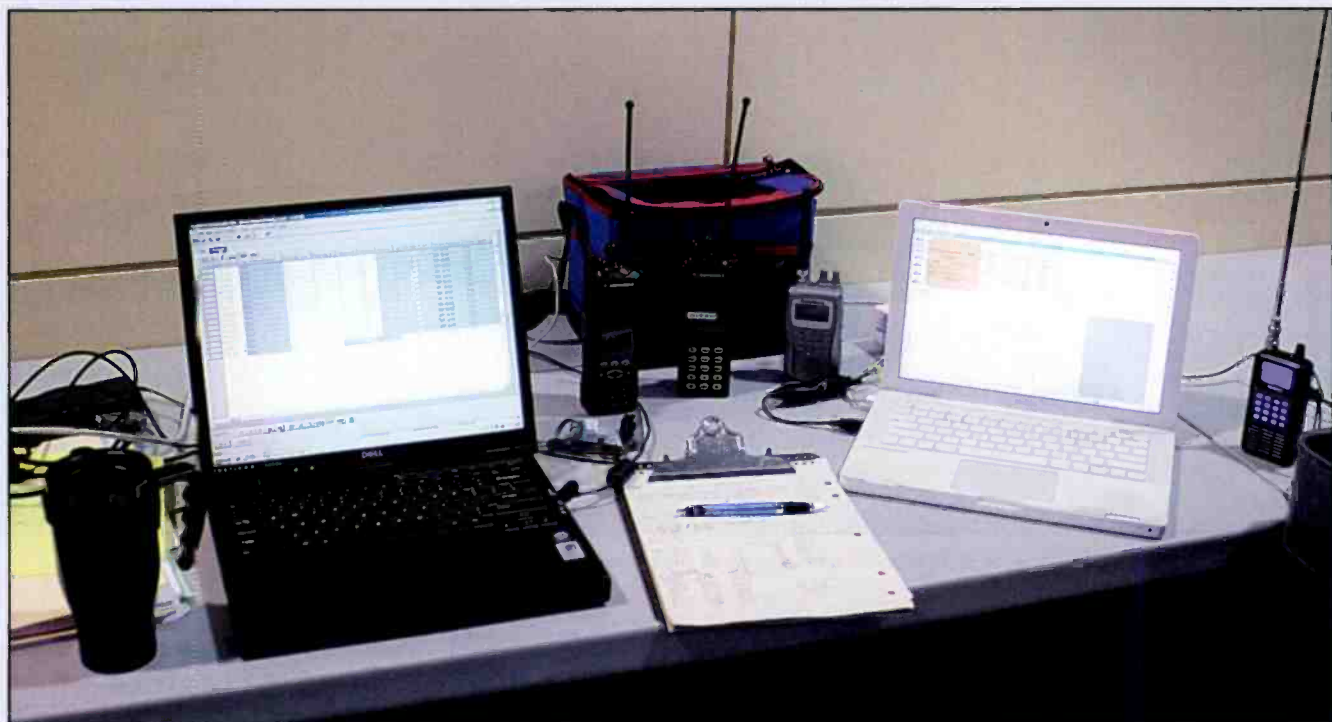
Don't forget to take along extra batteries; if you run dry, there aren't going to be any places to charge them. You might find a vendor at the show selling batteries, but you can't count on it, so make sure to bring along some fresh ones.

Another must-have is a set of good-quality earphones; the best are comfortable "ear bud"-type phones used with the Apple

Table 2. USN Blue Angels 2008 Schedule

Mar 8	NAF El Centro, California	Jul 19/20	Duluth, Minnesota
Mar 15/16	Sacramento, California	Jul 26/27	Twin Falls, Idaho
Mar 29/30	NAS Meridian, Mississippi	Aug 02/03	Seattle, Washington
Apr 05/06	NAS Kingsville, Texas	Aug 08–10	Fairchild AFB, Spokane, Washington
Apr 12/13	Smyrna, Tennessee	Aug 16/17	Chicago, Illinois
Apr 19/20	Peoria, Illinois	Aug 30–Sep 1	Cleveland, Ohio
Apr 26/27	Vidalia, Georgia	Sep 06/07	NAS Brunswick, Maine
May 03/04	Fort Lauderdale, Florida	Sep 13/14	Eau Claire, Wisconsin
May 10 /11	Barksdale AFB, Bossier City, Louisiana	Sep 20/21	NAS Oceana, Virginia
May 16–18	Andrews AFB, Maryland	Sep 27/28	Grand Junction, Colorado
May 21	USNA, Annapolis, Maryland	Oct 04/05	MCAS Miramar, San Diego, California
May 23	USNA Fly-By, Annapolis, Maryland	Oct 11/12	San Francisco, California
May 24/25	Jones Beach, New York	Oct 18/19	Little Rock, AFB, Arkansas
Jun 7/8	MCAS Cherry Point, North Carolina	Oct 25/26	NAS Jacksonville, Florida
Jun 14/15	Quebec City, Canada	Nov 01/02	Lackland AFB, San Antonio, Texas
Jun 21/22	Davenport, Iowa	Nov 08/09	Kennedy Space Center, Florida
Jun 28/29	Huntsville, Alabama	Nov 15	NAS Pensacola, Florida
Jul 04–06	Traverse City, Michigan		
Jul 11	Pensacola Beach, Florida		

For more information, visit www.blueangels.com.



At Work At An Air Show

In my own experience working at 2007's Gathering of Mustangs and Legends, I was mostly confined to the Event Operations Center. With my responsibility being programming and maintaining public safety radios for the show, I had to stay close in the event of a problem. During the performances, however, I was able to dedicate some time to monitoring the action.

This photo shows my work station in the EOC. From left to right you can see my coffee mug (very important...public safety personnel generally run on coffee); my programming computer with Motorola software on the screen; a Motorola XTS-5000 walkie-talkie monitoring the event's Communications Support talkgroup; my own Motorola MTS-2000 walkie-talkie monitoring another of the event talkgroups; a RadioShack PRO-83 scanner monitoring civilian air frequencies; my MacBook laptop; and my Uniden BCD396T scanner monitoring the Thunderbirds and other military demonstration teams. The MacBook is running Windows in a window using virtualization software; the program running is ARC396 from Butel, which is controlling the '396 and recording the Thunderbirds audio.

Table 3. USAF Thunderbirds 2008 Schedule

Mar 15	San Angelo, Texas	Jul 26/27	Rochester, New York
Mar 29	Tyndall AFB, Florida	Aug 8-10	Abbotsford, Canada
Apr 5/6	Punta Gorda, Florida	Aug 16/17	Offutt AFB, Nebraska
Apr 12/13	Lakeland, Florida	Aug 20	Atlantic City, New Jersey
Apr 19/20	Wilmington, North Carolina	Aug 23/24	Kansas City, Missouri
Apr 26	Charleston AFB, South Carolina	Aug 30/31	Travis AFB, California
May 3/4	March ARB, California	Sep 6/7	Westover ARB, Massachusetts
May 10/11	Langley AFB, Virginia	Sep 12/13	Reno, Nevada
May 17/18	Fort Smith, Arkansas	Sep 14	Mountain Home AFB, Idaho
May 24	Tinker AFB, Oklahoma	Sep 20/21	Scott AFB, Illinois
May 28	USAF Academy (invitation only)	Sep 27/28	Salinas, California
May 31/Jun 1	McGuire AFB, New Jersey	Oct 4	Vance AFB, Oklahoma
Jun 7/8	Rockford, Illinois	Oct 11/12	Fort Worth, Texas
Jun 14/15	Québec City, Canada	Oct 18/19	Dobbins AFB, Georgia
Jun 21	Klamath Falls, Oregon	Oct 25/26	Houston, Texas
Jun 24	Eielson AFB, Alaska	Nov 1/2	Lafayette, Louisiana
Jun 28/29	Elmendorf AFB, Alaska	Nov 8/9	Nellis AFB, Nevada
Jul 4/6	Battle Creek, Michigan		
Jul 12/13	Milwaukee, Wisconsin		
Jul 19/20	McChord AFB, Washington		
Jul 23	Cheyenne, Wyoming		

For more information, visit <http://thunderbirds.airforce.com/>.



A B-52 bomber on the ramp at Rickenbacker. (Photo by the author)



The Thunderbirds in flight. (Photo by Bob Williams of the Columbus Regional Airport Authority)

iPod and other similar music players. You're looking for a type that will block outside noise so you can hear the action. Most electronic stores like Best Buy and Circuit City carry these earphones, which cost around \$20. It's kind of pricey, but you need something that's comfortable and will allow you to hear the action.

Another must-have is a still or video camera. You'll definitely want plenty of photos of the action, so take along your favorite camera and a selection of lenses if you have them. Something else to consider bringing along is audio recording equipment. The sounds of an air show are impressive, and if you'd like to put together an interesting multimedia presentation some good-quality audio recordings are worth having.

And, of course, remember this is an outdoor, fair weather venue, and you're going to be spending a lot of time in the bright sunshine on hot asphalt or concrete. Wear comfortable, loose-fitting clothing of a light color, and don't forget the sunscreen!

You've Got The Dates, Now Grab Your Scanner

So if you have not yet made your 2008 summer plans, better make them now, and they really ought to include a trip to an air show. Check out the schedule lists for the Blue Angels and the Thunderbirds (Tables 2 and 3) and visit their respective websites for more information. Then make your plans to attend your own once-in-a-lifetime event—or maybe even the first of a new annual tradition. Enjoy!

LPFM's Rallying Cry— Low Power To The People!

The Prometheus Radio Project Raises The Barn For Community Access

by Kate Blofson, KB3PYW

If you had asked Pete Tridish, KB3LNS, of the Prometheus Radio Project 10 years ago where he thought he'd be in 2007, I'll bet you a Crown FM 300 broadcast transmitter that he would not have said heading down to Washington, D.C., at the drop of a hat to meet with FCC Chairman Kevin Martin. Tridish, a former radio pirate who lives in Philadelphia, is a founding member of the Prometheus Radio Project, an organization that works primarily on Low Power FM (LPFM) radio. His title? Director of Electromagnetism.

Operating with a small staff and limited budget from a church basement in West Philadelphia, Prometheus has become the leading organization advocating for LPFM, its scruffy activists suiting up to visit Congress and the FCC to promote the value of local community radio.

LPFM In Action

The FCC began issuing licenses for the Low Power FM Radio Service in 2000 to increase community access to radio and to add new voices and perspectives to the FM dial. These small stations operate at 100 watts, with a service area of five to 10 miles. As a non-commercial service, LPFM licenses are held by nonprofit organizations like schools, churches, civic groups, and, yes, even a couple of amateur radio clubs. LPFM owners are supposed to live in the community they serve, and stations must originate at least eight hours of local programming each day. There are currently over 800 LPFM stations on the air across the country, serving their communities with local news, music, public affairs, special interest shows, religious services, and talk.

While there was some abuse of the FCC's intention with the service, scroll through a list of LPFM stations and applicants at www.lpfmdatabase.com and you'll find a variety of groups that reflect the wide range of local organizations in American communities: high schools and universities, libraries, Native American tribes, local churches, environmental, civil rights and farmworker groups, arts organizations, municipalities—you'll even find a Drum and Bugle Corps in Ohio and the Scottsdale Italian Social Club in Arizona. And where you find a low power station—if you're lucky enough to have one in your area—you'll likely find a ham or other radio enthusiast who's involved.

One outstanding example of an LPFM station is WQRZ-LP

Kate Blofson is a community organizer with the Prometheus Radio Project.



All hands were on deck to raise the tower on a Sunday morning at the WRFN-LP barn raising outside of Nashville, Tennessee, April 2004. (Photo copyright Pablo Virgo)

in Hancock County, Mississippi. It operates at 2000 watts under an FCC-granted Special Temporary Authority (STA) and is licensed to the Hancock County Amateur Radio Club. Ham radio operators consistently step in to provide initial point-to-point communications during an emergency, and WQRZ-LP demonstrates the critical role local broadcast radio plays to keep the public informed when there's a disaster. In fact, it was one of just a handful of stations on the Gulf Coast—including commercial outlets—that managed to stay on the air during and after Hurricane Katrina, thanks to the prodigious efforts of station operator Brice Phillips, KB5MPW.



It was a long way up for the brave souls installing the antenna on the water tower in Woodburn, Oregon, at the KPCN-LP barn raising in August 2006.

Katrina devastated Hancock County. As the storm approached and tides surged, Phillips braved the floodwaters to relocate his station to the Emergency Operations Center (EOC), providing the only line of communication in and out of Hancock County in the days after the storm. WQRZ was instrumental in disseminating critical emergency information to county residents, such as where to get food, water, and ice. In the months after Hurricane Katrina, WQRZ-LP continued to broadcast important relief and recovery updates from public safety officials.

The story of WQRZ is a compelling example of the importance of local broadcasting, and how it can make a difference between life and death in times of disaster. Hancock County EOC Director Brian "Hooty" Adam is convinced that the station saved lives, and Phillips has received national recognition for his service. It still operates under an STA.

Many municipalities have partnered with LPFM stations to get emergency information out. For example, WRIR-LP is the official emergency broadcast outlet for Richmond, Virginia, a city of around 200,000. Emergency managers across the country have endorsed LPFM as an invaluable means of getting reliable local information to citizens during emergencies.

Passing The Torch

Prometheus dedicates itself to supporting these tiny stations, and has constructed 10 LPFMs across the country in community events it calls barn raisings, drawing on the metaphor of bringing people together to build something big and lasting.

Community radio takes much more than one person working alone—it requires the input, effort, knowledge and experience of many. In preparation for a radio barn raising, Prometheus works with the local community to bring in radio enthusiasts from across the country to help build the station and lead training workshops in radio production, station organization, fundraising, and technical issues. A typical barn raising features over 25 workshops, led by teams of experts, on topics like Studio-Transmitter Links, Antenna Building and Tuning, Interviewing Skills, Digital Editing, Internet Streaming, FCC Applications, Fundraising, Station Governance, and Youth Radio. All this is in conjunction with the studio-building activities that happen day and night (with breaks for mealtimes, of course!)

Engineers and carpenters team up with people who've never touched a power tool or a soldering iron and put those tools in *their* hands to help demystify the technology around radio. And it works. Newcomers to radio learn how to solder the audio cables, build studio furniture, install equipment, wire the studio, burn in and test the transmitter, raise and tune the antenna, and produce radio for the inaugural broadcast, which somehow comes together by late afternoon on Sunday, after a couple of late nights in the studio.

Prometheus Technical Director Andy Gunn, KB3NSE, has his hands full coordinating the studio building crews and smoothing over the inevitable mistakes that crop up when a hundred odd people, many of them new to radio, contribute to the process. From microphone to antenna, a radio station is born, all in the course of one hectic weekend. As Pete Tridish says, "It's not the most *efficient* way to build a radio station, but it is the way to build a community radio movement."

Committed to ensuring that groups that historically have not had access to broadcast outlets get on the air, Prometheus is proudest of the stations it has built with civil rights organizations, environmental groups, and farmworkers' unions. Prometheus believes that radio stations are an invaluable tool for connecting people, building communities, and contributing vital energy and debate in the media system, a linchpin of American democracy. Over 100 dedicated volunteers may pass through the studios of LPFMs each week, a testament to community support and the enthusiasm for the locally oriented service these stations provide.



Monks get a soldering lesson at the WXOJ-LP barn raising in Northampton, Massachusetts, August 2005.

Prometheus launched the barn raising model in 2002 with WRYP-LP in Sherwood, Maryland, licensed to SACReD (South Arundel Citizens for Responsible Development), a group committed to promoting environmental

awareness in a unique Chesapeake Bay community. WRYP, like so many low power stations, features local music, offering a rare opportunity for musicians to get on the air in their own hometowns. Its programming includes shows about the

environmental issues facing the waterfront, prominent Chesapeake women, local political news and debate (it's known for being the only outlet getting local politicians on the airwaves to debate each other in advance of elections), alternative

A Historical Perspective On Low Power FM

LPFM has a long history with roots in Class D and micro-power broadcasting. The FCC began issuing low power Class D licenses in the non-commercial educational (NCE) band, from 88 to 92 MHz, to schools and universities in 1948. Class D stations traditionally served as a training ground for future broadcasters, allowing students to learn the ropes and make mistakes along the way.

With the institutionalization of public radio after the Public Broadcasting Act of 1967, the Corporation for Public Broadcasting increasingly viewed Class D as a waste of spectrum and petitioned the FCC to phase out the licenses. The FCC complied in 1978, and while some extremely low power Class Ds remained on the NCE band, those operating above 100 watts had to move to the commercial band. Many couldn't find space and were forced off the air.

Over the next two decades, locally owned and operated radio stations were displaced as large corporations gobbled up outlets across the country, especially after the Telecommunications Act of 1996, which lifted national radio station ownership limits. For radio listeners, that meant voice-tracking, homogenized content, and fewer local voices on the airwaves. Across the country, radio stations began to sound the same, and citizens decried the lack of opportunity for community voices in radio.

Micropower radio—commonly known as pirate radio—flourished as people took to the airwaves in protest. Spurred by stations like WTRA in Springfield, Illinois, where Mbanna Kantako began broadcasting in 1986 at 1 watt from his apartment in a housing project, and Free Radio Berkeley, operated by radio activist Stephen Dunifer out of the Berkeley, California, hills in the early 1990s, a micropower movement was born, and hundreds of unlicensed LPFM stations cropped up across the country.

In the late 90s the National Association of Broadcasters (NAB) declared war on micropower radio. At the same time, however, Congress cut the Commission's funding, and the FCC lacked the manpower to stem the rising tide of microradio stations. In 1998, the Commission accepted two important petitions to resurrect low power radio. It received tens of thousands of inquiries from citizens seeking low power licenses, and over 3,500 comments on the low power radio proposal, overwhelmingly in favor of resurrecting the service. That same year, a small group of micropower radio activists established Prometheus to promote LPFM.

In the fall of 1998, early Prometheans and micropower activists from across the country converged in front of the FCC and NAB in Washington, D.C., to demand that the FCC recognize the importance of low power radio for communities. The protest featured a 12-foot puppet of then-Chairman William Kennard with a Pinocchio nose, controlled by other huge puppets representing NAB and media corporations. The radio activists broadcast (at low power, of course!) right into

the FCC offices, and Prometheus' Tridish challenged Kennard personally to come down and arrest him if what the protesters were speaking for was so very wrong. (Kennard didn't and actually took the protest in good stride, often mentioning the Kennard Pinocchio puppet at trade association meetings when broadcasters complained that he wasn't doing enough for them!)

The FCC listened to the public outcry and voted to create the LPFM service at the beginning of 2000. Thousands of groups nationwide jumped at the opportunity, but the plot thickened. In the middle of the application windows, Congress acted to limit LPFM at the behest of the NAB and National Public Radio, which cited interference concerns. The Radio Broadcasting Preservation Act of 2000 placed restrictions on LPFM, barring the service from the third adjacent channel pending an interference study, despite the fact that the FCC's engineers had determined that LPFM would not cause interference.

As a result, thousands of applications were dismissed, and community groups across the country lost out—while over 3,200 applications for LPFM stations were filed, there are only 836 LPFMs on the air today, mostly in rural areas and small towns. Cities were hit especially hard. Under the FCC's original plan, there was room for at least one low power station in each of the top 50 radio markets in the country, except New York and Los Angeles. With the Congressionally imposed limitations, however, there's just one LPFM that reaches a top 50 market, in Columbus, Ohio.

An independent engineering firm, the MITRE Corporation, completed the interference study in 2003 (to the tune of \$2.2 million in taxpayer money) and concluded that LPFM on the third adjacent channel would not cause interference to existing broadcasters. MITRE recommended that Congress expand LPFM and allow the FCC's original design for the service. It declined to complete a second part of the study on the economic impact of LPFM interference on incumbent broadcasters, since it found no interference to speak of.

However, the restrictions on the service will remain in place until Congress acts to expand LPFM. The churches, schools, and community groups that applied for licenses back in 2000 are still hoping that Congress will lift the restrictions so they can get on the air.

In November 2007, the FCC took up many LPFM issues at an open Commission meeting, and once again advised Congress to expand LPFM. It also introduced a number of measures to strengthen and expand the service, and took steps to save LPFMs that face fatal encroachment by full power stations.

If Congress expands LPFM we may find thousands more of these unique outlets cropping up on the FM dial, serving communities with local perspectives and voices that have all but disappeared from the airwaves. "Low Power to the People!" has become the LPFM movement's rallying cry, and Prometheus vows to continue its work to make low power radio a reality in communities like yours around the country!

news, as well as songs, stories, and poems from the Chesapeake region.

Another organization Prometheus helped, the Southern Development Foundation, is the first civil rights organization to own a radio station, KOCZ-LP in Opelousas, Louisiana. The SDF launched agricultural cooperatives in the 1960s to help farmers get fair prices, and it organizes a yearly Zydeco Festival in Opelousas, attended by over 20,000 people. KOCZ broadcasts gospel, youth hip-hop shows, Sunday religious services, information about community-supported agriculture programs, public affairs programs on community issues and health information. It's also the only radio station in the area that plays Zydeco music—in the town where this special form of American music began.

WCIW-LP is operated by the Coalition of Immokalee Workers in Immokalee, Florida, a community-based organization that fights for workers' rights. It broadcasts music, information, and public affairs programming in Spanish, Creole, and indigenous languages to a farmworker community that struggles against poor working conditions and low wages in the tomato fields of South Florida. Their radio

station has helped them win fair wages from companies like Taco Bell. In April 2007, the FCC invited the station to participate in an official panel to testify about the importance of LPFM during times of disaster: WCIW transmitted crucial emergency information to their listeners in a number of languages during Hurricane Wilma and used its broadcasts to coordinate relief efforts.

Coming To A Town Near You...?

Do you want low power community radio in your city or town? Then join thousands of citizens across the country who are contacting their representatives to ask them to expand LPFM. From Tulsa to Tallahassee, legislators are interested in LPFM, but they want to hear from you on this issue. Call or email your Congressional representatives to tell them what you've learned about LPFM and ask them to support The Local Community Radio Act, HR 2802 or S1675.

You can log onto www.freepress.net/lpfm for a quick and easy webtool to write your representatives about LPFM. Or look up their information at www.congress.org—your phone calls and emails will ensure that LPFM becomes a reality in thousands more communities across the country. With the results of the MITRE study proving that low power radio won't



Securing mounting hardware for the tower at the WRFU-LP barn raising in Urbana, Illinois. (Photo copyright Jacques-Jean Tiziou)

provide interference, there's no reason for Congress to retain third adjacency limitations on LPFM.

In your phone call, you can say something like, "As a constituent, I want my representative to know that I support Low Power FM. Our communities need diverse broadcast information and a voice in their cities and towns. We need local stories, emergency and safety information, and much more. Please ask Congressperson _____/Senator _____ to support House Bill 2802/Senate Bill 1675, the Local Community Radio Act of 2007, which will expand low power FM radio."

Now's the time to act to expand LPFM. To learn more about Prometheus and LPFM, visit www.prometheusradio.org.

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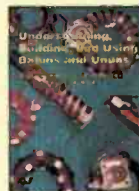
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An Innovative License-Free Alternative To FRS/GMRS

The TriSquare TSX300 900-MHz FHSS Handheld Transceiver Is Positioned To Dominate The Consumer Two-Way Radio Market

by Bernard Bates

PopComm's November 2007 cover story, "Digital Two-Way Radio Technology Reaches Consumer Market" covered the emerging trend of new 900-MHz FHSS (Frequency-Hopping Spread-Spectrum) radios becoming a serious license-free alternative to FRS/GMRS radios. Picking up where that article left off, this article will review one such radio, the TriSquare TSX300.

This new handheld transceiver sets a new price/performance standard, using innovative digital technologies to offer many features we're accustomed to seeing only in PCS/cellular handsets. It's about time two-way radio users and hobbyists started benefiting from these exciting new personal communications technologies.

FRS/GMRS Problems Create Opportunity

Back in 1999, TriSquare was a major OEM manufacturer of FRS/GMRS radios for several companies marketing under various well-known brand names. As the popularity of FRS/GMRS radios skyrocketed over the next five years, the market approached saturation and profit margins dropped to unsustainably low levels. And, not surprisingly, the widespread use of 50 to 80 million FRS/GMRS radios created severe congestion on the 22 FRS/GMRS channels at crowded events, metropolitan areas, and elsewhere. Tens of millions of users, including many large

Bernard Bates holds a degree in Telecommunications Engineering from Penn State University. His interests include volunteering, radio communications, and lunar astronomy.

and small businesses, blatantly violated FCC regulations by using GMRS channels without obtaining the required \$75 license, or by using FRS channels for business purposes.

At the same time, many FRS/GMRS radio users became increasingly aware of the glaring feature disparity between their simple two-way radios and their feature-rich cell phones (which offered private and interference-free voice communications, text-messaging, caller ID, call waiting, contacts lists, hands-free operation, ringtones, vibrating alerts, etc.).

Engineering A Solution

In 2004 TriSquare started engineering a solution. Its years of experience designing DSP (Digital Signal Processing) and SDR (Software-Defined Radio) technologies into consumer two-way radios, and the falling cost of digital components needed to implement these technologies, convinced the company that it was feasible to build feature-rich FHSS two-way radios for the consumer market to supplant FRS/GMRS. DSP and SDR technologies allow advanced features and functions to be designed and implemented in software, and then duplicated in firmware, at far lower cost than using many dedicated electronic components.

Fortunately, the FCC had issued its Part 15.247 regulations, which authorize unlicensed 1-watt FHSS voice and limited data transmissions in the 902-928 MHz ISM (Industrial, Scientific, and Medical) band if certain challenging technical requirements are met.

Was a practical solution buried in these obscure FCC regulations? Since FHSS can effectively create a nearly unlimited number of "virtual" radio channels (by using many different hopping sequences)

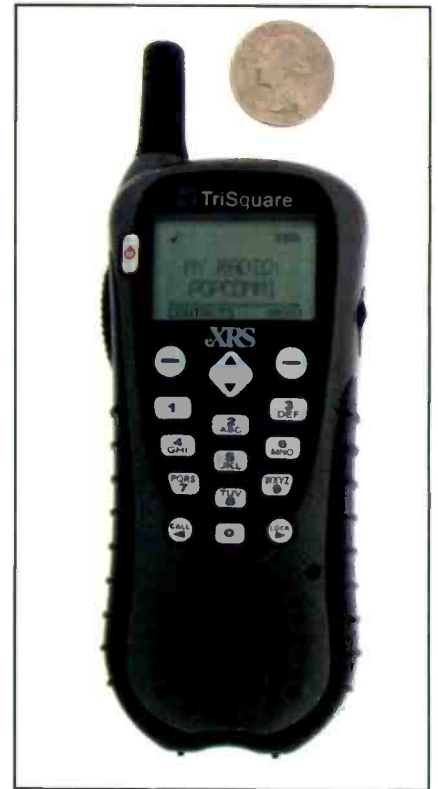


Photo A. The TSX300 eXRS (eXtreme Radio Service) Handheld Frequency-Hopping Spread-Spectrum (FHSS) Transceiver. Never before has so much sophisticated radio communications technology with so many advanced features been available in a two-way radio priced for consumers.

it could solve the severe channel overcrowding and privacy problems vexing tens of millions of FRS/GMRS radio users. Because ISM spectrum is unlicensed, FCC licensing requirements wouldn't be an issue.

eXtreme Radio Service Is Born

Armed with its two-way radio engineering expertise and these new FCC regulations, TriSquare filed 33 U.S. patent claims and bowed out of the FRS/GMRS OEM market in 2005 to focus on what it saw as a huge market opportunity for low-cost, license-free, short-range two-way voice and text-messaging products that

TSX300 Owner's Manual

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8. UP/Down Volume and Scroll Button
9. Call / Back Button
10. Lock / Next Button
11. 0-9 Alphanumeric Keypad
12. Microphone
13. Speaker

Rear View Call Outs include:

14. Belt Clip
15. Battery Compartment Door
16. Charging Contacts

Backlit LCD Call Outs:

17. Audible & Vibrate Icon
18. Test Message Icon
19. VOX Icon
20. Keypad Lock Icon
21. Battery Low Icon
22. Channel / User Interface
23. Softkey Labels

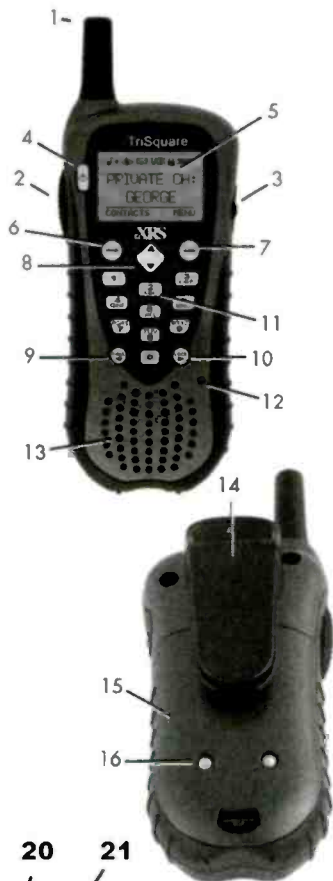
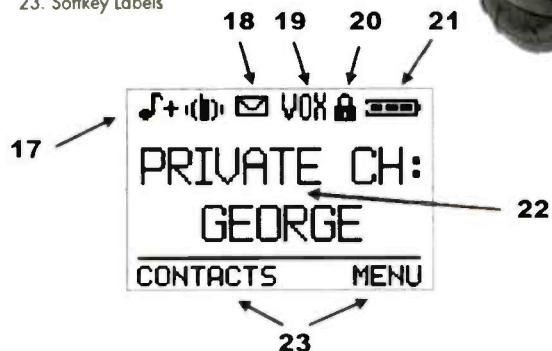


Figure 1. A page from the TriSquare user manual depicting some of the TSX300's many features and controls.

are practically immune to channel overcrowding and interference.

TriSquare trademarked the names "eXtreme Radio Service" and "eXRS" for its new technology and made plans to overtake the stagnating FRS/GMRS radio market in just two to three years with a line of portable FHSS transceivers—starting with its flagship TSX300 (Photo A) and its entry-level TSX100 (which has a very limited feature set but is about one-third the price). TriSquare also laid plans to establish eXRS as a *de facto* standard for licensing to other companies.

These are ambitious goals, but TriSquare is gambling that its patent-

pending eXRS technology—and the many new features it makes possible—will be a big hit with a general public accustomed to cell phone features and ergonomics, and who desire a private two-way radio solution with similar features.

Complete Package

Pop'Comm asked TriSquare to send me an early production TSX300-2VP "Value Pack" for review (see Photos B and C), which is a retail peg-display package containing two TSX300 radio transceivers, two PTT/VOX headsets, two NiMH battery packs, two swivel belt

clips, a dual desktop drop-in charging bay with AC adapter, and one illustrated user's manual.

After installing the two 4.8V, 750mAh NiMH battery packs and dropping the radios into the dual desktop trickle charger for the night, I noted it had built-in protection against overcharging and short-circuiting batteries. The charger takes about 12 hours to fully replenish battery packs that are fully discharged. The next morning (about 11 hours later) the radio's LCD battery gauge indicated they were fully charged.

A nice feature is the option to use three standard AA alkaline cells instead of the included NiMH pack, so in an emergency you're never at the mercy of the slow trickle charger. Additional NiMH battery packs are sold separately, in case you want to keep a spare set charging and ready for action at all times. The plastic battery cover fit loosely, but TriSquare informed me this was an early production problem that has since been fixed. Rated NiMH battery life is 15 hours based on a 5/5/90 duty cycle (5% transmit, 5% receive, 90% standby), while standard AA alkaline cells should provide about 45 hours of 5/5/90 use. My test results were consistent with those ratings.

Physical Features And User Interface

The TSX300's appearance and user interface blurs the distinctions between two-way radios and cell phone handsets (see Figure 1). It not only looks a lot like some cell phones, it also shares many of their features. The housing is rugged ABS/PC plastic and slightly larger than a second-generation non-flip PCS/cellular handset. Its sides curve slightly inward and are ribbed to fit comfortably in your hand, so you can operate the full keypad one-handed with your thumb.

For day/night readability the 16-button keypad has silver-painted translucent silicone keys, which are laser-etched with numerals and all letters of the alphabet. An Up/Down button and two Left/Right "Softkeys" allow selection of dynamically displayed functions and menu options—similar to how many cell phone menus work. Above the keypad is the large backlit bitmapped LCD that displays up to seven lines of text and icons, depending on the screen and function being viewed.

Other TSX300 cell phone-like features include SMS-like text messaging with message-waiting indicator, ring-

TriSquare TSX300 Features:

- 900-MHz FHSS Frequency-Hopping Spread-Spectrum technology (less interference and potentially better propagation than FRS/GMRS)
- 10 billion virtual channels (good privacy; not easily monitorable)
- License-free, unrestricted personal & business use
- NiMH battery pack - or use (3) AA alkaline cells
- Wireless cloning of contacts & configuration
- NOAA weather receiver (no SAME decoder)
- Hands-free (VOX) w/3 sensitivity levels
- VOX/PTT headset w/boom microphone
- Private "one-to-one" or "one-to-many" voice/text communications
- Real-time communications (no appreciable vocoder latency)
- Backlit LCD (bitmapped w/up to 7 lines of text & icons)
- Backlit 16-button alphanumeric keypad with 2 Softkeys
- Contact List: 100 names (up to 8 alphanumeric chars)
- SMS-like text messaging (up to 80 chars)
- Page/call alert (ringtone or vibrate)
- Caller ID w/name
- Call waiting w/name
- Non-volatile memory
- 5 ringtones (not assignable)
- Transmitter timeout (0–120 sec)
- Battery meter w/low battery alert
- Dual drop-in desktop trickle charger
- Standard 2.5-mm headset jack

- Keypad lock
- Roger beep
- Keybeep
- Removable swivel belt clip
- One-year manufacturer's warranty

TriSquare TSX300 Specifications:

- FCC ID: O9GTSX300
- Transmitter: 1-watt ERP; FHSS 906.275–923.750 MHz
- 700 hopping frequencies; 25-kHz spacing, 400-msec/hop
- 10 billion virtual channels (unique frequency-hopping patterns)
- Transmission protocol: Half-duplex TDMA
- 4.0 kHz FM RF deviation (nominal)
- 3.0 kHz compressed audio bandwidth (nominal)
- Receiver: (nominal specifications)
- Sensitivity (12 dB SINAD): -124 dBm
- Adjacent channel rejection: 50 dB
- Audio output @ 10% THD: 330 mW
- S/N ratio: 60 dB
- NOAA WX sensitivity (12 dB SINAD): -118 dBm (nominal)
- NOAA WX selectivity (adjacent channel): 60 dBm (nominal)
- Battery types: NiMH 4.8V 750mAH or (3) AA Alkaline cells
- Battery life: NiMH pack: 15 hrs; AA alkaline cells: 45 hrs (5/5/90 duty cycle)
- Dimensions: 4-3/4 x 2 x 1-1/4 inches HWD (not incl. 1-inch non-removable antenna)
- Weight: 4 oz. (113grams) without batteries

Figure 2. TriSquare TSX300 features and specifications.

tones or silent (vibrate) alert, hands-free operation, caller ID with name, call waiting with name, and voice/text privacy. (See **Figure 2** for a complete list of TSX300 features and specifications.)

The TSX300 comes from the factory with its default "My Radio" channel set to 0, but you can assign any channel from 0 to 999999999 (that's 10 billion channels). The radio will constantly monitor that channel, regardless of what "Group Channel" you happen to be using. Group Channels, or Contacts, are used for communicating between groups of people and are not the same as the "My Radio" channel on your or others' radios, which are always used for Private Channels. It's a little confusing at first, but after reading the illustrated step-by-step manual and navigating through the fairly intuitive menus it becomes clear. To paraphrase an old advertising slogan, "This is *not* your father's two-way radio."

TriSquare suggests using your 10-digit telephone number as your unique "My Radio" 10-digit channel code because it's unique and easy to remember. But if communications security (COMSEC) is a concern, such a publicly

available number would be a poor choice. One hundred Group Channels (i.e., Contacts) can be entered and labeled with up to eight alphanumeric characters, such as George, Basecamp, Warehouse, Security, and A-Team.

Theory Of Operation

The TriSquare TSX300 is a hybrid digital/analog two-way radio designed to make the best and most economical use of both technologies. Its proprietary eXRS FHSS scheme uses 700 frequencies spaced 25 kHz apart between 906.275 and 923.750 MHz. Heavy concentrations of cordless telephone traffic around the top and bottom of the license-free 902–928 MHz ISM band led TriSquare engineers to avoid interference on those frequencies, as well as with the most commonly used portions of the 33-cm amateur radio band, which is allocated on a shared/secondary basis (many of TriSquare's engineers are hams).

Depending on which 10-digit channel code is chosen, an embedded pseudorandom number generator algorithm selects a different set of 50 frequencies to hop

and cycle through every 20 seconds. Each 400-millisecond hop frame contains both voice and data.

Since each radio "knows" (based on the channel selection) what the hopping frequencies are as well as their order, the receiving radio(s) need only know when to start hopping to remain synchronized. The receiver starts hopping when the preamble signal is received, and stops hopping 20 seconds after no signal is received. The transmitter's microphone audio is digitized, modified by a DSP algorithm to extract only the most useful information, summed with a digital timing and position signal, and time-compressed to allow proper hop framing and provisioning of the control data (caller ID, private call, etc.) within each frame. The receiver's DSP extracts the modified audio, performs digital noise reduction, and expands it back to the original voice signal timing (slightly delayed after processing).

This scheme is less DSP-intensive than full-fledged vocoders, such as VSELP (Vector Sum Excited Linear Predictive) used by Motorola's DTR series of two-way 902–928 MHz FHSS radios (see "The Motorola DTR410



Photo B. The TSX300-2VP "Value Pack" includes two TSX300 two-way radios and a complete set of accessories: two VOX/PTT headsets, two NiMH battery packs, a dual desktop drop-in charger with AC adapter, and illustrated users manual. Radios and accessories are also available individually, so you don't have to buy unwanted replacements.

Frequency-Hopping Radio," December 2007, *Pop'Comm*). As a result, the TSX300's audio reproduction sounds less synthetic and isn't severely distorted by non-speech background sounds. It's also near real-time audio, so there's no annoying delay caused by vocoder latency.

Audio Quality

TSX300 audio is quite intelligible but sounds slightly "fuzzy," like low bitrate compressed audio. Speech sounds relatively natural compared to the synthetic speech sound of some vocoders and has ample volume except in very noisy environments (where the included PTT/VOX headset can be used.) Hands-free (VOX) has three sensitivity settings and works in either speakerphone or headset mode, although the most sensitive isn't very. The included PTT/VOX headset fits comfortably around your earlobe and into your ear canal and has an inline PTT/VOX mode switch and momentary PTT button. By *de facto* design convention, the TSX300 works with many third-party audio accessories, such as XLT Communications' line of single 2.5-mm plug speaker mics, earbud mics, and

throat mics designed for Motorola and Cobra FRS/GMRS radios.

Channel Overcrowding Solved?

FRS channel overcrowding and mass unlicensed use of GMRS channels has frustrated many FRS/GMRS radio users over the years, but TriSquare's eXRS technology could alleviate that. According to TriSquare, and the Kansas State University engineering study it commissioned, more than 100,000 eXRS users within talk range can enjoy uninterrupted communications in the 902–928 MHz ISM band. By comparison, several dozen FRS/GMRS users within the same talk range could render their bands unusable. Channel overcrowding, as we know it, could become a thing of the past.

Operational Range

There are many variables that determine the effective range of two-way radios, but TriSquare took the high road by refusing to make any specific distance claims—unlike so many FRS/GMRS

vendors that make outlandish claims like "range up to 25 miles and more!" Instead, TriSquare guarantees its eXRS radios will "meet or exceed the range performance of other UHF HTs." Testing confirmed this claim, with range comparable to a pair of 2-watt 70-cm amateur radio Handie-Talkies in simplex mode. Outdoors over flat terrain the TSX300's effective range was about one and a half miles, and over three miles from hill to hill.

These radios performed particularly well inside tall office buildings. From the 55th floor of Philadelphia's Liberty Place tower, usable voice and text communications with another TSX300 in the lobby was achieved. Whether the 900-MHz signals bounced around inside the structure or outside and back in is unknown, but neither a pair of FRS/GMRS radios nor the aforementioned pair of 70-cm amateur HTs could accomplish this. Perhaps the TSX300's 33-cm band wavelength, which is much shorter than the lower frequencies used by those other two-way radios, passes more easily through a tall building's metal framework and window frames. Obviously, the TSX300 would be an excellent business radio in a multi-floor office building where other two-way radios can't cut it and where COMSEC is a concern.

On the road between automobiles, the TSX300's range was reduced to less than a mile, probably due to signal attenuation by vehicles' steel bodies and other obstructions.

Text Messaging

Upper-case text messages of up to 80 characters can be sent between TSX300 radios. Four custom text messages can be stored for repeat sending, plus there are six permanent "canned" text messages to choose from (YES, NO, OK, WHERE ARE YOU?, CAN YOU TALK? CAN'T TALK RIGHT NOW). A triple-beep and/or vibrate alert tells you when a text message is received, and a message-waiting envelope icon is displayed until the message is read. Text messages are sent "in the blind"; there's no error-correction or handshaking to acknowledge a message was received accurately or at all. Half-duplex synchronous data transmission makes this impossible in real time, but it would be nice if the TSX300 could *automatically* transmit an ACKnowledgement signal to the sender after receiving a text message. If the radios are within range, text-message delivery shouldn't be a problem. Oddly, the character set's punctuation is limited, offering just !?., @#\$%&().

Cloning

The settings of one TSX300 can be wirelessly cloned to another TSX300 held next to it. Selected Contacts, the full Contacts list, or the entire radio configuration can be cloned. This feature can save lots of time and aggravation for a group of users or a business needing to program several radios for interoperability. Plus, there's no cloning cable to buy or lose. Neat!

NOAA Weather Receiver

The built-in NOAA weather receiver works, but is not very sensitive. It receives strong local stations fine, but not weaker distant NOAA stations that most scanners and dedicated weather radios can pull in. The 900-MHz antenna probably has lots to do with this. Still, it's a nice extra feature in strong signal areas, but I wouldn't trust my life with it hiking or camping in the remote wilderness far from any NOAA stations.

Documentation

As with any feature-rich digital consumer electronics product, reading the manual is worthwhile. The most basic two-way radio features are intuitive enough to use right away. The 35-page owner's manual is well written and walks the user through the TSX300's many features with illustrated step-by-step instructions, but the small booklet isn't much bigger than the radio itself so its small print may be hard for some people to read. Fortunately, it can be downloaded in PDF format from TriSquare's website and enlarged as necessary. It's interesting reading if you're simply curious about the coming trend of FHSS two-way radio for the masses.

What I Liked

There's a lot to like in the TSX300 (see **Figure 2**), and its many features make it an exceptional price/performance value. It's clear that much thought went into the design of this



Photo C. The TSX300-2VP "Value Pack" in its retail packaging. It's a sign of the times when a complete and highly sophisticated FHSS voice/data radio communications system is sold on retail peg displays for less than \$100. Until recently, two-way radios with similar advanced technology cost thousands of dollars and were generally available only to government and military users.

radio and its accessories. Following are some features I particularly liked:

- Exceptional communications privacy
- No interference from other users
- Advanced technology made easy
- All accessories included
- Geek/coolness appeal
- Good ergonomics
- No license required
- Non-volatile memory
- NiMH or alkaline batteries

What I Disliked

The more features any product has, the more likely there'll be some nitpicking, so here's mine:

- Ringtones cannot be assigned to specific callers, and the five ringtones are similar-sounding and unimaginative.
- NOAA weather receiver is insensitive and cannot receive weaker distant stations.
- Text-messaging character set is missing several commonly used punctuation characters like the semicolon, colon, quotation marks.

- Text-messaging message triple-beep alert is too brief and quiet, and the vibrating alert is too brief compared to cell phone handsets' vibrating alerts.
- VOX sensitivity is low; the most sensitive of three settings isn't very sensitive.

Features I'd Like To See

- NOAA SAME decoder with alarm
- Increased NiMH battery mAh capacity
- Charging/Charged indicator on drop-in charger
- Rubber overmolding for better grip and drop protection
- USB PC interface for storing different radio configurations, firmware updates, and for dispatching text messages from a connected PC (which could be automated)
- User-definable ringtones, assignable to specific callers

- Repeater capability (no restrictions under FCC Part 15.247)
- Transmitter lock (for use as a room or baby monitor)

Final Thoughts

The TSX300 is a very cool two-way radio with unprecedented privacy and other features. The more I used it, the more I liked its design and capabilities. This is an excellent first-generation implementation of consumer FHSS two-way radio technology and is an exceptional value (price/features/performance.) While the extensive digital feature set may be overkill for some users, it's a good balance between what's possible and what people will really use.

If the general public discovers it can enjoy private and interference-free two-

way radio communications—with an operational range comparable to FRS/GMRS but with many more useful features, TriSquare's patented eXRS technology might just catch on and become the new preferred medium. Conveying the benefits of this advanced technology to average consumers might be challenging in the face of notorious false claims made by FRS/GMRS resellers (i.e., fantastical range claims and so-called "Privacy Codes"—which provide no privacy at all).

But TriSquare is ahead of the curve with its TSX300. Its innovative and unprecedented range of features stands apart from all other consumer two-way radio offerings. There's nothing remotely like it, except perhaps Motorola's DTR business series, which offers fewer features, less privacy, and costs several times as much.

Pricing And Warranty

Suggested retail price for the TSX300-2VP "Value Pack" is \$99.99, but some online resellers are advertising it for even less. It has a one-year limited manufacturer's warranty against defects. More information can be found on TriSquare's website at www.trisquare.us.

Two-Way Radio Privacy For The Paranoid

There are lots of reasons people might want private two-way radio communications, including for personal or family matters, proprietary business operations, secret hunting and fishing spots, outdoor action/strategy games, political/social direct actions, etc. With CB/MURS/FRS/GMRS radios, all of that is easily and likely to be overheard on a handful of public channels. Worse, your kids could be subjected to unsavory messages by strangers, or even lured by criminals monitoring those channels. Granted, this is not a widely documented problem, but why risk it if you don't have to?

Until very recently, "privacy" and "consumer two-way radios" were contradictory terms. Now there's a paradigm shift that people will have to get used to. For instance, with 10 billion eXRS channels you won't be able to find and make new friends like you can by randomly overhearing people on CB/MURS/FRS/GMRS channels, or be able to scan and listen to what they're saying and doing. COMSEC can be a double-edged sword.

Arguably, TriSquare's eXRS technology might offer the general public more short-range COMSEC than landline or cellular/PCS network phone calls, which can now be remotely and instantly monitored by many people at local, state, and federal government agencies thanks to CALEA (Communications Assistance for Law Enforcement Act) and the Patriot Act. Not that most of us worry about that sort of thing, but being "off the network" can offer peace of mind to the paranoid among us.

If it's privacy you want, you may feel reassured knowing how unlikely it is that another eXRS radio user could monitor your communications without knowing your radios' 10-digit channel codes. An eXRS channel code is somewhat like a simple encryption key with 10 billion (10^9) permutations—far more than any other eXRS radio user could try manually in a lifetime. Neither scanners nor other manufacturers' two-way radios can receive eXRS' FHSS radio signals—further reducing the likelihood of interception. The characteristic of FHSS that rapidly slices and scatters a signal to appear as noise across a wide swath of radio spectrum makes it inherently difficult to track and demodulate.

Still, if you're *really* paranoid, you should know that a well-equipped and determined eavesdropper *could* use a highly specialized surveillance receiver like the WJ-8654 Microceptor to track and demodulate eXRS' FHSS radio signals. More affordable fast-sweeping receivers like those from Optoelectronics aren't quite fast enough to track and demodulate a 400-msec FHSS signal. But if you're worried about that, you probably won't be using inexpensive consumer two-way radios anyway.

It's safe to say the TriSquare TSX300 offers unprecedented two-way radio communications privacy to consumers, who can feel safe from eavesdropping by all but the most determined and well-funded spooks.

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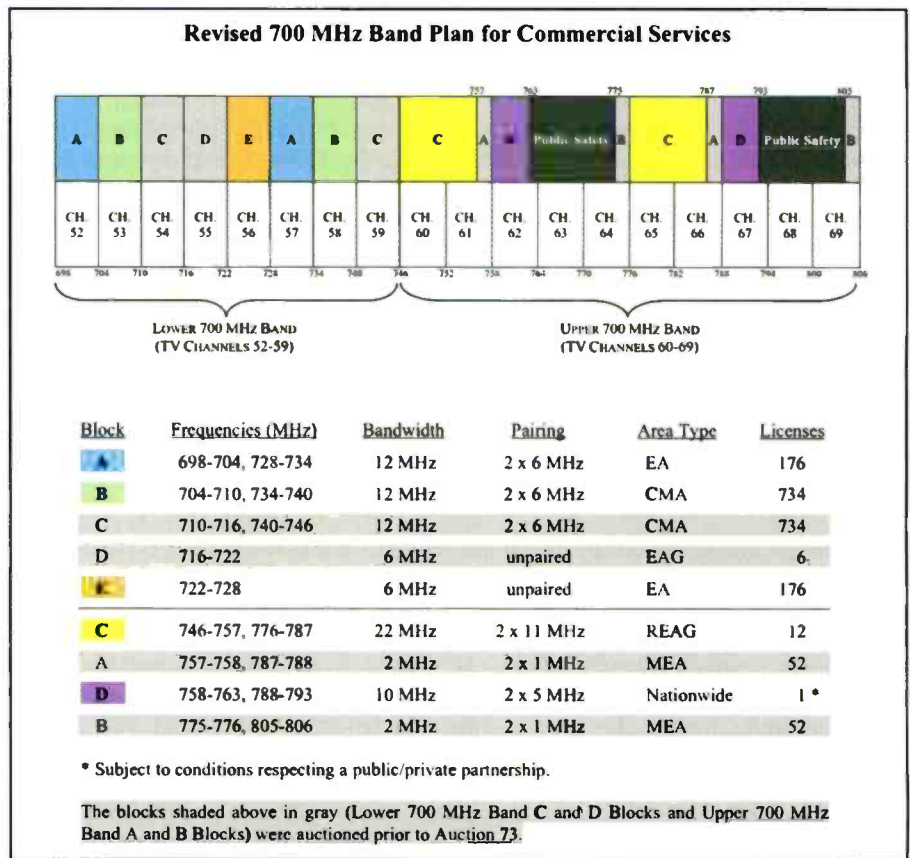
No doubt you've heard about the 700-MHz spectrum. You might also be aware that there are plans for public safety frequencies contained in the 700-MHz band, and perhaps you've been concerned about getting a radio that covers those frequencies so you'll be all set when they spring to life. Or perhaps you've not paid attention to any technology news for a while and have missed the whole thing. I have to admit I wasn't paying real close attention until this latest round of headlines. Let's see if we can figure out what is and is *not* going to happen on these prime frequencies.

The Plan

This sudden interest in 700 MHz has been sparked by the fact that it appears we're really going to get around to switching to digital television sometime in the next year or two (I thought we were good for one or two more extensions, but who knows for sure). Part of the provision for doing that is that the conventional TV Channels 52 to 69, or 698 MHz to 806 MHz, will be freed up for re-allocation. That's just over 100 MHz of space in a very prime UHF region, so there's been a lot of interest in getting control of it.

The good news is that no one entity will in fact have control over the whole thing, but prominent in the recent news is the speculation about, and close watching of, just who is interested in pieces of it. No fewer than 200 separate applications have been filed with the FCC for portions of this band, and the minimum bid for the auction is 4.3 billion. That's billion...with a B. Some serious players are interested in this space as it represents a gold mine that, ultimately, you and I will pay for.

For purposes of the auction(s), the band has been divided into lower 700, from 698–746, and upper 700, from 746–806. The upper portion represents TV Channels 60 through 69 and was supposed to be vacated first. The lower portion comprises TV Channels 52 through 59 and was supposed to be vacated later, but apparently in some areas it is already vacant and being transitioned to new purposes. There were previous auctions to deal with those frequencies.



Here's the breakdown of the 700-MHz spectrum and how it's being carved up. Note the lower and upper divisions and the further segmenting by blocks for auction purposes and the use that the different portions of the band will ultimately be put to. The column labeled Area Type gives some indication of how the frequencies will be licensed. (All illustrations from the FCC website)

These upper and lower segments are themselves further divided into blocks, A–E in the lower and A–D in the upper band. Confused yet? Just wait. Some of the blocks had been previously auctioned off and are not under consideration now. It happens that Blocks A, B, and E in the lower band and C and D in the upper band are what's up for grabs in the current auction. So some of each is being sold, but they're not together (if you follow my drift), nor do they mean much other than a group of frequencies auctioned at once.

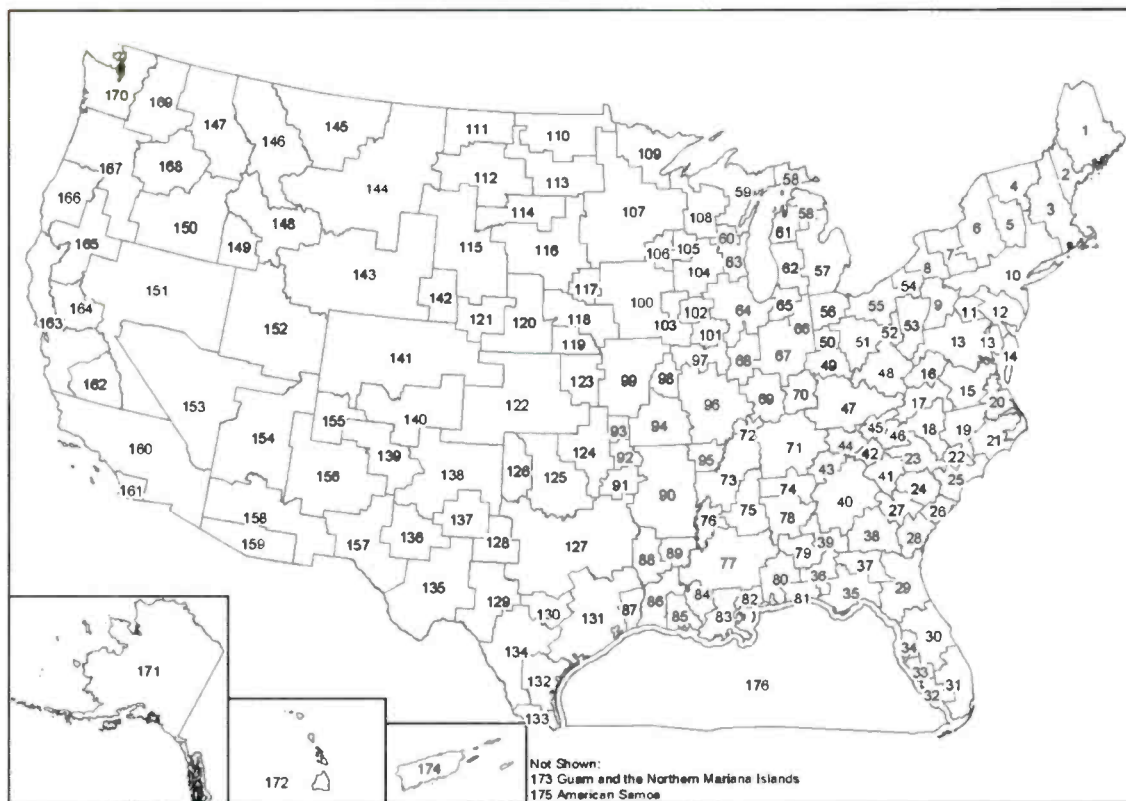
Then, to further confound the matter, some of the blocks are subdivided regionally while others are not. Block D is of interest to us (more on that later), and there will only be one nationwide license. Block C is the one that's being most hotly contested and there will be 12 regional

licenses issued. So, in theory, it's possible that different areas of the country will get different services or packages from the final winner of the auction. The 12 areas are referred to as Regional Economic Area Groupings and appear to be arbitrary patchwork of states.

Block B is divided into 734 licenses, apparently based on metro areas. These metro areas are actually the FCC's Cellular Market Areas, and are spread all across the nation and also include U.S. possessions like the Virgin Islands, Guam, American Samoa, and the Northern Mariana Islands. Keeping all of it straight is, to say the least, a challenge.

Public Safety

And there's more good news: Some of the spectrum is being set aside for public



Federal Communications Commission, Wireless Telecommunications Bureau, Auctions and Spectrum Access Division

The 176 economic areas appear to be divisions of the country based on a "local economy." Part of the lower 700-MHz band, Blocks A and E will be licensed according to this map.

safety applications. More of it is being auctioned off for private interests, to be sure, but at least public safety is getting a nod.

Specifically, two segments of the band are to be set aside for public safety use as Channels 1–960 (769–775 MHz) and Channels 961–1920 (799–805 MHz). The channels are spaced 6.25 kHz apart and paired for repeater use. Channels 1–960 are designated for base operation and 961–1920 for mobile operation. No doubt most will be trunked systems with digital modulation when they arrive there. This area is designated as public safety on the frequency chart and not included in any of the aforementioned blocks.

There's also a scheme for interoperability on a nationwide basis. This will make use of the block D frequencies mentioned above. The system is intended to provide broadband access to public safety agencies through a commercial provider nationwide. The idea, from what I can gather, is that the commercial entity, whatever that winds up being, will build the infrastructure in cooperation with public safety agencies nationwide. Once built, it can be used for both com-

mercial and public safety traffic, but the public safety agencies would have priority in times of emergency.

By working from scratch a better network can be built for public safety applications, we hope. And by partnering with commercial interests, financing might not have to be quite so painful. Of course, getting the network built by a commercial entity and funding equipment for police and fire vehicles to be on that network are two different issues. Look for a bond issue soon coming to a ballot near you.

The Rest Of The Band

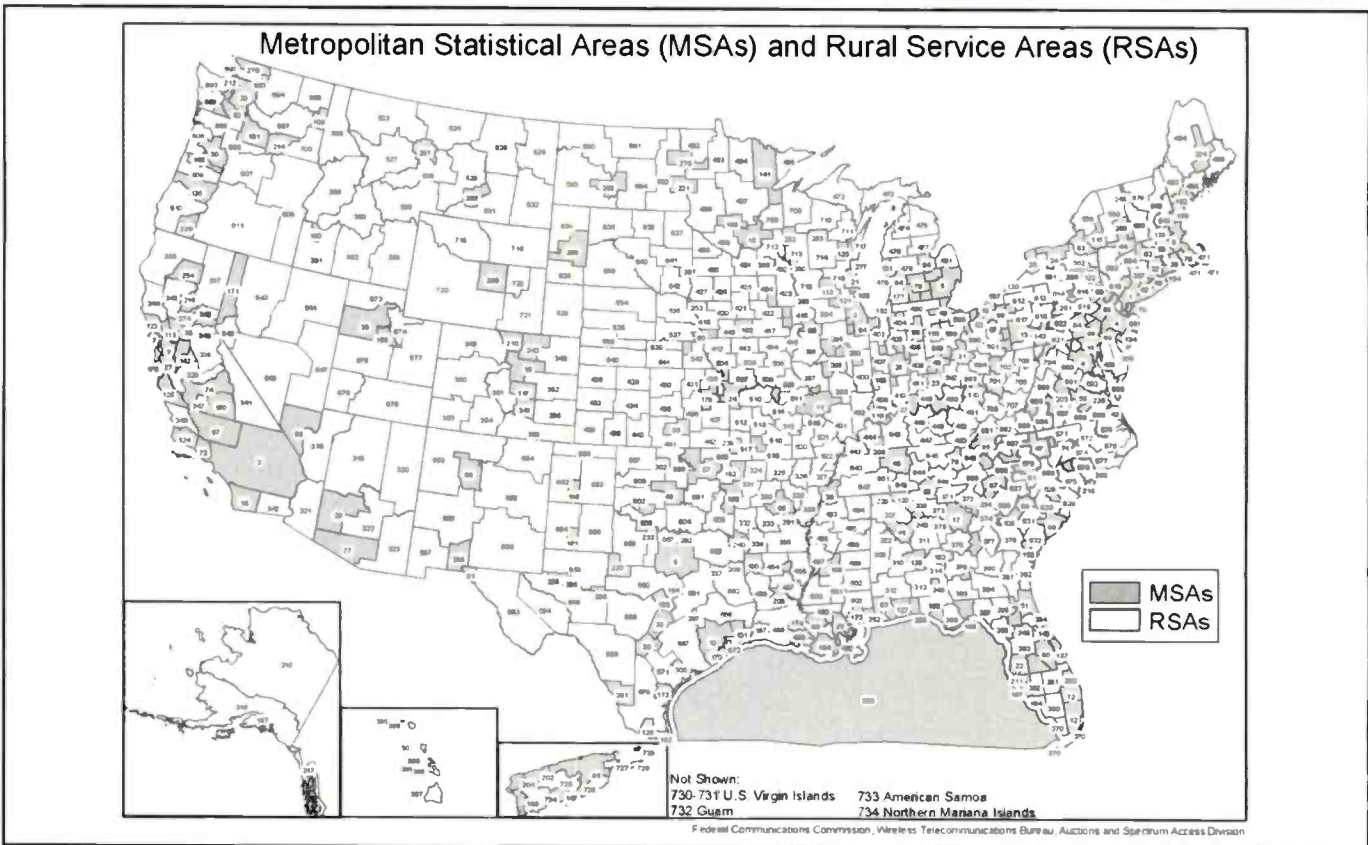
So now that we have that small portion dealt with, what happens to the rest? That's up to the auction...and the highest bidder. It is clear, however, that data will play an important role in the ultimate plan. It seems that there will be a cellular service of some kind in the lower B and C blocks as both of those appear to be licensed as cellular market areas. Whether it's data only or a regular voice/data network like we have now is hard to say.

The area generating most interest (and headlines) is Block C (746–757 and

776–787 MHz) with its 12 regional licenses. Google entered the bidding, and the public discussion that followed prompted a modification of the rules to include some provision for open access data devices (think WiFi on a large scale). It appears that the provision will include guaranteed access by any device that is "safe" to operate on the network—as opposed to some cellular providers who require that you buy your phone from them and will not allow other equipment on their network. Verizon actually sued the FCC over this provision and then withdrew their challenge at the last minute, announcing that their own network would now allow other devices as well.

That's clearly what Google has in mind with its bid. But Google, once in the infrastructure business, might be a different animal. Several leading analysts seem to think that Google is not really a likely winner, but entered to help promote the public access dialog, which Google would be very interested in.

Other bidders include several wireless telephone carriers, Cox Cable, DISH network, and a host of other smaller compa-



Cellular Market Areas (CMAs) are a bit easier to understand, and the B Block of the lower 700-MHz band will be auctioned for this purpose. Note that the lower C Block was also auctioned for this use, similar to the two sets of frequencies in the 800-MHz band designated for wireline carriers and others (systems A and B).



This map shows the Regional Economic Area Grouping (REAGs) of the hotly contested C Block of the upper 700-MHz band.

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 the lucky winner a free one-year gift subscription, or extension, to *Pop'Comm*.

Our most recent winner is **Jerry F. Schmidt** of Eau Claire, Wisconsin. Congratulations, Jerry.

The frequency this month will be **151.880**. Have a listen and let me know what you hear. You can send your entry via email to radioken@earthlink.net, or by more traditional methods to Ken Reiss, 9051 Watson Rd. #309, St. Louis, MO 63126. Please be sure to put the frequency in the subject line or on the envelope so it can be routed correctly.

nies interested in establishing some kind of wireless service. How the auction will go, or what might eventually happen on any of the 12 regional licenses, is anyone's guess right now, but by the time you read this more may have been decided, or shortly will be.

Where We Come In

Whether it will be for data devices only, some kind of handheld Internet device (iPhone on a leash?), or some also-ran cellular service is all in the bidders' hands right now. Once we have our winner and the services start to show up, you'll get to help pay for all that lovely spectrum space if you decide to use any of the devices.

In the meantime, I wouldn't rush out to buy a new radio. It's likely to be late 2008 or even 2009 before licenses are issued and systems built, except in very special areas. When they do begin to appear, a digital requirement is almost certain, and the protocols could change by the time things actually hit the air. If you need a new radio now, you might want to keep this in mind, but until something major in your area switches to this band I'd sit tight on the equipment you have and see what develops.

Until next month, good listening!

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Calendar includes dates of important Ham Radio events such as major contests and other operating events, meteor showers, phases of the moon, and other astronomical information, plus important and popular holidays. The CQ Ham Radio Operators calendar is not only great to look at, it's truly useful, too!

8



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9



Air Band Antennas

Apparently, there are quite a lot of aviation comms fans out there among our readers. I never realized just how popular it is to listen on Unicom Channel or to the local airport control towers. I have personally avoided communicating with control towers since I sold off my half of an Aerocoup years ago, but our valued readers have spoken, and this construction project was suggested by one of them.

In **Photo A** and **Photo B** you see a two-element and a three-element Yagi antenna designed around 125 MHz, but they have more than enough bandwidth for the entire VHF comm band.

In **Plot 1** you see a network analyzer plot of the two-element Yagi. The -10 dB line represents about a 2 to 1 SWR, and the -20 dB line represents about a 1.2 to 1 SWR. As you can tell, we have a pretty good SWR over the aircraft VHF communications band.

Construction

If you've been following "The Antenna Room" columns, you know I like to use that J-shaped driven element on my beam antennas, but this time we're going to use a simple dipole driven element. For you folks who already have antenna modeling software, yes, I'm again using element-to-element spacing to load the 72-ohm driven element down to 50 ohms. Most Yagis

have different stubs, bars, or capacitors on the driven element to impedance-match the driven element to the 50-ohm coax, but this design uses the construction of the Yagi itself and the distance between elements to do the impedance matching for you. Just build per the dimensions and put it up.

For the elements I used bronze welding rod, but just about any stiff wire will work. Aluminum rod from another antenna, coat hangers, copper wire, hobby tubing, or thin water tubing can all be used. Heck, I even used clear plastic tubes full of salt water, but that's a story for another column.



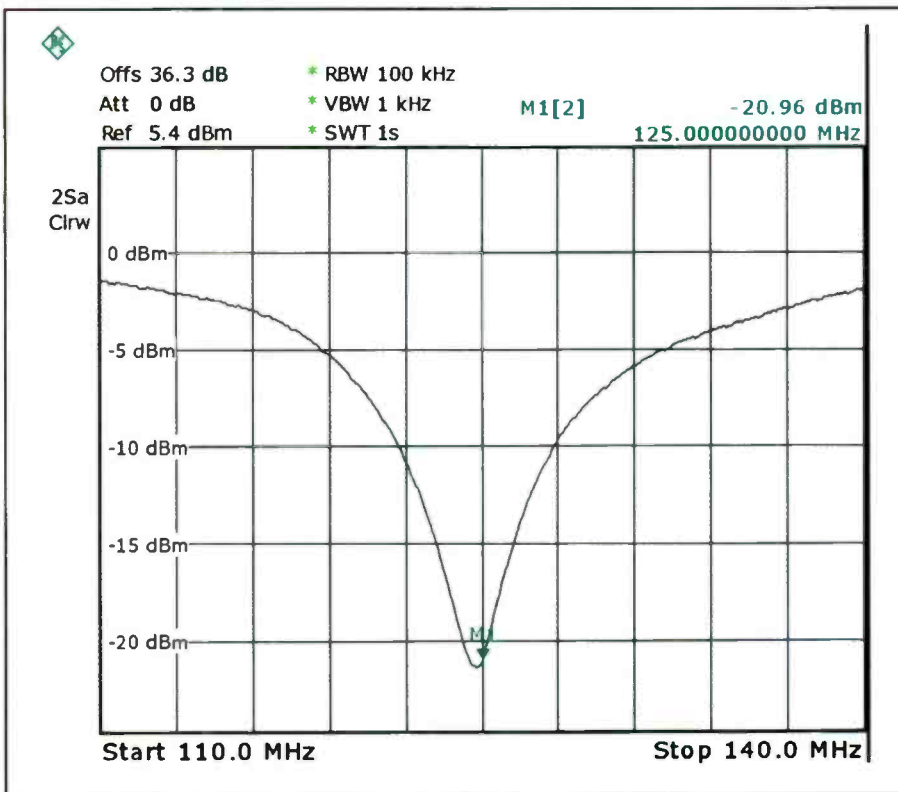
Photo A. The two-element air band Yagi.



Photo B. The three-element air band Yagi.



Photo C. Element-to-element connection.



Plot 1. Network analyzer plot of the two-element Yagi.

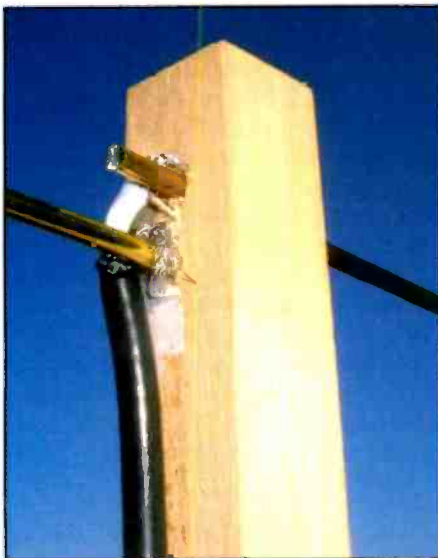


Photo D. Attaching coax to the driven element.

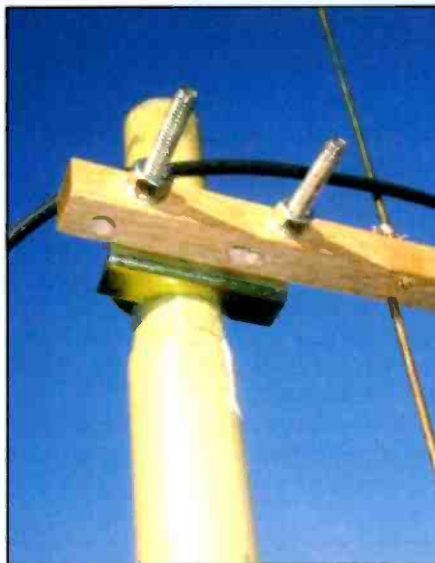


Photo E. Antenna-mast mounting.

Because 48 inches is kind of long for most rods and tubes (they seem to come in 36-inch lengths), I just drilled two holes in the boom, pushed them through, and as you can see in **Photo C**, just soldered a strap between the two. This shorts out the two pieces and makes it one long element.

The elements can be between 1/8 and 1/2 inch in diameter without changing performance. For the driven element you really want to use a material you can sol-

der to. Again, I used bronze welding rod, which solders pretty well, but it's possible to make some clips out of brass or tin and solder the coax connections to the clips. In **Photo D** you can see where I have the coax shield soldered to one element, and the center conductor of the coax to the other element. You want to use RG-58, RG-8X, RG-8, or some other 50-ohm coax. If you plan to mount the antenna outside, I would suggest some RTV or

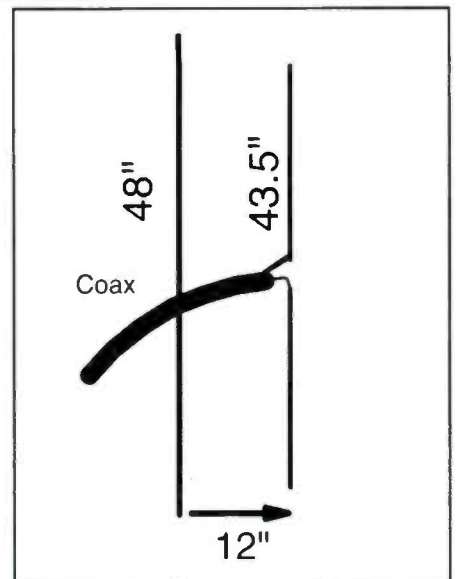


Figure 1. Two-element Yagi dimensions.

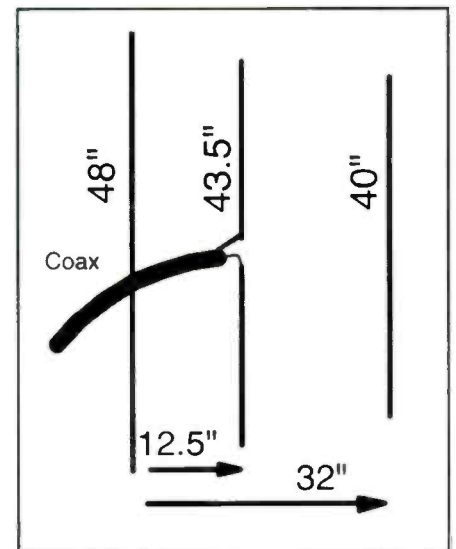


Figure 2. Three-element Yagi dimensions.

similar glue on the open part of the coax shield to help keep water out of the coax.

For the boom you can use from 3/4 x 3/4 to 1-1/2 x 1-1/2-inch wood. Yes, you can use PVC pipe, but I'm not a fan of round plastic booms. Again, if you plan to mount the antenna outside for long periods of time, a quick coat of paint on the wood will add years to its life. Spar Varnish seems to work best, but clear spray paint, epoxy paint, and even house paint works well also.

Mounting

For testing, I mounted the antennas horizontally. That's good for testing but

Pop'Comm March 2008 Reader Survey Questions

This month we'd like to ask you about your reading habits concerning *Pop'Comm*. Please use the Reader Survey Card and circle all appropriate numbers. Thanks for participating.

Are you currently a subscriber to *Pop'Comm*?

- Yes 1
- No 2

If not, where do you usually procure your copies of *Pop'Comm*?

- Bookstore 3
- Electronics Store 4
- Supermarket 5
- Convenience Store 6
- Newsstand 7
- From a friend 8

How many years have you been reading *Pop'Comm*?

- Less than 1 year 9
- 1-5 years 10
- 5-10 years 11
- 10-20 years 12
- Since its launch 13

How many of the last four issues of *Pop'Comm* have you read or looked through?

- Four of four 14
- Three of four 15
- Two of four 16
- One of four 17
- None 18
- Haven't yet received four issues 19

About how many times do you refer to a typical issue of *Pop'Comm* before you are finished with it?

- Once 20
- Twice 21
- Three to four times 22
- Five to six times 23
- Seven to nine times 24
- Ten times or more 25

When you are done with a typical issue of *Pop'Comm* what do you do with it?

- Save it 26
- Throw it out 27
- Pass it along to someone else 28



Photo F. Antennas that are not what they appear to be.



Photo G. Close-up of the hidden antenna.

poor for reception since most air band signals are vertically polarized. When I mounted the antennas vertically for photographing, I realized my wood boom was kind of short, and it needed to be 4 or 5 inches longer.

You really want that reflector element farther away from the mounting mast. In

Photo E you can see where I had the boom drilled for vertical or horizontal mounting, but the three-element is really good close to the mounting mast for good performance.

On The Air

You're going to see quite a boost in those air band signals. First off, they're AM signals, not FM. So a little more signal really knocks down the background noise. Next, most scanner antennas are not really tuned to 108-135 MHz, so these Yagis end up giving you nearly 15 to 20 dB more signal than a typical scanner ground plane or discone antenna.

While they work best in the air, you can also get good service mounting the Yagis inside your attic. This keeps them out of the weather and away from the prying eyes of neighbors. I've had some similar antennas in my attic for over 15 years now, and except for a little dust, they still look and work fine.

Other Uses

The first request for air band Yagis came from a CAP (Civil Air Patrol) organization. They were interested in using these on 121.5 MHz to track down ELTs (Emergency Locator Transmitters). If you're involved in a group like this (or any other group), it's good to know that you can build a handful of these Yagis for just a few dollars.

And, sometimes, you may want an antenna that isn't what it appears to be. You see lots of these set top TV antennas with a small dish for UHF reception like the one in **Photo F**. But...there is a bit of a problem here. For a dish to bring a radio wave to a proper focus, it really

Coming In April...

EPA Report: SWR Declared Endangered Species

We have all gone to great lengths to clean off those little pesky SWRs that crawl all over our antennas. It looks like we've done too good a job.

From EPA researcher, Dr. Chart Smith, we learn: "It is a classic case of habitat destruction. With all the new antennas getting their SWR count under two, the little critters just never have a chance to breed."

New research on an SWR habitat is being conducted. It is hoped the researchers can find that elusive antenna with an infinite SWR, thus creating a home for all the SWRs in the universe.

Not really, I just couldn't resist. And not being scheduled for the April issue, I had to get my little April Fool's joke in early.—kb

OUR READERS SPEAK OUT

should be 10 wavelengths across. You can get by with only five wavelengths across, but at reduced efficiency. At TV CH 68, a radio wave is just over a foot long. So a UHF TV dish antenna needs to be at least 5 feet across! So what's the deal with this 6-inch dish?

Have a close look at the edge of that plastic dish in **Photo G**. See the wire embedded in the rim? That is a loop antenna just like the UHF loop on most indoor antennas. The "dish" is just for show. But hey, 99 percent of TV antennas are sold on marketing, not because of how well they work. I guess the best example of this kind of marketing is how many dogs buy dog food?

A Reader Question

From California we get this question: "Silver has less resistance than copper. Would a silver wire antenna work better on shortwave?"

The short answer is not really. A long wire antenna has about a 1000-ohm impedance. A 1-ohm loss in copper versus a .8-ohm loss in silver wire is not going to change signal levels very much. And on shortwave your big enemy is usually noise, not signal levels. So you would never hear a difference between copper and silver antenna wire. But let's look at a mobile antenna.

A mobile antenna for 3 to 7 MHz may have a radiation impedance of only 1 or 2 ohms. Now that few tenths of an ohm can make an improvement, especially if the antenna is used for transmitting. You also have additional inductors in the matching network that match your 50-ohm transmitter to the low-impedance antenna where a little less loss is again a big help. So you pick up a few percentage points more efficiency, but not much.

But whenever Room Temperature Super Conductors become available, I'll have several antenna designs I want to play with! Zero Loss Near Infinite Q... now those will be interesting antennas.

Topic Suggestions?

As always, you, our readers, are the best sources of topics for this column, and we are happy to help you with your antenna questions. Just drop an email to wa5vjb@cq-amateur-radio.com or visit www.wa5vjb.com/, where you can also see some of my other antenna projects (see the Reference section).

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 Scanning In New York City

The following letter was sent to Ed Muro, author of "Scanning Heats Up For The Holidays In New York City" in the December 2007 Pop'Comm.

Dear Ed:

My family and I just returned from a four-day trip to New York City. The day before we left, I got the December issue of *Pop'Comm* in my mailbox. Your article certainly attracted my attention. I only planned to take a small ham HT along with me. Now that I had actual frequencies listed for me, along came my ICOM R5 scanner as well. (One day, I'll feel rich enough to get a 396 or new 500 handheld scanner. It sure would have been nice to have that near-field capability numerous times!)

We stayed at the Hampton Inn just south of the southwest corner of Central Park. From what I could figure, we were in the NYPD zone 4. Here at home (near Atlanta), I enjoy listening to the police traffic when I can. In my county of Cobb, they went trunking AND digital, so until I'm rich(!), I'm out with the locals. So it was fun using the scanner up there. I didn't find too much activity on FRS, and no activity on GMRS. Ditto for CB (although I only had a rubber duck). A local ham (K2MAK) showed me his handheld and how he listens to the traffic copters directly. Used to do that here in Atlanta too, but they moved to cell phones and reports from lay people like you and me instead. Cheaper than running a copter I guess?

So *thanks* for taking the time to write the article. I found it very useful. It was also simply amazing how much RF is in Manhattan. Even with my squelch all the way tight, I still had intermod all the time (unless inside a building). Sure seems like PL or DPL is the way to go up there?

Tim Lemmon, WK4U
Via email

And here's another take on the same article...

Dear Editor:

Your December cover story, "Scanning Heats Up For The Holidays In New York City" made me laugh when I read the suggestion: "In this post-911 world, if you plan on taking a handheld scanner to some event, make sure you use discretion and don't make a 'public spectacle' of yourself" so as not "to be mistaken for a 'techno-geek terrorist.'" So does this mean *Pop'Comm* readers shouldn't act like the fellow on your magazine cover publicly displaying his handheld scanner at Rockefeller Center?

Are terrorists really going to risk making a "public spectacle" of themselves by waving around handheld scanners? Or are law enforcement officials in New York City naive and clueless enough to believe they would? What's a "techno-geek terrorist" anyway, and how many have been apprehended? Too many people, including government officials, conflate the fanciful plots and stereotypes portrayed in TV dramas and Hollywood movies with reality.

The misconception that people who appear to be technologically "geeky" and carry around electronic devices pose some kind of threat to public safety is one that we should dispel, rather than foster by suggesting we should be "leaving the radio home or hidden." That seems cowardly and counterproductive: If more citizens conspicuously carried radio scanners, they wouldn't appear so threatening in the eyes of ignorant people.

In this "post-911 world" we DO indeed have a responsibility: To exercise our rights more than ever, rather than meekly allowing over-reactionary officials to take away or have a chilling effect on the very freedoms we should be defending. It is not illegal to carry a scanner in New York City or any other U.S. city, and any law-enforcement officer who says it is needs to take remedial courses in criminal and constitutional law. Such ignorance should be nipped in the bud before it continues spreading like a cancer that further erodes our valued freedoms.

A. Listener
Northeast, Pennsylvania

The ARTV Monitoring Center

Imagine earning a living by monitoring broadcast signals. The FCC once manned monitoring sites across the country until budget cutbacks and downsizing put an end to it. The FCC now depends on self-monitoring by the broadcast industry. BBC Monitoring might be an option, but it's primarily a news gathering agency. How 'bout the broadcast monitoring center of Radio Televizioni Shqiptar, or RTSH (Albanian Radio and Television, or ARTV)? It's an elite group in Albania responsible for monitoring everything from AM radio to satellite TV broadcasts from a technical standpoint.

Background

The ARTV Monitoring Center of Radio Tirana was first created by the Chinese in 1966 and installed at the Albanian Telegraphic Agency (ATA) receiving station in Kamez Field, eight kilometers northwest of the capital city of Tirana. It was transferred to the Radio Tirana headquarters in 1993. The Monitoring Center has been working under the supervision of the government Directory of Radio and TV Transmitting Stations-Tirana from 1966 to 1994, under the Directory of Radio Tirana from 1994 to 1998, and thereafter again as an extension of the Directory of Radio and TV. The staff consists of a chief electrical engineer and four operational technicians.

Present duties of the ARTV Monitoring Center include keeping under continuous interactive technical control the technical quality of the following radio and TV broadcasts: Radio Tirana Channel 1 on MW-Shijak (ceased on February 3, 2006), on FM-Dajt and via satellite, Channel 2 on FM-Dajt, and Channel 3 (Radio Tirana International) on MW-Fllakë and SW via Shijak; Foreign broadcasting by the BBC on FM-Dajt, VOA on FM-Dajt, Deutsche Welle on MW-Fllakë, TransWorld Radio (TWR) on MW-Fllakë and HF-Shijak, and China Radio International (CRI) on MW-Fllakë; and Radio Televizioni Shqiptar via Dajt on VHF-I, VHF-II, and UHF; and TVSH on satellite. The Monitoring Center informs the relevant sectors and directors immediately of irregularities and problems during the trans-

mission of programs, with daily written reports provided by the head of the Monitoring Center.

International Collaboration

Previously a Communist nation aligned with the Soviet Union and later with China, government reforms led to democratization of Albania in the 1990s. For the first time, in April 1995, international monitoring cooperation with many other radio monitoring centers in Europe, the Middle East, and North America was established by exchanging reception reports and technical data on reciprocal radio and TV broadcasts.

"As Head of the Monitoring Center since 1995, I am also cooperating very closely, mainly in a technical point of view, with medium and shortwave listeners to Radio Tirana from every part of the world," summarized Chief Engineer Drita Cico in a status report and five-year plan. "From 2004 we have been very active in cooperating with the Këshilli Kombëtar i Radios dhe Televizionit (KKRT - National Council of Radio & Television) for providing Albanian radio data to the co-editors of the *World Radio & TV Handbook*."

The Monitoring Center also compiles the winter and summer frequency schedules on shortwave for Radio Tirana in cooperation with the High Frequency Coordination Conference (www.hfcc.org), the group informally responsible for coordinating shortwave broadcast frequencies.

Equipment List

In order to accomplish its tasks, the ARTV Monitoring Center has assembled an impressive array of equipment, including:

- Three Yaesu FRG-8800 general coverage communications receivers (without FM band block), gifted by Radio Tirana. "For



Shortwave antennas at the Shijak transmitter site of Radio Tirana.



Another view of the Shijak site. The single stick on the left is the 1089 MW antenna.

FCC Callsign Changes

New Call	Location	Freq	Old Call	New Call	Location	Freq	Old Call
Pending							
WAYP	Marianna, FL	88.3	WJNF	KIDI-FM	Lompoc, CA	105.1	KRTO
WSKK	Luka, MS	104.9	WFXO	KXOB	Madera, CA	107.1	KMMM
KBXJ	Los Ybanez, TX	98.5	KYMI	KAYF	Bayfield, CO	92.5	New
KLPF	Midland, TX	90.9	KAQQ	KBCO	Boulder, CO	97.3	KBCO-FM
Changes							
WGNQ	Bridgeport, AL	1480	WYMR	KSTY	Canon City, CO	104.5	KKCS-FM
WLYJ	Centre, AL	1560	WZTQ	KPAU	Center, CO	105.3	New
WWFF	Fairhope, AL	660	WDLT	KDVC	Dove Creek, CO	102.5	New
WJBY	Gadsden, AL	1350	WGAD	KDNG	Durango, CO	89.3	New
WZTQ	Jasper, AL	1240	WLYJ	KRWA	Rye, CO	90.9	KXWY
WGAD	Rainbow City, AL	930	WJBY	KJWA	Trinidad, CO	89.7	KRYI
KGIL	Beverly Hills, CA	1260	KMZT	WDSO	Dover, DE	94.7	WRDX
KSMX	Santa Maria, CA	1240	KSMA	WRDX	Smyrna, DE	92.9	WDSO
KLVZ	Brighton, CO	810	KLDC	WLYJ	Marathon, FL	91.5	WHWY
KLDC	Denver, CO	1220	KLVZ	WKCP	Miami, FL	89.7	WMCU
WWWT	Washington, DC	1500	WTWP	WFLF-FM	Parker, FL	94.5	WFBX
WMCU	Coral Gables, FL	1080	WTWS	WFRU	Quincy, FL	90.1	New
WSGC	Elberton, GA	1400	WNGA	WRBF	Plainville, GA	104.9	New
KILE	Hilo, HI	1590	KIXC	KMWB	Captain Cook, HI	93.1	New
KHCM	Honolulu, HI	880	KHNR	KHCM-FM	Honolulu, HI	97.5	KHNR-FM
KHNR	Honolulu, HI	690	KHCM	KJMQ	Lihue, HI	98.1	KAWV
WRFM	Muncie, IN	990	WLHN	KRID	Ashton, ID	96.5	New
WCWC	Williamsburg, KY	1440	WEZJ	KTYY	Middleton, ID	88.7	New
WWWB	Frederick, MD	820	WTWT	KXJO	St. Maries, ID	92.1	New
KVXR	Moorhead, MN	1280	KVOX	WJWR	Bloomington, IL	90.3	New
WXYG	Sauk Rapids, MN	540	New	WZGL	Charleston, IL	88.1	New
KPNP	Watertown, MN	1600	KZGX	WARW	Dorsey, IL	89.5	WDRS
WGAM	Manchester, NH	1250	WKBR	WCFS-FM	Elmwood Park, IL	105.9	WCKG
WGHM	Nashua, NH	900	WGAM	WHPI	Glasford, IL	101.1	WXMP
WCNL	Newport, NH	1010	WNTK	WLFH	Rantoul, IL	95.3	WMYE
WYBY	Cortland, NY	920	WKRT	WFDM	Franklin, IN	95.9	WIAU
KVOX	Fargo, ND	740	KKAG	WEXM	Indianapolis, IN	93.1	WNOU
WWHM	Sumter, SC	1290	WQMC	WCNB	Lebanon, IN	91.5	New
WWDX	Huntingdon, TN	1530	WDAP	WZRP	Richmond, IN	89.3	WVXR
WGGQ	Newport, TN	1060	WNPC	WNOU	Speedway, IN	100.9	WYJZ
KVDG	Midland, TX	1150	KJBC	WENS	Wadesville, IN	90.1	WRFM
KNVR	San Saba, TX	1410	KBAL	KDSO	Cascade, IA	88.9	New
KNIW	Wink, TX	1480	New	KKDT	Burdett, KS	93.5	New
WITM	Marion, VA	1330	WHGB	KERP	Ingalls, KS	96.3	KSSH
WTPS	Petersburg, VA	1240	WROU	KNZS	Kingman, KS	100.3	KTCM
WURA	Quantico, VA	920	New	KXNC	Ness City, KS	104.7	New
WKDL	Warrenton, VA	1250	WPRZ	WPBK	Mount Vernon, KY	102.9	WANK
KWLE	Anacortes, WA	1340	KLKI	WKYN	Owingsville, KY	107.7	WKCA
KTBK	Auburn-Federal Way, WA	1210	KWMG	WYKY	Science Hill, KY	106.1	New
KDYM	Sunnyside, WA	1230	KZTS	WRKZ	Lexington Park, MD	97.7	WYRX
KDYK	Union Gap, WA	1020	KYXE	WFMR	Orleans, MA	91.3	New
KJNT	Jackson, WY	1490	New	WBCK-FM	Battle Creek, MI	95.3	WBXX
WBFA	Ft. Mitchell, AL	98.3	WAGH	WTKQ-FM	Carrollton, MI	100.5	WSGW-FM
WHWT	New Hope, AL	103.5	New	WXYT-FM	Detroit, MI	97.1	WKRK-FM
WWFA	St. Florian, AL	102.7	New	WBXX	Marshall, MI	104.9	WRCC
WAGH	Smiths, AL	101.3	WBFA	KSCK	Blackduck, MN	104.5	New
KHKY	Akiachak, AK	92.7	New	KXLP	Eagle Lake, MN	94.1	KXRP
KHZX	Yakutat, AK	103.9	New	KATO-FM	New Ulm, MN	93.1	KXLP
KDDL	Chino Valley, AZ	94.3	KFPB	KZRV	Sartell, MN	96.7	KKSR
KEEC	Teec Nos Pos, AZ	95.3	New	WLVS	Collins, MS	107.1	WKNZ
KIXC	Bearden, AR	92.7	New	KEXS-FM	Ravenwood, MO	106.1	New
KLMK	Marvell, AR	90.7	New	KERT	Alberton, MT	105.5	KHLN
KCGC	Coarsegold, CA	94.5	New	KXGZ	Frenchtown, MT	101.5	New
KRTO	Guadalupe, CA	97.1	KIDI-FM	KHLN	Montana City, MT	98.5	KERT
KGBB	Johannesburg, CA	103.9	KEDD	KHSK	Allen, NE	100.9	New
KVPW	Kingsburg, CA	106.3	KSXE	KCNB	Chadron, NE	94.7	New
KNIG-LP	Laguna Niguel, CA	93.5	New	KBTK	Grand Island, NE	91.5	New
				KNPQ	Hershey, NE	107.3	New
				KBZR	Lincoln, NE	102.7	KFRX
				KFRX	Lincoln, NE	106.3	KLMY
				KZTL	Paxton, NE	93.5	New

New Call	Location	Freq	Old Call	New Call	Location	Freq	Old Call
KRNP	Sutherland, NE	100.7	New	WXPB	Middletown, PA	88.7	WZXM
KFRH	Boulder City, NV	102.7	KSTJ	WZDB	Sykesville, PA	95.9	New
KHIJ	Mesquite, NV	96.7	New	WJWF	Charleston, SC	96.9	WSUY
KJIV	Reno, NV	89.5	New	WGSP-FM	Pageland, SC	102.3	WRML
KEBG	Spring Creek, NV	103.9	New	KIOL	Lennox, SD	99.1	KHJK
WBNJ	Barnegat, NJ	91.9	New	WPFT	Pigeon Forge, TN	106.3	New
KRRT	Arroyo Seco, NM	91.3	New	KCHT	Childress, TX	104.1	New
KSMX-FM	Clovis, NM	107.5	KSMX	KKDL	Dilley, TX	93.7	New
KRAR	Espanola, NM	91.9	New	KHJZ	Houston, TX	95.7	KHJZ-FM
KBQL	Las Vegas, NM	92.7	New	KHJK	La Porte, TX	103.7	KIOL
KRRE	Las Vegas, NM	91.9	New	KRTS	Marfa, TX	93.5	New
KSFQ	Santa Fe, NM	90.7	KSFR	KRQX-FM	Mexia, TX	104.9	KWGW
KBOM	Socorro, NM	88.7	New	KPGA	Morton, TX	91.9	New
KSFR	White Rock, NM	101.1	KSFQ	KNVO-FM	Port Isabel, TX	101.1	KZPL
WQTK	Ogdensburg, NY	92.7	WBDB	KTTQ	Turkey, TX	107.5	New
WRUN-FM	Remsen, NY	90.3	New	KGXL	Winters, TX	96.1	KNCE
WBON	Westhampton, NY	98.5	WBZB	KEMR	Castle Dale, UT	102.1	New
WNCM	Garysburg, NC	103.1	New	KHUN	Huntington, UT	107.1	New
WPRZ-FM	Newton Grove, NC	90.7	WZRL	WWTJ	Charlottesville, VA	107.5	WCJZ
WBNK	Pine Knoll Shores, NC	92.7	New	WWWT-FM	Manassas, VA	107.7	WTWP-FM
WEZU-LP	Roanoke Rapids, NC	95.9	WZNC-LP	WOTX	Lunenburg, VT	93.7	WXBN
WZCP	Chillicothe, OH	89.3	WVXC	KQOL	Vancouver, WA	105.9	KIJZ
WNNF	Cincinnati, OH	94.1	WVMX	WLVW	Moundsville, WV	96.5	WRKP
WKRR-FM	Cleveland Heights, OH	92.3	WKRI	WLGE	Ephraim, WI	106.9	New
WKCA	Georgetown, OH	97.7	WAXZ	KYEN	Cheyenne, WY	103.9	New
WZWP	West Union, OH	89.5	WVXW	KMWY	Jackson, WY	91.1	New
KZZF-LP	Klamath Falls, OR	107.7	KEUI-LP	KPKL	Moorcroft, WY	106.1	New
WXMJ	Cambridge Springs, PA	104.5	WXXO	KKWY	Superior, WY	106.5	New
WMAJ-FM	Centre Hall, PA	99.5	WLTS	KRMZ	Steamboat Springs, CO	24	KMAS-TV
WNAE-FM	Clarendon, PA	102.7	New	WTGL	Leesburg, FL	45	WLCB-TV
WHMJ	Franklin, PA	99.3	WOXX	WPCH-TV	Atlanta, GA	17	WTBS
WLRI-LP	Gap, PA	92.9	WLAL-LP	KGLA-TV	Hammond, LA	42DT	WHMM
WZXM	Harrisburg, PA	88.1	WXPB	WMTW	Poland Spring, ME	8	WMTW-TV

the FRG-8800 receivers we use a mediumwave antenna that we spell by the name 'G,' but its form is like the letter G in the Russian alphabet," says Cico. "It is installed on the roof of Radio Tirana House, at a height of 18 m from ground level."

- A Lowe HF-225 Portable Remote Monitor (PRM) modified and gifted by TWR in 1994, with MW and HF (without FM band block) for field strength and modulation measurements, with an active omnidirectional mediumwave antenna.

- A modified TELFM01 FM receiver and Software Radio Monitor (SRM) Version 4.7 for modulation measurements on the FM band, installed by two Italian specialists from Prais (www.prais.com) in 2000.

- A Grundig YB-500 AM/FM receiver, bought from the Directory of Radio Tirana, 1994.

- A Grundig Ocean Boy AM/FM receiver, bought from the Directory of Radio Tirana, 1994.

- Radio-Magnetophone Grundig RR1350 (AM-FM), bought from the Directory of Radio Tirana, 1994.

- Two Samsung color televisions (14- and 17-inch), bought from the Directory of ARTV Transmitting Stations, 1998.

- An Alfa Gold Digital free-to-air digital satellite receiver, installed in 2004.

- Additional receiving antennas, including VHF-I, VHF-III, UHF, and an 80-cm satellite dish.

Monitoring Center equipment no longer in use includes a Russian copy of an old Chinese tube system for frequency and modulation measurements on MW and HF, two WS423 MW/HF band receivers, two TF-2 modulation meters, one PBE-1 frequency meter for measurements up to 30 MHz, and one

generator of standard frequencies 500 Hz, 1 kHz, 10 kHz, 100 kHz, 1 MHz, etc.

"With this system our Monitoring Center worked non-stop since it was created in 1966 till 1993 for corrections of all frequencies and mediumwave modulation signals of Radio Tirana MW and HF radio stations in Filakë, Shijak, and Cerrik, on received ground signals of Radio Tirana when the Monitoring Center was working at the ATA receiving station in Kamez Field," adds Cico, referring to the retired equipment.

Additional Rohde & Schwartz professional equipment once used by specialists of the former Technical Directory now stored at the Monitoring Center includes: an ESU-2 VHF-UHF test receiver, HFV 25-300 MHz field strength meter, and HFH field strength meter covering up to 30 MHz with different antennas.

Digitalization

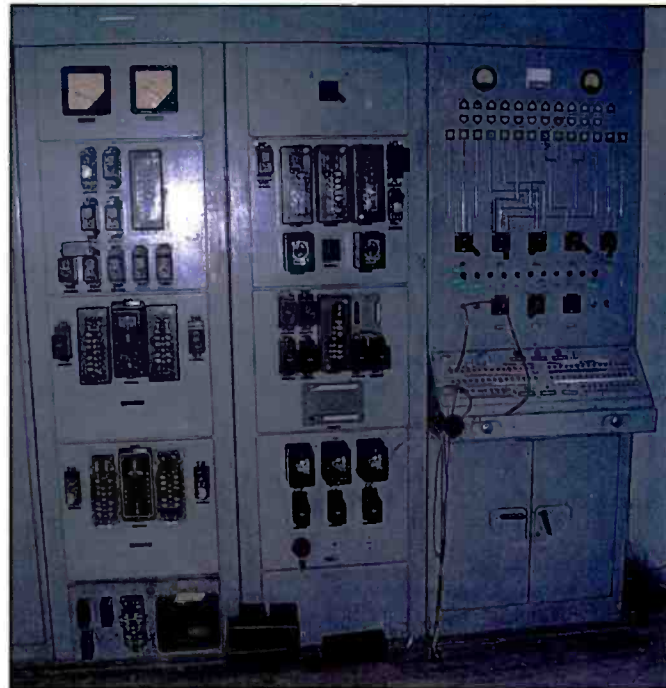
The Monitoring Center is proposing a major upgrade for a digital future. In a first draft of the 2007-2012 ARTV Digitalization Project, Chief Engineer Cico calls for new equipment and requests international professional assistance.

"The Monitoring of Radio Tirana and other stations on MW, SW, FM, and satellite bands will be realized by doing field strength, modulation and bandwidth measurements, and program recordings, all saved for at least 90 days," says Cico. Equipment for this task, she says, includes:

- Four computerized measurement and recording systems for digital broadcasting on MW, SW and FM—three in use, and one as reserve, depending on the band priority; Two professional



One of the more modern Chinese transmitters, a Continental clone, used for Radio Tirana shortwave broadcasts.



Decades-old transmission equipment at Radio Tirana.



The Yaesu FRG-8800 general coverage communications receiver.

satellite receivers connected with audio recorders—one in use and the other as reserve for the second satellite program of Radio Tirana when on the air; Four semi-professional digital receivers to simultaneously keep audio control of Radio Tirana on MW band; One MW antenna, a rotary SW antenna and one satellite dish 120 cm or larger; plus two MW transmitters in Fllakë, one MW transmitter in Shijak, and one as reserve.”

Additional digital television and satellite receivers will be required for the monitoring of TVSH on VHF, UHF, and satellite bands.

The first draft of the five-year digitization plan also proposes a Mobile Monitoring Center, needed to periodically monitor the network of ARTV terrestrial digital broadcasts over the mountainous terrain of Albania. To accomplish this difficult task, a mini mobile monitoring vehicle will be required, equipped with the minimum of digital equipment and relevant antennas.

“In the frame of the ARTV Digitalization Project, the Monitoring Center will need more space, and this is available on the existing floor,” says Cico in concluding the draft proposal. “Since 1993, the Monitoring Center has been located in a single room on the fourth floor of the Radio Tirana headquarters. Its present space is only 28 meters square.”

Mediumwave Transmitter Sites

Radio Tirana currently operates three high-power mediumwave transmitters in Albania. Two Chinese-manufactured

transmitters located in Fllakë broadcast at 1215, 1395, and 1458 kHz. Transmitter 1 was installed in 1966, number 2 in 1970; they have a power of 500 kW each that can be combined for 1000-kW operation on one frequency. The third transmitter is located in Shijak, a Russian SV-150 at 1089 kHz with a power of 150 kW, installed in 1961 but silent since 2006 despite reported interest for hire by Merlin Communications and Rai Italy. The Fllakë daily broadcast schedule includes Radio Tirana domestic services as well as programs from China Radio International and TransWorld Radio.

This aging fleet of transmitters in operation for over 37 years is in need of replacement, as indicated in the five-year digitalization plan. The two Fllakë mediumwave transmitters are notorious for drifting off frequency from nominal European channels. Moreover, 1215 is variable, last measured at 1214.654 kHz; 1395 has also been low at 1394.812 kHz, and 1458 at 1457.626 kHz. The distinctive frequencies make them easy targets for DXers worldwide. Reception reports are highly appreciated. Write to the ARTV Monitoring Center at Lek Dukagjini Street, Tirana, Albania, or to Radio Tirana at Rruga Ismail Qemali Nr



The 1961 Russian CV-150 MW transmitter

11, Tirana, Albania. Radio Tirana is online at <http://rtsh.sil.at>.

Broadcast Loggings

Radio Tirana isn't the only distinct off-frequency signal on the AM broadcast band. More radio stations are noted drifting in this month's selected logs. All times are UTC.

570 CMDC Radio Reloj, Santa Clara, Cuba, at 0540 loud and clear atop the channel with news in Spanish, syncopated clock, "RR" in Morse code and voice IDs.

(DeLorenzo-MA)

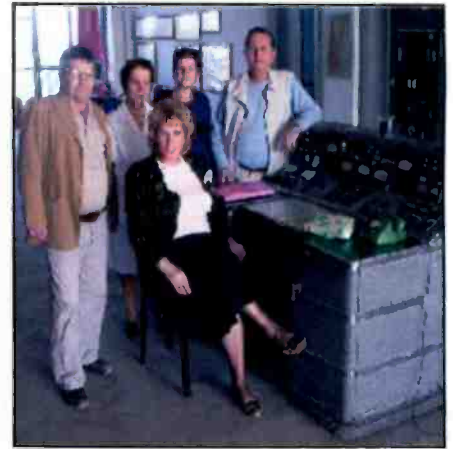
630 YVKA Caracas, Venezuela, at 0400 with national anthem, off-frequency at 631.277 kHz, producing a loud het against 630 WPRO Rhode Island. (Conti-NH) At 0549 drifting from nominal frequency of 630 kHz, a good signal with ID, "Radio Nacional de Venezuela," and RN Noticias news in Spanish. (DeLorenzo-MA)

640 XEJUA Ciudad Juárez, Chihuahua, Mexico, at 2315 romantic ballads, very clear, deliberate ID in Spanish, "XEJUA...Radio Recuerdo... música romántica." Coming in very strong on my dashboard radio, a couple of hours before sunset, on a frequency normally dominated by KFI Los Angeles. (Barton-AZ)

711 RTM Addakhla, Western Sahara, at 2333 with fast Arabic talk, off-frequency at 711.05 kHz, causing a sub-audible het against 711 France. (Connelly-MA)

770 HJJX Bogotá, Colombia, at 0155 parallel 760 HJAJ with American news items, briefly atop WABC with a poor signal. 760 HJAJ Barranquilla was also poor through remnants of nulled WJR Detroit. (Chiochiu-QC)

780 WCXH Monticello, Maine, QSL card from Allan H. Weiner received in 10 days for a tentative CD report of DX test reception, where I could only make out the Morse code W and H. Address: 28 Houlton Road, Presque Isle, ME 04769. My second Maine station heard and QSLed from Oregon! (Martin-OR)



Chief Engineer Drita Cico (seated) and crew at the Shijak transmitting facilities.

819 RTM Rabat, Morocco, at 2330 an Arabic vocal with dramatic instrumentation featuring a large string section and drums, measured off-frequency at 818.935 kHz, causing a sub-audible het against 819 Egypt. (Connelly-MA)

891 Chaîne 1, Algiers, at 2323 a good signal with an Arabic vocal and folk guitar, off-frequency at 890.97 kHz. (Connelly-MA)

900 XEDT Cuahtémoc, Chihuahua, Mexico, at 1300 with sign-on anthem, very clear, deliberate and repeated ID. (Barton-AZ)

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The ARTV Monitoring Center is located here, on the fourth floor of the Radio Tirana headquarters.

1040 YVLB Valencia, Venezuela, at 0046, "La Voz de Carabobo" separable from 1040 jumble, at 1039.62 kHz. (Connelly-MA)

1107 RNE5 synchros, Spain, at 0100 with "Radio Nacional de España, Informativos" through a loud sub-audible het caused by an off-frequency synchronized station at 1107.127 kHz, believed to be from Caceres, Spain. Egypt is also off-frequency here, previously measured at 1106.772 kHz. (Conti-NH)

1140 KNWQ Palm Springs, California, at 1520 a sports recap after ID and "Fox News." Good, clear signal, a full hour and a half after local sunrise and still hanging in there at rechecks until just before 1600 UTC. (Barton-AZ)

1190 HJCT Barranquilla, Colombia, at 0137 bits of Spanish talk, off-frequency at 1190.33 kHz with a fat het against 1190 WLIB New York. (Connelly-MA)

1290 KOUU Pocatello, Idaho, a very friendly letter from owner and general manager Paul Anderson was received in 9 days for a CD report. He mentioned that it was especially of interest as they are operating at a power of 30 kW while in the process of upgrading, soon to be 50 kW days with a two-tower directional array. Address: PO Box 97, Pocatello, ID 83204-0097. Idaho QSL #70, MW QSL 2977. (Martin-OR)

1332 4BU Bundaberg, Australia, at 1553 faded in with an ad for Enterprise auto dealership. "The dealer Bundaberg trusts," faded out, faded in, "Bundaberg's Classic Hits 4BU," six time pips, and repeated ID. A poor signal, but over an unidentified Fox Sports station, maybe "Radio Sport," Auckland, New Zealand, once heard rebroadcasting WFLF Florida. (Park-HI)

1386 Radio Rurale, Labé, Guinea, at 2253 with an African vocal, getting piled on by slop from 1380 WMYF and 1390 WPLM. (Connelly-MA) Signed off at 2330 with an announcement in French. Off-frequency at 1385.92 kHz. (Conti-NH)

1485 EP do Kuanza-Sul, Sumbe, Angola, at 2310 with fragmentary audio, off-frequency at 1484.52 kHz, producing a het

against 1485 Spain. (Connelly-MA)

1510 WWZN Boston, Massachusetts, noted off-frequency heard at 1510.018 kHz, and easily separated from other 1510 signals on the SDR IQ spectrum analyzer display. (Conti-NH)

1580 WVKO Columbus, Ohio, at 2100 with a good signal, "Finally the liberal media you've heard so much about, 1580 WVKO Columbus," and "Free Speech Radio News on Air America Radio dot com." (Conti-NH)

1640 WKSH Sussex, Wisconsin, at 2000 carrying "Radio Disney," off-frequency at 1640.113 kHz. Broadcast engineer Barry McLarnon reported measuring it as high as 1640.123 kHz, noted drifting since the HD digital signal was abandoned last summer. (Conti-NH)

We end with a tip of the hat to the dedicated group of DXers who maintain a comprehensive list of MW offsets worldwide. Over 2,000 radio stations are listed. Go online to www.myradiobase.de/mediumwave/mwoffset.txt for the latest list and to learn more about the group. A special note of thanks goes to Chief Engineer Drita Cico, ARTV Head of Monitoring Center, for the photos and background information, and thanks to our team of broadcast monitors: Rick Barton, Bogdan Chiochiu, Mark Connelly, Marc DeLorenzo, Patrick Martin, and Dale Park.

Till next time, 73 and Good DX!

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This listing is designed to help you hear more shortwave broadcasting stations. The list covers a variety of stations, including international broadcasters beaming programs to North America, others to 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	6025	Radio Amanecer, Dominican Republic	SS	0300	7200	Radio Omdurman, Sudan	AA
0000	11935	Radio Veritas Asia, Philippines	local	0300	4976	Radio Uganda	EE/vern
0000	11810	KBS World Radio, South Korea	KK	0300	5975	Sudan Radio Service, via Rwanda	M-Fri
0000	15525	Radio Australia		0300	4828	Radio Zimbabwe	vern
0030	4717	Radio Yura, Bolivia	SS	0300	5915	Radio Zambia	EE/vern
0030	11900	China Radio International	CC	0300	9610	Vatican Radio	SS
0030	9880	Radio Canada International		0300	4750	Radio Peace, Sudan	vern
0030	4800	Radio Buenas Nuevas, Guatemala	SS	0300	5010	Radio Madagaskara, Madagascar	Malagasy
0030	11690	Radio Vilnius, Lithuania	GG	0300	4990	Radio Apinte, Suriname	DD
0030	3310	Radio Mosoj Chaski, Bolivia	SS	0330	4885	Radio Clube do Para, Brazil	PP
0100	4815	Radio Difusora-Londrina, Brazil	PP	0330	6080	Radio Prague, Czech Republic	
0100	5035	Radio Aparecida, Brazil	PP	0330	7350	Voice of Russia, via Vatican	
0100	4052.5	Radio Verdad, Guatemala	SS	0330	7320	Radio Rossii, Russia	RR
0100	5980	RTV Marocaine, Morocco	AA	0330	7125	Voice of Russia, via Moldova	
0100	4635	Tajik Radio, Tajikistan	Tajik	0330	11665	BBC Relay, Seychelles	
0100	4915	Radio Difusora-Macapa, Brazil	PP	0330	7215	Trans World Radio, via South Africa	
0100	6255	The Mighty KBC, via Lithuania		0330	6175	Voice of Vietnam, via Canada	
0100	9565	Radio Tupi, Brazil	PP	0400	4950	Radio Nacional, Angola	PP
0100	11780	Radio Nacional Amazonas, Brazil	PP	0400	3340	Radio Misiones Internacional, Honduras	SS
0130	7235	Voice of Islamic Rep. of Iran		0400	9575	Radio Medi Un, Morocco	AA
0130	4815	Radio El Buen Pastor, Ecuador	SS	0400	9765	Radio Voice of the People, via Madagascar	
0130	4824	La Voz de la Selva, Peru	SS	0400	9635	Radio Okapi, Congo, via South Africa	
0130	4547	Radio Huanta 2000, Peru	SS	0400	7390	Channel Africa, South Africa	FF
0130	9870	Radio Austria International	T-F	0400	4775	Trans World Radio, Swaziland	vern
0200	4985	Radio Brazil Central	PP	0400	4965	The Voice-Africa, Zambia	
0200	5025	Radio Rebelde, Cuba	SS	0400	7100	Voice of the Broad Masses, Ethiopia	Amharic
0200	7165	BBC Relay, Cyprus	unid	0400	7210	Adventist World Radio, via Austria	AA
0200	6010	La Voz de tu Concencia, Colombia	SS	0400	7275	RTT Tunisienne, Tunisia	AA
0200	7415	WBCQ, Maine		0430	7425	Radio Tirana, Albania	
0230	6165	Radio Nederland, via Bonaire		0430	4960	Voice of America Relay, Sao Tome	
0230	11745	CVC-La Voz, Chile	PP	0500	5005	Radio Nacional, Equatorial Guinea	SS
0230	9580	China Radio International, via Cuba	CC	0500	6250	Radio Nacional, Equatorial Guinea	SS
0230	4780	Radio Cultural Coatan, Guatemala	SS	0500	4770	Radio Nigeria	
0230	11550	Radio Sweden International		0500	5910	Marfil Estereo, Colombia	SS
0230	3396	Radio Zimbabwe	vern	0530	4777	RTV Gabonaise, Gabon	FF
0300	11710	Radio Argentina al Exterior (RAE)		0530	6300	Radio Nacional de la RASD, Algeria	AA
0300	6020	China Radio International, via Albania	CC	0530	9550	Radio Havana Cuba	SS
0300	3279	La Voz del Napo, Ecuador	SS	0600	4760	ELWA, Liberia	
0300	3250	Radio Luz y Vida, Honduras	SS	0600	6020	Radio Victoria, Peru	SS
0300	4780	Radio Djibouti	AA	0630	7180	Radio Romania International	
0300	4790	Radio Vision, Peru	SS	0700	9470	Croatian Radio, via Germany	EE/Croatian
0300	7105	Radio Farda	Farsi	0700	9525	Star Radio, Liberia, via Ascension	
0300	3200	Trans World Radio, Swaziland		0700	9290	Latvia Today	
0300	3320	Radio Sondergrense, South Africa	Afrikaans	0900	9600	Radio UNAM, Mexico	SS

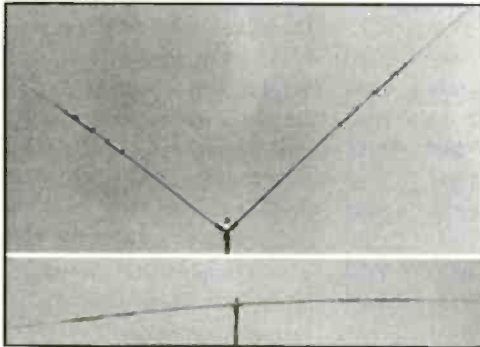
UTC	Freq.	Station/Country	Notes	UTC	Freq.	Station/Country	Notes
0900	13660	Voice of Russia		1600	17605	Radio France International	
1000	5940	Radio Melodia, Peru	SS	1600	12135u	AFN/AFRTS, Florida	
1100	13635	CVC, Australia		1600	11690	Radio Jordan	
1100	7280	Voice of the Strait, China	CC	1600	11785	Voice of Indonesia	AA
1100	3925	Radio Nikkei, Japan	JJ	1600	11570	Radio Pakistan	
1100	6003	Echo of Hope, Korea	KK; clandestine	1630	17895	Voice of America, Botswana Relay	
1100	7445	Radio Taiwan International		1730	21455	HCJB, Ecuador	SS
1100	7220	Voice of Vietnam	CC	1800	17680	CVC-La Voz, Chile	SS
1100	3905	Radio New Ireland, Papua New Guinea		1800	11990	Radio Kuwait	
1100	6185	Radio Singapore International		1800	15345	RTV Marocaine, Morocco	AA
1130	9770	KBS World Radio, South Korea	CC	1830	9420	Voice of Greece	Greek
1130	9690	Voice of Nigeria		1830	12050	Radio Cairo, Egypt	AA
1130	3215	Radio Sanduan, Papua New Guinea	Pidgin	1830	9785	Voice of Turkey	
1130	3335	Radio East Sepik, Papua New Guinea	Pidgin	1900	13605	All India Radio	
1130	5040	Radio Myanmar	BB	1900	15275	Deutsche Welle, Germany, via Portugal	
1200	12130	KWHR, Hawaii		1900	9990	Radio Cairo, Egypt	GG
1200	9740	BBC Relay, Singapore		1900	9265	WMLK, Pennsylvania	
1200	5900	IBRA Radio, Sweden, via Russia	CC	1900	9895	Deutsche Welle, Germany	
1200	15190	Radio Africa, Equatorial Guinea		1930	12015	Radio Exterior de Espana, Spain	AA
1200	4754	RRI-Makassar, Indonesia	II	1930	15290	Radio Nacional, Venezuela	SS
1230	11620	All India Radio	unid	2000	11660	Radio Australia	
1230	9920	FEBC International, Philippines	unid	2000	13790	Deutsche Welle, Germany, via Rwanda	
1230	9810	Radio Thailand		2000	9580	Africa Number One, Gabon	FF
1230	11625	Voice of America Relay, Northern Marianas	unid	2000	13695	Radio France International	FF
1300	6080	Radio Australia		2000	11735	Radio Tanzania-Zanzibar	Swahili
1300	13580	Radio Prague, Czech Republic		2000	13570	WINB, Pennsylvania	
1300	5950	Radio New Zealand International		2000	9755	Vatican Radio	
1300	6160	CKZU, Canada		2030	15476	Radio Nacional Arcangel, Antarctica	SS
1300	6890	KNLS, Alaska	CC	2030	11695	Radio Budapest, Hungary	HH
1300	7170	Radio Singapore	Tamil	2030	15120	Voice of Nigeria	
1300	13750	Radio Tirana, Albania		2030	11940	Radio Romania International	
1300	9580	Radio Australia		2100	15785	Galei Zahal, Israel	HH
1330	9450	Polish Radio External Service, via Germany		2100	15590	KTBN, Utah	
1400	9625	CBC Northern Quebec Service, Canada		2130	15400	BBC Relay, via Ascension	
1400	17725	Radio Jamahiriya, Libya	AA/EE	2130	9705	La Voiz du Sahel, Niger	FF
1400	12035	Voice of Turkey		2130	9780	Republic of Yemen Radio	AA
1400	15665	WHRA, Maine		2200	4845	Radio Mauritanie, Mauritania	AA
1430	12000	Radio Havana Cuba	SS	2200	17850	Radio Exterior de Espana, Spain, via Costa Rica	SS
1430	11980	HCJB, Ecuador	SS	2200	9660	BBC, via Australia	
1430	15140	Radio Sultanate of Oman	EE/AA	2200	9675	Radio Romania International	
1430	11845	Radio Marti	SS	2230	15345	Radio Nacional/RAE, Argentina	SS
1500	9935	RS Makedonias, Greece	Greek	2230	5030	Radio Burkina, Burkina Faso	FF
1500	17630	Africa Number One, Gabon	FF	2230	9760	Cyprus Broadcasting Corp	Wknds; Greek
1530	13775	Radio Austria International, via Canada	GG	2230	6090	Radio Belarus, Belarus	
1530	17510	Bible Voice Broadcasting, via Germany	unid	2230	7105	Sound of Hope, Taiwan	CC
1530	11690	Radio Jordan		2230	7115	Radio Japan/NHK, via UAE	JJ
1530	11710	Voice of Korea, North Korea	KK	2230	3975	Kossuth Radio, Hungary	HH
1530	11510	Radio Free Asia, via Kazakhstan	unid	2300	13630	Trans World Radio, Guam	CC
1530	9870	Broadcasting Service of the Kingdom, Saudi Arabia	AA	2300	13650	Radio Japan/NHK	CC
1530	11510	Voice of America Relay, Sri Lanka		2300	11735	Broadcasting Service of the Kingdom, Saudi Arabia	AA
1530	13765	Vatican Radio		2300	12085	Radio Damascus, Syria	AA
1600	11775	Caribbean Beacon, Anguilla		2330	9700	Radio Bulgaria	
1600	17485	Radio Prague, Czech Republic		2330	12090	Radio Medi Un, Morocco	AA
1600	11680	Adventist World Radio, Guam		2330	12090	KFBS, Northern Marianas	VV
1600	15630	Voice of Greece	Greek	2330	11725	Voice of America Relay, Philippines	
				2330	9520	Nei Menggu PBS, China	CC

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The H-422 quad-band rotatable trapped dipole from Comet Antennas covers the 40-, 20-, 15-, and 10-meter bands in either a "V" or "straight" configuration.



It features a compact design for easy installation, even in antenna restricted locations, and can be assembled in either a "V" or "straight" configuration (the "V" shape achieves good performance at a minimum of 10 feet above ground). Additional features and specifications include VSWR: less than 1.5:1 at center freq; Impedance: 50 Ohms; CBL-2000 2kW Balun included; Length: Assembled in "V" shape: 24' 5"; Assembled "straight": 33' 10"; Weight: 11 lb 14 ozs; Max Power: 1000W SSB / 500W FM; Max Wind Survival: 67 mph; Wind Load: 9.9 sq feet.

Construction is of telescoping aluminum tubing with extruded aluminum/stainless steel mounting hardware included. A mast diameter of 1.25 to 2.5 inches is required. Three pre-drilled radiator lengths are provided for easy tuning.

For more information on the the H-422, which retails for \$389.95, contact NCG Company at 800-962-2611 or via email at micks@cometantenna, or visit their website at www.cometantenna.com.

Wilson Electronics' New Cell Phone Cradle Plus

Wilson Electronics, a manufacturer of cellular amplifiers and antennas, has introduced the new Cradle Plus, a cell phone car cradle with a built-in antenna. When combined with a Wilson amplifier and an outside antenna, the Cradle Plus accommodates any hands-free device and offers improved cellular signal and increased driver safety in any vehicle.

The outside antenna communicates with the cell site, and the built-in cradle antenna communicates with one or multiple cell phones, depending on the amplifier used, significantly improving cell phone performance. With up to 10 times more power than a typical cell phone, the system extends signal range and strength, allowing users to communicate reliably in places they never could before.



Wilson Electronics' new Cradle Plus cell phone car cradle with a built-in antenna offers improved cellular signal and increased driver safety.

Cradle Plus is now available in two plug-and-play kits. In one kit (#801213) the Cradle Plus is paired with the Dual-Band Mobile Wireless Amplifier, which accommodates multiple cell phone users. In the other kit (#811214) the Cradle Plus is paired with the SignalBoost Amplifier, which accommodates one cell phone user. Both kits include a magnet-mount roof antenna.

The Cradle Plus kit retails for \$249 with the SignalBoost Amplifier, or for \$459 with the Dual-Band Mobile Wireless Amplifier. They're available through wireless dealers and RadioShack stores.

For more information, visit www.wilsonelectronics.com.

MFJ-653 hamProAudio Speech Articulator

The MFJ-653 hamProAudio Speech Articulator improves transmit speech intelligibility and removes powerful low frequencies that overwhelm important high frequencies. With the MFJ-653 you can boost the highly intelligible band of frequencies centered around 2 kHz by up to 16 dB and remove powerful low frequencies that have little intelligence. The high-pass filters' cutoffs are 1.1 kHz and 500 Hz. Using its SSM-2166 broadcast industry speech compression IC, the MFJ-653 syllabic compressor, with its adjustable 15 to 1 compression ratio, can nearly double your RF output power with low distortion.

A highly effective noise gate (downward expansion), with front panel level and delay controls, removes annoying background noise picked up during speech pauses.

Retailing at \$149.95, the MFJ-653 is compatible with any transceiver and almost any microphone (high/low impedance, dynamic, and electret); adjustable preamplifier lets you even use low-level output mics. It measures 1-3/4 x 5 x 4-3/4 inch-



The MFJ-653 hamProAudio Speech Articulator improves transmit speech intelligibility and is compatible with any transceiver and almost any microphone.

es (HWD) and uses 12 VDC or 110 VAC with optional MFJ-1312D (\$15.95) power supply. Output cables to connect transceivers with 8-pin round or 8-pin modular microphone connectors are included.

To order, get a free catalog, or for your nearest dealer, contact MFJ Enterprises at 800-647-1800, or visit them online at www.mfjenterprises.com.

Integration/Distribution For Next Generation HDMI v1.3 Formats

Connectivity solutions provider Gefen offers support of the upgraded HDMI v1.3 format in the next generation models of Gefen's 3x1 HDMI Switcher and 4x1 HDMI Switcher. Both deliver the ability to connect either three or four high-definition audio/video sources to one HDMI display for plug and play system integration in A/V, information technology, and consumer electronics/home theater environments. Users select which source they want to view using the IR remote or the front panel switch. High-definition video in resolutions to 1080p with multi-channel digital audio are switched for each source.

The 3x1 HDMI Switcher, which allows consumers to access up to three sources from one HDTV display, sells for \$299; the 4x1 Switcher, for access to up to three sources, sells for \$399.

For more information, visit www.gefen.com.



Gefen's 3x1 and 4x1 HDMI Switchers let users connect either three or four high-definition audio/video sources to one HDMI display for plug and play system integration.

Streambox Mobile Software Encoder

The Streambox Mobile Software Encoder is a software solution for video streaming of breaking news and events via broadband. The Mobile Software Encoder features the same Streambox ACT-L3 advanced proprietary compression technologies widely used by news organizations, government agencies, and other organizations and individuals. It extends the news gathering capabilities of broadcasters, first responders, and citizen reporters, helping to deliver live breaking news and events to the newsroom faster, smarter, and at a lower cost while at the same time powering video portals and social networking sites. A software-based solution ported to a variety of Windows mobile devices, the Streambox Mobile Software Encoder transports broadcast video over Wi-Fi and 3G networks for real-time and store-and-forward news coverage. The solution provides mobility without sacrificing performance, reliability, or quality. Price: TBA at press time.

For more information visit www.streambox.com.



The Streambox Mobile Software Encoder extends the news gathering capabilities of broadcasters, first responders, and citizen reporters.

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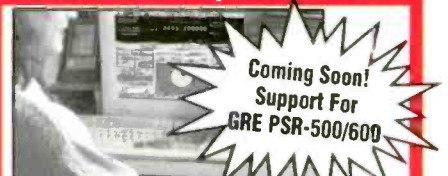
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More From Moldova And Monrovia, And Still More...

A couple of years ago a station known as Radio PMR, headquartered in the breakaway portion of Moldova, was active on shortwave. It didn't last long before disappearing from the airwaves. Now it's back with something of an international service. Radio PMR is operating according to a schedule consisting of 15-minute segments of English, French, and German beginning at 1500, 1600, 1700, 1800, and 1900 on 7370. These, obviously, are not opportune hours for us in North America (unless you have your feet in the Atlantic Ocean). However, the station also offers similar fare at 2300 and 0000 on 6240, which some are reporting at excellent strength (here in Wisconsin the S-meter went to attention when the carrier came on around 2254 the other night).

The transmitter is that 500-kW monster at Grigoriopol in the Trans-Dniester region, a site also used by Moldovan Radio and some of the Voice of Russia broadcasts, among others. Radio PMR studios are in Tiraspol, in the Pridnestrovian Moldavian Republic, a "country" which has not achieved much in the way of diplomatic recognition.

Another old friend has reappeared. ELWA in Monrovia, Liberia, recently returned to the air. Over the past couple of decades ELWA had twice been destroyed in the country's horrible civil wars and twice has returned, refusing to be a victim of still another African warlord. This most recent return, however, wasn't due to a conflict but rather was by design, the downtime the result of a new transmitter installation, which probably required more time to complete than originally planned. Whatever the reason, it's nice to have ELWA active again back on its old 4760. It can sometimes be heard in our late afternoons, especially by you ESTers. The rest of us are more likely to find it at its 0600 morning sign on.

Ethiopia's Radio Fana has added a third frequency, 5970, to its 6110 and 7210 dial spots from sign on just prior to 0300. None of the three produce speaker-shaking signals; you'll have to dig a bit to come up with anything.

International Radio Serbia is once again broadcasting from its own in-country site at Bijeljina. There's just one 250-kW transmitter operational here at present, using 6100.

Don't hold your breath, but way, way down the road we may see the resurgence of Radio Ghana. The station says there are plans afoot to bolster its shortwave service with a 50-kW transmitter. Ghana is shown as currently active with up to 50 kW on 4915, but my guess is that "inactive" is a more accurate description, since it's almost never reported. So this boils down to information you can just file away in case GBC does show up in rejuvenated form down the road.

The All India Radio outlet at Gauhati (4940, 7280, and 7420) is off the air temporarily, according to an Indian SWL. There's no word on why or whether a return is expected.

Reader Logs

Remember, your shortwave broadcast station logs are always welcome. But please be sure to double or triple space items, list them by country and include your last name and state abbreviation after each log. Also much wanted are spare QSLs (or good copies) you don't need returned, station schedules, brochures, pennants, station photos, and anything else you think would be of interest. And the wait continues...I'm still looking for that phantom photo of you at your listening post!

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 specified, the broadcast is assumed to have been in English (EE).

ALBANIA—Radio Tirana, 7425 at 0439 on their Ministry of Justice. (Wood, TN) 9390-Shijak in AA at 2036. (Charlton, ON)



↑
This listener certificate and pennant from Radio Santa Ana, Peru, was received by Rich D'Angelo. Years ago there was a great quote from a young DXer to the effect that "those Peruvian stations send you letters, postcards, QSLs, calendars—all sorts of stuff. But if they don't reply, you don't get anything at all!" →



Help Wanted

We believe the "Global Information Guide" consistently presents more shortwave broadcast loggings than any other monthly SW publication! (A whopping 656* 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 (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.*

ANGOLA—Radio Nacional, 4950 very weak in PP at 0250. Just audible in USB. (Parker, PA)

ANGUILLA—Caribbean Beacon, 11775 heard at 1615 with Mrs. Scott preaching. (Wood, TN)

ANTARCTICA—Radio Nacional Arcangel/LRA36, 15476 at 2052 weak with some music and talk by a woman in SS. Off at 2106. (D'Angelo, PA)

ARGENTINA—Radio Argentina al Exterior, 11710 in PP with man annr and short music breaks at 0134. (Parker, PA) 0330

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
Annt(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
comm(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

in FF. Also 15345 in GG to Europe at 2150. (Wood, TN) 1952 with sports in SS. (MacKenzie, CA) 0128 with live sports in SS. (Brossell, WI)

ASCENSION ISLAND—BBC Atlantic Relay, 6145 at 0320, 7105 in FF at 0450, 7160 at 0323, 17830 at 2002. (MacKenzie, CA) 7160 at 0319. (Brossell, WI) 15400 at 2145. (Wood, TN)

AUSTRALIA—Radio Australia, 6080-Shepparton at 1419. (Strawman, IA) 7240 with a live symposium at 1410. (Brossell, WI) 9630 in Indonesian 2305. (Ng, Malaysia) 11880-Shepparton at 2020. (Maxant, WV) 1910. Also 12080-Brandon at 2015. (MacKenzie, CA)

ABC Northern Territories Service, 2310-Alice Springs fair to poor from 1203. And 2325-Tennant Creek in parallel at 1203. Also 2485-Katherine in parallel at that hour. (Ronda, OK)

CVC-Darwin, 13635 with news at 1103. (Ng, Malaysia)

AUSTRIA—Radio Austria Intl, 13775 via Canada in GG at 1536. (Charlton, ON)

BANGLADESH—Bangladesh Betar, 4750-Dhaka, 0339 in Bengali with man anncr and local music. Faint CODAR QRM. (Parker, PA)

BELARUS—RS Belarus, Minsk, 7360 at 2245 with EE anncr, pops, one-minute news bulletin at 2259. Much weaker parallel on 7390. (Alexander, PA)

BOLIVIA—Radio San Miguel, Riberalta (p), 4699.4 at 0950 in SS, very weak. (Alexander, PA)

Radio Mallku, Uyuni, 4796.4, very weak with M anncr in SS at 2341. (Parker, PA)

Radio Eco, Ballivan, 4409.8 with man in SS at 0013. Weak. (Parker, PA)

Radio Chicha, Tocla, 4763.1 with deep-voiced male in SS at 2328. (Parker, PA)

Radio Yura, Yura, 4716.7 with male anncr, flutes and male vocals at 0055. (Parker, PA)

BONAIRE—Radio Nederland Relay, 6165 in SS at 0220, 15315 at 1935 and 17810 at 1931. (MacKenzie, CA)

BOTSWANA—VOA relay, Moepeng Hill, 4930 with news at 0321 and 9885 with "Daybreak Africa" heard at 0403. (Parker, PA) 7340 in listed Kinyarwanda at 0405 and 9885 ending news at 0408. (Ronda, OK) 12080 in FF at 2020 and 13710 with EE Afro-pops at 2005. (MacKenzie, CA) 4930 at 0433. (Brossell, WI) 12080 in FF at 1935. (Charlton, ON) 17895 in Special English at 1645. (Fraser, ME)

BRAZIL—(All in PP) Radio Aparecida, Aparecida, 5035 with boisterous male anncr at 0315. (Parker, PA) 11885 at 2317. (Charlton, ON)

Radio Cultural Ondas Tropicais, Manaus, 4845.2 at 0005 with talk, choir, more talk. (D'Angelo, PA) 0105 with pop vocals. (Parker, PA)

Radio Imaculada Conceicao, Campo Grande, 4754.9 at 0250 with M/W talks. (Parker, PA) Presumed at 0250 with religious talks and songs. (Ronda, OK)



This QSL confirmed Rich D'Angelo's reception of the "Open Radio for North Korea" broadcast over KWHR-Hawaii.

Radio Bandeirantes, Sao Paulo, 6090 with PP talks at 0835 when Anguilla was off the air, //9645. (Alexander, PA) Tentative, 11925 at 1612 with talks and mentions of Sao Paulo. (Wood, TN) 0258 with talks. (Parker, PA)

Radio Brazil Central, Goiania, 4985 with female vocal at 0143. (Brossell, WI) 0420 with anncr, jingles, woman on phone and pops. //11815 had less QRN but more QSB, though both were otherwise excellent. (Parker, PA)

Radio Educacao Rural, Tefe, 4925 with religious songs and woman talking at 0013. (Parker, PA)

Radio Alvorada, Londrina, 4815 with two men talking, possible ID at 0002. (Parker, PA)

Radio Ibitinga, Sao Paulo, 4845 at 0826 with what sounded like preaching or a political speech. (Parker, PA)

Radio Capixaba, Vitoria, 4935 with man/woman talk at 0233. (Parker, PA)

Radio Globo, Manaus, 4895 with upbeat female vocal at 0348. Very weak. (Parker, PA)

Radio Cancao Nova, Cachoeira Paulista, 4825, monitored at 0221 with songs and anmts. (Ronda, OK)

Radio Difusora Acreana, Rio Branco, 4845 at 0140. (Brossell, WI) 0425 with slow religious music. (Parker, PA)

Radio Nacional Amazonia, 11780 at 0153 with male anncr, reverb and pops. (Parker, PA) Vocals at 2326. (Brossell, WI)

Radio Difusora, Londrina, 4815 with call-ins at 2345. (Parker, PA)

Radio Congohas, Congohas, 4775 with talk by man at 0040. (Parker, PA)

Radio Clube do Para, Belem, 4885 at 0311 with reverb and usual pops and 50s numbers sung in PP. (Parker, PA) 0418 with folk songs. Not their usual techno sound. (Wood, TN)

Radio Novo Tempo, Campo Grande, 4895v with talks and two IDs heard at 0246. (Ronda, OK)

Radio Difusora, Macapa, 4915 at 0142 with PP songs. (Brossell, WI) 0316 with male anncr and pops. (Parker, PA)

Radio Difusora do Amazonas, Manaus, 4805 at 0019 with a male anncr, slight reverb and a possible speech. (Parker, PA)

Radio Mundial, Osasco, 4975 heard at 0647 with man talking. Weak but in the clear. (Parker, PA)

Radio Municipal, Sao Gabriel da Cachoeira, 3375.1 at 0250 with slow mix of M/W vocals. (Parker, PA)

Radio Alvorada, Parana, 4865 heard at 0140 with M/W talks, religious music. (Parker, PA)

Radio Cultura Araraquara, Araraquara, 3365 at 0431 with PP pops. QRM'd several times by apparent 2-way communications. (Parker, PA)

BULGARIA—Radio Bulgaria, 9700-Plovdiv with domestic songs at 2345. (Charlton, ON)

BURKINA FASO—Radio Burkina, 5030 at 0525 open with test tone, NA, opening FF anmts and local music. FF and vernacular talks. University Network was absent so there was only some splatter from Cuba-5025. (Alexander, PA) 2344 to 0000 close with FF highlife vocals and man in FF hosting. NA at 2358 just as University Network signed on. (D'Angelo, PA)

CANADA—Radio Canada Intl, 7230 via Germany in AA at 0324. (Brossell, WI) 9815-Sackville in FF at 1759. (Charlton, ON) 9880 at 0047. (Ng, Malaysia)

CBC Northern Quebec Service, 9625-Sackville with pops at 1418. (Charlton, ON)

CHU, Ottawa, 7335 time signals in FF/EE at 1845. (Maxant, WV)

CHILE—CVC/La Voz, 11745 in PP at 0230 and 11970 in SS at 0215. (Parker, PA) 11805 at 0326 in EE/SS with contemporary and hard rock Christian selections. Also 17680 in SS at 2128. (Wood, TN) 17680 in SS at 1808, mixing with RDP-Portugal. (MacKenzie, CA)

CHINA—China Radio Intl, 6020 via Albania in CC at 0326, 9580 via Cuba in CC at 0236, 9645 in FF at 1847, 9665 via Brazil in SS at 0303, 11820 in Cantonese at 0019, 11900 in CC at 0025, 11975 via Mali in CC at 2255 and 11990 in Cambodian at 0043. (MacKenzie, CA) 7110-Shijiazhuang in Mandarin at 1255 (Ronda, OK) 9440-Beijing with CC lesson at 1046 and 9695 in JJ at 2315. (Ng, Malaysia) 7220-Xi'an in VV at 2309. (Strawman, IA) 11695 via Albania in FF heard at 1906, 13670 via Albania in FF at 1549 and 13740 via Cuba at 1543. (Charlton, ON)

China Peoples Broadcasting Station/China National Radio, CNRI, 5030 in CC at 1359 with time signal at 1400. Stronger than adjacent Radio Rebelde. (Strawman, IA) 7110 in CC at 1245. (Brossell, WI) 11740 in CC at 0000 and 12045 in CC heard at 0047. (MacKenzie, CA)

Hunan PBS, Changsha, 4990 in CC at 0524. Poor. (Parker, PA)

Guangxi PBS, Nanning, 5050 in CC at 1210. (Ng, Malaysia)

In Times Past...

Here's your "blast from the past" for this month:

Radio Portales, Santiago, Chile—9572 in SS at 0429 on 20 January 1966 broadcasting with 10 kW. (Dexter, WI)

ABC Radio Frequency Guide Northern Territory

105.7 ABC Darwin
1 Cavenagh Street GPO Box 9994 Darwin NT 0801
Phone: (08) 8943 3222

783 ABC Alice Springs
The Gap Road PO Box 1422 Alice Springs NT 0871
Phone: (08) 8950 4711

106.1 ABC Katherine
Katherine Regional Tourist Association Office
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106.1 ABC
Katherine



783 ABC
Alice Springs



ABC
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After a couple of tries Bob Brossell confirmed ABC NTS-Tennant Creek. They apologized for the delay, which they said was caused by staff changes.

Yunnan PBS, Kunming, 6035 with CC ID "Yunnan Renmin Guangpo Dientai" at 1100 f/by news. (Ng, Malaysia)

Voice of the Strait, Fuzhou, 4900 (Amoy Channel) at 1218 with soft Asian vocals. 7280 (Entertainment Channel) at 1105 with usual mix of pop and talk in Mandarin. (Ronda, OK)

Firedrake Music Jammer, 7300 at 1140, possibly against V of Russia, 9930 against KWHR in CC to Asia at 1415 and 11540 targeting RFA via Kuwait at 1540. (Brossell, WI) 9355 at 1838, //9875. Also 9455 at 2005 and 15510 at 1830. (MacKenzie, CA)

CONGO (Dem. Rep.)—Radio Okapi, 9525 via South Africa at 0700 when Ascension is scheduled to be carrying Star Radio (Liberia). Opened with "Okapi" jingles and mentions of Congo throughout the program. Continued with Cotton Tree News at 0730 as usual. Some sort of fluke as it was only noted on this one occasion. Also 9635 at 0502 to 0600 close with FF talk, Okapi jingles. (Alexander, PA) 9635 via Meyerton at 0357 open carrier, instl. ID and sign on anmts with news features, remote reports and numerous jingles. (D'Angelo, PA)

CROATIA—Croatian Radio/Voice of Croatia, 7285 via Germany in Croatian at 0337. (MacKenzie, CA) 9470 with four-minute EE news at 0700. (Alexander, PA)

CUBA—Radio Havana Cuba, 9550 at 2309, 11655 in SS at 1712, 11760 in SS at 1416 and 12000 in SS at 1440. (Charlton, ON)

Radio Rebelde, Bauta, 5025 in SS at 0256. (Parker, PA)

CYPRUS—Cyprus Broadcasting Corp., 9760 from 2215 opening. Mostly all Greek talk with a bit of local music. //7210 fair and

mixing with strong CRI with //6180 weak under Brazil. (Alexander, PA)

CZECH REPUBLIC—Radio Prague, 6080-Litomyšl with "Inside Europe" at 0333. (Brossell, WI) 6200 at 0123 with sign off anmts and gone at 0125. (Wood, TN) 13580 at 1315 about a beer-vending machine. (Fraser, ME) 17485 at 1618. (Charlton, ON)

DJIBOUTI—RTV Djibouti, 4780 at 0300 sign on with NA, opening anmts, Koran at 0303. (Alexander, PA) 0303 with Koran and man in presumed Somali. Excellent signal. (Parker, PA)

DOMINICAN REPUBLIC—Radio Amanecer, Santo Domingo, 6025 with religious music and SS anmts, "La Voz de Esperanza" jingle. "Radio Amanecer" ID at 2231. Somewhat distorted audio and some adjacent channel splatter. (Alexander, PA)

ECUADOR—HCJB, 11920 in PP at 0206. (Parker, PA) 11980 in SS at 1439. (Charlton, ON) 21455 monitored at 1752. (MacKenzie, CA)

La Voz del Napo, Tena, 3280 in SS heard at 0240. (Parker, PA) 1115 with man in SS. (Ronda, OK)

Radio El Buen Pastor, Saraguro, 4815 at 2350 in SS with man and short bits of music fill. (Parker, PA)

Escuelas Radiofonicas, Riobamba, 5010 with SS songs at 0245. (Brossell, WI)

Radio Chaskis, Otavalo, (p) 4909.2 at 1050 in SS with Ecuadorian music. (Alexander, PA)

EGYPT—Radio Cairo/Egyptian Radio, 6290 with a drama in AA at 0017. (D'Angelo, PA) 0239 with a capella vocals. (Ronda, OK) 9460-Zaabal, at 2308, 9990-Abis in GG at 1901 and 12050-Zaabal in AA at 1845. (Charlton, ON) 12050 in AA heard at 1900. (MacKenzie, CA)

ENGLAND—BBC, 3255 via South Africa at 0330. (Ronda, OK) 0335 with current affairs features. Also 7210-Rampisham in Swahili at 0308. (D'Angelo, PA) 3255 at 0402 with World Service. (Parker, PA) 7120 via South Africa at 0444 and 7205 via South Africa in possible RR at 0437. (McKenzie, CA) 7120 via South Africa at 0440, 7165 via Cyprus in unid language with EE sound bites at 0205, 9740 via Singapore at 1223. (Brossell, WI) 7380 at 1850. (Maxant, WV) 9410-Rampisham at 1938, 11680-Skelton in AA at 1819 and 12095 via South Africa at 1826. (Charlton, ON) 12095 at 1730. (Fraser, ME) 17790 via Oman at 1030. (Ng, Malaysia)

Bible Voice Broadcasting, 17510 via Germany in unid language heard at 1550. (Brossell, WI)

EQUATORIAL GUINEA—Radio Nacional, Bata, 5005 heard at 0459 sign on with NA, SS anmts and variety of SS tunes. Also noted in the afternoon to 2301 close. (Alexander, PA)

Radio Nacional, Malabo, 6250v, at 0519 with non-stop Afro-pops, ID and news at the half hour. (Wood, TN) 0620. Reactivated. (Alexander, PA)

ETHIOPIA—Radio Ethiopia, Gedja, 9704 at 1915 in possible Amharic, local pops,

Koran, US and techno, HoA music. Fair on //7110 and very weak on //5990. To 2100. (Alexander, PA)

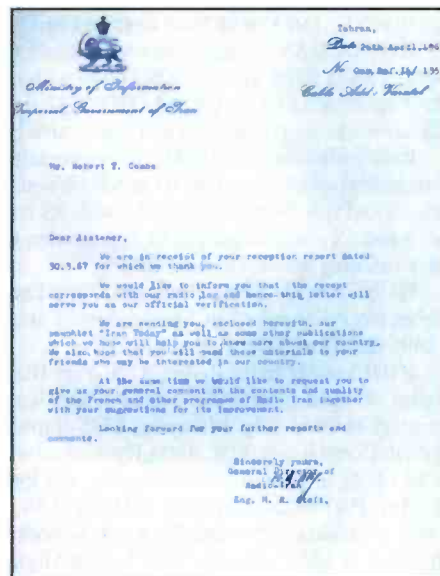
Voice of the Tigray Revolution, 5980 at 0356 sign on with familiar IS, opening ID at 0359 and anmts in Amharic to apparent news at 0400. (D'Angelo, PA)

FRANCE—Radio France Intl, 7135 in FF at 0442. (Brossell, WI) 5995 French Guiana Relay at 0107 and 11615 at 1600 sign on and into EE to North Africa. (Wood, TN) 9790 and 11705 in FF at 1907, 15160 in FF at 1620 and 15300 in FF at 1838. (Charlton, ON) 9955 in CC at 2325. (Ng, Malaysia) 13695 in FF at 2008 and 17630 French Guiana in SS at 1810. (MacKenzie, CA) 17605 monitored at 1605. (Fraser, ME)

GABON—RTV Gabonaise, 4777 at 0506 with news in FF. (Wood, TN) 0525 with M/F anncrs, woman with seeming dance lesson over disco sounds. (Parker, PA) 0559 sign on with local music, opening FF anmts. (Alexander, PA)

Africa Number One, 9580-Moyabi, in FF at 2015 and 15475 in FF at 1834. (Charlton, ON) 15745 in FF at 1801 and mentioning this broadcast was for Eastern North America and Western Africa. (Wood, TN) 17630 heard at 1500 with FF talk and lots of Afro-pops. (Ronda, OK)

GERMANY—Deutsche Welle, 7245 Rwanda Relay at 0445 and 9825 Portugal Relay in GG at 0215. (Brossell, WI) 9735 in GG at 1802, 11795 in PP at 1942, 11915 Sri Lanka Relay in RR at 1719, 15275 Rwanda Relay in GG at 1837 and 15620 in Hausa at 1836. (Charlton, ON) 9785 Sri Lanka Relay with EE lesson at 0045, 13790 via Abu Dhabi at 0330 and 15640 Sri Lanka Relay at 1039. (Ng, Malaysia) 9715 in RR at 1852, 11725 Rwanda Relay in GG at 1907, 13790 in AA at 2010, 15275 Rwanda in GG at 1844, 15620 in Hausa at 1820 and 17860 Rwanda Relay in



Here's a reply from Iranian Radio from 1967.
(Thanks Bob Combs, NM)




Re: Reception Report: Cotton Tree News via Ascension Islands on 9,525 kHz
 From: aberneth@hirondelle.org
 To: rdangelo3@aol.com
 Cc: gbenett7@yahoo.ca.uk; rdangelo@FirstEnergyCorp.com
 Date: Sun, 29 Jul 2007 2:43 pm

Cotton Tree News, Sierra Leone, aired via Ascension, confirmed Rich D'Angelo's reception on 9525.

FF at 1755. (MacKenzie, CA) 15275 Portugal Relay in EE at 1917 and into PP at 1930. (D'Angelo, PA)

GREECE—Voice of Greece, 7475 with Greek music at 0055. (Maxant, WV) 0417 in Greek. (MacKenzie, CA) 9420 in Greek at 1840 and 15630 in EE at 1612. (Charlton, ON)

RS Macedonia, 7450 in Greek at 1523. (Parker, PA) 2106. (Strawman, IA)

GUAM—Trans World Radio/KTWR, 13630 in CC at 2303. (MacKenzie, CA)

Adventist World Radio, 11680-Agat at 1608 with a comedy routine repeating on a one-minute loop. (Wood, TN) 15260 with Japan SW Club DX report and 11645 in CC at 0111. (Ng, Malaysia)

GUATEMALA—Radio K'ekchi, San Cristobal, 4845 with SS songs at 0135. (Brossell, WI)

Radio Buenas Nuevas, San Sebastian, 4800 in SS at 0333. (Parker, PA) 1152 with songs in SS. (Brossell, WI)

Radio Cultural Coatan, San Sebastian, 4780 at 0056 with music and SS ID. (Parker, PA) 0131. (Brossell, WI) 0234 to 0240 close with man in SS, several IDs and closing annts. The carrier stayed on for another five minutes. (D'Angelo, PA)

Radio Verdad, Chiquimula, 4052.5 with SS inspirational music, religious talks between songs. (Wood, TN) 0504 in EE with old time religious chorals, announced P.O. Box 5 address and free calendar offer. Excellent audio. (Parker, PA) 1122 with children's chorus. (Ronda, OK)

HAWAII—KWHR, 12130 with Jack Van Impe broadcast heard at 1224. (Brossell, WI)

WVH, 15000 with time annt at 1746. (MacKenzie, CA)

HONDURAS—Radio Luz y Vida, San Luis, 3250v. with religious pgm in SS at 0226. (Ronda, OK) 0249 with music and short SS talks. (D'Angelo, PA) 0331. (Wood, TN) 0347 to 0355 close with man in SS, slow music, ID, anthem and open carrier. (Parker, PA)

Radio Misiones In/HRMI, Comayagua, 3340 at 0340 with SS translations of EE preacher, ID in SS. (Wood, TN) 0420 with M/W SS anncrs and rap. (Parker, PA) 0557 with SS religious talks. EE translations and SS music to past 0630. (Alexander, PA) 1112 with SS ID and easy listening music. (Ronda, OK)

HUNGARY—Radio Budapest, 3975-Jaszbereny, 0450 with telephone interview or call-in. Strong, despite amateur QRM. (Parker, PA) 11695 in HH at 2039. (Charlton, ON)

INDIA—All India Radio, 4760-Port Blair (Andaman Is.) fair in Tamil at 1140. Also 9705-Panaji (Goa) with Hindi song and commentary at 0000. (Ng, Malaysia) 4775-Imphal with music competing with R. Congohas at 0050, 4800-Hyderabad with woman in unid dialect at 0114, 4840-Mumbai in vernacular and long instrumental at 0135. (Parker, PA) 9425-Bangaluru in Hindi at 1439, 9820-Panaji (Goa) at 1408 in Sinhala with some EE words or phrases and 9870-New Delhi in Hindi at 1356. (Ronda, OK) 11620-Aligarh in unid lang at 1235. (Brossell, WI) 13605-Bangaluru at 1902 mentioning soccer scores. (Charlton, ON) 13605 at 1845. (Maxant, WV)

INDONESIA—Radio Republik Indonesia, 3975-Pontianak in II at

1052. 4750-Makassar in II at 1151 and 4925-Jambi with II pops at 1148. (Ng, Malaysia)

IRAN—Voice of the Islamic Republic of Iran, 3945-Kalamabad at 0330 in presumed Kurdish and 3985-Kalamabad in SS at 0350. (Parker, PA) 7235 at 0130 sign on and 15260 with Koran at 1235. (Brossell, WI) 7325 in CC at 0003 and 15460 in EE. (Ng, Malaysia)

ISRAEL—Kol Israel, 7545 with EE news at 0431. (Wood, TN) 11590 at 1841 and 13675 in HH at 1858. (Charlton, ON)

Galei Zahal, 6973 in HH at 2100. //15785.1 (Alexander, PA)

ITALY—IRRS, 7285 with EE religious program at 1845, UNI (United News and Information) newscast at 1932, music and poems. Also 9510 with similar programming at 1042. (Alexander, PA) *(The transmitter location for this is still uncertain.—gld)*

JAPAN—Radio Japan/NHK, 5960 via Canada in JJ at 0335, 9835 in JJ at 1855, 11910 in JJ at 2250, //11665, 13650 in JJ at 2303 and 15355 via Gabon in JJ at 1840. (MacKenzie, CA) 6110 via Canada at 0505 with news and 11935 via Bonaire in JJ at 0307. (Parker, PA) 9535 on Japanese tourists in Australia. (Maxant, WV) 11815 with news at 0905 (Wood, TN) 11935 via Bonaire in JJ at 0316. (Wood, TN) 15355 via Gabon in JJ at 1828. (Charlton, ON)

Radio Nikkei, 3925 in JJ monitored at 1040. (Ng, Malaysia) 1117. (Ronda, OK)

JORDAN—Radio Jordan, 11690-Kharana with US pops at 1538, under RTTY. (Charlton, ON) 1600-1759 close with instls, Euro-pops, call-in show. Noted in FF at 1500 check. (Alexander, PA)

KUWAIT—Radio Kuwait, 11990 at 1757 sign on with AA, NA and into EE pgm on religion there, US pops, pgm on Kuwaiti women at 1900. (Alexander, PA) 1830 with non-stop US pops, local "FM Super Station" ID and into news. (Fraser, ME) 1822 in EE. Also 13620 in AA at 1547. (Charlton, ON)

LAOS—Lao National Radio, 6130 in Lao with W talk, Laotian music. Big Ben-like TS at 1159 and ID at 1200. (Ng, Malaysia)

LATVIA—Latvia Today, Ulbroka, 9290 at 1350 with local pops, talk on Latvian history. (Alexander, PA)

LIBERIA—Star Radio/Cotton Tree News 9525 via Ascension at 0703 with Star Radio IDs, weekly review pgm. Into CTN News at 0735 (ex-13760). (Alexander, PA)

ELWA, 4760, Monrovia at 2230 with religious messages and music. NA at 2303 sign off. (Alexander, PA) (p) at 2237 with religious talk and chorus. Off at 2300. (Ronda, OK)

LIBYA—Radio Jamahiriya/Voice of Africa 9590 in FF at 1835 and 11620 in AA at 1711. (Charlton, ON) 17725, ex-17870 with EE pgm at 1400 to past 1500. //21695. (Alexander, PA) *(Libya has resumed use of its Sabrata site. Issoudun is no longer being used by Libya.—gld)*

LITHUANIA—Radio Vilnius, 11690 in GG heard at 0045. (Maxant, WV)



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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 **Bob Fraser** of Belfast, Maine, who has received a complimentary copy of the 2008 *World Radio TV Handbook*, one of the few SWBC reference books you should not be without whenever you turn on your radio. It's available at your radio communications dealer and at most large bookstores.

MAURITANIA—Radio Mauritanie, 4845 with M/W talks in AA at 0005. (Parker, PA) AA talking at 0211. (Brossell, WI)

MEXICO—Radio UNAM, 9599v with classical music heard at 0755. Also noted at 0940, 1356, 1910 and 2225, all with classical music. (Alexander, PA) (in SS—*gld*)

MOROCCO—RTV Marocaine, 5980 with YL and anmts in AA, ME music at 0104. (Wood, TN) 15340 in AA at 1238. (Brossell, WI) 15345 in AA at 1819. (Charlton, ON)

Radio Medi Un, 9575, Nador, with AA music, woman anner at 0504. (Ronda, OK)

MYANMAR (Burma)—Radio Myanmar, 5040 with minority music pgm at 1105. (Ng, Malaysia)

NETHERLANDS—Radio Nederland, 9795 with "Amsterdam Forum" at 1004. (Ng, Malaysia) 11655 Madagascar Relay at 2030. (MacKenzie, CA) 17810 at 2025. (Maxant, WV)

NEW ZEALAND—Radio New Zealand Intl, 5950 at 1309 on back pain research. (Ronda, OK)

NIGERIA—Voice of Nigeria, Ikorudu, 15120 at 1901. Poor audio. (Charlton, ON) 1926 with talks and African music. (MacKenzie, CA) 2030 on trade with Japan. (Maxant, WV)

Radio Nigeria, 4770-Kaduna, at 0435 with news items. (Ronda, OK) 0502. (Parker, PA) 0508 on local elections. (Wood, TN) 7275-Abuja at 0610 with EE news. (Alexander, PA)

NORTH KOREA—Voice of Korea, 11710 in KK with martial music at 1540. (Brossell, WI) 11735 with EE commentary at 1015. (Ng, Malaysia) 11910 at 1906 and 15245 in EE and KK at 1846. (McKenzie, CA)

NORTHERN MARIANAS—KFBS, 12090 in VV at 2359 to EE ID and sign off. (MacKenzie, CA)

OMAN—Radio Sultanate of Oman, 15140 at 1452 with EE pgm, local and Euro-pops, chimes/gongs at 1500 and into AA. (Alexander, PA)

OPPOSITION—Radio RASD (to Morocco) (t) 6300 via Algeria with sign on over freakish Radio Havana signal at 0456 and into AA and Koran. (Parker, PA)

Southwest Africa Radio, (to Zimbabwe), 12035 via Rampisham at 1750 with news items about Zimbabwe. (Charlton, ON)

Radio Farda (to Iran) 7105 via Germany in presumed Farsi at 0315. (Brossell, WI)

Echo of Hope (to North Korea) 3985 in KK at 0445 with M/W anners and Korean music. (Parker, PA) 6003 (p) at 1125 with local music, unid lang. (Alexander, PA) Poor at 1314 with long talk in KK. (Ronda, OK)

Radio Marti (to Cuba), 11845 via Greenville in SS at 1436. (Charlton, ON)

Radio Free Asia, 9355 via Northern Marianas in unid lang. at 1155, EE ID at 1157. (Brossell, WI) 11510 via Kazakhstan at 1535 in unid lang. (Charlton, ON) 15430 in CC at 2315. Also 21570 in Tibetan at 0633. (Ng, Malaysia)

Miraya Radio (to Sudan), 9825 at 1458 with Afro-pops. "111 Miraya FM" ID and EE news. Poor to fair. (Alexander, PA)

Radio Voice of the People (to Zimbabwe), 9765 via Madagascar at 0400 sign on with local music and multi-lingual ID. Covered by a strong music loop jammer at 0403. Also 11610 at 0400 sign on with some EE IDs and short music breaks. Co-channel jamming. (Alexander, PA)

11610 with 0357 open carrier and on with instl music at 0400, opening ID and anmts in vernacular to news start at 0401. Jammed soon after began. (D'Angelo, PA)

Radio Liberty, 9760 via Kuwait Relay in Asian language at 0327. (Brossell, WI)

PERU—Radio del Pacifico, Lima, 4974.8 with W anner in SS at 0415. (Parker, PA)

Radio Santa Monica, Cusco, 4965 in SS with man anner and music at 0310. (Parker, PA)

Radio Huanta 2000, Huanta, 4747 at 1009 with man in SS, ID and ad string. (D'Angelo, PA) 2325 with man in SS. (Parker, PA)

Radio Vision, Chiclayo, 4790 at 0551 with rancho style religious music and man preaching to what appeared a jammed cathedral. (Parker, PA)

La Voz de la Selva, Iquitos, 4824 with talks in SS at 0133. (Brossell, WI)

Radio Atlantida, Iquitos, 4790 with man, guitar and vocal, ID and into upbeat accordions at 2333. (Parker, PA)

Radio Tarma, Tarma, 4775 in SS with reverb, up-tempo songs at 2320. (Parker, PA)

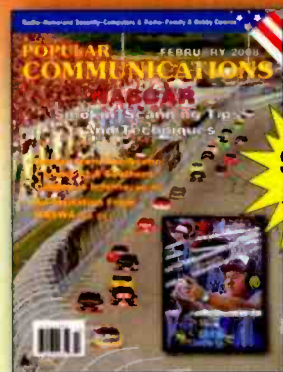
Radio Ancash, Huaraz, 4990 at 0701 with slow LA music, M/W vocals. Low modulation. (Parker, PA)

Radio Melodia, Arequipa, 5939.3 at 0955 with SS talk, commls, promos, mentions of Arequipa. (Alexander, PA)

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PHILIPPINES—Radio Veritas Asia, 11935 at 0028 in Karen and into Tamil at 0030. (MacKenzie, CA)

FEBC, 9435 in Mandarin at 2240. (Ronda, OK) 9920 at 1230 with ID over "Joy to the World" and into unid Asian lang. (Brossell, WI) 15325 at 1000 with EE ID and into a religious pgm. (Ng, Malaysia)

Radio Philipinas, 12025 at 0200 with ID, news. (Ng, Malaysia)

PIRATES—WBNY, 6925u variously at 1452, *1541, *1559, *1641, 1734, 2038, and 2046 with Commander Bunny and his presidential campaign, jingles, mention of Kraker also being on the ticket, risqué song, Hendrix-like version of NA, t-shirt offers. (Zeller, OH)

The Crystal Ship, 3288.7 at 0037 ending pgm of folk, ID by woman at 0041* (Zeller, OH) 3420 at 0303 with a sea chanty, punk rock thing, and a "Dragnet" bit. Also 6900v at 2230 with spooky/monster songs, dramatic rendition of "The Raven." (Wood, TN) 6903.6 at 1517 with rock and a recorded Alan Weiner rant. (Strawman, IA)

Long Range Radio, 6925u, variously heard at *2112, *2211, and 2206 with comedy bits, sending possible SSTV image, digital noise and ID just before 2152 close. Also rock/pop and two guys discussing Googling things on the Internet. (Zeller, OH)

Channel Z Radio, 6925u at *0254 and *1515 with classic rock, slogan "the only channel you'll ever need" and several esoteric numbers. Blue Ridge Summit and channelzradio@gmail.com. (Zeller, OH)

Radio Free Speech, 6925 heard at 2050 with "Bill O' Rights" host. (Zeller, OH)

"Voice of Pancho Villa," 6925u at *1939 with replay of a broadcast from a prior Kulpsville Winterfest, adding a minute of rock at the end. (Zeller, OH)

WBST, 6925u at 2331, anncr with maniacal laugh and organ music. (Wood, TN) 2330 including a sketch about trouble dolls. (Zeller, OH)

WMPR, 6925u, 1749 with instl dance and "WMPR Dance Party" ID. They said they don't have an address. (Zeller, OH)

Undercover Radio/Laser Hot Hits, 3240 at 0237 with Dr. Benway talking of relaying Laser Radio. Also dance club things, t-shirt ads and *Offshore Echoes* magazine ads. (Wood, TN) 6924.9 at 1342 lasting until 1539* with Dr. Benway and excerpts from older pgms, story of a deranged man who thought he was God, various rock and new age pieces. Reports to both Merlin and undercoverradio@gmail.com. (Zeller, OH)

Wolverine Radio, 6925u at 2302 with ID and anncr with Ray Parker, Jr. "Ghost Busters." (Wood, TN)

Captain Morgan, 6925u at *2220 with lengthy and confusing pgm, clear IDs with "you're in the pirate zone." (Zeller, OH)

Radio Jambu Intl, 6925u at *1706 with Twilight Zone noises, Wikipedia discussion, odd noises, mention of WBZ and Winter SWL Fest. Other bcsts discuss pirates. "Have a good weekend, take plenty of drugs and call me in the morning." Three Stooges noises at close. (Zeller, OH)

"WBCQ relay," 6925u at *1346 relaying recent comments by Alan Weiner who criticizes quality of current pirates. No ID or address given. (Zeller, OH)

WTCR, 6925u heard at *0040 with various rock selections and slogan "Twentieth Century Radio." Belfast address. (Zeller, OH)

WTPR—Tire Pressure Radio, 6925u at 1508 and *1653 signing on with Alan Weiner's latest rant criticizing quality of current pirates and into regular WTPR pgm warning of loss of tire pressure if you don't turn off your radio. No address. (Zeller, OH) 2040 listing people whose tires went flat due to listening to the station. (Gay, KY)

WFUQ, 6925u heard at 0016 with several IDs and techno sound. (Wood, TN)

Oscar Lima—6925u at *2314 with guy discussing "my failures" and then with a "coded" message of 1 and 2 digits. (Zeller, OH)

WHYP, 6925 at 2127. ID presumed based on James Brownyard noises. Rock pgm. (Zeller, OH)

Radio Nonsense, 6925u with "Monster Mash" and comedy skit at 2153. (Gay, KY)

Northwoods Radio, 6925 at 2150. Anncd as an AM bcst but no modulation on the LSB side, hence an A3H designation. Hosted by Jack Hines Savage. northwoodsradio@yahoo.com address. Was to return in 20 minutes after 2209 close "beamed west." Also at 0125 with one country selection, loon SFX, IS and short CW segment at close. (Zeller, OH)

Reflections Europe (Euro) (p) 6295 at 2227 with religious vocal and talk. Poor at best. (D'Angelo, PA)

PORTUGAL—RDP Intl, 15560 in PP at 1608. (Charlton, ON)

ROMANIA—Radio Romania Intl, 11940 at 2030 sign on and into world news. (Fraser, ME)

RUSSIA—Voice of Russia, 6155 at 0305 with World Service, 7125 via Moldova in RR at 0320 and 7350 via Vatican at 0330. (MacKenzie, CA) 6240 via Moldova at 0249 with EE documentary. (Ronda, OK) 0329 on patronage system of music composers. (Wood, TN) Classical music at 0347 to 0358 and World Service ID. (D'Angelo, PA) 7145-Petropavlovsk in Mandarin at 1107 also 7155-Komsomolsk-Amur. (Ronda, OK) 7260-Vladivostok at 1310. (Strawman, IA) 13660 on songs of Russia at 0851. f/by ID and news. (Ng, Malaysia)

Radio Rossii, 7320-Magadan with RR ID at 0359 and time signal at 0400. (Ronda, OK)

SAO TOME—VOA Relay, 4960-Pinheira with "Daybreak Africa" at 0410. (Parker, PA) 15730 Sao Tome in FF heard at 1838. (Charlton, ON)

SAUDI ARABIA—BSKSA, 9870-Riyadh, with AA ballads and woman anncr at 1552. (Wood, TN) 11735 in AA at 2322. (MacKenzie, CA) 11820-Riyadh in AA at 1850. (Charlton, ON) 21670 with mail-bag pgm in Indonesian at 0935. (Ng, Malaysia)

SEYCHELLES—BBC Relay, 11665 in EE at 0335. (Wood, TN)

SINGAPORE—Radio Singapore Intl, 5090 in CC at 1110 on an ASEAN meeting. (Ng, Malaysia)

SOUTH AFRICA—Channel Africa, 3345 with MOR pops at 0349. (Wood, TN) 7390 at 0318 with two men and EE comments, features. (MacKenzie, CA) 0413 with classical music and FF anmts. (Ronda, OK) 15235 at 1733 with news by W. Abrupt close at 1750. (Parker, PA)

Radio Sondergrense, 3220 in Afrikaans at 0159. (Brossell, WI) 0215 with music variety. (Parker, PA) 0245 with CODAR pulses. (Ronda, OK)

Trams World Radio, 7215 at 0338 in listed Sidamo language. EE ID at 0345 at close. (D'Angelo, PA) 0340 with EE, African vocals, ID, off at 0345. (MacKenzie, CA)

SOUTH KOREA—KBS World Radio, 9570 with "Seoul Calling" at 0815. 9770 at 1130 with EE ID and into news in CC. (Ng, Malaysia) 11810 in Korean at 0015. (MacKenzie, CA) 9805-Kimjae in Indonesian at 2251 with long fades. (Ronda, OK)

SPAIN—Radio Exterior de Espana, 3350 Costa Rica Relay in SS at 0228 and 17850 via Costa Rica with live sports coverage at 2205. (MacKenzie, CA) 0426. (Parker, PA) 12015-Nobeljas in AA. (Charlton, ON)

SUDAN—Republic of Sudan Radio, 7200 in AA at 0325. (Brossell, WI) 0410 in AA between ARO chatter. (Ronda, OK)

SWEDEN—Radio Sweden, 11550 in EE at 0243. (Ng, Malaysia)

IBRA Radio, 5900 via Petropavlovsk at 1206 with woman in Mandarin and soft religious vocals. Some lists show this as Taiwan. (Ronda, OK) 1254 with continuous CC talk. (Strawman, IA)

SWAZILAND—Trans World Radio, 3240 in presumed listed Ndaui at 0334-0345* (Parker, PA) 0322 in vernaculars and 4775 with contemporary Christian music. (Wood, TN) 0345 in Ndaui, and 4775 in listed Lomwe at 0349. (Ronda, OK) 0403 in GG. (Parker, PA) 4775 in GG at 0409. (Brossell, WI)

SYRIA—Radio Damascus, 12085 in AA at 2346. (Brossell, WI)

TAIWAN—Radio Taiwan Intl, 7445 at 1104 on garbage collections. (Ng, Malaysia) 9780 in CC at 1235. (Brossell, WI) 11635-Paochung in Mandarin at 2320. (Ronda, OK) 11710 in CC at 2350. 11885 in CC at 2245. (MacKenzie, CA)

TAJIKISTAN—Tajik Radio, 4635-Yangiyul in Tajik with man anncr and local music at 0046. (Parker, PA)

TANZANIA—Voice of Tanzania, 11735-Zanzibar with time pips and anmt EE news at 1800. "Spice FM" ID. (Alexander, PA) 1913 in unknown language (*Swahili-gld*) and frequent mentions of Uganda. (MacKenzie, CA) 2032 with lively vocals and short anmts in Swahili, Spice FM ID, anthem and off at 2059. (Ronda, OK)

THAILAND—Radio Thailand, 7260 with EE ID at 1115 and into an Asian language. (Brossell, WI) 9680 at 0010 on education there. (Ng, Malaysia) 9810 monitored at 1230 opening anmts and news. (Alexander, PA)

TURKEY—Voice of Turkey, 7240 from 0450 to 0456* with tail end of news and sign off anmts. (Wood, TN) 9785 with news at 1830, mostly on domestic terrorism. (Fraser, ME) IS and ID at 1830. (Charlton, ON) 11735 with EE news at 1330 and 17690 in Farsi at 0930. (Ng, Malaysia) 12035 ending "DX Corner" heard at 1411. (Strawman, IA)

UGANDA—Radio Uganda, Kampala, 4976 at 0214 with an African dialect. (Brossell, WI) 0235 in vernacular, man with news and short bits of local music. (Parker, PA)

UNITED STATES—VOA, 6040 via Tinian in CC at 1415 and 6105 via Philippines at 1424. (Strawman, IA) 7190 in CC at 0011 and 9645 via Thailand Relay in Tibetan at 0025. (Ng, Malaysia) 11510 Sri Lanka Relay in EE at 1553. (Wood, TN) 11625 via Northern Marianas in an Asian language at 1235. (Brossell, WI) 11725 Philippines Relay at 2355 //15185, 11805 in Indonesian at 0008 //15205; 15150 in Special English at 2315 and 15410 via Morocco at 1835. (MacKenzie, CA) 11745 in unid lang at 1948, 15410 Morocco Relay at 1843. (Charlton, ON)

Family Radio/WYFR, 3955 via Skelton in GG at 0445. (Parker, PA) 9280 via Taiwan in CC at 1155. (Brossell, WI) 9355 via Moldova in listed Nepali at 1427. (Strawman, IA) 9465 via Taiwan at 1025. (Ng, Malaysia) 9625 at 1130. (Fraser, ME)

AFN/AFRTS, 5446u, Key West relaying ESPN Sports Radio at 0249. (Ronda, OK) 12133.5u at 1225 on violence in Guatemala. (Brossell, WI) 1625 carrying National Public Radio. (Wood, TN)

WMLK, Bethel, PA, 9265 at 1929 with ID and usual theme to sign off at 1932. I believe sign off is usually around 2000-2100. (Alexander, PA) 2010 with a sermon. (MacKenzie, CA)

KTBN, Salt Lake City, 15590 at 2139 with EE interview; apparently from TV audio. (Wood, TN)

WWRB, Manchester, TN, 6370 with Brother Stair's Overcomer Ministries at 0510. The second harmonic of 3185. (Alexander, PA)

Sudan Radio Service, 5975 via Kigali at 0300 opening ID. EE News at 0302. Monday-Fridays only. (Alexander, PA)

WEWN Vandiver, AL, 15220 with preaching at 2010. (Maxant, WV) 2132. (Wood, TN)

VATICAN—Vatican Radio, 9755 at 2015. (Maxant, WV) 9610 in SS at 0306, //11910. (MacKenzie, CA) 11625 in PP at 1817, 13765 at 1534 and 15595 in FF at 1608. (Charlton, ON) 13765 at 1545. (Brossell, WI) 13785 in CC at 0035. (Ng, Malaysia)

VENEZUELA—Radio Nacional, 15290 via Cuba in SS at 1955. (MacKenzie, CA) 11875 via Cuba in SS at 1818, 13680 via Cuba in SS at 1445 and 13750 via Cuba in SS at 1446. (Charlton, ON)

VIETNAM—Voice of Vietnam, 7220 in CC at 1100 and 7285 in Khmer at 1033. (Ng, Malaysia) 6175 via Canada at 0255 and off by 0257. (MacKenzie, CA) 0335. (Parker, PA)

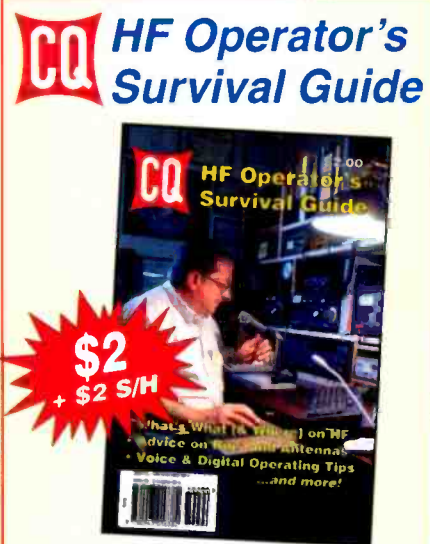
ZAMBIA—ZNBC/Radio Zambia-Program One, 5915 at 0240 sign on with Fish Eagle IS, choral anthem, local music and talk in vernacular. (Alexander, PA)

The Voice-Africa, 4965 at 0030 with non-stop Christian music. (D'Angelo, PA) 0314 with EE sermon. (Brossell, WI) 0345 with religious talk. (Parker, PA) 0422 with male hosting Christian music. (Wood, TN)

ZIMBABWE—ZBC/Radio Zimbabwe, 3396 in African dialect at 0203. Also on 4828 at this time but not in parallel. (Brossell, WI) 3396 at 0247 with male anncr in vernacular and variety of African music. 4828 at 0357 with pops. (Parker, PA) 4828 with African chorals at 0255. (Ronda, OK)

And, once again order is restored! An avalanche of thank-yous to those who made the effort to send logs this time: Joe Wood, Greenback, TN; Peter Ng, Malaysia; Stewart MacKenzie, Huntington Beach, CA; George Zeller, Cleveland, OH; Richard Parker, Pennsburg, PA; Brian Alexander, Mechanicsburg, PA; Jim Ronda, Tulsa, OK; Bob Fraser, Belfast, ME; Chris Gay, Lexington, KY; Charles Maxant, Hinton, WV; Robert Chandler, Windsor, ON; Robert Brossell, Pewaukee, WI; Jerry Strawman, Des Moines, IA; and Rich D'Angelo, Wyomissing, PA. Thanks to each of you!

See you all again next month. Until then—good listening!



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Coronal Holes As Prop Puzzle Pieces

Coronal Mass Ejections (CMEs) play a major role in the propagation of radio waves, especially in the world of shortwave radio. CMEs carry millions of tons of plasma from the sun's polar regions, some of which collides with the magnetosphere that surrounds our planet. Under the right conditions, this solar plasma enters the atmosphere, changing the ionospheric conditions, sometimes even causing aurora.

The sun's magnetic field permeates the entire solar system, and beyond, in a giant "bubble" called the "heliosphere." The heliosphere is created by the solar wind, which is always blowing out away from the sun. This solar wind contains magnetic field lines that also originate in the sun. These magnetic fields interact with the Earth and Earth's magnetic field, which is known as the "magnetosphere."

The solar wind consists of ionized atoms from the solar corona, as well as these magnetic fields. As the sun rotates once approximately every 27 days, the magnetic field transported by the solar wind gets wrapped into a spiral, called the "Parker spiral" (see photo). The sun's huge magnetic field is known as the Interplanetary Magnetic Field (IMF), and is a primary cause of space weather. The plasma that escapes or is blown away from the sun rides the IMF on the solar wind.

As Earth orbits the sun, it dips in and out of the wavy current sheet of the Parker spiral. The spiral's magnetic fields have polarity. On one side of the magnetic field, the field is oriented to the "north," or toward the sun. On the other side it points "south," or away from the sun. The IMF's orientation at the point of measurement is indicated by an index that solar scientists label B_z . When the B_z is negative, it indicates a southerly orientated IMF; when positive, it indicates a northerly oriented IMF.

South-pointing solar magnetic fields tend to "magnetically reconnect" with the Earth's own magnetic field (the magnetosphere), at the point where the two fields interact. This allows the solar wind, and the plasma riding on the IMF, to flow in to the magnetosphere and collect in a reservoir known as the boundary layer. The energetic particles riding the solar wind can then penetrate the atmosphere, causing aurora, and triggering geomagnetic storms. If the IMF is oriented northward, however, this magnetic reconnection does not take always take place. Yet, if the pressure of the shock wave from a passing CME is great enough, even with the IMF oriented northward, the geomagnetic field will become disturbed.

When the IMF connects with the magnetic field around the Earth, and as solar wind plasma flows into the atmosphere, the

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 $A_p > 20$) 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>.

geomagnetic field may become extremely disrupted. This is known as a geomagnetic storm.

Geomagnetic storms cause a degradation of radio signal propagation as a result of ionospheric recombination. This recombination is similar to what takes place during the hours of darkness, with a lowering of the frequencies each ionospheric layer can refract. Geomagnetic storms can cause long-term depression of the Maximum Usable Frequencies (MUFs), lasting hours or even days and reducing the critical frequencies by as much as 50 percent of normal.

The origin of most of the solar plasma riding the solar wind appears to come from coronal holes and CMEs. A CME is an ejection of solar plasma that typically occurs as a result of a solar flare out of an active solar region (groupings of sunspots associated with frequent flares). When the plasma reaches the Earth as an ICME (Interplanetary CME), it may compress the magnetosphere on the dayside and extend the nightside magnetospheric tail. When the magnetosphere reconnects on the nightside, it creates trillions of watts of power that is directed back towards the ionosphere. This process can cause particularly strong aurora.

A coronal hole is an area where the sun's corona has lower density plasma than the surrounding corona. A coronal hole appears darker than the rest of the corona, and is colder, too. Coronal holes are linked to unipolar concentrations of open magnetic field lines. During solar minimum, coronal holes are mainly found at the sun's polar regions, but they can be located anywhere on the sun during solar maximum. The fast-moving component of the solar wind is known to travel along open magnetic field lines that pass through coronal holes. Coronal holes may also produce plasma ejections, when bubbles of plasma caused by magnetic fields in the coronal hole pop. When the bubble bursts, huge amounts of plasma escape from the sun, flying away on the solar wind. These plasma clouds interact with Earth's magnetosphere in the same way as a CME.

Solar X-Ray Jets

Recently, in November of 2006, another source of solar wind plasma was discovered coming from coronal holes, as well as from other areas of the sun. Astronomers using Japan's Hinode spacecraft found that the sun is bristling



The "Parker spiral," named after the scientist who first described it, is formed by the sun's magnetic field as it is carried out through the solar system. As the sun rotates, the rotation winds up the magnetic field into a large rotating spiral. The magnetic field is primarily directed outward from the sun in one of its hemispheres and inward in the other. This causes opposite magnetic field directions in the Parker spiral. The thin layer between the different field directions is described as the "neutral current sheet." Since this dividing line between the outward and inward field directions is not exactly on the solar equator, the rotation of the sun causes the current sheet to become "wavy," and this waviness is carried out into interplanetary space by the solar wind (see text). (Source: NASA)

with powerful X-ray jets. These jets were first discovered by the Skylab X-ray telescope in the 1970s. They spray out of the sun's surface hundreds of times a day, launching plasma at a top speed of two million miles per hour. These jets add significant mass to the solar wind.

The Hinode (known also as "Solar-B") is a highly sophisticated observational satellite equipped with three advanced solar telescopes. It was launched on September 22, 2006. Its solar optical telescope (SOT) has an unprecedented 0.2 arcsec resolution for the observation of solar magnetic fields. If it observed the Earth it could resolve a feature of 50 centimeters. The X-ray telescope (XRT) has a resolution three times as high as the Yohkoh telescope, and the EUV imaging spectrometer (EIS) has a sensitivity 10 times as high as the ESA SOHO instrument. These X-ray and EUV telescopes would reveal the heating mechanism and dynamics of the active solar corona. These telescopes are vastly superior than the first telescope used in Skylab!

The discovery of a very high number of X-ray jets in coronal holes "is awe-

some and very much unexpected," said Jonathan Certain of the Marshall Space Flight Center, a key figure in the discovery. He recalls how it happened: "Hinode had just been launched and its instruments were coming online." To calibrate the spacecraft's X-ray telescope, mission controllers in Japan pointed the telescope at a coronal hole. Certain analyzed the data and "there they were!"

Certain notes that X-ray jets have been seen before, but never in such abundance. They were called X-ray jets because they were bright at X-ray wavelengths. The phenomenon was later confirmed by a Naval Research Lab ultraviolet telescope that flew aboard the space shuttle in the 1980s as well as by Japan's Yohkoh X-ray telescope in the 1990s. "All those instruments saw very few jets—typically one or two per day," said Certain. X-ray jets were thus regarded as a curiosity of little importance.

Hinode has changed all that. The spacecraft's advanced X-ray telescope can take pictures rapidly enough to catch these fast-moving eruptions. "We now see that jets happen all the time, as often

as 240 times a day. They appear at all latitudes, within coronal holes, inside sunspot groups, out in the middle of nowhere—in short, wherever we look on the sun we find these jets. They are a major form of solar activity,” said Cirtain.

Each jet is triggered by a magnetic eruption or “reconnection event”—essentially the same process that powers solar flares, albeit on a much smaller scale. “The energy in a typical jet is about a 1000 times less than the energy of an M-class (medium sized) solar flare,” explained Cirtain. Individually, jets are weak; *en masse*, however, they pack quite a punch. “If we add up all the energy jets deposited into the sun’s atmosphere, the daily total is on par with solar flares,” he added.

Indeed, the jets may contribute significantly to the solar wind. “We’ve added up the mass flowing in these jets and it amounts to between 10 percent and 25 percent of the solar wind. That’s a significant fraction,” said Cirtain.

When taken into consideration, these newly found x-ray jets begin to solve some of the mystery that has puzzled radio communicators who rely on the ionosphere for propagation of radio transmissions. During this period of solar cycle minimum, there are days when very little activity is occurring on the sun, yet the geomagnetic field can become disturbed enough that HF propagation is degraded. Perhaps this is due in part to these x-ray jets increasing the plasma riding the solar wind and the IMF.

HF Propagation

March is one of the optimal DX months. As the Spring Equinox approaches, the gray-line begins to run straight north and south. With the return of sunlight to the polar north, north-to-south openings on 11 through 25 meters are improving. However, since we are at the very bottom of the solar cycle, openings on east/west paths on higher frequencies will be shorter than in the last few years, if they occur at all.

Sixteen meters will still stay open into the evenings. You’ll occasionally find 16 meters open all night long into regions in the other hemisphere. Daytime paths will not significantly degrade until midsummer. You’ll experience early closures if you live closer to the North Pole, if any openings occur at your latitude.

Twenty-two and 19 meters will remain in excellent shape. Both short- and long-path circuits are reliable and solid. All

nighttime paths are open during March, though they’ll be short and weak. Prime-time evening hours in the United States are sunrise hours across Russia, Africa, and both the Near and Far East. Expect occasional short- and long-path DX from these areas of the world.

Between sunset and midnight, expect occasional DX openings on all bands between 15 and 41 meters. Conditions should favor openings from the east and south. These bands should peak for openings from Europe and Africa near midnight.

From midnight to sunrise, expect optimum DX conditions on 31 through 90 meters, and occasionally on 120 meters. Conditions should favor openings from the west and south. Some rather good openings on 19 and 22 meters should also be possible from the south and west during this time.

Noise levels are slowly increasing as we move toward Spring. Geomagnetic storms will increase, disrupting the mid- and high-latitude ionosphere. During the Spring Equinox, Earth’s magnetic field is sufficiently perturbed by solar wind particles flowing into the auroral zone (between 50 and 70 degrees north geographic latitude) to cause the ionosphere to be depleted. During days of high solar activity (coronal hole mass ejections, high-speed solar winds, flares, and so on), an increase in aurora and geomagnetic storms will shut down many paths, while VHF openings off the auroral zone may increase.

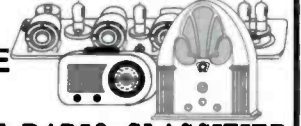
Daytime MUFs continue to drop and the planetary A (Ap) is on the rise, so take advantage of the current conditions and hunt for those weaker signals. Look for gray-line DX in the mornings and evenings on lower frequencies. Trans-equatorial propagation will be more likely toward sunset during days of high solar flux and a disturbed geomagnetic field—look for days with an Ap greater than 15, or a planetary K (Kp) greater than 3. Sporadic-E openings should be increasing for shorter-range openings.

VHF And Above

Check for low-VHF short-skip openings during the daylight hours. Some short-skip openings over distances of about 1,200 to 2,300 miles may occur. The best times for such openings are during the afternoon hours.

Auroral activity often occurs during periods of radio storminess on the HF bands. Look for days where the Ap index

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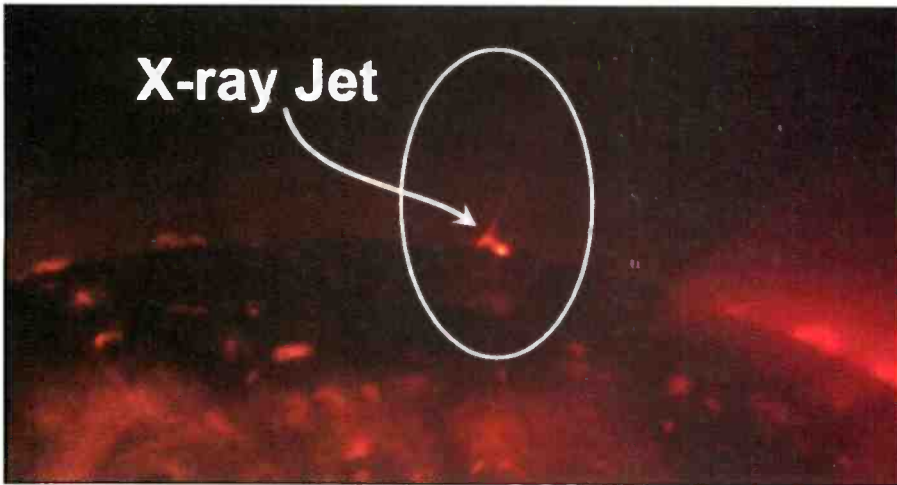
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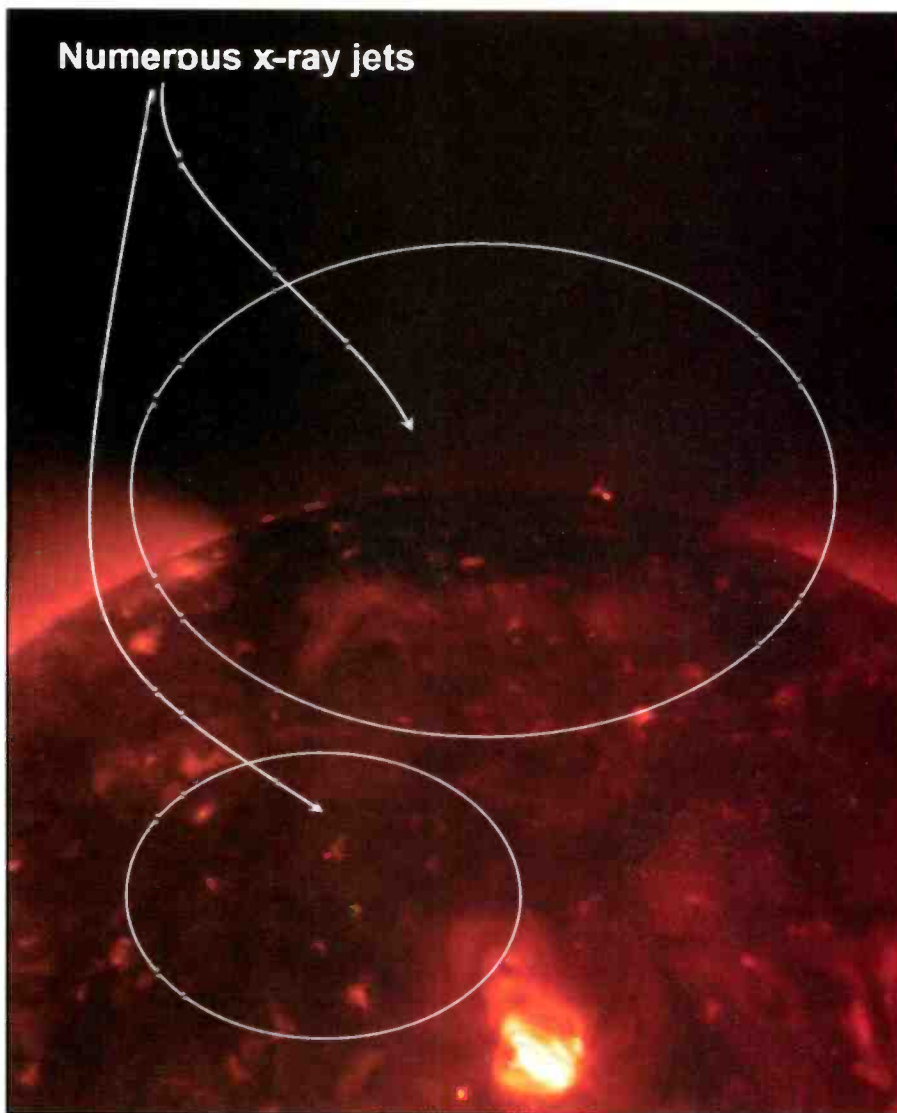




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A close-up of an X-ray jet spraying out of a coronal hole. Such jets significantly contribute to the plasma riding on the solar wind and may influence radio propagation (see text). (Source: National Astronomical Observatory of Japan/Hinode Project)



The Hinode team discovered that the sun was teeming with X-ray jets, not only in coronal holes (the dark area indicated by the upper circle), but all over the corona, one of the atmospheric layers of the sun. (Source: National Astronomical Observatory of Japan/Hinode Project)

is climbing and when the Kp index reaches 4 or higher. These are the days on which VHF auroral-type openings are most likely to occur.

Current Cycle 23 Progress

The Royal Observatory of Belgium reports that the monthly mean observed sunspot number for November 2007 is 1.7, up from October's 0.9. Perhaps we've seen the lowest monthly mean, and the end of Cycle 23 is indeed at hand. The lowest daily sunspot value of zero (0) was recorded on November 1 to 5, 7 to 15, 18 to 23, and 27 to 30. The highest daily sunspot count was 10 on November 16 and 24. The 12-month running smoothed sunspot number centered on May 2007 is 8.7. A forecast for 2008 has been released, calling for a smoothed sunspot count of 3 for March, reflecting a much more conservative and gradual start to Cycle 24.

The Dominion Radio Astrophysical Observatory at Penticton, BC, Canada, reports a 10.7-cm observed monthly mean solar flux of 69.7 for November 2007. The 12-month smoothed 10.7-cm flux centered on May 2007 is 74.2. The newly released predicted smoothed 10.7-cm solar flux for March 2008 is 61.

The observed monthly mean Ap index for November 2007 is 5. The 12-month smoothed Ap index centered on May 2007 is 8.4. Expect the overall geomagnetic activity to be varying greatly between quiet to minor storm levels during March.

I'd Like To Hear From You

You can join in with others in discussing space weather, propagation, and low frequency, mediumwave, shortwave or VHF listening at <http://hfradio.org/forums/>. Be sure to check out the latest conditions, as well as the educational resources about propagation, which I've 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, Ap reading, and so forth using a cell phone or other WAP device, check out <http://wap.hfradio.org/>, the wireless version of my propagation site.

Please don't hesitate to write and let me know about any interesting propagation that you've noticed. Do you have questions about propagation? I look forward to hearing from you.

Happy signal hunting!

From Hamfests To Solar Cycles— Spring Has Sprung!

Whether solar Cycle 24 is picking up steam or still taunting us with its promise of ionospheric goodness, spring has definitely sprung here in the frozen North. (As I write this, my “mouse hand” is a bit sore from chipping ice off the sidewalk, a December hazard in southern Minnesota.) It’s the start of hamfest season, at least above the Mason-Dixon Line, and hams, and groundhogs, are poking their heads out of their burrows, hoping to catch a glimpse of spring.

I’ve written about hamfests for the past 19 years. And my universal message to hams new and experienced alike is: Get out there and get involved. But if you’re a newcomer to the hobby, you might be wondering what’s in store. Good point!

Hamfests are like the state fairs of amateur radio. There’s a lot going on, including, seminars, flea markets, demonstrations, licensing tests, “eyeball QSOs,” and more, all in an atmosphere of camaraderie and *good food!*

At ham radio flea markets you’ll find hundreds (sometimes thousands) of fellow hams, tons of bargain-priced radio and computer gear (including hard-to-find components and electronic assemblies), interesting forums and lectures, ham radio exams, and tasty grilled sausages. The exact mix of the things you’re likely to find depends a lot on the kind of hamfest you’re attending, its size, and to some extent, the region of the country.

Large multi-day hamfests, such as the annual Dayton HamVention or the many ARRL Division Conventions, attract thousands of hobbyists. Local hamfests may draw only a hundred. But the fun factor is universal, regardless of size.

Most hamfests have a swapfest or flea market where hams and dealers set up shop. Most are also piled high with comput-

er stuff, from obsolete parts to new systems. Computer technology is forever merged with amateur radio, so worrying about the number of computer vendors at hamfests is a moot point. Why not take a look at everything?

Hamfest Schedules

Information about upcoming hamfests is available from several sources. Members of your local ham club will probably be “in the know,” especially when it comes to nearby happenings (hamfests tend to be annual events, publicized well in advance). Nationally, dozens of hamfests and amateur radio events are listed in our sister publication *CQ* and also *QST* magazine. You can browse hamfest listings electronically at www.arrl.org/hamfests.html or at the *World Radio* website, www.wr6wr.com/.

Hamfests are typically held at hotels, schools, parks, National Guard armories, fairgrounds, or civic centers. Organizers usually host events at identifiable and accessible locations (although sometimes you’ll be surprised!).

Sparsely populated parts of the country tend to be a bit starved for hamfest opportunities, while high-tech centers like the Boston area (with MIT and all) and Silicon Valley seem to have as many hamfests as yard sales. For all its hassles, population density has an advantage or two...

Buying Stuff

Because we think of hams as friends, it’s difficult to think that we could never run into a bum deal at a hamfest. After all, these people are fellow hams! Although most individuals and commercial outlets selling hamfest gear are on the level, smart shopping and a healthy dose of preventive caution will help you avoid unwelcome surprises. Here are some tips:

- Make a budget and stick to it. For some, going to a hamfest is like going to the candy store. If you’re not careful, you’ll go home with plenty of “candy” and no mortgage money. Try to plan your spending in advance.

This is what I love about hamfests: old radios! In this case, Heathkits from the '60s and '70s. This shot was taken by Ken Barber, W2DTC, at the 2005 Rochester, New York, hamfest. Ken has hamfest pictures galore (and lots of other interesting radio stuff) at his website, www.w2dtc.com.



Has Solar Cycle 24 Begun?

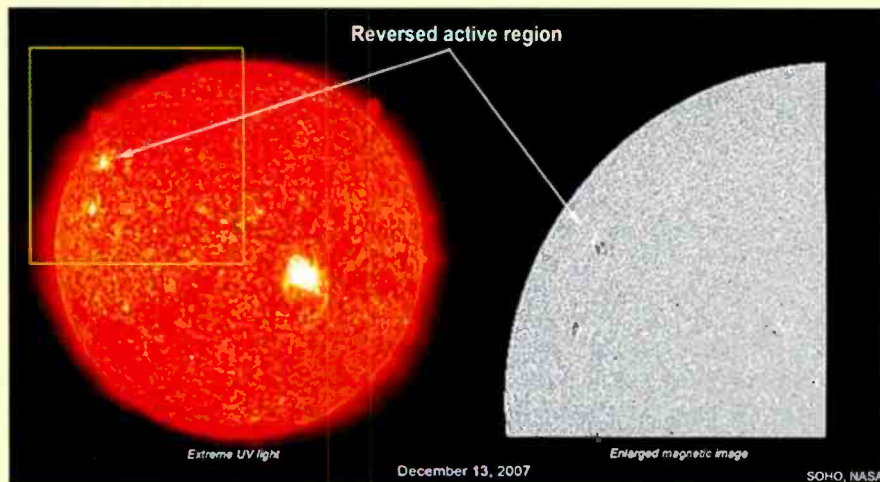
If you're relatively new to the HF bands, you might not know (or remember) what it's like to operate during a peak of the sunspot cycle. Well, I'm here to tell you—it's unbelievable, especially when you compare it to today's relatively horrible conditions on the upper HF bands. There's DX of some sort almost every day, even today, but during the peak years, 20 through 10 meters is open to just about everywhere, just about all the time. Frequencies above 20 meters may close down a bit at night, but they might just stay open to the South Pacific and Asia well past your bedtime! And 20 meters is wall to wall, around the clock.

In 1979, my first solar peak, I had just become a ham (in 1977), and I thought that the excellent conditions I took for granted were the norm. Wrong! I wasn't all that prepared for life at the bottom of the sunspot cycle, often called the "doldrums," which is what we're experiencing today (December 2007 as this is being written).

In 1990, my second peak season, I discovered that, even with a crummy antenna and a 5-watt signal, I could converse (as in lengthy chats) with European and Japanese hams on an almost daily basis on CW and SSB. Until the next cycle picks up in a few years, those globe-spanning, casual, everyday chats are reserved for Big Gun stations with power and high-gain antennas. And even then propagation has to be favorable.

The science behind the solar cycle, exactly how it affects the physics of radio-signal propagation, the earth's magnetic fields, the ionosphere, etc., aren't exactly simple. Thankfully, there's *Pop'Comm's* excellent column by Tomas Hood, as well as plenty of websites, to help you to understand these concepts. Read Tomas' material in this magazine, then check out his website at <http://prop.hfradio.org> and follow the links.

I must confess that, even after 30 years as a ham, my ultimate understanding of solar science and its effects on propagation aren't what I'd like them to be! But there are a few rules of thumb: In general, you can never be too rich or too thin. That's just common sense. When it comes to antennas, bigger is better and higher is better. Ditto. And when it comes to solar cycles, for HF ops in general, the closer to the peak, the better. Makes sense.



This is the reverse-polarity, high-latitude magnetic region of the sun that has scientists wondering whether Cycle 24 has just begun. See text. (NASA image from December 11, 2007)

The funny thing is, even the scientists who study the sun on a daily basis can't accurately tell us when a solar cycle has begun *until it's already begun!* Predicting the start of a solar cycle, the cycle's expected peak intensity, and the cycle's expected duration is a lot like predicting earthquakes. There are a lot of competing theories forecasting this earthquake or that, but it's all largely speculative until an earthquake hits. Then, and only then, do all the forecasters agree that, yes, *there was an earthquake!* After the fact, the date, time, epicenter, magnitude, fault system, duration, and consequences are precisely known.

Working with systems that are still beyond our comfort zone, like solar physics, is like that. Someday we'll have it down cold. Until then, it's a mystery—a fun and fascinating mystery that has a direct bearing on our experiences as hams.

Because you'll be reading this a couple of months after I wrote it, the December 2007 buzz about the possible start of Cycle 24 might have already been answered and be old news! That risk aside, solar scientists are hurriedly trying to determine whether Cycle 24 has taken its first detectable step forward or whether we're still wallowing in the shallows of Cycle 23, just before the new dawn.

According to NASA scientists, new solar cycles always begin with a reversed-polarity sunspot at relatively high latitudes. The magnetic polarity a cycle's



And this is what the solar surface looked like on December 19, 2007. No sunspots, no nifty regions, no nothing! The blank and featureless solar disk perfectly illustrates the concept of "the solar doldrums," which we've been experiencing for the past year or more. See text. (NASA image)

sunspots varies from cycle to cycle, so the emergence on December 11, 2007, of a reversed-polarity, high-latitude magnetic region—not yet a sunspot!—has scientists abuzz (see photos).

If the newly formed regions coalesce into a *bona fide* sunspot, scientists will consider that the start of Cycle 24. Will it happen? Did it happen? You, dear reader, may already know!

Whenever it comes and whatever heralds its arrival, let's toast the beginning of a new solar cycle and hope it's a doozie. We'll know in a few years... after the fact!

- **Negotiate.** Hamfests are a lot like open-air Byzantine street markets, and haggling over the price of used gear or components is expected. Don't be a jerk, but do get in there and have some fun. Much like with merchants of every stripe, you can deal on price, terms, and quantity. If you buy two or three items you might get a break on the price. If you trade a valuable goody along with your cash, you might get the deal of the century (depending on how badly the other person wants your goody). You never know until you ask.

- **Arrive early and/or stay late.** The best hamfest deals are usually made in the first and last hours of each event. Getting to the hamfest early will allow you to snap up some of the best merchandise. If you wait too long, your favorite stuff may be gone. Alternately, if you play the waiting game, sellers may be quick to discount stuff they don't want to pack up and take home.

- **Always test expensive gear.** If you're buying a major item, such as a transceiver or receiver, make sure you're able to plug the thing in somewhere to see if it works. Most sellers represent their merchandise accurately, but it never hurts to power up a potential acquisition. And make sure you get the seller's name, address, and phone number—just in case.

Selling Stuff

If you're looking to upgrade your station equipment or accessories and you don't have tons of extra cash, why not reserve a seller's table (or flop down your pickup's tailgate) and take advantage of "flea market fever" by selling your existing gear at a hamfest to finance all or part of your new setup? Here are a few tips to stand you in good stead.

- **Appearance.** That means you, your table, and your gear! Think of your hamfest table as a storefront. Clean up your gear, display it neatly and make index card signs for big-ticket items, listing the details and the price. Dress casually and presentably.

- **Realistic pricing.** This is a biggie! It's a hamfest, folks! Don't price your used (and sometimes abused) gear as though it were gold plated! Remember the win-win scenario? Sentimental attachment doesn't promote sales. Be reasonable and friendly—that's how to sell stuff at hamfests.

- **Talk it over.** Many flea market attendees are tire kickers, but with a little salesmanship, many a tire kicker has been "persuaded" to take home merchandise. People like to joke, laugh, and have fun (even hams!), so be sure to blurt something out when you catch someone peeking at the stuff on your table. This breaks the ice and sets the stage for friendly chatter...and potential sales.

- **Negotiating, Part II.** Nearly every flea market price is at least somewhat negotiable. People will ask you to sell your stuff for less than your asking price, they'll ask you for "volume discounts," and they'll ask you to accept trades. You should at least be comfortable in jockeying your prices a bit, and if you can take a trade, that's just fine. It's your show, but by being flexible you'll be more successful. A 10 to 15-percent reduction in price seems about right. Anything more turns haggling into railroading! Don't wait for your customers to start haggling; you can get the ball rolling by offering a deal of your own. It works!

- **Good terms.** To ease buyers' fears of getting ripped off, represent your gear honestly and offer reasonable terms. Some sellers offer a five-day money-back guarantee, especially for big-ticket items, holding onto a customer's payment to make sure he or she is happy with the deal. Why would you want an unhappy ham customer (friend), anyway?

- **Miscellaneous.** Arrive early! Many of your best sales will be to other sellers who relish the opportunity to check out everyone's stuff before the masses get through the gates. If you set up as early as possible, you won't have to try to sell and set up at the same time, and you'll be free to search for your own goodies to buy! Be prepared for weather changes if your event is outdoors. Bring a friend or helper so you're not tied to your table for the whole show. Bring lots of change and dollar bills. Accepting checks can be hazardous nowadays. Be careful.

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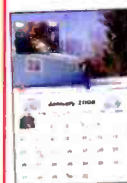
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A Systems Approach To Mobile EmComm

Last month we started a multi-part series on outfitting our Scamp camp/travel trailer with radio gear, supplemental power, antennas, and accessories necessary to perform emergency communications (EmComm) duties during exercise or real-world disaster scenarios. During my 20 years in USAF Comm Command, I was trained to regard communications as an entire “system” rather than a transmitter, receiver, antennas, transmission medium, etc. Taking the “systems approach” in turning our tiny Scamp camper into a mobile comm facility makes a whole lot of sense for a number of reasons, and luckily both my wife, Patricia, and I are now retired and so have the time to devote to EmComm training and deployment.

Even though our Scamp/comm facility would be only one part of the overall picture in a possible emergency situation, it would serve a vital role in furnishing communications to the various served agencies that would be involved in mitigating a disaster. We are fully self-contained and can function independently of any other system. Therefore, we need to regard our Scamp not only as part of the system, but as a mini-system within the bigger disaster mitigation system.

EmComm—A Systems Approach

Since we’re going to take a systems approach to our Scamp project, we can now start breaking things down into bite-sized chunks for easy digestion. The radio gear, of course, is vital, but it’s only part of the Scamp system. We also need antennas, feedlines, and power, plus some operator/creature comforts, just to name a few things. All these and more need to be factored into the Scamp equation.

Last month we looked at the rationale of how I ended up deciding to use ICOM IC-706 transceivers. Of course, having the same (or similar) radio gear in each vehicle AND the Scamp/comm facility makes it easy for operators to transition from one station to another without having a steep learning curve. During the extreme stress of a real-world disaster, the less distraction you have to deal with the better. In the case of radio gear, if you’re



Frank Henrikson, KLØSW, from Alaska has constructed his Go-Box using a modified GI ammo can that houses a simple “rack” system that can be dismantled and re-deployed quickly. His radio setup consists of a Kenwood TS-50 for HF and an ICOM IC-V8000 for VHF FM. There’s a deep cycle gel-cell battery housed in the base of the rack and an A&A Engineering “smart charger” that will not overcharge the battery if left on full time. HF antenna matching is handled by a small MFJ 160-10 manual tuner and the SWR bridge on the TS-50. Many thanks to Frank for the photo.

already using one piece of equipment, an IC-706 or anything else, in your normal operating, adapting the same rig to your mobile EmComm environment poses virtually no problems. The controls are all the same, the ergonomics are identical, muscle memory takes over and you find yourself working the new station like a seasoned pro. Life is good!

One other comment regarding the equipment we place into our mobile comm facilities: use it! That’s right, use it. All the time. Every day. Use it, period! The reason for having similar gear is obviously the comfort level that only comes with constant use. In my military days, training was paramount. There was an old adage: “The more you sweat in training the less you bleed on the battlefield!” That’s a simple fact. Training is everything. The added emotional/psychological stress incurred during a real-world disaster is NOT the time to learn how to use your comm gear.

I feel very strongly that if you arrive at a location ready to furnish communications, you had better be properly trained and KNOW how to use your gear and both the strengths and the limitations of your mobile comm facility. Okay, enough of beating the dead horse.

Grab Gear Bargains, Answer Opportunity’s Knock

I easily found the additional ICOM IC-706 gear I needed for the Scamp conversion on eBay. As a matter of fact, I was amazed that I was able to obtain three of these units at around \$500 or less each! Granted they’re not the latest version with 70cm, but that’s ok since there are virtually no 70-cm EmComm circuits being used here in NE Pennsylvania.

Our two car installations (one in my wife’s Nissan Pathfinder and the other



John Gianotti, W9WY, of Munster, Indiana, has done a terrific job assembling his EmComm Go-Box in a musician's equipment case. This case features standard 19-inch rack panel spacing and is extremely versatile. John covers HF with a Yaesu FT-100D transceiver and VHF/UHF with a Kenwood dual-bander. He excluded internal batteries in favor of a small switching power supply since all his ARES/RACES callouts to date have had 120 VAC available. John provided front and back views of his EmComm Go-Box.

one in my Nissan Frontier) were pretty straightforward, and this brings me to a valuable installation tip: Use serendipity to your advantage.

Since Pat wanted to add a remote starter so she could warm up her Pathfinder prior to leaving work, we had the shop that installed the remote starter/security system also run the main DC power cable (#10 AWG red/black zip cord) and two of the antenna coaxial cables for the radio gear at the same time. This worked out very well, because it can be daunting trying to feed wires from the engine compartment into the cockpit via the firewall without disturbing wiring harness bundles, computer sensors, etc. They did a bang up job and it was an easy install from that point forward.

I terminated the red/black zip cord in 20-amp fuse holders, which terminated at the battery. The other end was terminated in 30-amp Anderson PowerPole connectors and plugged into the power patch panel below the dashboard. Nice and slick. I use a five-port RigRunner power patch panel from West Mountain Radio (www.westmountainradio.com/). It allows up to five pieces of DC-powered gear to be connected to one 13.8-VDC buss line, and certainly cleans up the rat's nest of power wiring that can ultimately take over a mobile installation.

Back to the radios. I procure good gear because I like the features and appreciate the benefits of versatility when it comes to radios. That's why Pat and I settled on a set of Kenwood TM-D700A dual-banders for our respective vehicles. Not only do they cover both 2 meters and 70cm, they also have internal packet TNCs and can be configured as in-car repeaters, more commonly called a "remote bases." Confession time, though: I have yet to utilize the internal packet TNC and have never configured either radio as an in-car repeater. Luckily I know someone who has...

Herb Comes Through...Again!

Herb, my muse, emailed me detailing his exploits using his Alinco DR-605 mobile dual-bander as a remote base station. Herb did take advantage of the unique characteristics of the UHF amateur band when he planned his mobile comm station. His DR-605 was configured as a remote base, transmitting to and

from his small Alinco DJ-C5T credit card-sized handheld unit on UHF, and cross-banding his signals onto 2 meters, where he could work through a local 2-meter repeater!

This may sound complicated, but it really isn't. Here's how it works: The UHF handheld (HT) communicates on UHF with the Alinco dual-band unit in Herb's vehicle. When Herb transmits on the UHF HT, his mobile unit receives it on UHF and immediately retransmits it on the input to a 2-meter (VHF) repeater in the local area. When Herb unkeys his HT, the UHF link drops between Herb and the vehicle, and the local repeater output is routed through his mobile radio gear to his UHF HT. So, basically, Herb is using a dual repeater system (this is called "cross-banding") to let him utilize a low-powered (300-mW) UHF HT to talk to the outside world via 2 meters!

One of the unique things about UHF is that it works quite well inside steel and concrete buildings. Therefore, the 300-mW output from his tiny HT is more than adequate for Herb to talk to the outside world using 2 meters and the in-car cross-band repeater. With this idea firmly seared in my cerebral cortex, I decided to investigate the option of putting both of my Kenwood dualies into a remote-base mode.

This plan has some definite merit. Radios don't do any good unless you have one in your possession when you need one. Patricia does not relish the idea of carrying even a small Yaesu VX-150 2 meter HT in her purse or on her person. Therefore, taking the lead from Herb, I purchased a set of Alinco DJ-C7Ts for Christmas (on clearance from an Internet source). Now these little beauties are really tiny, yet offer loads of features, including 200 memory channels, CTCSS encode/decode, scanning, 300-mW RF output with internal batteries or 500-mW with an external 6-VDC supply, and a TX/RX frequency spread of 144-147.995 MHz/420-449.995 MHz, with an extended wideband receive function (88.1-107.995/108-173.995/380-511.995 MHz AM/FM/WFM). They're so small and compact that they officially classify as "cute"!

Abracadabra!

With the mobile car installations in the bag (kind of a dry run as it were), it was time to turn my full attention to the Scamp



Here's my EmComm Go-Box project in the works, showing what the ammo box will eventually contain (from left to right): an ICOM IC-706 with MFJ 160-10 ATU, Tysonic 20A/hr gel-cell battery with "smart charger," ICOM IC-2100 2-meter FM transceiver (below) along with a RadioShack 40-channel CB set (top), and a RadioShack PRO-79 scanner (which will be updated later to a digital/analog trunk tracker). I was going to include a second 20A/hr gel-cell battery inside the ammo box, but that would bring the total weight to 30 pounds in batteries alone! Eventually the ICOM IC-2100 will be replaced with another Kenwood TM-D700A dual-band FM rig. The really nice thing about this Go-Box is that both the HF and VHF/UHF units can be removed if table/workbench space is at a premium. It's all about the versatility!

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installation. One thing I really don't like about our small Scamp is that storage is so limited. There is just not enough physical space to accommodate all the things we need. So, when it comes to planning a radio installation, the key is to make the radio gear disappear when not being used! Unfortunately, my name is not David Copperfield!

Herb was working on a small radio rack system for his EmComm gear. I took a page from his playbook (again) and decided I needed to find the proper-sized ammo can and go from there. It was important to me to be able to dismount the radio gear and have it highly portable so it could be used basically anywhere necessary, with or without the Scamp. Ergo, the ammo can.

A quick look over the Coleman's Surplus catalog (www.galleria-e.com/cgi-bin/Colemans.storefront/en/product/162901) yielded several good candidates for my portable EmComm station. The ammo can I chose was a 20mm (roughly 17 x 14 x 8 inches) version that would easily house an ICOM IC-706 HF (plus 6 and 2 meters) and a 2-meter FM

set. Also on the list of gear to shoehorn into the can was a small 11-meter (Class D Citizen's Band) rig and a VHF/UHF scanner with analog and digital trunk tracking. A small Kantronics TNC along with a palm top computer (for packet radio or PSK-31 operations) will be included if there's room. Oh, yeah, the two 20A/hr gel electrolyte batteries will furnish power where there's a lack of AC mains (of course, they weigh a total of 30 pounds by themselves, which definitely puts this "portable" comm center in the "luggable" category!).

More To Come...

Okay, gang, that's all for this installment. I'll have detailed pictures and maybe even a drawing of the Scamp for next month's column. For now, I hope you enjoy the photos of Go-Boxes related to our recent challenge.

In the meantime, make sure you get on the air with the EmComm gear you intend to use and USE it! Remember: Preparedness is not optional!

Radio Fun And Going Back In Time

Q. Who was the first person to have a CB license and why did he get it?

A. The first CB license was awarded to Al Gross, W8PAL, who had lobbied the government for years to create a license class for use by businesses that needed mobile and handheld transmitters. His Gross Electronics had several patents for various portable and cordless telephone devices. In September 1958 Gross Electronics was granted the first FCC license on the new Class D 27-MHz Citizen Band.

Many of Gross' fellow hams felt he had let the ham community down because the new frequencies came from the old 11-meter ham band. Nevertheless, Al Gross operated on both amateur and CB bands until his death in December 2000. His CB handle was Phineas Thaddeus Veeblefretzer after the eccentric inventor Phineas Fogg in Jules Verne's *Around the World in 80 Days*.

Q. What is meant by the term "hitch-hiking" in clandestine radio operations?

A. Turning on your transmitter on the same frequency as an enemy radio station after the "other guys" go to bed. Late listeners may think that they're still listening to "their" station, rather than "your" radio station. "Surfing" is putting your signal next to the other guys so that if the listener doesn't tune closely he gets you instead of "them."

Q. You've said that one of the key operations of the British Navy and Colonial Armies in World War I was to break up the German wireless system to keep them from communicating with their colonies. Most of the German colonies were in Africa and the South Pacific. How was it done?

A. At the beginning of World War I there wasn't much going on in German South-West Africa. There was some copper mining, and a few diamonds had been located. These, however, were not worth taking German troops off the western front to defend. There were, however, three major wireless stations in the colony, which were very important. The German Navy had 17 Naval cruisers with the responsibility to guard the sea lanes between Germany's colonies in the South Pacific, China, Africa and The Fatherland. Wireless stations kept the

fleet in touch with Berlin from the Southern Hemisphere.

To take these stations off the air, in 1915 the South African Army mounted a major military operation to turn German South-West Africa into South West Africa, aided by Britain and her Allies as part of a concerted effort to destroy Germany's ability to communicate outside Europe. The South Africans were successful. South West Africa was administered by South Africa until 1990 when it gained its independence as Namibia.

Q. What part, if any, did commercial radio play in the Pearl Harbor attack?

A. In those pre-radio beacon days it was not uncommon for the military to ask commercial radio stations to remain on the air after the hours of broadcasting allowed by their licenses. This would allow military flights to pick up a signal near their destination and use the signal to home in on. Such a request was made by the Army Air Corps at Hickam Field, Territory of Hawaii, to the local broadcaster at KGMB radio. A group of B-17s was inbound from California. KGMB stayed on the air all night playing Hawaiian music.

Also listening to the music was Commander Kanjiro Ono, communications officer for the Japanese Navy attack force 320 miles north of Oahu. Ono was aboard the attack flagship *Akagi* and wanted to determine the level of alert of the Hawaiian Defense Command. At 6 a.m. the attack formations began taking off from the task force carriers. Still thinking their only airborne audience was

American bombers, KGMB played on. The Japanese planes followed the signal to Oahu and attacked at 7:55 a.m.

At 8:04 KGMB interrupted its music program with a call for all Army, Navy, and Marine Corps personnel to report to their duty stations immediately. The call was repeated every 15 minutes. Many people called the station to ask if was just another drill. The station staff got used to answering the question with "No! This is the real McCoy!" The broadcast announcement "This is the Real McCoy" became one of the chief memories of listeners who tuned in that day.

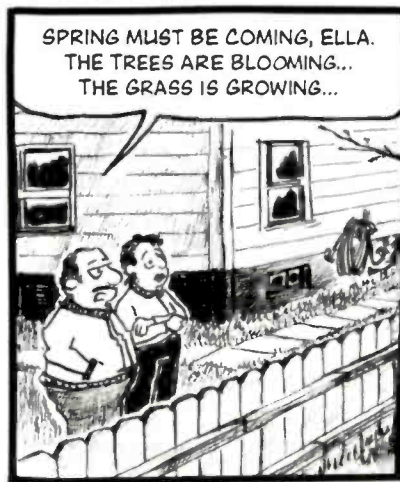
By about 8:30 another radio station, KGU, started making calls for doctors, nurses and defense workers to report for emergency work. By 8:40 all stations were sending out bulletins, "A sporadic air attack has been made on Oahu,"... "enemy planes have been shot down,"... "The Rising Sun insignia has been sighted on their wing tips."

The Japanese were still listening to the commercial radio response to the attack. The broadcasters' response convinced the Japanese that a scheduled second attack would be extremely dangerous because Hawaii was organizing a response. Admiral Nagumo, worried about the safety of his task force, cancelled the second attack thus missing many priority targets.

At 11:42 all commercial stations were ordered off the air by the Army authorities who feared another attack. KGU and KGMB both went dark, having contributed to the defense of Hawaii as much as any military organization on the island.

SPURIOUS SIGNALS

By Jason Togyer KB3CNM



All About Your Own Marine Shore Station License

If you live near a seacoast or waterway, you likely tune in to ship stations transmitting on marine VHF as well as long-range marine single sideband frequencies. But did you know that the FCC allows coast (shore) stations to legally transmit from shore to ships? You yourself might qualify for an FCC coast station license, and you may not need the services of a commercial licensing company to get you through the FCC process! We're still a couple of months away from warm weather boating, so now is the perfect time to sit down at the computer and "license-up" for VHF and SSB shore-to-ship communications.

Who Qualifies

Subpart K, FCC Rule 80.501 describes the eligibility requirements for a shore-to-ship coast station license. If you have a REAL requirement to talk from a shore radio station to ships at sea or nearby boats in the harbor or on a lake, you'll need to meet at least one of the following eligibility requirements:

- You run a marina with boat slips
- You run a launch ramp
- You fix electronic equipment aboard a boat
- You fix ANYTHING aboard a boat
- You run a port or waterway
- You run a boat rental or charter business
- You run a drawbridge
- You assign buoys for mooring
- You run a yacht club
- You run a gas dock or marine repair facility
- You sell live bait
- You run an emergency medical water rescue agency
- You rent fishing poles
- You rent water skis and inflatable tow rafts

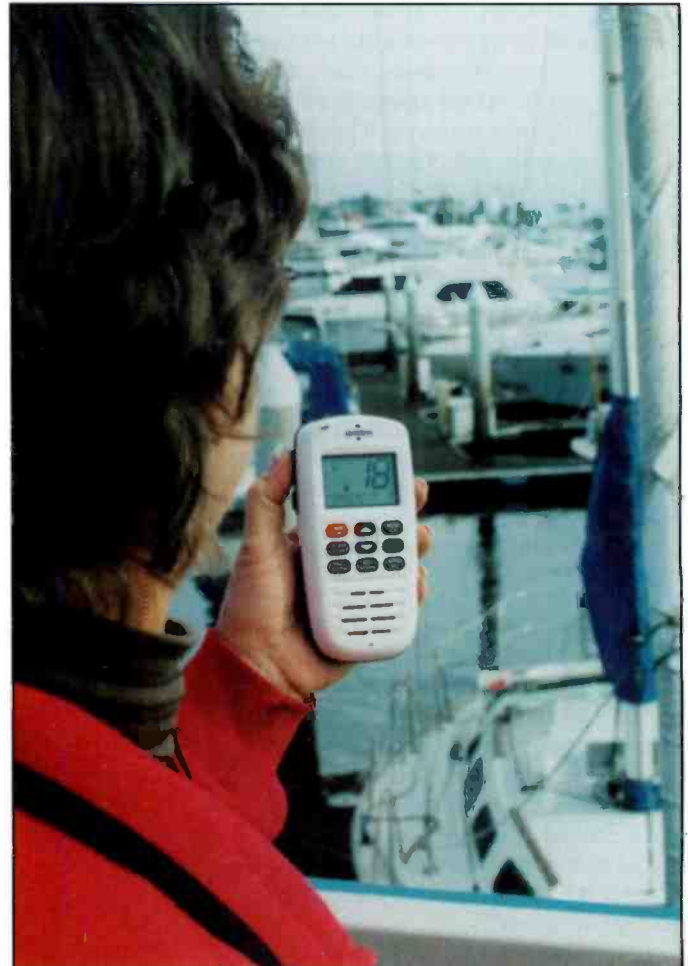
You will *NOT* qualify if:

- You just want to yak with anyone out on the water
- You have absolutely nothing to do with boating, but always wanted to own a yacht
- You want to help the Coast Guard when someone yells MAYDAY
- You just want to hang some FCC wallpaper in you ham shack

More Than Just Commercial Reasons

"Having more VHF and SSB shore stations guarding the distress channels will add to our listening watches," said U.S. Coast Guard Telecommunications Joe Hersey. He agrees that more marine dockside businesses listening on VHF Channel 16 will mean a better chance that someone overboard with just a submersible VHF handheld may be radio-rescued.

Members of the Radio Technical Commission for Maritime Services (<http://rtcmm.org/>), a non-profit scientific, professional, and educational organization involved in policy, regulatory, and



Using marine VHF requires a coast station FCC license.

standards issues, are quick to point out that a shore station license is not a permit to chit-chat about non-essential radio traffic to a buddy out on the lake. The shore station license is also *NOT* intended to circumvent a handful of marine VHF duplex telephone systems still on the air, nor is long-range marine SSB shore licensing intended for use as a ham radio party line with boats at sea. But for those of us actively involved in some sort of boating on shore and who truly *need* VHF and/or SSB communications to nearby and distant ships, FCC rules will allow shore station licensing on several marine VHF channels, plus several long-range marine SSB frequencies.

Your marine shore station license can also be a life saver. Say you run a radio repair business out of your house, next to the big lake, and late one night, while keeping a radio watch on VHF Channel 16, 156.800 MHz, you hear a faint MAYDAY. The local lake patrol is down around the corner and can't hear the call.



This long-range coast station SSB antenna system covers 4 MHz–26 MHz with the SGC autotuner. (Photo courtesy N9ZGE)

You jump in, discover it's an elderly couple stranded on a sandbar, with hubby having chest pain. You're the hero for alerting local rescue agencies to bring in help.

On long-range marine SSB, like 12.356.0 MHz, you may hear a ship's station calling from thousands of miles away for *anyone* who can relay a message to a hospital in another country that the ship is coming in with an injured seaman. It takes some phone persistent calling, but you can get through to a local Coast Guard station where they'll take over on the normal ship-to-shore non-emergency working channel.

Frequencies Available For The Asking

If you run some sort of business enterprise from shore, you may apply for two marine commercial-channel frequencies to stay in touch with your own workboat out on the water. This could be VHF Channel 7A (156.350 MHz Simplex) and VHF Channel VHF 79A (156.975 MHz Simplex). You would also apply for two *non-commercial* channels to talk with pleasure boats inquiring about your facility. This could be VHF Channel 69 (156.475 MHz) and VHF Channel 71 (156.575 MHz).

You would also need to apply for VHF Channel 16 (156.800 MHz) to guard the distress channel, plus VHF Channel 9 (156.450 MHz) as a permissible channel for both commercial and non-commercial traffic, plus calling.

You would also apply for VHF Digital Selective Calling (only data) Channel 70 (156.525 MHz), because your shore station grant will also include an important nine-digit Maritime



Digital Selective Calling (DSC) marine radios dual-watch VHF Channel 70 for distress calls.

Mobile Service Identity (MMSI) number that sounds off if anyone within range should transmit a digital MAYDAY from THEIR DSC radio.

If you're seeking licensing in the Pacific Northwest or Southern California, the rules will instruct you to obtain required frequency coordination on your marine VHF channel choices. In all other areas of the country, use your scanner to meet the rules that require you to have surveyed the marine VHF band and have found non-interfering frequency choices for the channels you request.

In this same application, you may also apply, and receive, authorization for up to 1000 watts on the following marine SSB bands:

- 2 MHz (restricted power)
- 4 MHz
- 6 MHz
- 8 MHz
- 12 MHz
- 16 MHz
- 22 MHz
- 26 MHz

The FCC will usually grant only one marine SSB frequency within each band. You may also apply for long-range SSB DSC channels, at 2, 4, 6, 8, 12, and 16 MHz, limited to 150 watts.

Your VHF shore station application could also allow up to 50 watts of power output—that's *double* the 25-watt power limit for a ship station. VHF radio equipment aboard small recreational vessels cruising in local waters *no longer* requires formal ship station licensing, which means most everyone these days carries a \$99 marine VHF handheld, or a \$125, fixed 25-watt unit aboard. Midland sells a pair of marine VHF handheld radios for less than \$125 in a blister pack!

FCC WARNING: Transmitting on shore between two marine VHF handhelds (or any other marine VHF radio) is strictly prohibited. This includes your shore station license. You can't get the license to set up your bait shop radio and then talk from the downtown mobile or base unit back to your marine base unit. **NOT LEGAL!** Using a pair of *marine* VHF handhelds to talk to each other *on land* is also **NOT LEGAL**.

Your coast station license only permits points of communication from shore to ship except in a life-threatening emergency,

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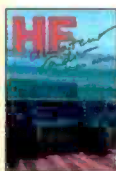
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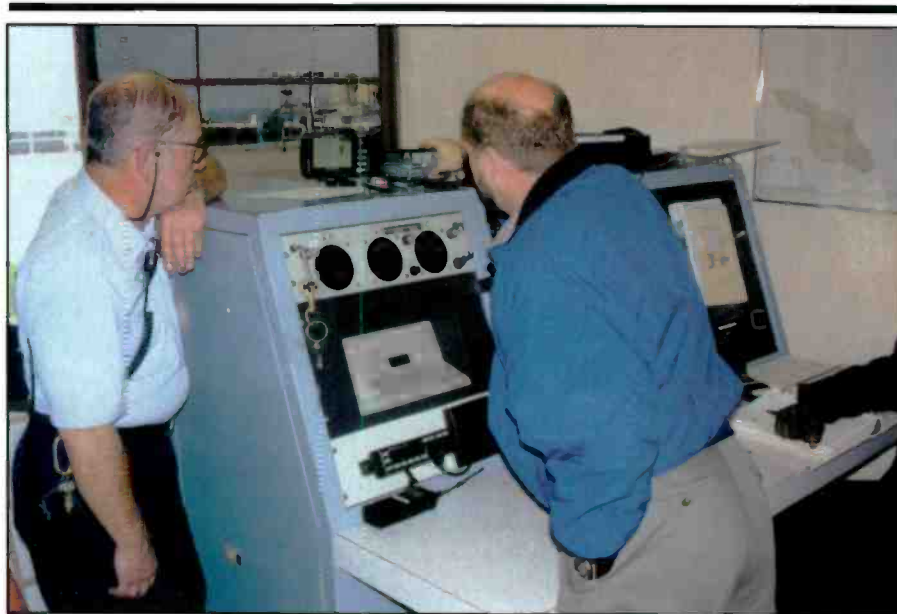
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Tow boat companies that transmit from shore must hold a valid FCC license.

when you may talk from shore to your local rescue agency.

The Licensing Process

The private coast station license process was previously conducted on a single form, FCC 503. This was a handwritten application that went to the FCC in Gettysburg, Pennsylvania. FCC agents in the marine division would give each application a wringing out, and it would usually take three or four attempts to get the application to pass muster. Now, your FCC shore station application is best filed electronically. In rare instances, some

applications have been granted in as little as 48 hours after filing!

Likely, unless you're familiar with all the intricacies of channel assignments, emission designators, carrier versus assigned frequencies, and variations of output power levels, your computer will halt you in midstream and ask for clarification, but give it a try—it's not as daunting as it may sound.

The forms that you'll need can be found on the Internet at wireless.fcc.gov. Check out and familiarize yourself with the following:

FCC form 601—Application for Wireless Telecommunications



A shore station license is even required if you transmit on shore from your test bench.

Bureau Radio Service Authorization
 FCC form 601—Schedule D,
 Instructions
 FCC form 601—Schedule D, Station
 Location and Antenna Structures
 FCC form 601—Schedule G, Technical
 Data for Maritime and Aviation
 Services
 FCC form 601—Schedule G, Technical
 Data

“You must file technical information for each fixed location, including the antenna structure and/or each hand-held/mobile transmit location, temporary fixed station location, or itinerant station. It is recommended that you finish Schedule D prior to completing Schedule G,” states the FCC, noting that electronic filing for coast station licenses will need to be letter and number perfect!

As you work through the licensing process for your marine shore station grant, your computer may flash that an error will prevent further progress until corrected. Sometimes the error is easily recognized, such as an incomplete mode designator or an incorrect power output level. Others may require real-live personal assistance from the FCC consumer branch, which you can reach at 877-

CALL FCC. When this phone number is answered in Gettysburg, you’re greeted with the predictable “For this, press 1, 2 for that, and 9 to start all over again.” Hang in there, because there’s a golden light at the end of the tunnel: an actual human being will pick up your call and assist you very pleasantly with your specific question on your application.

I’ve personally visited the FCC call center, and can attest that you’ll receive professional, interested, and friendly help with your application problem until it’s resolved. We regularly get follow-up phone calls from FCC Call Bureau supervisors to evaluate their personnel’s service and courtesy.

The FCC 10-year shore station license fee, charged to a credit card, is \$315, plus an additional credit card charge of \$60 if you also need the Restricted Radiotelephone Operator permit. Commercial licensing companies may also assist you with this process. There are also some individuals who offer low-cost help with personal licensing and who can save you a bundle on the processing fees and time.

You can also call 714-549-5000 for information. There you’ll reach my wife

Suzy and me, and we can also assist you with questions about licensing and eligibility plus turn you on to rapid coast station licensing where all of the keystrokes are done for you!

Remember, After You’re Licensed...

Monitor VHF Channel 16 at all times. Even though you may be authorized for additional shore-to-ship VHF commercial and non-commercial channels, maintain a good watch on the distress channel for the literally thousands of VHF radio operators out there on the water. Be sure to program the MMSI into all your shore station DSC equipment so you can also add the digital distress calling watch capability. If you’re working up a long-range SSB shore station, up to 1000 watts output, keep your antennas away from everyone nearby, and, again, program your MMSI into your marine SSB transceiver with DSC capability.

Remember, the more shore stations listening on the distress channels, the more safety we can provide boaters and sailors with a shore station radio watch this summer.



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Helping Others Helps You, Too

You join a REACT Team to help others, right? Right, but you will almost certainly learn a great deal that will help you as well. Perhaps the first thing you'll learn as a REACT volunteer monitor is that very few operators know how to capitalize on their radios in emergencies. Too often, you hear callers simply yell "Help!" If they're too distant to hear you asking for key details, like location and problem, the radios most of them bought with safety in mind will bring no help.

One California REACT Team reported that in a given month 94 percent of the distress calls its volunteers monitored failed to get sufficient information across to send assistance. Imagine their frustration. The REACT monitors heard each one, but the callers gave no critical details (exact location, problem, name). In that mountainous terrain, callers could not hear REACT monitors asking in vain for the needed information. The calls failed. Needlessly.

Yes, you learn fast as a REACT volunteer that in an emergency you must broadcast repeatedly *WHERE exactly* you are and *WHAT* is wrong. That knowledge alone could save your life some day. You learn that distance, terrain, and/or weather can prevent callers from hearing police or REACT monitors. Those monitors are totally dependent on the caller to air *repeatedly* essential details monitors must have in order to send help. This applies whether you're using CB, FRS, GMRS, or any other type of radio.

Precious Lessons

Another lesson REACT volunteers quickly learn is that "skip" propagation can be an ally or an enemy. You won't serve too long as a REACT monitor before you encounter "skip shooters" trying to contact distant stations. They can be hundreds of miles away and unaware that they're making it impossible for you to handle local distress calls where lives may hang in the balance.

The flip side is that skip may bring you a distress call from far away. You learn to keep a road atlas handy. If the distant caller knows his emergency radio procedure, you may have the privilege of alerting authorities to his plight. At my station in Ontario, I've been able to assist with distress calls from as far away as Illinois, Kansas, Oregon, and Texas. Skip can work for you or against you as a REACT monitor; it depends on the operators involved and their radio skills. But skip calls on CB, FRS, and other bands have certainly saved lives.

Also, all radio equipment is not created equal. That's another lesson you'll quickly learn. The same radio and antenna will perform quite differently given specific weather conditions or radio traffic at a particular time.

As your REACT Team works with local authorities, you'll learn valuable emergency preparedness tips that can benefit you and your entire family. By being well prepared in advance, you'll be in a better position to assist your community. You'll have peace of mind, knowing that your family is safe at home or in a shelter.

While your original goal as a REACT volunteer was, and remains, to put your radios to work helping others, you'll find yourself on a personal learning curve. You'll learn "on the job." You'll learn from other REACT Teammates. You'll learn with your REACT Team through exercises conducted by local authorities. You'll learn from speakers and workshops at REACT Council meetings or conferences. And all that you learn will help you become more efficient at helping those in distress. What helps you personally is a welcome bonus.



Putting Learning To Work

During the recent California wildfires, Crest Communications REACT members put all they'd learned to urgent use. Some sent their families to the safety of shelters but stayed behind themselves. They reported to authorities on fire locations, changes in direction, and fire progress via the Team's GMRS repeater system.

Crest REACT members are silhouetted by hellish fires as they radio their latest report to fire officials over the Team's GMRS repeater system. The Red Cross was also able to use the REACT GMRS system when its own radios malfunctioned. (Photo courtesy Crest REACT)



Hill Country REACTers (left) use radio to entice hams to visit their safety display. Other REACTers (right) give treats and safety info to visitors. The candy vanished quickly. Note the homebrew antenna mount, which worked very well. (Photo courtesy Hill Country REACT)

Part of the local "Fire Watch" program, REACTers were valuable on-scene "eyes and ears" for fire officials who couldn't be everywhere. The Red Cross also used the Crest GMRS repeaters for a while when their own radio system went down at the peak of the fires.

Being thoroughly familiar with their own communities, REACTers provided radio updates on the changing situation, giving comfort to neighbors who were barred from returning. They also were able to help firefighters identify homes that had been destroyed so owners could be notified promptly.

At least one REACTer lost his home. Meanwhile, another REACTer grabbed a length of PVC plastic pipe to beat out flames that had jumped a firebreak and threatened to ignite nearby homes. REACT volunteers were even able to rescue some pets whose homes had been destroyed and whose lives were at risk.

You hope your learning is never tested to this extent, but it happened in this tragedy. These REACT personnel drew effectively and efficiently on their learned skills to help protect their own homes and those of their neighbors.

What Goes Around

Sometimes REACTers can bring their knowledge from other fields to bear on community service. Hamilton County REACT (Nebraska) recently put a Team

member's skills with cell phone and laptop computer at the disposal of the Nebraska Highway Patrol during an armed robbery.

With the Team's assistance, NHP was able to monitor a store's surveillance cameras from a safe distance. The armed robber wisely decided to surrender without incident, perhaps realizing that police could track his every move thanks to some special REACT expertise.

Hamilton County REACTers were happy to return to more mundane duties, assisting the Aurora Police Department with crowd safety for a parade and later

conducting Halloween patrols to give local police more eyes and ears on the streets.

Tables Turned

Normally, Hill Country REACT (Texas) would use its radio skills to monitor for distress calls. However, when the Canyon Lake Chamber of Commerce invited the Team to participate in a community safety fair, Hill Country REACT reversed that pattern. The Team broadcast clear directions to the event on the Central Texas Traffic System Net, inviting ham operators in the area to drop by their display.

It worked. REACTers went through 10 huge bags of candy provided by the Chamber. It took visitors to the REACT display less than two hours to devour the candy supply and pick up REACT safety information. The Team even scored some potential new members. Here was another good example of how all that learning can benefit both the public and REACT volunteers.

Cash In

Put your radio skills to work on behalf of others. Join your local REACT Team. If there is none nearby, form one with a few like-minded friends. You'll enjoy learning and furthering valuable radio skills on the job with REACT.

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A Simple AC Current Sensitivity Multiplier: An Easy Weekend Project You Can Build!

There's a new "guy" kind of toy store that opened a few months ago near where I work: a Harbor Freight retail outlet. While most of the items offered are "imported," and thus perhaps more aligned with the needs of bargain hunters, I still get a rush when window-shopping the endless shelves piled high with inexpensive equipment and tools. It's fun to role-play Tim Allen, of the *Home Improvement* TV show fame, and imagine what home projects could be successfully undertaken if backed by an arsenal of manly power tools!

The Harbor Freight Cen-Tech Digital Clamp Meter

An item there recently caught my eye. Harbor Freight's Cen-Tech digital clamp meter was on sale for several dollars—a deal I could hardly resist!

In my professional life I use one of several Fluke digital meters with a companion Fluke Y8100 AC/DC current probe. The Y8100 is a very sensitive device, and it's also capable of measuring DC current. To show the differences, **Photo A** contrasts the self-contained Cen-Tech clamp-on meter to the Fluke



Photo A. The Cen-Tech clamp-on ammeter is shown in the lower portion of the photo. Above it is a Fluke clamp-on probe that will measure both AC and DC currents when used with a companion digital meter.

clamp-on probe, which requires a separate companion meter. But few hobbyists really need a clamp-type meter often enough to justify buying one. When they fail, it will cost more to replace the three lithium cells that power the meter than I paid for the meter itself. I consider it an expendable throwaway item! Note that while the package incorrectly advises that batteries are not included, I found that they were indeed packed inside when I opened the bubble packing.

What It Can Do, There Are Limitations...

Let's take a look at the Cen-Tech clamp meter to see what it can do. It has two ohmmeter ranges, with a diode check, and will read resistances up to 200K-ohms. That's not much use for radio work, since we often encounter resistor values of 1 megohm or higher. Ditto for the DC voltage range, which is 300 volts. Many transformer sets will have voltages that are well over 400 VDC. Strike two! Sigh.

The AC voltage range is 300 volts, and that's useful if we're using an un-metered Variac (variable autotransformer) and isolation transformer to set the line voltages for testing. Here's where the meter will really come in handy!

The meter has three ranges for AC current: 20, 200, and 400 amps. Note that unlike the other ranges, which use test lead probes, the AC current measurements are made by clamping the meter probe over one of the AC conductors in the circuit that's being measured. Clamp-on meters are very popular with electricians; they can simply clamp the meter probe over breaker leads on an electrical panel and measure the current draw on each of the branch circuits. Likewise, motor currents and other loads can be measured without having to cut into the circuit to insert the measuring instrument! Obviously, this is not only safer, but it saves a lot of time as well.

How It Works

The clamp-on probe is part of a transformer core, and the lead bearing the AC current becomes a single-turn primary winding when the probe is clamped over it. One section of the core is moveable, and when the jaw is opened these laminations are moved away from the rest of the core body. When the jaw is open you can see the edges of mating surfaces for those laminations. **Photo B** is a good view of the core laminations in the section of the clamp that pivots open. The secondary winding is internal to the instrument, and the related electronic circuitry computes the AC current based on the magnetic field generated by the current flowing through the wire.

Putting It To Work!

By now I'm sure most of you are wondering, "Good enough, but how is this going to help me fix old radios!" Fair question!



Photo B. Clamp-on meters measure the magnetic field generated by the conductor the probe is clamped over. The conductor acts like a single-turn primary winding in a transformer. In this photo the core laminations in the moveable portion of the clamp probe are visible.

Our March 2007 column showed a simple project for using a digital voltmeter to measure the AC current being drawn by a piece of equipment. Now I'm going to show you another very simple trick that will let you use any low-cost clamp ammeter with a low-current 20-amp range to do the same thing!

As is, these meters have three-digit resolution, and the lowest 20-amp current range only offers 10-mA resolution at best. Small current changes may not show unless they're enough to cause the meter to change to another digit. There is a fix for this limitation, however. Read on...

Our project this month is a simple AC inline adaptor that makes it easier to use the meter when measuring current draw for any plug-in AC device. Remember that the probe must only surround one current carrying lead, either the neutral or the hot; if it's over both leads the magnetic fields from each conductor will cancel each other out and you won't get a reading!

We'll be making both a single-turn loop for directly reading the AC current

and a 10-turn loop that will act as a 10-times (10X) sensitivity multiplier for the meter. The 20-amp range will become a 2-amp range with 1-mA resolution when using the 10-turn loop for sampling. Remember to mentally move the decimal point one digit to the right when reading the meter LCD display when using the 10X sensitivity adapter.

Building The Current Multiplier

Here's how I made my version of the adapter. All you'll need are a few lengths of wire, an AC plug, and an AC cord receptacle, most of which are available at your local hardware or electrical supply house. I used electricians' THHN 14 gauge insulated wire. This wire has a rugged nylon coating, which protects it against abrasion while it's being pulled through an armor jacket or conduit. Nylon cable ties or lacing cord are a good idea, as these will help keep the

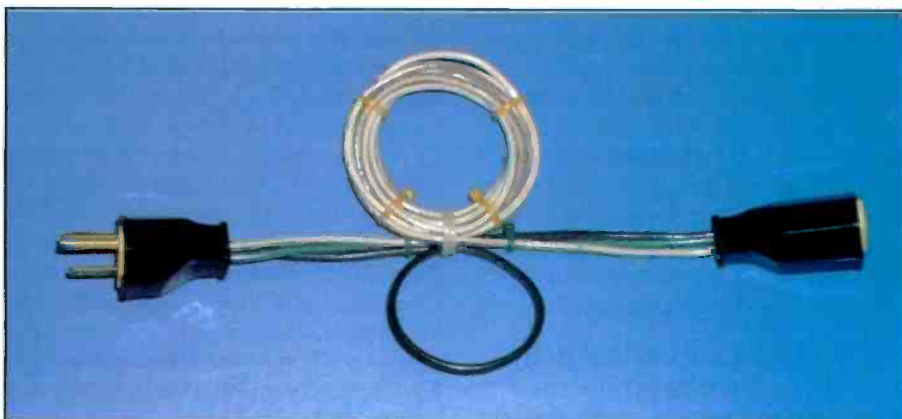


Photo C. Here's a quickly thrown together example of an easy-to-build 1X and 10X adapter for measuring the current being drawn by an AC device.

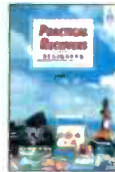
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coil bundles tight and the wiring looking neat. Of course, a good picture is literally worth a thousand words, and you can almost build the project by simply following the photos. My hastily constructed current sensitivity multiplier is shown in **Photo C**.

Notice that the coils are wound on the same axis but placed on either side of the cable bundle. One coil is a single turn and is the one for making 1X current measurements; the other coil has 10 complete outside turns and will give you a 10X sensitivity multiplication when using the clamp-on ammeter. The actual coil diameters aren't critical; the coils only need to be large enough to be comfortably accommodated in the opening of the ammeter's clamp-on jaw. Only one leg of the circuit should be clamped over at any time.

Notice that I used white, green, and black colored THNN stranded wire. The color-coding helps keep track of the AC neutral (white), AC hot (black), and safety ground (green) wiring between the AC plug and cable receptacle. For the wiring, #14 gauge will handle up to 15 amps, which is close to the current rating for the style of AC plug and cable socket used for this project. Some sharp-eyed readers might note that I used #12-gauge wire in



Photo D. The Cen-Tech meter is clamped over the 10-turn winding in this test setup. The meter is indicating the current being drawn by a small pencil soldering iron. While the meter is showing 2.86 amps, remember that this reading is actually 10 times more than the actual current being drawn. The iron is drawing 1/10th that current: 286 mA.

the unit shown in the photos, but I found that gauge it is too heavy to work with comfortably for this application.

Photo D is a shot of the meter and multiplier coil in action! In this photo I'm measuring the current draw of a small pencil soldering iron. Note that the meter is indicating 2.86 amps. Since the meter is clamped on the 10-turn coil, the actual current is 1/10th that current, or 286 mA in this instance.

Warning! If you're in a country other than the United States your AC wiring may be very different!

Either the black or white wires can be wound for the pickup coils. To be picky, the white (neutral) is the better choice, since any abrasion bad enough to expose bare wire won't subject the user to dangerous voltage potentials.

In closing, these inexpensive meters are probably not true RMS devices. Filter capacitors only charge on small portions of the AC cycle in radio sets, and the resulting distorted AC waveforms may confuse an averaging-type AC meter. So the readings taken may not be entirely accurate, but they should be close enough for our needs.

Future Columns And Projects!

If any readers have suggestions for similar projects, I'd love to hear from

you. I owe a special thanks to Michael Terrell of Florida for suggesting this month's project.

On another note, in late October the postman delivered another regenerative receiver project from Bob Ryan! This set uses two type-49 pentode tubes—and, boy, it is a very hot performer! I'll be featuring Bob's receiver sometime this summer, and I think you'll be impressed with how this one plays! I've been using it for the past few months as my daily player in the shop.

Bob enjoys exchanging ideas with fellow radio enthusiasts who share an interest in building these fascinatingly simple receivers! I've been trading letters with Bob for years, and you should join in! He doesn't have email, so please drop him a note via regular mail. His address is Bob Ryan, Apt.132, 1000 South Gilbert Street, Hemet, CA 92543-7065.

Adding more fodder for future columns, reader Norm Leal was also kind enough to mail us information on a nifty space-charge radio that he came up with for a club project in California. Norm's radio uses a 12K5 space-charge tube, and his design is very simple and runs on a 12-volt wall wart! We'll be showing you how to build your own version later this year as well.

Until next month, keep those soldering irons warm and those old tubes glowing!

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A Look At The High Frequency Beacon Society

If you live in the northern latitudes as I do, the month of March is welcomed as a time when things begin to clear up a little. By that, I mean things such as the weather, or perhaps those mountainous piles of snow on either side of your driveway. However, since March is already a “clearing up” month for many of us, it’s only fitting that we use this month’s column to clear up a few things concerning our radio activities as well.

We’ll begin this tidying-up session with a look at the High Frequency Beacon Society, because they’re the folks behind some of those mysterious beacon stations many of us have logged and wondered about the origins of.

Simply stated, the High Frequency Beacon Society is a private organization of radio experimenters whose aim is to study the propagation of shortwave beacons. To do this, the Society’s members have placed on the air a number of low-power (usually 100 mW or less) HF beacons, in various locations around the continental United States. These beacons, as we shall see, are often of the “homebrew” variety—the spirit of radio experimentation being very much alive among the Society’s members—and lately have been getting noticed more frequently by contributors to the readers’ logs that accompany this column every month.

Table 1 is a list of the High Frequency Beacon Society’s beacons that were operative as of this writing. However, the Society reports that new beacons are being constructed and put on the air often, and since they are experimenters, beacons may go on and off the air at any time. Therefore, it’s recommended that you check the Society’s website for the most up-to-date information before you start listening for a beacon that may no longer be on the air—or neglect to listen for one that is! I’ve included

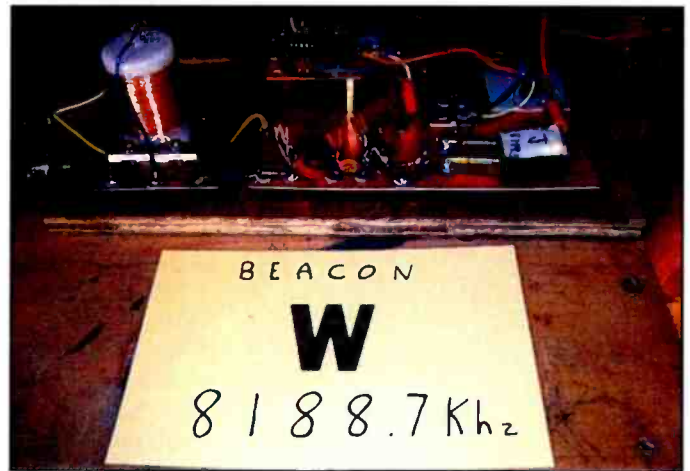


Photo A. The “W” beacon transmitter; see article text. (Courtesy of High Frequency Beacon Society)

the URL for the website in the table; once there just click the “Beacons” button to see the current list of listening targets the Society’s experimentation is providing.

In addition to facilitating the study of propagation, these beacons provide listeners with a bit of a challenge, since these are very low-powered transmitters. As the Society notes on its website, “copying weak signals requires many unique skills and we salute the listeners who dig out these beacons.” They’re not just paying lip service to the skills needed to dig these weak signals out of the mud, either. Send your listening reports and sound files to hiferbeacon@yahoo.com and it’s possible you’ll receive QSL cards from beacon operators!

Photo A shows another reason why these beacons are interesting, namely, the “homebrewing” aspect of constructing these stations. The beacon transmitter in the photo is an example of what’s known as “Manhattan”-style construction. The transmitter shown is the actual transmitter for the Society’s “W” beacon, which operates 24/7 on 8188.7 kHz from an undisclosed (for security reasons) location in Colorado, using a simple dipole antenna and a small battery charged during the daytime by a solar panel. This is a throwback to the early days of radio, when there were no such things as RadioShack, MFJ, etc., and if you wanted to put a radio transmitter on the air, you had to “roll your own.” It’s great how the use of solid-state technology and the incorporation of the solar panel elegantly marries old and new construction designs and techniques.

Like many of the Society’s beacons, the “W” beacon simply sends one or more letters in Morse code using the CW mode; in this case, it’s the letter W, but others send S, OK, OR, MO, or PA. You may also hear a “dasher” type that sends a Morse dash character” or a “ditter” type that sends a series of Morse dits with a dash at the end.

You’re cautioned, however, to check the Society’s website for the correct location of any of their beacons that you may hear, because the letters sent do not necessarily tell you the beacon’s location. If I had my druthers, that’s the only thing I’d change about the entire operation, because previous to becoming aware

Table 1. High Frequency Beacon Society Beacon Information

(as of December, 2007)

FREQUENCY	IDENTIFIER	LOCATION
3450.0	OK	Oklahoma
4077.0	MO	Oklahoma
4094.0	PA	Arkansas
4111.7	Dasher	Florida
5499.2	Dasher	Washington State
8000.3	S	Arizona
8188.7	W	Colorado
10237.8	Dasher	Florida
10245.2	Dasher	Colorado
—	OR	Oregon*

* off the air at press time.

For more information, visit <http://highfrequencybeacon.society.bravehost.com/index.html>.



Photo B. The transmitter for an often-heard “dasher” beacon located in Colorado; see article text. (Courtesy of High Frequency Beacon Society)

of the Society’s website, I’d assumed that the PA beacon was in Pennsylvania and the MO beacon in Missouri, but they’re not.

Fortunately, I happened to mention this in the #monitor IRC channel one night when several of us were hearing a couple of these beacons. One of my fellow utility enthusiasts there promptly pointed me to the Society’s website, and to the listing that has “morphed” into Table 1. Score another one for hanging out in #monitor, a habit I apparently inherited from R.D. Baker when he had this column several years ago, and without which I, and perhaps you, might still be in the dark as to the relative whereabouts of these beacon stations.

If you’re going to hunt for them, you should keep in mind that loggings of the various beacons have reported them somewhat above and below the frequencies appearing in the Table, so check a few kHz up or down if you don’t hear them right away. And, of course, these are low-power beacons and their reception is subject to propagation, so if at first you don’t succeed, keep trying at different times until you do.

Photo B shows a somewhat different design, which happens to be the one used for the “dasher” beacon. This particular beacon is located in Colorado and operates 24/7, sending 120 dashes per minute on a frequency of 10245.2 kHz. It, too, uses solar power and a dipole antenna, but as you can see from the photo, its design

is more of a “breadboard” affair, constructed on a piece of perfboard and set inside a project box using some panel-mounted parts. Note, however, the homebrew coil, a characteristic shared with the W beacon shown in Photo A; these folks wind their own coils as part of building beacon transmitters—they are definitely not the “appliance operator” types!

In any event, you now know something about the beacon stations that show up rather often in the readers’ logs, and hopefully, armed with the knowledge of their general location, you can use these as a tool for learning about propagation on the HF frequencies.

My thanks to the High Frequency Beacon Society for permission to use the photos of the transmitters that accompany this article. Do visit their website, which has a map as well as some helpful details on constructing your own beacon station should you be interested (in which case, the Society notes, “We would love to have you join us”).

When Is An NMN Not An NMN?

Don’t worry, I won’t keep you in suspense: the answer to the question posed above is, “When it’s really an NMG.”

So, now you’re out of suspense, and perhaps deep in confusion, especially if you’re unfamiliar with the stations associated with those two callsigns. Since we’re supposed to be clearing things up this month, rather than dragging you from the frying pan to the fire by creating more confusion, let’s straighten this out right away.

NMN is the callsign of the United States Coast Guard’s HF communications facility in Portsmouth, Virginia, also known variously as “CAMSLANT,” “CAMSLANT Chesapeake,” or its official and unabbreviated name, “United

States Coast Guard Communications Area Master Station Atlantic.” This station has a staff of about 100 and also provides technical assistance and training to other Coast Guard units.

NMG is the callsign of the Coast Guard radio station in New Orleans, Louisiana, once a manned COMMSTA (Communications Station), but now operated via remote control from CAMSLANT. In fact, while all of the USCG’s COMMSTAs used to be manned, almost all of them are now remotely operated, either from CAMSLANT or its sister CAMSPAC (callsign NMC) station at Pt. Reyes, California. NMG was the last to be taken over by CAMSLANT, in 1998. The only exceptions I’m aware of are NOJ (COMMSTA Kodiak, in Alaska) and COMMSTA San Juan (NMR, in San Juan, Puerto Rico).

Because NMG, along with NMA in Miami and NMF in Boston, are remotely operated from CAMSLANT, their regularly scheduled HF voice transmissions of maritime weather information are identified by the callsign NMN. However, a peek at the schedules of these transmissions on a Coast Guard website and on the National Weather Service’s weather.gov website reveals that it’s possible to determine the actual transmitter in use, and I’ve noticed that on certain frequencies the identification given on the air is NMN, even though the transmitter actually in use is NMG.

For example, the HF voice broadcasts of maritime weather information, occurring several times daily on 4316.0, 8502.0, and 12788.0 originate from NMG (New Orleans), even though they’re identified on the air as NMN. Other HF voice and digital transmissions originate from other stations’ transmitters, such as NMF, NMA, NRV, NMG, or NMO, even though they may be identified as NMN or NMC (CAMSPAC).

Table 2. USCG HF Communications Station Callsign Information

CALL	LOCATION	COMMENTS
NMA	Miami	Remotes to CAMSLANT
NMC	Pt. Reyes	CAMSPAC
NMF	Boston	Remotes to CAMSLANT
NMG	New Orleans	Remotes to CAMSLANT
NMN	Portsmouth, VA	CAMSLANT
NMO	Honolulu	Remotes to CAMSPAC
NMR	San Juan	COMMSTA San Juan
NOJ	Kodiak, AK	COMMSTA Kodiak
NPN	Guam	Formerly COMMSTA Guam
NRV	Guam	now remotes to CAMSPAC

Two websites you can use to help determine which transmitter you're actually hearing can be found at the following URLs:

www.navcen.uscg.gov/marcomms/cgcomms/call.htm

www.weather.gov/om/marine/hfvoice.htm

The first is for a page on the U.S. Coast Guard Navigation Center website that provides information on the Coast Guard's HF distress and safety watchkeeping schedule. The second is for a page on the National Weather Service website that has information on USCG HF voice weather broadcasts.

Even though CAMSLANT remotely operates NMA, NMF, and NMG while CAMSPAC operates NMO and NRV, for our purposes we're concerned with the location of the transmitter, and not necessarily that of the operator. This is because the signal we hear is radiated from the transmitter, and not from wherever the operator happens to be while he or she is operating that transmitter under remote control. So if the transmission you're hearing is a scheduled maritime weather HF voice broadcast on 4316.0 kHz, you're hearing NMG's transmitter. The voice will identify it as NMN, but it really isn't, and it should properly be logged as NMG since that's where the signal is radiated into the atmosphere.

With the information available from the webpages at the two URLs given above, you're better equipped to determine which transmitter you're actually hearing when listening to these signals. I hope that this clears that up for you. I frequently see transmissions from these stations misidentified in loggings, particularly those from NMG, so beware: these transmissions are the only time you can be certain you're hearing the transmitter at NMG (even though the Coast Guard misleads you by identifying it as NMN).

To further aid in correct identification and logging of these stations, **Table 2** has a list of the callsigns and locations of these stations and, for those that are remotely controlled from elsewhere, the station they are controlled from.

Our Readers Log In

We have a large batch of logs from our readers again this month, as well as the tables accompanying this column, so I'll give my poor harried editor a break on shoe-horning everything into the available space and get right to the logs. As usual, our thanks go out to those who submitted the logs for this month: 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 (SS/TX); and John Kasupski, Tonawanda, NY (JK/NY).

2182.0: Unid. SITOR station idling for over 4 hours on long-standing Distress and Safety frequency used for emergency voice contacts, in SITOR-B at 0202Z and much later. (SJ/KY)

2598.0: St. Anthony Coast Guard, St. Anthony, Newfoundland, finishing a broadcast with "St. Anthony's Coast Guard out" in USB at 0644Z. (GV/CO)

2618.5: GYA, RN Fleet Weather and Oceanographic Centre, Northwood, England w/"RISK OF ICE ACCRETION AND ICE EDGE" chart for N Europe, N Atlantic and Arctic region, in FAX at 0049Z. (SJ/KY)

2749.0: VCS, Canadian CG, Halifax, Nova Scotia w/Notice to Shipping bulletins, alternating live male and female voices re malfunctioning light buoy updates and warning of large area of seaweed adrift, in USB at 0249 to s/off w/ID at 0253Z. (SJ/KY)

2872.0: Gander Radio wkg Condor 163 in USB at 0513Z; Gander wkg EL AL 103 for amended clearance, FL360, in USB at 0705Z; Gander wkg "Speedbird 204" for position report, in USB at 0709Z;

Gander with SELCAL check CRBE in USB at 0704Z; New York Radio with SELCAL check HPAK in USB at 0703Z. (ALS)

2887.0: New York Radio wkg Martinair 607 for altitude change to FL350, in USB at 0524Z; New York wkg Air Mexico 001 for position report in USB at 0530Z and again at 0620Z; New York wkg Air Canada 090 for position report in USB at 0539Z; New York wkg Air Europa 064 for position report in USB at 0543Z. (ALS)

2899.0: Gander Radio wkg Air Canada 58 in USB at 0723Z; Gander working REACH 962 for SELCAL check in USB at 0728Z; Gander working US Air 750 in USB at 0559Z. (ALS)

2962.0: Santa Maria Radio wkg var airliners in USB heard at 0551Z. (ALS)

2971.0: Gander Radio wkg Jordanian 262 for POSREP, flight is KJFK-OKAI (Queen Alia IAP), 1373 miles down, 4358 miles to go, FL370, in USB at 0650Z; Gander wkg REACH 5004 for POSREP and SELCAL check in USB at 0651Z. (ALS)

3016.0: New York Radio wkg REACH 167 for routing, hands off to 5598, SELCAL checks, in USB at 0726Z; Santa Maria Radio wkg var airliners for routing, SELCAL checks, in USB at 0745Z. (ALS)

3167.0: OZU clg 3YH (USN vessels) in USB with no joy heard at 0234Z. (MC/SC)

3308.0: Link-11 data transmission at 1043Z. (MC/SC)

3413.0: San Francisco Radio wkg various A/C in USB heard at 0630Z. (GV/CO)

3452.0: San Francisco Oceanic wkg American 286 (B-757, PHLI-KLAX) for SELCAL check in USB at 0918Z; San Francisco wkg REACH 755 for position report in USB at 0949Z. (ALS)

3455.0: New York Radio working flight and handoff to VHF in USB at 0639Z. (GV/CO)

3455.0: New York Radio wkg KLM 744 and for routing in USB at 0718Z; New York wkg REACH 726 for POSREP of 38N, 70W (over Atlantic, east of Delaware) in USB at 0842Z; New York wkg Delta 153 for change to higher altitude in USB at 0927Z; New York wkg Jet Blue 708, at FL320, estimates position CHAMP at 1004, in USB monitored at 0931Z. (ALS)

3476.0: Gander Radio wkg Delta 102 for POSREP of 51N, 40W, in USB at 0505Z; Gander wkg BVR 202 (Bavarian 202, ACM Air Charter, Germany) for position report in USB at 0507Z. (ALS)

3926.0: Unid. M8A numbers station, 5-letter groups, in CW at 0430Z. (JK/NY)

4036.0: Unid. Spanish numbers station in USB at 0440Z. (SS/TX)

4058.0: Link-11 data transmission, fast rate, at 1044Z. (MC/SC)

4077.0: Beacon MO (Oklahoma) in CW at 0611Z. (GV/CO)

4089.2: "Dasher" beacon in CW at 0421Z. (GV/CO)

4094.0: Beacon PA in CW at 0418Z. (GV/CO)

4094.4: Unid. beacon w/slow transmission of "PA" once every 5 seconds, in CW at 0353Z. (SJ/KY)

4096.6: "Dasher" beacon in CW at 0405Z. (GV/CO)

4101.0: Unid. vessel using speech inversion voice scrambling, in DSB at 0044Z. (SJ/KY) (*Presumably USN; this is a known US Navy tactical freq.—jk*)

4102.3: Beacon W, wind speed dasher beacon, weak but readable under co-channel from speech inverted signal, in CW at 0433Z. (GV/CO)

4113.0: Unid. speech inversion w/stong levels in USB monitored at 0447Z. (GV/CO)

4146.0: Unid. males in casual simplex QSO in English, heavy Jamaican accents, in USB at 0218Z. (SJ/KY)

4177.0: Unid. vessel w/very weak extended t/c to equally weak coast station or another vessel on paired freq 4215.0 kHz, only copy was "diesel" and "agua," but no coast stations in Spanish or Portuguese-speaking countries are listed for this pair of frequencies, in SITOR-A at 0430Z; Another unid. vessel w/date and SELCAL VYXS (0719) for unlisted Brazil coast station, in SITOR-A at 0708Z; XCTO, TOLTECA, 44,690-ton Mexico-registered PEMEX oil products tanker w/callsign and crew roster info very similar to previous copy on 8, 12 and 16 MHz SITOR-A frequencies, in QSO w/unlisted PEMEX coast or ship stations, in SITOR-A at 0229Z. (SJ/KY)

4181.5: Unid. vessel w/SELCAL MKCV (4360) for TAH, Istanbul R., Turkey, no contact, in SITOR-A at 0334Z. (SJ/KY)

4149.0: Tug PILOT WBN3011, position report to WPE JACKSONVILLE, in USB at 0618Z. (MC/SC)

4149.0: WBN6510 (tug *SENTINEL*) checking in with WPE Jacksonville (Crowley Marine), files formatted report, in USB at 0607Z. (JK/NY)

4213.5: NOJ, USCG, Kodiak, Alaska w/idle frequency marker in CW+SITOR-A at 0400Z. (SJ/KY)

4215.0: XSG, Shanghai R., China w/very weak idle frequency marker in CW+SITOR-A at 1256Z. (SJ/KY)

4218.5: XSG, Shanghai R., China w/very weak idle frequency marker, station not listed for this frequency, in CW+SITOR-A at 1102Z. LZW, Varna R., Bulgaria w/very weak idle frequency marker "DE LZW LZW," in CW+SITOR-A at 0445Z. (SJ/KY)

4316.0: NMN Coast Guard from Chesapeake, VA w/automated maritime WX in USB at 0330Z and again at 0515Z. (SS/TX) (Actually originates from NMG in New Orleans. see column text.—jk)

4369.0: WLO, Mobile, AL, synth YL w/maritime WX BC in USB at 0519Z. (JK/NY)

4721.0: OFF (Offutt HF-GCS) clg R23444 (UH-60A, 1-137 AVN, OH ARNG) in USB ALE at 0044Z. (MC/SC)

4772.0: Link-11 data transmission at 1303Z. (MC/SC)

4865.0: Link-11 data transmission at 0400Z. (MC/SC)

5071.0: Link-11 data transmission at 0400Z. (MC/SC)

5158.0: KBNNO (NNNOKBN, SC Navy MARS) sounding in USB ALE at 1337Z. (MC/SC)

5208.0: Unid. stations using speech inversion voice scrambling, possibly duplexed w/5248.0 kHz, in DSB at 0042Z. (SJ/KY)

5210.0: Unid. males in casual simplex QSO in Spanish, mentioned "Palestinos" and "Annapolis," during the peace conference there, in USB at 0302Z. (SJ/KY)

5248.0: Unid. stations using speech inversion voice scrambling, possibly duplexed w/5208.0 kHz, in DSB at 0042Z. (SJ/KY)

5505.0: Shanwick VOLMET with recorded weather forecasts, in USB at 0647Z. (ALS)

5547.0: San Francisco Oceanic wkg N578FE (Federal Express MD-11F #48458) for position report and SELCAL Check FRCS in USB at 0618Z; San Francisco wkg American 2AB who asks if San Francisco has capability to transmit in AM mode, San Francisco responds "negative," end of comms, in USB at 0856Z; San Francisco wkg Northwest 806 for routing change in USB at

0859Z; San Francisco shifts American 286 (B-757, PHLI-KLAX) to 3452.0 kHz, in USB heard at 0916Z. (ALS)

5598.0: Gander Radio wkg various airliners in USB at 0824Z; New York Radio wkg var acct for POSREPs and SELCAL checks in USB at 0805Z; NY wkg "___6401" (partial callsign) for POSREP in USB at 0658Z. (ALS)

5696.0: CG 2131 (HU-25, CGAS Corpus Christi) wkg CAMSLANT during SAR for vessel *FAIR PLAY* in Houston/Galveston area, in USB at 0227Z. (MC/SC)

5730.1: XNet Yachting Association email service w/idle frequency marker, station also heard previously on 8035.1, 8080.1, 9115.1, 10385.1 and 13977.1 kHz, in CW+PACTOR-3 at 0241Z. (SJ/KY)

5732.0: CG 1502 (HC-130) departing Andros en route Clearwater, requests guard from CAMSLANT, in USB at 2117Z; CBE (USCGC *TAHOMA* WMEC 908) clg J32 (HH-60J, CGAS Cape Cod) in USB ALE at 1114Z. (MC/SC)

5851.5: R26078 (UH-60A) clg T1Z137 (1-137 AVN, OH ARNG) in USB ALE at 2355Z. (MC/SC)

6131.0: Link-11 data transmission at 1302Z. (MC/SC)

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."

- 6235.0:** Link-11 data transmission at 1522Z. (MC/SC)
- 6265.5:** SVOL. *NAUTILUS*, 43,538-ton Greece-registered chemical/oil products tanker w/MMSI and abbreviated ID "NAUT," in SITOR-A at 1138Z: 3FVX9. *NIPPON HIGHWAY*, 16,827-ton Panama-registered vehicles carrier w/AMVER/FR for arrival at Veracruz, Mexico, in SITOR-A at 1222Z: S6DY. *LACANDON* (former *OPAL STAR*), 12,716-ton Singapore-registered chemical/oil products tanker w/AMVER/SP for departure from Houston, TX, en route to Coatzacoalcos on Mexico's southern Gulf coast, included MMSI and abbreviated ID "OSTR," in SITOR-A at 2338Z, repeated full report 5 minutes later. (SJ/KY)
- 6266.0:** H8XD. *ANDROMEDA LEADER*, 21,443-ton Panama-registered vehicles carrier w/MMSI, abbreviated ID "ANLE" and brief THX msg to coast station operator at NOJ, USCG. Kodiak, Alaska, on paired freq 6317.5 kHz, in SITOR-A at 0225Z. (SJ/KY)
- 6316.0:** XSQ, Guangzhou R., China w/very weak idle frequency marker, in CW+SITOR-A at 1107Z. (SJ/KY)
- 6317.5:** NOJ, USCG, Kodiak, Alaska, w/very weak idle frequency marker, in CW+SITOR-A at 0323Z. (SJ/KY)
- 6322.5:** UDK2, Murmansk R., Russia w/very weak idle frequency marker "DE UDK2," in CW+SITOR-A at 1151Z. (SJ/KY)
- 6501.0:** NMN (USCG, Portsmouth, VA) with maritime WX BC in USB at 2144Z. (JK/NY)
- 6586.0:** New York Radio wkg Air Canada 090 for POSREP in USB at 0607Z; NY wkg Continental 336 for SELCAL check in USB at 0610Z; NY wkg Cubana 470 at FL350, handed off to VHF freq, in USB at 0613Z; NY wkg United 874 for POSREP in USB at 0836Z. (ALS)
- 6586.0:** New York Radio wkg Delta 120 for POSREP, hands off to VHF freq, in USB at 1125Z; NY wkg Jet Blue 780 for POSREP, estimates nav fix BURTT at 1157Z, in USB at 1145Z; NY wkg United 860 for SELCAL check AGBS in USB at 0850Z. (ALS)
- 6586.0:** New York Radio clears American 956 to climb to FL350, in USB at 0900Z; NY wkg Jet Blue 732 for position report, current position BURTT, in USB at 1223Z; NY announces she is changing freqs; now Primary 5520, Secondary 3455, in USB at 0825Z. (ALS)
- 6604.0:** New York VOLMET, recorded WX forecasts in USB at 0753Z; hrd another night at 0929Z; Gander VOLMET, WX reports in USB at 0929Z, hrd another night at 0801Z. (ALS)
- 6628.0:** Santa Maria Radio wkg Speedbird 234, at FL370, POSREP 17N, 37W, also SELCAL check, in USB at 0756Z; Santa Maria wkg Delta 35 for POSREP and SELCAL check RSBL in USB at 0754Z; Santa Maria wkg REACH 388 for POSREP in USB at 0757Z. (ALS)
- 6628.0:** New York Radio wkg Speedbird 207 for POSREP and SELCAL check MSGP in USB at 0807Z; NY wkg Red Comet 970 for routing in USB at 0815Z; NY wkg North American 976 for POSREP 33N, 50W in USB at 0908Z; NY wkg Delta 35 for POSREP 30N, 60W in USB at 0917Z; NY wkg Delta 35 for POSREP in USB at 0759Z. (ALS)
- 6737.5:** Unid. 2 OM/SS in QSO in USB at 0845Z. (ALS)
- 6746.4:** STATION 1 (USN SPAWAR, Charleston) sounding in USB ALE at 1436Z. (MC/SC)
- 6754.0:** Trenton Military VOLMET with recorded WX reports for various Canadian aero facilities, in USB at 0639Z; also hrd another night at 0725Z and another at 0835Z. (ALS)
- 6760.0:** Link-11 data transmission at 1212Z. (MC/SC)
- 6903.0:** Unid. possible radiotelephone circuit, male & female in Spanish, "compañero" and "on hold" music, in USB at 0229Z. (SJ/KY)
- 6947.0:** Link-11 data transmission at 1212Z. (MC/SC)
- 7635.0:** HEAD CAP 40, net control in CAP net, in USB heard at 1508Z. (MC/SC)
- 7642.0:** EBCNNN (NNN0EBC, WV Navy MARS) sounding in USB ALE at 1654Z. (MC/SC)
- 8000.1:** Beacon S (Arizona), carrier shift down with each dot, in CW at 2213Z. (GV/CO)
- 8045.1:** XNet Yachting Association email service w/idle frequency marker in CW+PACTOR-3 at 2054Z. (SJ/KY)
- 8183.5:** KKL, MarineNet, Republic R., WA w/idle frequency marker, occasional ID "CQ CQ CQ DE KKL," same station heard previously on 4016.5 and 13174.5 kHz, in CW+PACTOR-3 heard at 0005Z. (SJ/KY)
- 8297.0:** Unid. group in QSO in an Asian language with one (apparently net coordinator) using NATO alphabet, in USB at 0431Z. (GV/CO)
- 8379.0:** VX9IYE, at Marine Institute of the Memorial Univ. of Newfoundland, St. John's, Newfoundland, Canada w/test msg, in SITOR-A at 1210Z; unid. vessel w/SELCAL KYVX (3701) for UAT, Moscow R., Russia, not listed for this frequency, in SITOR-A at 2129Z; WDD9455, *BARTHEL TIDE*, brand-new 1,313-ton U.S.-registered offshore supply ship w/extended Telex to WLO, Shipcom R., Mobile, AL, on paired freq 8419.0 kHz, included MMSI and abbreviated ID "BART," in SITOR-A at 0015Z; HBFF, *ST-CERGUE*, 39,384-ton Switzerland-registered container ship w/AMVER/PR, 150 miles west of Costa Rica's Pacific coast, en route to Shanghai, China, in SITOR-A at 0552Z: P3GK9. *UBC SINGAPORE*, 31,759-ton Cyprus-registered crude oil tanker w/AMVER/FR for arrival at Puerto Jose Terminal, Venezuela, included MMSI and abbreviated ID "SING," in SITOR-A at 0415Z. (SJ/KY)
- 8381.0:** LAFY5, *SYRENA*, 48,135-ton Norway-registered general cargo ship requesting radio check from WLO, Shipcom R., Mobile, AL w/out using standard command format, in SITOR-A heard at 2237Z. (SJ/KY)
- 8383.5:** 3FPK8, *JUPITER GLORY*, 298,816-ton Panama-registered very large crude carrier w/AMVER/PR and MMSI, 560 miles ENE of Nassau, Bahamas sailing on course 260 at 14.6 knots, in SITOR-A at 1609Z: 3EKQ5, *ORANGE TRIDENT*, 78,000-ton new-built Panama-registered bulk carrier w/MMSI, abbreviated ID "ORTD," TEST and HELP commands, in SITOR-A at 0436Z. (SJ/KY)
- 8385.5:** BOOB, *BAO SHAN HAI*, 64,909-ton China-registered bulk carrier w/HLP+ and TST+ commands, MMSI and abbreviated ID "BSHA" to XSG, Shanghai R., China on paired freq 8425.5 kHz, fair signal but unfortunate callsign, in SITOR-A at 1135Z. (SJ/KY)
- 8386.0:** H8FE, *VANCOUVER BRIDGE*, 65,002-ton Panama-registered container ship w/MMSI and abbreviated ID "VABR," in SITOR-A at 2152Z. (SJ/KY)
- 8387.5:** Unid. vessel w/SELCAL MCPV (4650) for A9M, Hamala R., Bahrain, strong signal here but no contact, in SITOR-A heard at 0505Z. (SJ/KY)
- 8412.0:** IDR, Italian Navy, Rome w/idle frequency marker: "/IDR2 /IGJ42 /IGJ43 /IDR4 /IDR3 /IGJ44 /CANALE OCCUPATO DA TUTENTE NON IDENTIFICATO EC ZUJ LISTE CHIAVI." in 75 baud, 850 Hz ITA2 RTTY at 0747 to past 0817Z. (SJ/KY)
- 8417.5:** XSV, Tianjin R., China, w/very weak idle frequency marker, in CW+SITOR-A at 2231Z, again several days later w/fair signal, in CW+SITOR-A at 2246Z. (SJ/KY)
- 8425.5:** XSG, Shanghai R., China w/fair idle frequency marker, in CW+SITOR-A at 2235Z. (SJ/KY)
- 8431.0:** XSQ, Guangzhou R., China w/weak idle frequency marker, mixing about evenly w/usual occupant TAH, Istanbul R., Turkey, in CW+SITOR-A at 2238Z. (SJ/KY)
- 8433.0:** XSG, Shanghai R., China w/weak idle frequency marker, in CW+SITOR-A at 2226Z. (SJ/KY)
- 8477.0:** Suspected FUF, FORT DE FRANCE NAVAL MARTINIQUE with open input feed, broken digital carrier randomly shifting 850 Hz and off-on heard at 0419Z. (GV/CO)
- 8602.0:** CWA, Cerrito R., Uruguay w/wx forecast in Spanish in fast machine-sent CW at 0052Z. (SJ/KY)
- 8764.0:** NMN (USCG, Portsmouth, VA) with maritime WX BC in USB monitored at 1727Z. (JK/NY)
- 8788.0:** WLO Radio w/automated maritime WX in USB heard at 0615Z. (SS/TX)
- 8906.0:** New York Radio wkg var acct in USB at 0943Z. (ALS)
- 8983.0:** CG 2112 (HU-25C+, CGAS Miami) passing "ops normal" report to CAMSLANT in USB at 1504Z. (JK/NY)
- 8983.0:** US Coast Guard CAMSLANT Chesapeake wkg CG 2129 (Falcon Jet HU-25C+, CGAS Cape Cod) for POSREP of 40-40N, 66-48W in USB at 1413Z; CAMSLANT wkg CG 6563 (HH-65C helo, CGAS Miami) for POSREP in USB at 1414Z; CAMSLANT wkg B5J who reports departing homebase with 04 SOB, CAMSLANT assumes radio guard, in USB at 1415Z. (ALS)
- 8983.0:** CAMSLANT wkg CG 6563 for POSREP of 22-45.6N, 75-11.5W in USB at 1428Z; CAMSLANT wkg CG 2120 (HU-25A, ATC Mobile), CG 2120 is departing homebase Mobile and heading eastward to Pensacola for training, in USB monitored at 1500Z. (ALS)
- 8983.0:** CG 2129 (HU-25, CGAS Cape Cod) requests CAMSLANT pass to cutter *DEPENDABLE* they are on scene for LE search mission, in USB at 1532Z. (MC/SC)

8992.0: LAJES HF-GCS wkg BK201 (P-3, poss EP-3E). for radio check, in USB at 1241Z. (ALS)

9007.0: CHR. Trenton Military, Canadian Forces. Ontario handling phone patch for CANFOR 325, aircraft not heard, in USB at 2216Z. (SJ/KY)

9040.0: Unid. V2A. YL/SS with "attention" and five-number groups, in AM at 0902Z. (JK/NY)

10006.0: Unid. stations in simplex QSO in English, out of band fishermen w/Virginia or North Carolina coast accents, casual discussion of hospital care and roof repair, some profanity but much less than their New England counterparts, in USB at 0507Z. (SJ/KY)

10051.0: Gander VOLMET with recorded weather reports, in USB at 0800Z. (ALS)

11175.0: TUFF 10 (B-52H, 2 BW) p/p via McClellan HF-GCS to Barksdale AFB to check on activity at Snyder Range, in USB at 1425Z. (MC/SC)

11175.0: HF-GCS station PUERTO RICO wkg DECEE 92 for phone patch to commercial number for Virgin Islands Flight Center, informs inbound, in USB at 1901Z; PUERTO RICO wkg PELICAN 713 (P-3C, Jacksonville, FL NAS) for p/p to FIDDLE OPS to pass "ops normal" message, in USB at 2227Z; PUERTO RICO wkg SAM 808 for radio check, in USB at 1907Z; PUERTO RICO wkg REACH 880 for radio check, in USB at 2203Z. (ALS)

11175.0: HF-GCS station PUERTO RICO wkg REACH 6007 (MN-ANG C-130H 96-1007) for phone patch to DSN number for Scott AFB Metro, rqsts WX update for CYYT (St Johns, Newfoundland) at 2100Z and CYQX (Gander) at 2100Z, in USB at 1923Z; PUERTO RICO wkg GOLD 32 (Coronet mission tanker) for p/p to DSN number for McGuire AFB metro, passes PiRep re WX near St Johns, Newfoundland; is 150 miles from St Johns; rqsts WX for Lajes and Moron AB; tells metro "See you when we get back next week," in USB at 1144Z. (ALS)

11175.0: HF-GCS Station PUERTO RICO wkg REACH 6413 for p/p to DSN number for Maxwell AFB TOIL OPS, reports en route to Travis AFB, rqsts that maintenance ship a part to Travis Crew Billeting, in USB at 1920Z; PUERTO RICO with test count in USB at 0704Z. (ALS)

11175.0: HF-GCS Station OFFUTT wkg "Little Rock Maintenance" for multiple radio checks in USB at 1908Z; OFFUTT wkg LL45 (P-3C, Jacksonville NAS VP-30) in USB at 2017Z; OFFUTT wkg LL11 (another JAX NAS P-3C) for p/p to DSN number for NAS Whidbey duty office, advises ETA of 1445 local time, in USB at 1953Z. (ALS)

11175.0: HF-GCS Station OFFUTT wkg RAIDER 09 (KC-130, MCAS Miramar VMGR-352) for p/p to DSN number of Miramar MCAS RAIDER Base Ops, ETA North Island in 3 hours, in USB at 2035Z; OFFUTT wkg REACH 9946 (Travis AFB KC-10A #79-1946) for radio check in USB at 2030Z. (ALS)

11175.0: HF-GCS Station OFFUTT wkg CORSO 01 (C-130, PR-ANG, San Juan) for p/p to two commercial numbers in Puerto Rico, no answer either number, in USB at

2030Z; OFFUTT wkg SPAR 120 (no typo, 3-digit SPAR callsign!) for radio check in USB at 2020Z. (ALS)

11175.0: OFFUTT wkg LK09 with Duty Office, rqsts local WX, is told that acft 771 is available as backup for LK 09 so will park next to LK 09, in USB at 2230Z; HF-GCS Station SIGONELLA wkg SHELL 90 (USAF tanker on Middle East tasking) for phone patch to DSN number for Tanker Ops in Middle East area, Ops says they have been trying to reach SHELL 90 by Satcom then tells them to fuel up and return home, in USB at 0830Z. (ALS)

11175.0: HF-GCS Station LAJES wkg BIRD 50 for radio check, station PUERTO RICO also responds "Lima Charlie" to radio check rqst, in USB at 2002Z; LAJES wkg S4JG (US Navy anonymity callsign) for radio check in USB at 1202Z; LAJES wkg REACH 9005 C-5A 69-0005 (Wright-Patterson AFB) for radio check, in USB at 1745Z. (ALS)

11175.0: HF-GCS Station LAJES wkg BK201 (P-3, poss EP-3E) for radio checks, BK 201 finds Lajes barely readable, in USB at 1232Z; LAJES wkg CW620 (USNR C-130T from New Orleans VR-54) for p/p to DSN number for New Orleans NAS JRB VR-54 Ops, reports departure two hours ago en route to Rota, Spain, in USB at 1904Z. (ALS)

11175.0: HF-GCS Station LAJES wkg SHUCK 85 (AWACS E-3 #76-1606, en route from Mildenhall, UK) for p/p to obtain WX at CYQX (Gander, Newfoundland) for 1230Z, CYYR (Goose Bay, Newfoundland) at 1330Z, and at KBGR, in USB at 0916Z. (ALS)

11175.0: ASCENSION wkg KING 31 (C-130, Moody AFB) for p/p to DSN number for Scott AFB Base Ops/Dispatch, requests to know parking spot so can plan for runway approach, will park on south ramp, ETA 0306Z, in USB at 2145Z; Station "McClellan" wkg SHADOW 01 for p/p to Little Rock Metro, gets WX for Little Rock at 2220Z, in USB at 2050Z. (ALS)

11175.0: TIGER 01 (P-3C, Modex 006, Brunswick NAS) via HF-GCS for p/p to Brunswick NAS Duty Officer, passes ETA to Brunswick of 2200 local time, in USB at 2159Z; REACH 9502 (KC-135R #59-1502, Grand Forks 319ARW) via HF-GCS for phone patch to DSN number for Grand Forks Nordic Control, in USB at 2337Z; NIGHTHAWK 06 (Quantico MCAS HMX-1 Presidential helo) via HF-GCS for p/p to a Washington, DC phone number, in USB at 0044Z. (ALS)

11175.0: LK009 (P-3C, Brunswick NAS VP-26 "Tridents") via HF-GCS for p/p to a commercial number at Brunswick NAS, reports off the ground and en route, have to RTB due to power fluctuation, engine shut down, ETA 5+30 hours, in USB at 2001Z; LK009 wkg LK02 in air-to-air comms, LK009 is 300 miles west of St Johns, in USB heard at 2100Z. (ALS)

11175.0: HF-GCS Station ANDREWS recites 22-character EAM, in USB at 1500Z; ANDREWS with a SKYKING Foxtrot "YTL" in USB at 0437Z; ANDREWS with 28-character EAM in USB at 0441Z. (ALS)

11175.0: Andrews HF-GCS with 28-character EAM, also hrd on // 4724, 6739, 13200,

15016, in USB at 1627Z. (JK/NY)

11175.0: SEA KING calling McClellan HFGCS in red for a comms check in USB at 2056Z. (GV/CO)

11220.0: HF-GCS Station ANDREWS wkg SHERLOCK 25 for p/p to NAS Key West, reports, "We have located OSCARS" and passes encoded long/lat position, course, speed 10 knots, ground party asks "Is ostrich the big ostrich or the little ostrich?" Sherlock 25 does not understand question, ground asks "Is this a falcon?" Sherlock replies "It is not a falcon, it is an owl." They discuss position of owl relative to that of ostrich, in USB at 1527Z then 1543Z. (ALS)

11220.0: SHERLOCK 25 via ANDREWS, p/p to NAS Key West, passes encoded position, did search on sighted bearing from Ostrich, has 20 miles left to remain on station, in USB at 1710Z. (ALS)

11232.0: PEACH 02 (E-8 JSTARS) p/p via TRENTON MILITARY to PEACHTREE regarding airspace orbit scheduling, in USB at 2002Z; CANFORCE 2125 wkg TRENTON MILITARY for WX at Elmendorf AFB, Anchorage IAP, and Homer, AK, in USB at 1842Z. (MC/SC)

11740.0: Link-11 data transmission at 1845Z. (MC/SC)

12479.0: HOZK. C.S. VICTORY, 32,385-ton Panama-registered bulk carrier w/ AMVER/PR, 150 miles east of Cozumel, Mexico, included INMARSAT-C info, MMSI and abbreviated ID "VICT." in SITOR-A at 1744Z. (SJ/KY)

12484.5: LZKK, VERILA, 10,871-ton Bulgaria-registered general cargo ship w/open text tfe in Bulgarian to LZW, Varna R., Bulgaria on paired freq 12587.0 kHz regarding equipment problems, requesting attempt to make SSB contact on 16 or 22 MHz, included MMSI and vessel name, good signal here, in SITOR-A at 1414Z. (SJ/KY)

12490.0: ZCBV6, SNOWDON, 170,079-ton Bermuda-registered bulk carrier w/garbled AMVER/PR, 5-digit SELCAL 48153 and abbreviated ID "SNOW." vessel heard again 2 days latter on 16696.5 kHz, in SITOR-A at 1400Z; 3EJL2, JOSE BRIGHT, 32,443-ton Panama-registered chemical/oil products tanker repeating MMSI and HELP command, in SITOR-A at 1824Z. (SJ/KY)

12585.0: NRV, USCG, Apra Harbor, Guam w/idle frequency marker, unusually good signal for mid-afternoon here, in CW+SITOR-A at 2038Z. (SJ/KY)

12613.0: XSQ, Guangzhou R., China w/weak idle frequency marker, my first 12 MHz China coast station SITOR catch, in CW+SITOR-A at 2251Z. (SJ/KY)

12629.0: TAH, Istanbul R., Turkey w/weak idle frequency marker, station not listed for this frequency, in CW+SITOR-A at 1530Z. (SJ/KY)

12637.5: XSG, Shanghai R., China w/very weak idle frequency marker, in CW+SITOR-A at 2255Z. (SJ/KY)

12648.5: XSQ, Guangzhou R., China w/very weak idle frequency marker, in CW+SITOR-A at 2252Z. (SJ/KY)

13348.0: San Francisco ARINC working aircraft in USB at 2045Z. (SS/TX)

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13907.0: CG 1500 (HC-130, CGAS Elizabeth City) p/p to E-CITY AIR, in USB at 1922Z. (MC/SC)

13927.0: USAF MARS Operator AFA3HS (Kansas City) wkg KING 64 (HC-130P, Patrick AFB 920RQW) for M&W phone patch in USB at 2136Z. USAF MARS Operator AFA6AY (Los Angeles) wkg VADER 03 (C-130, AFRC Youngstown OH) for phone patch to DSN number of Youngstown 910AW Vader Ops), announces inbound, in USB at 2245Z; AFA6AY wkg TAZ 85, an OH-ANG KC-135 from Rickenbacker ANGB, for phone patch to Rickover, states ETA there is 0200Z, then M&W phone patch to Ohio, in USB monitored at 2219Z. (ALS)

13927.0: USAF MARS Operator AFA2XD (Satellite Beach, FL) wkg REACH 224, north of New York City, for radio checks in USB at 1730Z; USAF MARS Operator AGA2PA (Patrick AFB) wkg REACH 1006 (MN-ANG C-130 96-1006) who gives POSREP in Newfoundland area, in USB at 1923Z. (ALS)

13927.0: KING 15 (C-130) p/p via AFA6PF, California to ANGEL OPS at Moody AFB, in USB at 1757Z. (MC/SC)

16685.5: Unid. vessel w/SELCAL CVPX (6051) for OFJ, Helsinki R., Finland, not listed for this mode or frequency, strong signal in SITOR-A at 1848Z. (SJ/KY)

16696.5: H9GP, NAVIOS ALEGRIA, 76,270-ton Panama-registered bulk carrier w/MMSI and abbreviated ID "ALGR," in SITOR-A at 1554Z; GDRJ, PACIFIC SAND-PIPER, 3,775-ton specialized United Kingdom-registered spent nuclear fuel carrier operated by Pacific Nuclear Transport, Ltd. w/AMVER/DR for reduction in speed, 200 miles off the Pacific coast of Costa Rica, vessel first heard 7 days earlier 125 miles south of Cabo San Lucas, Baja California, Mexico, sailing at 12 knots on course 117 for Panama Canal transit, speed reduced to 8.5 knots this day, still several hundred miles from Balboa to initiate transit, in SITOR-A at 1520Z, heard again 6 days later after canal transit, 125 miles south of Santo Domingo, Dominican Republic, back up to 12 knots on course 053, in SITOR-A at 1750Z; ZCBV6, SNOWDON, 170,079-ton Bermuda-registered bulk carrier w/AMVER/DR for change of speed due to adverse weather, 220 miles east of Natal, Brazil sailing on course 206, in SITOR-A at 1642Z; MAHG5, MONTREAL EXPRESS (former CANMAR SPIRIT), 16,963-ton United Kingdom-registered container ship w/AMVER/PR, MMSI and abbreviated ID "CSRX," 20 miles south of Channel-Port aux Basques, Newfoundland and headed into the Gulf of St. Lawrence, Canada, in SITOR-A at 1745Z. (SJ/KY)

16812.5: NRV, USCG, Apra Harbor, Guam w/very weak idle frequency marker, in CW+SITOR-A at 2220Z. (SJ/KY)

16822.5: UDK2, Murmansk R., Russia w/weak idle frequency marker "DE UDK2," in CW+SITOR-A at 1909Z. (SJ/KY)

17202.0: Unid. males in casual simplex QSO in Spanish, decent signals, in USB at 1748Z. (SJ/KY)

17435.0: Unid. V2A, YL/SS 5-number groups, apparently moved here from former 17436, in AM at 1713Z. (JK/NY)

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Now That Bears Repeating

My HPJIE* brought me in from a well-deserved vacation to find out why one of our repeating transmitters was not repeating as it should. You may remember from previous episodes that my knees (and some say my, er—girth) will not let me climb beyond about 10 feet. For that, we hire our friends at US Tower, who are by far the best and most professional climbers and riggers I've ever met. If I may be serious for just a moment (ok—time's up!) I'm pleased to give them a little plug.

So the boss and I make sure that the main transmitter is transmitting, and is doing what it should. We have learned to check and double-check all the obvious things on the ground before calling in the acrobats to check transmission lines, connections (kindly remember the name of this column), and antennas. We have learned to assume nothing, and to actually look at the signal going into the transmitter, and at the signal coming out of the transmitter, and the signal coming out of the antenna before driving the two hours of traffic, steep hills, and mud to the repeating transmitter site.

And when we get there, we look for bears before climbing out of the truck. We have never seen any, but we know deep down that they are lurking behind every tree, waiting for a chance to eat us alive and steal the truck for a weekend of joyriding before running out of gas. In my heart, I know that my life will eventually be portrayed in a Gary Larsen cartoon.

Unlike the last time, one of us remembered to bring the keys to open the gate and the door to the transmitter building. We see that no signal is being received, therefore, none can be repeated, yet we know that the main transmitter is sending a lovely signal toward us. We are sure. Well, pretty sure. We verified that there was a signal, but neither of us bothered to check the output power.

We are now sure that the problem lies in the receiving antenna. Or the receiving converter. Or the receiving line. Or maybe the transmitter is not putting out as much as it should, because we can see a weak signal where we should see a strong one. Then again, recent storms may have blown either of the directional antennas off their intended path; it wouldn't take much—just a few degrees on either end would do it.

I know that the answer lies at the top of the 120-foot tower. If only I were up there, I could swap receiving converters, check the connection, and swing the antenna from side to side to see if it had indeed been blown off its intended axis and find out in a few moments just what the problem was.

I ponder the 120-foot climb. It's only 12 stories. I think about my excessive, er—girth, and my knees. I tell the boss if I climb slowly, my knees should hold out, and we could have the answer this afternoon. I know that we can't get a tower crew to the site until at least tomorrow.

The boss looks at me, then slowly looks down at my, er—girth. I get my cell. They'll have a crew here in the morning.

For twenty miles in any direction from the tower site, no cell phones will function in any of the valleys. Although some 300 million cars clog all the two-lane roads twice a day, no

cell provider has deemed it necessary to provide any coverage. This complicates my meeting the tower crew and directing them to the site, which is not exactly "downtown." Once we make contact at the designated parking lot, hand signals and flashing headlights get us to our destination. Technology. I love it.

I explain the situation to the crew. They suit up and begin the climb, checking everything we've discussed. I keep waiting to hear of a broken line, a bad connection, an antenna twisted on its mount. They tell me everything is perfect. What rotten news.

With all that equipment proven good, we can only head to the main transmitter site, where again the crew finds everything to be perfect. This time, we measure our transmitter power; it is also fine.

With no possible causes left but a bad receiving antenna (these antennas almost *never* fail) we head back to the mountain. The boss and I are analyzing and diagnosing and pondering and beating our heads together and hoping against hope that the receiving antenna really *is* bad. We have brought along a replacement.

Good tower crews never complain (at least not to us). They suit up again, take the replacement antenna, and begin their third climb of the day.

While the boss and I are hoping that this replacement does the trick (because we are completely out of ideas) we get a call on the radio:

Tower to ground. Do you guys know that the feedhorn on the old antenna is kinda crooked? We didn't notice it before, but since we have this one to compare it with, it definitely looks a little crooked. Do you want us to try adjusting it, or should we just replace the antenna?

We opt for adjustment. A little arguing with rusty screws and nuts and the old feed horn is straightened. We notice a beautiful signal inside the equipment building. They tighten it down and begin the climb to the ground.

The boss and I try to convince each other that we're not stupid. We have been doing this kind of thing for years, and we've heard stories of the same kind of thing from every other engineering team we meet. None of that makes us feel any smarter, but we know one more thing to ask the tower guys to check. Next time.

After the tower crew drives away, we think we see a bear behind a not-too-distant tree. "I'll go and check to see if it's really a bear," I say, bravely.

"Okay," the boss says. The woods are quiet. Dead quiet.

"Nah," I say, "I see it now—it's just a branch."

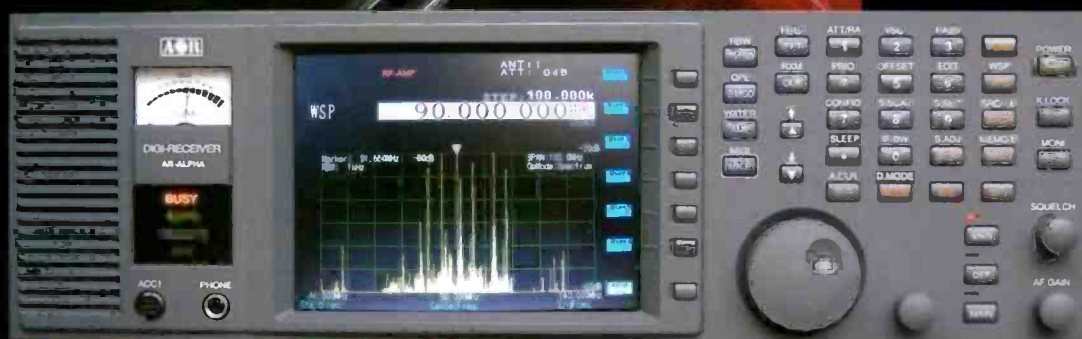
"Okay," the boss says. We each got into our trucks, and each of us was sure that if he'd been there alone, he'd have discovered that problem on the first climb. Sure.

I looked back at the tower as I drove away. A large turkey vulture soared around and landed on the feedhorn. My window was down; I was pretty sure I heard a bear snicker.

*High-Paying Job In Electronics

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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
Fast Scan
Optional DSP
1000 Memory Channels
PCR Upgradeable



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)