Radio–Homeland Security–Computers & Radio–Family & Hobby Comms

45635

POPULAR COMMUNICATIONS

JULY 2006

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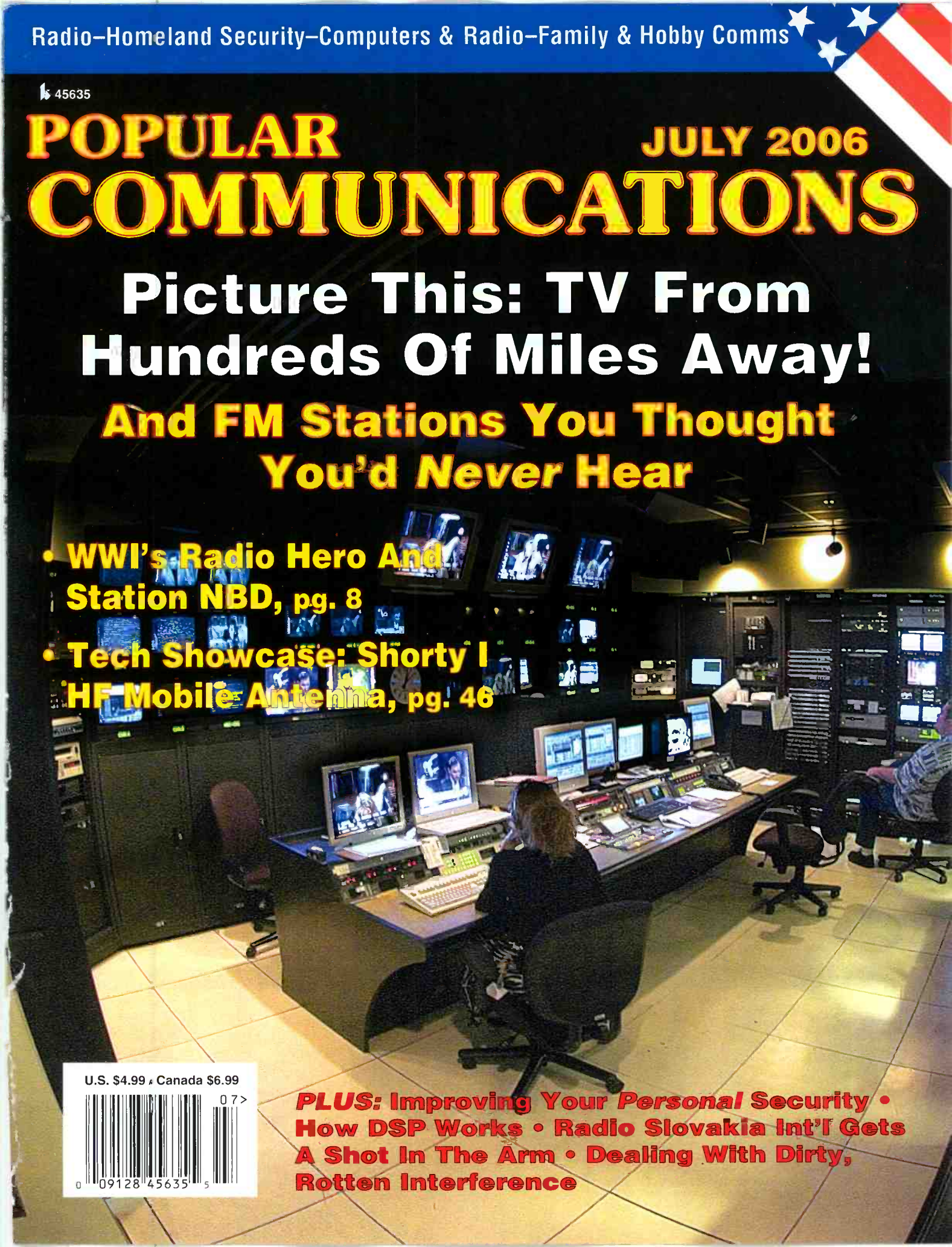

- WWI's Radio Hero And Station NBD, pg. 8
- Tech Showcase: Shorty I HF Mobile Antenna, pg. 46

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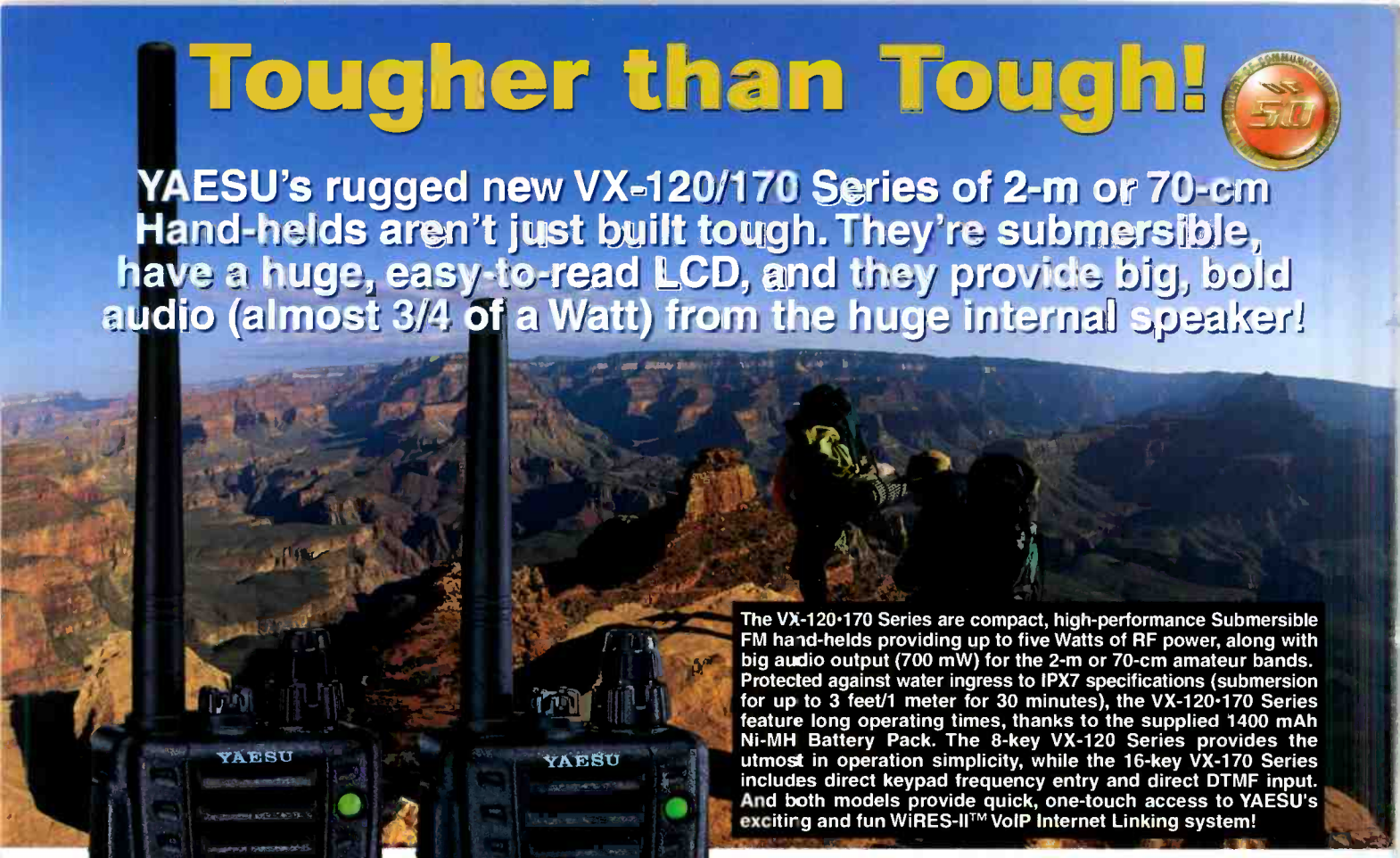
PLUS: Improving Your *Personal* Security • How DSP Works • Radio Slovakia Int'l Gets A Shot In The Arm • Dealing With Dirty, Rotten Interference

Tougher than Tough!

YAESU's rugged new VX-120/170 Series of 2-m or 70-cm Hand-helds aren't just built tough. They're submersible, have a huge, easy-to-read LCD, and they provide big, bold audio (almost 3/4 of a Watt) from the huge internal speaker!



The VX-120·170 Series are compact, high-performance Submersible FM hand-helds providing up to five Watts of RF power, along with big audio output (700 mW) for the 2-m or 70-cm amateur bands. Protected against water ingress to IPX7 specifications (submersion for up to 3 feet/1 meter for 30 minutes), the VX-120·170 Series feature long operating times, thanks to the supplied 1400 mAh Ni-MH Battery Pack. The 8-key VX-120 Series provides the utmost in operation simplicity, while the 16-key VX-170 Series includes direct keypad frequency entry and direct DTMF input. And both models provide quick, one-touch access to YAESU's exciting and fun WiRES-II™ VoIP Internet Linking system!

- 5W FM Transceiver
- Wide Receiver Coverage
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- Loud Audio 700 mW via Internal Speaker
- Long Life Battery FNB-83 (7.2 V/1400 mAh) included
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- Enhanced Paging and Code Squelch (EPCS)
- CTCSS/DCS included
- Security Password Feature
- Direct Keypad Frequency Entry (VX-170 Series)
- Transmit Time-Out Timer (TOT)
- Automatic Power-Off (APO)
- Automatic Repeater Shift (ARS)
- YAESU's exclusive ARTS™ (Auto-Range Transponder System)
- RF Squelch Circuit
- 200 Standard Memory Channels with 10 Memory Banks
- Alpha-Numeric Labeling of Memories
- Dual Watch (Priority Channel Scanning)
- Emergency Feature
- Smart Search Memories

IPX7 Submersible 3 feet (1m) for 30 min. | Huge LCD | Big 700 mW Audio! | 1400 mAh Long Life Battery

FM Mono Band Hand Held Transceiver

VX-120/VX-170 Series

(8 key Version / 16 key Version)

VX-120/170 (VHF) VX-127/177 (UHF)

HANDHELD TRANSCEIVERS

IPX7 Submersible 3 feet (1m) for 30 min.

5 W Ultra-Rugged, Submersible 6 m/2 m/70 cm Tri-Band FM Handhelds

VX-7R/VX-7RB

IPX7 Submersible 3 feet (1m) for 30 min.

5 W Heavy Duty Submersible 2 m/70 cm Dual Band FM Handheld

VX-6R

5 W Heavy Duty 2 m/70 cm Dual Band FM Handheld

FT-60R

1.5 W Ultra Compact 2 m/70 cm Dual Band FM Handheld

VX-2R

Ultra-Rugged 5 W Full Featured 2 m FM Handhelds

VX-150/VX-110

IPX7 Submersible 3 feet (1m) for 30 min.

Waterproofing specifications are assured only when using the genuine YAESU FNB-83 Battery Pack or FBA-25A Battery Holder. The use of after-market batteries or other accessories may compromise the effectiveness of the waterproofing.

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

Universal Radio — Quality equipment since 1942.

ICOM R75

Universal Radio is pleased to continue to offer the Icom R75 receiver. With full coverage from 30 kHz to 60 MHz; all longwave, medium wave and shortwave frequencies are supported plus extended coverage to include the 6 meter amateur band. Some innovative features of the R75 include: Synchronous AM Detection, FM Mode Detection (but not the FM broadcast band), Twin Passband Tuning, Two Level Preamp, 99 Alphanumeric Memories, four Scan Modes, Noise Blanker, Selectable AGC (FAST/SLOW/OFF), Clock-Timer, Squelch, Attenuator and backlit LCD display. Tuning may be selected at 1 Hz or 10 Hz steps plus there is a 1 MHz quick tuning step plus tuning Lock. The front-firing speaker provides solid, clear audio. The back panel has a Record Output jack and Tape Recorder Activation jack. The supplied 2.1 kHz SSB filter is suitable for utility, amateur, or broadcast SSB. However, two optional CW/SSB filter positions are available (one per I.F.). The formerly optional UT-106 DSP board is now included and factory installed! A great value. *Order #0175* **Call for price.**

R3

The R3 tunes 500 kHz to 2450 MHz (less cellular) in AM, FM-W, FM-N and TV via a 2 inch TFT color TV screen. You can receive regular TV [NTSC], and you may be able to see certain video feeds and ham radio Fast Scan TV. A second mono LCD display that can be used to conserve battery life. You get: 450 alpha memories, 4-step attenuator, bandscope, video and audio outputs and auto power-off. Comes with Li-Ion battery, charger, belt clip and BNC antenna. **Call**

R20

The Icom R20 covers an incredible 150 kHz to 3304.999 MHz (less cellular) with 1250 alphanumeric memories, bandscope and SSB/CW. It has: two VFOs, dual watch, voice scan control, NB, large two line LCD and CTCSS/DTCS/DTMF. A built-in IC audio recorder can record 1, 2 or 4 hours of reception! This radio comes with charger, Li-ion battery, belt clip and wrist strap. More info on website. **Call**

R5

The R5 covers 150 kHz to 1309.995 MHz (less cellular gaps) in: AM, FM Narrow and FM wide. 1200 memories store: frequency, mode, step size, duplex direction and offset, CTCSS tone, tone squelch and skip settings. Other features include: attenuator, LCD lamp, AM ferrite bar antenna, auto power off, CTCSS decode, weather function and battery save. A great value at under $200.00. **Call, or visit website for price.**

ICOM PCR1500 R1500

NEW!

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 98SE/ME/2000/XP™ CD.

The Icom R1500 is similar to the above, but also includes a controller head for additional operation independent of a PC. **Call for prices.**

ICOM PCR2500 R2500

NEW!

The Icom PCR2500 wideband computer receiver uses a similar form-factor to the PCR1500, but has several enhancements, including two powerful features, previously only available in high end military receivers. These two features are dual watch and diversity reception. With dual watch, the radio can receive two signals simultaneously. With diversity reception, two antennas can be connected at the same time and employed to provide very stable reception. The optional UT-118 Digital Unit provides D-STAR® digital voice reception and the optional UT-121 supports APCO25 digital voice decoding. See the Universal website for detail, options and screen shots. [R2500 shown above].

The Icom R2500 is similar to the PCR2500, but includes a controller head for additional operation independent of a PC. **Call for prices.**

R8500

Icom has reintroduced the unblocked, government/export version of the R8500. This receiver covers 100 kHz to 1999.99 MHz. Please see our catalog or website for the full story on this extremely versatile multimode wideband receiver priced at $1699.95.

www.universal-radio.com

◆ **Visit our website or request our free 108 page catalog for other exciting ICOM products.**

Universal Radio is also pleased to carry the complete ICOM amateur radio equipment line. The IC-7800 shown.

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POPULAR COMMUNICATIONS

Volume 24, Number 11 July 2006

Features

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On The Cover

TV stations such as Sarasota, Florida's WWSB channel 7—and standard FM broadcast stations–can often be captured hundreds of miles beyond their target area. How? It'seasy, if you know when to listen. Be sure to check out Bruce Conti's Broadcast Technology column this month beginning on page 12, titled "FM/TV DXing: What Can You Get?" for complete details.(Photo by Larry Mulvehill)

Tap into secret Shortwave Signals

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

MFJ-462B **$189.95**

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

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

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

Eavesdrop on the World

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

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

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

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

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

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

High Performance Modem

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

Easy to use, tune and read

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

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

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

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

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

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

MFJ-1800 **$29.95**

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

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

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

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

Super Active Antenna

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

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

MFJ-1024 **$149.95**

Indoor Active Antenna

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

MFJ-1020C **$89.95**

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

Compact Active Antenna

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

MFJ-1022 **$59.95**

Eliminate power line noise!

MFJ-1026 **$189.95**

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

MFJ Antenna Matcher

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

MFJ-959C **$109.95**

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

High-Gain Preselector

High-gain, high-Q receiver preseletor covers 1.8-54 MHz.

MFJ-1045C **$79.95**

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

Dual Tunable Audio Filter

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

MFJ-752C **$109.95**

MFJ Shortwave Headphones

MFJ-392B **$24.95**

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

High-Q Passive Preselector

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

MFJ-956 **$59.95**

Super Passive Preselector

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

MFJ-1046 **$109.95**

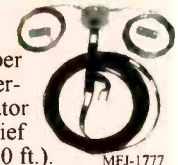
MFJ Shortwave Speaker

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

MFJ-281 **$12.95**

MFJ All Band Doublet

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



MFJ-1777 **$49.95** Ship Code A

MFJ Antenna Switches

MFJ-1704 **$69.95**

MFJ-1702C **$29.95**

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

Morse Code Reader

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

MFJ-461 **$89.95**

MFJ 24/12 Hour Station Clock

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

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by Harold Ort, N2RLL

A Hearing Aid For COMTek

In what can only be described as yet another Corporate Big turning a deaf ear to what the rest of the world is hearing, COMTek and the City of Manassas Virginia, *continue* their campaign of ignorance of the facts. And I mean *verifiable* facts that clearly point to *their* BPL (Broadband Over Powerline) system as the *continuing* generator of interference so great that you practically don't need a radio to hear it! But COMTek isn't listening anyway.

A recent *ARRL Letter* points to "flaws in Manassas BPL interference report," and has "again demanded that the FCC shut down the system until the interference problems are solved." So far, though, there has been no official response from the FCC. I suspect the Commission, in its bureaucratic mindset—thinks that it *has* responded appropriately. It has not.

Interference is so bad and the Commission's non-response so lacking that the League in its most recent 10-page letter called the situation a "...tortured history of interference complaints involving the BPL system."

What does COMTek say? "COMTek believes that the current configuration of the Manassas BPL System is not the source of interference to amateur radio licensees." The League shoots back that the COMTek report is, "fatally and obviously flawed." Frankly, the COMTek Bigs aren't as stupid as they sound in public; chances are most other BPL providers would respond as COMTek has if they knew the FCC wasn't very concerned about enforcement of their own regulations. The thought process has to be something along these lines: "Hey, let's feed them the usual BS because, after all, they're only going through the bureaucratic motions giving the public the *impression* they're serious about enforcement, but they aren't."

The COMTek BPL network in Manassas is the first commercial deployment of BPL in the nation to use a city-wide electricity grid to provide homes and businesses with direct "plug in" broadband access through electric sockets, rather than over dial-up phone connections, DSL, or cable. Going back to 2004, licensed radio operators have demonstrated—as has the ARRL—that the COMTek BPL interference *is* the source of major interference to the HF bands, and yet for reasons only known to the FCC, the Commission hasn't held COMTek's feet to the fire. I suppose it's a lot easier to bust a pirate radio operator or track down wayward illegal 10-meter operators driving the nation's interstates than it is to drive a few miles to Manassas, listen to the interference firsthand, and enforce the very simple Part 15 rules.

In a letter to two FCC officials dated April 14, 2006, ARRL General Counsel Christopher D. Imlay, W3KD, concluded:

> In light of the record of long-standing interference to licensed stations in Manassas, and the failure of COMTek and the City of Manassas to comply with Section 15.615(d), the Commission should require that the BPL system be shut down immediately, and not resume its operation until the facility is shown to be in full compliance with Commission rules regarding radiated emissions and the non-interference requirement of Section 15.5 of the Commission's rules.

That doesn't sound terribly demanding or complicated to me; basically find the interference, and shut down the offending "transmitter"—in this case, COMTek's BPL system. Pretty straightforward, wouldn't you say?

But then again you and I don't work for COMTek and we're responsible enough as radio operators (hams, CBers, GMRS operators, and even public safety comm professionals) to accept responsibility for our actions and take our corrective-action medicine. Of course, that's *not* how it works in much of Corporate America today; in fact, the opposite is usually the norm: blame the other guy and deny any culpability, and eventually those complaining will either go away frustrated and broke from hiring lawyers, or they'll just simply grow weary and stop fighting City Hall. Either way, Average Joe loses.

Thankfully the ARRL isn't taking that road. But the Commission and COMTek...well, that's another story. The League's letter included an in-depth technical study by ARRL Lab Manager Ed Hare, W1RFI, and concluded, "...the testing that was performed [by COMTek] in no way is sufficient to reach any general conclusions about emissions levels." The analysis goes on to criticize the methodology and conclusions of the COMTek tests. Hare's analysis found a number of deficiencies in the PSE report, including:

- The testing was not done in accordance with the FCC's recommended test guidelines;
- The test equipment used—a spectrum analyzer and a passive loop antenna—was not sufficient to measure notch depth nor to measure the ambient noise levels;
- PSE tested only one amateur band at a single location, which was insufficient to establish compliance or non-interference; and
- The testing did not follow good engineering practice and was not sufficient to have met the requirements set forth by the FCC for this testing.

So, off goes the League's letter to the FCC, and as of this writing there has been no response from Washington. Over *seven months ago* in our January "Tuning In" we discussed the Manassas COMTek BPL interference issue. It strikes me as very odd that this issue still hasn't been resolved. I know the bureaucracy moves like a snail stuck in a vat of epoxy, but come on! What on earth *could* the Commission say in its response to the ARRL? That it's taken care of the problem? It has not. The FCC certainly cannot say it cares about the amateur community in this instance, because it is proving that it doesn't.

I've read the entire COMTek supplemental filing to the FCC, along with the test results from Product Safety Engineering, Inc. And as the League correctly asserted, the testing methodology and equipment used would cause most folks to question the report's reliability. It doesn't take an engineer or rocket scientist to also wonder why COMTek would only allow testing in the 40-meter amateur band. Yes, that's the band where the local amateurs are reporting the interference, but, to me, any comprehensive report would take a look at other parts of the spectrum—unless, of course, they did and the noise was so deafening it was conveniently ignored. Any

(Continued on page 82)

by Harold Ort, N2RLL, Editor, and D. Prabakaran

News, Trends, And Short Takes

Radio Vanuatu Gets Funds From Australia

Australia handed over a check for 2,181,000 Vanuatu vatu (U.S. $20,364) to General Manager of Vanuatu Broadcasting and Television Corporation Jonas Cullwick. The infusion was made possible through AusAID funding and will be used to replace two studio transmitter links that transmit shortwave and mediumwave programs from the main studio to the Emten Lagoon transmitter site. This transmission has not been operational since May 2005, and Radio Vanuatu has had to use alternative FM transmissions to enable shortwave and mediumwave to be broadcast to the outer islands.

RRI To Broadcast News In Up To 13 World Languages

A report by Indonesia's Antara News Agency says that state radio broadcaster Radio Republik Indonesia (RRI) has been conducting trial news bulletins in 11 international languages in an effort to enable foreigners in Indonesia to obtain factual and accurate information. According to RRI Director Parni Hadi, the trial broadcasts have been in Arabic, English, French, German, Indonesian, Japanese, Korean, Malaysian, Mandarin, Spanish, and Thai. The report says that RRI also plans to use Russian and Italian in the near future.

Pakistan's State Broadcaster To Begin English Service For European Listeners

Pakistan Broadcasting Corporation (PBC) External Services has begun an English Service to Pakistanis residing in Western Europe. The time of broadcast is 0730 to 0830 UTC and will be beamed on 15100, 17835 kHz. With the introduction of the service, the number of external services of PBC will increase to 17 languages. The broadcaster is already broadcasting in Arabic, Bangla, Chinese, Dari, English (targeting Eastern India), Gujarati, Hindi, Hazargi, Pushto, Persian, Turkish, Russian, Nepali, and Sinhalese.

Christian Vision Acquires Jülich Transmitter Facility

T-Systems and its parent Deutsche Telekom AG have completed the sale of the Jülich shortwave transmission facility to UK charity Christian Vision. Jülich, in northwest Germany, is recognized as one of the leading transmission sites in Europe, equipped with 100-kW analog and digital (DRM) transmitters and numerous antennas with global reach.

Under the terms of the deal, T-Systems Media&Broadcast, will continue to service its clients at Jülich until the end of 2007, at which time Christian Vision will take full operational control. Christian Vision's media arm, CVC, intends to use the site for analog and DRM transmissions in numerous languages to reach targets including Europe, Africa, the Middle East, Russia, and West Asia.

Radio Waddenzee Says Work On Its Radio Ship Is Progressing

Dutch commercial broadcaster Radio Waddenzee/Radio Seagull, based in Friesland, reports that in the next month its radio ship, which will be used on its assigned frequency of 1602 kHz, will begin to look more like a broadcasting vessel. The custom-built mast, which was made in the UK, recently arrived and consists of five sections. The first one will be painted red, the next one white, and so on. It's eight feet wide at the base. Before the summer, a studio will also be constructed. The equipment is already on board the ship, but the transmitter is still overseas, awaiting transportation.

Podcasting Radio Network Begins Broadcasting On Shortwave

In a complete reversal of the usual trend, the Enigma Radio Network has announced that its podcasts will be heard throughout most of the world on shortwave radio.

"The Daily Dig," a three- to five-minute world news program, can be heard on 15825 kHz on WWCR, Monday through Friday at 1:05 p.m. Eastern time. This news program covers the day's top stories with commentary on current events and is hosted by Kathleen Keating, a best-selling author and investigative journalist.

"The Enigma Files," an hour-long weekly show hosted by Keating, will be available on Wednesdays at 4 p.m. Eastern, also on 15825 kHz on WWCR. "The Enigma Files" was the winner of the 2005 People's Choice Podcasting Award for World News, and is one of the network's most popular shows.

"Homeland Security Weekly," an hour-long weekly show hosted by Doug Hagmann, can be heard on 15.825 kHz on WWCR on Thursdays at 4 p.m. Eastern. Hagmann is the founder and director of the Northeast Intelligence Network and CEO of a licensed private investigative agency serving many Fortune 500 clients.

More information on the Enigma Radio Network's shortwave debut and its programming can be found at www.ernradio.com.

VOA's English To Africa Service Launches New Program Lineup

Millions of VOA listeners across the African continent will now receive more in-depth local and world news, breaking news reports, and a broader range of topical features covering social and political issues, developments in science and technology,

(Continued on page 82)

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: Harold Ort, N2RLL, Editor, Popular Communications, *25 Newbridge Road, Hicksville, NY 11801-2909, or send e-mail via the Internet to popularcom@aol.com.*

Problem Time

Dear Editor:

Hi, I have a problem. There is a station 20 miles away that I always received and in stereo, but now a station that was on 90.9 moved to 90.3. This station is located about a mile away from me and blots out the station I want, but if I hold the amplified antenna I use just right I can get the station from 20 miles, but I can't let go of the rabbit ears, what do I do?

David Tager,
Via e-mail

Dear David:

Get someone else to hold the rabbit ears and enjoy the music!

Red Robinson Fan

Dear Editor:

Thank you so much for the article on Red Robinson [April 2006]! I started off my life—and my fascination with all things radio—in the City of Vancouver in Canada. Red Robinson was one of my leading inspirations in the early days of Rock 'n' Roll and radio. Whenever Red did a live "remote" I made every effort to go and watch him as he worked. He was terrific and not only piqued my interest in "doing" radio, but was also the deejay who played—and talked about—the music of that time.

Later, I was to move to the States and Wolfman Jack took over, in terms of my radio and music education, although when I returned to Canada for visits I would try to listen to Red whenever I could! I went on to work in radio as a "deejay" in California for many years and I owe so much to Red, and others, who were my early influences!

Steve
Via e-mail

Foolin' With The Mind

Dear Editor:

MMMMM! Old Harold almost had me hook, line, and sinker with his April "Tuning In." Had me on the edge of my seat when he mentioned he and old Price went to visit the Chief Honcho in charge...El Presidente himself. Then I woke up and realized what I was reading was the April issue of *Pop'comm*. Done good, Harold. Hey, better than that other mag I get with three letters in its title. I sure do miss their April issues with hams in swimming pools and bath tubs running kilowatts.

Al Ogrizovich,
Jacksonville, Fl

Dear Al:

Hams in swimming pools and bathtubs running *anything*—now there's a Kodak Moment. On second thought...!

Cents Of Humor?

Dear Editor:

When I read your April "Tuning In" I was all ears—eyes, actually—right up to near the end when you had Price walking out of the White House munching on the donut. You've got quite an imagination, but I wonder if The Prez would think it's funny (although, as you pointed out, he doesn't read the newspapers). Surely he *must* have a sense of humor, don't you think? Thank you for a great magazine and insight I can't get anywhere else. Do you really believe he doesn't read magazines and newspapers?

Garry Marble
Via e-mail

Dear Garry:

Please don't ask me to answer that question—please!

Got The FR300

Dear Editor:

I read your review of the FR300 in the May *Pop'Comm* and liked what I read so much that I went out and bought one for myself and one for my Mom. While it's not meant to be a DX radio, it's perfect for emergencies, as you pointed out, and has lots of great features. Thanks for your help.

Bob Grant,
Phoenix, AZ

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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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"The Most Important... Station In The World"

The Story of Alessandro Fabbri and Radio Station NBD

by Richard Moseson, W2VU, Editor CQ, w2vu@popular-communications.com

Photo A. The Fabbri Memorial in Acadia National Park marks the location of Allesandro Fabbri's ham station-turned-Navy listening post during World War I. The location at the top of Otter Cliffs provided a great radio path to Europe and the Atlantic, while the thick cover of spruce trees protected the station from spying U-boats.

You've probably never heard of him, but according to the U.S. Navy, Allesandro Fabbri ran "the most important and most efficient" radio station in the world during and after World War I from a cliff top location in what is today Acadia National Park in Maine.

If you're one of the three million people a year who visit Acadia National Park, chances are you'll take a drive along the Park Loop Road, perhaps stopping at Thunder Hole or Sand Beach. Just past Otter Cliffs, chances are you'll see a small sign that reads "Fabbri Memorial." And chances are you'll keep on going. But if you do happen to pull off the road, manage to pull yourself away from the magnificent view off the top of the cliffs (**Photo A**) and make your way over to a tiny grove of spruce trees on the "back" side of the parking lot. There you'll find a big rock (**Photo B**) containing a fading plaque to a man and a radio station that played a central role not only in early radio history but also in the outcome of World War I.

The plaque honors the memory of "Allesandro Fabbri, Lieutenant, U.S.N.R.F." (**Photo C**) and the Naval radio station at that location, which he commanded during World War I. It's described on the plaque (and on Fabbri's Navy Cross citation) as "the most important and most efficient station in the world," yet most of us have never heard of Allesandro Fabbri nor his radio station.

Photo B. Today, the fading plaque on this chunk of red granite is the only reminder of the radio history that took place at this site during and after World War I.

Who Was Fabbri?

The book that was my primary source of information about the radio station, *The Fabulous Radio NBD*, by Brandon

Wentworth[1], described Fabbri only as "a well-to-do socialite and yachtsman who spent his summers at Bar Harbor" and having "devoted much of his time to scientific endeavors, one of which was experimenting in wireless telegraphy. It became his principal hobby." When the federal government started licensing amateur stations in 1912, the book says, Fabbri received the callsign 1AJ, the tenth license issued in the first call district. It took quite a bit of digging—including a fortuitous contact with a relative of Fabbri—to find out more.

According to a genealogical website[2] maintained by Emily Randall[3], whose great grandmother was Fabbri's first cousin, Alessandro's grandfather, Giovanni Fabbri, was a successful silk merchant in Florence, Italy, in the early 1800s. Two of Giovanni's sons, Ernesto and Egisto, came to New York in 1851. Egisto, described on another website[4] as an economist and mathematician, made a fortune in shipping (he and Ernesto were partners in Fabbri & Chauncy, a shipping firm that also controlled Thomas Edison's electric light patents in Italy and South America[5]) and in banking—he was a partner of J.P. Morgan—and was one of the founders of the Metropolitan Opera Company in New York. Ernesto married Sara Ann Randall and they had eight children, the youngest of whom was Alessandro. Ernesto died suddenly in 1884, and Egisto, who had no children of his own, took in the whole family.

Alessandro was born in 1877 and, according to Emily Randall's genealogy, was "a scientific dilettante and inventor," who made archaeological digs in Arabia and "backed Guglielmo Marconi in his wireless experiments." Online records from the Westchester County, New York archives show that he at least made some attempt at going into business, having incorporated two businesses there—the Seamless Metal Ware Company and the Metal Furniture Company—with his brother, Ernesto, in 1900 and 1901. But, according to his obituary in the *New York Times*, Fabbri "disclosed a greater interest in scientific research than he did in matters of business and finance," and "perfected a moving picture machine with which it was possible to take pictures of microscopic organisms showing their development."

He lived in the family home in New York City (now an Episcopal retreat house known as the "House of the Redeemer") and a palatial "cottage" in Bar Harbor, Maine (**Photo D**). It was here on Mount Desert Island, the highest coastal headlands in the Americas north of Rio De Janeiro[6], that Alessandro built his amateur station.

An Offer Nearly Turned Down

When the United States entered World War I in 1917, Wentworth says Fabbri offered to donate both his 125-foot yacht and his radio station to the U.S. Navy, with the stipulation that he be named station manager to assure that the operators would be as good as the equipment. The Navy quickly accepted the offer of the yacht, but said it was against policy for a military radio station to be managed by a civilian, particularly in wartime. He was advised that he would need to become, at minimum, an ensign in the Naval Reserve, in order to be put in charge of his own station.

Fabbri promptly applied for a commission and was just as promptly turned down, with no reason given. Frustrated, he turned for help to an old friend and fellow yachtsman who happened at the time to be Assistant Secretary of the Navy, Franklin D. Roosevelt. FDR cut through the red tape and secured Fabbri his commission, clearing the way for the Navy to take over his station while keeping him in charge.

Photo C. Allesandro Fabbri as a Lieutenant in the Naval Reserve. This photo is inscribed, "For Uncle Dave and Aunt Emily with much love from Sandro, Feb. 17th, 1920." (Photo courtesy Emily Randall.)

Two prominent engineers then began surveying Mt. Desert Island, looking for the best possible spot to locate the station. They selected a site on Otter Cliffs that had the combined benefits of a great radio path to the Atlantic and Europe and physical seclusion behind a stand of spruce trees to keep U-boats from spying on it. The site was privately owned and leased to the Bar Harbor Country Club. Fabbri subleased the whole site, including a clubhouse, for the Navy's use.

The station, set up on the cliffs, was commissioned on August 28, 1917. It operated briefly with the call letters AA2 and K2B, then was assigned NBD, which it retained throughout the war. It had an early de Forest "audion" vacuum tube receiver which, combined with its ideal location, made it the premier receiving site on the Atlantic coast. The antennas were designed and installed by none other than antenna pioneer H.H. Beverage. (If you've ever heard of a Beverage antenna, that's who it's named for.)

All incoming messages were linked directly by wire to Navy headquarters in Washington. The station was rarely used for transmitting, as most outgoing messages were sent via the Navy stations in Arlington, Virginia (NAA), or New Brunswick, New Jersey (NFF). One of the few times it was used for transmitting was when the Navy received word of an explosion at Halifax,

Nova Scotia, but could not raise the station there. NBD was ordered to call and quickly made contact, learning that the station there was on auxiliary power and that its antennas were nearly destroyed. NBD was the only station that could copy its signals and immediately sent word to Boston, from which a U.S. Navy hospital ship was quickly dispatched with medical supplies and personnel. It was later learned that a French munitions ship had blown up in the harbor, killing 2000 people and destroying much of the city.

NBD's main job during the war was to copy encrypted messages from station YN, the main transmitting point for the American Expeditionary Forces in France. All of this was immediately relayed to Washington for decryption, including much of the ongoing communication between Expeditionary Force Commander Gen. John Pershing and President Woodrow Wilson. A letter from Fabbri quoted by Wentworth states that by mid-1918, the station was handling "over 20,000 words a day from Radio YN. A good percentage is in cipher. We are told that no other U.S. station is receiving YN on a solid day-to-day, around the clock basis."

The Fabbri Memorial Plaque

The wording on the plaque of the Fabbri Memorial is difficult to read in a photograph (frankly, it isn't too easy to read when you're right in front of it, either), so here's what it says:

IN MEMORY OF
1877 ALLESANDRO FABBRI 1922
LIEUTENANT, U.S.N.R.F.

A RESIDENT AND LOVER OF MOUNT DESERT ISLAND
WHO COMMANDED THE
UNITED STATES NAVAL RADIO STATION
UPON THIS SITE FROM ITS ESTABLISHMENT ON AUGUST 28, 1917 UNTIL DECEMBER 12, 1919. AT THE END OF THE WORLD WAR, HE WAS AWARDED THE NAVY CROSS. HIS CITATION STATED THAT UNDER HIS DIRECTION THE STATION BECAME "THE MOST IMPORTANT AND THE MOST EFFICIENT STATION IN THE WORLD."

THIS TABLET ERECTED BY HIS FRIENDS AND FELLOW
TOWNSMEN IN TESTIMONY TO HIS PATRIOTIC SERVICE,
HIGH CHARACTER AND ENDEARING QUALITIES,
1939.

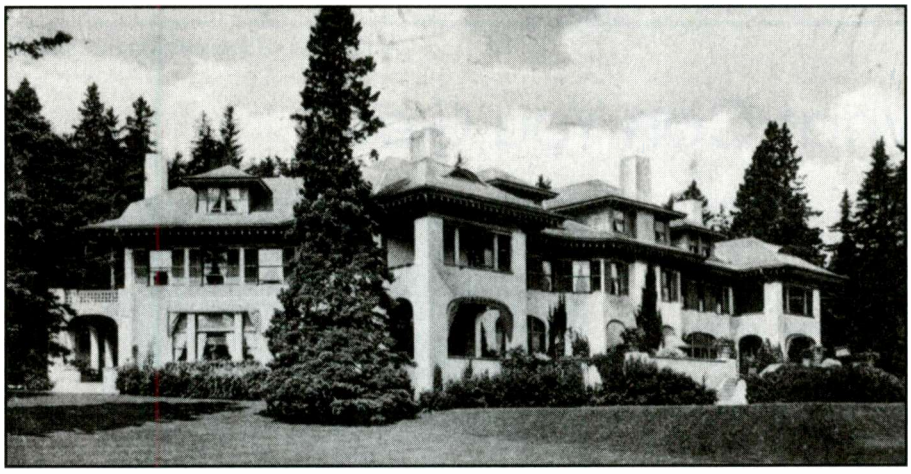


Photo D. The Fabbri "cottage" in Bar Harbor, Maine. In the early 20th century, Bar Harbor and surrounding communities became favorite vacation spots for some of America's wealthiest citizens, many of whom built huge and luxurious "summer cottages" along the seacoast. Today, much of the area has become a favorite vacation spot for all Americans, preserved as Acadia National Park (another fascinating story, but one that has nothing to do with radio). (Photo courtesy Emily Randall.)

The station also received and relayed numerous distress calls from merchant ships that came under attack from German submarines. Often, it was the only shore station able to copy these calls for help. The most memorable message received at Otter Cliffs, according to Wentworth's accounts of interviews with operators there, came not from the American station YN, but from German station POZ, on October 6, 1918. According to Wentworth (who transcribed the text from the original message hanging on the ham shack wall of the operator who received it), the message read:

PRESS 37 WDS 127-128 TRANSOCEAN PRESS NR. 2045

Fourth special sixth - The note transmitted to President Wilson through agency of Swiss government is as follows colon quote German government request President of United States of America to take his hand in restoration of peace comma to inform all beligerent states of this request and to invite them to send plenipotentiaries for the purpose of making negotiations stop It accepts programme presented by President of United States of America in message to Congress of Eight of January nineteen hundred eighteen and his later declarations comma especially address of twenty seventh of September as foundation for peace negotiations stop In order to prevent further bloodshed German government requests immediate conclusion of a general armistice on land water and in the air unquote stop.
TRANSOCEAN BERLIN OCTOBER 6th 1918 (8:58 PM)

This, apparently, was the first public word of Germany's decision to surrender and accept President Wilson's famous "Fourteen Points." Interestingly, despite the message's call for the "immediate conclusion of a general armistice," it took more than a month to agree on terms for the armistice and for fighting to actually end—on what used to be known as Armistice Day, November 11, 1918.

After the fighting ended, the station continued to be an important communications link. It maintained constant contact with the first successful east-to-west transatlantic airplane flight, and when President Wilson sailed to Europe in 1919 to sign the peace treaty formally ending World War I, NBD handled much of the President's communications during the trip. The station remained the Navy's principal transatlantic receiving site well after the end of the war, until it was retired and dismantled in 1935, moved to the nearby Schoodic Peninsula, where there is still a Coast Guard station today.

An Honor Briefly Enjoyed

Exactly two years after the armistice, on November 11, 1920, President Wilson awarded Allesandro Fabbri the Navy Cross, citing his station as being "the most important and most efficient" in the world at the time. According to Wentworth, Fabbri appreciated the recognition, but told friends, "I deserve but one two-hundredth part of the honor. The officers and men who served with me deserve as much of the credit as I do." In a similar vein, Fabbri wrote to the operator who received Germany's final peace message on November 10, 1918, that "(a)s Commanding Officer, I was the recipient of the decoration—but you and the others, on whom I chiefly relied, may well feel that you each own a share in this honor."

Fabbri himself was not able to share in the honor for very long. Back home in New York in early 1922, Fabbri joined fellow members of the South Side Shooting Club duck hunting on Great South Bay. According to his obituary in the *New York Times*, "he complained of having a chill when he returned home," a chill that quickly turned into pneumonia—a fatal ailment in those days before antibiotics. Allesandro Fabbri died at home three days later, on February 6, 1922, at age 44.

In 1939, four years after the station was relocated to the Schoodic Peninsula, Fabbri's former neighbors and friends in Bar Harbor erected the monument at Otter Cliffs that can still be seen today by those who happen to turn off the Park Loop Road at the sign that says, "Fabbri Memorial."■

The Navy Cross

Following is the full text of the citation[7] accompanying the Navy Cross awarded to Lieutenant Allesandro Fabbri, U.S. Navy Reserve Force, on November 11, 1920:

The Navy Cross is awarded to Lieutenant Allesandro Fabbri, U.S. Navy (Reserve Forces), for exceptionally meritorious service in a duty of great responsibility in the development of the radio receiving station at Otter Cliffs, Maine, and the small receiving station at Sea Wall. Under Lieutenant Fabbri's direction, the station was developed from a small, amateur experimental station until at the end of the war it was the most important and the most efficient station in the world.

Notes:

1. Wentworth, Brandon, *The Fabulous Radio NBD*, Beech Hill Publishing Company, Southwest Harbor, ME, 1984; ISBN 0-933786-07-7.
2. http://freepages.genealogy.rootsweb.com/~knower/fabbripage1.htm
3. Special thanks to Emily Randall for her assistance, for her copy of the *New York Times* obituary of Allesandro Fabbri, and for the use of her photographs.
4. www.yamaguchy.netfirms.com/josephson/baron_17.html
5. http://edison.rutgers.edu/list.htm
6. Acadia Byway Corridor Management Plan, Hancock County (ME) Planning Commission, 2000.
7. Full Text Citations for Award of the Navy Cross to Members of the U.S. Navy, World War I, <www.homeoftheheroes.com/verify/1_Citations/nc_02_WW1_Navy-ADM.html>

by Bruce A. Conti, BAConti@aol.com

FM/TV DXing: What Can You Get?

Many of us are into hearing shortwave signals from around the world or local and regional scanner action. But those FM and TV signals that *normally* reach a distance of about 60 miles often surprise even seasoned DXers. Actual standard coverage area will vary depending upon transmitter and receiver antenna height as well as terrain. This is because local FM/TV signals are limited by line of sight. Unlike AM or shortwave, there is no groundwave and "skip" of FM/TV under normal conditions.

FM/TV transmitting antennas are usually located atop mountains, skyscrapers, and tall towers to increase distance to the horizon, thereby increasing line-of-sight coverage area. (The world's tallest man-made broadcasting structure is the KVLY TV 11, Fargo, North Dakota antenna mast, which at 2,063 feet set the standard for the maximum allowed per FAA regulations.) However, for every rule there is an exception, and there are unusual atmospheric conditions that will "bend" the line-of-sight rule.

Bending The Rule—Tropospheric Ducting

The two basic modes of long-distance FM/TV propagation are tropospheric ducting and sporadic-*E* (*Es*) skip. Both involve some form of bending or redirecting of signals back toward Earth. The troposphere basically consists of the entire lower level of the atmosphere where weather takes shape through the formation of clouds. Under normal circumstances temperature decreases as altitude increases.

Tropospheric ducting is a local to regional phenomenon, producing reception typically in the range of 300 to 500 miles. It's caused by an inverse temperature differential between the ground level and upper levels of the atmosphere where the air is actually warmer at a higher altitude. A frontal boundary where warm air overrides cold air below, a temperature inversion that traps ground fog in the valleys and smog over large cities, or an onshore flow of cool humid air that produces pea-soup fog are examples of conditions ripe for tropospheric ducting.

These inverse temperature differentials can bend a signal much like a beam of light through a prism. As light passes from air into the prism, each frequency within the light beam is bent at a different angle, revealing the rainbow of colors. Similarly, as signals pass from one temperature zone to another, each frequency is bent at a slightly different angle. With continued bending, distant VHF and UHF signals are scattered or showered back toward the ground level well beyond the horizon.

While tropospheric ducting may occur at any time of day or night, it's most common in the early morning hours when the air is still and fog is most likely to develop. A tropospheric DX opening usually produces very steady signals that may last for hours during a local fog event, or continue over several days with a temperature inversion.

Sporadic-*E*, Or *E*-skip

The *E* layer is an ionospheric layer of the atmosphere that normally forms during daylight hours due to energy from the sun. *Es* is an abnormality in the atmosphere that is not well understood, but usually associated with strong weather fronts that produce lightning storms. Intense pockets of energy positioned inside towering thunderheads act like mirrors that can reflect signals back to Earth over a distance in the range of 1,000 to 1,500 miles. Under rare conditions, a signal may take a second hop for total distances of over 3,000 miles. Thus, the *Es* phenomenon in DX terms has become known simply as *E*-skip.

The WGBH antenna mast stands high atop the Great Blue Hill outside Boston. (Photo by Jeff Lehmann)

Because of the nature of *Es*—it's usually associated with fast moving weather systems—*E*-skip signals don't last very long, typically five minutes to half an hour. As the *Es* pocket changes with the weather, so does reception. At one moment Illinois might be in the clear, five minutes later Kentucky is dominant, and in half an hour the opening completely fades away. *E*-skip is most likely to occur late afternoon toward dusk, when thunderstorm intensity peaks and the *E* layer itself is changing with the setting sun.

E-skip is usually limited to FM and the low VHF TV frequencies, and Channels 2 and 3 are the first to check for TV DX. Remember that the FM broadcast band is between TV channels 6 and 7, so when DX reception reaches as high as Channel 6, be sure to turn on the FM radio for more excitement.

A Gift From Space!

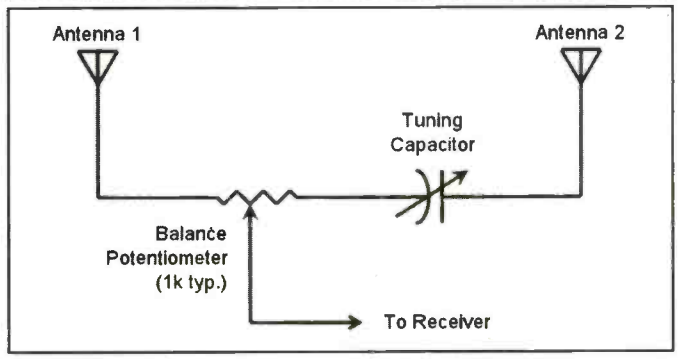
Other mechanisms for FM/TV DX reception include auroral conditions and meteor scatter. Auroral conditions can give *E*-skip openings a boost. Meteor scatter is more of an FM DX technique as signals may only last a few seconds, briefly reflected off a burst of energy when a meteor enters the atmosphere.

Overall, FM/TV DX is best late spring and throughout the summer when the sun is at full strength and weather patterns are more conducive to temperature inversions.

Equipment—The Antenna Is Most Important

Sophisticated equipment isn't required to get started in FM/TV DXing. It's all about being in the right place at the right time. Learn to recognize weather conditions indicative of potential DX, primarily fog, stagnant air, and approaching frontal systems. When conditions are right, reception over 1,000 miles is possible even on the most modest of receivers. Just remember, safety first. Turn off the TV and disconnect the antenna, or turn off the radio and collapse the whip, when lightning is near. Remember, it doesn't take a direct hit to do damage, and a close lightning strike can be harmful to a receiver front end.

The first rule of thumb in any DX endeavor, that a receiver is only as good as its antenna, holds true for FM/TV DXing. An outdoor directional TV antenna from RadioShack is an easy and effective upgrade for multi-band FM/TV DXing.



A simple FM/TV antenna phaser.

Mount the antenna high to increase line of sight, and use a rotator to beam in signals from various directions. Don't bother with any of those miracle indoor antennas. While they may indeed improve local reception, they won't provide much enhancement of DX signals.

An outdoor directional antenna is definitely the way to go. Advanced DXers typically use separate antennas specifically

Other Resources For FM/TV DXing

Interested in learning more about FM/TV DXing? The Worldwide TV-FM DX Association (WTFDA) is dedicated to the observation and study of the propagation of long-distance television and FM broadcast signals at VHF and UHF. The club publishes a monthly newsletter, along with regularly updated TV station and Mexican FM radio guides. It also maintains e-mail reflectors for general FM/TV DX discussions and tropo alerts. Visit www.anarc.org/wtfda to find out more about the benefits of WTFDA membership.

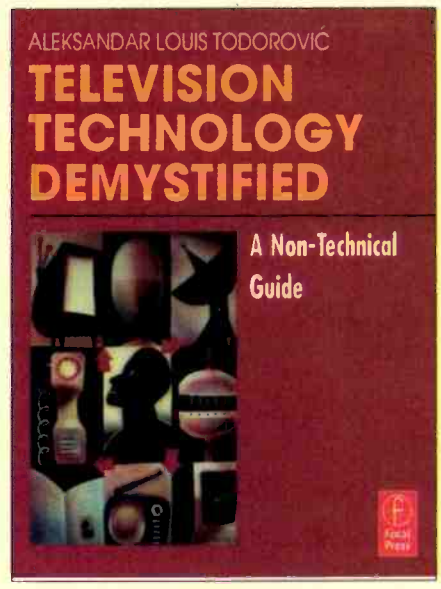
If you're an FM broadcast DXer, then you need the 20th edition of *The FM Atlas* by Bruce F. Elving, Ph.D. Yes, it contains technical information that anyone can access for free through the FCC website and other Internet databases, but the *Atlas* has more to offer. It has become an indispensable reference for DXers, with listings that include slogans and format information not found in the FCC database. More importantly, regional maps show the locations of every radio station, so when a tropo or *Es* opening to a specific area is in progress you've got an instant list of potential targets. New to the 20th edition is the inclusion of LPFM listings. *The FM Atlas* is available through DX clubs and the folks at Universal Radio (www.universal-radio.com); visit http://home.aol.com/fmatlas to learn more.

Did you know that the National Television System Committee was the first to establish a standard for color television? The United States was indeed the first to adopt the newly defined color TV standard—the NTSC standard—in 1954. NTSC then became the standard throughout much of the Americas. However, mainly because of economic reasons, Europe and the rest of the world lagged far behind in the introduction of color television.

Of course, as would be expected for groundbreaking technology, the NTSC standard wasn't perfect. One particular problem with the NTSC standard resulted in inconsistent hue because of accumulated phase distortions along the signal path from transmitter to receiver. NTSC became known as the acronym for "Never Twice the Same Color."

Before a color standard was finally introduced overseas in the 1960s, Europe improved upon the NTSC standard by implementing a phase alternation line (PAL) system to eliminate the accumulating distortion. PAL earned the nickname "Peace At Last," as it rapidly gained acceptance as the color standard for most the world. Meanwhile decidedly different France took another approach, developing the Sequentiel Couleur a Memoire (SECAM) standard, or "Something Essentially Contrary to the American System."

The NTSC/PAL/SECAM story is only a small sample of the wealth of information contained in a new book written for non-technical professionals in the television industry. *Television*



Television Technology Demystified *is a great resource.*

Technology Demystified: A Non-Technical Guide, by Aleksandar Louis Todorovic (2006, Focal Press), covers it all—from the first television experiments of 1923 to the digital advances of today—with simplified explanations of complex topics. The book includes an appendix of acronyms and abbreviations that makes a good quick reference to technical jargon. *Demystified* is informative and interesting reading, recommended for students, professionals, and curious radio hobbyists.

FCC CALLSIGN CHANGES

Pending

New Call	Location	Freq.	Old Call
WSRC	Fair Bluff, NC	1480	WZFB
WSTL	Providence, RI	1220	WRIB
WGPB	Rome, GA	97.7	WKCX
KISY	Twin Falls, ID	102.1	KISI
KXMP	Victor, ID	103.7	KKTN
KYPT	Victor, ID	92.3	KMQS
WVEI-FM	Pittsfield, MA	105.5	WBEC-FM
WTWS	Harrison, MI	92.1	WVXH
WMLQ	Manistee, MI	97.7	WVXM
WIGO	White Stone, VA	104.9	WNDJ
KSHF	Newcastle, WY	99.5	KRKI

Changes

New Call	Location	Freq.	Old Call
WHIY	Huntsville, AL	1600	WEUV
WEUV	Moulton, AL	1190	WHIY
KYOL	Littleton, CO	1510	KCUV
WDSP	De Funiak Springs, FL	1280	WGTX
WVVM	Dry Branch, GA	1670	WMWR
WIFE	Connersville, IN	1580	WCNB
WWLV	South Bend, IN	1620	WHLY
WUBR	Baton Rouge, LA	910	WNDC
WUPE	Pittsfield, MA	1110	WUHN
WDRJ	Inkster, MI	1440	WMKM
WZFN	Dilworth, MN	1100	New
WVBG	Vicksburg, MS	1490	WRTM
KQYS	Neosho, MO	1420	KBTN
KDAN	Beatty, NV	1240	New
WGAM	Nashua, NH	900	WSNH
WTKU	Pleasantville, NJ	1490	WUSS
KUCU	Farmington, NM	1060/1090	New
WRJD	Durham, NC	1410	WSRC
KDKT	Beulah, ND	1410	KHOL
KKAG	Fargo, ND	740	New
WDNT	Dayton, TN	1280	WALV
WLAY-FM	Russellville, AL	103.5	WJOR-FM
WVNN-FM	Trinity, AL	92.5	WWXQ
WQRV	Tuscumbia, AL	100.3	WLAY-FM
KZND-FM	Houston, AK	94.7	KADX
KHZK	Kotzebue, AK	103.9	New
KHZF	Fagaitua, AS	103.1	New
KZAI	Coolidge, AZ	89.9	KCOO
KGPS-LP	Kingman, AZ	97.1	New
KFSZ	Munds Park, AZ	106.1	New
KXRL	Cherry Valley, AR	90.1	New
KEAF	Fort Smith, AR	90.7	New
KXLW	Avalon, CA	88.7	KISL
KSOJ-LP	Banning, CA	103.5	New
KXBC	Garberville, CA	89.1	New
KVUH	Laytonville, CA	88.5	KVFR
KMVE	Mojave, CA	96.1	New
KKLC	Mt. Shasta, CA	107.9	KMJC-FM
KMHX	Rohnert Park, CA	104.9	KRPQ
KCFM-LP	San Bernardino, CA	105.5	New
KRVC	Santa Maria, CA	90.7	KGDP-FM
KXRD	Victorville, CA	89.5	KVXT
KNJR-LP	Westlake Village, CA	107.9	New
KJOR	Windsor, CA	104.1	KMHX
KLRD	Yucaipa, CA	90.1	KVXF
KSYY-FM	Bennett, CO	107.1	KSIR-FM
KKGN	Eaton, CO	88.9	KLCQ
KWDI	Idalia, CO	94.1	New
KTNI-FM	Strasburg, CO	101.5	KBRU-FM
WCTZ	Stamford, CT	96.7	WKHL
WTHP	Gibson, GA	94.3	New
WSGA	Hinesville, GA	92.3	WSSJ
WTHG	Hinesville, GA	104.7	WSGA
WSSJ	Statesboro,, GA	100.1	WMZD
KXRG-LP	Honolulu, HI	101.1	New
KSNA	Rexburg, ID	94.3	KADQ-FM
WKJD	Columbus, IN	90.3	New
WIFE-FM	Connersville, IN	100.3	WIFE
WOZW	Goshen, IN	97.7	WZOW
WWDL	Lebanon, IN	91.5	New
WZOW	New Carlisle, IN	102.3	WOZW
WARA	New Washington, IN	88.3	WSOH
WWDN	New Whiteland, IN	88.3	New
WWPO-LP	Oakland City, IN	94.1	WOCU-LP
KDMU	Bloomfield, IA	106.9	KOJY
KWDN	Newell, IA	100.9	New
KZLN	Patterson, IA	105.9	New
KAIP	Wapello, IA	88.9	KLRX
KIBB	Augusta, KS	100.5	KPLN
KYFA	Manhattan, KS	88.7	New
WLAI	Danville, KY	107.1	WHIR-FM
WLPP	Shelbyville, KY	101.7	WXTF
WBRJ-LP	Baton Rouge, LA	105.7	New
KFLO-FM	Blanchard, LA	89.1	KOUZ
WBKL	Clinton, LA	92.7	WQCK
WFQR	Harwich Port, MA	93.5	WDVT
WFRQ	Mashpee, MA	101.1	WTWV
WUPE-FM	Pittsfield, MA	95.9	WUPE
WVBG-FM	Redwood, MS	105.5	WVBG
WIVG	Tunica, MS	96.1	WYYL
KHZA	Bunker, MO	106.3	New
KFRD	Butte, MT	88.9	KNFR
KFRT	Butte, MT	88.1	KFRD
KJLF	Butte, MT	90.5	New
KWDE	Eureka, MT	93.5	New
KPBR	Joliet, MT	105.9	New
KPLN	Lockwood, MT	106.7	KZLN
KYJK	Missoula, MT	105.9	KKNS-FM
KHZS	St. Regis ,MT	99.1	New
KWDV	Valier, MT	105.7	New
KHZY	Overton, NE	99.3	New
KHZZ	Sargent, NE	92.1	New
WTKU-FM	Ocean City,, NJ	98.3	WUSS
KQEL	Alamogordo, NM	107.9	KKBO
KQAI	Roswell, NM	89.1	KRSR
WKUV	Brockport, NY	104.9	WMJQ

designed for FM, VHF, and UHF reception. Antenna Performance Specialties' (www.antennaperformance. com) Yagi antennas are DXer favorites. The antenna lead-in cable is important too. Invest in high-quality low-loss coax or twin-lead. Of course, if you're in an apartment building or community with antenna restrictions, then indoor antennas will be the best course of action.

A phased array of two antennas will really pull in signals by further reducing interference from unwanted stations. A simple phasing unit can be assembled from parts that can probably be found in your electronics junk box. It consists of a tuning capacitor in series with one antenna to provide some phase shift adjustment, and a balance potentiometer with the clockwise leg connected to one antenna lead-in, the counterclockwise leg to the other antenna, and the wiper to the receiver. The assembly should be housed in a metal chassis with proper lead-in connectors and control knobs to minimize "hand coupling" during operation. Experimentation with phasing various antennas will be required to get a feel for what works best under different conditions.

The Bolin Phase Box is a more elaborate design that will easily handle a full 360 degrees of unidirectional beam steering using almost any combination of antennas. Although it isn't available commercially, an Internet search for "Bolin phase box" will produce a number of hits including home-brew sources for fully assembled units.

Vintage Receivers

FM DXers are hooked on vintage receivers. At the top echelon is the Burmester 978 with wide and narrow filter selections, superior sound, and a price tag approaching $15,000 for the professional-grade model. On a more practical scale, the Yamaha T-85 is considered one of the best consumer-grade receivers ever manufactured, featuring four bandwidth settings and reasonably priced at $300 to $500 on the used market.

Onkyo has long been quite a favorite of audiophiles and DXers. The Onkyo T-9090 is a popular FM DX receiver, selling in the range of $500 to $800. The Eton/Grundig model S350 general coverage communications portable is a good entry-level performer on FM, coming in at just under $100. The GE Superadio portable, although hampered by a poorly calibrated analog tuning dial, is another DXer favorite.

If you're seriously considering an investment in a new or used receiver, keep in mind that FM is currently in transition from analog to digital audio broadcasting (DAB) with the advent of HD radio. During the transition phase, FM radio stations are broadcasting simultaneously in analog and digital through what is called the hybrid mode of operation (see last month's "Broadcast Technology") Eventually, conversion to an all-digital mode will make analog FM receivers obsolete, but a timetable for completing such a transition to digital radio is yet to be determined. So don't anticipate analog to be phased out anytime in the near future.

Whether it's a vintage or modern receiver, narrow IF filtering is critical. The filtering in most off-the-shelf FM receivers is 200 kHz wide, which is fine for reception of local signals, but too wide

FCC CALLSIGN CHANGES (Continued)

New Call	Location	Freq.	Old Call	New Call	Location	Freq.	Old Call
WSPH-LP	Ellenville, NY	93.7	New	WALV-FM	Dayton, TN	104.9	WDNT-FM
WGMY	Montgomery, NY	88.1	New	WMXV	St. Joseph, TN	101.5	WJOR-FM
KLRX	Jamestown, ND	88.9	KLJA	KWDC	Coahoma, TX	105.5	New
KCVD	New England, ND	95.7	New	KYFB	Denison, TX	91.5	New
KCVF	Sarles, ND	105.9	New	KEZB	Edna, TX	96.1	KGUL
WWOC-LP	Bowling Green, OH	97.7	New	KHCF	Fredericksburg, TX	91.5	New
WCRC-LP	Columbus, OH	102.1	New	KMLR	Gonzales, TX	106.3	KQQT
WCRS-LP	Columbus, OH	102.1	New	KZAR	Gonzales, TX	88.1	KITG
WCRX-LP	Columbus, OH	88.1	New	KTWL	Hempstead, TX	105.3	KEZB
WORI	Delhi Hills, OH	90.1	WJYC	KYLR	Hutto, TX	92.1	KQJZ
WCRG-LP	Groveport, OH	90.7	New	KGGB	Yorktown, TX	96.3	New
WEKV	South Webster, OH	94.9	WSNA	KMMG	Benton City, WA	96.7	KZTB
KDOE	Antlers, OK	102.3	New	KWEW-LP	Wenatchee ,,WA	96.3	New
KWEY-FM	Clinton, OK	95.5	KQMX	WMGA	Kenova, WV	97.9	WDNQ
KYAL-FM	Muskogee, OK	97.1	KMMY	WDKV	Fond du Lac,, WI	91.7	WLWR
KQSO-LP	Dayton, OR	96.3	New	WPHF-LP	Menomonie, WI	105.3	New
KQRZ-LP	Hillsboro, OR	96.3	New	WZBY	Sturgeon Bay, WI	99.7	WLYD
KZTB	Milton-Freewater, OR	97.9	KHTO	KZDR	Cheyenne, WY	93.7	KSHF
KWDP	Prineville, OR	98.9	New	KWHO	Chugwater ,WY	99.5	KCUG
KUJJ	Weston, OR	101.9	KMMG	KADQ-FM	Evanston, WY	98.3	KSNA
WFKB	Boyertown, PA	107.5	WBYN-FM	KNXT-TV	Visalia, CA	49	KDFE-TV
WRKW	Ebensburg, PA	99.1	WYOT	WSBS-TV	Key West, FL	22	WDLP-TV
WYOT	Johnstown, PA	92.1	WRKW	KSCW	Wichita ,KS	33	KWCV
WSGY	Mount Union, PA	106.3	WWLY	WPCW	Jeannette, PA	19	WNPA
WOYE	Rio Grande, PR	97.3	WDGT	KWWT	Odessa, TX	30	KPXK
WIDI	Quebradillas, PR	98.3	WOYE	KCWX	Fredericksburg, TX	2	KBEJ
WHHD	Clearwater, SC	98.3	WSLT				
WSAA	Benton, TN	93.1	WOCE				
WCVD-LP	Cordova, TN	106.7	New				

for DXing between the locals. The 110-kHz Murata filters are the preferred upgrade of FM DXers, in many cases available as direct replacements for wide filters, making installation easy for do-it-yourselfers. An Internet search will locate multiple sources for Murata filters, as well as repair shops that can perform modifications for DXers who aren't too handy with a soldering iron.

Digital Changes

While the transition to digital *radio* remains open, the end of the transition period for digital *television* draws near. The U.S. Senate Commerce Committee has set April 7, 2009, as the cutoff date for analog television, when all analog television transmissions will cease. The Digital Transition and Public Safety Act of 2005 requires that all television stations convert to digital. The process includes reassignment of channels, which will free up spectrum. Most notably UHF Channels 60 through 69 will be shut down. While some of the opened spectrum will be reserved for public safety, much of it will be auctioned to produce needed revenue for the federal government. The auction process is set to begin in 2008. An FCC Report and Order further requires that every new television receiver sold in the U.S. be equipped to receive digital as of March 1, 2007.

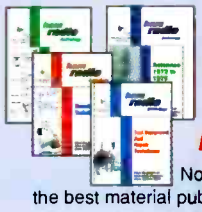
A public awareness campaign will be initiated to inform citizens about the changes. In the meantime millions of analog receivers won't become obsolete overnight. Hearkening back to the 1950s, when UHF converter boxes allowed the new channels to be viewed on older VHF-only receivers, digital converter boxes are available to keep analog receivers in service. In addition, the Digital Transition Act proposes government subsidies for digital-to-analog converters, perhaps in the form of tax breaks for manufacturers and consumers. So if you've already invested in a converter, save the receipt just in case.

TV DXers are just beginning to discover the magic of digital TV. One distinct advantage is that when a digital TV signal is locked in, the picture is crystal clear, unlike analog TV DX, which often suffers from interference that creates a granular image referred to as "snow." Clear digital TV signals have been logged over 1,000 miles. Maintaining a lock on a digital signal can be difficult though, as changing weather conditions cause significant fluctuations in signal strength.

FM DXers may not be as lucky with long distance reception of in-band on-channel digital radio because of its wide bandwidth. But that doesn't mean they shouldn't try!

How Did You Do?

Put this month's tips to good use and be sure to let us know about your FM/TV DX achievements. Photos of TV DX as well as written accounts are always welcome. 73 and Good DX to you! See you again next month. ■



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First Ladies Of The Air

A Special Tribute: In 1900 One Third Of The Telegraphers Were Women, But Who Was First?

By R.B. Sturtevant, KD7KTS

We do not know, and probably never will, who was the first woman to transmit over a "wireless set." This is because before 1912 nobody was licensing or keeping records of who was using radio to communicate.

We *do* know, however, that a great number of women had been working as telegraphers since before the Civil War. It's estimated that as many as a *third* of telegraphers in 1900 were women. So there was never a shortage of women who were able to sit at the key. We also know that the first woman wireless operator was stepping outside the realm of what that post-Victorian society considered "appropriate ladylike behavior." In fact, as late as 1920 *Radio Amateur News* published and article by an anonymous radio operator who refused to give her name or callsign.

Trailblazers

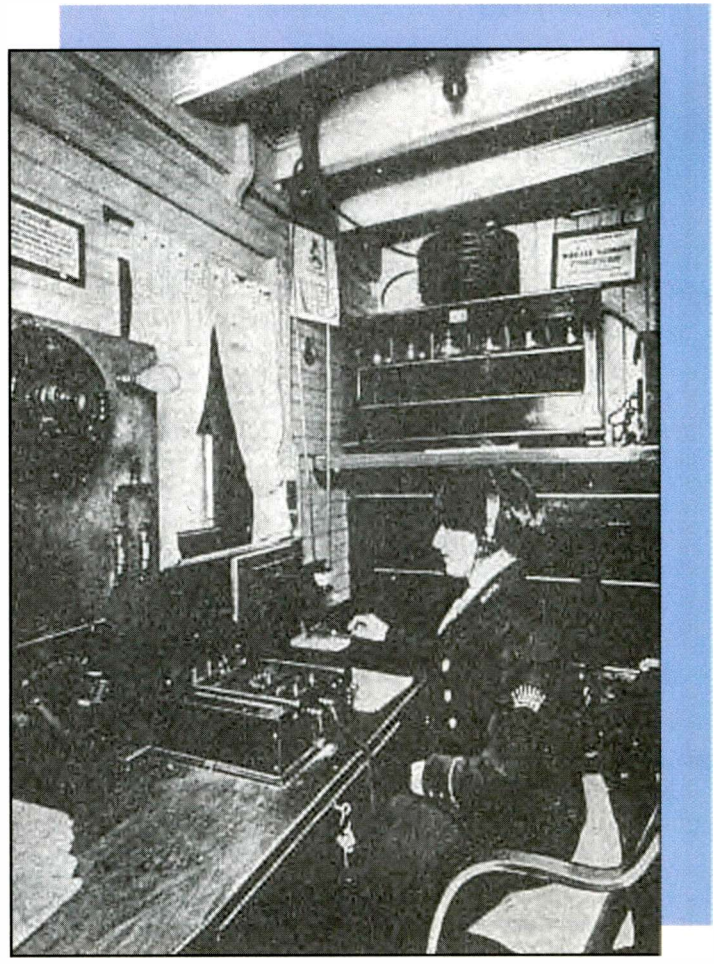
Among the first women of radio was Graynella Packer who, after working at a shore station in Sanford, Florida, for two years, shipped out aboard the steamship *S.S. Mohawk*. Credited with being the first female wireless operator to go to sea, Packer served from November 1910 until April 1911.

Another, a Boston lady whose name is not recorded, is said to have applied for a job as a wireless operator aboard a ship but was told that it could not possibly hire her. After the sinking of the *Titanic*, ships were required to carry two radio operators. The ship she applied to already had one male wireless operator, with whom they were very happy, and all wireless men bunked together. Not to be put off by mere company policy, the lady simply married the current wireless operator and the couple spent their honeymoon at sea.

A Proper Lady!

It was extremely difficult for a proper lady to get the training needed to work as a wireless operator. Because most ships, or houses for that matter, didn't have AC current running everywhere, she needed to learn about small engines that drove generators, as well as the generators themselves. Morse was required, of course, as was construction and maintenance of the set, the building of antennas (no simple feat in that primitive day), the handling of atmospheric electricity, and a myriad of other things we today take for granted.

The real problem, of course, was that many men didn't take them seriously. One woman, inspired by Miss Packer, applied for a job with a steamship company and was told that one of her duties would be a daily climb into the ship's rigging to grease the antenna wires so the signal could "shove off" faster. Left-handed Monkey Wrench jokes aside, it was difficult in those days for a "nice girl" to walk up to a radio operator and say, "Can I have a look at your apparatus."



Graynella Packer aboard the S.S. Mohawk. (Photo courtesy Radio Amateur News, March 1920)

Sixteen In 1916

Nevertheless, determined and virtuous women did overcome these obstacles. In 1916 *Electronic Experimenter* did a feature article on then 16-year-old Kathleen Parkin who had a license from the Department of Commerce since 15, and who had built and was operating her own station. She pushed a 1/4-kW signal using the callsign 6SO and was a strong advocate of radio. And she had no problem with telling errant operators what was what. Morse code did hide the fact that she was a 16-year-old girl, but she did what needed to be done. Kathleen even set up

The 15-year-old Kathleen Parkin, Expert Radio Operator, made her own equipment (Photo courtesy Radio Amateur News, March 1920)

a wireless station in San Rafael, California's Dominican College to help instruct physics classes where she attended high school.

Yonkers Woman Was Self Taught

One of the most focused amateur operators of this period would have to be Mrs. Alexander MacKenzie. A member of the New York State Women's Suffrage Party, this Yonkers woman had her son install a wireless setup in her home with an antenna on the roof. She had taught herself to send and receive messages to a limited extent. During the summer of 1915 she would fire up her station three times a day and send out the message, "VOTES FOR WOMEN." Her signal carried 400 miles and her replies ranged from GOOD FOR YOU OLD LADY and WE ARE WITH YOU to OH, PIFFLE and some that would not be appropriate for a refined magazine like this one. Mrs. MacKenzie answered all comers with a Morse code speech on how she had grown old waiting for the right to vote.

On election night in 1916, when American men were re-electing Woodrow Wilson, the Suffragettes held a 24-hour demonstration in Yonkers' Mansion Square. Above the speakers' platform a wireless station was set up to receive messages from various celebrities and prominent suffragettes. Mrs. MacKenzie was there at her key. One can only hope that she was still at a key to send out the word in 1920 that she cast her first vote.

By 1916 wireless instruction was being included in studies at girl's camps and business schools, including the famous Hunter College. It seems that women were finding jobs working for large department stores. In a day that knew little about long-distance telephone calls, radio got the orders out.

Soon enough, however, maritime laws would *exclude* women from serving as radio operators on seagoing vessels. Nevertheless, when Hudson Navigation Company announced that radios would be installed on their largest vessels on the Hudson River passenger service, women radio operators figured prominently in their plans. And, of course, ladies serving at shore stations for the merchant marine were not affected by maritime law.

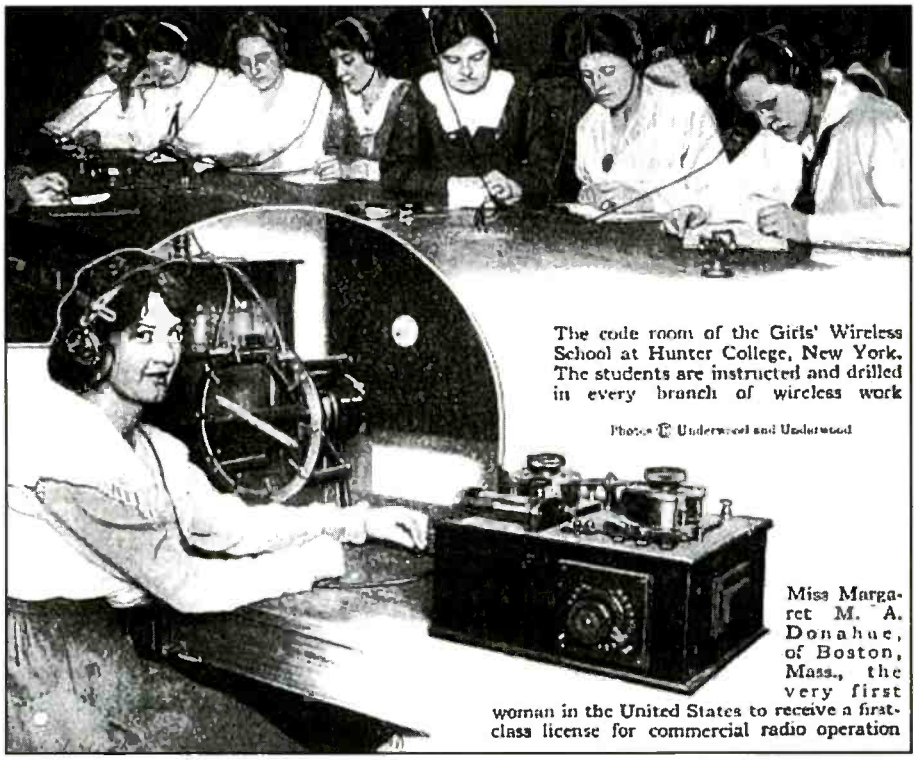
Amateurs?

So, what did a woman have to do to get an amateur license? Same as anyone else back then, of course. They had to apprentice themselves to another amateur and show two years of good operation. At that point a *provisional* license was issued. If a Department of Commerce Radio Division inspector came by they could have their license upgraded, but it was not required. Licenses were renewable without charge after two years.

If a person, male or female, wanted a first grade amateur or first grade commercial license he or she had to go to one of 10 Department of Commerce radio inspectors offices: Washington D.C., four others on the east coast, Chicago, Detroit, New Orleans, Seattle, or San Francisco. The applicant was then given a two-hour exam that included a Morse code test, requiring sending and receiving at 12 words per minute. Drawing a diagram of a transmitter was required, as was giving an accurate description of a radio station hook-up.

The difference between a first and second class amateur license was an inspection of the transmitter and receiver used by the amateur. Without the inspection, a second class license was issued. Margaret

Some of the patriotic young women studying radio telegraphy at a summer preparedness camp. (Photo courtesy The Electrical Experimenter, October 1916)



The magazine called it "a preparedness move in the right direction" as these "feminine radio operators" copied messages as they arrived.(Photo courtesy The Electrical Experimenter, October 1916)

M.A. Donahue was the first woman to earn a Commercial license.

Pioneering Patriots

As World War I loomed on the horizon, women, like everyone else, looked for ways to do their patriotic bit. Many joined the Naval Reserve and served on shore stations as radio operators. They usually handled messages like, "TESTING GOING ON 43K CALLING 96E. LOUD 500 CYCLE NOTE JAMMING. CONFIRM." But they were on the air and doing their part.

At the beginning of the war, the Department of Commerce sealed all civilian radio transmitters. The only radio frequencies being used were reserved for the Army's Signal Corps or the Navy. Many of those military transmitting stations were "manned" by women. Their work may have been mundane, even dull, but they had the satisfaction of freeing a brother radio operator for duty at sea or in combat. To paraphrase the poet: They also serve who only stay at home and monitor the frequencies. ■

by Richard Fisher, KI6SN

Capitol Hill And FCC Actions Affecting Communications

Settle Dispute Off The Air, FCC Tells Texas Radio Operators

Four Texas radio amateurs have been advised by the FCC to take an "ongoing dispute" off the air or face enforcement action. According to the American Radio Relay League's *ARRL Letter*, Riley Hollingsworth, Special Counsel in the FCC Enforcement Bureau, in February sent warning letters to Luis A. Caraballo, N7PLC, and Sharon E. Millhouse, KC5PRX, both of Floresville, Texas; and to Thomas O. Caldwell, WD5GXH, and Gary Sheets, WD5FWP, both of San Antonio. Hollingsworth said the dispute has "led to allegations of slander and deliberate interference" on the amateur bands, as reported in the *ARRL Letter*.

"The Commission is not concerned with the merits, or lack thereof, of any dispute between you or of how you settle such disputes," Hollingsworth wrote, "but any use of amateur frequencies to carry on the dispute is contrary to Section 97.1 of the rules and will lead to enforcement action against the licenses of each of you."

The disagreement among the four radio amateurs has been going on for several years, eventually spilling over onto 2 meters, Hollingsworth told the ARRL. FCC efforts to resolve the dispute have been unsuccessful, he said. "It's degrading the Amateur Service."

Sanctions could include license revocation or suspension as well as fines of up to $10,000, Hollingsworth warned. "We may also consider proceedings to restrict or remove the voice privileges of your licenses," he said. "This is the last warning you will receive before enforcement action is initiated."

In early April, Hollingsworth said he'd gotten responses from all but one of the individuals who received his letters, but only one reply was in writing. In a handwritten note, Sheets pledged to amend his attitude and practices, the ARRL reported. Hollingsworth said he was awaiting written responses from the other three recipients.

FCC Asks Radio Amateur To Give Up License For Two Years

A Corte Madera, California amateur radio operator has been offered a deal by the FCC to give up his license for two years in exchange for avoiding possible revocation of his license, fines of $7,500 to $10,000, or both. Steve L. Wingate, KG6TXH, had not yet accepted the deal, "but he did request copies of recordings that accompanied complaints of his most recent alleged on-air behavior," according to the *ARRL Letter* in March.

The FCC was responding to allegations against Wingate of deliberate interference. "The Enforcement Bureau has continued to receive complaints about the operation of your station since January 2005," wrote Special Counsel Riley Hollingsworth. While conceding that not all the complaints were valid or recordings genuine, Hollingsworth said evidence the FCC determined was legitimate showed a pattern of similar alleged violations "for which you were warned twice, and for which you twice gave assurances of future compliance."

Wingate's responses to FCC letters coupled with continued complaints, including recordings, and telephone conversations between the FCC and Wingate, "indicate that by your own admission you have a serious problem with an impairment that prevents you from maintaining control over your station," Hollingsworth continued, according to the ARRL.

If Wingate declines the FCC's offer, Hollingsworth said the Commission would proceed with enforcement action against his amateur extra class license.

Canadian Company To Develop Radio Platforms For Lockheed

A contract for three flexComm SDR-3000 software-defined radio (SDR) platforms and related engineering services to Lockheed Martin for research, development, and prototyping of advanced satellite communications applications was announced by Spectrum Signal Processing Inc., in March. "These applications will offer improved performance under stressing channel conditions and are designed for future net-centric space systems that will support Defense Department and other government organizations," the Canada-based company said.

"The SDR-3000 is the only high performance commercial-off-the-shelf platform of its kind designed specifically for communications applications," said Pascal Spothelfer, Spectrum's President and CEO. "The addition of Spectrum's application engineering services will further help accelerate Lockheed's development and deployment of transformational communication systems."

APCO Applauds Formation Of New FCC Bureau

The formation of the Public Safety and Homeland Security Bureau by the FCC has been endorsed by the Association of Public-Safety Communications Officials (APCO) International. "APCO International supports the creation of this new bureau to focus attention on the needs of public safety," APCO International President Wanda McCarley said in an announcement on the organization's website. "We look forward to working with the FCC on the details of the transition to the new bureau."

The FCC adopted the proposal to create the new bureau at its open commission meeting on March 17, 2006.

Panel Assembled For National Emergency Response

Thirteen radio amateurs have been named to serve on the American Radio Relay League's National Emergency Response Planning Committee, the League announced in March. The committee was formed in early 2006 to "appropriately prepare for future large-scale disasters." The team will develop disaster response strategies for regional, national, and international events. The committee formation was one of the first acts of new ARRL President Joel Harrison, W5ZN. "ARRL First Vice President Kay Craigie, N3KN, will chair the ad hoc committee," the ARRL announced.

Appointed to the committee were Henry Leggette, WD4Q; Andy Oppel, N6AJO; Tom Abernethy, W3TOM; Greg Sarratt, W4OZK; Ed Bruette, N7NVP; Jerry Reimer, KK5CA; Jeff Beals, WA4AW; Tom Carrubba, KA2D; Karl Bullock, WA5TMC; Gene McGahey, AL7GQ; Rick Palm, K1CE; and Dave Patton, NN1N.

Craigie said one of the committee's "principal tasks is to help ARES (Amateur Radio Emergency Service) evolve to be able to respond effectively to disasters that overwhelm the resources" of a single region. Now, ARES is structured along lines defined by sections created by the ARRL around the country. There is no structure beyond the section level at this time.

by Gordon West, WB6NOA, WB6NOA@arrl.net

Wireless Marine VHF Mic Control For Uniden Radios

While it's pretty common knowledge that a VHF marine radio doesn't have to be FCC licensed if used locally in U.S. waters (and no operator license is required either for domestic use of marine VHF), this "no license" operating authority does *not* mean that anything goes on the marine VHF 156-MHz band. The FCC is quick to prosecute marine VHF handheld users working their equipment on shore.

A year ago one prominent marine VHF manufacturer was advertising handheld radios, sold in blister-pack pairs, as ideal for "hunting and fishing." The company soon changed its ad to read, "...between fishermen aboard boats on the water!" And, except for the relatively complicated and expensive process of licensing a marine VHF shore station or marine utility station on shore, shore-side operators were not allowed to carry their 25-watt marine VHF back to their lakeside cabin to transmit from shore to ship.

Uniden's Approach

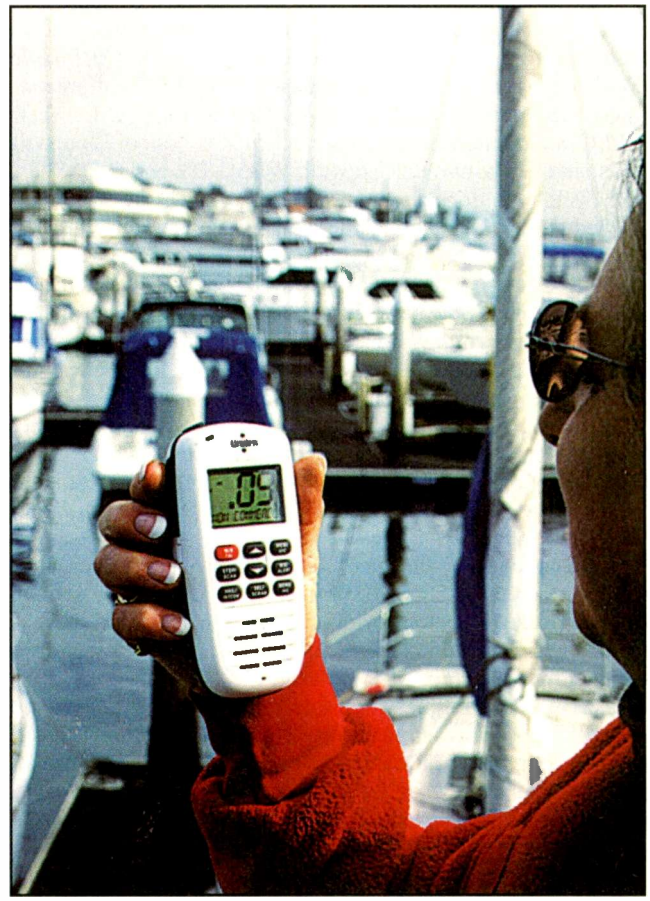
Let's take a look at the band itself, and from there see what another manufacturer, Uniden, has done to help us out. The marine VHF radio band begins with VHF Channel 1"A" at 156.050 MHz and extends up to marine VHF channel 88"A" at 157.425 MHz. A 4.6-MHz up-duplex split around 162 MHz is authorized for public correspondence shore stations. VHF Channel 16 156.800 MHz, the worldwide distress channel, along with VHF channel 22"A" 157.100 MHz, works as a liaison channel between commercial and recreational vessels to U.S. Coast Guard stations. (The designator "A" on some marine VHF channels indicates U.S. operators using simplex on this frequency, rather than the 4.6-MHz duplex found in Europe. Any VHF marine channel without an "A" is simplex worldwide).

Uniden now bridges the shore-to-ship gap with an FCC-approved 2.4-GHz wireless microphone which *completely* controls its 25-watt marine VHF radios equipped to offer "WHAM" (a wireless microphone for Uniden Oceanus/Polaris marine radios), compatibility for full-function, half-duplex, remote-control for Uniden marine radios.

How It Works

Here's how it might work for a lakeside marine rescue or tow boat group. Say each watercraft has a permanently installed 25-watt VHF on board, and one boat is selected to have the step-up Uniden marine radio with a 9-dB gain maximum-range VHF antenna system also on board. Radio operators now have full control of this marine VHF system, anywhere on or around the vessel, including *ON SHORE*!

"Up to four wireless microphones can control the marine VHF radio, and you can also intercom from one wireless handset to another, or have one master microphone do a group call to all others in the system," explains Todd Crocker, vice president of the Marine Division at Uniden. He points out that you can even communicate over the wireless microphones using VOX and a headset, giving you hands-free talk and listen, as if you were aboard the boat right at the coiled microphone.



The 2.4-GHz remote mic signaled over 600 feet across the channel!

"The 2.4-GHz wireless microphone allows full function control of the marine radio, including volume, squelch, channel changing, and even a digital selective call emergency distress message, too," adds Crocker, explaining the benefits of this technology at a recent boat show.

Anything that you can do on the Uniden 25-watt VHF marine radio can mostly be done with any one of four wireless WHAM microphones. Only the initial maritime mobile service identity setup needs to be accomplished on the face of the radio itself.

Now let's say you're working around the marina and a distant vessel calls your specific ship station. You can respond to that distant station's call, and switch them over to an appro-

The radio can take up to four "WHAM" 2.4-GHz microphones.

priate working channel, all with your wireless remote mic. The other station hears you loud and clear from your 25-watt ship station installation, tied into that 9-dB gain VHF antenna on board. You likewise hear the distant station loud and clear, even though its signal is nearly inaudible to a marine VHF handheld up at the marina office. Keep in mind that it would not be legal to transmit from shore to ship without a special coast station shore license. But using the wireless 2.4-GHz mic, shore use is 100 percent legal to that 25-watt, fixed-mount, marine VHF transceiver aboard the boat.

How Far?

So what's the range between the wireless microphones to the ship down at the dock? Could you drive into town and still have comms? Not a chance! How about a half mile away? Not a chance! How close do you need to be to the associated ship station and its small 2.4-GHz extended-range antenna system?

Range is similar to what you would get with a 2.4-GHz cordless phone, according to Uniden. And that is exactly how this wireless microphone operates, just like their Part 15 cordless phone products where maximum range will be about 300 feet in normal conditions.

When I did some sea testing of the system down at the local marina, I did find that a well-elevated, external 2.4-GHz antenna system doubled my range to one of my waterproof, submersible, WHAM wireless microphones. I actually rowed all the way across the harbor and was still in touch with the Uniden ship station marine VHF radio system.

The 2.4-GHz antenna is built in, plus there's a provision for an external antenna (upper left jack).

How Good?

Receive audio was excellent, and transmit audio from the wireless microphone was good, though markedly "thin." What do I mean by thin? A pronounced lack of bass due to the waterproof covering of the microphone element. The wireless WHAM microphone is actually submersible to JIS-7 standards, meaning it could survive an accidental dunk if it's hanging on your belt and you step into chin-deep water. Just blow it dry and you're back on the air!

How Useful?

The new 2.4-GHz Uniden wireless microphones work with the Uniden UM525 and UM625 marine VHF transceivers with imbedded 2.4-GHz circuitry. These same radios are backward compatible with the older Uniden 900-MHz microphone systems, but the older Uniden marine transceivers are not upward compatible to the new 2.4-GHz system. This is because the two new Uniden 25-watt marine VHF transceivers have the 2.4-GHz electronics and external antenna port built-in.

So if you need portability and legality to talk from shore-side through marine VHF radio frequencies, and don't require any more wireless microphone range than you would get with a 2.4-GHz cordless telephone, Uniden has you covered! Check it out at www.uniden.com. ■

by Kirk Kleinschmidt, NTØZ, kirk@cloudnet.com

Dirty, Rotten Interference—And What To Do About It!

Now that I live in a downtown commercial building, whenever I get on 6 meters and swing my pathetic little Yagi in a southeasterly direction—the most likely to produce DX on a hot summer day in Minnesota—I hear a deafening buzz on the sweet part of the band. It's no doubt due to the ancient power line that's only 10 feet away, at the same height as the Yagi, which is about 35 feet above the ground. Some insulator up or down that line is abuzz with dirt, an untimely crack, or whatever. Or maybe it's the air conditioning unit atop the adjacent building. Whatever it is, it almost never lets up. At my QTH, 6 meters isn't open all that much these days, and when it is, the locally generated noise is a real killer.

I can take some small consolation in the fact that I'm not alone. Modern hams are surrounded by RF devices and electronic gadgets that all seem to be waiting to pounce when it comes to radio interference. And all that stuff doesn't even begin to include the somewhat humorous fact that, as hams, we even interfere with ourselves!

Most interference issues can be solved or minimized. Running low power is an excellent first step if you're interfering with other electronic stuff. If interference is really ruining your day, check out a recent edition of *The ARRL RFI Book*. This BIG reference is a comprehensive resource for fixing every imaginable interference problem in your home or mobile shack. Check your local library or pay the few bucks required to get your own copy. You'll use it during your entire ham radio career (fortunately or otherwise, interference doesn't change too much, and neither do the techniques required to resolve interference issues).

Who's Responsible?

When interference rears its ugly head, who's to blame, anyway? And who's responsible for cleaning up the mess? The answers are varied. Before we examine specific solutions, let's look a few interesting RFI facts.

Hams must operate their transmitters in accordance with all appropriate FCC regulations. Make sure your station equipment is properly installed, has a good RF ground, uses a good low-pass filter at the station output, etc.

Hams are not required to help their neighbors with RFI complaints that do not involve their transmissions (although they may elect to do so).

The FCC considers telephones, VCRs, alarm systems, CD players, audio amplifiers (etc.) that receive RFI to be *improperly functioning* as radio receivers. These design inadequacies are manufacturer issues (despite what your neighbors may say!).

The RFI susceptibility of consumer electronic devices is limited only by the manufacturers' voluntary compliance with committee-developed standards. The voluntary standards do not address operating the equipment in close proximity to powerful transmitters. Transmitter operators are not responsible for RFI in such situations.

Described by some hams as a "lucky rabbit's foot" for RF, having a low-pass filter at the business end of your HF station can sometimes keep harmonics of your signal out of nearby TVs, wireless Internet transceivers, etc. MFJ's Model 704, shown here, has been praised for its effectiveness, and the price is right: less than $50. Check it out, along with its 200-watt little brother, at www.mfjenterprises.com.

In general, equipment owners are responsible for proper operation of their equipment. As an example, if your neighbors experience RFI from your properly licensed, engineered, and operated ham station, they are responsible for any corrective measures.

FCC regulations require that ham transmitters not emit *spurious signals* that interfere with other *radio services*. This is the ham operator's sole *regulatory requirement*, and it doesn't apply to interference to non-radio consumer devices.

My downtown neighbor, who runs a wireless Internet service, was eying my new horizontal loop antenna (on top of my building) suspiciously one day, when he actually got up the nerve to warn me about interfering with his commercial Internet system. Imagine his surprise when I showed him how, as a licensed ham, I was actually the primary allocated user of his system's 2.4-GHz frequencies, and that I could "interfere" with his unlicensed setup all day long, while he couldn't legally "interfere" with my 2.4-GHz activity in ANY way, lest he be promptly ordered to cease transmitting by the FCC!

Of course, I wasn't actually operating at 2.4 GHz, and I didn't bother scaring him half to death by mentioning that I can run 1500 watts there, should I uncover such a need! The moral of the story: It's often good to be the licensed, primary spectrum user!

From a purely regulatory perspective, we're on pretty solid ground. If our stations are properly engineered, interference is mostly *their* problem, not *ours*. But in the real world we'll

probably have to (or want to) be more accommodating.

First Steps

The first step in resolving RFI problems is to be sure that your transmitter *is* the cause. After all, some other transmitter or RF noise source may be the problem. No matter what the specific interference, perform a few tests to see what bands, modes, and power levels are involved.

Most RFI problems aren't mode sensitive, but they're usually power related. That's why low-power operation is the only universal RFI band-aid. Most RFI problems are also frequency related. This can help you find solutions and it gives you an opportunity to work other bands while that solution is in progress.

To start your RFI-elimination project, use good engineering practices at all times: run low power; put up the best possible antenna system (outdoor is better than indoor, higher is better than lower, etc.); provide a high-quality RF station ground (using a counterpoise tuner or "artificial ground" if it helps); and use a decent low-pass filter at your transmitter output (such a filter won't eliminate all types of RFI, but it will attenuate higher-frequency harmonics and spurious signals that might produce RFI).

Basic Tips

Remembering that this column is a mere introduction to RFI issues, there are several basic RFI categories:

• Spurious emissions (harmonics, mixing products, noise) and other unwanted signals generated by your transmitter. Reducing transmitter power and using a low-pass filter can sometimes eliminate this type of interference.

• Intermodulation and external rectification. Poor-quality electrical connections (usually outdoors); corroded joints in downspouts, antenna towers, or metal-sided buildings; bad solder joints, telephone systems and junction boxes, and a whole host of similar items can radiate RF energy and harmonics when excited by your station's RF. These problems can be frustrating and difficult to track down.

• Fundamental overload. This is the most common culprit. Your transmitted RF (from your clean, perfectly engineered station) simply overpowers the affected device. What's more, your signal might be "getting into" the affected system in a variety of ways: antenna lead-ins, speaker wires, AC line cords, ground wires, whatever.

Modus Interferus

Your RFI cures will typically be aimed at one of two main culprits: differential-mode RFI or common-mode RFI. Basically, differential-mode RFI involves a transmission line such as the coax that runs from a TV antenna to a TV receiver. If the TV antenna receives the desired TV signals and your undesired ham signal, it will pass both signals on to the TV receiver through the coax (and the ham RF will interfere with the set). If you install a high-pass filter at the TV receiver's antenna terminals—a typical differential-mode RFI cure—the filter will attenuate the lower-frequency ham RF while passing the desired TV RF.

Differential-mode cures can be simple. Unfortunately, most RFI is a common-mode problem, where the interfering signal is arriving via both conductors (the coax center conductor and the shield braid) or all conductors (antenna leads, ground leads, speaker wires, AC line cords, DC power cables, etc.). Determining specific interference modes may be necessary, as differential-mode cures won't work for common-mode problems, and vice-versa.

Common Cures

When RF from your station is adversely impacting some other device, the first step in solving the problem is determining exactly how the RF is "being received." Just because a TV set has an antenna, don't assume that the unwanted signals are getting in through the front door. Power cords, speaker wires, audio/video input and output cables and ground leads can also receive RF. Disconnecting the various "potential RFI antennas" is a good way to start the tracking process.

• TVs and VCRs. First, disconnect the coax or twinlead from the set's antenna terminals (or the antenna input on the VCR) and try a few test transmissions from your shack. If the RFI stops, you know that the problem is in the antenna side of the system and not in the power leads, speaker wires, or interconnecting cables. If the problem is being caused by harmonics of your transmitted signal or simple front-end overload (differential-mode RFI), installing a high-pass filter (available at your local Radio Shack

store) at the set's antenna input (and/or a low-pass filter at your transmitter output) may be all that's necessary.

If the interfering signal is still a problem when a high-pass filter is in-line—or if the interference is present when the antenna is disconnected—unwanted RF is entering the system through the outside of the antenna lead-in, the power cable, or some other interconnecting cable. This is usually common-mode RFI. If the set has A/V cables or speaker wires running to a stereo amplifier or other home theater components, disconnect these lines to see if the RFI situation changes. If it does, plugging them back in one at a time will often pinpoint the source of the problem.

RadioShack, your local ham radio store, and various mail-order catalogs sell ferrite cores in several shapes and sizes to help you in your plight. Cleaning up my own RFI problems required quite a few cores! Treating signal cables, coaxial antenna leads, speaker wires, and power cords for common-mode RFI requires similar measures, so don't be shy about applying them to the AC line cord, too.

To make a common-mode RFI choke, wrap a few turns of the cable, cord, or wire through an appropriately sized ferrite core as close to the chassis/connector end as practical, securing the windings with electrical tape if necessary. This will often reduce or eliminate the RFI and will let you know whether you're on the right track. Curing severe common-mode RFI may require chokes on several cables or interconnects (AC power, antenna, A/V inputs, etc.).

• Stereos and PC Sound Systems. To determine whether the radio portion of the system is experiencing problems from harmonics or front-end overload, disconnect the antenna. If the interference disappears, install a high-pass filter at the antenna terminal (50-ohm for coax, 300-ohm for twinlead).

If the RFI is still present, leave the high-pass filter in place and begin the search for common-mode culprits as described above. Disconnect cables and speaker wires and reconnect one at a time to pinpoint the trouble spot(s) and apply/wind common-mode chokes as necessary. Speaker wires are often cut to convenient lengths that happen to correspond with quarter-wave ham antenna dimensions. Lengthening or shortening the speaker leads can sometimes help eliminate or reduce RFI.

For speaker-related problems, RF signals often enter the system via the speaker leads, which conduct RF energy to diodes or transistors in the audio amplifier circuits. The solid-state devices rectify the RF and mix the distorted signal into the amplified audio chain. Adding common-mode chokes often keeps the RF from reaching the amplifier circuits.

• Telephones and related devices. The most common way to clear up RFI that's being "received" via telephone lines is to install in-line filters or common-mode chokes at the service entry, at each telephone, and sometimes in the handset lines! These filters are available from mail-order vendors, retailers, and the phone company (sometimes).

If components inside the telephone are receiving your RF directly, try reducing power and/or moving your antenna farther from the telephone. Or get a different phone.

A Winnable Battle

RFI is ham radio's "disease of civilization" and it will most likely require treatment for the duration. Boning up on the basics will stand you in good stead in the future. ■

by R.B. Sturtevant, AD7IL

Radio Fun And Going Back In Time

Q. Who was the first reporter to transmit the sounds of an active combat area?

A. Everyone, of course, remembers that Edward R. Morrow stood on the roof of a building in London to bring America the sounds of the Blitz. Morrow used a wire going from the roof to his telephone. But the first reporter to go on an offensive attack was Richard C. Hottelet, who took a wire recorder powered by two auto batteries on a B-26 Marauder. Hottelet recorded the sounds and his commentary on a bombing raid over occupied Europe.

Q. What was the United States' first nationally broadcast radio program?

A. It started in 1924 and was called the "A&P Radio Hour." Shoppers in the east will recognize the sponsor as the Atlantic and Pacific Company, or A&P, grocery chain.

Q. What is the latest thing in interior design for your radio shack?

A. Well, I'll tell you one thing that *isn't*. That's Stealth Wallpaper! Developed by a UK firm, the stuff is designed for high-security locations in the military and government that need to keep their secrets inside and out of the view of hackers and spies.

Using the same Stealth technology on radar-invisible aircraft, it's called Frequency Selective Surfaces. The stuff blocks outsiders from listening in on wireless computer nets. Not available to the public yet, it blocks all radio signals, is programmable, and will let selected frequencies through, like AM-FM radio and cell phones.

You think you're having trouble getting those hard to hear DX stations now, redo your shack in this stuff and you can take up knitting if you don't have a terrific antenna on the roof and a shielded connecting line to it. Maybe they could come up with something that *amplifies* signals next.

Q. Did radio play any part in Eastern European dissatisfaction with Communism? When did it first start to show up?

A. On June 1, 1953, riots broke out in the Skoda Industrial Works in Pilsen, Czechoslovakia, and spread quickly to other cities. Police quickly suppressed the disorder with 500 arrests.

On June 16, demonstrations in East Berlin led to 19 deaths and a general strike. The disorder quickly spread across the Eastern zone of Germany. Soviet military might put down the uprisings on June 17, leaving 125 more dead. Civil disorder, demonstrations, and riots broke out across East Germany in more than 400 places throughout the summer of 1953.

Recent research shows that Communist authorities blamed the influence of Radio in the American Sector (RIAS) from Berlin for causing the unrest that led to the first open rebellion against Soviet control of Eastern Europe. Unable to get clear instructions from the American government, RIAS wavered between calling for a full scale uprising and calling for calm. In the end, John Foster Dulles, still mired in Korea and fearing a third world war so soon after the second, called for restraint. The Soviets were forced to stop any jamming of RIAS when the station started asking the Germans and Czechs not to look for direct help from NATO and called for calming of tensions.

Q. When and where were the first major scientific studies of the ionosphere conducted.

A. Studies of the Antarctic area were conducted during the Second International Polar Year (1932–33). It was the first time that scientists searched for additional information on the ionosphere. The First International Polar Year, 1882–83, was before the ionosphere was even speculated (1902) or proven to exist (1920).

As a result of these experiments another year of scientific research was suggested by the Joint Commission on the Ionosphere with members from the International Union of Scientific Unions. They met in Brussels in 1950 and set up programs that resulted in the International Geophysical Year (July 1, 1957, to December 31, 1958). The IGY was the largest joint enterprise undertaken by scientists. From this, came much of what we knew about the ionosphere, prior to the American space program's inception. Much of the work done on the ionosphere was done with high altitude rockets. Knowledge gained through those experiments pushed forward our knowledge of rocketry as well.

Q. When our POWs were forced to make radio broadcasts by the North Vietnamese were they able to get out any information about their actual conditions?

A. Only if they were very careful. Taking advantage of the Vietnamese lack of understanding of American slang, Air Force pilot Edward Brudno was picked up by American radio monitors saying, "Thanksgiving dinner was great, just like the barf my mother-in-law used to make." Brudno was also the one who got out, "I just enjoy watching the animals wander about. They are very gross animals, like everything here, by the way." Brudno's best, however, was, "Next time you see Mrs. Johnson, the one on Lyndon Street, tell her son to keep it up with vim and vigor." Edward Brudno is a courageous man!

Looking Back...

Five Years Ago In *Pop'Comm*

Back then Ken Reiss's "ScanTech" column was called "Overheard," and yes, it was in many ways a "different" world. We were on top of things, always trying to help folks be ready...just in case. So it was with Ken's column in July 2001 in which he talked about organizing those scanner banks because you just never know when you'll need them ready to go! New was Alinco's DJ-X2T wideband receiver and Uniden's BC780XLT.

Ten Years Ago In *Pop'Comm*

The Optoelectronics ad said, "multiple radios, multiple functions." That ad was for the new Optolinx universal interface. And back then there were ads for unlocking "full 800 MHz." GPS receivers have certainly come a long way in 10 years: new was the Magellan GPS 2000, and RadioShack jumped in on the GPS craze offering the receiver through its special order program.

Twenty Years Ago In *Pop'Comm*

New were Ten-Tec's RX-325 shortwave receiver, Bearcat's 800XLT, and Regency's HX1200. Whatever happened to Dick Smith Electronics? There it was with a small ad on page 45 of the July 1986 *Pop'Comm*, advertising, "148 pages—100's of new products."

by Ron McCracken, KG4CVL / WPZX486

Hitting The Road?

Travel time is nearing its peak for another summer. Planning a road trip? Include a radio, or three, as you pack. Check your radio gear *early* to ensure reliable comms when you do hit the road.

Your radios can make travel a lot more fun, and a lot safer, too. Remember, your cell phone is really a radio, and therefore behaves just like one. That means it can be just as helpful, and just as ornery as any other radio.

Also, your trusty CB can prove invaluable as a source of critical information. I just returned from a road trip, and believe me, I know. Listening to those professional drivers in their 18-wheelers on Channel 19 can keep you out of a whole lot of trouble. If anything does happen, that same CB can get help to you , too.

FRS radios will help you keep tabs on the kids when you visit state parks or major attractions along your route. The price is right, so be sure each person in your party has one. FRS can also save time trying to round up everyone when you want to move on, not to mention the additional safety and security it gives. If you're licensed for GMRS, the FRS-GMRS combo units offer the greater range GMRS affords. One GMRS license now covers the entire family, too.

Your scanner radio can also bring a lot of enjoyment as you monitor boating, aircraft, and other comms along your way. If you have room, slip it in somewhere for some relaxing fun on your journey.

If Trouble Occurs...

Whatever the radio, if you run into trouble, *you* will be the key player in getting help. REACT volunteers and police dispatchers must depend entirely on your radio skills. Often, they can hear calls but a caller cannot hear their replies. One California REACT Team reported a 94-percent failure rate among calls for that very reason. But every one of them would have succeeded had the radio operator only known how to use the radio skillfully.

You need to broadcast *repeatedly* **WHERE *exactly*** you're located. Once REACT or police monitors hear that, help can be on the way. Include the state, road, travel direction, nearest town, crossroad, landmarks, etc. Keep each broadcast the same. Help the monitors as much as you can by pinpointing your location. It is critical. On a cell phone, this is the first information you utter to dispatchers. Then, even if the call "drops" police can still send aid.

Next, broadcast **WHAT** is wrong. Are there injuries? Is there a fire? Is anyone trapped? This information helps dispatchers send the right kind of help initially. Realize that you may not hear a reply. Plan on that. After you repeat your distress call several times slowly on one channel try another, particularly one where you can hear voices.

On CB, Channel 9 is the emergency channel, Channel 19 will get the attention of trucks, while Channel 13 is used by RVers and boaters. On FRS, Channel 1 (without tone) is the unofficial emergency channel. On GMRS, 462.675 is the unofficial emergency frequency. That will be Channel 20 on most FRS-GMRS combo units, but check your owner's manual to be certain, because some units do vary—you need to be *sure*. And please respect these emergency channels; they are so designated for your safety and the safety of all.

Knowing and remembering these tips can save lives in an emergency. It is heartbreaking for REACT volunteers or police to receive screams for "Help!" but no vital information that will enable them to send

"A newspaper delivery bag will protect your handheld radio from the rain while you use it," a Ramsey County REACT member tells Maline Fish of Radio City, one of 150 vendors at the Midwinter Madness Hamfest in Buffalo, Minnesota. Give it a try!

it. Teach others to employ these tips too, so they can use your radio effectively in any emergency. Lives may depend on it.

Always On Standby

Speaking of road trips, REACTers never know when they'll be called upon to aid others. So it was, recently for two Colleton County (North Carolina) REACTers out with friends on a Blue Knights bike run. As they travelled, they came upon an SUV that had struck a tree and had flipped over onto its roof. The driver had been ejected and was seriously injured. Many REACT members have Red Cross first-aid training, so this couple was able to stabilize the victim and stem her bleeding until emergency personnel arrived. For that woman, it was not the REACTers' radio skills that mattered.

Out In The Rain

They say some people don't know enough to come inside. Others can't, because circumstances require them to be out in the rain. When REACT Teams agree to assist with a local event, they don't have a choice. Rain or shine, often the event must proceed—and comms can be even more important in bad weather.

Ramsey County REACT (Minnesota) recently passed along a simple tip to visitors at their safety display. There was something that would protect handheld radios in rainy weather. They even gave out free samples. They had offered them over various radio nets in the community to those who stopped by. The occasion was the Midwinter Madness Hamfest. Over 1000 people attended.

What was it? Simple newspaper delivery bags. Placing the bag over a handheld will keep it dry, and you can still key the radio, hear and speak through the thin plastic film. This tip could benefit you, too, if your family goes camping or on some other summer trip, especially if you like your youngsters to carry an FRS radio. Give it a try. Recycling can pay extra dividends.

Matching Up Resources

Flagler County REACT (Florida) can be proud of an astute Team member, Bill Sturidge. Monitoring his scanner, Bill heard a Coast Guard alert asking boaters to keep watch for two missing craft. He had already heard the Flagler County fire department helicopter aloft on an exercise at the same time. Bill contacted the fire department and advised them of the Coast Guard request. As a result of his call, the fire department plans to purchase a scanner for its helicopter so it can monitor marine frequencies and cooperate with the Coast Guard in future emergencies. Bill's alertness has enabled two agencies to work more closely to benefit all.

How About You?

As these accounts illustrate, REACT volunteers serve their communities in many varied ways. You can bring your talents and abilities to benefit your community through its REACT Team, and you'll gain a lot of satisfaction from serving. Visit www.react-intl.org and click on "Team Directory" to learn if your area has a REACT Team. If not, you and a few friends can form a Team. Call 1-866-REACT-9-9 to request a Team Charter kit. You'll enjoy working with police and other emergency services to help make your community safer.

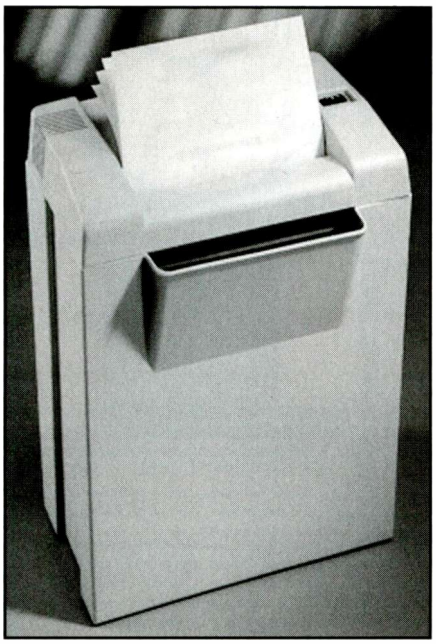
Enjoy your summer travels with your radios. Look for us again in the September issue of *Popular Communications*. ■

by Rich Arland, K7SZ, richard.arland@verizon.net

Putting Personal Security At The Top Of Your List!

In writing the "Homeland Security" column I have a degree of latitude in the subject matter I present each month. Since I became intensely interested in military communications (MilComm) equipment, I outlined how a concerned emergency communications (EmComm) volunteer and/or serious radio hobbyist could press some of these older military radios into service on the ham bands to fulfill EmComm requirements under specific circumstances. In the past, I've also discussed various antennas and their construction and use, along with state-of-the-art comm gear needed for today's EmComm environment. We've even talked about computers and computer (especially wireless fidelity or Wi-Fi) security.

This month's column we'll look at another type of security, outlining how you can be much more conscious of your *personal* security in your daily life. Personal security should be at the top of your list. If you don't feel "secure" in your daily life then you won't act "secure," and you'll be taking valuable mental resources away from your job performance. This is not a good thing. Therefore, I'll present a few ideas on how you can become more proactive in your personal security and get some much-needed peace of mind on a day-to-day basis.



Identity Theft

One of the fastest growing crimes today is identity theft. It's nearly impossible for the perpetrator of the crime to get caught in most cases, as unscrupulous individuals worm their way into your personal and private life and use your credit cards, charge accounts, bank accounts, etc., for their own pleasure and gain. Identity theft is a big business on the street and, for the most part, very safe for those individuals who would penetrate your inner life and steal your identity. We're going to cover some things you can do to protect yourself from identity theft and keep your private life, well...private!

Buy And Use A Paper Shredder!

Believe it or not, your old bank statements, credit card statements, financial records, personal records, etc., are very easily intercepted on their way to the landfill by anyone with the time and talent to rifle through your garbage (called "dumpster-diving" in the trade), grab the paperwork, and piece all the paper trails together. It sounds like a lot of work, but in reality, it's very easy to do, especially at night, the evening before the city trash pickup.

If you spend between $50 and $75 for a *good quality cross-cut paper shredder* and *use* it religiously to destroy all paper documents including check registers, financial or medical records, and prescription labels, you are denying a perpetrator the ability to easily access your garbage and piece together a profile of your private life.

That's right—you're gonna have to spend some money, but the paltry amount spent on a quality cross-cut shredder will be worth it in the long run if it keeps your private life private! The cheaper paper shredders merely cut the paper placed in the hopper into long strips. It is entirely possible for anyone with patience to take the strips and reconstruct the original document(s) if given a few hours.

Spend the money up front for a quality cross-cut shredder and be done with it. You'll appreciate the peace of mind. Perps are after financial records, such as bills, receipts, credit applications, and pre-approved credit cards. But if you make life difficult for them, they won't spend the time trying to invade your private life; they'll move on to other, more vulnerable folks down the block.

Install A Mail Slot In Your Front Door!

Okay, how many times have you left bills in your mailbox, beside your home, with the flag up for the postal carrier to pick up on their rounds? Come on, be honest. Well, I'll tell ya, that little red flag on the side of your mail box is a dead giveaway for any potential identify thief to come by and pilfer your outgoing mail, grab a letter or two with your checks inside, and start the ugly process of stealing your identity. I can hear some of you now: "The thief can't use the check(s) since they're not made out to him." You're absolutely right, *but* the identity thieves *can* do any one of a number of things with these checks, including use special solvents to bleach out the "Pay to the order" and "amount" lines on the check, change the names and amounts, and then proceed to cash the checks. You're out the money and the thief is headed outta Dodge with a handful of your hard earned cash!

Here's another scenario: the identity thief takes your check, obtains the account and routing numbers and then tries to raid your account some time in the future.

Pre-approved credit cards are a beacon to would-be thieves. We've all gotten them in the mail. Major credit card companies target potential credit card users by trying to entice them into accepting a pre-approved piece of plastic with a variable interest rate. They even go to the trouble of cutting the credit card, mailing it to the potential customer in an envelope that has "Inside is your pre-approved Vis-Mat card." How stupid is that? Here you

have an advertisement on the *outside* of the envelope that screams "Steal Me!" Hey, we don't have to be dealing with rocket scientists here, folks. Nope, even stupid thieves can read basic English (all right, most can, okay?), and when they see pre-approved on the outside of an envelope...well, what can I say? Goodbye credit card, hello identity theft!

Enterprising ID thieves can and do raid mailboxes and take all they find to a secure location, prowl through their ill-gotten bootie, and come up with some rather unique and creative ways to invade the private lives of their "marks." So be aware of all this and remove the mailbox and replace it with a mail drop slot in your front door. That way you're denying the ID thief easy access to valuable intelligence on you and your family. Better yet, get a local post office box, visit it once per day (or maybe every two days) and collect your incoming mail that way. Doing this will keep your precious private information within the confines of the post office and away from potential thieves. Be proactive, guard your privacy like you would your life, because it's virtually the same thing!

Telephones—The Bane Of Society!

Face it, folks, telephones are here to stay! Yeah, I know, as hard as that is to believe, it's true. Luckily, there are also some things you can do to protect your privacy as far as the telephone goes. First of all, if you're paranoid, pay the extra small monthly fee and get your number unlisted. That way it won't appear in the public telephone directories.

You can get the local telephone company to block the personal identity of your telephone so those with caller ID can't tell who's making the call. All it will display on a caller ID screen is "Blocked Call." This is a two-edged sword, however, since there are some folks out there who will not answer their telephones unless they know who's calling. Just be aware of that fact.

There are computer programs and websites out there in Internet-land that specialize in obtaining personal data and displaying it to anyone who logs onto the site or purchases the software. I'm not sure if obtaining an unlisted number will keep your info out of those programs and off those sites, however. Logic would dictate this would be the case, but one cannot employ logic when dealing with the Internet.

Several years ago, the federal government set up a "do not call list" for citizens to sign up for to keep their telephone numbers out of the hands of telemarketers. This has met with limited success, but occasionally I still get the errant telemarketer calling my home phone with some "special offer." Anyway, a good idea is to get on that do-not-call list and report to the authorities any telemarketers who manage to get through to you. Of course, nothing will be done, but it does serve to line your ducks up should a case come down in the future—you'll be on record as having provided information to the list managers that your privacy was invaded by an unwelcome telemarketer.

Cell Phones—The Bane Of The Universe!

As long as we're on the subject of telephones, let's look at the pros and cons of owning (or renting) a cell phone. I truly despise the damned things. It never fails that when my wife and I go out dining or to a movie theater or concert, some doofus has his or her cell phone turned on (even though the theaters caution us to turn them off during the presentation) and starts receiving or initiating a non-stop string of calls.

Nobody, and I do mean *NOBODY* (accept the President of the United States along with a few other key policy makers) needs a cell phone or that kind of accountability. If you can't turn off your cell phone for an hour or two, then you need to get a life! Seriously, folks, this cell phone issue has gotten way out of control. It seems that everyone has a cell phone now. Talk about a tremendous waste of frequency spectrum and technology. Damn, I wish I'd thought of this "back in the day." I'd be so rich right now I wouldn't know how to spend all that money (and Harold Ort would be working for me rather than vice-versa!).

Okay, back to the topic at hand. My rantings aside, you really need to control the usage of your cell phone. Always, always, always use a password on the phone and, when you recharge the unit, be sure to turn it off; that way, should the phone fall into unscrupulous hands, it can't be turned on without entering the password. For obvious reasons, keep the password secure and don't give it out to *anyone*. If you have to tell someone your cell phone password, don't forget to change it immediately when you get the phone back.

When you get your monthly bill, scrutinize it closely to determine if all the usage charges are yours. There are some really innovative ID thieves out there who can snag the electronic serial number of your phone, pirate that information, and start cloning cell phones using your account settings—and you'll be paying for someone else's usage.

If you *must* have a cell phone, I recommend buying a Pay-as-You-Go phone that lets you buy minutes as you need them. With these units there are no cumbersome, idiotic, time-consuming, draconian plans to deal with, just pay by the call and you have all the convenience of the cell phone without a lot of the hassle.

Credit Cards—The "Easy" Way To Bankruptcy

It seems that since about the end of WWII, Americans have taken the easy way out and, thanks to the liberal credit policies of banks and other lending institutions, ours has become a country of debtors. Nobody pays cash today. Plastic...it's not really money, you know. The hell it ain't! Credit cards are a curse upon modern society. We can and do rack up huge personal debt just because we "want it now" and don't want to wait until we have the cash on hand to make the purchase, also helping to drive up consumer costs.

The price of automobiles, for example, has risen to spectacular heights. In the 1960s you could get a mid-range car for around $3,000. Now, if you want an "average" car, plan on spending from $18,000 to over $30,000 for the vehicle! Now before you brand me a communist or socialist, I'm not against anyone making a reasonable profit. I like capitalism and it works for America. Unfortunately, the prices of goodies like cars, SUVs, and RVs have gotten so high that you almost have to buy used just to afford the purchase. Of course there's always that easy financing arranged by car dealerships and cooperating banks.

Credit cards have become a necessary evil. If you don't have credit established you can't get credit. Hmm...talk about a catch-22. Okay, so you're going to bite the bullet and get one or more pieces of plastic. There are some special considerations regarding them that you should keep in mind.

First, the card itself is stupid. It doesn't know who 's using it, so safeguard your cards just like you would a solid gold bar.

Seriously, lock them up unless you plan to use them. Put them, along with all your other valuables and critical paper work (marriage license, mortgage papers, professional licenses, coin collections, medical records, passports, etc.) into a safe and *LOCK THEM UP!* Take the credit cards out only when you're going to use them. Too many people leave them in their wallets or purses and make it very easy for an identity thief to grab them during a moment of lost concentration. Once out of your possession, the "fun" begins.

Keep the phone numbers of all your credit card issuing agencies on a list in your wallet or purse. Keep another list in the safe. Should you lose control of a card call the issuing agency immediately and report the loss. Minutes count! Once on the street, your cards can quickly start racking up huge debts that you may have to repay, depending upon your issuing institution's lending policies.

One more thing regarding credit cards: When you dine out and your food-server says, "I'll take that bill any time you're ready," be aware that there have been scams in the past where a food service worker takes a credit card and bill, walks toward the cashier to ostensibly pay, but before getting to the cashier runs the credit card through a small handheld scanner which records all the credit card info for later use. No, I'm not kidding.

Another restaurant scam involves a paid bill left on the table, with the entire credit card account number visible on it. Most card reader machines now only print the last four digits of your credit card. However, older machines printed out the entire account number, which, in the wrong hands, can equate to identity theft. Be on top of your game and watch what's going on.

Be observant and understand that these credit cards are just as valuable, probably even more so, than cash. You can't be too careful. Safeguard them. Your financial, and maybe even personal, life depend upon it.

Safes

Regarding locking up your valuables, you obviously don't need the protection of Ft. Knox, but a small safe, bolted to the floor of your closet, could mean the difference between holding onto your identity and losing it. Safes are inexpensive and a sure fire way to protect your valuables. Various retail outlets have small- to medium-size steel safes for under a couple of hundred dollars. Hey, that's a small price to pay for security and peace of mind.

If you do get a safe, mount it securely in an out of the way area, like the back of your closet or under some steps, using bolts or lag screws in the floor and/or the wall studs. This keeps the safe in one place and denies the perp the ability to lift the safe, move it outside, and take his sweet time opening it.

I have several safes in my home. There's a gun safe on my nightstand where I keep a gun (imagine that!), spare magazines, and ammo, along with several of my most used credit cards. This is bolted securely to the nightstand, which is also bolted to the floor. In another area of the house I have the armory. That's right, a real armory with a bunch of guns, ammo, reloading supplies, weapons cleaning supplies, and some more important papers. This safe is bolted to the wall studs and floor joists and is practically impossible to remove.

My wife and I both enjoy shooting sports, so we have a number of firearms. We also have kids and grand kids, none of whom need access to our armory. In this day and age it's absolutely imperative for you to positively secure any firearms you have in your possession. No

Popular Communications July 2006 Survey Questions

I'm experiencing noise when I listen to shortwave or use the HF ham bands:
Yes....1
No....2
Not Sure....3

The level of noise I'm experiencing is best described as:
Severe....4
Moderate....5
Light....6

BPL has been deployed near my home and I'm certain it's the cause of my interference:
Yes....7
No....8

The noise I hear is: (mark all that are appropriate)
Confined to a very small segment of the HF spectrum....9
Covers a wide portion of the spectrum....10
Only on VHF/UHF....11
Intermittent during the day....12
Intermittent during the night....13
Is constant....14

I've determined the source of the noise to be from:
Overhead powerlines (insulator, transformer, or other pole hardware)..15
Inside my neighbor's house (possibly a fish tank heater, alarm system, computer monitor, TV or other product)....16
Something inside my house....17
BPL (broadband over powerline)....18
Something in my neighborhood....19
A nearby company (fluorescent lights, welding apparatus, etc.....20

I've tried to find the source of my interference problem:
Yes....21
No, because I don't have the time....22
No, because I don't believe I'll be successful....23

I'm not sure if it's BPL interference I'm receiving, but I have tracked the noise source to a specific power pole and have reported it to the utility company:
Yes, and they've been cooperative....24
Yes, and nothing has been done....25
No, the interference isn't that bad, I can live with it....26

one wants an accidental discharge to injure, or God forbid, kill an innocent person. Be smart. Be safe. Get a gun safe and use it. Not only will you have peace of mind regarding your family members, but a gun safe, like a small safe for your personal papers and credit cards will deny a burglar/robber access to lethal weapons.

But does all this also help our level of preparedness? I'd like to think so. Should my wife and I have to evacuate the house, all it will take is a couple of quick combinations and we have access to all our personal weapons and important documents. This beats running all over the house hunting for various papers and it drastically cuts down our "muster time" when we're called to come out and play disaster preparedness radio.

Computer Security

We've covered this topic several times, so I won't dwell on the obvious. Just keep your passwords for the computer and various websites you visit (like bank/credit union sites) secure. Keep them in a small notebook locked in that all-important safe. If you give out a password to another member of the family, change it at your first opportunity. You can't be too careful.

For wireless fidelity, or Wi-Fi, use the built-in security package to keep prying eyes out of your wireless transactions. Turn off the SSID of the wireless server and move from channel 6 (the default channel) to another channel on the system. Not only does this help foil potential ID thieves, it also reduces interference in your neighborhood. I was the first person in my area to have a working Wi-Fi node set up. Now there are at least a dozen, 10 of them on channel 6! Needless to say I am *not* on channel 6, for obvious reasons. Reducing the population on a given Wi-Fi channel also increases the data throughput, because you don't have as many systems crowded onto one channel, all fighting for the same bandwidth.

So, you bought that new computer from a special deal you saw on TV. What plans do you have for the old computer? Give it to the Salvation Army? Sell it at a yard sale or flea market? Give it to another family member? Good for you! However, you better wipe that hard disk clean of *any* sensitive passwords, important financial information, even website log-on info. An old hard disk drive (HDD) is one very scary commodity. It has tons of information about you, your family, your banking and bill paying habits, and your medical information. You name it; it's probably on the drive. It might be a real good idea to completely remove the drive, take a quarter-inch drill and drill completely through the HDD in several places to totally destroy its usefulness. It's then a relatively simple task to buy another HDD, install it in the older computer, and mount an operating system before giving it away.

In any case, don't let that old HDD out of your possession until you've wiped the drive either with special software that will clean the HDD in accordance with military standards (Norton has a good program for this) or physically destroyed the drive with a drill. There is too much critical information on that drive to let it out into the world without taking these precautions.

EmComm Coming Up

Well, gang, that's a wrap for this month. I have some important news about EmComm volunteer communicators for next month's column, so be sure to tune in and read all about it. In the mean time, remember: Preparedness is not optional!

Radio In The Rum War

Communications Figured Prominently In Enforcement—And Breaking—Of The Law

by R.B. Sturtevant, KD7KTS

It was controversial from the very beginning, "something the women snuck through while the boys were over in Europe fighting for Democracy." But, of course, no women ever voted for Prohibition. It was the 18th Amendment and Women's Suffrage was the 19th, passed in 1920. But in 1919, when The Volstead Act was finally ratified, everyone was sure that the "Noble Experiment" was going to succeed—or fail.

In 1920, when it became law of the land, nobody asked the Coast Guard, the Bureau of Prohibition, the Bureau of Customs, or the Department of Commerce what they thought about Prohibition. They were just told to make it work.

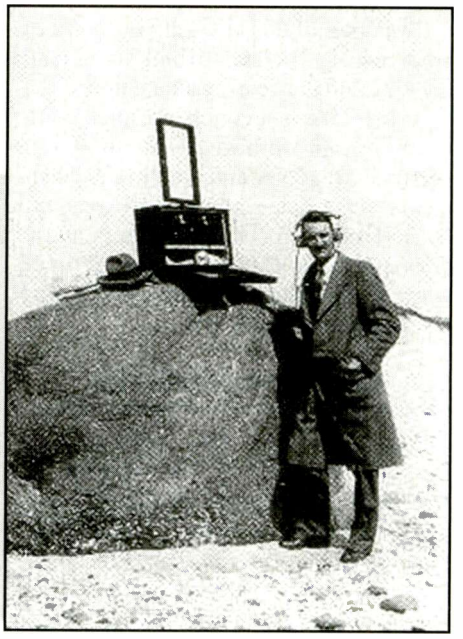
The Coast Guard had one of the hardest jobs. With no increase in budget and a force of only about 4,000 people and 75 vessels, it had to patrol 12,000 miles of American seacoast, including numberless bays, coves, bayous, rivers, inlets, ports, and beaches to make sure nobody landed any illegal spirits. It also had to keep up the high standard of lifesaving, aids to navigation, tariff collection, and other types of smuggling controls that it had established over its proud history.

The Coast Guard brass also knew that the last time the U.S. coast had been embargoed was during the Civil War when the Union blockaded the Confederacy with more ships and manpower then was available during Prohibition. That had been a much smaller job and by no means a success. Nevertheless, the attitude of the Coast Guard during this period was expressed by their Commandant, Rear Admiral Fredrick C. Billard: "The Coast Guard will not fail in the performance of this...task. You men are the last line of defense..."

The earliest official mention of the Coast Guard's work in reducing this illicit trade was in their 1921 fiscal report. In June of that year the report cited that the Florida coast patrol had been "particularly vigilant" and had made "hundreds of trips" in support of the Bureau of Prohibition's authorities and had seized several vessels.

The Operative Word: FAST!

The basic plan for profitable ocean-going rumrunner was worked out by one William S. McCoy. McCoy, a Florida yacht builder and racer, went to Gloucester, Massachusetts, and bought a 90-foot-long sail-powered schooner with two auxiliary engines for emergencies, a type known as a Gloucester Fisherman. He sailed to Nassau and loaded her with 3,000 cases of liquor. Fifteen hundred cases went to his backers in Savannah at $10 per case. In less than two weeks he had sold the balance of his cargo for enough to almost cover his $20,000 investment and at no risk to himself. He simply sat outside the three-mile limit of U.S. control and sold his liquor to anyone who would run out and pick it up. Within a few months every major port on the East Coast had a "Rum Row" with hundreds of ships sitting just outside the Coast Guard's jurisdiction selling booze as fast as they could to anyone with a small boat that could make the three-mile trip, fast.



A Coast Guard-developed radio direction finder the size of a small suitcase. Its small size made it easily transportable. Coast Guard intelligence operations were among the many unsung Coast Guard successes during the "Rum War."

And fast was the operative word. Coast Guard vessels were able to make from 10 to 18 knots. They were great at locating and harassing the "Mother Ships" but didn't have much of a chance against the much faster "contact boats." What is now called a "cigarette boat" got its start at this time. Especially built to outrun the Coast Guard cutters, these purpose-driven contact boats were said to have the profile of a cigarette floating on the water. The Coast Guard was limited to yelling at the Mother Ships and continuing to patrol for the contact boats, although at least one potato fight was reported.

Radio Helps Enforce—And Break—The Law

Radio, which had undergone a great deal of development and refinement during World War I, figured prominently in both enforcing and breaking the law. The newly developed art and science of radio direction finding (RDF) helped the Coast Guard locate newly arrived Mother Ships, while monitoring their frequencies helped to keep track of their activities. At the same time, however, law breakers established shore stations to communicate between the Mother Ships and their on-shore owners to tell the contact boats when and where to meet and give advice on the whereabouts of law enforcement officials.

It was at this time that the Coast Guard lobbied and got the three-mile limit extended to 12 miles. The added nine miles of open sea was in an effort to get the weekend sailors and amateurs out of the picture.

From the very beginning the bootleggers used codes and ciphers to try to hide their illegal activities. At first the Coast Guard had to rely on the native talent and interest of their own Coast Guardsmen to intercept the illegal message traffic and then break the codes and ciphers, often while simultaneously being called upon for other duties.

Another problem was that the Radio Division of the Department of Commerce (which would grow into today's FCC) could do little about illegal transmitters. They could only inspect legal transmitters and had no policing authority. The inspectors had to go with Prohibition Agents or other policing authorities on a raid of a rum runner's operation, and then be *invited* to look at an illegal transmitter to cite violations—a very cumbersome process to say the least.

By 1925, the illegal importation of spirits had taken on the form it would maintain until repeal. The West and Gulf Coasts were supplied from British Columbia and Mexico. Nova Scotia, British Honduras, and the West Indies supplied the East Coast. Mother Ships would take on a cargo of spirits manifested for a country where it could be legally landed. The smugglers would proceed to a rendezvous point and notify shore stations when and where they had arrived. The high-speed contact boats would transfer the booze and run it ashore. Since the Mother Ships would anchor together in Rum Row, just outside the Coast Guard's jurisdiction, only the contact boats could suffer arrest—if they could be caught.

Captain Frank M. Meals—as a lieutenant, he was greatly responsible for the success of radio communications in the fight against the smuggler.

Illicit Stations Proliferate

Also by 1925 the Coast Guard realized that its methods of radio interception needed improvement. This led to the establishment of Radio New York. Robert Iversen, an engineer at the *New York Times* radio station, left his job and, with the help of Coast Guard funds, set up a monitoring station especially designed to monitor frequencies used by the rumrunners. He acquired a low-frequency receiver to cover 20 to 200 kHz, a medium frequency one to cover 300 to 750 kHz, and borrowed a 200 to 1000 kHz receiver from his old employer. His time was spent primarily monitoring the 600-kHz frequency of the RCA-run international radio traffic between London and New York. Most of the messages where in International Morse plain text in uncoded English and were forwarded directly to Coast Guard Intelligence Division in Washington D.C.

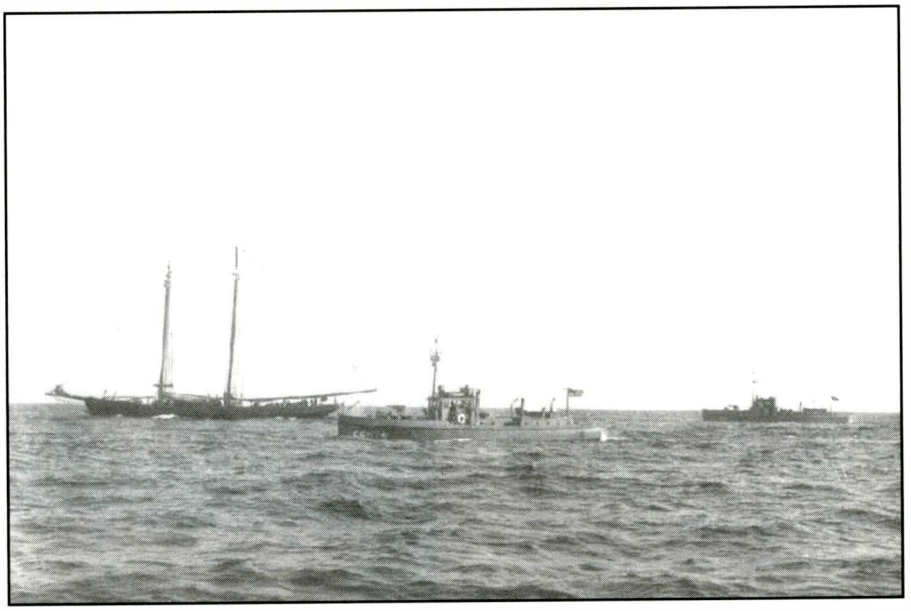
Coded messages, however, were sent to the Justice Department in New York for deciphering by Victor Weiskopf, a part time cryptanalyst with the famous "American Black Chamber" run by Herbert O. Yardley. This was the organization that had helped the State Department by breaking the Japanese diplomatic codes during the Washington Naval Conference after World War I.

By 1930 the Coast Guard Communications System at its Headquarters in Washington had identified over 70 illicit stations, both ship and shore, operating in the New York area alone. Originally the smuggling had been done by independent operators, but had become increasingly under the control of a few large gangs. On the West and Gulf Coasts a monopoly developed, run by Consolidated Exporters Corporation of Vancouver, British Columbia.

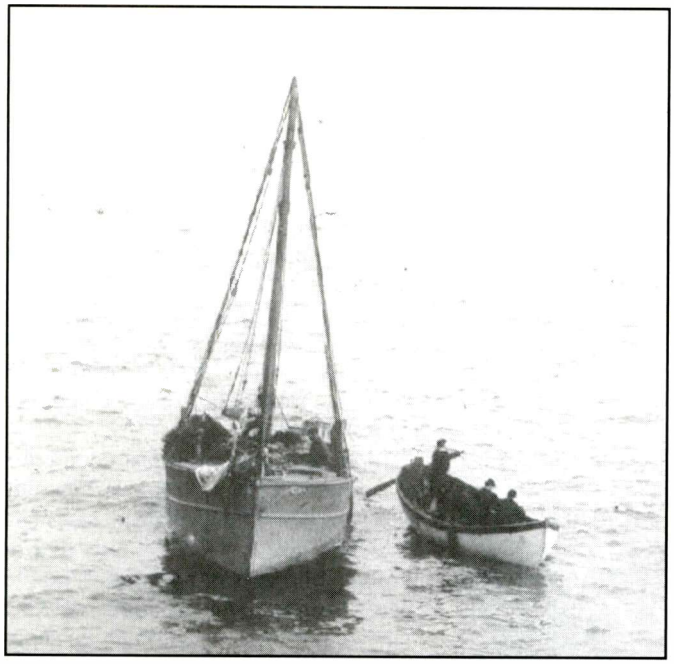
Illicit radio stations transmitted internal communications of the various rumrunner organizations. These messages concerned directions to ships, ordering supplies, and arranging contact points. There were 103 illicit stations between Maine and Florida, 45 of them on shore. It was known that there were four shore stations in the Newark area, one of which was directing the activities of nine ships which were landing illegal spirits valued at six or seven million dollars per month.

These stations had the best and newest equipment available, were capable of working foreign countries, and were manned by very experienced operators. Procedures used by these operators showed they had amateur and commercial experience for the most part, but occasionally the operators showed themselves to be veterans of the Army, Navy, or Coast Guard.

Interception was not difficult because it only took a reliable receiver and com-



Two 75-foot patrol boats (right) from Coast Guard Base 7, Gloucester, Massachusetts, picket two rum running schooners." (Photo Courtesy USCG: International Newsreel Photo)



A motorboat makes contact with liquor smuggling British schooner Katherine off the New Jersey coast to smuggle the booty ashore.

petent operator to copy the message traffic. Direction finding was a different story, however. DF fixes on high-frequency stations were only approximate and varied widely because of terrain or other forms of interference. Two or more fixes had to be obtained at roughly the same time and communicated to a central point. As early as 1919, the Coast Guard Cutter *Androsscoggin* was improvising DF equipment. Two years later Navy DF equipment was coming into use.

Some of the early DF work was done by the 75-foot patrol boat *CG-210* under the command of Lieutenant Frank M. Meals. At the time, Meals said,

> This is something new and just how it will work I do not know, but our experience before the radio compass [direction finding equipment] has been...that the directional factor is limited as to distance and it is also approximate. In this connection we are up against high frequencies which are very erratic. The apparatus is not entirely suitable, especially the compass apparatus, so that you encounter technical difficulties in locating stations, but I think the success we have had in locating the Highlands case and some of the others is very remarkable when you consider the apparatus.

Nevertheless, increased training and more experience brought out the usefulness of this system. The successes resulted in 10 shore stations being established as well as an increasing number of DF-equipped vessels. The use of RDF was not lost on the more sophisticated rumrunners, either, and they started using it to locate cruising cutters.

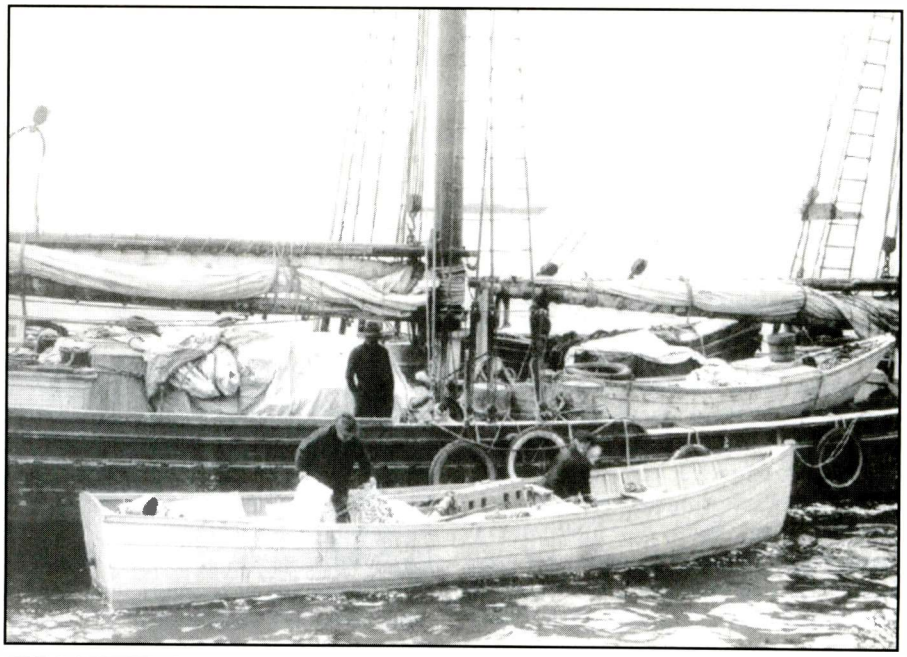
It was also not unheard of for the Coast Guard to receive a distress call, send its cutters to the scene of the accident, and find no one there. Meanwhile, the rumrunners crept through the gap created by the false signal. Mother Ships sometimes tried to shorten the run for their contact boats. They would wait until after dark and run inside the 12-mile limit. This was risky, of course, and required good radio communications. Some of them found out that the Coast Guard had been listening, too.

Codes and ciphers became more of a problem as time went along. Due to a lack of trained personnel and insufficient time for experienced personnel to work on the problem, by 1927 a tremendous backlog of undecoded messages had piled up in the Intelligence Division. The Coast Guard and the Bureau of Prohibition jointly set up intercept stations in San Francisco and Florida. The Coast Guard supplied the equipment while Prohibition supplied the personnel.

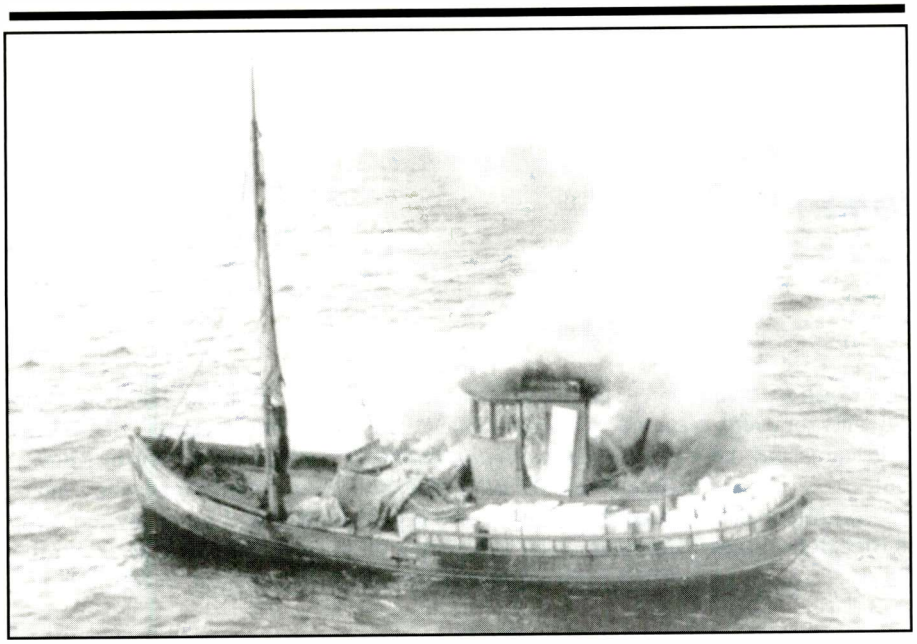
One person involved in the cooperation was a Mrs. Elizabeth S. Friedman—a true wonder. Working with only one clerk, she managed to clear up the years of backlogged encrypts in only two months. She then went to Coast Guard stations in San Pedro and San Francisco, California. Until she arrived, both stations had been sending encoded messages to Washington D.C. for decoding. Mrs. Friedman trained personnel on the West Coast in decoding systems that had already been broken, thus making the information available for law enforcement use much more quickly.

Different Code Systems For Every Vessel!

It was known that Consolidated Exporters Corporation was paying a retired British Navy lieutenant commander the unheard of sum of $10,000 annually to develop its codes. The company had codes that were changed about every six months. Between 1928 and 1930 there were some 3,300 messages passed between the Pacific rumrunners and their principles in Vancouver, British Columbia. Their four or five shore stations were using 50 separate code systems to communicate with their 25 vessels. According to Mrs. Friedman "there was a different system for practically every vessel, some of them of a complexity never



Boarding party from a Coast Guard cutter examining papers of a suspected rum-runner. (Photo by United News Pictures)



A rum runner afire. After being pursued by a patrol boat, the crew of the rum-runner Linwood sets fire to their vessel in order to destroy the evidence.

attempted by any government, for its most secret communications."

By 1930 Consolidated had agents in Mexico, British Honduras, Cuba, Louisiana, Florida, Quebec, and the Bahamas. All their operations communicated directly with Vancouver monthly with hundreds of encrypted messages.

The Cryptanalytic Unit decrypted about 12,000 messages after looking at 25,000 messages annually. The messages divulged illegal activity on the Pacific Coast from Vancouver to Ensenada, Mexico, on the Gulf Coast from Belize to Tampa, and on the Atlantic from Key West to Savannah, including Havana and the Bahamas, and from New Jersey to Maine. The Cryptanalytic Unit consisted only of Mrs. Friedman and one clerk.

The Big Raid

In 1931 Prohibition agents raided Consolidated Exporters Corporation's New Orleans offices and over 100 people were arrested, including the ring leaders who controlled illegal activities in the Gulf. Mrs. Friedman used hundreds of intercepts from the Coast Guard Intercept Station in Mobile, Alabama to prove the government's case when it came to trial in early 1933. The same year Prohibition was ended with the election of Franklin Roosevelt.

Most people were of the opinion the "The Great Experiment" had failed due to a lack of adequate enforcement. Most of the illicit liquor had been manufactured inside the country. Imported booze came from Canada by land (about two-thirds) and Rum Row contributed another third. It is well known that the majority of the gangster activity of that period was based on domestic *beer* production, not smuggling.

A Large, Thankless Job Well Done

At the time it was thought that the Coast Guard was stopping only about five percent of what was coming into the country from the sea. Historians are now beginning to think that small percentage does not do the Coast Guard justice. The Coast Guard came out of Prohibition a much larger and more sophisticated force than it was when it started. It learned to use radio monitoring and direction finding as well as intelligence gathering and code breaking. The Guard did a hard, thankless job and did it as well as it had been allowed to.

After the repeal, however, the smuggling did not stop. The Treasury Department was losing $35,000,000 annually because of failure to pay duties on imported liquor. The Coast Guard worked closely with the Royal Canadian Mounted Police, teaching what it had learned about stopping the smuggling trade. By 1938 and '39 illegal liquor smuggling had finally come to an end. The Coast Guard started to look in other directions, on a path that would take them into World War II. ■

Report: Survey Results

What You've Told Us Recently— And Three Free Subscription Winners!

by Harold Ort, N2RLL, Editor

We're back with another few months' worth of your survey responses. Again, a special thanks for everyone for taking the time to complete the cards, pay the postage, and wait for me to report back to you!

Remember, your card automatically enters you in our random drawing for a free one-year subscription (or extension) to *Pop'Comm*. Have you sent in your card?

Is It Digital?

Yes, CW is indeed digital. A while back we asked shortwave listeners if they were interested in monitoring digital comms. Out of the 66 responses we received, two—hams nonetheless—asked if we knew what we were talking about by including CW in the list of digital modes. CW meets all the criteria for digital communications. It's spectrum efficient, the information is transmitted as a standardized code (Morse), and it's decoded at the receiving end. It can also be sent high speed.

So now that our little trivia tidbit is out of the way, about one-third of you said you were interested in monitoring digital comms, while only about one-sixth said you were not. And CW is still the favorite digital mode, with about 25 percent of you weighing in for in its favor.

Nearly one-third of the respondents said they didn't know what was needed to receive those transmissions. Since we took that survey, we've discussed the topic numerous times—both in the "Utility Communications Digest" and "Computer-Assisted Radio Monitoring" columns—so it's our hope that when we ask this question again in the near future there'll be a heightened interest in and understanding of monitoring the digital modes.

Fifteen percent of you said RTTY was your favorite, followed by FAX mode, with ALE and PSK31 coming in with about 10 percent each. GTOR didn't get any votes.

Surprisingly, about 42 percent of you reported that although you're a ham you currently don't use the digital modes, while about 15 percent said you did. Even less reported "sometimes" using the digital modes, and about seven percent said you weren't interested in digital, preferring voice contacts over digital. The same number of folks reported not having a computer in the shack!

Sometimes, it's not the mode or fact that many enthusiasts just aren't interested in venturing from voice mode, but that the instructional material—books, articles, etc.—is lacking. More than a third of you said that was the case, while about 25 percent reported it was not, and that some articles help but really only scratch the surface of digital comms. A considerable number of you—about 19 percent—reported needing more hands-on material.

So there's good news on the digital front: several books and numerous articles have been published recently. Be sure to check out our *Digital Modes For All Occasions* book by Murray Greenman, ZL1BPU. This is the book for everyone who's interested in amateur radio digital modes, as it's simply the most complete book yet written on this subject. Also check out the ARRL's *HF Digital Handbook* by Steve Ford, WB8IMY.

Propagation Not So Complicated— Thanks To Tomas Hood!

It takes a real thorough, caring expert to help us work our way through the science of propagation in order to get a better understanding of how those signals get from here to there—or, in some cases, why they don't!

Tomas Hood, our "Propagation Corner" columnist, is that expert, each month taking us into a fairly complicated subject and coming out the other end no worse for the wear! Most of you certainly agree with that assessment. Thirty-five percent of you report being interested in the subject and read his column, and nearly the same number found propagation very confusing, but said the column helped you understand it better. Furthermore, 15 percent of you reported it was very helpful, while 17 percent said it was somewhat helpful. About 1 percent said it was not very helpful. A very small percentage—about half of 1 percent—said propagation just doesn't interest you and it's too confusing to bother trying to figure it out.

We also asked you when propagation is bad on one part of the spectrum what you do. Most—about 48 percent—reported going to another band and experimenting there, while about 1 percent said you turn off the radio and do something else. No one said they go to the Internet, and about 15 percent of you reported going to "The Propagation Corner" to learn more! About 30 percent of you said that propagation doesn't affect your radio operations that much because you operate on VHF, while only about 3 percent said you operate on local CB channels so you aren't that affected.

Emergency!

The one thing we'll never be able to predict is when an emergency will arise. Typically, though, radio enthusiasts seem to be more prepared than most Americans. Here's what our survey results said.

We asked if you were a member of a volunteer emergency radio group, and nearly 40 percent said yes, and about 40 percent said no. Another 24 percent said there was no local emergency comms group.

How prepared are you for an emergency with basic supplies? About 45 percent of you said you were ready with enough alkaline batteries to power your two-way radios for at least 48 hours; about 30 percent of you said you were ready to power the radios for three or four days. About 57 percent of you reported having a ready-to-go portable antenna for ham and scanner equipment, while about 35 percent of you said the same about CB. But about 60 percent of you reported having a ready-to-go portable shortwave antenna to stay in touch with the outside world in the event of an emergency!

How important are those portable battery packs versus alkalines? About 46 percent of you reported using a portable battery pack, ready with appropriate adapters, with your radio gear. That gear was composed of a multitude of radios, including 30 percent of you saying a pair of FRS radios with alkalines was in your arsenal; 26 percent of you said you used the same radios for an emergency, but with fully charged NiCd or NiMH batteries.

CB walkie-talkies powered by alkalines only netted 3 percent, while a good pair of CB walkie-talkies powered by fully charged NiCd or NiMH batteries is used by about 29 percent of our readers.

What radio is the king of the hill? You guessed it. A NOAA All Hazards emergency receiver is reported to be in 70 percent of your emergency bags.

Speaking of bags, we asked how you transport your emergency radio gear, whether it's a pair of FRS radios or an entire load. Most of you—about 69 percent—reported using a small piece of luggage (likely grabbing a couple of radios and extra batteries, tossing them in with the socks and extra whatever! Coming in second was a briefcase at about 40 percent, followed by about 10 percent of you using a soft camera bag for transporting emergency radio gear.

Till Next Time

That's it for this month. We'll bring you another report—along with the names of a couple of lucky readers who sent in their survey cards—very soon.

Our winners this time around were Robert Cole of Cincinnati, Ohio; Kenneth Roth of Van Nuys, California; and Fred Pickett, Jr. of Annandale, Virginia. Congratulations! ■

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

This listing is designed to help you hear more shortwave broadcasting stations. The list includes 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
0000	9505	Radio Record, Brazil	PP
0030	9400	Radio Bulgaria	RR
0030	4985	Radio Brazil Central	PP
0030	6160	CKZN, Canada	
0030	9570	China Radio International, via Albania	
0030	9375	Voice of Greece	Greek
0030	9575	Radio Medi-Un, Morocco	AA
0030	7125	Voice of Russia, via Moldova	
0030	6055	Radio Exterior de Espana, Spain	SS
0030	11780	Radio Nacional amazonia, Brazil	PP
0030	7130	VOA relay, Thailand	
0030	7455	Radio Tirana, Albania	
0100	9710	China radio International	SS
0100	9800	Radio France International, via Fr. Guiana	SS
0100	4780	Radio Cultural Coatan, Guatemala	SS
0100	7455	Radio Tirana, Albania	
0100	3249	Radio Luz y Vida,. Honduras	SS
0100	7230	Radio Slovakia International, Slovak Rep.	
0100	4319	AFRTS, Diego Garcia	USB
0100	3230	Radio Sondergrense, South Africa	Afrikaans
0100	11735	Voice of Korea, No. Korea	
0100	6165	Radio Nederland relay , Bonaire	
0100	9760	Radio Sultanate of Oman	AA
0100	7400	Radio Bulgaria	BB
0100	4717	Radio Yura, Bolivia	SS
0130	9645	Radio Bandeirantes, brazil	PP
0130	5045	Faro del Caribe, Costa Rica	SS
0130	11745	Voz Cristiana, Chile	PP
0130	11760	Radio Havana Cuba	SS
0130	11765	RAI, Italy	II
0130	11935	Radio Japan-NHK	
0130	9870	Radio Budapest, Hungary	HH
0130	11550	Radio Sweden, via Madagascar	
0130	13760	Voice of Korea, North Korea	
0130	6150	Radio Romania Int.	
0130	9810	All India Radio (Goa), India	Hindi
0130	4800	Radio Buenas Nuevas, Guatemala	SS
0200	4885	Radio Clube do Para, Brazil	PP
0200	3279	Radio Maria/Para Voz del Napa, Ecuador	SS
0200	4052.5	Radio Verdad, Guatemala	SS
0200	7320	Radio Jamahiriya, Libya	AA/EE
0200	6973	Galei Zahal, Israel	HH
0200	7600	Radio Varna, Bulgaria	EE/BB UTC Mon
0200	9495	Voice of Justice, Iran	

UTC	Freq.	Station/Country	Notes
0230	6115	Radio Tirana, Albania	
0230	3340	Radio Missions Internacional, Honduras	SS
0230	4819	La Voz Evangelica, Honduras	SS
0230	4965	The Voice-Africa, Zambia	
0230	6612	Zimbabwe Bc Corp	vern-harmonic
0230	7125	Russian Int. Radio, via Moldova	
0300	6035	VOA relay, Botswana	
0300	5025	Radio Rebelde, Cuba	SS
0300	7110	Radio Ethiopia	Amharic
0300	5010	Radio National Malagasy, Madagascar	Malagasy
0300	4810	Radio Transcontinental de America, Mexico	SS
0300	4780	Radio Djibouti	FF
0300	7110	Radio Republica (clandestine to Cuba) via UK	SS
0300	4976	Radio Uganda	
0300	11675	Radio Kuwait	AA
0300	6040	Radio Monte Carlo, Monaco, via Canada	AA
0330	9675	Radio Cancao Nova, Brazil	PP
0330	9720	RT Tunisienne, Tunisia	AA
0330	9760	Adventist World Radio via UAE	unid
0330	6175	Voice of Vietnam, via Canada	
0330	4910	ZBC - Radio Zambia	Swahili
0400	3345	Channel Africa, South Africa	
0400	7390	Channel Africa	FF
0400	5910	Radio Ukraine Int.	
0400	11690	Radio Okapi, Dem Rep of Congo via S. Africa	unid
0400	9780	Republic of Yemen Radio	
0400	4775	Trans World Radio, Swaziland	GG
0400	5500	Voice of the Tigray Revolution	vern
0400	3200	Trans World Radio, Swaziland	
0400	6940	Radio Fana, Ethiopia	Amharic
0400	9675	Radio Cancao Nova, Brazil	PP
0430	7270	Radio France International, via Ascension Is.	FF
0430	5985	Radio Congo, Congo Rep.	FF
0430	6045	Radio Universidad, Mexico	SS
0430	6165	Radiodif.. Nat. Tchadienne, Chad	FF
0500	5030	Radio Burkina, Burkina Faso	FF
0500	4777	RTV Gabonaise, Gabon	FF
0500	7255	Voice of Nigeria	
0530	5005	Radio Nacional Bata, Equatorial Guinea	SS
0530	4770	Radio Nigeria	

UTC	Freq.	Station/Country	Notes
0600	6190	Deutschlandfunk, Germany	GG
0600	3291	Voice of Guyana	EE, others
0600	6185	Radio Educacion, Mexico	SS
0600	9720	Radio Victoria, Peru	SS
0600	5885	Vatican Radio	
0600	6010	Radio Mil, Mexico	SS
0630	6155	Radio Austria International	GG
0700	4845	Radio Mauritanie, Mauritania	AA
0845	9765	Radio Tikhiy Okean, Russia	RR
0900	9885	Radio New Zealand	
0900	7120	Wantok Radio Light, Papua New Guinea	
0900	6135	Radio Santa Cruz, Bolivia	SS
0930	6160	Radio Japan-NHK, via Canada	
0930	3310	Radio Mosoj Chaski, Bolivia	QQ
1000	5925	Voice of Vietnam	
1000	3210	ABC No. Territory Svc, Alice Springs, Australia	
1030	9970	RTBF, Belgium	
1030	6070	Voz Cristiana, Chile	SS
1030	6010	La Voz de su Concencia, Colombia	SS
1030	9865	Trans World Radio, Guam	
1030	3385	Radio E. New Britain (New Britain) Papua	NG
1030	9680	Radio Republik Indonesia	II/EE
1030	9615	KNLS, Alaska	
1100	12005	HCJB, Ecuador	
1100	11710	Radio Japan-NHK	GG
1100	11795	KBS World Radio, S. Korea, via Canada	SS
1100	7260	Radio Thailand	
1100	6060	Sichuan PBS, China	CC
1100	11755	YLE/Radio Finland International	Finnish
1100	4746	Radio Huanta 2000, Peru	SS
1130	3205	Radio Sandaun, Papua New Guinea	Pidgin
1130	5860	Voice of Jinling, China	CC
1130	5020	SIBC, Solomon Islands	
1130	5745	Radio Marti, USA	SS
1200	4790	Radio Republic Indonesia-FakFak	II
1200	7270	Radio Malaysia, Sarawak	
1200	4900	Voice of the Strait, China	CC
1200	6055	Radio Nikkei, Japan	JJ
1200	5985	Radio Myanmar (Burma)	vern
1230	5030	Central Peoples Broadcasting Station, China	CC
1230	6080	Radio Singapore International	
1230	9920	Far East Broadcasting, Philippines	
1300	9580	Radio Australia	
1300	7245	Voice International, Australia	Indonesian
1300	13362	AFRTS, Guam	USB
1300	9525	Voice of Indonesia	
1300	6035	BBC relay, Thailand	
1300	11850	Radio Veritas Asia, Philippines	VV
1330	15700	Radio Bulgaria	PP
1330	9425	All India Radio	Hindi
1330	13790	Voice of Islamic Rep. of Iran	
1330	9685	BBC relay, Cyprus	unid
1400	9355	Trans World Radio, Guam	CC
1400	15240	Radio Sweden, via Canada	
1400	15155	Voice of Turkey	TT
1400	9435	Radio Farda, to Iran, via Greece	Farsi
1400	15140	Radio Sultanate of Oman	
1400	15265	Radio Solh,(to Afghanistan via UK)	Pashto/Dari
1430	12065	Adventist World Radio, Guam	
1500	11870	University Network via Costa Rica	Dr.Gene Scott
1500	15575	RDP Int., Portugal	PP
1530	17770	Channel Africa, South Africa	
1530	13765	Vatican Radio	
1600	11690	Radio Jordan	
1600	15160	Radio France Int., via South Africa	
1630	11990	Radio Kuwait	AA
1630	11945	Radio Free Asia, USA, via Tinian, No. Marianas	unid
1630	17715	VOA relay, Botswana	
1700	12050	Radio Cairo	AA
1730	9600	Adventist World Radio, Guam	unid
1800	11840	Radio Free Southern Cameroon, via Russia	
1830	11730	Radio Pilipinas, Philippines	Tagalog
1830	11630	RDP International, Portugal	PP
1900	11735	Radio Tanzania - Zanzibar	Swahili/EE
1900	11655	Radio Nederland relay, Madagascar	
1900	15275	Deutsche Welle relay, Rwanda	
1930	9965	Public Radio of Armenia	
2000	15345	RTV Marocaine, Morocco	AA
2000	15240	Voice of America relay, Morocco	
2030	11685	Radio Canada International	AA
2030	9800	Adventist World Radio, via Austria	FF
2030	7130	Voice of Islamic Rep. of Iran	SS
2030	9895	Radio Nederland Relay, Madagascar	
2030	11845	Adventist World Radio, via South Africa	unid
2030	9870	BSKSA, Saudi Arabia	AA
2030	11610	Radio Slovakia Int.	SS
2036	11890	Deutsche Welle, Germany relay, Sri Lanka	AA
2100	15505	Radio Kuwait	AA
2100	11620	All India radio	
2100	11975	VOA relay, Sao Tome	
2100	11630	Radio Jamahiriya/V of Africa, Libya, via France	AA/EE
2130	15515	Radio Australia	
2130	12085	Radio Damascus, Syria	AA/EE
2130	7250	Vatican Radio	AA
2200	17785	Radio Belarus	
2200	9990	Radio Cairo	
2200	7450	RS Makedonias, Greece	Greek
2200	5980	Africa Number One, Gabon	FF
2230	6070	CFRX relay CFRB, Canada	
2230	9330	Radio Taiwan International	
2230	12090	Far East Broadcasting, Saipan, No. Marianas	unid
2230	7105	BBC relay, Oman	
2230	9580	Africa No. One, Gabon	FF
2230	9605	BBC relay, Seychelles	
2300	7285	Croatian Radio	
2300	15345	Radio Argentina al Exterior	SS
2300	7300	Voice of Turkey	TT
2300	9575	Radio Medi Un, Morocco	FF/AA
2315	12115	Rikisutvarpid, Iceland	Icelandic
2330	7345	Radio Prague, Czech Republic	
2330	7325	Radio Vilnius, Lithuania	
2330	7590	AFRTS, Iceland	USB
2330	9740	BBC relay, Singapore	
2330	9670	Radio Veritas Asia, Philippines	VV
2330	9820	Radio Nacional Venezuela, via Cuba	SS

by Harold Ort, N2RLL

New, Interesting, And Useful Communications Products

Three New Magellan RoadMate Portable Vehicle Navigation Devices

Thales Navigation has announced three new portable vehicle navigation devices: the Magellan RoadMate 3000T, 3050T, and 6000T. The products introduce a new intelligent design that's compact easy to use.

The devices combine the Magellan user interface with the advanced speed and accuracy of Magellan NavEngine routing technology, an Intel XScale processor, and real-time traffic information for out-of-the-box routing, traffic avoidance, multimedia functions and features that simplify driving.

The Magellan RoadMate 6000T delivers hands-free calling with Bluetooth-enabled phones. It includes a built-in real-time traffic receiver and a photo viewer, and can simultaneously receive turn-by-turn route guidance while letting users enjoy MP3 and WMA music files from an SD or MMC memory card. The Magellan RoadMate 6000T also offers SayWhere text-to-speech guidance that speaks the name of the road for upcoming maneuvers. The product's integrated battery lets drivers operate the device without its cigarette lighter adapter, in or away from the car, whether for listening to music, inputting addresses, or accessing the database of more than six million points of interest for phone numbers and locations of shops, entertainment, restaurants, banks and other businesses.

In addition to providing SmartDetour, a free, integrated feature that provides drivers the option to route around freeway traffic, Thales has teamed with NAVTEQ to provide real-time traffic service to North American customers. The subscription-based service provides live updates on traffic slow downs, road construction, accidents, and incidents that delay the normal flow of traffic. The Magellan RoadMate provides traffic alerts and automatically re-routes the driver around traffic.

Magellan's RoadMate 3000T can easily be moved from car to car or packed in a suitcase. The 3.5-inch, color touch screen is highly visible and easy to use.

The small (4 x 5 x 1.5 inch, HWD), lightweight Magellan RoadMate 3000T, 3050T, and 6000T can easily be moved from car to car or packed in a suitcase. The 3.5-inch, color touch screen and buttons provide fast, one-touch access to key features.

The Magellan RoadMate 3000T was scheduled to be available in April for $599. The TrafficKit accessory for the 3000T will be available in June for $149, and will include 15 months of service. The Magellan RoadMate 3050T will be available in June for U.S. $649, and will include the TrafficKit accessory along with three months of service. Available in July, at a price to be announced, the Magellan RoadMate 6000T, with integrated traffic receiver, will include three months of service.

For more information on Magellan RoadMate vehicle navigation products, or to learn about Magellan handheld GPS receivers, software and accessories, visit www.magellan GPS.com.

The new MFJ AC line RFI filter.

New MFJ AC Line RFI Filter

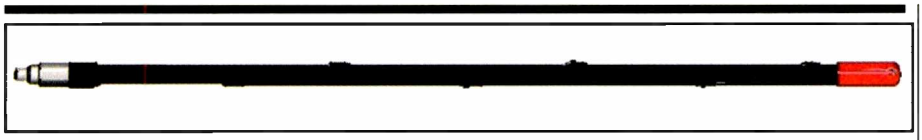
MFJ tells us that its new RFI filter "squashes computer hash." The MFJ-1164, which sells for $59.95, filters and reduces AC power line RFI, hash, noise, transients, and surges generated by computers, motors, RF transmitters, and static/lightning by 30 dB and up to 60 to 80 dB with a good earth ground. MFJ says, it has, "super fast, nano-second over-voltage protection."

The MFJ-1164 provides inductive isolation, capacitive decoupling, RFI rejection, over-voltage protection of both common mode *and* differential signals, while it rejects/shunts undesired signals to ground. It has four three-wire, 15-amp, 120-VAC outlets that are spaced for large adapters. It has a wing nut for ground and features an all-aluminum case.

The MFJ-1164 is protected by the company's "No Matter What" one-year limited warranty. To order, get a free catalog, or for your nearest dealer, contact the company at MFJ, 300 Industrial Park Road, Starkville, MS 39759; Phone: 800-647-1800; Fax: 662-323-6551; Web: www.mfjenterprises.com.

Firestik's MURS 5/8-Wave Mobile Antenna

The Firestik MURS45 antenna is an omni-directional antenna for the MURS 151.820- to 154.600-MHz service (MURS, short for Multi-Use Radio Service, is an FCC-authorized "no-



The Firestik MURS45 antenna is an omni-directional antenna for the MURS 151.820- to 154.600-MHz service and offers a low angle of radiation for optimum ground wave propagation of your MURS signal.

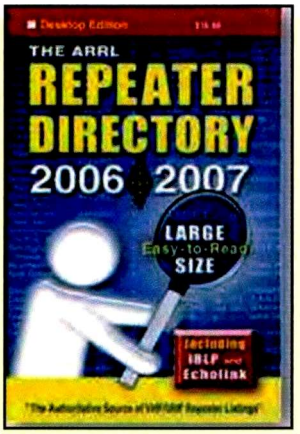
license" VHF Citizens Band radio service). The Firestik design offers a low angle of radiation for optimum ground wave propagation of your transmitted communications. This 5/8-wave (physical and electrical) antenna has a nominal impedance of 50 to 52 ohms, and its wide bandwidth exceeds the 2.78-MHz bandwidth of the MURS band. The overall length is 45 inches. Gain over isotropic is 6 dB; gain over 1/4 wave is 3 dB.

The MURS45 antenna is rated at 400 AM watts (800 P.E.P.), thus exceeding the initial authorized 2-watt transmitter output by a factor of 200. The core is 3/8-inch solid fiberglass (a special Firestik formula for balance of ruggedness and flexibility). The conductor is double insulated 19-gauge copper wire, and the static noise resistive covering is made of PVC with added UV and pigment stabilizers. The antenna base is chrome plated machine brass with standard 3/8-24 threads for full compatibility with all Firestik mounts and accessories. It's available in black or white and carries an MSRP of $24.99.

Firestik also offers quarterwave tunable tip MURS antennas, the 16-inch MURS16-B, for $17.99 and the MURS16S-B, a 17-inch quarterwave (includes spring) for $24.99 MSRP. The core material is solid 3/8-inch fiber-rich, custom blended fiberglass. Each is hand-wound with double insulated 19-gauge copper wire. The antennas have a 3/8-24 threaded base that will fit all common mounts and accessories. Both antennas are covered with a static reducing, watertight sleeve containing UV and pigment stabilizers.

The MURS16-B should be selected when the user has no need for the added protection from a spring. However, for roof mounts and other methods that place the antenna in a location where physical contact with immovable objects is probable, the MURS16S-B is the proper choice. The MURS16S-B antenna production length is factory adjusted to compensate for the stainless steel spring.

For more information on these Firestik MURS antennas contact the company directly at www.firestik.com or write to Firestik Antenna Company, 2614 E. Adams St., Phoenix, Arizona 85034-1495; Phone: 602-273-7151; Fax: 602-273-1836.



The new ARRL Repeater Directory (Desktop Edition) measures 6 x 9 inches and is $15.95 from the ARRL.

New ARRL Repeater Directory (Desktop Edition)

The ARRL announced its new, large easy-to-read Desktop Edition of the traditional pocket-sized *Repeater Directory*. It includes 20,389 listings for VHF/UHF repeaters across the United States and Canada. New features include IRLP, WIRES-II, and Echolink (Internet-linked) nodes, emergency message handling procedures, and transceiver memory log. The *Repeater Directory* also includes repeater operating practices, repeater lingo, and hints for newly licensed hams; frequency coordinator contact information, using CTCSS tones and digital coded squelch (DCS); VHF/UHF band plans and 2-meter channel-spacing map; IRLP (Internet-linked) nodes; and tips for handling interference.

The new *ARRL Repeater Directory* (Desktop Edition) measures 6 x 9 inches and is available now from the ARRL for $15.95. The standard pocket-size book is $10.95. For more information, contact the American Radio Relay League at 888-277-5289 or via the Web at www.arrl.org.

by Peter Bertini

Shorty I HF Mobile Antenna—Short In Size, Long On Performance!

In the course of a pleasant chat with Harold after his appearance as a guest speaker at my local radio club, he offered me a chance try out a mobile HF antenna for a possible *Pop'Comm* review. Mobile ham radio HF operation was something I hadn't experienced, so I accepted Harold's offer on the spot! He returned from his car with the Shorty I *screwdriver* antenna, one of four mobile HF antennas products manufactured by Larry's Antennas LLC[1]. I wasn't expecting what he handed over; the antenna was hefty! Indeed, it was built like a Sherman tank!

The heart of the antenna is shown in **Photo A**. What you get with your order is the antenna, mounting post, some hardware, along with some cabling, and a reversing switch that lets you remotely tune the antenna from the driver's seat in the vehicle. What *you* need to provide is a stainless steel whip and a means to securely the mount the antenna.

Mobile Antenna Challenges

Maybe I'm getting ahead of myself here, and perhaps many of you are wondering what the heck a *screwdriver* antenna is, so let's backtrack a bit.

Hams operating HF mobile (using ham bands between 160 and 30 MHz) face some interesting challenges, and the selecting the proper antenna is at the top of the list. For instance, a 100-inch whip will work as a very efficient quarterwave radiator on 10 meters, but you'd need a whip nearly 70 feet tall for 80 meters (3.5 MHz)! Hams often used single band antennas, which required retuning to move to a new portion of a band, or possibly even changing of *loading coils* (inductors), whips, or some other form of manual intervention when changing bands or moving to another frequency.

Screwdriver Antennas

One way to operate a short antenna at a lower frequency is to use a *loading coil* at the base of the antenna to lower its resonant frequency. Some form of antenna loading was needed to limit the mobile antenna height to less than 13 feet 6 inches, the legal height limit in most states. Many mobile HF antennas use a large coil with movable jumper to allow operating on several bands by manually moving the tap point position on the coil to tune the antenna.

Photo A. Here's the Shorty I antenna. Hidden inside is a remote-controlled DC motor that tunes a variable inductor, permitting the antenna to operate continuously across the HF spectrum! The antenna is well made and very rugged. A stainless steel whip is needed, as well as a means to mount the antenna on your vehicle.

Eventually someone figured out that a small DC motor could be controlled remotely to tune the antenna, either by moving the entire coil up and down, or just using the finger stock contact fingers that slide across the face of the windings. As it turned out, those inexpensive rechargeable battery-powered screwdrivers sold at every hardware store were ideal and easily adapted for this task. Hence the "screwdriver" antenna was born!

"I strongly advise having a professionally fabricated metal bracket securely welded or bolted to the car frame for mounting any HF antenna."

Mounting The Antenna

These antennas are hefty, and require substantial support. The Shorty I uses a 3/8-inch grade-8 mounting bolt to secure the mounting post. The best place to mount the Shorty I is on the highest point of the vehicle (usually the center of the roof), which is most easily done with a magnet mount. There are special four-magnet, extra-heavy-duty mounts that may be suitable for this, but they are expensive. I *strongly* advise having a professionally fabricated metal bracket securely welded or bolted to the car frame for mounting any HF antenna.

Worldwide Emergency Communications

A major disaster will disrupt commercial and government communication infrastructures. Cell phone service will be the among the first communications casualties as the Telco's interconnecting T1 carriers fail and remaining circuits become overloaded. The World Trade Center attack showed the vulnerability of government and civilian communication systems. On a wider scale, the wide-

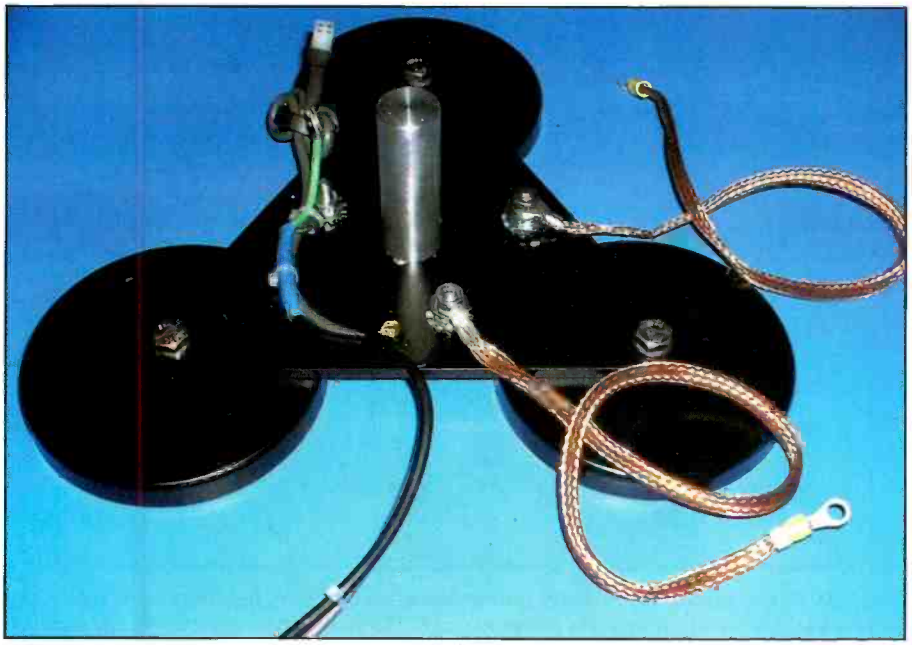


Photo B. A MFJ-336 magnetic mount was modified to allow installation of the Shorty I mounting pin. The antenna can be removed from the magnetic mount by loosening a setscrew and lifting the Shorty I off its mounting pin. Braided copper ground straps are needed to bond the antenna to the car body, which serves as the ground counterpoise for the antenna to work against.

spread devastation caused by Hurricane Katrina left amateur radio as the only means of getting information in and out of many communities. HF radio almost always gets through.

The Shorty I *continuously* tunes from 3.5 MHz to over 30 MHz, spanning the 80/75-, 60-, 40-, 30-, 20, 17-, 12-, and 10-meter amateur bands, *along with the 11-meter CB band* and HF MARS (Military Affiliate Radio System) assignments. (It also operates on 6 meters when tuned to 40 meters.) This means a mobile station equipped with a screwdriver antenna and a modern HF transceiver is capable of providing emergency communications for on a community, state, national, or even worldwide basis by simply matching the band that gives the best propagation for the needed coverage area. The newly assigned 60-meter ham band (just above 5 MHz) was authorized because of its ability to fill propagation gaps that existed in our existing amateur radio frequency assignments.

Emergency preparedness was one of the motivations behind my becoming HF mobile ready! Are you prepared?

MFJ-336 Magnet Mount And The MFJ-1964 Stainless Steel Whip

Since I intended to have the antenna mounted only while my vehicle was parked, I needed a method that permitted easy installation and removal of my Shorty I. A modest magnet mount would be ideal. A quick search of the MFJ catalog[2] provided a solution (as MFJ often does!) for my dilemma: the MFJ-336 tri-magnetic mount was inexpensive, and could be easily adapted to meet my needs!

Photo B shows the modified MFJ-336T mount that I used for my Shorty I installation. I removed the MFJ-supplied coax cable and connector from the top plate. (I reused the 17 feet of coax for the Shorty I antenna cable) and installed the Shorty I mounting post in the center of the plate using a grade-8 bolt and lock washers. The aluminum mounting post can be seen in the center of the plate. The Shorty I simply slides onto the mounting post and a setscrew firmly locks the antenna in place. **Photo C** shows the Shorty I installed on the MFJ-336 mount.

I drilled and tapped two quarter-inch-20NC holes to provide connection points for two copper braid ground straps (more on this later). I also provided a cable strain relief for the coax cable and control cable. I prepped and installed the coax according to the directions in the Shorty I manual. The control cable end that connects to the antenna is equipped with a ferrite toroid to keep RF from entering the vehicle.

Stainless Whip

The antenna requires a stainless whip. Larry recommends a whip length of between 48 and 82 inches for the Shorty I. He also says that 72 inches optimal, so the MFJ-1964 72-inch stainless whip is a good bet here and is what I used with my Shorty I.

The Control Box

Larry provides an interconnecting control cable that's equipped with Molex connectors at the antenna and reversing switch ends of the cable. Although it's now provided, my revers-

Photo C. The Shorty I and MFJ-336 magnetic mount ready for installation on the vehicle.

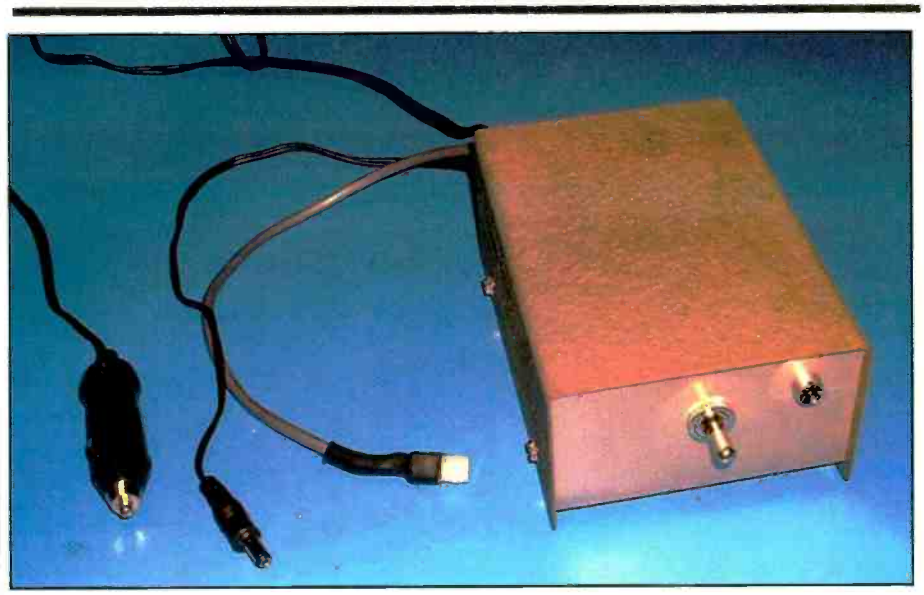


Photo D. I used an older RadioShack project box as a convenient housing for the screwdriver antenna's reversing switch and power resistor. The switch and resistor are now supplied already mounted in a small box.

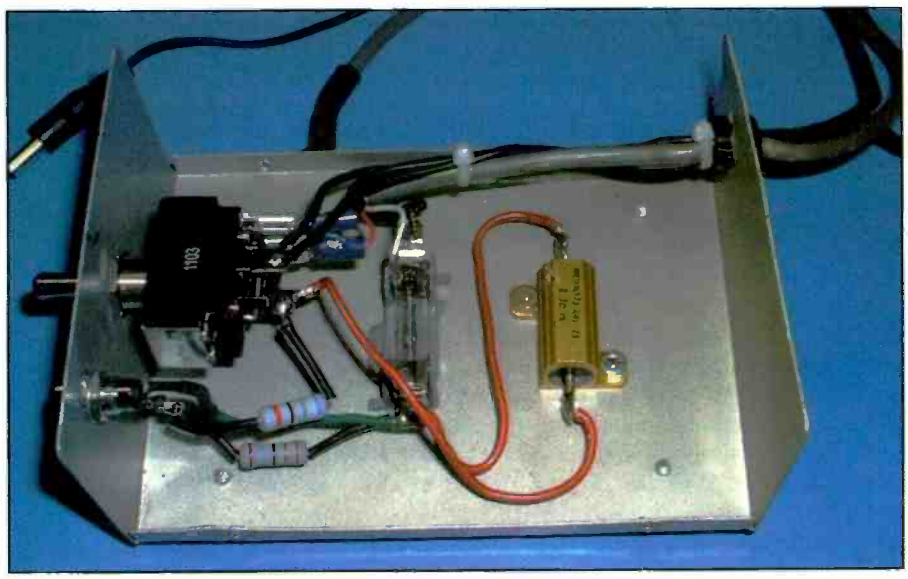


Photo E. An inside view of the control box wiring. I added a 7-amp fuse as suggested by the manufacturer.

ing switch (and an associated power resistor) were supplied without a box, so I opted to mount the switch and resistor in small RadioShack project enclosure (**Photo D**).

The resistor will get hot when the antenna is being tuned, so it's good practice to bolt it to a metal surface to help dissipate the heat. The resistor slows the motor speed, making it easier to tune the antenna. It also limits the motor's stall current when the mechanical end limits of the antenna tuning range are reached. **Photo E** shows the internal wiring for the reversing switch control box. You should also provide a 7-amp fuse to protect the screwdriver motor in case of overload.

Going Mobile!

My Voyager van seemed to be a good place to try things out. The Shorty I, along with the companion MFJ magnet mount and whip are shown in **Photo F**. The ideal location would have been in the center of the roof, but it was more convenient to have the Shorty I near the rear hatch. The Voyager's luggage carriers were positioned over the magnetic base for added security; I suspect with a little more work these devices might be utilized to better

Photo F. I mounted the Shorty I near the rear hatchback on my Voyager van. The center of the roof would have been a better location, but it was inconvenient.

Photo G. I ran the ground straps between the hatchback and van body to the metal body inside the van. Adding heatshrink tubing or tape over the braid will help protect the vehicle paint at the entry points.

secure the antenna, allowing it to be left on the vehicle on a permanent basis.

Now, getting back to the ground wires made from RG-8 coax braid that I mentioned earlier. Without getting into a lot of theory, short HF antennas are generally very lossy; they have a very low radiation resistance, meaning a lot power is wasted as heat. A good ground is essential to minimize losses, especially as the antenna becomes a smaller fraction of wavelength (going lower in frequency).

The Shorty I must be directly grounded to the vehicle frame using short, heavy wires. These connections should be bolted to the body to ensure low-resistance connections. **Photo G** shows where the braided copper grounds are run between the hatch and car body to a point inside where they're connected to the car body. Do not connect to a point that is hinged, like the hatchback door, because it *will not* provide a good electrical connection to rest of the car body! All exposed metal portions of the Shorty I are RF "hot"—pets and people should be kept clear of the antenna while it's transmitting.

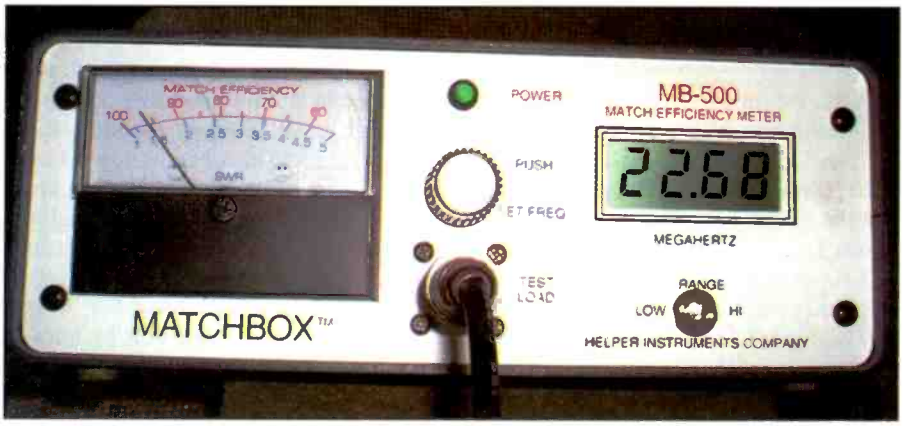


Photo H. A Helper Matchbox proved useful to quickly verify the frequency coverage and SWR across the antenna's advertised operating range. It passed with flying colors!

Fixed Station Operation

A screwdriver antenna makes a very good fixed station antenna as well. However, two things are needed for base station use. First get the antenna as high off the ground as possible, at least above nearby metal clutter, such as parked vehicles, chain link fences, etc. Second, you'll need at least four radial wires run from the ground connections on the mounting plate. These should be kept at 90 degrees from each other and should be at least a quarterwave long (the exact lengths are not overly critical) for the lowest frequency you'll be operating. The radials are counterpoises and can be laid directly on the ground if desired.

Testing The Antenna

I used a Helper model MB-500 Matchbox (**Photo H**) and an CIA-HF analyzer to check the frequency range and SWR plots for the Shorty I. The antenna easily covered from 3.5 MHz to over 30 MHz in my tests, and the SWR was always below 1.5 to 1. **Photo I** is a shot of the CIA HF analyzer screen, showing a swept SWR display for a center frequency of 14.225 MHz (20 meters) with a 500-kHz per division setting.

Antenna tuning was smooth, and the antenna was easily set to any desired frequency without much effort. The settings also seemed to be stable, with no random jumps noted. The bandwidth sweeps showed reasonable sharp SWR curves; if they were too broad it

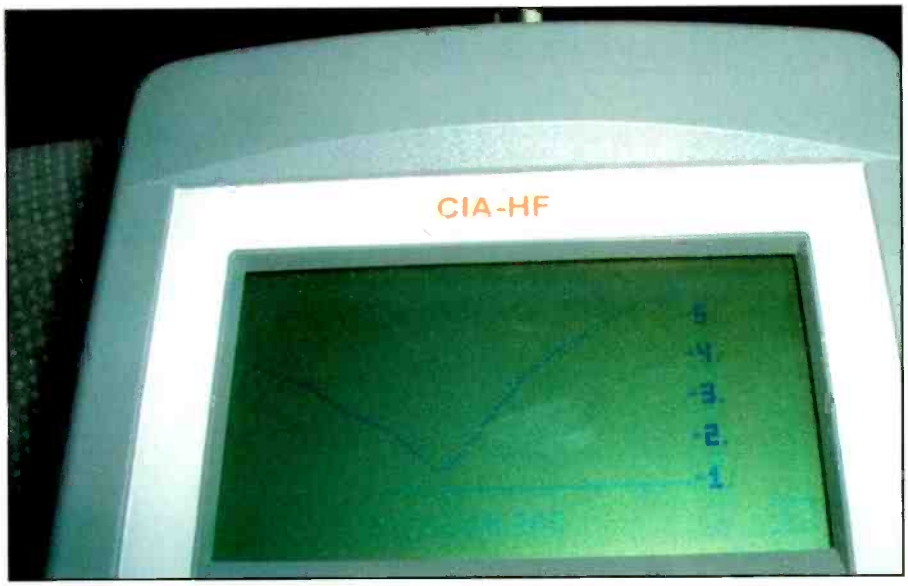


Photo I. With my CIA-HF antenna analyzer I graphically plotted the SWR curves at various frequencies to see how the antenna performed. The SWR plots were not overly broad, an indication that resistance losses are reasonable. The analyzer's LCD screen was a bit difficult to photograph.

might be an indication of excessive resistive losses.

On The Air!

Alas, I didn't have a 12-volt-capable HF multimode rig on hand, and the on-air tests were performed using my MFJ-9420 20-meter SSB QRP transceiver! My mobile operating position is shown in **Photo J**.

I conducted most of the tests during bad band conditions on a Saturday morning. Random CQs didn't generate much interest, but I quickly learned that the secret to making QRP contacts was to seek out stations and call them! My first contact was with a station in Minnesota; I had a hard time convincing him that I was mobile and running only 5 watts! If I had a typical 100-watt mobile station, I'm sure I would have been able work anything I heard using this antenna. I'll probably set up everything for the ARRL Field Day in June, just to see how many stations I can work with 5 watts and the Shorty I.

Larry advises that since *Pop'Comm* received the evaluation unit he's made numerous improvements to his antenna line. This review version is several months old as you read this, so you might expect to see some changes in the newer versions. His other models cover from 160 meters through 6 meters, and Larry has models that are better suited for bumper-height mounting (they have longer base tubes to elevate the radiating portion of the antenna).

Do I recommend the antenna? Yes, but please remember there's related mechanical and electrical work that needs to be done. Just as any beam antenna is only as safe and secure as the tower beneath it, there's a lot of unseen work and sweat behind every safe and effective HF *mobile* installation. No one, and I mean no one, manufactures a plug-and-play screwdriver antenna.

That said, these antennas are very well made, very rugged, and they work! We give it enthusiastic thumbs up!

For more information on the Shorty I, which sells for $319 plus $30.30 shipping, contact Larry's Antennas LLC. And be sure to tell them you read about the Shorty I in *Popular Communications*. ■

References

1. Larry's Antennas LLC, 12316 NE 192nd Ave. Brush Prairie, WA 98606; Web: www.kj7u.com; E-mail: kj7u@msm.com; Phone: (360) 896-5810.

2. MFJ Enterprises, Inc., 300 Industrial Park Rd., Starkville, MS 39759; Web: www.mfjenterprises.com; E-mail: mfj@mfjenterprises.com; Phone: (662) 323-5869; Fax: (662) 323-6551.

Photo J. My QRP mobile test setup used the MFJ-9420 20-meter SSB transceiver. Worldwide communications are possible when conditions are favorable.

by Ken Reiss, radioken@earthlink.net

Looking For New Frequencies? Here's An Easy Way To Find 'Em

Finding new frequency information can be quite a chore. If you're just getting started with scanning, however, you're pretty well served by traditional frequency lists and Internet sites. Get familiar with all that these publications and websites have to offer. See if any of your local RadioShack employees have an interest in scanning, or check to see if there's a local website. This could lead you to a wealth of information and save you a ton of work.

After you get a bit more experience with scanning, though, you'll begin to learn the details of the departments you're monitoring. You may also find additional services you didn't think you were interested in, but turned out to be quite entertaining. As you do, you can begin to develop a band plan for your area, meaning what's used and by whom. It can be very helpful and informative to make a list of every possible channel on a band and plug in the information you already know. Now you can see how many "holes" there are in your knowledge.

Look for Line In or Mic In jacks on your computer to record the traffic from your scanner. Exercise great caution if you have to use the Mic In jack as you can overload the circuit and cause damage. On most computers, you can set a gain for the Line In and Mic In jacks in the control panel. Some experimentation will be necessary, but you can make excellent recordings.

How many bands do you need to look at? Well, some areas operate almost exclusively in the VHF range, while others (particularly large metro areas) squeeze additional channels anywhere they can. Don't ignore the other bands even if your local police and fire are all in one spot. You never know what you'll find.

Once you've completed your list, or band plan, you can begin searching for unknowns with some confidence that you can correctly identify the intercepted signal, whether it's a new frequency for you or just one you'd forgotten about.

Even without reading the rest of this article, if you only take this suggestion and create lists, you'll be way ahead of most scanner enthusiasts and have much information to share with your local club. Take the time to catalog what you know and what you don't know. Look at the channel listings in the back of *Police Call* and see just how many channels there might be near you. How many can you identify in your area?

Searching For New Stuff— It Takes Time But It's Worth The Effort

Searching for new frequencies isn't easy. Not only is it time consuming, but figuring out what's new versus what you already know about isn't exactly fun. On top of that, there's the feeling (or reality) that you're missing something good on the frequencies you'd normally be listening to, instead of "wasting" your time searching.

Adding to the aversion most people have is the fact that the search function on most scanners is a bit inconvenient to use and quite (here's that phrase again) time consuming. Days, or weeks, can go by with little or no return. But when you do find new frequencies or identify a new user, it makes it all worthwhile.

Luckily, some new tools have become available to us in recent years to help in this process. Some can even to make your scanner do things that you never thought of!

The most significant improvement in the searching process has been the advent of computer-controllable scanners and the software that drives them. With software, it's not only possible to search large amounts of spectrum—over time of course—but also to turn your non-productive scanning time into a useful and worthwhile part of your hobby activities.

But even without a computer-control system, there are many things you can do to enhance your scanning, decrease your search time, and even convert down time into useful activities. The introduction of the voice-activated tape recorder made a lot of monitoring activities possible that simply weren't viable before. With a voice-activated recorder, a computer-control system, and some additional equipment, you can make time away from the shack just as productive as hunkering down within it.

Even if you don't want to search, but simply want to start plugging a group of those unknown channels into an empty scanner bank for a week or month at a time, you can find a *lot* of traffic. Or there might be nothing. You just won't know until you try!

Searching For Unknowns

It's normally a simple matter to hook up a tape recorder to your scanner, but if you're not familiar with the procedure,

see the sidebar, "Caught On Tape—Audio, That Is!" Alternately, you can use any of several freeware/shareware/commercial programs for your computer to turn it into a very functional recorder. My favorite for scanner use is Scanner Recorder, a freeware utility built just for scanner and radio recording. You can check it out yourself at www.davee.com/scanrec/index.html. Another popular one is RecAll Pro, which is shareware but also offers some nice features. It's at www.sagebrush. com/recpro.htm.

Adding a tape recorder to your shack will allow unattended searching. The amount of tape used will give you a feel for how much activity is found, even before you listen to it. By playing back the tape, you can at least get a good feeling for the activity in the range you searched and then decide if it's worth your time to pursue those active frequencies any further. If you're searching in a frequency area where you already know some channels, you may be able to identify some of the traffic just based on how it sounds. After that, you can pick specific frequencies you think might be worth following up on.

Perhaps you've heard through the rumor mill that a certain agency uses a specific channel. Here's a great use for the recorder while you're at work, running errands, or anywhere besides in your shack. Put the scanner on that frequency (or talkgroup, with the new trunktrackers) and set the recorder. You can verify a lot of information in a week just by spending the day on one frequency at a time!

Some scanners—mostly the newer model Uniden base units—feature an AUX feature to assist in recording specific channels. This can be very beneficial if you think you've pegged a few frequencies you want to follow. Just set up the recorder to tape only those specific channels and let it run. You'll be surprised at how quickly you can begin to match frequencies with that activity after you return to the shack from listening to the tape. I frequently carry tapes with me in the car to listen through while I'm driving from appointment to appointment or sitting in rush hour traffic. (It's a lot more fun to listen to that stuff than to most talk radio programs I've sampled lately.)

If you're fortunate enough to have a computer-controlled system, you can really make maximum use of your scanning setup while you're away. Almost any computer-controlled scanner can perform a search and keep track of the hits that occur on each channel. In addition, you can keep a log of the frequencies the scanner found active, as well as the sequence/time and date of activity. By playing back the tape and following along in the log, it's usually a pretty quick affair to figure out an active frequency. Then you can set it up for more detailed monitoring if you're interested. There are also a few recorders that feature a time and date stamp on the audiotape. That would make following the log very simple—assuming, of course, that the clock of the recorder and the computer are synchronized.

The number of computer-based recording programs on the market continues to grow, and many of them are getting quite sophisticated. Most, however, simply use the sound card to record, just like a voice-activated recorder. These make a great substitute for the recorder if you don't need to take the tape with you. Or you can convert the files to MP3 format or something that is portable, if required.

148-149.9 FIXED MOBILE MOBILE-SATELLITE (Earth-to-space) US319 US320 US323 US325 5.218 5.219 G30	148-149.9 MOBILE-SATELLITE (Earth-to-space) US319 US320 US323 US325 5.218 5.219	Satellite Communications (25)
149.9-150.05 MOBILE-SATELLITE (Earth-to-space) US319 US320 RADIONAVIGATION-SATELLITE 5.223		
150.05-150.8 FIXED MOBILE US216 G30	150.05-150.8 US216	
150.8-152.855 US216	150.8-152.855 FIXED LAND MOBILE NG4 NG51 NG112 US216 NG124	Public Mobile (22) Private Land Mobile (90) Personal Radio (95)
152.855-156.2475	152.855-154 LAND MOBILE NNG4 NG124	Auxillary Broadcast (74) Private Land Mobile (90)
	154-156.2475 FIXED LAND MOBILE NG112 5.226 NG117 NG124 NG148	Maritime (80) Private Land Mobile (90) Personal Radio (95)
156.2475-157.0375 5.226 5.227 US77 US106 US107 US266	156.2475-157.0375 MARITIME MOBILE US77 US106 US107 NG117 5.226 5.227 US266	Maritime (80) Aviation (87)

Just looking at the official FCC frequency table is enough to make your head spin, but there's some useful information there if you take the time to dig it out. Looking at this section, you can tell that there's a land mobile block (that's anything land based and usually of interest to us) that starts at 152.855 and has a sub-band starting at 154. The 154 isn't as definite as there could be some channels that don't exactly fall at that divider, but the 152.855 is a firm starting point for searching in that range. A lot of police and fire departments operate in this range on 15-kHz spacing (now officially 7.5, but not many of the splinter channels are in use). You can view the entire table at www.fcc.gov/oet/spectrum/table/fcctable.pdf

Searching Techniques

One of the biggest mistakes we all make when getting started is to search too large an area. It's tempting to set up a search for the entire military air band, for instance, or the federal portions of the

Don't forget to set an appropriate mode and frequency step when searching any band, but in particular the military and aircraft bands need to be in AM.

UHF band. You might get lucky and find a *few* things this way, but the odds are against you.

You have to remember that you're trying to find transmissions that don't take place very often, nor do they last long when they're on. Your scanner has to be in the right place (on the frequency) at the time the transmission is occurring. In short, you have a moving target being followed by a moving search engine. In a large block of frequencies, you're chances of winning the lottery are probably better.

So if reducing the size of the blocks will improve your chances of hitting something in that block, go for it! How small do they have to be? Well, that depends on exactly what you're looking for, and how fast your scanner can search. With a fast scanner, and assuming you're not looking for a frequency that's only used once in a blue moon, 2 to 4 MHz of space is probably about right. "Two to 4 MHz?" I hear you cry. "Do you know how long it's going to take to do the entire Military band?" Yes, I do. But what else are you using your scanner for during the workday when you're not there?

The second most important thing in a search operation is patience. This is particularly true with military operations, but it also applies everywhere, because some of the frequencies are not used on a daily basis. Perhaps some National Guard-type frequencies are only active when they're having exercises once a month. Or training frequencies may only be active during training operations that take place only occasionally. To find these obscure channels, you may have to search the same area of the spectrum over and over for a month, hearing nothing until the exercise starts. What fun, right? *But* it's worth it when you hit something!

Identify targets for your search. If you glance at almost any frequency guide—or our handy chart—you'll quickly see that there are pre-determined band plans for each area of the spectrum. In other words, there are places or frequencies in your

Caught On Tape—Audio, That Is!

Before we even get started on adding a tape recorder to your system, let me address the idea of taping in context. There has been some considerable flap over tape-recorded scanner intercepts in recent months. What I'm advocating here is taping as a *tool* for increasing your scanning time, not for use by any other persons, for sale, or even replay for anyone but yourself. The Communications Act of 1934 is fairly plain on the issue of disclosure—don't do it! If you're going to engage in any of the above mentioned activities, find another hobby. Ours has been damaged too much already by improper use of equipment.

Now, having said that, hooking up a tape recorder should be a relatively simple procedure, but it can be a bit confusing if you don't understand what all the connections do.

Essentially, there are only two connections to the recorder that you have to be concerned with, and only one that really matters. You need the audio from the scanner to get to an input for the tape recorder so that what comes over the scanner is put on the tape. Many newer scanners have a "Line Out" jack just for this purpose. If your tape recorder has an "Aux" or "Auxiliary" input, that's where the connection should be. The audio level out of a "Line" jack is too high for the microphone input of most recorders.

If your scanner has a "Line" output, but your recorder only has a "Mic" input, you can get something called an attenuating patch cable from RadioShack. This cable reduces the signal from the higher levels of the line output to a lower level that the microphone input will accept without a problem.

If you're using a voice-activated recorder, you simply turn on the voice activation feature, and the recorder will stop and start when it detects sound from the scanner. If you don't have voice activation, your recorder will run continuously, and you'll run out of tape pretty quickly. This is where a scanner, or computer interface, with a recorder comes into play.

One of the jacks on most recorders is labeled "Remote" and is for the remote control of the record motor. Finding the right cable can sometimes be a chore, but usually, it can be done, at least with adapters. Now, the computer or scanner has to know when to turn the recorder on and off, but that's normally controlled by the channel on the scanner, or by a setting in your software.

Once you have both stop and start control (using either method) and audio, you're in business. Good hunting!

scanner's coverage range where you should expect to find something and places where you shouldn't. For example, our local police occupy 154.830 and 154.845, which are, as it turns out, adjacent channels under the old plan. In the new frequency split plan, there could be a low-power service at 154.8375. Nobody should be on .835 or.840, but most scanners would pick up 154.8375 if you programmed either of the channels beside it.

Again, by simply mapping the available channels against what you already know, you can find a revealing number of holes in your information. A computer spreadsheet makes short work of this, but it can be done with pen and paper, too. Once you've found your missing areas, it may turn out that you have a very narrow range to search in a particular band. This will cut down on search time and help you identify transmissions on the recorder.

Develop A Tracking System

My final piece of advice is to develop a tracking system. Computers are great for this, too, but you can also do it with a notebook or index cards. Make notes of when you searched what segments. What day of the week was it? Could you be looking for something that is only used on weekends? Or every third Wednesday when they test the tornado sirens? What did you find on your search? Can you identify any of it, just based on what you already know or can find from frequency directories and other sources? The more information you have, the more useful the system will be in the long run.

It's A Big World Out There

Having said all that, maybe this searching thing is too much trouble for you. If you're quite happy scanning the local police and fire frequencies that you already know about, keep scanning. But if you're getting bored and wonder who else uses some of those other frequencies your scanner covers (maybe even that same local police or fire department—you'd be surprised!), searching, especially while you're away from the equipment anyway, can be extremely productive.

As always, I welcome your letters and e-mails. Contact me at Ken Reiss, 9051 Watson Rd. #309, St. Louis, MO 63126, or via e-mail at radioken@earthlink.net. And let me know what you've found in your searching! See you again next month.

Frequency Of The Month— And From Months Past

I've had several e-mails and letters from folks telling me that they've dedicated a bank to the "Frequency of the Month" idea. That's great! To get you started on your own bank, I've included a list of the past frequencies we've used (see below)!

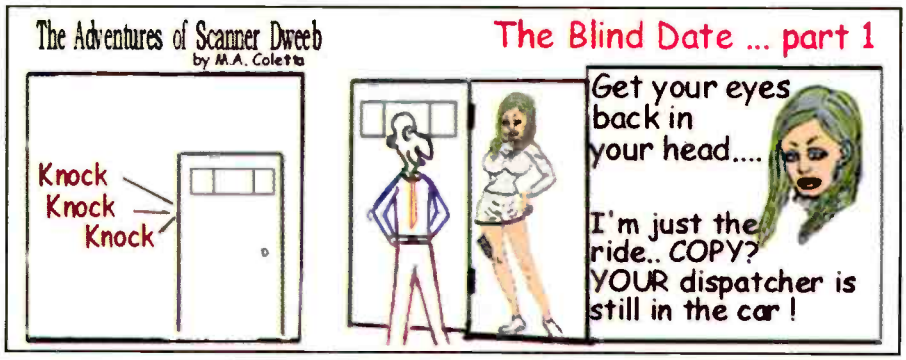
I've also noticed that I tend to get two kinds of entries: one from those who recognize the frequency as something local and can tell me off the top of their heads what it is; and one from people who have no idea what they're listening to, but have obviously been trying to guess over several days or weeks of listening to the traffic.

Here's a hint for the latter group: If you don't hear anything on the frequency, leave it in there for a while. It may just be one of those frequencies that doesn't get used often. Or it may just be a channel with no traffic in your area—at least then it won't slow down your scanning too much.

Our frequency this month is **459.8750**. Have a listen and see what you hear. Of course, you're welcome to enter, even if you don't hear anything! You can send info to Ken Reiss, 9051 Watson Rd. #309, St. Louis, MO 63126, or via e-mail at radioken@earthlink.net.

And now for FOTMs from the past. I thought using them as a search bank might be a good idea, so here's the complete list.

6/2006	160.59000	**3/2004**	462.67500	**11/2001**	450.55000
5/2006	154.81500	**2/2004**	157.00000	**11/2001**	450.55000
4/2006	119.10000	**1/2004**	146.94000	**10/2001**	155.79000
3/2006	154.86000	**12/2003**	155.83500	**7/2001**	155.56500
2/2006	450.58000	**11/2003**	123.45000	**6/2001**	42.02000
1/2006	160.27500	**10/2003**	460.70000	**6/2001**	42.02000
12/2005	155.76000	**9/2003**	155.65500	**5/2001**	151.94000
11/2005	155.74500	**8/2003**	161.77500	**4/2001**	452.45000
10/2005	460.38750	**7/2003**	157.10000	**3/2001**	155.73000
9/2005	121.80000	**6/2003**	42.22000	**3/2001**	155.73000
8/2005	856.58750	**5/2003**	155.64000	**3/2001**	155.73000
7/2005	154.60000	**4/2003**	467.58750	**2/2001**	152.48500
6/2005	160.23000	**3/2003**	282.10000	**2/2001**	152.48500
5/2005	156.60000	**2/2003**	153.89000	**2/2001**	152.48500
4/2005	119.40000	**1/2003**	856.68750	**1/2001**	462.25000
3/2005	155.47500	**12/2002**	170.97500	**1/2001**	462.25000
2/2005	857.43750	**11/2002**	453.22500	**12/2000**	162.40000
1/2005	460.22500	**9/2002**	154.16000	**12/2000**	162.40000
12/2004	154.57000	**8/2002**	121.90000	**11/2000**	118.50000
11/2004	153.87500	**7/2002**	118.90000	**11/2000**	118.50000
10/2004	118.30000	**6/2002**	460.12500	**10/2000**	860.71250
9/2004	857.71250	**5/2002**	156.80000	**9/2000**	460.25000
8/2004	155.73000	**4/2002**	166.10000	**9/2000**	460.25000
7/2004	156.45000	**3/2002**	42.12000	**8/2000**	154.84500
6/2004	856.68750	**2/2002**	154.13000	**8/2000**	154.84500
5/2004	155.25000	**1/2002**	462.66250	**5/2000**	166.50000
4/2004	153.86000	**12/2001**	154.74000		



by Tomas Hood, NW7US, pc-prop-man@hfradio.org

Powerful Computer Tools To The Rescue For Reliable Propagation Predictions!

Several months ago we started to explore the question, "When will good propagation occur?" Last month, we took a look at radio propagation analysis and forecasting tools, specifically ACE-HF (www.acehf.com). These tools help you unlock the science of radio propagation at the high frequencies.

Because of the mathematics involved, and the vast amount of data that must be analyzed when analyzing and forecasting radio signal propagation via the various ionospheric layers, you need more than a pad of paper and a quick mind. Sophisticated programs that are dedicated to the task are better suited to helping make the job more approachable. With powerful computers available for reasonable prices, and with affordable tools like WinCAP Wizard (www.taborsoft.com/) and ACE-HF, any radio hobbyist can begin to make sense of all the factors that play a role in radio communications on HF. This month, let's dive into the VOACAP model (www.greg-hand.com/hfwin32.html), and specifically, the "reliability factor."

Propagation Reliability

Whether you're a ham or a shortwave listener, anyone who has listened on the HF shortwave bands knows how variable the ionosphere can be. Even without considering the other system factors of transmitter power, receiver sensitivity, noise, frequency, and so forth, the varying ionosphere is always with us, creating ever-changing propagation conditions that can make our DX hunting, or evening listening to a favorite station, a challenging experience.

When we listen on HF radio and hear those elusive signals coming and going, chances are that the changing ionosphere is the cause. Most of the time, HF signals are stronger at night and become weaker during the daytime. Those diurnal effects are easy to understand because when the sun shines on the upper atmosphere, more of the gaseous atoms are converted to ions, and those charged particles multiply and expand the ionosphere to lower altitudes. At night sunlight is gone, so the masses of charged particles tend to dissipate and the ionosphere's reflection height rises.

But even when a radio circuit is entirely in daytime or nighttime, the signals still vary because the ionosphere is not uniform. I've never seen the ionosphere, but I suspect it would look like undulating cloud layers—and here in the Seattle area I've seen *lots* of those!

With all that going on, how in the world do we answer that old question, "When will good propagation occur?" The solution is to use a propagation prediction program. Modern HF propagation models assume that HF signals "bounce" off a reflection layer of the ionosphere, and models like ACE-HF and VOACAP include elaborate ionospheric profiles that describe electron and ion density as a function of height. The profiles vary with day and night, and are applied by the model according to each circuit's geometry. A long circuit may have several ionospheric reflection points (usually called control points), and the profiles may be different at each point. It takes a sophisticated computer model to keep track of all that.

Nevertheless, such models are based on average, or ambient, ionospheres. So, how do they account for the undulating ionosphere that might vary from the average? The answer is that the models use a statistical computation to account for a range of ionospheric (and other system parameters) variability. And in HF system computations, those variables are expressed as *reliability*. In the world of HF, *Reliability* means *Time Availability*. For example, if our model predicts a reliability of 50 percent, it means that the prediction will be as computed or better during 15 days of a 30-day month. If we want a more conservative prediction, we could specify a *Required Reliability* of 90 percent. Those predicted reliabilities that equal or exceed 90 percent are those that would exist during 27 days of a 30-day month. If we set our Required Reliability at only 10 percent, then the predictions would be less accurate because they would show the conditions that would exist during only three days of a 30-day month.

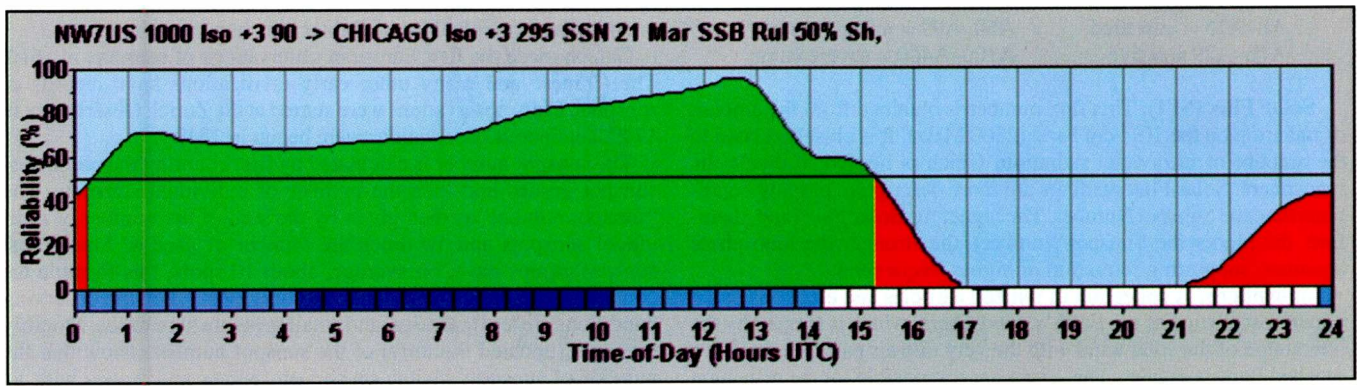


Figure 1. Reliability vs. Time-of-Day from Brinnon to Chicago on 40 meters, with a required Reliability of 50 percent. (Source of all figures Tomas Hood, NW7US, using ACE-HF)

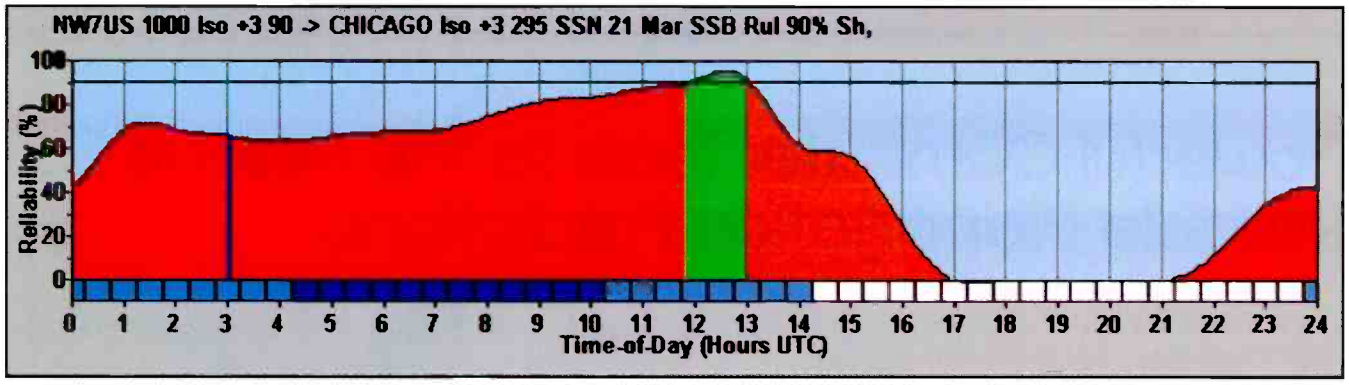


Figure 2. Reliability vs. Time-of-Day from Brinnon to Chicago on 40 meters, with a required reliability of 90 percent.

In ham radio operation, most users set Required Reliability at a median value of 50 percent. But for military HF systems, 90 percent is used. The military wants to know what connectivity will exist most of the time; they don't care what will happen only some of the time.

Using ACE-HF, I modeled a circuit from my ham station in Brinnon, Washington, to Chicago and first specified a Required Reliability of 50 percent. **Figure 1** shows that the Reliability vs. Time-of-Day chart is well in the green most of the time in the 40-meter band (7.1 MHz). That is, the predicted reliabilities are above the 50 percent black line of the chart.

I wondered what would happen if I used the more conservative Required Reliability of 90 percent? With one click I changed to 90 percent and saw the chart of **Figure 2**. Oh, oh. My nice circuit has turned to mud! Before, except for the daytime hours when even 50 percent wouldn't work (remember that lowered ionosphere), the predicted reliability is now below 90 percent most of the time. What to do?

Well, maybe I could increase power—but, I was already using my 1000-watt power amplifier. I had specified isotropic antennas with gains of +3 dBi at both ends of the circuit, so perhaps I could achieve more power by using directional antennas. Using ACE-HF's new antenna analysis capability, I learned that a typical Yagi antenna has a gain of +12.7 dB at 40 meters, as shown in **Figure 3**. That should work!

Sure enough, when I specified Yagi antennas at both ends of the circuit, I could enjoy 90 percent reliability over a much longer time period, as seen in **Figure 4**. The band was still dead

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 (Kp > 5 or Ap > 20) mean stormy conditions with an active geomagnetic field. The more active, the more unstable propagation is, with possible periods of total propagation fade-out. Especially around the higher latitudes and especially 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 transpolar 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 (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 large distances.

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 waxes and wanes with an approximate 11-year cycle.

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

during most of the daytime hours, but it was nearly in the green the rest of the time.

But wait! Why is it that when I added 12.7 dBi of power gain at both ends of the circuit—25.4 dB in all—the reliability didn't jump to 100 percent? After all, that much gain is like increasing my transmitter power level to more than 100,000 watts. The answer is that *reliability is non-linear.*

Just for fun, I did some testing, varying antenna gain by different amounts to see what would happen to predicted reliability. Starting with my original isotropic antennas, I produced the curve shown in **Figure 5**. Even with an equivalent power level of more than 100,000 watts, the predicted reliability almost never reaches 100 percent. In contrast, a similar graph of Signal-to-Noise Ratio (SNR) would be linear—predicted SNR increases, dB-for-dB, as transmitter power and/or antenna gain increases.

Now here's where statistics come in. ACE-HF (and VOACAP) computes reliability as a function of SNR distribution, which in turn is based on the specified Required Reliability. If you specify 90-percent Required Reliability, then the model computes SNR at 90 percent as:

$$\mathbf{SNR90 = SNR - SNR_{LW}}$$

where **SNR** is the monthly median SNR

and $\mathbf{SNR_{LW} = (SIG_{LW}{}^2 + N_{up}{}^2)^{0.5}}$

where $\mathbf{SNR_{LW}}$ and $\mathbf{SIG_{LW}}$ are the lower decile* values of SNR and Signal respectively,

and $\mathbf{N_{up}}$ is the upper decile value of total noise power.

** If a set of numerical values is ordered from lowest to highest and divided into 10 equal parts, the values separating the 10 parts are called deciles. Hence there are nine deciles which separate the 10 sections. The upper and lower deciles are the 90-percent and 10-percent levels, respectively.*

These statistical factors are based on many years of field measurements, where distributions of signal and noise power were gathered during a wide range of ionospheric variation. So when one specifies a higher Required Reliability factor, like 90 percent, the statistical factors come into play and effectively reduce the predicted SNR and predicted Reliability from their 50-percent median values.

Getting back to my circuit, I wondered what would happen to predicted Reliability in the other ham bands. Again using ACE-HF, I created a *Summary REL* chart to determine reliability over the frequency range. **Figure 6** shows the result, where the green areas are for reliabilities of 90 percent or more and the yellow areas are for reliabilities of from 50 to 90 percent. The figure shows that the lower bands are favorable at nighttime, but as daylight approaches the path, 20 meters and higher become preferred.

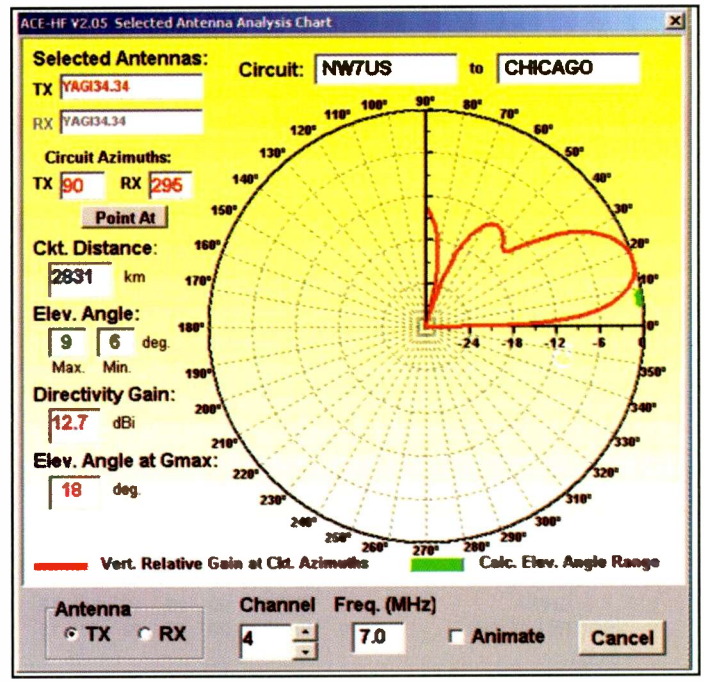


Figure 3. Yagi antenna gain at 7.0 MHz.

One other ACE-HF tool is useful for understanding the effects of higher reliability settings. As shown in **Figure 7**, I created an area coverage display around my station and selected the combined reliability setting of 50 percent and 90 percent. In this case, I returned to the original isotropic antennas with +3 dBi gain each, and selected 80 meters for my frequency.

The resulting display clearly shows that higher Required Reliabilities result in more conservative connectivity predictions. In the figure, the inner curve bounds the area in which reception with 90-percent reliability or more can be obtained. The outer, 50-percent, curve shows that we can be assured of much greater coverage if we don't mind that it may not be available on half of the days of the month.

To Be Continued...

This month we've explored the effects on HF communications of the Reliability, or Time Availability, of our prediction

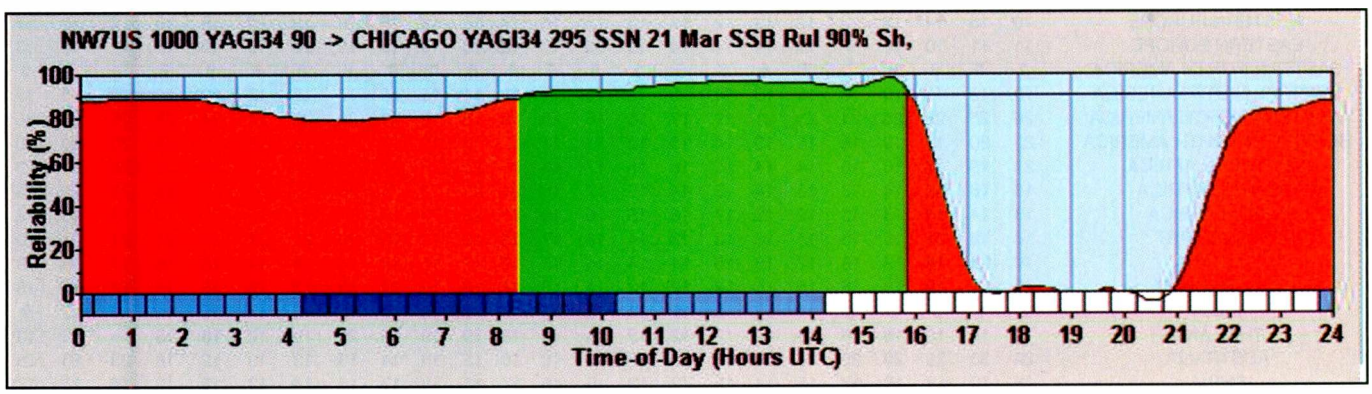


Figure 4. Reliability vs. Time-of-Day with a required reliability of 90 percent and Yagi antennas.

Optimum Working Frequencies (MHz) - For July 2006 - Flux = 70, Created by NW7US

UTC TO/FROM US WEST COAST	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CARIBBEAN	22	22	21	21	20	18	16	15	14	13	12	11	12	14	15	17	18	19	20	20	21	21	21	22
NORTHERN SOUTH AMERICA	28	28	28	26	24	22	20	18	17	16	15	14	14	16	19	21	23	24	25	27	27	28	28	28
CENTRAL SOUTH AMERICA	27	25	23	21	19	18	17	16	15	14	13	16	16	18	20	22	24	25	27	28	28	29	29	29
SOUTHERN SOUTH AMERICA	23	17	15	15	14	13	13	13	12	12	12	12	12	15	18	20	22	24	25	26	27	28	28	26
WESTERN EUROPE	12	12	11	10	10	9	14	13	12	11	10	12	15	17	18	19	20	20	20	20	19	18	17	15
EASTERN EUROPE	9	9	9	9	12	15	14	12	11	11	10	10	13	16	17	18	19	19	18	17	16	14	10	10
EASTERN NORTH AMERICA	25	25	25	24	24	23	21	19	17	16	15	15	16	18	19	21	22	23	24	24	25	25	25	25
CENTRAL NORTH AMERICA	14	14	14	14	13	13	13	11	10	10	9	8	8	9	10	11	12	13	13	13	14	14	14	14
WESTERN NORTH AMERICA	7	7	7	7	7	7	7	6	6	5	5	4	4	4	5	5	6	6	7	7	7	7	7	7
SOUTHERN NORTH AMERICA	23	23	23	22	22	22	20	18	17	15	14	13	13	13	15	17	18	19	20	21	22	22	22	23
NORTHERN AFRICA	17	15	14	13	12	12	14	13	12	11	11	14	16	17	18	19	20	20	20	21	20	20	19	18
CENTRAL AFRICA	18	16	15	14	14	14	14	13	12	11	10	13	15	17	18	19	20	20	20	21	21	21	21	19
SOUTH AFRICA	15	14	14	13	13	12	13	18	17	15	15	16	18	19	21	22	23	23	24	22	20	18	17	16
MIDDLE EAST	14	13	13	13	15	16	13	12	11	11	10	10	14	16	18	19	19	20	20	20	19	18	17	15
JAPAN	19	20	20	20	20	20	19	19	18	17	16	14	13	13	14	14	13	13	13	14	16	17	18	19
CENTRAL ASIA	20	21	21	20	20	20	19	19	18	17	15	14	13	13	14	15	17	16	15	14	14	15	17	19
INDIA	18	18	18	18	18	17	16	13	12	11	10	10	9	10	9	9	9	8	8	11	14	15	16	17
THAILAND	17	18	20	20	20	20	19	18	17	15	14	13	12	11	13	15	17	18	16	15	14	13	13	15
AUSTRALIA	29	30	30	30	30	30	29	28	26	23	21	20	18	17	16	15	14	14	13	13	15	21	25	27
CHINA	19	19	20	20	20	19	19	18	16	14	13	12	11	11	13	16	16	14	14	14	14	16	17	18
SOUTH PACIFIC	29	29	29	29	28	26	23	18	15	14	14	13	13	13	12	12	12	12	12	20	24	27	27	28

UTC TO/FROM US MIDWEST	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CARIBBEAN	25	24	24	24	22	20	18	17	15	14	13	13	14	16	18	19	21	22	23	23	24	24	24	25
NORTHERN SOUTH AMERICA	26	26	25	23	21	19	18	17	15	14	14	13	13	16	18	20	21	23	24	24	25	26	26	26
CENTRAL SOUTH AMERICA	27	25	23	21	19	18	17	16	15	14	13	15	17	19	21	23	24	26	27	28	28	29	29	29
SOUTHERN SOUTH AMERICA	23	17	16	15	14	14	13	13	12	12	12	12	12	17	20	22	23	25	26	27	28	28	27	26
WESTERN EUROPE	15	13	12	11	11	10	13	13	12	12	14	16	17	18	19	19	20	20	20	20	19	19	18	17
EASTERN EUROPE	10	9	9	9	9	14	13	12	11	11	13	15	17	18	19	20	20	19	19	18	17	16	14	10
EASTERN NORTH AMERICA	18	18	18	17	17	15	14	13	12	11	10	10	12	13	14	15	16	17	17	18	18	18	18	18
CENTRAL NORTH AMERICA	8	8	8	8	8	8	7	6	6	5	5	5	5	6	6	7	7	8	8	8	8	8	8	8
WESTERN NORTH AMERICA	14	14	14	14	14	13	13	12	11	10	9	8	8	9	10	11	12	12	13	13	14	14	14	14
SOUTHERN NORTH AMERICA	16	16	16	16	15	14	13	12	11	10	9	9	9	10	11	12	13	14	14	15	15	16	16	16
NORTHERN AFRICA	20	19	17	16	15	14	15	14	14	14	15	16	17	18	19	19	20	20	20	21	21	21	21	20
CENTRAL AFRICA	18	16	15	14	13	13	15	14	14	14	15	16	17	18	19	19	20	20	20	20	20	20	20	19
SOUTH AFRICA	15	14	13	13	13	12	12	20	18	17	17	18	21	23	24	26	27	27	25	22	19	18	17	16
MIDDLE EAST	14	13	12	12	14	15	14	13	12	12	14	16	17	18	19	20	20	20	20	20	19	19	17	16
JAPAN	20	20	20	20	19	19	18	17	15	14	13	13	13	15	16	15	13	13	13	15	16	17	18	19
CENTRAL ASIA	20	20	20	20	19	18	18	16	15	13	12	12	13	15	17	18	18	17	15	14	14	15	17	19
INDIA	12	14	16	17	17	15	13	12	11	11	10	13	15	17	17	16	14	12	10	9	9	9	8	8
THAILAND	17	18	20	19	19	18	16	14	13	12	11	11	13	16	17	18	19	18	17	15	14	13	13	14
AUSTRALIA	29	30	30	30	29	29	28	26	23	21	20	18	17	16	15	14	14	13	13	13	16	22	25	28
CHINA	18	19	19	19	18	17	16	14	13	12	11	11	13	16	17	17	16	14	14	14	14	16	17	18
SOUTH PACIFIC	29	29	29	28	27	25	22	16	15	14	14	13	13	12	12	12	12	12	12	21	25	27	28	29

UTC TO/FROM US EAST COAST	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CARIBBEAN	20	20	19	18	16	15	14	13	12	11	10	10	12	14	15	16	17	18	18	19	19	20	20	20
NORTHERN SOUTH AMERICA	23	23	22	20	18	17	15	14	13	13	12	11	13	15	17	18	20	20	21	22	22	23	23	23
CENTRAL SOUTH AMERICA	27	24	22	20	19	17	16	15	15	14	13	16	18	20	22	24	25	26	27	27	28	28	28	28
SOUTHERN SOUTH AMERICA	21	17	16	15	14	14	13	13	12	12	12	12	17	19	21	23	24	26	27	27	28	28	27	25
WESTERN EUROPE	16	15	14	13	12	12	13	12	12	13	15	16	17	18	18	19	19	19	19	19	19	18	18	17
EASTERN EUROPE	11	11	10	10	9	13	14	14	14	15	16	17	18	18	19	19	19	20	19	19	18	17	15	13
EASTERN NORTH AMERICA	9	9	8	8	7	7	6	6	5	5	5	5	6	6	7	7	8	8	8	8	9	9	9	9
CENTRAL NORTH AMERICA	19	19	19	18	18	16	15	14	12	12	11	11	12	14	15	16	17	18	18	19	19	19	19	19
WESTERN NORTH AMERICA	26	25	25	25	24	23	21	19	17	16	15	15	15	18	19	21	22	23	24	24	25	25	26	26
SOUTHERN NORTH AMERICA	20	20	19	19	18	16	15	14	13	12	11	11	12	13	15	16	17	18	18	19	19	20	20	20
NORTHERN AFRICA	21	19	17	16	15	14	14	15	15	15	17	19	21	22	23	24	24	25	25	25	25	25	24	23
CENTRAL AFRICA	18	16	15	14	13	13	14	15	14	15	17	19	21	22	23	24	24	25	25	24	24	23	21	19
SOUTH AFRICA	15	14	13	13	13	12	12	17	16	15	16	19	21	23	24	26	27	27	25	21	19	18	16	16
MIDDLE EAST	18	16	15	15	15	15	13	13	13	14	15	17	18	19	19	20	20	21	21	21	21	21	21	20
JAPAN	19	20	19	19	18	17	16	15	14	14	14	15	17	17	16	15	14	14	14	15	16	17	18	19
CENTRAL ASIA	20	20	19	18	18	16	15	14	13	12	14	16	17	18	19	19	19	17	16	15	14	14	17	18
INDIA	9	9	9	8	13	14	13	12	12	14	16	17	18	19	19	19	18	18	17	16	14	11	10	9
THAILAND	16	18	18	18	16	15	14	13	12	13	15	17	18	19	19	20	20	19	17	16	15	14	13	13
AUSTRALIA	29	30	29	29	28	26	24	22	20	19	17	16	16	15	15	14	13	13	13	12	18	23	26	28
CHINA	18	19	19	18	17	15	14	13	12	12	15	16	17	18	18	17	16	14	13	12	12	15	16	17
SOUTH PACIFIC	29	28	28	27	26	24	20	15	14	14	13	13	12	12	12	12	12	12	12	22	25	26	28	28

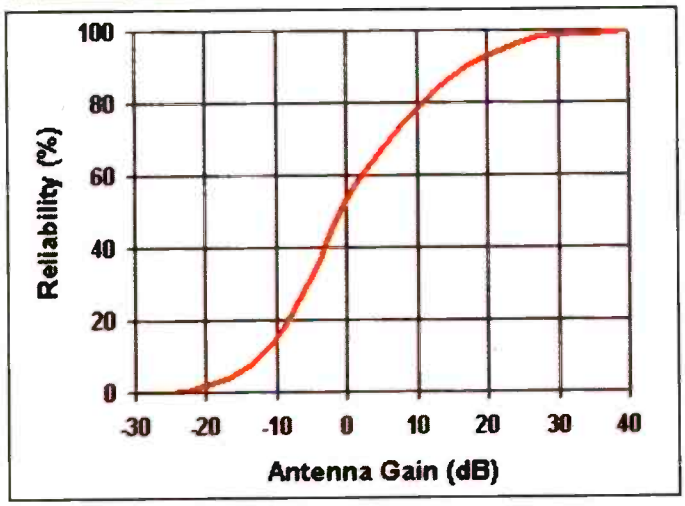


Figure 5. Reliability vs. Antenna Gain for Brinnon to Chicago circuit at 40 meters and 01 UTC.

and have shown how variable ionospheric conditions are accounted for by the statistical nature of modern propagation prediction models. As one might expect, the amount of power we focus on the ionosphere is paramount in determining the reliability of our circuit. And that power is a result of both transmitter power rating *and* antenna gain.

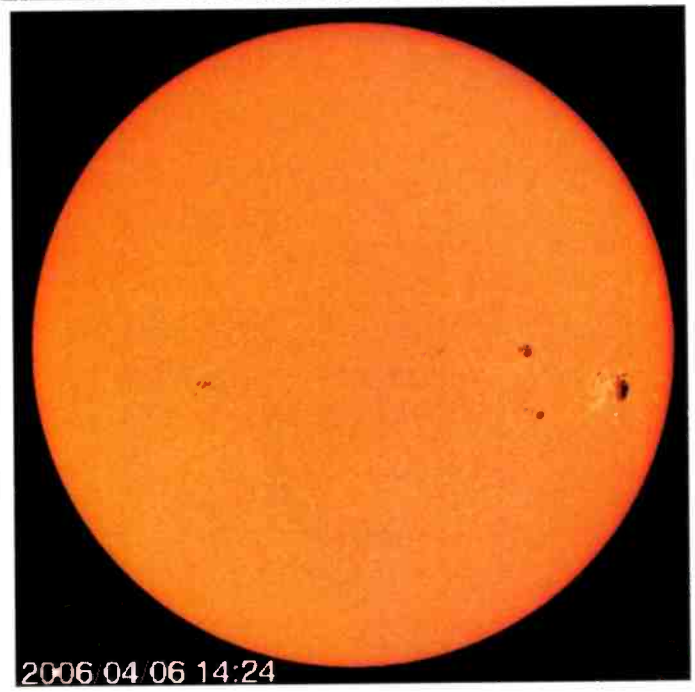
We'll continue diving into the science of the ionosphere and space weather, as well as using computer software tools that aid in understanding, analyzing, and predicting radio signal propagation. Stay tuned right here, each month!

Sporadic-*E* Season Is In Full Swing

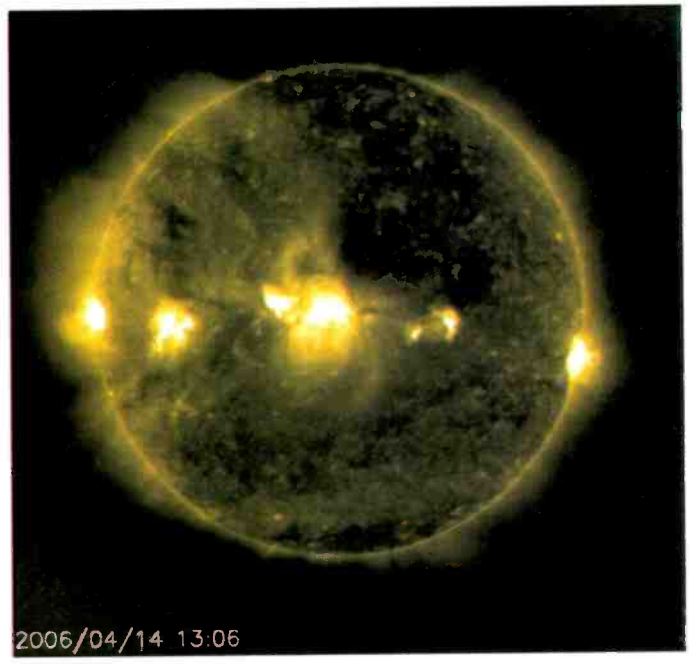
In past issues, we've looked into the radio propagation mode known as sporadic-*E* (*Es*). *Es* is mostly a summertime phenomenon, when it tends to occur in two peaks during the daylight hours, centered on either side of noon. *Es* occurrence during the year seems to follow a similar trend, with the main peak in the late summer, and a second but weaker peak occurring in the winter. During the winter peak *Es* is most common just after sunset. The summer daytime peak is in the morning between 7 a.m. and 12 p.m., local time. A secondary peak occurs between 8 and 10 p.m. However, observations over many decades show a slightly stronger likelihood of *Es* in the morning than in the afternoon or evening.

Despite the apparent greater likelihood of *Es* in the morning hours, however, this diurnal characteristic is much less noticeable in the day-to-day casual observation of DXers. In addition, check for *Es* after dark! I remember many summertime *Es* openings around midnight between Washington State and California, on 10 meters. Many still remember an opening that occurred after midnight on June 19, 1992, that resulted in propagation of 144-MHz and higher signals.

While there are various contributing factors and influences that are known, or at least thought, to create *Es*, one strong theory (supported by good science and observational data), suggests that *Es* is correlated with the presence of an excess of meteor dust in the *E* layer. This dust is pushed into dense patches on the outside of jet stream wind eddies. Several studies over the past 30 years have confirmed the presence in *Es* clouds of dense patches of meteoric comet dust. This idea is further supported by looking at the seasonal nature of *Es* and how it coincides



The Sunspot image of April 6, the day when the sunspot count reached 105. Remember, just prior to this short burst of activity, the sunspot count was zero (March 25–27 2006)! (Source: Solar and Heliospheric Observatory)



The sun on April 14, 2006, showing continued coronal hole activity that triggered strong geomagnetic activity on April 14, 2006, when the Kp index reached 7. The bright spots are sunspot activity. During the first half of April, there were 15 flares observed, two of which were moderately powerful M-class X-ray flares (April 6). The sunspot count reached 105 on the same day. The 10.7-centimeter solar flux on April 3 and April 4 reached 100. This is an expected "flare-up," as we've seen such quick periods of activity during the last months of the last several solar cycles. Such solar activity is welcomed by DXers on HF, though the coronal hole activity is the bane of HF propagation, but a possible blessing for VHF activity. (Source: Solar and Heliospheric Observatory)

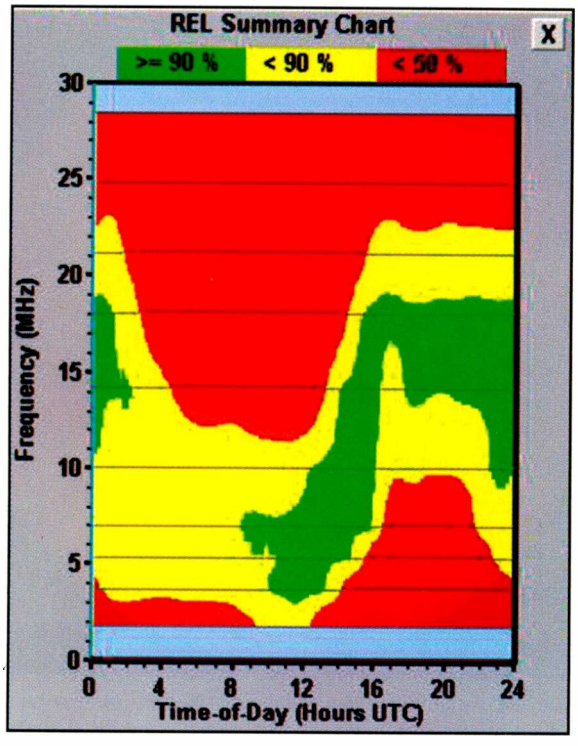


Figure 6. Reliability Summary Chart for Brinnon to Chicago.

directly with those times of year when the Earth passes through the dense tracks of comet dust.

How To Know When *Es* Is Beginning

DX enthusiasts know that during the summer months, television channels between 45 and 108 MHz, and also FM radio stations between 88 and 108 MHz, are regularly propagated long distances via *Es*. The first sign that an *Es* event is starting is the appearance of "rolling" black bars across TV Channel 2 (or the appearance of signals on that channel if you have no local station on the channel). As the ionization level increases, Channels 3 through 6 and the FM band become filled with signals. During *Es* propagation, signals can abruptly appear or disappear. Signals are usually very strong during *Es*. Ordinary "rabbit ears" are adequate for *Es* reception, and are preferred by some TV and FM DXers because they can be sharply directional.

Is it possible that *Es* can support DX of signals in the higher VHF frequency band, say, 175 to 226 MHz? Doubling the frequency reduces the probability to one tenth. This means if you are receiving via *Es* a signal of 50 MHz, then a 100-MHz signal will be propagated one tenth of the time period of the 50-MHz signal. A 200-MHz signal will be propagated one hundredth of the time. Since many high MUF (Maximum Useable Frequency) propagation paths are multi-cloud, the probability could be higher than these figures.

The MUF of a single cloud can be lower than the frequency propagated by a two-cloud path. In practice, it's difficult to know of a possible propagation path for the highest frequency because of the geometric restrictions imposed, and unless the DXer and the transmitter are in precise relative positions, the DX station will not be heard.

Since *Es* reception above 138 MHz often involves high path losses, it is important that you use the highest gain and lowest noise receiving equipment possible. A directional Yagi antenna, with at least 8 dB of gain, mounted 15 to 20 feet above ground level, with low loss matched coax cable, low noise receiver, and a low noise MOSFET pre-amplifier are ideal for receiving weak signals.

HF Propagation For July

Solar activity is much quieter than it was just one year ago. We are now seeing long periods with no visible sunspot activity. This results in lower MUFs for the same period than last year. Even so, there have been a few short outbursts of exciting activity, some during the 2006 spring season that even triggered aurora.

We can expect poor to fair openings into most areas of the world throughout the day on 22, 19, and 16 meters, for those of us in the lower latitudes. At higher latitudes (above 40 degrees), these opening are a bit less frequent and tend to be weaker. Through the summer, you can expect propagation between north and south regions during the daylight hours. Nineteen and 16 meters will be the strong daytime bands, with 19 remaining a popular band throughout the year. Reception of stations located in tropical or equatorial areas may be possible well into the hours of darkness. For distances between 800 to several thousand miles, expect exceptionally strong signals. Multi-hop signals will be observed.

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

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

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

VHF Conditions

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

Current Cycle 23 Progress

The Dominion Radio Astrophysical Observatory at Penticton, BC, Canada, reports a 10.7-centimeter observed monthly mean solar flux of 75.5 for March 2006. The 12-month smoothed 10.7-centimeter flux centered on August 2005 is 89.3. There was some confusion in the reporting of the figure from July 2005; the figure on record for July is 87.8. The predicted smoothed 10.7-centimeter solar flux for July 2006 is about 70, with a range from a high of 91 to a low of 60.

The Royal Observatory of Belgium reports that the monthly mean observed sunspot number for March 2006 is 10.8, a nice bump up from the lowest figure since solar cycle maximum, February's 4.7. Still, March's figure is down from January's 15.4. The lowest daily sunspot value during March, recorded on March 1–3, 7–11, and 26–27 was zero (0). The

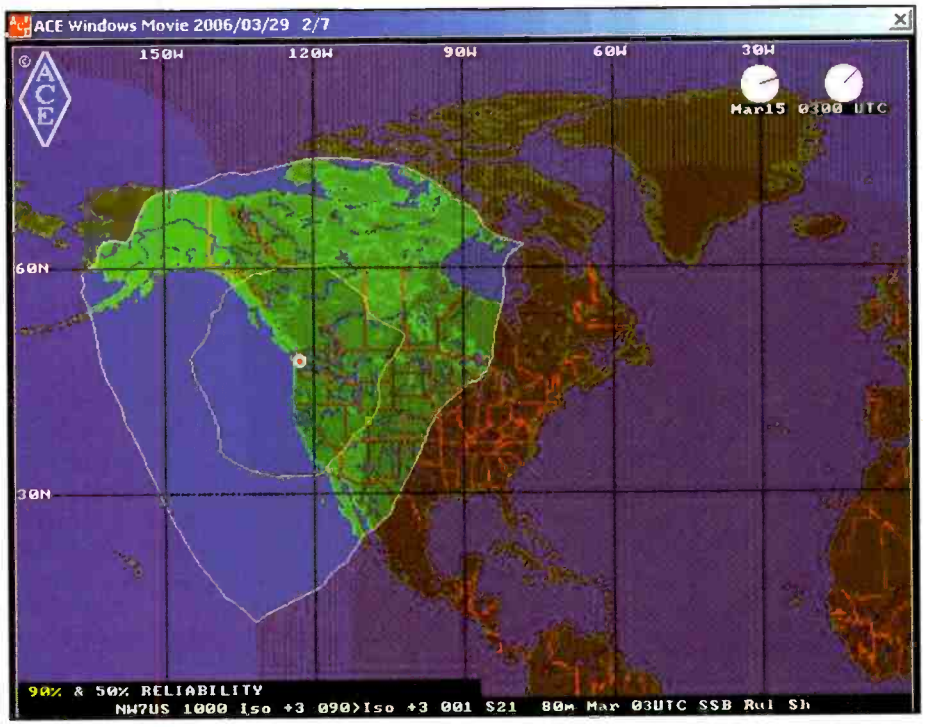


Figure 7. Area Coverage from NW7US at 80 meters for 50 and 90 percent required reliability.

highest daily sunspot count was 24 on March 31. The 12-month running smoothed sunspot number centered on August 2005 is 45.4, and the final figure on record for July 2005 is 42.9. A smoothed sunspot count of 7 is expected for July 2006, but can be anywhere from a high of 21, down to zero, which is more and more likely as we near the very end of Solar Cycle 23.

The observed monthly mean planetary A-Index (Ap) for March 2006 is 8. The 12-month smoothed Ap index centered on August 2005 is 12.2, with the final July 2005 figure recorded as 11.8. Expect the overall geomagnetic activity to be quiet to unsettled during most days in July, with one or two possibly stormy periods.

Got A Question Or Comment On Propagation?

You can join in with others in discussing space weather, propagation, and 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 have put together for you at http://prop.hfradio.org/. I also provide a WAP/WML resource for wireless devices. If you want the latest propagation information like the solar flux, Ap reading, and so forth, 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 you've noticed. Do you have questions about propagation? Why not drop me a line? I look forward to hearing from you. Happy signal hunting! ■

by Joe Cooper, carm_popcomm@hotmail.com

Digital Signal Processing—Part III
The Haunted Father Of Digital Technology

As I pointed out in last month's column on digital signal processing (DSP), the theory behind today's "modern" technology is far from new. In fact, today's electronic DSP technology has its origins in the very early days of telegraphy. Remember, telegraphy (the original digital mode) was first employed as a purely visual means of communications, using various systems of semaphores, which could employ arms, flags, suspended balls, or sign boards.

This medium of visual communication was a vast improvement over earlier systems such as couriers on foot or horseback, but the signal (the visual images of the semaphores) could be interfered with by smoke, fog, rain, or nighttime, thus losing the message (or intelligence). Just as today's radio signals can be interfered with by noise (static, electrical discharge, or lightning strikes), or fading (disturbances in the ionosphere), those visual telegraph "signals" could encounter their own form of noise with visual interference.

One can argue that the act of converting a visual telegraphic signal into electrical pulses and transmitting them along metal wires was the first true application of electronic DSP technology. The use of such electrical signals over wires was indeed a successful strategy for reducing the amount of noise in a given signal and to ensure that the intelligence in a given signal was delivered.

Electrical telegraphy is one of the most robust forms ever developed for the transmission of information over a long distance and has profoundly influenced the development of today's digital technology. Your computer, CD player, digital cell phone, HDTV, and a host of other devices are in a sense nothing more than glorified telegraph keys, wires, and sounders.

In the 1930s, thanks to a desire to incorporate that robustness into the transmission of audio signals (whether through wires or radio waves), the theoretical foundation of the digital revolution was established. The major breakthrough came about when a brilliant, but eccentric, English scientist attempted to build a machine to communicate with the spirits of the dead, using a combination of spiritualist ideas and scientific theory. In fact, he claimed that many of his ideas for digital communications came from discussions with the spirit of 19th-Century scientist Michael Faraday. In addition to conducting these "collaborations," he spent time trying to scientifically measure "moon beams" and to communicate with an American Indian "spirit guide" named Red Cloud.

Despite his eccentricities, however, this British scientist was at the forefront of the development of single sideband (SSB) modulation and its use in long distance communications in the shortwave bands. Such early theoretical work led to our current methods of digital sampling, which is the core of DSP technology.

Alec Harley Reeves

When voice-based radio broadcasting became popular in North America during the early 1920s, AM and analog circuitry was already old hat. Early radio broadcasting used what was then 40-year-old telephone technology in its microphone and audio amplifying components.

By the time radio broadcasting and point-to-point transmissions matured in the 1930s, it was apparent that AM, and even SSB transmission, had reached its operational limits.

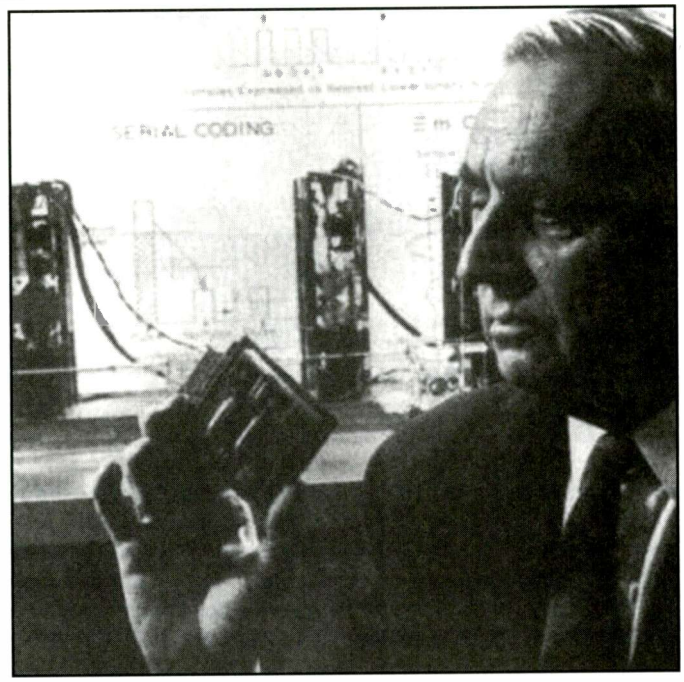
It was during this pioneering period that our British scientist and engineer, Alec Harley Reeves (1902–1971), began to look beyond the limits of conventional methods of modulating radio signals. If Reeves's name is unfamiliar to you, it is a great shame since he almost single-handedly changed the course of 20th Century history with his influence on radio engineering theory and practice. It's possible that few people know about Reeves because his work was also the foundation for several very important top secret military projects that were, in many respects, as significant as the atomic bomb. One such project was the SIGSALY system of encrypted communication, described in last month's column, which relied on Reeves's digital theories.

Prior to that important project, Reeves assisted in the development of the High Frequency Direction Finder (also known as HF/DF or "Huff Duff"), which was used to triangulate the position of enemy submarines when they transmitted a radio signal. Likewise, HF/DF could triangulate the location of British fighter squadrons, particularly important when they were out of range of the early RADAR systems.

The HF/DF project led to Reeves's direct involvement in developing a system of radio-enabled pinpoint bombing, called "OBOE," for the British Air Force during WWII. This system allowed bombers to track two microwave signals to their convergence point, which was set to a military target. Bombers flying at 30,000 feet could then deliver payloads within 50 yards of their targets, enabling the British to eliminate virtually of all Germany's manufacturing and transportation capability. The OBOE military targeting system was so precise that it was not superseded until the introduction in the 1970s of GPS satellite positioning.

Reeves was also the inventor of fiber optic transmission and led the development team that created the first practical fiber optic system in the late 1960s, which he predicted would eventually allow people to work from home using a linked computer network, foreshadowing the Internet. And to top it all off, he also perfected the condenser microphone, the cornerstone of today's recording and broadcast industry.

Each one of these inventions alone would have been a significant lifetime achievement for any one individual, and this list only *highlights* Reeves's long list of accomplishments, which resulted in over 100 unique patents held in his name. For many, however, Reeves's invention of the digitally based pulse code modulation (PCM) in the late 1930s, which is the basis of all digital technology, was his greatest accomplishment. Ironically, the foundation for his theory of PCM came out of his research into communicating with the spirits of the deceased using electronic equipment he designed and built himself. Reeves's story shows again how truth is often far stranger than fiction.



Alec Reeves, the father of the information age, was a truly brilliant scientist and engineer, yet eccentric in his personal beliefs. The CD player, computer sound card, digital cell phone, and any number of other digital sound and video recording and playback devices are the results of Reeves's revolutionary concepts. His theories developed from his attempts to contact the spirits of the departed through electronic digital sampling. (Photo courtesy David Robertson)

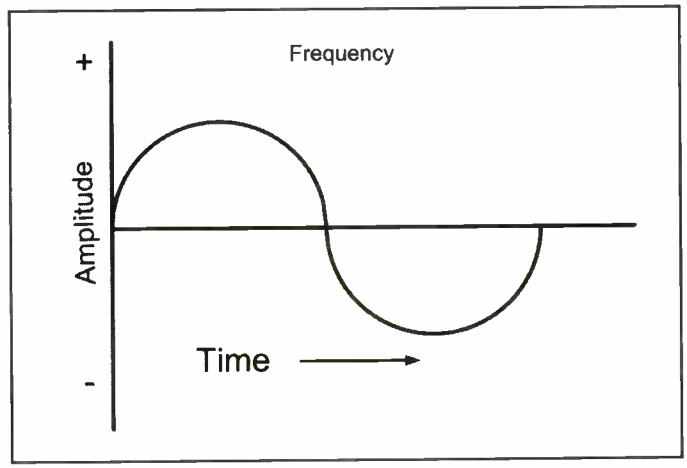
ESP And The Digital Revolution

Educated at the Imperial College of London, Reeves first found employment in 1923 with Bell Lab's International Western Electric, at the time was one of the world's leading manufacturers of radio equipment. In 1925 Bell Lab's parent, AT&T, sold International Western Electric to International Telephone and Telegraph, an independent European holding company that specialized in acquiring telecommunications companies around the globe. Reeves went to work in ITT's laboratory in Paris.

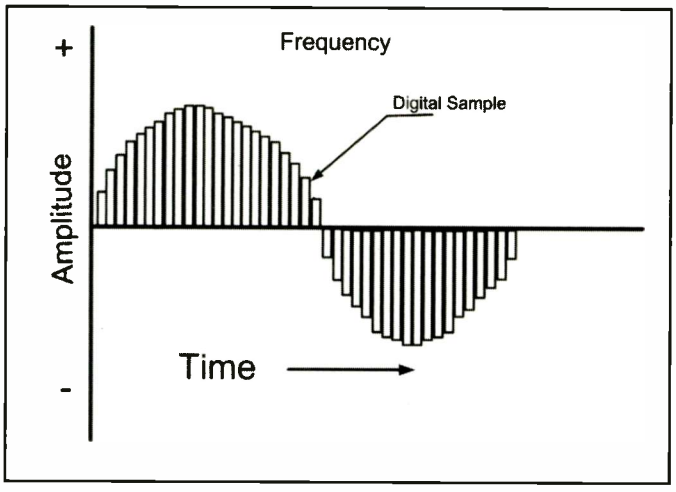
While a respected scientist during working hours, his personal time revealed his eccentric side. Reeves made no secret of the fact that his real interest in life was pursuing spiritualism and paranormal phenomena. After his death in 1971, biographers who examined his private papers found extensive notes on conversations with the spirit of Red Cloud (1822–1909), a Lakota Chief who successfully defeated the U.S. Army in Wyoming and Montana in the late 1860s. In addition to having Red Cloud as a personal spirit guide, Reeves also made claims to friends and colleges that he was in almost constant communications with the spirit of eminent 18th Century scientist Michael Faraday. Not only did Reeves claim contact with Faraday, he believed Faraday was giving him instructions on how to create his inventions.

Through his random "spirit channeling" experiences, Reeves became convinced that it was possible to communicate with the spirit world in a *rational* way, such as with telephone, telegraph, or radio. As a result, Reeves spent a considerable amount of time in developing radically new technologies in an attempt to achieve that goal. Reeves believed that any inter-dimensional communications would have to take place through something equivalent to Morse code and so became an expert in all aspects of digital communications.

Reeves developed an electronic "ESP machine" with which to communicate with departed spirits. His machine could generate a random sequence of Morse code characters and then apply a "decoding" methodology to the sequence with the goal



This is a standard analog signal showing its characteristic sine wave. The two main observable characteristics are amplitude (how loud it is) and frequency (the number of plus and minus oscillations it contains over a measured period of time). Less apparent is the fact that such a signal contains a continuous stream of information. In the real world, this signal would also carry noise, limiting its usefulness in communicating information effectively.



This is a graphic representation of the analog signal after it has been digitally sampled. In much the same way a camera takes a series of still photographs to create a "motion picture," each section of the analog signal has been analyzed and recorded in digital form. Each sample point is represented by a square, and each square contains a unique set of digital information.

of finding meaningful "intelligence." In the hands of a mere crank this undertaking would have been simply an insane project. However, Reeves was far insane and his work had a real and rational application.

Today, with computers and other digital devices, generating Morse code randomly is easy, but all Reeves had to work with were switches, relays, and other primitive electronic devices. Despite the difficulty involved, he built the machine and made it work; whetherhe received any messages is open to debate.

Reeves also built a working electronic television that he hoped would enable him to view inter-dimensional images. While the intent of using ESP devices to view extra-dimensional events was questionable, the technology Reeves was creating was rational. With these ESP devices, Reeves attempted to create a digital "sample" of extra-dimensional phenomena and then convert it to an analog form so it could be viewed in "our" world. The technology behind Reeves's ESP machine? You guessed it, DSP.

DSP allows you to create a digital sample of something in the "real" world, convert it into digital form, and then convert the generated digital information back into analog form so the information can be used in a practical way. When Reeves turned his mind to creating a new mode of digital transmission in the late 1930s, he simply applied his research into paranormal phenomena to a practical application.

The Limits Of SSB

Reeves's research in digital radio communication grew out of his pioneering work in SSB radio. The United States Navy developed SSB transmission during experiments that focused on improving the efficiency of voice communication in an increasingly congested radio spectrum.

The Navy tested various new methods of voice transmission at their experimental radio station in Arlington, Virginia, in 1914. In these experiments Navy engineers found that by suppressing the carrier and one sideband in an AM signal, the signal-to-noise (S/N) ratio of the received signal was significantly improved. Much of the Navy's radio communications took place at very low frequencies (10 to 50 kHz) where bandwidth was very limited. Because SSB modulation removed roughly half the bandwidth required to transmit a signal, a larger number of signals could occupy a smaller amount of RF "real estate," and do so with greater efficiency.

In 1915, however, John R. Carson of Bell Labs applied for a patent on SSB technology, which resulted in prolonged litigation over who actually owned the intellectual rights to this method of transmission. Carson and Bell Labs eventually won the patent rights, in 1923, after which IT&T farmed out further development work to ITT in Europe.

Bell Labs used ITT, rather than its own research staff, because of Reeves's expertise of in high-frequency radio, such as shortwave (2 to 30 MHz) and VHF (above 30 MHz). AT&T wanted to use its newly patented SSB technology to establish a network of long-distance radio telephone links around the world, and Reeves was placed in charge of a research team tasked with applying SSB transmission technology to shortwave frequencies. At that time, scientists were just beginning to understand the phenomenon of long-distance skip propagation on shortwave frequencies, and this research was as leading edge as satellite communications is today. Reeves and his team established the first practical radiotelephone link between France and England, then to the United States.

While this newly developed mode of transmission was a great improvement, Reeves came to realize that even this accomplishment was ultimately limited because of the inherent limitations of SSB to deliver an ideal S/N ratio, even in the best transmission and reception conditions. The reason was simple: any mode of communications that employed an analog method of modulation would always amplify noise and errors equally with the signal. Reeves eventually proposed a radically new method of audio communications where a signal would be transmitted using the same robust digital method used to transmit Morse code.

How Digital Sampling Works

During the late 1930s Reeves had a specific goal in mind with the creation of a radically new method of modulation. For Reeves that method of transmission had to be digitally based as that was the only way to produce a truly robust signal, meaning one with a near perfect S/N ratio at the receiver. Moreover, digital transmission would provide the following ideal characteristics:

- Quality of the received signal would depend *only* on the state of the original signal.
- Quality of the received signal would be independent of transmission media.
- The method of transmission would be completely compatible with different media and intelligence (video, audio, data).
- The technology involved would be low cost.
- One could embed new features in the new medium very easily.

Although Reeves set these concepts down in 1937, they're an exact description of the primary characteristics found in today's DSP and software-defined radio (SDR) technology. At the time, however, the technology Reeves envisioned was more

akin to a highly sophisticated telegraph system than today's micro-computer-based radios. Still, his genius let him see what others missed: the foundation of Morse code technology was what we now call digital sampling.

Rather than simply taking for granted the action of a telegrapher sending code and having it decoded at a receiving station, Reeves saw something more important happening—the telegraphic process was the creation of a virtual copy of the original text with an encoding process occurring in the mind of the sending telegrapher, who then converted that virtual copy into digital form with a telegraph key. That virtual copy was then reconstructed back into its original form at the receiving station through a decoding process taking place in the mind of the receiving telegrapher.

More significantly, Reeves believed that the large quantity of data required to describe complex events as digital information was possible. All that was required was replacing the human beings operating telegraphy keys with high-speed electronic devices. There was already an example of Reeves's approach—motion pictures, which are actually just digital samples.

Motion Pictures As Digital Sampling

The movie camera is simply a device that takes a sample of events occurring in the real world and converts them into photographic images on a moving roll of light-sensitive celluloid film. When light focused through a lens falls on chemically treated photographic film, the chemicals react to the light in a gradient of impressions between dark and light (using black and white film as an example just to keep things simple). That film is processed through a chemical treatment to make the photographic images visible. These can then be viewed by means of a movie projector.

The movie camera and the digital sampling device used with radio signals are similar in how the sampling is performed. The movie camera does not make a continuous record of the events occurring in front of its lens (as an *analog* tape recorder makes a continuous record of sound occurring in front of a microphone). Instead, the movie camera takes a single photograph so many times per second and does so in a sequential manner as the photographic film is pulled past the camera lens. So what you have once the film is processed is a sequential record of individual events that took place in front of the camera.

When that film is run through at projector, each individual picture is placed in front of the lens at the same per-second rate that it was photographed. Each frame stops, is projected, then replaced by the one behind it, which is replaced by the one behind it, and so on. Because of a phenomenon called "persistence of vision," the human brain perceives each of these individual frames shown in sequence as being in motion, and thus appearing to be the same state as the original.

The method of digital sampling signals (audio, video, or radio) is almost identical to that used in a movie camera. The only difference between a movie camera and a digital sampling device is that the latter takes an electronic "snapshot" of the state of that signal rather than a photographic picture. So instead of bringing a radio signal into a conventional analog circuit from an antenna, as when using a super-heterodyne radio, a digital sampling device is hooked up to that antenna instead.

Thus when the digital sampling device is turned on, it begins to take electronic samples of the signal that it finds on the antenna, and it does so much like a movie camera because it records those samples as a series of timed events. However, unlike a movie camera that may be taking 24 samples per second, the digital sampling device takes samples many millions of times per second. This raw digital information can then be processed (or, to continue the analogy, developed like the pictures on the movie film) to convert the digital information to an analog form.

A movie projector takes individual pictures and makes them "move," and a device that converts the digital information back into analog form performs a similar task. And, in the same way the movie's relatively small images can be projected (amplified) to a significantly larger size with relatively little noise (grain or distortion on the film), the same "low noise" amplification of the digital signal takes place.

What also takes place—and this is critical for a full appreciation of the strengths and weaknesses of digital sampling techniques—is a loss of information "between frames."

Reeves, however, had some interesting ideas on how to tackle this problem, each approach giving today's engineers an important foundation to work upon when developing DSP solutions.

Coming Next Month

Next month I'll finish this series on the foundations of DSP technology with a look at how Reeves envisioned a means to successfully capture large amounts of digital information and then convert it back into analog form. Although Reeves had no practical way of testing his theory at the time, when the technology did become available many decades later, his ideas turned out to be completely correct.

E-mail me with any questions at carm_popcomm@hotmail.com. As mentioned before, I cannot answer general questions on computers, but will be more than happy to help you with any issues raised in the columns.

Even though summer has just begun, early severe storms have already taken lives and left many homeless. I would like to suggest that rather than waiting for a disaster to occur before contributing, you send a donation now to the American Red Cross (www.redcross.org/donate/donate. html) to help your fellow Americans in this time of trouble. However, there are many other good (and ethical) organizations that you can contribute to, so please use them if you wish, but do not give into "charity fatigue."

Again, if you have a job, a family around you, and live in a stable neighborhood, show your thanks for that wonderful good luck by sharing with someone less fortunate, and do so regularly.

Let's also not forget our troops overseas who continue to need our visible support, particularly as tensions in the Middle East and Afghanistan continue to rise. Refer to the U.S. Department of Defense's official webpage, "Defend America," where you can find an amazingly wide range of practical and useful ways that you can directly help (www. defendamerica.mil/support_troops.html).

If you're fortunate enough to live in the United States of America, please remember to give thanks for your personal blessings by remembering to pass on that blessing to others through regular acts of selfless sharing. ■

by Gerry L. Dexter, gdex@genevaonline.com

Radio Slovakia International Gets A Shot In The Arm

A celebration of sorts is in order! It seems that Radio Slovakia International will keep on keepin' on, at least through the rest of this year. The government came through with the necessary funds to keep the service alive. This appears to be one case in which listener feedback helped save the day. Reception reports and QSLs are wonderful and important but we should all be doing a lot more in the way of writing and e-mailing stations with comments about programs or to point out technical problems, rather than making ourselves heard only when a station is on the brink of disaster. You can reach Radio Slovakia International at englishsection@slovakradio.sk or through their website at www.rsi.sk or via regular mail at P.O. Box 55, 817 55 Bratislava, Slovakia.

Two new Bolivian stations have opened on shortwave recently. Radio Logos in Santa Cruz is occupying 6165. Best times to check for this one would be in the early, early hours, say around its 1000 sign on. The other one is Radio San Rafael in San Rafael, Cochabamba, on 5680 variable, operating from around 0945 to sign off at 2200 (sometimes to as late as 2240). Although it's announcing as Radio San Rafael, DXers in South America say it is a reactivation of La Voz del Campesino, which was located in Sipe Sipe.

Richard Cuff (left) and John Figliozzii are the evil geniuses in charge of the SWL Fest held in Kulpsville, Pennsylvania, each March. Get more info on this great event at www.swlfest.com.

VOA QSLs

If you've been trying to get a QSL out of the Voice of America lately and your efforts have brought only frustration, be patient. The person responsible for QSLs at the VOA passed away some months ago and it has taken a while to find a replacement. Now the QSL machinery seems operational again.

The Italian Radio Relay Service (IRRS), which carries various independently produced radio programs, was once exclusive to Milan, Italy, with something less than thunderous power. Now, after several years on the air, it appears to also be using powerful transmitters in Bulgaria; never mind that the timings are not conducive to reception in much of North America. Frequencies used are 5775 and 5885. One of their clients is Brother Stair and his Overcomer Ministry.

Reader Walter Francis of Arthur City, Texas, received this QSL card from Radio Buenas Nuevas (4800) in Guatemala.

Time To Bag Iceland, Before...

Undoubtedly you are aware that the United States is pulling its military presence out of Iceland. It seems very likely that this will mean the end of the AFN/AFRTS outlet at Grindavik, which operates on 7590 and 9340. The U.S. base in Iceland is scheduled to close at the end of September so you still have time to bag the Grindavik site.

The Zimbabwe opposition station SW Radio Africa is now using 3230 for a daily broadcast from 0300 to some minutes past 0330. These broadcasts are via an out-of-country relay, possibly Meyerton, if not the Radio Nederland site in Madagascar, which has been used for its transmissions up until now.

Reader Logs

Remember, your shortwave broadcast station logs are always welcome. But please be sure to double or even triple space items, list them country name first, and include your last name and state abbreviation after each log. Also very welcome are spare QSLs you don't need returned, station schedules, brochures, pennants, station photos, and anything else you think would be of interest. And we *know* you've been meaning to send a photo of you at your listening post, so where is it?

Here are this month's logs. All times are in UTC. Double capital letters are language abbreviations (SS = Spanish, RR =

Help Wanted

The "Global Information Guide" consistently presents more shortwave broadcast loggings than any other monthly SW publication! (This month we processed **482** loggings!)* Why not join the fun and add your name to the list of "GIG" reporters? Send your logs to "Global Information Guide," 213 Forest St., Lake Geneva, WI 53147. Or e-mail them to your "GIG" editor at gdex@genevaonline.com, or if you have problems getting through there, directly to Editor Harold Ort at popularcom@aol.com (see the column for formatting tips). Our deadline is the 25th of each month.

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

Russian, AA = Arabic, etc.). If no language is specified the broadcast is assumed to be in English (EE).

ALBANIA—Radio Tirana, 6155 with news by woman and ID at 0249. (Montgomery, PA) 7455 in Albanian at 0105. (DeGennaro, NY)

ARGENTINA—Radio Argentina Exterior (RAE) 11710 in PP to Brazil at 0005 with talk about Argentina. (Paszkiewicz, WI) 0112. (DeGennaro, NY) 15345 in SS heard at 2320. (MacKenzie, CA)

ARMENIA—Public Radio of Armenia, 9965 at 1930 with IS, anthem, ID, schedule

Abbreviations Used In This Month's Column

*	— before or after a time (time the station came on or left the air)
(l)	— after a frequency (lower sideband)
(p)	— presumed
(t)	— tentative
(u)	— after a frequency (upper sideband)
v	— variable
//	— in parallel
AA	— Arabic
ABC	— Australian Broadcasting Corporation
AFN	— Armed Forces Network
AFRTS	— Armed Forces Radio TV Service
AIR	— All India Radio
Anmt(s)	— announcement(s)
Anncr	— announcer
AWR	— Adventist World Radio
BSKSA	— Broadcasting Service of Kingdom of Saudi Arabia
CC	— Chinese
Co-chan	— co-channel (same frequency)
Comml(s)	— commercial(s)
CP	— Bolivia, Bolivian
CRI	— China Radio International
DD	— Dutch
DJ	— disc jockey
DW	— Deutsche Welle/Voice of Germany
EE	— English
ECNA	— East Coast of North America
f/by	— followed by
FEBA	— Far East Broadcasting Association
FEBC	— Far East Broadcasting Company
FF	— French
GBC	— Ghana Broadcasting Corp
GG	— German
GMT	— Greenwich Mean Time
HH	— Hebrew, Hungarian, Hindi
HOA	— Horn of Africa
ID	— station identification
II	— Italian, Indonesian
Int	— international
IRRS	— Italian Radio Relay Service
IS	— interval signal
JJ	— Japanese
KK	— Korean
LSB	— lower sideband
LV	— La Voz, La Voix
NBC	— National Broadcasting Corporation (Papua New Guinea)
ORTB	— Office de Radiodiffusion et Television du Benin
PBS	— People's Broadcasting Station
PP	— Portuguese
PSA	— public service announcement
QQ	— Quechua
RCI	— Radio Canada International
Rdf.	— Radiodifusora, Radiodiffusion
REE	— Radio Exterior de Espana
RFA	— Radio Free Asia
RFE/RL	— Radio Free Europe/Radio Liberty
RNZI	— Radio New Zealand International
RR	— Russian
RRI	— Radio Republik Indonesia
RTBF	— RTV Belge de la Communate Françoise
Relay	— transmitter site owned/operated by the broadcaster or privately operated for that broadcaster
relay	— transmitter site not owned by the broadcaster
SCI	— Song of the Coconut Islands (transition melody used by Indonesian stations)
s/off	— sign off
s/on	— sign on
SIBC	— Solomon Is. Broadcasting Corp.
Sked	— schedule
SLBC	— Sri Lanka Broadcasting Corporation
SS	— Spanish
TC	— time check
TOH	— top of the hour
TT	— Turkish
TWR	— Trans World Radio
Unid	— unidentified
USB	— upper sideband
UTC	— Coordinated Universal Time (as GMT)
UTE, ute	— utility station
Vern	— vernacular (local) language
(via)	— same as "relay"
VOAS	— Voice of America
VOIRI	— Voice of Islamic Republic of Iran
WCNA	— West Coast of North America
ZBC	— Zimbabwe Broadcasting Corporation

Here's Bob Swenson's listening post in Shrewsbury, Massachusetts. That Hallicrafters S-38B on the right triggers great memories for many a senior SWL!

and news. (Burrow, WA) 2003 in GG just prior to opening in EE at 2010 to 2030 when there was another language change. (D'Angelo, PA) 2010 opening in EE with mailbag program at 2020. (Alexander, PA)

ASCENSION ISLAND—BBC Relay, 9525 in SS at 0030. (DeGennaro, NY) 12095 with news at 1930. (Brossell, WI) 15400 with "Newshour" at 2033. (Jeffery, NY) 2130. Also 21470 with sports at 1543. (Wood, TN)

AUSTRALIA—Radio Australia, 6020 in Pidgin at 1052, 9580 at 1139 and 9590 at 0949. (DeGennaro, NY) 9560 at 1135 and 17785 at 2000. (Maxant, WV) 15515 at 2131. (Wood, TN) 17795 at 2300. (Clapshaw, WA)

ABC Northern Territory Service, Alice Springs, 2310 at 1250 with discussion. (Strawman, IA) 1718. (Foss, Philippines)

Voice International, 7245-Darwin, 1355 in II with splatter from Radio Australia on 7240. (Strawman, IA)

AUSTRIA—Radio Austria Int., 6155 in GG at 0631. (DeGennaro, NY) 2025 in GG. Also 13730 in EE at 1352. (Brossell, WI) 13675 at 1600. (Maxant, WV)

Adventist World Radio, relay, 9800 in FF heard at 2040. (Brossell, WI)

BELARUS—Radio Belarus, 7125 in GG to Europe at 2039. (DeGennaro, NY)

BELGIUM—RTBF, 9970 in FF at 1055 with music and laughter. (DeGennaro, NY)

BOTSWANA—VOA Relay, 6035 with sports news at 0326. (Brossell, WI)

BRAZIL—Radio Guaruja Paulista, Presidente Prudente, 5045 at 0610 with anmts, ballads, commls. Also heard on 3235 at the same time but with different programming. (Alexander, PA) 2327 with anmts and commls. (DeGennaro, NY)

Radio Clube do Para, Belem, 4885 at 0800. (Clapshaw, WA) 1005 with music and commls. (DeGennaro, NY)

Radio Cultura, Araraquara, 3365.1 at 0327 with continuous easy listening music, ID by man at 0402 and back to music at 0403. (Alexander, PA)

Radio Anhanguera, Goiania, 4915 at 0956 with morning greetings and music. (DeGennaro, NY)

Radio Anhanguera, Anhanguera, 4905 with woman anncr and music at 1001. (DeGennaro, NY) 4905.1 at 0251 to 0301 sign off. (Alexander, PA)

Radio Senado, Brasilia, 5990 at 1023 with music and anmts. (DeGennaro, NY)

Radio Aparecida, Aparceida, 5035 with music and talk at 1018. (DeGennaro, NY) 6134.9 at 0200 with talk, commls, jingles, and light music, ID. Off abruptly at 0216. (Alexander, PA)

Radio Banderientes, Sao Paulo, 9645 at 0145 with m/w talk and brief music break, //11924.9 which was weak. (Alexander, PA) 0416 with live sports. (DeGennaro, NY)

Radio Brazil Central, Goiania, 4985 at 0046 with man anncr and slow ballads. (Wood, TN)

Radio Tupi, Sao Paulo, 9564.9 at 2320 with sermon and religious music, //6060. (Alexander, PA)

Radio Nacional, Macapa, 4915 at 0552. (DeGennaro, NY)

Radio Educadora, Braganca, 4825 with music and commls at 0951. (DeGennaro, NY)

Radio Difusora, Londrina, 4815 heard at 0948 with music and anmts. (DeGennaro, NY)

Radio Educacao Rural, Campo Grande, 4754 with music and talk at 0943. (DeGennaro, NY)

Radio Congohas, Congohas, 4775 with music and anmts at 2305. (DeGennaro, NY)

Radio Record, Sao Paulo, 9504.8 with talk, commls, jingles at 2305, //6149.9. (Alexander, PA)

Radio Educacao Rural, Tefe, 4925 with hymns at 1059. (DeGennaro, NY)

Radio Nacional Amazonia, Brasilia, 6180 at 0939 and 11780 at 1102. (DeGennaro, NY) 0044 with ID, mention of Brasilia and into Brazilian music. (Alexander, PA)

Radio Alvoarada, Londrina, 4865 at 0958. (DeGennaro, NY)

Radio Cancao Nova, Cachoeira Paulista, 9675 with religious message at 0410. (DeGennaro, NY)

Radio Rural, Santarem, 4765 with domestic news heard at 1018. (DeGennaro, NY)

Radio Difusora do Amazonas, Manaus, 4805 with news and interviews at 1014. (DeGennaro, NY)

BULGARIA—Radio Bulgaria, 5800 with music at 1855. (Parker, PA) 5900 in BB at 0614, 7400 in BB at 0112, 7500 in SS at 0058 and into BB at 0100, 9400 in RR at 0040 and 11700 in BB at 1107. (DeGennaro, NY) 15700 in PP at 1338. (Brossell, WI)

BURKINA FASO—Radio Burkina, 5030 in FF and vernacular heard at 2321. (DeGennaro, NY)

CANADA—Radio Canada Int., 6100 in SS at 0152 with mentions of Cuba and what might have been a jammer in the background. (Montgomery, PA) 11685 in AA at 2034. (Parker, PA) 17740 with "Vinyl Café" at 1815. (Maxant, WV) 17765 at 2129 with IS and ID in FF and EE and then off. (Wood, TN)

CBC Northern Service, 9625 at 2333 with live comedy show. (Wood, TN)

CFRX, Toronto, 6070 at 1115 and 2215. (Maxant, WV) 0434 with long stream of commls. (Wood, TN)

CKZN, St. John's, Newfoundland, 6160 with domestic news at 2030. (Brossell, WI)

CHILE—Voz Cristiana, 6070 in SS at 1027 and 11745 in PP at 0121. (DeGennaro, NY) 17680 in SS at 1539. (Wood, TN) 1835. (Parker, PA) 2013. (MacKenzie, CA)

CHINA—China Radio Int., 5955 with current events at 1330. (Barton, AZ) 7215 via Albania in AA at 2143, 7250-Urumqi in SS at 2200, 9570 via Albania to NA at 0023 and 9710-Kashi in SS at 0111. (DeGennaro, NY) 9425 in CC at 2323. (MacKenzie, CA)

CPBS/CNR 5030-Beijing in CC at 1312. (Brossell, WI) 1327. (Strawman, IA) 11960-Beijing at 2126. (Parker, PA)

Voice of the Strait, 4900-Fuzhou at 1322 with pops. (Strawman, IA) 1647 with mellow rock. (Foss, Philippines)

Voice of Jinling, Nanjang, 5860 in CC at 1301. (Foss, Philippines)

Xizang PBS, 6050-Lhasa (Tibet) in CC at 1429. (Brossell, WI)

Music Jammer, 15550 at 2313 against Radio Free Asia. (Brossell, WI)

COLOMBIA—La Voz de su Concencia, Puerto Lleras, 6010 heard at 1049 with music and SS anmts. (DeGennaro, NY)

CONGO (DEM. REP)—Radio Okapi, 11690 via South Africa in an African dialect at 0405. (Brossell, WI)

COSTA RICA—University Network, 11870 with gospel music at 1509. (Wood, TN)

Faro del Caribe, (p) 5055 in SS/EE at 0012. Strong but slightly over modulated. (Montgomery, PA) 0402 in SS. (Wood, TN)

CROATIA—Voice of Croatia, 6165 in Croatian at 2020. (Brossell, WI) 2139 in EE with light rock. (Wood, TN) 2315 in EE. (Maxant, WV) 7285 in EE heard at 0305. (Weronka, NC) 2315 with news in EE. (Montgomery, PA) 2317. (DeGennaro, NY)

CUBA—Radio Havana Cuba, 6000 in EE at 0425 and 9550 with DX pgm at 2345. (Wood, TN) 6000 in SS at 1058, 9820 in EE at 0123 and 11760 in SS at 0124. (DeGennaro, NY) 17705 in SS at 2300. (Barton, AZ)

Radio Rebelde, 5025 in SS at 1103. (DeGennaro, NY

CYPRUS—BBC Relay, 9685 in a Slavic language at 1330. (Brossell, WI)

CZECH REPUBLIC—Radio Prague, 6200 to North America at 0212, 7345 at 2333 and 9880 at 1100 opening in GG. (DeGennaro, NY) 7345 at 2354 on the grape and wine industry there. (Wood, TN)

DIEGO GARCIA—AFN/AFRTS, 4319u heard at 0021 with sports program with co-channel RTTY QRM. (Montgomery, PA)

DJIBOUTI—Radio Djibouti, 4780 with up-tempo Afropops and AA talk at 0352. RTTY QRM. (Wood, TN)

ECUADOR—HCJB, 3220 at 1035 and 6050 in QQ at 1055. (DeGennaro, NY) 12000 in SS at 2142. (Parker, PA) 12005 in EE at 1120. (Maxant, WV)

La Voz del Napo/Radio Maria, 3279 with SS religious programming at 0152. (D'Angelo, PA) 1042 with local notices. (DeGennaro, NY)

EGYPT—Radio Cairo/Egyptian Radio, 9990 in FF at 2047. (Brossell, WI) 2125 in EE. (Maxant, WV) 2151 with various features in EE. (Wood, TN) 2215 with AA pops. Also 12050 in AA at 1630. (Parker, PA)

EL SALVADOR—Radio Imperial, Sonsonate, 17835 in SS heard at 1948. (Parker, PA)

ENGLAND—BBC, 5875 in Romanian at 0608. (DeGennaro, NY) 12095 at 1625. (Parker, PA)

EQUATORIAL GUINEA—Radio Nacional, Bata, 5005 in SS with high-life music heard at 2240. (Alexander, PA) 2248. (Parker, PA) 0520 with highlife, SS talk, marching band, ID. (D'Angelo, PA) 0557. (DeGennaro, NY)

ETHIOPIA—Radio Ethiopia, 7110 in presumed Amharic at 0350. (Brossell, WI) 7165//9559.2 at 1602 with IS, ID and weak talk. (Burrow, WA)

FINLAND—YLE-Radio Finland Int., 9595 in RR at 1326. (Brossell, WI) 11755 in Finnish at 1116. (DeGennaro, NY) 11920 in presumed Finnish at 1657. (Barton, AZ)

FRANCE—Radio France Int., 7135 via South Africa in FF at 0346. (Brossell, WI) 7160 via South Africa in FF at 2131. (DeGennaro, NY) 7270 via Ascension in FF at 0430. (Clapshaw, WA) 12025 in AA at 1635. (Parker, PA)

FRENCH GUIANA—Radio France Int., Relay, 9800 in SS at 0120. (DeGennaro, NY)

GABON—RTV Gabonaise, 4777 opening at 0456 with carrier, tone, opening ID and frequency anmts in FF, national anthem at 0459, another ID and techno sounds to news at 0501. (D'Angelo, PA) 0459 sign on in FF with "Radio Gabon" IDs. (Alexander, PA) 0542. (DeGennaro, NY)

Africa Number One, 9580 with rap and hip-hop at 2157, ID at ToH and FF news. Also 17630 in FF at 1537. (Wood, TN) 15475 with panel discussion at 1614. (Burrow, WA)

GERMANY—Deutsche Welle, 5910 in RR at 0618 and 7145 via Portugal in RR at 2048. (DeGennaro, NY) 6225 in CC at 1321. (Brossell, WI) 9555 at 2315. (Maxant, WV) 11890 via Sri Lanka in AA at 2036 and 12035 via Portugal in FF at 1633. (Parker, PA)

Deutschlandfunk, Berlin, 6190 in GG at 0637. (DeGennaro, NY)

Deutschlandradio, 6005 in GG with pops and man anncr heard at 0346. (D'Angelo, PA)

GREECE—Voice of Greece, 5865 at 0603, 0375 at 0044 and 9420 at 0036. (DeGennaro, NY) 9420 at 2020. (Parker, PA) 17565 via Greenville at 2016. (MacKenzie, CA) 15565 at 1529. (Wood, TN) 15630 at 1336. (Brossell, WI) 1816. (Jeffery, NY) (*all in Greek—gld*)

RS Makedonias, 7450 in Greek with news at 2200. (Wood, TN)

GUAM—AFN/AFRTS, 13362u with pop-rock at 0447. (Foss, Philippines)

Trans World Radio, 9355 in CC at 1409. (Brossell, WI)

Adventist World Radio/KSDA, 9585// 12065 with religious discussion. The 12-MHz frequency was running one second behind. ID and close down at 1629. (Burrow, WA)

GUATEMALA—Radio Verdad, Chiquimula, 4052.5 with SS/EE woman anncr at 0213. Long SS talk by man at 0214. (Montgomery, PA) 0215 with group vocals. (D'Angelo, PA) 0534 in EE. (DeGennaro, NY)

Radio Cultural Coatan, San Sebastian, 4780 at 0147 with audio problems and possible ID at 0202. (Montgomery, PA) 1055. (DeGennaro, NY)

GUYANA—Voice of Guyana, 3291.2 at 0054 with EE religious feature, ID, TC and program previews at 0100, another religious feature to news at 0110. (D'Angelo, PA)

HONDURAS—La Voz Evangelica, 4819.2 at 1011 with SS religious programming. (DeGennaro, NY)

Radio Luz y Vida, 3249-3250 at 0310 with repeated IDs and inspirational music in SS. (Wood, TN) 0312. (Brossell, WI)

Radio Misiones Int./HRMI, 3340 at 0055 with vocals and periodic IDs. (D'Angelo, PA) 0112 with SS hip-hop. (Wood, TN) 0526 with religious message in SS. (DeGennaro, NY)

HUNGARY—Radio Budapest, 6025 at 2008 with pgm on various holiday celebrations there. (Brossell, WI) 2015 on repair of a bridge. Also 9735 on relations with Romania. (Maxant, WV) 9780 at 0335. (Weronka, NC) 9870 in HH at 0129. (DeGennaro, NY)

ICELAND—AFN/AFRTS, GRINDAVIK, 7590u at 2253 with interview and ID for National Public Radio. (Montgomery, PA) 2348 with a financial program. (Wood, TN)

INDIA—All India Radio, 4860-Delhi, with usual Hindi vocals monitored at 1315. (Strawman, IA) 5010-Thiruvananthapuram in presumed Hindi at 1325, 6165-Delhi in Asian language at 1315, 9820-Panaji (Goa) in Hindi at 1423 and 11620-Bangaluru (Bangalore) with news at 2049. (Brossell, WI) 5010-Thiruvananthapuram with EE news at 0035. (Montgomery, PA) 9425-Bangaluru.with pop tunes at 2150. (Clapshaw, WA) 2223 with overseas service to 2230 close. Also 9705 with sub-continental music at 2324. (Wood, TN) 9445 in EE at 2115, 9820-Panaji at 1825. (Maxant, WV) 10330-Bangaluru in Hindi at 0139. (DeGennaro, NY) 11620-Bangaluru at 1922 with EE features and sub-continental music. (Wood, TN) 2119. (Montgomery, PA) 2127. Also 13770-Bangaluru at 1615. (Parker, PA) 17510-Delhi on investments in India at 1010. (Foss, Philippines)

INDONESIA—Radio Republik Indonesia-Palangkaraya, Kalimantan, 3325 with news in II at 1303. (Foss, Philippines)

RRI-FakFak, 4790 in II at 1308. (Brossell, WI) 1318. (Strawman, IA)

RRI-Cimanggis, Jawa, 9680 in II at 2340. (MacKenzie, CA)

Voice of Indonesia, 9525 with pops and anmts or ad clusters. Off with NA at 1359. (Strawman, IA) 2010. (Maxant, WV)

IRAN—VOIRI, 7130 in SS at 2044 and 9905 in SS at 0135. (DeGennaro, NY) 7330//9940 at 1605. (Burrow, WA) 13790 at 1349. (Brossell, WI)

ISRAEL—Kol Israel, 7545 at 0056 and 11590 at 1837. (DeGennaro, NY) 2010. (Maxant, WV)

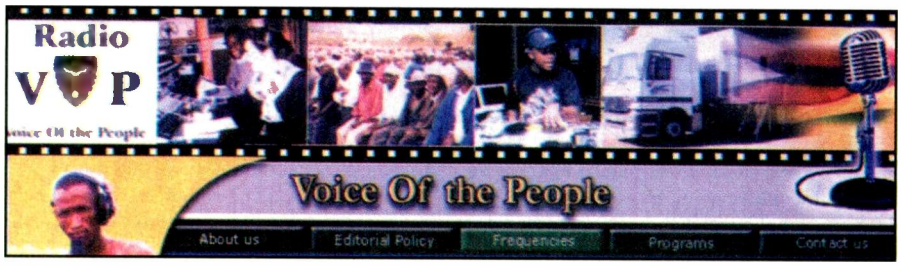
Galei Zahal, 6973 in HH at 0221. (DeGennaro, NY)

ITALY—RAI, 6110 via Ascension in II at 0202, 9840 in II at 0126, 11800 in FF at 0128 and 11765 in II at 0151. (DeGennaro, NY) 11765 via Ascension in II at 0150. (Clapshaw, WA)

JAPAN—Radio Japan/NHK, 6120 via Canada in EE at 1059, 7225 in JJ at 2147, 9660 via French Guiana in SS at 0413, 11710 via Skelton, UK in GG at 1111 and 11935 via Bonaire in EE at 0138. (DeGennaro, NY) 6120 at 0955. (Maxant, WV) 11835 via Ascension at 2122. (Parker, PA)

JORDAN—Radio Jordan, 11690 with local FM relay heard at 1610. (Maxant, WV) 1621. (Burrow, WA) 1700. (Parker, PA)

KUWAIT—Radio Kuwait, 9855 in AA at 2043. (Brossell, WI) 9880 in AA at 1856. //9855 was fair, 15495 poor, and 15505 good. (D'Angelo, PA) 9885 in AA at 2345. (Maxant, WV) 11990 in AA at 1637. (Parker, PA) 15495//15505 in AA at 1805. (Yohnicki, ON) 15505 in AA at 2132. (Wood, TN)



Radio Voice of the People broadcasts opposition programming to Zimbabwe via the Radio Nederland transmitter in Madagascar.

LIBYA—Radio Jamahiriya/Voice of Africa, 7205 in EE at 2133 and 7330 in AA at 2326. (DeGennaro, NY) 7320 with EE ID and news at 0224, into FF at 0227. (Alexander, PA) 7320 in EE at 2220, and also 11860 in EE at 1741. (Montgomery, PA) 11630 in EE at 2140. (Maxant, WV) (*all transmissions via France—gld*)

LITHUANIA—Radio Vilnius, 7325 with EE sign on at 2330. (DeGennaro, NY) 2340 in EE. (Maxant, WV) 9875 at 0035 in EE with various EE features. (Montgomery, PA)

MADAGASCAR—Radio National Malagasy, 5010 from 0258 sign on with choral anthem, opening ID and anmts in Malagasy. News at 0330. (D'Angelo, PA)

Radio Nederland Relay, 9895 at 2045. (Brossell, WI)

MALAYSIA—Radio Malaysia, 5030-Kuching at 1500 with time pips and into music. (Barton, AZ) 7270-Kuching heard at 1237 with Koran. (Foss, Philippines) 7295-Kajang with EE news and IDs for Traxx FM. (Burrow, WA)

MALI—ORTM, 5995 at 2242 with man in FF, highlife vocals, more talk, ID at 2302. (D'Angelo, PA)

MARUITAINIA—Radio Mauritanie, 4845 with AA at 2313. (DeGennaro, NY)

MEXICO—Radio Educacion, Mexico City, 6185 at 0112 with SS vocals to ID at 0116. (D'Angelo, PA) 0116 in EE at with ID at 0119 and URL and e-mail address. (Montgomery, PA) 0940 in SS. (Maxant, WV) 1032. (DeGennaro, NY)

Radio Universidad, San Luis Potosi, 6045 in SS at 2018. (Brossell, WI)

Radio Transcontinental, Mexico City, 4810 at 0307 with long SS talk, apparent ID by woman at 0339, brief music and more talk. (D'Angelo, PA)

MOLDOVA—Russian Radio Int., on 7125 at 0037 with RR rock and man anncr. (Wood, TN)

MONGOLIA—Radio Ulaanbaatar (t), 7260 at 0920. Weak with man in local language with lots of Mongolian music. Possible ID by a woman at ToH. Possible news by man at 1002. (Montgomery, PA)

MOROCCO—RTV Marocaine, 15345 in AA at 1810. (Yohnicki, ON) 2026 in AA. (Jeffery, NY)

Radio Medi-Un, 9575 in FF and AA heard at 0020. (DeGennaro, NY) 0025 in AA. (Jeffery, NY) 2300 with Mideast pops. (Clapshaw, WA)

VOA Relay, 15220 in FF at 2015 and 15240 in EE at 2020. (Jeffery, NY)

NETHERLANDS—Radio Nederland, 7120 via Madagascar in EE at 2033 and 11655 via Madagascar in EE at 1845. (DeGennaro, NY) 1900. (Clapshaw, WA) 12065 via Uzbekistan in unid Asian language heard at 1349. (Brossell, WI)

NETHERLANDS ANTILLES—Radio Nederland Bonaire Relay, 6165 at 0144. (Montgomery, PA) 1104 in SS. (DeGennaro, NY) 15315 monitored at 2025. (Maxant, WV) 2324 in SS. (MacKenzie, CA)

NEW ZEALAND—Radio New Zealand Int., 9870 with NZ news at 1602. (Burrow, WA) 9885 relaying National Radio at 0910 (Maxant, WV) 0953. (DeGennaro, NY) 15720 at 2000. (Barton, AZ) 2020. (MacKenzie, CA)

NIGERIA—Voice of Nigeria, 7255 with FF at 2157 to close at 2159. (DeGennaro, NY) 15120 from 1629 opening to 2100 sign off with audio quality varying from program to program. (Alexander, PA) 1940 with woman and news. (Wood, TN) 2006 with news and ID. (Burrow, WA)

Radio Nigeria, Kaduna, 4770 in EE at 0540. (DeGennaro, NY)

NORTH KOREA—Voice of Korea, 9990//11545 at 1635 with ID and "revolutionary" music. (Burrow, WA) 11735 with EE to the Americas at 0118. (DeGennaro, NY) 13760//15180 at 0140. (Clapshaw, WA)

Pyongyang Broadcasting Station, 6398.8 in KK at 1517. (Foss, Philippines)

NORTHERN MARIANAS—Far East Broadcasting/KFBS, 12090 in unid language at 2235. (Clapshaw, WA)

VOA Relay, Tinian, 13755 with news at 2255. (Clapshaw, WA)

OPPOSITION—SW Radio Africa, 3230 monitored at 0305 with EE talks about Zimbabwe and elections, IDs and address info. (D'Angelo, PA)

Voice of Biafra Int., 7380 via South Africa at 2148 in heavily accented EE mentioning homes being confiscated, other events and comments about Nigeria and support for an independent Southern Republic of Biafra. ID: "This is the Voice of Biafra International, coming to you from Washington, D.C." (Wood, TN)

Radio Free Asia via No. Marianas. 11945 with oriental music at 1643. (Parker, PA)

Radio Liberty, 7220 via Greece in RR at 0049. (Montgomery, PA) 9805 via Northern Marianas in RR at 1352. (Brossell, WI) 11805 in RR at 1650. (Parker, PA)

Radio Republica, 7110 in SS at 0329. (D'Angelo, PA)

Radio Solh, 15265 via Rampisham, England to 1500 close. (Yohnicki, ON) (*presumed this was in Pashto or Dari—gld*)

Radio Farda, 9435 via Greece heard at 1412. (Brossell, WI) 15410 via Wooferton at 1523. (Wood, TN) (*presumed this was in Farsi—gld*)

Voice of the Tigray Revolution, 5500 at 0352 with open carrier until familiar IS at 0359, ID at 0400 and opening anmts by woman in Tigrigna, then man with news. (D'Angelo, PA)

Radio Free Southern Cameroon, 11840 via Russia at 1800 sign on with EE ID, sked and choral anthem, talk about freedom in Southern Cameroon, highlife music, ID heard at 1858 and close. (Alexander, PA)

Echo of Hope, 6348 in KK to North Korea at 1512. (Foss, Philippines)

OMAN—Radio Sultanate of Oman, 9760 in AA at 0115. (DeGennaro, NY) 15140 with open carrier at 1400 but no audio until midway through their newscast, usual pops at 1411, chimes at 1500 and into AA. (Alexander, PA)

This Month's Book 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!

Our book winner this month is **Joe Wood** who has received a copy of Fred Osterman's great book *Shortwave Receivers Past and Present*, courtesy of the good folks at Universal Radio. You should have Universal's current catalog in your shack. It's easy to get a copy of this gem-filled wish book. Just call Universal at 614-866-4267, send an e-mail to dx@universal-radio.com or drop a note to them at 6830 Americana Parkway, Reynoldsburg, OH 43068, and they'll drop everything to rush a copy to you.

BBC Relay, 7105 at 2241 remembering John Lennon. (Foss, Philippines)

PAKISTAN—Radio Pakistan, 9375 at 1558 with IS, opening at 1600. Off at 1615. (Burrow, WA)

PAPUA NEW GUINEA—Radio Sanduan, Vanimo, 3205 at 1248 in unid language with up tempo South Seas singing. (Foss, Philippines)

PERU—(All in SS) Radio Altura, Cerro de Pasco, 5014.4 at 1005 with talk, music, IDs, ads. (Alexander, PA)

Radio Victoria, Lima, 9720 at 0630 with religious programming. Stronger on //6020. (Alexander, PA)

Radio Madre de Dios, Puerto Maldonado, 4950 in SS at 1046. (DeGennaro, NY)

Radio Cultural Amuata, Huanta, 4955 with talk and music at 1053. (DeGennaro, NY)

Radio Huanta 2000. Huanta, 4746.8 at 1008 with flutes, long talk including IDs. (D'Angelo, PA) 1052. (DeGennaro, NY)

Radio Oriente, Yurimaguas, 6188 at 1105 with talk, OA music and ballads. Canned "Oriente" ID. (Alexander, PA)

Radio Luz y Sonido, Huanuco, 3234.7 with music and talk at 1039. (DeGennaro, NY)

PHILIPPINES—Radio Veritas Asia, 9670 in VV at 2344. (MacKenzie, CA)

Radio Pilipinas, 11730 in Tagalog at 1850. (Clapshaw, WA)

PIRATES—The Crystal Ship, 6854 at 1429 with IDs "You are tuned to The Crystal Ship." "You're aboard The Crystal Ship, plundering the airwaves." Mentions of blue and red states, PSAs for voting rights and audio clips of President Bush. (Wood, TN) 6875 at 2252 with various rock/pop things, audio clips about the atomic bomb. (Balint, OH)

Sunshine Radio, 6925u at 2127 with frequent IDs and e-mail info for QSLs (grasscutterradio@yahoo.com), various rock things. Last song was dedicated to Undercover Radio. Said Grasscutter Radio show was coming up next. (Balint, OH)

Grasscutter Radio, 6925u at 2218 with frequent IDs between rock songs and a mention that the QSL e-mail is the same as for Sunshine Radio above. (Balint, OK) 2240 with rock. (Hassig, IL)

Captain Morgan, 6924v at 0135 with rock things other bits of pop. Off suddenly at 0200. (Hassig, IL) 2335 with rock. Also at 0156 sign on with classic rock and rock oldies and "You're in the pirate zone" slogan. (Zeller, OH) 6925 at 2331 with *Twilight Zone* theme, rock things. No address noted. (Balint, OH)

Undercover Radio, 6925u at 1656 with a repeat of an earlier show discussing the programs they had broadcast during the past year. Also at 2310 with mostly rock and talk on past programs. (Zeller, OH) 2024 with ID and announcing P.O. Box 293, Merlin, Ontario N0P 1W0, Canada as address. (Wood, TN)

Progressive Music Radio, 6925u at 0000 with Pink Floyd, Grateful Dead and said to QSL via *Pop'Comm* and "broadcasting from the middle of nowhere."

Radio Sierra Poppa, 6925u at 2143 with mostly a guy talking and some apparently staged CB-style QSOs. No address announced. (Hassig, IL)

WBNY (?) 6925 at 2250 with the warbling tones of an SSTV broadcast. (Hassig, IL) Noted at 1503, 1526, 1547, 1606, 1616 with digital noise and a CW ID for WBNY at the end of each transmission. Also at 0029 sign on with mostly a voice program but some digital SSTV and several airings of a children's song. (Zeller, OH)

Northwood Radio, 6959 heard at 2223 with comedy songs about rednecks. Reports to northwoodradio@yahoo.com. (Cooper, NY)

Ground Zero Radio, 6925.2 at 0023 with mostly Johnny Cash songs and request for reports on their audio quality to GZRSW@yahoo.com and the Elkhorn, Nebraska, address. (Zeller, OH)

Cherokee Asylum Radio, 6925 at 0139 with usual program of the story of Graham Conner at the Cherokee Mental Asylum in Iowa where he has been for 26 years. Numerous repeats of "radio is my friend—my friend is radio." Mentioned reception reports but no address noted. Also at 0238 sign on, repeating the 0139 broadcast. (Zeller, OH)

KSUR, 6925.7 monitored at 0023 with mostly guitar music and man saying "bringing the surfing music of the West Coast to shortwave" and some surf sound effects. E-mail to ksurradio@yahoo.com. (Zeller, OH)

PORTUGAL—RDP Int., 11630 in PP to Europe at 1842. (DeGennaro, NY) 21655 in PP to West Africa and South America at 1825. (Parker, PA)

Here's another colorful QSL card from Radio Prague. (Thanks Rich D'Angelo)

ROMANIA—Radio Romania Int., 6150 at 0146 and woman with talks during "Week in Review" program. (Montgomery, PA) 7105 to Europe at 2142. (DeGennaro, NY) 11940 with frequencies, targets and times at 2150. (Maxant, WV)

RUSSIA—Voice of Russia, 7180 via Moldova at 0310. (Weronka, NC) 7240 via Ukraine in RR at 0355. (Brossell, WI)

Radio Gardarika, St. Petersburg, 6235 in RR at 2036. (Brossell, WI)

RWANDA—Deutsche Welle Relay, 15205 in AA at 1933. (Brossell, WI) 15275 in GG at 1802. (Jeffery, NY) 1911 in GG. (Brossell, WI)

SAO TOME—Voice of America Relay, 4960 at 0413. (Jeffery, NY) 6035 at 2017 with news for Africa. (Brossell, WI) 11975 at 2105. (Wood, TN)

SAUDI ARABIA—BSKSA, 9870 in AA at 2043. (Brossell, WI) 11820 in AA at 2034. (Parker, PA)

SINGAPORE—Media Corp Radio, 6150 with pops, ID, schedule at 1556. (Burrow, WA) 7170 at 0137 with Middle Eastern type music. (Foss, Philippines)

Radio Singapore Int., 6080 with pops at 1309. (Brossell, WI)

BBC Relay, 9740 heard at 2332. (MacKenzie, CA)

SLOVAKIA—Radio Slovakia Int., 7230 at 0102 with woman anncr opening a 30-minute program and man with full ID at 0105. (Montgomery, PA)

SOUTH AFRICA—Channel Africa, 3345 at 0400 with news. (D'Angelo, PA) 0349

Radio Senegal sent this card to your column editor in July 1965, when they were active on 4890 kHz.

with news and mentions of the maritime industry. Also 17770 with religious program at 1540. (Wood, TN) 7390 heard at 0405. (Brossell, WI)

Radio Sondergrense, 3320 in Afrikaans at 0107. (Wood, TN)

Adventist World Radio via Meyerton, 11845 in African dialect monitored at 2053. (Brossell, WI)

SPAIN—Radio Exterior de Espana, 6055 with classical music, SS talks and pop at 0549 tune. (Burrow, WA) 0157 and news at 0200. (Montgomery, PA) 6055 in EE to NA at 0021 and 9620 in SS to South America at 0105. (DeGennaro, NY) 9660 via China in SS at 2342 and 17850 via Costa Rica Relay in SS at 2005 (MacKenzie, CA) 17850-Costa Rica in SS at 1951 and 21610 in AA to Middle East at 2040. (Parker, PA)

SOUTH KOREA—KBS World Radio, 5975 at 1624 with news, music, "Let's Learn Korean" at 1631. (Burrow, WA) 11795 via Canada in SS at 1122. (DeGennaro, NY)

SRI LANKA—Deutsche Welle Relay, 9615 with lots of trumpets and cornets at 2146. (Wood, TN)

SWEDEN—Radio Sweden, 6065 via Canada about Swedish human rights at 2230. (Maxant, WV) 9490 in Swedish to Europe at 1127 and 11550 via Madagascar in EE to South Asia. (DeGennaro, NY) 9530 in RR at 1415. (Brossell, WI) 11550-Madagascar monitored at 1415, //15240 via Canada. (MacKenzie, CA)

SYRIA—Radio Damascus, 12085 at 2008 opening EE with ID, sked, news at 2010 and again at 2103 and 2110. Ran until abrupt close at 2159. Weaker on parallel 9330. (Alexander, PA) Tentative at 2144 with woman in EE. Weak modulation with carrier at S9 level. (Montgomery, PA)

TAIWAN—Radio Taiwan Int., 9330 at 2245 on making electronic components in Taiwan. (Maxant, WV)

Voice of Han (t), 9745 at 2135 with CC vocals and man anncr. (Wood, TN)

TANZANIA—Radio Tanzania-Zanzibar, 11735 airing local "Spice FM" news at 1802. (D'Angelo, PA) 2045. (Barton, IA) Talks in Swahili at 2051. (Brossell, WI)

THAILAND—VOA Relay, 7130 at 0030 with news items in EE. (Montgomery, PA) 9720 in Burmese at 2335, //9490 and 9535. (MacKenzie, CA) 13600 with news items heard at 1513. (Wood, TN)

BBC Relay, 6035 monitored at 1315 in EE but with sound bites in an Asian language. (Brossell, WI)

TUNISIA—RT Tunisienne, 7190 with AA vocals to ID at 0800. (D'Angelo, PA) 9720 in AA at 0343. (Brossell, WI)

TURKEY—Voice of Turkey, 5960 with news items at 2305. (Maxant, WV) 7155 in FF at 2052 and 7300 in TT at 2320. (DeGennaro, NY) 15155 heard at 1415 with Turkish language lesson. (Barton, AZ)

UGANDA—Radio Uganda, 4976 with African news at 0422. (Brossell, WI) 0350 in local language, ID at 0400 and EE news. Also 5026 at 0344 with conversation, light music and news heard at 0400. seemingly parallel to 4976. (D'Angelo, PA)

UKRAINE—Radio Ukraine Int., 5880 with "Roots of Culture" program at 0417. (Wood, TN) 5910 with "Ukraine Today" in progress heard at 0412. (Brossell, WI)

UNITED ARAB EMIRATES—Adventist World Radio, 9760 via UAE in an African dialect at 0350. (Brossell, WI)

USA—AFN/AFRTS Key West, 5446.5 at 2255 and 12133.5 at 2245. (Maxant, WV) 5446.5 at 2332 and 7811 at 0049. (DeGennaro, NY) 7811 at 2247. Also 12133.5 at 0020. (Montgomery, PA) 12133.5 heard at 2147. (Parker, PA)

VATICAN CITY—Vatican Radio, 4005 in SS at 0337 with RTTY QRM. (Brossell, WI) 5885 in EE at 0611, 7250 in AA closing at 2200, 7305 in SS at 0122 and 7335 in Hindi at 0118. (DeGennaro, NY) 7250 in EE at 0737. (D'Angelo, PA) 7335 at 0148, not parallel to 7305. (Montgomery, PA) 9605 at 0315. (Weronka, NC) 13765 heard at 1530. (Maxant, WV)

VENEZUELA—Observatorio Naval Cagical, Caracas, 5000 with SS time signals at 1009. (DeGennaro, NY)

Radio Nacional, 9820 via Cuba in SS at 2348. (MacKenzie, CA)

VIETNAM—Voice of Vietnam, 5925-Xuan Mai, in VV at 0957. (Foss, Philippines) 6175 via Canada at 0340. (Weronka, NC)

ZAMBIA—The Voice, 4965 with man and EE anmts at 0100. (Montgomery, PA) 0115 with woman hosting pop vocals. (D'Angelo, PA) 0116. (Wood, TN)

ZIMBABWE—ZBC, 6612h at 0236 in Shona and/or Ndebele with man anncr, nice African music. Complete ID and address at 0200. (Montgomery, PA)

A gazillion or three thanks to the following who came through for you this time: Rick Barton, Phoenix, AZ (and traveling in Iowa); Richard Parker, PA; Jerry Strawman, Des Moines, IA; Joe Wood, Greenback, TN; David Weronka, Benson, NC; Robert Brossell, Pewaukee, WI; Bruce Burrow, Snoqualmie, WA; Robert Montgomery, Levittown, PA; Dave Balint, Wooster, OH; Marty Foss, Guinayangan, Philippines; William Hassig, Mt. Prospect, IL; George Zeller, Cleveland, OH; Stewart MacKenzie, Huntington Beach, CA; Michael Yohnicki, London, ON; Arnold Zeck, Bayberry, NY; Michael Clapshaw, Port Angeles, WA, Charles Maxant, Hinton, WV; Rich D'Angelo, Wyomissing, PA; Cero DeGennaro, Feura Bush, NY; Brian Alexander, Mechanicsburg, PA; Dave Jeffery, Niagara Falls, NY and Sheryl Paszkiewicz, Manitowoc, WI.

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

In Times Past...

And now for some nostalgia. We give you a blast from the past here each month—perhaps a logging or a station tidbit from the *Pop'Comm* shortwave history book. Here's comes one now:

VENEZUELA—Radio Giradot, YVLG in Maracay, on 2440 kcs. at 0101 on 24 November 1966 with domestic service in SS. 1 kilowatt. (Dexter-WI)

by Bill Hoefer, flacap388@hotmail.com

Airport Frequency Update

Editor's note: Last month in Bill Hoefer's *Plane Sense* column we could not include his usual excellent listing of airport frequencies, so here it is this month! Bill will return next month with *Plane Sense*.

NEW/CHANGED/DELETED FREQUENCIES

NEW

AK
Delta Junction, Fort Greeley (BIG/PABI)
LC 125.35
Kotzebue, Ralph Wien Memorial (OTZ)
ATIS 135.45
McKinley National Park Airport (INR)
Interaircraft Comm 122.725/123.65
Nelson Lagoon (OUL/PAOU)
AWSS 119.025
Nikolai (FSP/PAFS)
AWOS 118.325
Nuiqsut (AQT/PAQT)
Anchorage ARTCC RCAG 119.4
Port Lions (ORI)
PCL 122.9

AR
Newport Municipal (M19)
AWSS 118.15

FL
Merritt Island (COI)
ASOS 119.025
Okeechobee County (OBE)
ASOS 118.675
Panama City, Tyndall AFB (PAM)
PFN Apch 136.4/338.5/392.1
Sanford, Orlando Sanford International (SFB)
CD 123.975
CD 121.35 (when ATCT closed)
Orlando (MCO) Apch 119.775/121.1/351.9
Titusville, Arthur Dunn Air Park (X21)
AWOS-3 119.725
Zephyrhills Municipal (ZPH)
ASOS 118.975

GA
Atlanta Hartsfield, Jackson Atlanta International (ATL)
ILS/DME Rwy 10 (I-OMO) 111.55
ILS/DME Rwy 28 (I-PKU) 111.75
Savannah, Hunter AAF (SVN)
ARNG Ops 38.15

ID
Driggs Reed Memorial (U59)
AWSS 128.225
Hailey, Friedman Memorial (SUN)
ATIS 128.225

IN
North Vernon (OVO)
AWOS-3 120.625

IA
Washington Municipal (AWG)
Chicago ARTCC (ZAU) GCO 121.725

LA
Bastrop, Moorhouse Memorial (2F8)
AWOS-3 118.375

MD
Leonardtown, Capt Walter Francis Duke Regional (2W6)
AWOS-3 119.575

MA
Marshfield Municipal (3B2)
AWOS 120.0

MI
Battle Creek, W. K. Kellogg (BTL)
PCL 126.825
Carsonville, Circle U Heliport
UNICOM 123.05
Three Rivers Municipal (HAI)
AWOS-3 119.975

MN
Canby, Myers Field (27D)
AWOS-3 118.575

MS
Olive Branch (OLV)
ATIS 119.925
CD (when ATCT closed) 121.3
Pascagoula, Trent Lott International Airport (PQL)
CTAF 122.8
LC 118.575

NV
Indian Springs, Creech AFB (INS)
ASOS 121.125

NH
Nashua, Boire Field (ASH)
AWSS 125.1/414.6625

NJ
Lumberton, Flying W Airport (N14)
Mount Holly, South Jersey Regional Airport (VAY)
Williamsport AFSS GCO 121.725

NY
Binghamton, Greater Binghamton-Edwin A Link Field (BGM)
Cortland County, Chase Field (N03)
Binghamton Apch 239.25

NC
Reidsville, Rockingham County (78N)
ASOS 119.775
Wadesboro, Anson County (AFP)
AWOS 119.325

OH
Bowling Green, Wood County (1G0)
AWOS 120.725
Ottawa, Putnam County (OWX)
AWOS-3 120.525

OR
Brookings (BOK)
ASOS 132.025

PR
Aguadilla, Rafael Hernandez (TJBQ)
CD 124.35/269.35

SC
Cheraw Municipal, Lynch Bellinger (47J)
AWOS-3 118.175
Eastover, McEntire ANGS (MMT)
Apch 269.4/306.2/316.4/379.5

TX
Crockett, Houston County (DKR)
AWOS-3 118.775
Galveston, Scholes International (GLS)
GC 118.625
LC 120.575
Orange County (ORG)
AWOS-3 118.975

WA
Auburn (S50)
Seattle AFSS (SEA) RTR 123.85
Olympia (OLM)
ATIS 135.725

WV
Pineville, Kee Field (I16)
AWOS-3 120.625
Sutton, Braxton County (48I)
AWOS-3 118.225

WI
Drummond Island (Y66)
AWOS-3 118.325

CHANGED

AL
Fort Rucker Ozark, Hanchey AHP (HEY)
149.6 was LC, now GC
GC was148.7/387.7, now 225.575
LC was 225.575, now 141.8/387.7

AK
Tetlin (3T4)
CTAF was 122.9, now 122.7

AZ
Chandler, Stellar Airpark (P19)
UNICOM/CTAF was 122.95, now 122.9

AR
Arkadelphia, Dexter B Florence Memorial (M89)
Hot Springs Memorial Field (HOT)
Malvern Municipal (M78)
Memphis ARTCC (ZME) RCAG was 127.825/288.25, now 128.475/377.15
Blytheville International (BYH)
Memphis ARTCC (ZME) RCAG was 350.3, now 316.15
Brinkley
Harrison
Memphis ARTCC (ZME) RCAG was 263.15, now281.55
Fort Smith Regional (FSM)
Memphis ARTCC (ZME) RCAG was 380.3, now 318.8
Memphis ARTCC (ZME) RTR was 380.15, now 353.57
Mena Intermountain Municipal (MEZ)
Memphis ARTCC (ZME) RCAG was 119.25/318.8, now 126.1/269.0

CT
Windsor Locks, Bradley International (BDL)
ANG OPS was 138.55, now 138.625

FL
Crestview, Eglin AF Aux No. 3 Duke Field (EGI)
PTD was 122.85, now 122.95
Homestead ARB (HST)
GCA was 339.3, now 279.55
LC was 295.7, now 257.675
Mary Esther, Hurlburt Field (HRT)
GC was 139.6, now 123.975

IL
Belleville, Scott AFB/Mid America (BLV)
126 ARW Cmd Post was 141.7, now 138.55

IN
Indianapolis, Eagle Creek Airpark (EYE)
ASOS was 126.425, now 121.575
Shelbyville Municipal (GEZ)
ASOS was 126.475, now 121.55

KS
Salina Municipal (SLN)
Kansas City ARTCC (ZKC) RCAG was 133.925/296.6, now 125.175/269.625

MD
Patuxent River NAS/Trapnell Field (NHK)
LC was 344.4, now 343.65

MI
Allegan, Padgham Field (35D)
Hastings (9D9)
Sparta, Paul C Miller (8D4)
Chicago ARTCC (ZAU) Apch was 128.5, now 128.4
East Tawas, Iosco County (6D9)
PCL was 122.8, now 122.85
Jackson County, Reynolds Field (JXN)
ATIS was 127.95, now 125.725

MS
Louisville, Winston County (LMS)
Memphis ARTCC (ZME) RCAG was 132.35, now 132.75

NY
Binghamton, Greater Binghamton-Edwin A Link Field (BGM)
LC was 242.7, now 239.25
Kingston, Ulster (20N)
Millbrook, Sky Acres (44N)
Newburgh, Stewart International (SWF)
Poughkeepsie, Dutchess County (POU)
Red Hook, Sky Park (46N)
Stormville (N69)
New York TRACON Apch was 387.15, now 363.1

OH
London, Madison County (UYF)
NDB was 284 kHz, now 263 kHz
Toledo, Metcalf Field (TDZ)
AWOS was 119.275, now 121.575

OK
Clinton, Sherman
Fort Worth ARTCC (ZFW) Low was 290.2, now 269.375

SC
Eastover, McEntire ANGS (MMT)
GC was 395.8, now 233.7

TN
Bolivar, William L Whitehurst Field (M08)
Selmer, Robert Sibley (SZY)
Memphis ARTCC (ZME) RCAG was 135.9/273.55, now 124.53/239.3

Jacks Creek (JKS)
Memphis ARTCC (ZME) RCAG was 317.65, now 269.9
Jackson, McKellar Sipes Regional
Memphis ARTCC (ZME) RCAG was 127.975/288.35, now 136.175/343.625

Memphis International (MEM)
ANG OPS was 138.1/341.6, now 138.95/341.75

Nashville International (BNA)
Memphis ARTCC (ZME) RCAG was 306.3, now 257.75

TX
Bellville, Grawunder Field (06R)
CTAF was 122.9, now 123.0
Del Rio, Laughlin AFB (DLF)
LC was 392.0, now 281.55
El Paso International (ELP)
LC was 118.3, now 126.05
Lubbock, Preston Smith (LBB)
Fort Worth ARTCC (ZFW) RCAG was 276.0, now 274.5
Wichita Falls, Sheppard AFB (SPS)
CD was 121.2, now 134.85

UT
Provo Municipal (PVU)
CTAF was 122.8, now 125.3
Toole, Bolinder Field
Salt Lake City ARTCC (ZLC) Delle RCAG was 380.05, now 269.175

VT
Springfield, Hartness State (VSF)
ASOS was 134.125, now 121.425

WA
Mattawa, Desert Aire (M94)
CTAF was 122.9, now 122.8

WV
Huntington, Tri State Milton J. Ferg
Elkins AFSS (EKN) RCO was 132.95, now 128.4

WI
Rick Lake Regional (RPD)
AWOS-3 was 118.0, now 120.525

DELETED

FL
Sanford, Orlando Sanford (SFB)
MCO Apch 121.1/351.9

LA
Lake Charles Regional (LCH)
Houston ARTCC (ZHU) RTR 119.75

MS
Olive Branch (OLV)
NDB 275 kHz (Decommissioning pending removal of dependent resources)

OH
Springfield, Beckley Municipal
ATIS 134.975

TX
Del Rio, Laughlin AFB (DLF)
PTD 140.975

CANADA
AB
Cold Lake (CYOD)
Apch 248.2/398.0

NEW AIRPORTS/CHANGED IDs/CLOSED AND ABANDONED AIRPORTS

NEW

IL
Hurst, Dury Estates Airport 0AN1

OH
Morrow, Buena Vista Farm Airport 0AN0

CHANGED IDs

CA
Brownsville was P49, now F25
Fresno Yosemite International (FAT) HILAN NDB was FA, now CUK
Mariposa was O68, now MPI
Paradise Skypark was P40, now L24

IL
Hurst, Dury Estates Airport was 0AN1, now IL71

OH
Morrow, Buena Vista Farm Airport was 0AN0, now OA12

CLOSED/ABANDONED

FL
Bryant Air Strip Airport FA70
Kissimmee, Osceola Sheriff's Office, Simpson Road Heliport 49FD
Monticello, Foxcreek Plantation Airport 4FD1
Ocala, Mulvihill Field Airport 4FL7
Oceanway, Baine Airport FL20
Tampa, Azzmac Heliport FD76
Tampa, Broady Airport 6FL7
Tampa, Fire Station No. 1 Heliport FL79

IA
Wall Lake Municipal 3Y0

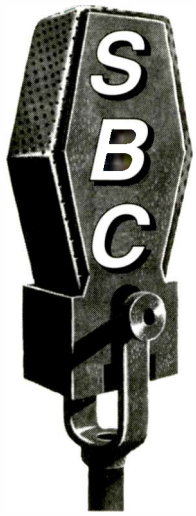
MN
Park Rapids, Whippoorwill Seaplane Base 4MN6

NY
Honeyoye Falls D70

OH
Olive Green, Zurik Stol Stolport 0OH4

by Shannon Huniwell, melodyfm@dreamscape.com

WMTR—A Model AM In The Baby-Boomer Era 'Burbs



"Not again!" I screamed with an exaggerated wave of my arms. As happens almost daily, my computer's inbox had been newly peppered with eBay "item of interest" e-mails forwarded by dear old Dad, the original, genuine AM & FM *radio nut*. This time his message simply promised, "Hey Kiddo, Get this stuff, and I'll give you some neat information about the New Jersey station noted in the picture. Love, Pop."

Clicking on the indicated link switched my screen to a cute image of a little boy dressed in a cardboard microphone costume. The youngster wore headphones, had been subjected to a dollop of lipstick on his nose (perhaps to signify a glowing audio tube), and was crowned with a crude rendition of a self-supporting broadcast tower. Apparently, though, nobody else was as impressed with the photo. My opening bid of under $10 remained the sole offer through the entire weeklong auction.

Almost immediately after winning the bid, Dad e-mailed me a story outline and reminder to "fire off a check ASAP so that the seller doesn't have a chance to misplace the valuable photographic support documentation for the pioneer suburban radio article." Honestly, sometimes I wonder why the *Pop' Comm* management doesn't just hire my father to ghostwrite this column!

When the eBay vendor's photo package arrived, I quickly discovered that few pictures in the deal had anything to do with radio history. In fact, the water-stained contents, which according to fine print from the seller had come from a yard sale back in the '80s, represented a mundane, bottom-of-the-barrel potpourri of one N. L. Silverstein, a Morristown, New Jersey photographer. My heart sank as I shuffled through the stack of relatively uninteresting shots, mostly depicting portly bald guys wearing wide ties and smiling for the camera during some long-forgotten dinner meeting.

"Annual Police Benevolent Association of Morris County at Dover Farms, Dover, NJ. 1949," was penciled on the back of about a dozen yellowed photos. One after another looked pretty much the same, except for different people in the group having their eyes closed, or with distracting glare from the flashbulb reflecting off a piece of silverware. Finally, the 8 x 10 glossy of the radio kid appeared at the end of this pile. Stuck to it via static electricity, were three small negatives and a related newspaper piece describing announcers captured in the foggy black and white reverse images.

Except for the picture of the child in the mic suit, none of it added up to enough for a broadcasting history article. I sure hoped my father could make good on his promise to "turn the photos into a 5000-watt story."

Don't Worry, Honey, We're Actually Related To A Newscaster Who Worked There!

Although admitting to having lost track of our radio relative 30 odd years ago, Dad vividly recalled visiting Don Barry, a broadcast newsman and second cousin on his mother's aunt's side—or some such distant connection—in the spring of 1966. The get-together took place at Mr. Barry's then-place of employment, WMTR 1250 AM, in Morristown, New Jersey, a venue less than 30 miles from New York City. Because my father would probably insist on monkeying with my wording of the following tale anyway, here's his direct account of the station tour:

In the distance, a pair of beautiful 200-foot guyed towers helped me navigate the last leg of my trip to the Horsehill Road, Cedar Knolls, New Jersey studio/transmitter facility of WMTR. For much of the jaunt, I'd been dialed into 1250 kilocycles, enjoying the middle-of-the-road music, pleased with the pleasant, easy-going, but professional announcing style, and marveling at the healthy "spot load" [number of commercials] advertising local as well as regional and national products.

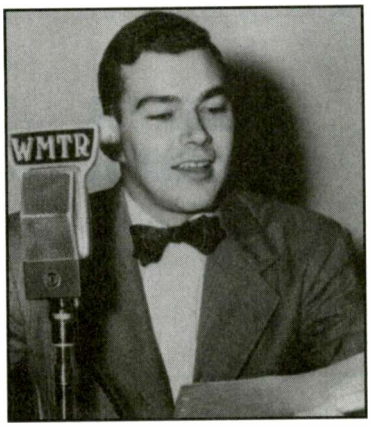
This was clearly not the little three-room, seat-of-the-pants, above-the-storefront brand of hometown radio station headquarters often the province of the Baby-Boomer suburbs. Instead, WMTR was a quality operation, complete with generous space for a decent-sized lobby, a record library, bank of offices, and studios arranged in a graduated fashion so that the control board operator/on-air talent had a commanding view, through a series of huge studio windows, down to the front entrance. One could be sitting at the board and take in much of the place's busy commerce, from an interview guest being greeted by the receptionist to a newscaster hurrying towards the announce booth with his freshly edited teletype copy.

Big, precisely accurate clocks hung on almost every third wall. For a visiting radio broadcast buff, they accentuated the reality that time flies when you're having fun!

WMTR's largest technical equipment was housed in a spacious room situated to the rear of the main studio. There, a Collins 21/E transmitter faithfully pumped out 5 kilowatts from sunrise to sunset. For backup, 1000 watts could be called upon from a Raytheon RA-1000 box. A phasing cabinet, with ample metering and small tuning cranks, coupled the RF generating gear to the coaxial cables that enlivened the directional antenna array out back. The "shack" was well illuminated, which made equipment realignment, recalibration, and repair less of a chore than was typically the case at stations without a bright, nicely stocked workbench.

More than anyplace else at WMTR, the engineering shop—complete with a busy FCC-licensed "First Phone" tech, who whistled while pulling maintenance on a reel-to-reel tape recorder—exuded a secure feeling throughout the station. What challenge couldn't the staff handle in an effort to serve Morris County as its dominant radio voice? Amidst the whoosh of exhaust fans, glowing transmitter tubes, and

The kid wearing that cardboard microphone suit looks like he's thinking, "I am never ever going to let anyone talk me into doing this again!" Here's hoping WMTR officials were paying the youngster at least a few bucks for his performance as WMTR's mascot, "Smiling Mike." The photo was taken in December 1949 as WMTR ownership celebrated their station's first year of broadcast service.



Many pictures of WMTR staff were snapped for use in various print publicity pieces. This one would have gone unidentified had it not been static cling trapping a related negative on which is written, "Bob Vesel...is the possessor of the 'Voice' you hear on our opening weekday show, Morning in Morris." Vesel was elevated to the WMTR program directorship around 1951.

emergency generator, visitors gazing upon the "shack's" activity could be assured that even a freak lightning strike "lasering" through vital components would shift the engineering staff into overdrive that'd get some kind of signal back on 1250 k.c. pretty quickly and ingeniously. Such technical luxury was not usually the case with daytime "rim-shot" outlets in the shadows of a major city.

Dad closed his account of that tour by remembering that his relative arranged for him to spend an hour or so in the master control room where he could engage in some "shoptalk" with the mid-day disc jockey. My guess is that Mr. Barry was too polite to suggest that the entire morning had been long enough to play tour guide and that he really needed to get back to the newsroom. Fortunately, the DJ knew a bit of WMTR history so, when father got palmed off on him, he was able to offer a few key details about WMTR's December 1948 debut.

The Ice Man Cometh... Into The Radio Biz

In all honesty, Dad's notes about the Morristown station's founding looked a lot like something I read in *The Airwaves of New York*, a fascinating 1998 volume by Bill Jaker, Frank Sulek, and Peter Kanze. "Okay, so maybe the WMTR listing in that history book helped jog my memory a little," he smiled.

To be on the safe side, I'm readily crediting those authors with digging up the fact that the corporate name on WMTR's FCC construction permit read, "Morristown Broadcasting Company," a firm formed circa 1947 by brothers Ken and George Croy, whose family operated a coal and ice business in the area.

While it might seem odd that folks in the ice and coal game moved on to radio in the 1940s, others—like the People's Coal Company in Pawtucket, Rhode Island—transitioned into broadcasting when electric refrigeration and oil- or gas-fired furnaces caused coal and ice vendors to morph into heating oil and home appliance dealers. Often, this appliance line extended into radios and television sets. And, as a logical progression, a local radio station emerged in the family business holdings. Without exception, the broadcast end of the operation soon eclipsed the rest of the revenues, leaving the "go-getters" of the clan in the radio industry.

The Croys would later expand their AM mini-empire westward to Washington, New Jersey, where they bought fledgling WCRV (see *Pop' Comm*, August 2004), but WMTR was obviously their baby.

Starting Off Small

Five hundred watts bottomed-out as minimum power for those seeking a construction permit on a regional frequency, such as 1250 kilocycles. It wasn't uncommon for consulting engineers to recommend that their clients apply "conservatively" and ask the FCC for a safe (from interference to existing stations) 1/2-kW output and non-directional antenna. The plan frequently included an overt hint that once the facility was on the air and making money, the owners could then seek Commission approval for double power and maybe even a full 5-kW with, if needed, some sort of directional, protective transmission pattern. The Croys went this route.

The inaugural 500-watt broadcast occurred on December 12, 1948. That aforementioned Raytheon RA-1000 (at half throttle) was likely the sender of that early signal from WMTR's original transmitter site, off Morristown's Evergreen Avenue. It got audio feed from studios at 10 Park Avenue in the city of license. *The Airwaves of New York* notes that the WMTR fare of the late 1940s and '50s was "pleasantly attuned to the exurban/rural lifestyle, beginning with hourly news, 'Morning in Morris' at 7:00 a.m., country and western music at noon, and the syndicated 'Candlelight and Silver' during the dinner hour. [This

offering was cut short during wintertime when sunset necessitated sign-offs by 5 p.m.] The Croys were very sensitive about keeping the musical selections quiet and slow, even destroying records that were too up-tempo."

The December 1949 WMTR Birthday Bash

Sometime during the station's first year, it acquired a mascot named "Smiling Mike." Surviving images bear the copyright symbol, so it may be that this personification of broadcast equipment (microphone, tower, headphones, and electron tube) was a syndicated character along the lines of various power companies' Reddy Kilowatt. Or, perhaps the Croys dreamed him up and commissioned some local artist to sketch the idea into fixed form.

Whatever his formative scenario, "Smiling Mike" was being used on invitations to WMTR's 1st birthday party. A human incarnation of "Mike" turned up at the festivities to give the already successful suburban AM outlet additional presence. The well-attended party underscored the value of establishing a community-minded broadcast operation in a burgeoning suburban area, at the dawn of the 1950s. By offering programming that represented the spirit of "let's be a part of our growing community's (and America's) progress," broadcast operations like WMTR became increasingly valuable to local residents and—as more homes were built, families moved in, schools constructed, old familiar stores expanded and new ones opened—such stations secured so much of the resultant advertising that they were a virtual license to print money.

Progress wasn't simply automatic, however, as constant self-promotion (along with cheerleading for one's coverage area), program fine-tuning, and attention to the broadcast signal needed to stay on management's agenda. There was always the risk that someone would find an open frequency in the neighboring town and introduce competition. As with any healthy relationship, WMTR brass knew the importance of focusing on the audience, so the audience would be prone to stay focused on WMTR.

Hire Her And Send This Paperwork To Washington

Early in the 1950s, a female-oriented talk show with the rather condescending name, "Women Are People," debuted at WMTR. The program was designed to strike a chord with the thousands of suburban housewives keeping the home fires burning while their husbands toiled in the Big Apple and their kids were at school.

Central to this brand of "chief cook and bottle washer" role was shopping locally and frequently. Sponsors pitched on the Monday through Friday 9:45 a.m. "Women Are People" slot, and appreciated the fact that many of their potential customers were listening to the show while driving to town. Most commercials would end with the request to tell the merchant "you heard this ad on WMTR." The promise of a modest "free gift" for those who did so prompted many a shopper to render the call letters and caused the advertiser to renew his WMTR contract.

By 1951, FCC officials told the Croys they could run the Raytheon RA-1000 wide open. A kilowatt's worth of output, however, got the brothers thinking about where a five-fold expansion might send their programming. While they figured such a signal could be heard all the way to downtown New York, the Croys wisely recognized a "hometown" Morris County-formatted station was far more impervious to competition than would be their WMTR recast to directly challenge the likes of Manhattan-based WNBC, WABC, WCBS, and WNEW.

In retrospect, during the 1950s the brothers should have mailed an FM application to Washington. Such a document could have successfully requested one of a couple of then-still-vacant 50,000-watt-equivalent New York City-based FM allocations or maybe a Morristown Class "A" FM channel with just enough power to keep the frequency hot—over either of which they could have conveniently simulcast daytimer WMTR and then gotten an eager, minimum-wage DJ to spin record albums after sunset. Had they tried for a Big Apple FM authorization for WMTR's sister (and a way to offer night service), no doubt by the 1970s, the frequency modulation outlet would have become the tail wagging the dog. Hindsight is 20/20, though, so we can't be too critical of the Croys for primarily seeking ways to strengthen WMTR-AM.

Near that decade's end, they'd gotten the governmental go-ahead to maximize daytimer WMTR at 5000-watts using a dual stick directional setup. This necessi-

This image came from a negative apparently used to print invitations for WMTR Radio's on-air 1st birthday celebration in late 1949. The "Smiling Mike" character was a personification of the intangible radio broadcast product - community service via over-the-air transmission of music, local news, sports, and weather. "Mike" was conceptualized to put a happy face on the local radio industry, the same way the animated "Reddy Kilowatt" lightning bolt and light bulb-nosed fellow did for dozens of regional electric companies.

tated a bigger piece of real estate to accommodate the two proposed towers. A decision was made to go completely "modern" and add a studio building to the transmitter upgrade project. WMTR's new combo digs (in Cedar Knolls, New Jersey) opened in 1960. The stronger signal went east nicely, but had a westerly null.

Though pointed towards New York, the 5000-watt pattern didn't prompt the Croys to move their programming focus far from Morris County. They did, however, affiliate with the modest, though respectable, New York-based Radio Press International news service, allowing reports and "actualities" from distant ports of call to supplement WMTR's main informational fare of local interest stories. No matter how far away from Morristown that an RP I network news story originated, though, "In service to Northern New Jersey," remained the station's motto.

A Good Run

Sometime in 1970, the Croy family accepted a purchase offer for WMTR from the owners of WDHA-FM, in nearby Dover, New Jersey. George and Ken left the radio business, having had the pleasure of growing WMTR from concept to icon for a "vibrant baby-boomer era suburban AM station."

To some traditionalists, the buyout by a small FM facility seemed like the tail was indeed wagging the dog, but WDHA-FM's rock format had allowed it to attract a useful audience, typically younger than the WMTR listeners. The new management, under the banner of Drexel Hill Associates, had WMTR newscasters also do news for WDHA-FM, and tweaked the AM's music offering so it sounded less like stuff old timers would embrace. No matter the tunes, WMTR remained true to its "suburban radio news" identification.

Uh Oh, Here Comes Competition!

After I finished the initial draft of this article, my father e-mailed a last minute recollection. This time he suddenly remembered running into cousin Don Barry at a family birthday celebration in early 1973. By then, Don was the WMTR news director and was kind enough to again talk shop with Dad about the local radio scene. He reported that WMTR and WDHA-FM made for a nice combination. Most notable from that Nixon-era conversation, however, was candid and genuine worry over a new Morris County-focused AM that had recently debuted in Parsippany, New Jersey (sometimes cited with dual cities of license, Parsippany-Troy Hills).

Originally dubbed WPRJ, the highly directional 1-kilowatter at 1310 was rumored to be gunning for WMTR. But Mr. Barry's concern proved unnecessary as WPRJ ended up making little headway. By the early '70s, WMTR's superior signal and decades-long devotion to local news provided it with a margin not easily eroded. And for the younger Morris County listener, upstart WPRJ also faced stiff competition from FM sources such as WDHA and a host of frequency modulation signals being programmed for the 18 to 34 demographic from New York.

How About WMTR Today?

Nighttime hours were added to the WMTR repertoire around 1984. Technically, this kilowatt sunset to sunrise authorization made the station "full-service," though it couldn't yank many (especially younger ears) away from FM after dark. Still, the AM maintained a marketable audience. When Drexel Hill Associates sold WMTR in the late 1980s, the format was tinkered with and, for a perplexing period, converted to "business news."

During the early 1990s, another sale put WMTR into the hands of owners who saw big band music as an avenue towards reclaiming adult listeners who felt lost with the musical fare offered by most other stations. As the pre-rock music buffs hit retirement age-plus, though, advertisers aiming for the big band crowd got harder to find. Consequently, under new ownership several years ago, WMTR changed to classic oldies (of the 1950s and 1960s).

Today, between its golden hits, the station still maintains a local flavor. For a while, the programming was simulcast on 1170 kHz out of Bridgewater Township, New Jersey. A WMTR webcast is available online during any part of its schedule, except while its airing certain sports. It's the latest way to pepper people all over the world with a taste of hometown broadcasting direct from the New Jersey suburbs.

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

radio enthusiast knows that RFI of this nature will likely be more pronounced at even lower frequencies, and harmonics might be heard as well.

Scott Stapf, a COMTek spokesperson, returned my call and wanted to make sure I had the second filing that COMTek submitted. While I didn't get a chance to speak directly with Mr. Stapf, perhaps he said a mouthful on my phone's answering system with the following: "The ARRL has made a great deal of noise about the fact they had concerns about the first filing, but they, of course, conveniently ignored the second filing which addressed that and...the issues they had raised..."

Are you kidding, Mr. Stapf? Interesting choice of words, "a great deal of noise." Why would the premier amateur radio organization in the United States take on an issue if there was *any* reasonable doubt about its measurements and findings? Remember, hams and the ARRL have been tracking down RFI and working with utilities for decades!

It's also important to point out here that while some folks are trying to portray the League as anti-BPL, that's just not true. They are anti-BPL *interference*. And they're not trying to increase membership by using BPL as a catalyst. That sort of Neanderthal narrow-minded thinking has no place in a radio community that prides itself on being self-policing and community-minded.

It's high time the Commission put an end to the seemingly unending, time-consuming, and costly testing, letter writing, and hand-wringing over the Manassas BPL situation. Clearly, the bureaucracy thrives on an unending barrage of reports and a back-and-forth Laurel & Hardy routine, but the public it serves does not.

As you might suspect there's usually a fairly simple solution to situations like this, so here's my idea. I think all concerned parties—COMTek, the FCC, and ARRL, and one impartial non-radio-enthusiast-referee-type person (perhaps Don Rickles or Al Sharpton)—should rent a minivan (I'll drive or we'll ask a local Manassas ham to take the helm), pick up a couple bags of McDonalds' burgers and fries, and personally check out the alleged interference. Everyone travels in one vehicle, we use simple off-the-shelf amateur equipment, and take notes on a steno pad. Nothing fancy, nothing complicated, and it's all done in a single afternoon. And *no lawyers* allowed. Then that evening they drive off to Outback, have a brew or two and some chips, and talk about it—and where there's a problem, they fix it. Sounds like a plan to me, but it's probably *too* easy, and the bureaucrats would argue over the color and make of the van so it would never leave the parking lot!

But aahh, yes, if life were as simple as renting a minivan and holding a 2-meter rig and HF receiver in the backseat, what would all the lawyers and engineers do for a living? And since the easy way of doing business isn't going to happen in my lifetime, we're stuck with letters and reports that weigh more than most (well, some) of us!

I also have to wonder where the public safety groups stand on this issue, because as we've said many times before, amateurs aren't the *only folks* using the radio spectrum. Why the silence from them, because surely the BPL interference isn't confined to 7 MHz? And who speaks for the fellow who runs down to RadioShack or orders a shortwave receiver to simply hear international news broadcasts only to find the BPL interference is so overwhelming he returns it in disgust? All he knows is shortwave is noisy and impossible to use, *not* that the problem could be down the block—*and* easily fixed!

What needs to happen is for *someone* in the Portals to intelligently and forcefully address the BPL interference issues in Manassas in a manner befitting the excellent job we know is possible; someone just have to get off his or her tail and do it. If it comes right down to it, and this is still an issue seven months from now, I'll personally rent the van if COMTek pays for dinner. ■

Editor's note: Next month we will bring back *Utility Communications Digest* with a new columnist, John Kasupski, KC2HMZ of Tonawanda, NY. John is active in ARES/RACES and has been a licensed ham since 1999. Stay tuned for some great utility topics and frequencies!

African youth, lifestyle, and music from the VOA. Enhancements will include additional broadcasts of "Daybreak Africa," paired with "World News Now," a 30-minute world news package, creating four hours of seamless and comprehensive news coverage. Additionally, "Africa News Tonight" will air feature segments examining developments in science, the environment, lifestyle and culture, and business, and "Nightline Africa," a longtime VOA listener favorite, will include a weekly round-up of African news during its weekend magazine show.

The VOA says music fans will also enjoy the new lineup, which introduces "African Beat," a new, lively, up-beat African music show featuring a mix of Pan-African music as well as the latest dance tunes from clubs around the continent. VOA's "Hip-Hop Connection" will now have two original shows each weekend, and the popular "Music Time in Africa" show has expanded to a full hour on Saturdays and Sundays. An expanded lineup of half-hour discussion shows covering news, health, general interest topics, and sports will run Monday through Friday, and VOA's live call-in show, "Straight Talk Africa," will continue to provide viewers with expert analysis and discussion of Africa-related news and events.

Vatican Radio And RAI Begin DRM Tests/Broadcasts

Vatican Radio has added a new broadcast to North America on 9750 kHz at 2300 to 2345 UTC. This broadcast is scheduled through October 28 from Santa Maria di Galeria.

Also, Italian public broadcaster RAI has started test broadcasting on 693 kHz from the Milano Siziano site. Power is 100 kW.

Voice Of Vietnam Launches New German Service

Radio the Voice of Vietnam (VOV) has officially launched its service in the German language. The programs will have information on politics, economy, culture, sports, and entertainment. European audiences can listen to the half-hour program on 7280 and 9730 kHz at 1530, 1800, and 2130 UTC. VOV Director General Vu Van Hien said the launch of a program in German will help German listeners as well as German nationals in Vietnam gain a better understanding of Vietnam. Those who can speak German will be able to access more information about the country. ■

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by Bill Price, N3AVY

Lots Of Buffet....But No SSB

Spring has sprung, the grass has riz, and Cowfield County is where Norm is. Or was. Norm's last visit was so brief that we just met in a supermarket parking lot off the infamous Washington, D.C. "beltway," where we transferred some ham radio gear from his car to my pickup. With the way we looked and the amount of junk we carried with us, we really had to work hard to appear as if we were *not* transferring stolen goods (which I really think several other groups of people *were* doing nearby).

This trip was different. This time, Norm got to stay for almost three days. He had talked to me about the possibility of getting a new dog, another Spaniel, just like Chump, his never-to-be-forgotten silent-paw friend from our days together in the frozen tundra. Unfortunately, this adoption didn't work out, and Norm must wait a little longer until he finds Chump II.

Norm said he had a coupon for some free nights at a motel, but I really think it was fear that my pet rats would crawl on him during the night that kept him from staying at the house with me. I assured him I'd close their cage doors and *not* give them free run of the spare room while he was there, but he just smiled and said, "That's okay. I've gotta use up these free coupons or they'll expire." I still don't think he had any coupons.

The first night when he came to the house I watched his eyes turn to the nice SSB rig he had given me. It was still sitting there on the floor in the dining room. *He* was wondering why anyone could allow such a nice gift to sit, neither connected nor used, while *I* was proud of myself for at least having brought it in from the truck within a month of the time he'd given it to me. Just because we're good friends does not mean we're alike. Not by a long shot.

After we did a lot of reminiscing about some people we had worked for, and worked with, and known over the years, he headed off to his motel. I told him I'd meet him and take him for an all-you-can-eat breakfast buffet the next morning. He said he really didn't eat enough to justify a buffet, but reconsidered and said it would be worth it just to watch me eat. I didn't let him down.

This time, I knew we would have to put up an antenna, and even if I never worked another soul, whether on sideband or otherwise, I would have regular QSOs with Norm. As much as I dislike telephones (or microphones) and have come to love e-mail, Norm is *not* an e-mailer, and I have promised to become a sidebander, even if only with him.

But the gods of thunder and lightning had declared that it was not to be.

We drove to the nearest Home Depot (the place where I walk the aisles and design *all* my projects for work) and picked up a few feet of this and that kind of wire, some bits of PVC for insulation, some hanging hardware, and some light cord to help haul the antenna up into the trees.

I even brought my slingshot from work—the one with the spincasting reel attached, the one that lets me shoot a lead sinker waaaaaaaaay up over a tree branch to drop down the other side, so I can attach some heavier cord and pull one end of my antenna wire up into the tree while I tie off that antenna. (We don't do that at work, but we do use the gadget to shoot lines across suspended ceiling tiles...and to engage in a little target practice when things get slow).

"With the way we looked and the amount of junk we carried with us, we really had to work hard to appear as if we were not transferring stolen goods (which I think several other groups of people were doing nearby)."

The drought conditions that had plagued all of Cowfield County ended abruptly when we returned home from our shopping spree. With a bang, in fact. With several bangs, quite a few bolts of lightning, and a power outage.

We played with my newest general coverage receiver (I have always been fondest of receivers), a tiny, shirt-pocket 530-29,999 kHz from my absolute favorite RadioShack in the world (that's the Kamp Washington store in Fairfax, Virginia). It has more features than you could shake a stick at (if that's your idea of a good time), and a portable radio, isolated from all AC power (and external antennas), is a really good thing during a lightning storm.

Norm and I are both such long-time radio guys that the constant lightning static didn't much bother us, but the constant rain did. It was still raining when the sun went down that day, and we headed out for yet another buffet.

"Norm's eyes were almost as big as my stomach as he watched me eat. I always felt sorry for him. The man has never gotten his money's worth at a buffet."

Norm's eyes were almost as big as my stomach as he watched me eat. I always felt sorry for him. The man has never gotten his money's worth at a buffet. Even the manager took pity on him and offered him a half a pie to take home. Of course he collared me on the way out and said there'd be some sort of "surcharge," but I managed to break free of his grip and slip into the crowded parking lot.

The farmers were happy about the downpour; Norm and I were not. The rain didn't stop until a few hours after he was back on the road, not due to return for a few months. The radio is still on the dining room floor, and the bag of wire is just inside the kitchen door where we left it. I'd like to say I'll put it up by myself, but I know better. The only way that antenna's ever gonna get up is if Norm comes back and puts it up *with* me.■

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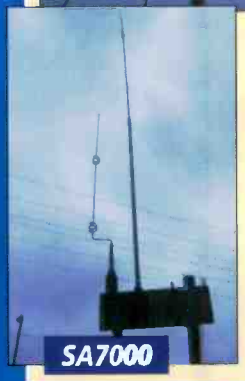

Designed for areas where space is a problem or when an "unobtrusive" installation is essential, **SA7000** is a super wideband coverage receive antenna with useable frequency coverage of 30 KHz to 2 GHz. The SA7000 is a passive arrangement with two whip elements: a long element for short wave up to 30 MHz and a second shorter loaded whip antenna for frequencies up to 2 GHz. The loading coils are tuned around 150 & 800 MHz to enhance VHF & UHF performance.

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AOR has made performance even better with the new **LA380** indoor antenna as successor to the popular LA350. The LA380 features full frequency coverage (40KHz – 500MHz) using a single receiving element. Designed to provide reception when away from the main monitoring location or when large external antennas are not practical, the LA380 is a compact active (1 foot diameter) loop antenna which features an internal high-gain amplifier (20dB for 40KHz-250MHz) and excellent overall strong signal handling (high IP3 +10dBm). The loop design allows directional control and nulling noise or interference. Perfect for listening in remote locations or in antenna-restricted areas.

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The **TVA-1 External NTSC TV Converter** is compact, lightweight and easy to install. Designed to be used with the AOR AR5000A series of communications receivers, its simple operation uses the 10.7 MHz IF input from your receiver. Audio and video outputs allow monitoring a variety of sources such as broadcast TV, public safety agencies, aircraft, Amateur Radio FSTV, news media video and more.

The **TV2000 External NTSC Video Decoder** is designed to be used with the AOR SR2000. Compact and lightweight, no external power supply is required (power is supplied from the SR2000). The video output is available from the rear panel of the TV2000 and audio is provided from the SR2000 through the external speaker jack.

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