JULY 2009

POPULAR COMMUNICATIONS

Shortwave Listening • Scanning • AM & FM • Radio History

Hot Weather, Hottest Action
Listen In On The Marine Bands

Set Up Your Own Home FM Radio Transmitter, p. 22

A Mariner's Dozen—12 Antennas For Marine Frequencies, p. 50

PLUS: **Shortwave Signals Migrate To 7200 • Baseball On AM Radio • Great Scanning Software For Your Shack**

THE PROFESSIONAL STANDARD

The compact desk-top VR-5000 is Yaesu's most versatile Communications Receiver ever! With ultra-wide frequency coverage and a host of operating features, you'll be on top of the monitoring action with the VR-5000!

- CONTINUOUS FREQUENCY COVERAGE: 100 kHz~2.6 GHz / LSB, USB, CW, AM-Narrow, AM, Wide AM, FM-Narrow, and Wide FM (cellular frequencies are blocked)
- 2000 MEMORY CHANNELS / 100 MEMORY GROUPS
- DUAL RECEIVE
- DIGITAL SIGNAL PROCESSING / BANDPASS FILTER, NOISE REDUCTION, NOTCH FILTER, NARROW CW PEAK FILTER (Optional DSP-1 requires)
- REAL-TIME SPECTRUM SCOPE
- WORLD CLOCK WITH UTC/LOCAL SETTINGS
- PRESET SHORTWAVE BROADCAST STATION MEMORY BANK
- EXTENSIVE SCANNING CAPABILITY/SMART SEARCH™
- AND MUCH, MUCH MORE. . .

● "RF Tune" Front-end Preselector (1.E9-1000 MHz) ● 20 dB Attenuator for strong signal environments ● IF Noise Blanker ● DVS-4 Digital Voice Recorder (option) with two memories of up to 8 seconds each ● 10.7 MHz IF Output Jack ● Field Strength Meter ● Audio Tone Control ● All-Mode Squelch Control for silent monitoring ● Password-protected Panel and Dial "Lock" feature ● Display Dimmer/Contrast Control ● Clone Capability for copying memory information from one VR-5000 to another ● Personal Computer Interface Port ● Two Antenna Ports ● Audio Wave Meter provides display of incoming signal's wave characteristics

COMMUNICATIONS RECEIVER

VR-5000

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

Enjoy the wide world of communications monitoring with the action-packed VR-5000, available from your Yaesu Dealer today!

All-Mode Wideband Receiver

VR-500

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

A TECHNOLOGY BREAKTHROUGH

50/144/(222)*/430 MHz
FM 5 W/AM 1 W(50 MHz) Triple Band Handheld

VX-8R

*222 MHz: 1.5 W (USA version)

- All-in-one High-performance Tri-Band Transceiver with GPS/APRS® Operation *1
- Bluetooth® for Hands-free Operation *1
- Barometric Pressure and Temperature Sensors
- Waterproof/Submersible IPX7 rated – 3 feet for 30 minutes
- Dual Ham band Operation (V+V/U+U/V+U) while listening to AM/FM Broadcasts
- Wideband Receive for 500 kHz-999.99 MHz *2
- Completely independent AM/FM receiver included!
- Internal Bar Antenna for better AM Broadcast Band reception.
- Enjoy FM broadcasts in stereo, with your stereo headset/earphone!
- Optional 1 watt operation, using three AA batteries *1
- A large LCD backlit display in a compact case!
- Up to 9 hours *3 of Amateur Band operation with the optional FNB-102LI, high capacity Lithium-ion Battery.

*1 With optional accessories
*2 Cellular Blocked per FCC rule Part 15.121, may not receive 900 MHz Amateur band
*3 Assuming a duty cycle of 6-second transmit, 6-second receive, and 48-second standby (50 MHz 5 W)
* APRS® is a registered trademark of Bob Bruninga WB4APR.

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Universal Radio — Quality equipment since 1942.

YAESU VR-5000

The **Yaesu VR-5000** provides sophisticated wideband reception. Coverage is from 100 kHz to 2600 MHz (2.6 GHz) less cellular, in AM, FM-N, FM-W, LSB, USB and CW. This radio features a real-time bandscope and you get 2000 alphanumeric memories grouped into 100 banks. Optional aids such as a DSP unit, voice synthesizer and digital voice recorder are available. Jacks on the back panel include: Mute, 13.8 VDC input, External Speaker, 10.7 MHz IF Output, Antenna Input A (SO-239 50 ohm) & B (Hi Z 450 ohm), CAT Interface Jack (4800/9600/57600 bps). The VR-5000 comes with the PA28B 117 VAC adapter and a DC power cord. This radio is only 7.1 x 2.75 x 8 inches 4.2 Lbs. Please visit our website for full specifications, color photos and current price.

ACCESSORIES

#3545	**DSP-1**	DSP Notch/NR/Bandp.	$119.95
#0560	**DVS-4**	Digital Voice Recorder	49.95

YAESU VR-120D PKG

The **VR-120D** is a compact wideband receiver covering 100 kHz to 1299.995 MHz (less cellular and image gaps), in AM, FM-N and FM-W with 640 alphanumeric memories. Scan features include: Full Mem. Scan, Mem. Bank Scan, Selected Mem. Channel Scan, Band-Limit Mem. Scan, Smart Search, Priority Channel Watch and Dual Watch. Manual tuning is via the tuning knob. A built-in AM ferrite loop insures good AM performance. A Channel Counter feature measures the frequency of a strong nearby signal. With BNC antenna, wrist strap and belt clip. This new **VR-120D "PKG"** configuration now ***includes*** the FNB79 NiCad battery, CA34 sleeve, NC82 stand and PA30B 120 VAC adapter. Size: 2.3 x 3.8 x 1 inches 8 oz. Limited supply.

Order #4120 $139.98

ACCESSORIES

#0384	**CA34**	Charging sleeve	$3.95
#4332	**CSC76**	Carry Case	19.95
#3646	**EDC15**	Cigarette lighter cord	36.95
#0353	**FNB79**	Ni-Cad 2.4V 700 mAH	9.95

YAESU VR-500 PKG

The **Yaesu VR-500** is the first to provide wideband coverage plus single sideband capability in such a small and capable package. Coverage is solid from 100 kHz to 1300 MHz (1.3 GHz) less cellular, in AM, FM-N, FM-W, LSB, USB and CW. You get 1000 regular memories (10x100) plus tuning steps from 50 Hz to 100 kHz. Other features include: backlit keypad, priority, power-off timers, adjustable battery saver, 60 channel bandscope, attenuator, dual watch, alphanumeric recall, bank scanning Smart Search™. The VR-500 operates from two AA cells. Includes BNC antenna, hand strap and belt clip. This new **Yaesu VR-500 "PKG"** configuration also *includes* the NiCd battery and wall charger Only 2.3 x 3.7 x 1" 8 oz. Please call or visit our website for more information and current price.

ACCESSORIES

#4037	**ADMS3**	Win Software & PC cable	$37.95
#4035	**CSC72**	Carry Case	19.95
#1693	**EDC5B**	DC Cable +Cigar Plug	23.95
#3116	**EDC6**	DC Cable	6.95
#0353	**FNB79**	NiCad Batt 2.4V	9.95
#0594	**NC60B**	AC Adapter	13.95

YAESU

FT-857D

FREE Yaesu orange mug with FT-857D/897D.

The **Yaesu FT-857D** is the world's smallest HF/VHF/UHF multimode amateur transceiver covering 160 m to 70 cm with 100 watts on HF. Now with 60 meters and DSP2 built-in.

FT-897D

The **Yaesu FT-897D** is a multi-mode high-power base/mobile transceiver covering 160 m to 70 cm including 60 meters. Now with TCXO.

FT-817ND

FREE black urban canvas case with FT-817ND.

The **Yaesu FT-817ND** is an improved, deluxe version of the hugely popular FT-817. It includes 60 meter coverage plus the new high capacity FNB-85 battery. This radio has an excellent shortwave receiver built-in and is a fully self-contained, battery-powered, low power amateur MF/HF/VHF/UHF QRP transceiver.

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POPULAR COMMUNICATIONS

JULY 2009
VOLUME 27, NUMBER 11

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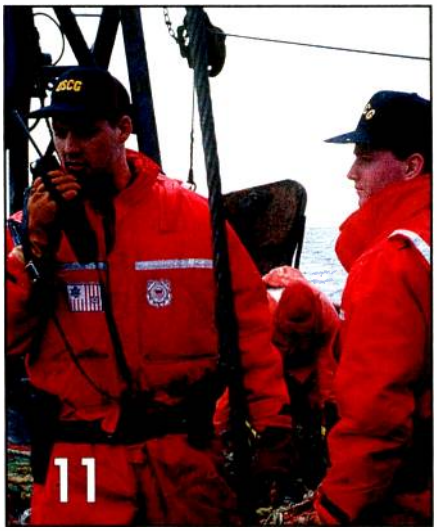
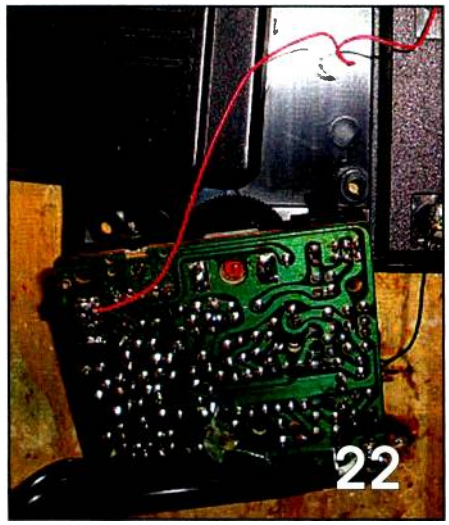




FEATURES

FEATURED COLUMNS

ON THE COVER

When the weather heats up so does the radio traffic on the nation's busy waterways, making for lots of great tuning action. See "Summertime And The Listening's Easy: Monitoring Maritime Transmissions" by Gordon West, WB6NOA, starting on page 11, for a boatload of tips and frequencies for listening in on all the commotion. (Cover photo of E-5/BM2 Shawn Fitchko on HT radio near the SunShine Sky Bridge Bridge at the head of Tampa Bay. Fitchko is stationed at the Coast Guard Station, St. Petersburg, Florida; photo by Larry Mulvehill, WB2ZPI.)

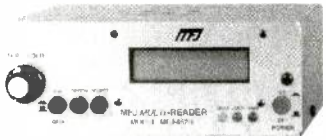
COLUMNS

DEPARTMENTS

Tap into secret Shortwave Signals

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

MFJ-462B **$199.95**



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

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

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

Eavesdrop on the World

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

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

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

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

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

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

High Performance Modem

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

Easy to use, tune and read

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

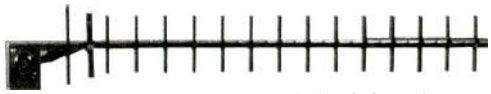
It's easy to tune -- a precision tuning indicator makes tuning your receiver easy for best copy.

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

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

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

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



MFJ-1800 **$29.95**

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

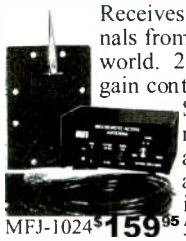
N-female connector. Tripod screw-mount. Wall and desk/shelf mounts. Use vertically/horizontally. 18Wx2¾Hx1¼D inches. 2.9 ounces.

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

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

Super Active Antenna

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



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

MFJ-1024 **$159.95**

Indoor Active Antenna

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

MFJ-1020C **$99.95**

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

Compact Active Antenna

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

MFJ-1022 **$69.95**

Eliminate power line noise!

MFJ-1026 **$199.95**

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

MFJ Antenna Matcher

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

MFJ-959C **$119.95**

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

High-Gain Preselector

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

MFJ-1045C **$89.95**

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 **$119.95**

MFJ Shortwave Headphones

MFJ-392B **$24.95**

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

High-Q Passive Preselector

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

MFJ-956 **$69.95**

Super Passive Preselector

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

MFJ-1046 **$119.95**

MFJ Shortwave Speaker

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

MFJ-281 **$12.95**

MFJ All Band Doublet

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

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

MFJ Antenna Switches

MFJ-1704 **$79.95**

MFJ-1702C **$39.95**

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

Morse Code Reader

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

MFJ-461 **$89.95**

MFJ 24/12 Hour Station Clock

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

Dealer/Catalog/Manuals

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EDITORIAL STAFF

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

CONTRIBUTING EDITORS

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

BUSINESS STAFF

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

CIRCULATION STAFF

Melissa Gilligan, Operations Manager
Cheryl DiLorenzo, Customer Service Manager
Ann Marie Auer, Customer Service

PRODUCTION STAFF

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

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25 Newbridge Road
Hicksville, NY 11801-2953 USA

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EDITORIAL
Tuning In

A-Scanning We Will Go

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

Until publicity surrounding brazen pirate attacks heated up—reaching a fever pitch in April 2009 over the capture and daring rescue of Richard Philips, the captain of the *Maersk Alabama*—most people thought of pirate raids (not the kind the FCC conducts) as merely the lore of the sea. But they were wrong. Piracy, as we've learned, didn't disappear with the hunting down of Captain Kidd, Blackbeard, Anne Bonney, and their ilk. Nor is it today limited to the dangerous waters lapping the Horn of Africa. Closer to home, the Caribbean still sees its share of piracy against pleasure craft and commercial vessels. Other nefarious types, such as drug traffickers and smugglers, may lurk in quiet coves as well.

Mother Nature has designed her own impediments to life on the bounding main, tossing wind, rain, fog, tides, reefs and the rest of her arsenal into the watery mix. Add in the human element in the form of inexperience, stupidity, alcohol, whatever, and things can get mighty hairy for those who play and toil on the water. (Oh, I almost forgot: sometimes commercial airliners *will land in the Hudson River* near the New York Waterway ferry terminal!)

Yes, the sea (and the bay, lake, river, etc.) can be a mighty dangerous place. And with the sheer number of vessels factored into the equation, it's practically a miracle that anyone gets where they're going in one piece. But it's not a miracle, I humbly submit: it's organization and communications that keep people safe, at the heart of which is the US Coast Guard, with over 40,000 active service men and women plus auxiliaries, and the Maritime Mobile Service, the internationally allocated radio service providing for safety of life and property at sea and on inland waterways.

Maritime commercial traffic is bustling all year, but recreational boating activity soars during warm weather months, and so do boating incidents and injuries. In 2007 there were almost 13 million registered recreational boats in the United States and over 5,000 accidents were reported to authorities, with fewer than 700 fatalities. In all, I'd say those are pretty good odds. Again, let's thank radio and those who monitor it.

The addition of radio to watercraft is arguably the greatest advance in maritime safety since the bailer. It eliminates the isolation of the solitary boater out alone at night and shrinks the vast expanses of the sea. And, for us hobbyists, it's there constantly for the monitoring.

If you're a boater yourself, you already have a marine transceiver on board (you do, don't you?) to keep you informed and in touch. But you don't have to be a boater, or own a marine transceiver, to enjoy all of the fascinating communications on those bands. In fact, you don't even have to be all that close to water. From sea to shining sea, and pretty much every body of water in between, warm weather means the scanning action heats up. For the in's and out's of catching the excitement, check out Gordon West, WB6NOA's feature "Summertime And The Listening's Easy: Monitoring Maritime Transmissions," starting on page 11. Gordo's column, "The Rigs Of Summer—Wet Specs And Water-Wise" (page 69), demystifies some of the radio specifications you'll encounter, and Kent Britain, WA5VJB's "Antenna Room" dishes up 12 (!) easy antennas for pulling in marine frequencies.

So grab your scanner and head for the water (or at least tune those watery frequencies). And to paraphrase the Coast Guard motto, *Semper Paratus* (meaning Always Ready), *Semper Scanatus*—Always Scan!

Happy Fourth of July. Stay safe and stay tuned. ■

AR5000A+3 Wide Coverage Desktop Communications Receiver

Discover the Choice of Professionals

The AR5000A+3 advances the frontiers of performance with coverage from 10 KHz to 3 GHz!*

This professional grade receiver with tuning accuracy to 1 Hz delivers automatic electronic front end preselection and precision stability from its built-in TCXO. Other features include:

- All analog mode reception AM, FM, USB, LSB & CW (APCO 25 accessory optional)
- Excellent strong signal handling
- Synchronous AM detector, Automatic Frequency Control & Noise Blanker
- NCO (Numeric Controlled Oscillator) with tuning stops down to 1 Hz
- Multiple I.F. bandwidths 3 KHz, 6 KHz, 15 KHz, 30 KHz, 110 KHz, & 220 KHz
- Rear panel 10.7 MHz IF output
- Auto mode bandplan selection
- Multi-function LCD with 7 character alpha-text comments
- Extensive search & scan facilities
- CyberScan® fast search & scan facilities
- Analog S-meter
- 2,000 memory channels
- 40 search banks with EEPROM storage
- Computer controllable
- Multiple antenna ports
- Auto memory store
- Extensive RS-232C command list
- Sleep timer/alarm
- Fully compatible with AOR SDU5600 Spectrum Display Unit

Available in a professional and consumer version, the AR5000A+3 is a proven performer!

From aircraft and public safety, to broadcast and shortwave, no wonder so many Federal and State law enforcement, military units, surveillance agencies, government users, hospitals, RF labs, news media and monitoring professionals rely on the AR5000A+3 for accuracy, sensitivity and speed!

Add to the capabilities of the AR5000A+3 with options:

- The ARD25 APCO 25 conversion unit
- Collins® Mechanical Filters (500Hz, 2.5 KHz, 4KHz or 6KHz)
- TV5000A NTSC video unit for monitoring TV video
- CT5000 CTCSS decoder module
- DS8000 Analog Voice Descrambler Unit *(for Government Use Only.)*
- DS3000A external antenna

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Documentation required.

The Weirder Side Of Wireless

by Staff

And The Winner Is...No. 962283

In a world gone celebrity crazy, it comes as a breath of fresh (if not free) air. According to a BBC report, a London-based prison radio station has received four nominations for the prestigious Sony Radio Academy awards, pushing aside famous entertainment hopefuls such as the hot-ticket comedian Russell Brand. The station, Electric Radio Brixton, garnered a nomination for the Interview Award for its piece with Jonathan Aitken, a former cabinet minister jailed for perjury. It's also up for awards in the Speech, Listener Participation, and Community categories.

The station was launched in 2007 by the Prison Radio Association. Its content is developed and produced by prisoners, and it broadcasts 24 hours a day. The station aims to help inmates develop communication and IT skills and has become the principal source of information for the prison population in the south London jail, according to the report.

Tim Blackmore, chairman of the Sony Radio Academy Awards, was quoted by the BBC as saying: "Every year we try to adjust the categories to match the continual evolution of our industry and this year's entries have shown once again that alongside their heritage of 27 years, these awards remain truly contemporary." In the interview, Aitken, describes the fear he felt while "in the cage" at HM Prison Belmarsh and discusses the physical threats he received, the report continued.

Why There's A Keypad Lock

Perhaps it was an effort to become a prison DJ... A 16-year-old was charged with felony vehicle burglary after the stolen mobile phone in his pocket "spontaneously" dialed Peoria police who heard him bragging to friends about stealing from a car. "It was bolted down—I had to rip it out," the teen could be heard saying. "It took all my energy to lift it out of the car." The unnamed teen was apparently recounting how he ripped off a car stereo and stole a Cricket phone, leaving the friends unimpressed that it wasn't a Blackberry. Despite long interludes of silence or muddied, unintelligible voices, police continued to eavesdrop and then used cell-phone-signal triangulation (with help from the phone company) for an approximate signal location. Upon arrival, cops found the chatty fellow with a stolen car stereo in his hands. The Peoria boy was released to the custody of his parents and will be prosecuted in juvenile court.

Accidental Lightening Strikes Twice

A Florida radio host who shot his wife and dog has claimed that the shootings were accidental, according to a report in the *Orlando Sentinel*. Shannon Burke, 43, of Orlando, said that he became angry with his cavalier King Charles spaniel and, in what one assumes was an attempt at discipline, began waving a gun around at the pet. A bullet went through the dog's leg and then grazed his wife in the head. He called 911 and told the operator that he was playing with the gun but didn't know it was loaded. His wife, Catherine Burke, 48, was taken to the Orlando Regional Hospital and the dog was taken to an emergency veterinary clinic. Burke was arrested and had bail set at $10,000. He was ordered not to have contact with his wife and not to go within 1,500 feet from his home. He was also charged with animal cruelty and aggravated assault with a deadly weapon. Burke is the host of the *Shannon Burke Show* on Clear Channel Radio's 104.1 in Orlando. The program airs from 11 a.m. to 3 p.m. weekdays.

Six Flu Over The Cuckoo's Nest

The Tribune news/talk station WGN, Chicago, recently invited listeners to compete in the first—and hopefully last—"Swine Flu Mask Fashion Show." Radio personality Randy Miller filled in for program hosts Kathy and Judy as master of ceremonies for the big event, held May 1 in front of the WGN Radio Showcase Studio at the Tribune Tower. Six contestants sported flu masks they decorated themselves. Masks were judged on originality and creativity. The coveted grand prize? A three-night, all-inclusive package for two to...Cancun, Mexico. The package was to be used in September or October 2009, so if the swine flu doesn't get 'em, the hurricanes still may.

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

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

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

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Bearcat 248CLT 50 channel base AM/FM/weather alert scanner	$104.95
Bearcat 244CLT 30 channel base AM/FM/weather alert scanner	$94.95
Bearcat 92XLT 200 channel handheld scanner	$105.95
Bearcat 72XLT 100 channel handheld scanner	$89.95
Bearcat BR330T handheld shortwave/scanner with Fire Tone out	$274.95
Bearcat BCT8 250 channel information mobile scanner	$169.95
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Bearcat® BC246T Trunk Tracker III

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

Frequency Coverage:

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

The handheld BC246T TrunkTracker scanner has so many features, we recommend you visit our web site at www.usascan.com and download the free owner's manual. Popular features include **Close Call Radio Frequency Capture** – Bearcat exclusive technology locks onto nearby radio transmissions, even if you haven't programmed anything into your scanner. **Dynamically Allocated Channel Memory** - Organize channels any way you want, using Uniden's exclusive dynamic memory management system. 1,600 channels are typical but **over 2,500 channels are possible** depending on the scanner features used. You can also easily determine how much memory is used. **Preprogrammed Service Search (10)** - Makes it easy to find interesting frequencies used by public safety, news media TV broadcast audio, Amateur (ham) radio, CB radio, Family Radio Service, special low power, railroad, aircraft, marine, racing and weather frequencies. **Quick Keys** - allow you to select systems and groups by pressing a single key. **Text Tagging** - Name each system, group, channel, talk group ID, custom search range, and S.A.M.E. group using 16 characters per name. **Memory Backup** - When power is lost or disconnected, your BC246T retains the frequencies that were programmed in memory. **Unique Data Skip** - Allows the BC246T to skip over unwanted data transmissions and birdies. **Attenuator** - You can set the BC245T attenuator to reduce the input strength of strong signals by about 18 dB. **Duplicate Frequency Alert** - Alerts you if you try to enter a duplicate name or frequency already stored in the scanner. **22 Bands** - with aircraft and 800 MHz. The BC246T comes with AC adapter, 2 AA 1,800 mAH nickel metal hydride batteries, belt clip, flexible rubber antenna, wrist strap, RS232C cable, Trunk Tracker frequency guide, owner's manual and one year limited Uniden warranty. For more fun, order our optional deluxe racing headset part **#HF24RS** for $29.95. Order now at www.usascan.com or call 1-800-USA-SCAN.

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News, Trends, And Short Takes

by D. Prabakaran

U.S. Psyops Seeks To Prevent Taliban Use Of Radio And Web

The United States has started a broad effort in Pakistan and Afghanistan to prevent the Taliban from using radio stations and websites to intimidate civilians and plan attacks. U.S. military and intelligence personnel are attempting to jam unlicensed stations used by Taliban fighters in parts of Pakistan near the Afghan border. They are also trying to block Pakistani chat rooms and websites that frequently contain videos of attacks and inflammatory religious material that attempts to justify violent acts, according to a report by Reuters.

The push takes the administration deeper into "psychological operations," which try to influence how the United States, its allies and enemies are seen, the report said, noting that officials involved with the new program say such operations are a necessary part of halting the deterioration of stability in Pakistan and Afghanistan.

(Source: Reuters)

New DRM Receiver Unveiled

A new state-of-the-art DRM digital radio receiver was unveiled to DRM members at the annual general assembly of the Consortium being held in Erlangen, Germany, where the world's two biggest broadcasting unions—EBU and ABU—reiterated their support to the DRM Consortium.

The new DRM receiver is called Di-Wave 100 and has been developed by Uniwave Development SAS. This is the first DRM receiver with a color screen and was expected to be in mass production by April 2009. The receiver has all the multimedia features offered by DRM technology, including identification by station name, program information, and listening time shift.

The radio can receive DRM broadcasts on shortwave, mediumwave, and longwave as well as analog FM, and can store 768 stations in memory. The receiver has a USB/SD card -reader and mp3/mp4 play-back. The 3.5-inch TFT color display can offer text in many different languages.

(Source: DRM Consortium)

WRN Confirms Involvement In Getting Radio Mada On Air

London-based TV and radio transmission company WRN has confirmed in its newsletter that it recently arranged a series of special, one-off shortwave broadcasts for Radio Mada Internationale, a clandestine station which supports the deposed Madagascan president Marc Ravalomanana. The station was an initiative of TIM, or Tiako I Madagasikara (I Love Madagascar), a political party in Madagascar founded in 2002. It is now the largest party in the National Assembly of Madagascar.

(Source: WRN)

Thai Forces Crack Down On Anti-Government Radio, TV Stations

Thai authorities are going after broadcast stations that support Thaksin Shinawatra, the former prime minister. Police raided three radio stations and a TV station, seizing equipment and arresting personnel, media reports said. The *Bangkok Post* also reported that the Internal Security Operations Command (ISOC) ordered all community radio stations to refrain on pain of facing closure from broadcasting messages that might cause political unrest.

Police raided a radio station in Chiang Mai province operated by the group Rak Chiang Mai 51, known for supporting the Thaksin. Transmission equipment was seized even as some 200 Red Shirts—anti-government protesters—gathered outside the radio station to protest. In the northeastern province of Udon Thani, police also confiscated transmission equipment of a radio station run by Kwanchai Praipana, leader of the pro-Thaksin group Khon Rak Udon. Wachira Khamsueb, a radio host of the station, was arrested and charged with broadcasting without a license. He was later released on bail. Meanwhile, a hundred members of the Khon Rak Udon protested in front of the police station. Another sympathetic radio station in Lampang province was also raided.

On April 16, some 30 policemen entered the premises of DStation at the Imperial Department Store in Lad Phrao, Bangkok. The police found none of the TV station's staff but seized several broadcasting devices. The Red Shirts used DStation to broadcast Thaksin's speeches and also provided news coverage of the Red Shirt demonstrations. On April 13 troops seized control of the Thaicom satellite station in Lat Lum Kaew, Pathum Thani province, which is used by DStation.

(Source: Southeast Asian Press Alliance)

Capitol Hill And FCC Actions Affecting Communications

by Richard Fisher, KI6SN

Nation's Capitol To Get First Look At Free Mobile TV

The first city in the United States to get digital TV broadcasts for cell phones, laptop computers, in-car entertainment systems and similar devices will be Washington D.C., it was announced in late April. Using new technology known as "mobile TV," the free broadcasts were scheduled to begin in late summer and feature programming from local CBS, NBC, PBS and Ion affiliates, as well as a Fox-owned independent station, according to an Associated Press report.

The Open Mobile Video Coalition—a group of companies backing the "mobile TV" technology—said the nation's capitol was selected as a test market "because the city is full of tech-savvy viewers who pay attention to local news. Attention from politicians and regulators probably doesn't hurt either," the AP reported. "The coalition has earlier pointed to the usefulness of free mobile TV broadcasts in case of emergencies and disasters like hurricanes." The broadcasts will be the same as those appearing on local television sets. The programming will also include the advertising.

By the end of 2009, "mobile TV" technology is expected to be presented in dozens of other U.S. cities, including Boston, Atlanta, New York, Chicago, San Francisco, and Philadelphia, and cover 39 percent of the nation's households.

FCC Developing National Broadband Plan

The FCC has begun development of a national broadband plan "that will seek to ensure that every American has access to broadband capability," the Commission said.

"In the American Recovery and Reinvestment Act of 2009—known as the stimulus package—Congress charged the Commission with creating a national broadband plan.

"In a Notice of Inquiry adopted [in April], the Commission [began] a proceeding to create that national broadband plan, seeking input from all stakeholders: consumers, industry, large and small businesses, non-profits, the disabilities community, governments at the federal, state, local and tribal levels, and all other interested parties," the FCC said.

The FCC faces a February 17, 2010, deadline for submitting its plan to Congress. "It will provide a roadmap toward achieving the goal of ensuring that all Americans reap the benefits of broadband." The Commission is seeking comment on several key areas of broadband deployment and use.

Indianapolis Police Officers Nabbed For Illegal Radio Use

Indianapolis Metropolitan Police Department officers who had been using amateur band radios illegally to supplement their normal communications were ordered to stop and amateur equipment has been removed from their cruisers following an FCC investigation. The unlicensed officers' operations included using amateur frequencies for tactical communications during drug surveillance. The FCC reminded the IMPD of the large number of tactical channels available on a secondary basis to police departments from the public safety pool of frequency allocations, according to a report in the American Radio Relay League's ARRL Letter. The equipment's removal from cruisers of unlicensed officers was initiated by order of Michael T. Spears, chief of police.

FCC Adopts Rules For 4.9 GHz First Responders

In a move that will enable first responders to more quickly communicate critical data and streaming video in emergencies, the FCC has adopted a Report and Order and Further Notice of Proposed Rulemaking (Order) addressing 4.9 GHz band rules, as well as miscellaneous Part 90 public safety rules.

According to a report posted on Wireless Network Online, the rules additionally "will help expand and enhance first responders' deployment of broadband communication technologies across the nation in the 4.9 GHz band, thereby helping to stimulate the economy."

Primary status was granted by the FCC to 4.9 GHz standalone, permanent fixed links that provide broadband service, such as a fixed video link used to monitor high-risk facilities or environments. ■

Communications And Privacy

by Rob de Santos
commhorizons@gmail.com

"For now, let's just consider the impact if every audio or video file carried with it information on where it was created...Your secret monitoring site now becomes public knowledge."

At the Winter SWL Festival in Kulpsville, Pennsylvania (see "Come One, Come All..." pg. 26, February 2009, *Pop'Comm*) this past March, I shared some of my thoughts on the future of communications with the attendees. One issue came up over and over: privacy. Perhaps that shouldn't be surprising. Given the audience and their unusually high degree of awareness of the changing horizons in communications, Fest attendees are probably more aware than the average person of the perils of progress. I'm sure many readers of this magazine are also aware of the challenges to privacy brought about by the advances we discuss in this column.

The very nature of communications is at odds with privacy: effective communication requires information to be sent to someone or something somewhere else. From the dawn of communications itself, whether spoken or written, this has been a problem for those who wished to keep information between themselves and those they *wanted* to share it with. The obvious way to ensure privacy is encryption, which has been used since the days of the Greeks and Romans, and beyond, often for military purposes.

Many readers will remember the panic in the mobile telephone industry in the late 1980s when it became known that early cellular phones could easily be monitored by hobbyists. The result was a bad piece of law known as the Electronic Communications Privacy Act (ECPA). Digital mobile devices and the encryption they allowed solved this problem, but the cellular bands remained off limits to hobbyists in the U.S., even though the law became mostly irrelevant (if it ever was). But privacy and technological advances in communications have always been marching side by side.

As an example, let's consider one advance I've discussed previously: cars that drive themselves on intelligent roadways. To ensure that it reached its objective in a safe and timely manner, a smart car on an intelligent road would have to identify itself in some unique way and communicate its intended destination, speed, and current location to a "controller" as well as to other nearby vehicles. Surely the communications to controllers would be encoded in some fashion, but how private would that data be? How easily could it be monitored (something of more than incidental interest to the readers of this magazine)? Of course, without any public roadway yet using this technology we can't definitely answer such questions, but we do need to pay attention as the technology evolves.

In an era with widespread traffic cams, red light cams, and other devices, it's no leap of faith to assume there'll be an immediate and intense interest in such data from law enforcement, private investigators, hackers, and even terrorists. For an indicator of what's coming we can look to how currently available data on cars and trucks is being used today by law enforcement, toll road management, and truck weigh stations. Combine this vehicular tracking ability with the widespread introduction of GPS devices into directional devices and mobile telephones and your every movement could be documented and tracked.

Privacy also touches on another area, which I'll be discussing further in a future column: geo-tagging of communications. For now, let's just consider the impact if every audio or video file carried with it information on where it was created. And not just "Jim's shack," but usable data such as the exact location on the Earth where the file was generated. Your secret monitoring site now becomes public knowledge. There's also the other end of the spectrum (pardon the pun): your radio can customize your listening by using GPS or RFID data to adjust your listening choices by your current location. The convenience factor is obvious, but the attendant loss of privacy coexists.

And, of course, privacy is already an issue within computer communications. Few computer users make serious attempts to "hide" their travels around the Internet, nor do they insist on secure connections except perhaps for online banking and such. We probably don't use encrypted email, and many of us have accounts on websites like Facebook or Twitter to share exactly what we're doing at any particular moment.

A vast amount of information is "out there" about us, and much of it is there indefinitely. Our hobby, once the province of the hobbyist in his shack listening to communications from around the world unnoticed by neighbors and friends, now is readily accessible on the Web by our posts. This may not yet matter much in countries like the U.S. and Canada, but the risk in others, such as China, is already significant.

Perhaps we've already crossed a threshold where the general public has grown used to the degree of privacy that's already been lost and is not disturbed by these issues, but I'm not so sure. What do you think? What do you see as the privacy risks to our communications hobby? Drop me a line and let me know.

Summertime And The Listening's Easy— Monitoring Maritime Transmissions

Boarding team members from Coast Guard Station Gloucester and Sector Boston talk to fishermen aboard the *Lady Jane* before they board the vessel to perform a safety inspection in Gloucester, Massachusetts. (Coast Guard photo by Petty Officer 3rd Class Connie Terrell)

When It Comes To Scanning For Excitement, The Marine Radio Service Offers Plenty Of Opportunities To Catch "The Big One"

by Gordon West, WB6NOA

Count on it: When the weather heats up, so does the scanning action along the nation's coast and inland waterways. From 2 MHz to 470 MHz, marine radio channels are always active in the summertime, so there's plenty of opportunity for exciting listening. A new petition by the Radio Technical Commission for Maritime Services (RTCM) to the FCC could soon lead to marine radio use on land, too!

VHF's A-Buzz

Before a marine SSB long-range radio may be installed aboard any ship, that vessel must first have short-range VHF. Recreational marine 25 watt VHF equipment no longer needs an FCC ship station license, and marine VHF equipment prices can be almost unbelievably low; for instance, you can get a 25 watt, all-channel marine VHF for $129, and a pack of two marine VHF handhelds for under $99. So, since a marine VHF transceiver is *required* equipment aboard all big boats, is likely installed aboard pleasure boats, and is most people's favorite handheld radio to take along in canoes and kayaks, you have plenty of ways to listen if you live within 20 miles of any water. And don't fret if you're landlocked miles away from any water; we'll talk about long-range single sideband later, too.

Gordon West, WB6NOA, writes *Pop'Comm*'s "Gordon West's Radio Ways" column. A prolific writer and teacher, he is a highly regarded "guru" in many aspects of the radio hobby.

What, Where, And How To Listen

The marine VHF band is located just above 156.00 MHz, in 25 kHz steps, 5 kHz common deviation. In the late '60s, marine VHF channels were subdivided from 50 kHz to 25 kHz steps, doubling the number of available channels. Currently, there are no firm dates to further subdivide the 25 kHz steps, nor any immediate plans for recreational and commercial radios to go narrow band at 2.5 kHz deviation. (However, the National Telecommunications and Information Administration, which governs the Coast Guard Auxiliary channels and other government channels, *has* mandated 2.5 kHz narrowband deviation.)

Allen Henney, co-founder and general editor of the *Capitol Hill Monitor* (www.henney.com/chm) and a *Pop'Comm* author, provided us with USCG Narrowband FM Special Use Channels; see "CG Special-Use Frequencies (FM)."

The modern marine 25 watt VHF radio and marine VHF handheld feature synthesized channel selection, allowing the

The Marine Radio Service Celebrates 100 Years On The Air

Following are some benchmarks of a century of maritime radio history:

1908	Steamships *Republic* and *Florida* collide off New York harbor sending "SOS" on 500 kHz
1912	"Titanic" sends "CQD" after striking an iceberg
1912	Radio Act for continuous 24 hour watches
1920	AM broadcast stations emerge
1927	Radio Act for Congress to create Federal Radio Commission (FRC)
1934	Communications Act with FCC replacing FRC
1940s	AM marine band 2–22MHz
1960s	Short-range marine VHF service
1970s	High frequency (3–30 MHz) switch from AM to upper sideband
1978	Safety of Life at Sea Convention for Global Maritime Distress Safety System (GMDSS)
1990	VHF for short range, HF SSB for long-range, Digital Selective Calling (DSC) available in both VHF and SSB equipment
2000s	500 kHz CW Distress Channel goes silent. Coast Guard adopts DSC and Rescue 21 expanded range VHF monitoring, and HF marine SSB continues strong, even with satellite communications available

A boarding officer from the U.S. Coast Guard cutter *Reliance* radios ship to report progress of boarding on fishing vessel in North Atlantic. (USCG photo by Robin Ressler, PA3)

CG Special-Use Frequencies (FM)

149.2000 Auxiliary 1r/2s (in: 138.475)	
150.7000 Auxiliary 3r/4s (in: 142.825)	
143.4750 Auxiliary 5s Simplex	
139.9750 CG	Channel 01
140.4750 CG	Channel 02
140.7250 CG	Channel 03
141.6125 CG	Channel 04
150.7250 CG	Channel 05
141.5500 CG	Channel 06
150.3000 CG	Channel 07
162.0500 CG	Channel 08
162.1250 CG	Channel 09
162.2500 CG	Channel 10
162.3250 CG	Channel 11
163.0500 CG	Channel 12
163.1375 CG	Channel 13
164.3000 CG	Channel 14
164.3125 CG	Channel 15
164.5500 CG	Channel 16
164.5625 CG	Channel 17
164.9000 CG	Channel 18
164.9125 CG	Channel 19
165.2625 CG	Channel 20
165.3125 CG	Channel 21
165.3250 CG	Channel 22
165.3375 CG	Channel 23
166.1875 CG	Channel 24
167.9000 CG	Channel 25
168.8625 CG	Channel 26
171.2375 CG	Channel 27
172.3125 CG	Channel 28
166.4625	DHS Common (Dept. of Homeland Security)

boater access to transmit and receive on numerous channels (see U.S. VHF Channels). However, marine VHF channels have been organized for specific use, as is detailed in FCC Rule 80.373 (f).

If you're monitoring with a scanner or tunable PLL receiver, dial in the specific FM frequency: if you're monitoring with a marine VHF radio, dial in the appropriate channel number.

Exciting distress calls can be heard on VHF Channel 16, 156.80 MHz. Once the emergency situation becomes stabilized, the US Coast Guard may switch the distressed boat over to VHF Channel 22A, 157.10 MHz. The "A" indicates an international duplex channel with U.S. operation on the simplex transmit frequency. The duplex offset is 4.6 MHz and higher; if a Coast Guard communications station switches a boater from 16 to 22A, but the boater only dials in Channel 22, their receiver is offset 4.6 MHz up, and they will never hear the Coast Guard calling them!

If you do encounter an emergency unfolding, tune the following channels/frequencies, government *only*, for behind-the-scenes US Coast Guard coordination during a distress:

Channel 6	156.300 MHz All Ships Safety Channel
Channel 21A	157.050 MHz
Channel 23A	157.150 MHz
Channel 80A	157.025 MHz
Channel 82A	157.125 MHz
Channel 83A	157.175 MHz Coast Guard Auxiliary units

It's interesting to note that these government-only channels are found in almost all marine VHF transceivers, and operate normal 5 kHz deviation, not narrowband 2.5 kHz deviation. Coast Guard Auxiliary repeater communications, located just above and below the ham radio 2 meter band, *must* incorporate 2.5 kHz narrowband modulation.

Big Ships On Harbors And Rivers

If you live along a major river, the bridge-to-bridge channel lets you eavesdrop on tugboat and barges giving each other plenty of clearance around a corner. Check out the following:

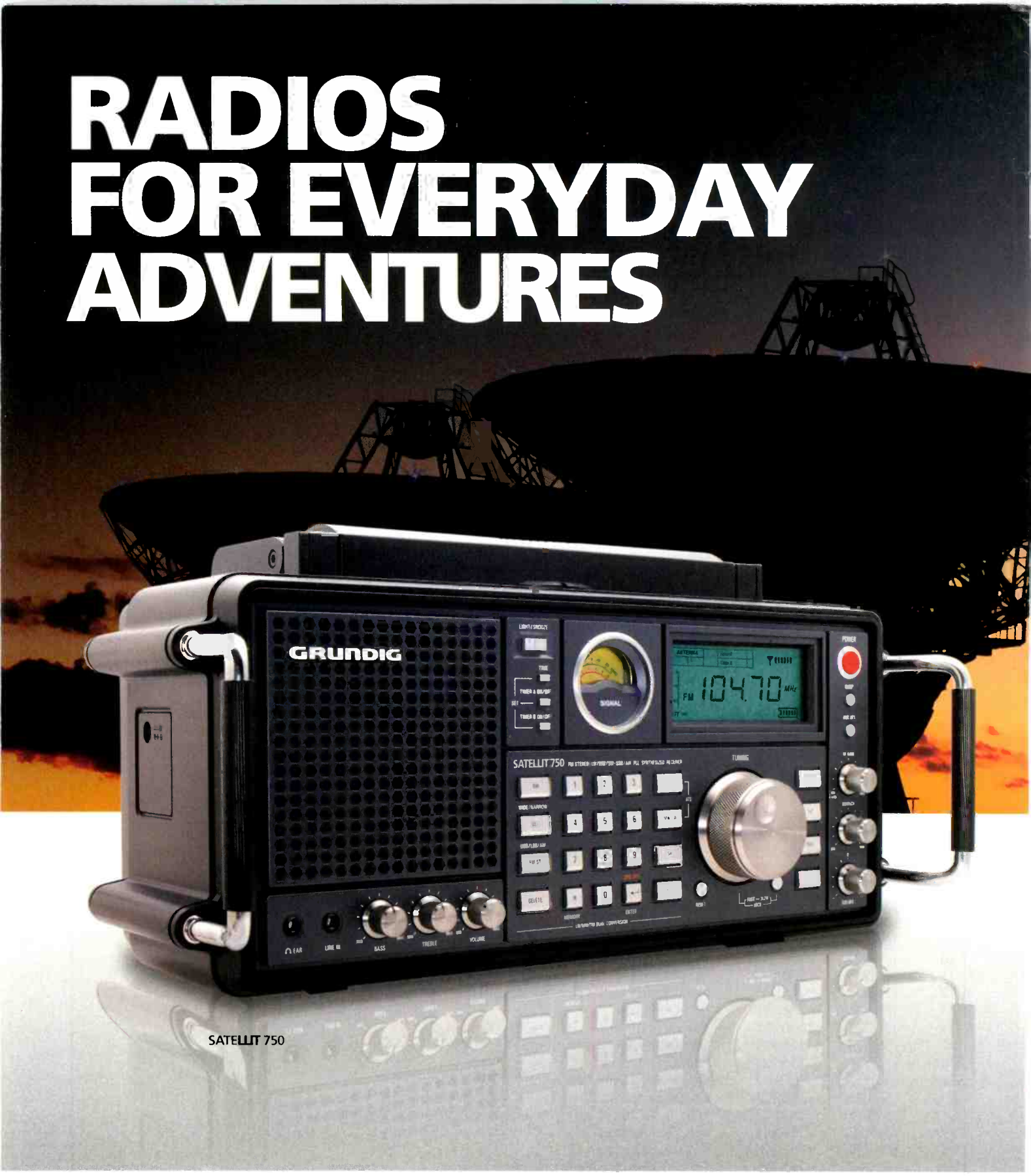
Channel 13	156.650	Ship's bridge to another ship's bridge
Channel 12	156.600	Port operations
NAVTEX	518.0 kHz	Digital Harbor Traffic

Listening to the Vessel Traffic System is much like tuning in to air traffic control. You'll hear a powerful shore station trans-

U.S. VHF Channels (in MHz)

Ch. #	Ship Xmt	Ship Rcv	Use
01A	156.050	156.050	Port Operations and Commercial, VTS. Available only in New Orleans / Lower Mississippi area.
05A	156.250	156.250	Port Operations or VTS in the Houston, New Orleans and Seattle areas.
06	156.300	156.300	Intership Safety
07A	156.350	156.350	Commercial
08	156.400	156.400	Commercial (Intership only)
09	156.450	156.450	Boater Calling. Commercial and Non-Commercial.
10	156.500	156.500	Commercial
11	156.550	156.550	Commercial. VTS in selected areas.
12	156.600	156.600	Port Operations. VTS in selected areas.
13	156.650	156.650	Intership Navigation Safety (Bridge-to-bridge). Ships >20m length maintain a listening watch on this channel in US waters.
14	156.700	156.700	Port Operations. VTS in selected areas.
15	—	156.750	Environmental (Receive only). Used by Class C EPIRBs.
16	156.800	156.800	International Distress, Safety and Calling. Ships required to carry radio, USCG, and most coast stations maintain a listening watch on this channel.
17	156.850	156.850	State Control
18A	156.900	156.900	Commercial
19A	156.950	156.950	Commercial
20	157.000	161.600	Port Operations (duplex)
20A	157.000	157.000	Port Operations
21A	157.050	157.050	U.S. Coast Guard only
22A	157.100	157.100	Coast Guard Liaison and Maritime Safety Information Broadcasts. Broadcasts announced on channel 16.
23A	157.150	157.150	U.S. Coast Guard only
24	157.200	161.800	Public Correspondence (Marine Operator)
25	157.250	161.850	Public Correspondence (Marine Operator)
26	157.300	161.900	Public Correspondence (Marine Operator)
27	157.350	161.950	Public Correspondence (Marine Operator)
28	157.400	162.000	Public Correspondence (Marine Operator)
63A	156.175	156.175	Port Operations and Commercial, VTS. Available only in New Orleans / Lower Mississippi area.
65A	156.275	156.275	Port Operations
66A	156.325	156.325	Port Operations
67	156.375	156.375	Commercial. Used for Bridge-to-bridge communications in lower Mississippi River. Intership only.
68	156.425	156.425	Non-Commercial
69	156.475	156.475	Non-Commercial
70	156.525	156.525	Digital Selective Calling (voice communications not allowed)
71	156.575	156.575	Non-Commercial
72	156.625	156.625	Non-Commercial (Intership only)
73	156.675	156.675	Port Operations
74	156.725	156.725	Port Operations
77	156.875	156.875	Port Operations (Intership only)
78A	156.925	156.925	Non-Commercial
79A	156.975	156.975	Commercial. Non-Commercial in Great Lakes only
80A	157.025	157.025	Commercial. Non-Commercial in Great Lakes only
81A	157.075	157.075	U.S. Government only - Environmental protection operations.
82A	157.125	157.125	U.S. Government only
83A	157.175	157.175	U.S. Coast Guard only
84	157.225	161.825	Public Correspondence (Marine Operator)
85	157.275	161.875	Public Correspondence (Marine Operator)
86	157.325	161.925	Public Correspondence (Marine Operator)
87A	157.375	157.375	Public Correspondence (Marine Operator)
88A	157.425	157.425	Commercial, Intership only.
AIS 1	161.975	161.975	Automatic Identification System (AIS)
AIS 2	162.025	162.025	Automatic Identification System (AIS)

RADIOS FOR EVERYDAY ADVENTURES



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mitting navigational advisories to incoming and outgoing big ships. The Vessel Traffic assignments are as follows:

Channel 1A	156.050	Lower Mississippi
Channel 5	156.250	Seattle
Channel 11	156.550	New York, New Orleans, Houston, Prince William Sound, Berwick Bay
Channel 12	156.600	New York, New Orleans, Houston, San Francisco, Sault Saint Marie
Channel 14	156.700	New York, New Orleans, Seattle, San Francisco, Los Angeles/Long Beach
Channel 63A	156.175	Lower Mississippi River

Commercial fishing boats are often heard on the following channels:

Channel 07A	156.350 MHz
Channel 67	156.375 MHz
Channel 10	156.500 MHz
Channel 18A	156.900 MHz
Channel 79A	156.975 MHz
Channel 80A	157.025 MHz
Channel 88A	157.425 MHz Fish-spotting aircraft

Pleasure boats can be heard talking about anything and everything here:

Channel 68	156.425 MHz
Channel 9	156.450 MHz
Channel 69	156.475 MHz
Channel 71	156.575 MHz
Channel 72	156.625 MHz
Channel 78	156.925 MHz

Local harbor police and harbor patrols may be found on Channel 12, 156.600 MHz, or state control on Channel 17, 156.850 MHz.

The marine VHF telephone service is virtually non-existent, and its duplex Channels 24–28, and Channels 84–86 are dead quiet. Marine radios do not offer a simplex override switch, so none of these public correspondence duplex channels could support simplex operation. These channels could go 2.5 kHz narrowband in five years.

AIS Mode And Frequencies

The duplex side of marine VHF Channel 87B and 88B, 161.975 MHz and 162.025, offers reception of Automatic Identification System (AIS) digital transmissions, easily decoded with almost any multi-mode terminal node controller, allowing you to watch as well as listen. You'll need a receiver with a narrow filter to pick up these data bursts. With the right software, you can decode local shipping traffic sending collision avoidance digital "squawks" every few seconds, superimposed on a chart of the local boating area. It can be fascinating to watch your computer screen as distant ships approach the harbor, and local ships leave on the way to the high seas. Reception range of AIS is line of sight, and if you enjoy watching your local ship traffic on the screen, AIS channels are full of activity.

The International Telecommunications Union World Radio Conference, in 1997, designated two marine VHF radio frequencies for AIS transmissions. AIS Channel 1 is 161.975 MHz,

Orange County, California, Harbor Patrol vessels constantly guard Channel 16 for in-harbor emergency calls. Their typical response time to harbor distress calls is one to three minutes.

corresponding to the duplex side of public correspondence Channel 87B. AIS Channel 2 is 162.025 MHz, corresponding to the duplex side of public correspondence channel 88B. Remember that public correspondence channels utilize a 4.6 MHz offset, and these two "B" AIS channels are the duplex side of the unused telephone channels.

The AIS transmission mode is 9.6 kb GMSK FM modulation, using HDLC Packet protocol. AIS stations transmit and receive over two radio channels to avoid interference problems and to allow channels to be shifted without communications loss from other ships. The system provides for automatic contention resolution between itself and other stations, and communications integrity is maintained, even in overload situations.

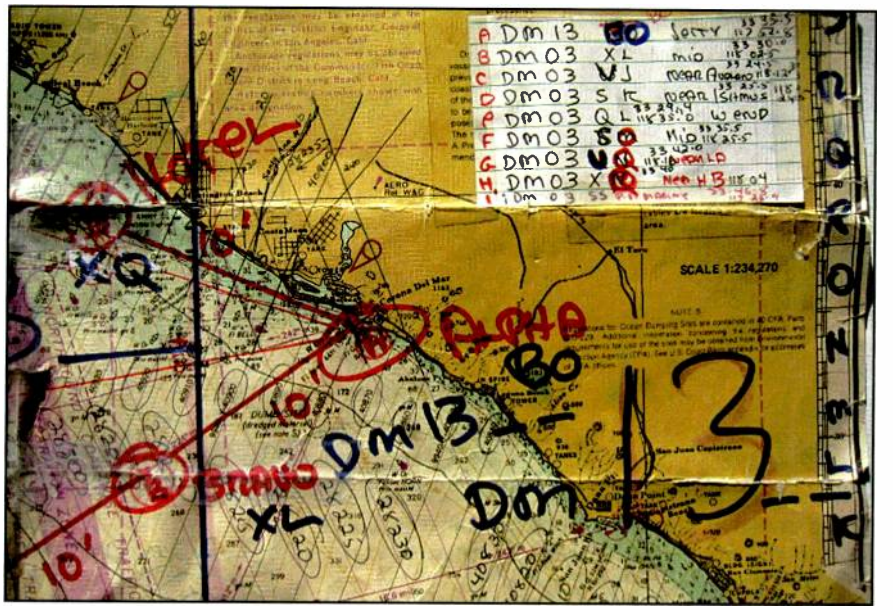
A position report from any one AIS station fits into one of 2,250 time slots, established every 60 seconds. AIS stations continuously synchronize themselves to each other to avoid overlap of slot transmissions.

Until the FCC's recent AIS Class B approval, big ship AIS equipment was in the $10,000 range. Now, pleasure boat Class B AIS equipment is available for around $1,000. For more information viewing AIS in action from your home computer, visit www.shinemicro.com. General AIS info is available from www.navcen.USCG.gov/marcomms/AIS.htm.

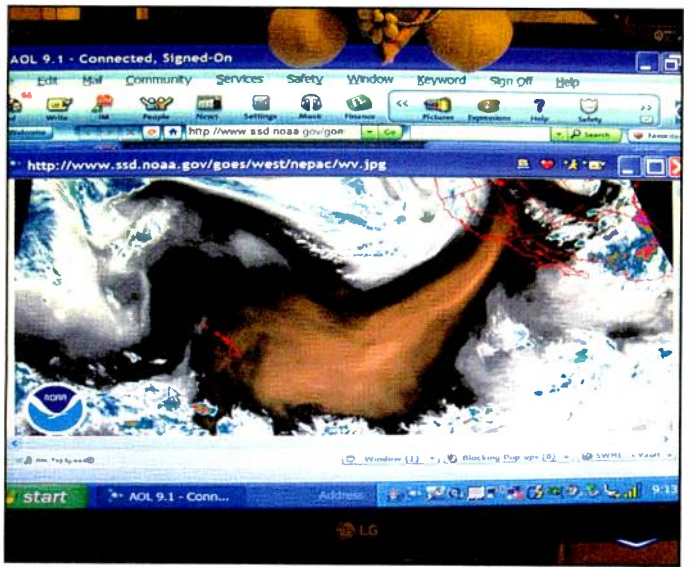
Weather And Weather Facsimile

The marine weather channels are at 162.00 MHz and up, and during summer months of tropospheric ducting, weather channel reception may extend out to 300 miles plus. Listen to NOAA weather radio frequencies at:

Channel	Frequency
WX1	162.550 MHz
WX2	162.400 MHz
WX3	162.475 MHz
WX4	162.425 MHz
WX5	162.450 MHz
WX6	162.500 MHz
WX7	162.525 MHz



Ham operators take to the ocean for working 10,000 MHz tropo contacts by grid squares (right) when local boaters hear Coast Guard calls from 500 miles away during temperature inversions (below).



Alternate Channel Designators (on *some* scanners)

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

It takes 10 minutes for your computer and a weather facsimile receive program to digest and display a detailed weather analysis of a cruising area. Weather facsimile signals sound like a twice-per-second sweeping tone, tuned upper sideband.

8680.1 kHz	Pacific Coast
12,784.1 kHz	Pacific Coast
11,088.1 kHz	Hawaii
12,748.1 kHz	Atlantic
8802 kHz	Gulf
12,788 kHz	Gulf

There are many more, but these usually provide great signals four times a day. For more information, visit www.nws noaa.goc/om/marine/faq.htm.

If you need weather fax software for your TNC, you might want to look into a nimble, powerful application for emergency service or storm-spotting ham radio operators from Creative Services Software. This software lets you manage image resolution, size, and color, offers pause, resume and synchronize capabilities, and prints to any Windows-compatible printer. It's included with Digital Desktop or available as a stand-alone weather fax solution (see www.cssincorp.com for more information and a free trial of any CSS solution).

Big Ship On-Board Repeaters

If you monitor near major seaports, you can catch the inside action aboard those huge container ships and most cruise ships. On-board repeaters with "leaky" coax below decks keep ships' personnel always in touch. Monitor the following in the common FM mode:

457.525 MHz
457.550 MHz
457.575 MHz
457.600 MHz

The unique transmit split is 10.225 MHz above these output frequencies.

Long-Range SSB Reception

As previously mentioned, long-range monitoring is possible. Skywave excitement on medium frequency and high frequency marine SSB channels is out there for those who aren't near a seaport.

The emission is always upper sideband (never lower), J3E (2K80J3E) with an authorized bandwidth of 3 kHz. Listen on the following bands, which are available for ship-to-ship and ship-to-shore data and voice communications:

2–3 MHz medium frequency "coastal" band
4 MHz
6 MHz
8 MHz

Sailing transport ship *Kwai*, anchored off Washington Island Landing, the South Pacific, waits for the swell to subside. The crew talks marine SSB to Hawaii—daily.

When a mariner transmits an automated DSC (digital selective call) distress call, the data burst changes all DSC receive radios to VHF Channel 16, 156.800 MHz, automatically.

US Coast Guard Communication Stations And Schedules

Station	SELCAL	Maritime Mobile Service ID
USCG Communications Area Master Station Atlantic, Chesapeake VA/NMN	-	003669995
USCG Communications Area Master Station Atlantic, remotely keying transmitters at Boston/NMF	-	003669991
USCG Communications Area Master Station Atlantic, remotely keying transmitters at Miami/NMA	-	003669997
USCG Communications Area Master Station Atlantic, remotely keying transmitters at New Orleans/NMG	-	003669998
USCG Communications Area Master Station Pacific, Pt. Reyes CA/NMC	-	003669990
USCG Communications Area Master Station Pacific, remotely keying transmitters at Guam/NRV	1096	-
USCG Communications Area Master Station Pacific, remotely keying transmitters at Honolulu HI/NMO	-	003669993
USCG Communications Station Kodiak AK/NOJ	-	003669899
USCG Marianas Section Guam	-	003669994

HF Radiotelephone (Single Sideband) – Distress and Initial Contact
This schedule was effective 010001Z SEP 08
Authorized for handling of the Distress message traffic and initial contact with United States Coast Guard Long Range Communication facilities.

Ship Station	Coast Station	NMF	NMN	NMA	NMG
4125	4125	2300-1100Z	2300-1100Z	2300-1100Z	2300-1100Z
6215	6215	24 HRS	24 HRS	24 HRS	24 HRS
8291	8291	24 HRS	24 HRS	24 HRS	24 HRS
12290	12290	1100-2300Z	1100-2300Z	1100-2300Z	1100-2300Z

(in kHz)

Ship Station	Coast Station	Station and Schedule (UTC) NMC	NMO	NOJ
4125	4125	24 HRS	0600-1800Z	24 HRS
6215	6215	24 HRS	24 HRS	24 HRS
8291	8291	24 HRS	24 HRS	
12290	12290	24 HRS	1800-0600Z	

(in kHz)

Ship Station	Coast Station	Station and Schedule (UTC) Guam
6215	6215	0900-2100Z
12290	12290	2100-0900Z

Note: 8291 and 12290 kHz are available under NOJ upon request
Note: 16420 kHz is available at all stations upon request

12 MHz
16 MHz
22 MHz
25 MHz

A simple way of calculating skywave first-hope range is to take the MHz band, and multiply it by 100 miles. You may calculate that 2 MHz won't propagate much farther than 200 miles, and 16 MHz channels will propagate up to 1,600 miles, first hop.

Nine US Coast Guard facilities continuously guard long-range marine distress frequencies (see "US Coast Guard Communication Stations And Schedules"). Here on the West Coast, my scanning high-frequency receiver has picked up many Mayday calls from vessels out on the high seas. Listen in on:

2182 kHz
4125 kHz
6215 kHz
8291 kHz
12,290 kHz
16,420 kHz

These same Coast Guard communications stations broadcast high seas weather on

4426 kHz
6501 kHz
8764 kHz
13089 kHz
17314 kHz

The last remaining voice public correspondence service is WLO Radio. Try some of the following frequencies to hear both weather reports and the shore side of a phone call to a ship at sea:

8788 kHz	Mobile , AL
13,110 kHz	Mobile, AL
17,362 kHz	Mobile, AL
8731 kHz	Seattle remote site
13,101 kHz	Seattle remote site

Chesapeake(NMN)
HF Voice Broadcast Schedule

4426, 6501, 8764 kHz (USB)	0330Z[1]	0515Z[2]	0930Z[1]			
6501, 8764, 13089 kHz (USB)			1115Z[2]	1530Z[1]	2130Z[1]	2315Z[2]
8764, 13089, 17314 kHz (USB)				1715Z[2]		

[1] Offshore Forecasts, hurricane information
[2] Highseas Forecast, hurricane information

Broadcast of hurricane and other weather broadcasts from this station may on occasion be preempted, as the frequencies are shared with other USCG stations.

New Orleans(NMG)
HF Voice Broadcast Schedule

4316, 8502, 12788 kHz (USB)	0330Z[1]	0515Z[2]	0930Z[1]	1115Z[2]	1530Z[1]	1715Z[2]	2130Z[1]	2315Z[2]

[1] Offshore Forecasts, hurricane information
[2] Highseas Forecast, hurricane information

Broadcast of hurricane and other weather broadcasts from this station may on occasion be preempted, as the transmitters are shared with the radiofax broadcast.

Pt. Reyes(NMC)
HF Voice Broadcast Schedule

4426, 8764, 13089 kHz (USB)	0430Z	1030Z		
8764, 13089, 17314 kHz (USB)			1630Z	2230Z

Broadcast of hurricane and other weather broadcasts from this station may on occasion be preempted, as the frequencies are shared with other USCG stations, and the transmitters are shared with the radiofax broadcast.

Kodiak(NOJ)
HF Voice Broadcast Schedule

6501 kHz (USB)	0203Z	1645Z

Honolulu(NMO)
HF Voice Broadcast Schedule

6501, 8764 kHz (USB)		0600Z	1200Z	
8764, 13089 kHz (USB)	0005Z			1800Z

Guam(NRV)
HF Voice Broadcast Schedule

6501 kHz (USB)		0930Z	1530Z	
13089 kHz (USB)	0330Z			2130Z

If you want to also use the service, see "WLO High Seas Marine Telephone." Note that you must be pre-registered with credit card.

Mariners who purchase a marine SSB will find hundreds of ITU duplex channels offering zero reception. Except for WLO Radio, public correspondence ship-to-shore communications have vacated the medium- and high-frequency ITU assignments.

Ship-to-ship calls are always entertaining, especially on weekends and during long offshore sailboat races. Ship-to-ship communications are always upper sideband. Listen to primary ship channels (SSB) here:

2638 kHz	Gulf and rivers
2738 kHz	Gulf and Rivers
4146 kHz	4 Alpha
4149 kHz	4B
6224 kHz	6 Alpha
6227 kHz	6B
8294 kHz	8 Alpha (great at night)
8297 kHz	8B
12.353 kHz	12 Alpha (good monitoring morning and evening)
12,356 kHz	12B
16,528 kHz	16 Alpha (good daytime channel)
16,531 kHz	16B
16,534 kHz	16C (afternoon Atlantic weather reports)

If you happen to be lucky enough to find yourself in or near the Caribbean, tune from 4000 kHz to 4057 kHz, in 3 kHz steps, for lively ship-to-ship and ship-to-shore chatter. Also tune 8101 kHz through 8191 kHz, in 3 kHz steps, for longer-range marine sideband ship-to-ship traffic. All areas of boating may use these channels on a non-interference basis to U.S. land stations.

If You Want To Talk As Well As Listen

Summertime is a great time to hear what's going on out on the ocean, down the river, over at the big lake, or even from some landlocked locations. For monitoring purposes, all you need is an inexpensive marine VHF transceiver to give you direct access, with official channel numbers, to marine and Coast Guard activity. There is no license required to purchase a marine VHF or for simply monitoring from home. If you're on the water, the Telecommunications Act of 1996 permits recreational boaters to have and use a VHF marine radio, EPIRB, and marine radar without having an FCC ship station license.

Mariners operating on the long-range marine SSB frequencies don't require an amateur radio General class license as these are marine frequencies, not ham. The ship must be registered for a 10-year FCC Ship Station license, and one person on board must hold a Restricted Radiotelephone Operator Permit (RR) or, for commercial vessels, a Marine Radio Operator Permit (MROP). Communications are limited to ship's business, and no ham-type ratchet jawing is permitted.

If your home or office is associated with any marine business, you should know that you may also qualify for a Marine Coast Station license for certain shore-to-ship transmissions, such as those involving fuel dock services, Search and Rescue group communications, boat towing, and the like. While the licensing process is complicated and can cost hundreds of dollars, if you own and operate a marine business on shore you may want to check it out (you can contact me at WB6NOA@ARRL.net and I'll give you some details).

If you're new to marine radios and do decide to purchase one, remember that until the RTCM petition (see www.RTCM.org/overview.php) goes through on marine VHF shore use of marine handhelds for hunting and hiking, VHF marine equipment may only transmit legally from a boat floating in water, or with a special Coast Station shore license.

Jump On In

Scanning all the maritime action this summer is easy and sure to be a lot of fun. Now you've got all the information you need to get started, and if you don't have an appropriate rig yet, check out those inexpensive marine band radios. Enjoy your monitoring voyage and maybe I'll see you out on the waves. ■

WLO High Seas Marine Telephone

C6	405	4077.0	4369.0	Voice
C7	607	6218.0	6519.0	Voice
C8	824	8264.0	8788.0	Voice
C9	830	8282.0	8806.0	Voice
C10	1212	12263.0	13110.0	Voice
C11	1226	12305.0	13152.0	Voice
C12	1607	16378.0	17260.0	Voice
C13	1641	16480.0	17362.0	Voice
C14	1807	18798.0	19773.0	Voice
C15	2237	22108.0	22804.0	Voice

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http://www.shipcom.com

Caveats: Privacy Issues And Expansion Channels

When you tune to marine VHF FM, or marine long-range SSB maritime signals, what you may hear may *not* be recorded or divulged to anyone else. The only exception would be emergency calls where authorities may need to know what you heard.

On marine VHF, some commercial fishermen incorporate speech inversion scramblers to prevent the competition from finding their hot fishing spots. On marine SSB, upper sideband with a normal 2.8 kHz filter, will give you some great voice reception.

Most marine VHF transceivers employ phase-locked-loop synthesis, in 25 kHz steps. Some sets are easy to modify for expanded receive, beginning at 155.00 MHz, and going all the way up to 162 MHz. However, the majority of channels within this range are assigned to the land-mobile radio service, operating on 15 kHz and 30 kHz steps. Most of what you might receive will be off frequency, and there is no easy way to reconfigure the 25 kHz channel step scheme to 15 kHz Land Mobile steps, in a marine VHF.

For years many commercial fishermen have operated with modified equipment, and it causes legitimate land mobile radio users near the seashore to receive interference, usually slightly off frequency. *Never ever* transmit on any expanded marine VHF transceiver.

Trivia And Toons

by R.B. Sturtevant, AD7IL

Q. Are there any clues that can be given by radio to tell a spy organization that one of its agents has been arrested?

A. In planning an operation that takes a spy into enemy territory, agencies instruct their operatives to make a specific mistake should they be captured and forced to transmit. For instance, they should always misspell the third and sixth word in their messages when sending code. That alerts the folks at home that they've been compromised.

Another way is to watch the agents "fist," that is, the way they send Morse code. Everyone sends CW slightly differently, just as everyone's handwriting is different. To establish the rhythm and sound of their transmissions, recordings are made agents' sending before they go on their mission. Then, if the enemy puts an agent in jail and substitutes another operator a good Intercept Operator, who knows the agent and know the "fist," will be able to detect a different operator. Of course, if the enemy radio operators are good enough they can study tapes of the captured agent sending and imitate the agent's fist, like a forger copying a signature. But then "all's fair in love and war."

Q. Why do the secret agents we see in the movies always use Morse code instead of voice transmission on their radios?

A. It may be because most of the movies are based on World War I- or II-era technology and CW was pervasive for some very logical reasons. CW uses a much narrower signal than voice and is, therefore, harder for intercept operators to find. CW, because of its narrower signal can use the same power to go farther. You can use less power and still get a long way with CW. Less power also makes it harder for interceptors to pick up the signal. CW sets are less complicated to build and can be made much smaller, making them easier to move around and hide, as well as easier to build or repair in hostile territory.

Q. Do spies who are operating radios "behind enemy lines" have to know all that much about the radio equipment they're using or do they just need to know how to operate the sets?

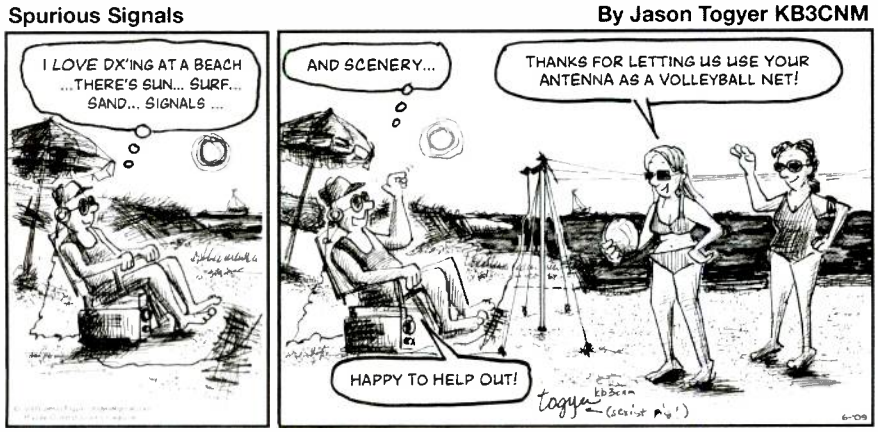
A. The more they know the better. Here's a case in point: The RRST-1 was one of the standard radios used by the early CIA during the Cold War. Operating under Cold War conditions meant that sometimes special steps had to be taken to get the job done. The RRST-1 used a single 6L6 tube as a tri-tet oscillator and a final and gave an output signal of about 10 watts under ordinary conditions. In certain circumstances, however, agents needed more power to get the job done. By using a more powerful transformer as a power supply and submerging the 6L6 in a jar of motor oil (!) the set could put out as much as 50 watts or more. With extra filtering the 6L6 would also allow the operator to send at up to 25 wpm, which is not possible with an unfiltered 6L6. The secret to getting this kind of innovation recruiting agents who know more about radio than just how to get a CW signal out of it.

Q. What does the term "black radio" refer to, and what is it used for?

A. I assume that you aren't talking about the color of the receiver. Well, in time of conflict, there are three kinds of "radio-borne" psychological warfare: white, gray, and black. Unlike white radio, which is supposedly truthful (for instance, "we are who we say we are and we're going to win because God is on our side"), black radio is usually false—or close to false—but credits its source to the other side. During World War II the Germans ran three black stations that were supposed to be from pro-Nazi groups within the British Isles. They were "The New British Broadcast Service," a British Nationalist station that wanted Britain to side with Hitler; "The Workers Challenge," a Labor-Socialist-Communist station; and "Radio Caledonia," a pro-Scottish Independence station. All were actually transmitted from Hamburg, but each for only a short time. A gray station is somewhere in the middle of those two and does not clearly identify itself as either pro or con, nor where it is supposedly coming from.

Experts can use all three types effectively by crafting their messages for their selected audience, and all three are on the air today. Now go out there and find an example of each one!

Spurious Signals — By Jason Togyer KB3CNM



Set Up Your Own Home FM Radio Transmitter

Here's A Great Way To Re-Create That Radio Experience With Your Favorite On-Line Music

by Philip Karras, KE3FL

Far from being the death knell of radio, the Internet can open up new opportunities to enjoy it. And it can also inspire new approaches to that enjoyment, as it did for me recently.

After one of my favorite FM radio shows was moved from standard FM to one of the station's HD broadcasts, I started looking for the show online, eventually acquiring a listing of all the stations in the U.S. that were broadcasting the show and had a live feed on the Internet as well. While doing this I also came across an Internet-only station I really enjoyed, called Folk Alley (www.folkalley.com), and I've been listening to this station whenever I'm at home.

At first I'd listen to the program using two computers, one upstairs and one downstairs, but the difference in the speed of the PCs seemed to guarantee that they would never be synchronized while playing the music. Then I got an idea.

What If...

I had a small FM transmitter in my car for use with a CD, iPod, or MP3 player. These neat little transmitters are able to re-broadcast the audio from an MP3 or any player that uses a simple mini-stereo connection cord and simply converts the audio signal to a standard FM broadcast signal at the frequency of your choice. It runs at an extremely low power that's usually good enough for a local radio to pick up, but no one else.

Philip Karras, KE3FL, an engineer/physicist, has been interested in radio since age four. He has served in numerous capacities as an amateur radio volunteer, and his writings have appeared in *QST*, *WorldRadio*, and *Popular Communications*. He can be reached at http://cs.yrex.com/ke3fl.

"This got me thinking that maybe there would be a way to use one of these small transmitters to broadcast my Internet music to the FM radios in my house."

In my junk-box, I had two of these little transmitters, which I'd picked up on sale after the particular model was discontinued. Similar FM transmitters, called SoundFeeders, are still being made by Arkon Resources, Inc., the manufacturer of the two I have. They can be purchased online at www.arkon.com/fmtransmitter.php, or you might find that an Internet search turns up additional sources (it seems every time I look around I find at least one model on sale for under $10).

In the Washington D.C.-Baltimore area where I live, however, there are no real clear frequencies to use with these extremely weak transmitters. If a frequency isn't taken outright, interference from close stations can make it unusable, so using this method to listen to an mp3 player in the car is not recommended, because every few miles a different "free" station has to be found.

Photo A. The small Arkon SoundFeeder FM transmitter shown hooked up to a longwire antenna. →

While I couldn't really use these little FM transmitters for their intended purpose in the car, I was able to use them with a nearby radio and the mp3 player I bought for home use. The transmitter just has to be very close to the radio and its antenna. This got me thinking that maybe there would be a way to use one of these small transmitters to broadcast my Internet music to the FM radios in my house.

Choosing A Frequency

As I expected, this turned out to be difficult, but it was not impossible. First, there was the job of trying to find a "free" frequency. It seemed that no matter what "free" frequency I found, it wasn't really free to all the radios in the house. Sometimes the radio in the garage could not hear my frequency due to a broadcast station. At other times the radio in the kitchen, just some 60 feet to the west of the radio in the garage, couldn't hear it. When I found a frequency clear enough for these two radios, the good stereo in my living room (which sports a really good homebrew FM broadcast band full-wave loop antenna) would pick up a distant station on that frequency.

I decided on an interstitial frequency, one in between two poorly received stations. Most of my radios can tune by 100-kHz steps so I was able to use the frequency 88.2 MHz. Since there were only weak competing stations on the adjacent normal FM frequencies of 88.1 and 88.3 MHz, I thought this just might work.

Hookup

The next step was to hook up my SoundFeeder transmitter to a better/bigger antenna, specifically my 80-meter dipole. This was done with a jumper wire with alligator clips on each end so it connected the SoundFeeder's little telescoping antenna to the center connector on my coax going to the 80-meter dipole. I selected this antenna because the wire extends from one side of the house to the other, and I hoped that a long wire above the entire house would enable the signal to reach radios all over the house (**Photo A**).

To improve the antenna match I redid the antenna connection on the SoundFeeder transmitter. First I opened the SoundFeeder, located the antenna connections, and removed the internal antenna, replacing it with a bit of mini-coax and an external BNC connector (**Photo B**).

Next I tested the modification with the SoundFeeder hooked up to the best antenna I had for the frequency I was using to transmit (88.2 MHz), which was my 144/440 MHz J-pole antenna for the 2-meter ham radio band. This much smaller antenna, with a better method of connection to the transmitter, allowed the signal to reach all the radios in the house with a better quality reception (**Photo C**).

Photo B. The SoundFeeder FM transmitter opened up for inspection. →

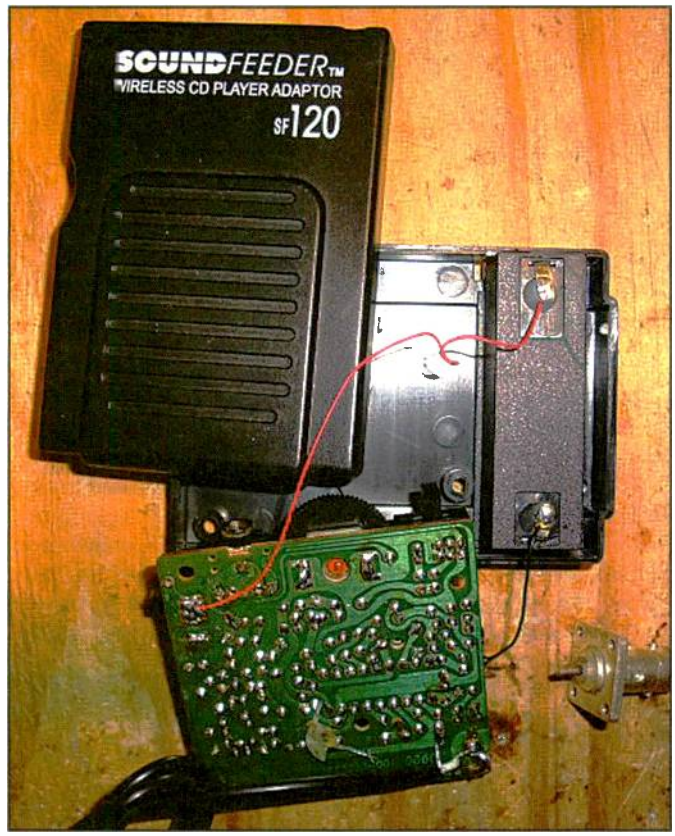


Photo C. The SoundFeeder FM transmitter is connected. ↓

Tweaking

I learned that sometimes just moving a few feet or adding a bit of height to an antenna is all that's needed to receive a station, including one you don't want. After much experimenting, I did manage to get all the radios to receive my weak broadcast on 88.2 MHz, even the radio in the kitchen. This radio could not tune to 88.2, but I found that when tuned to either 88.1 or 88.3 it would work well enough.

During this project, I observed a couple of interesting things. For one, it was intriguing to note that sometimes one frequency worked better than the other; at other times that was reversed. I also discovered that it sometimes mattered which way I tuned to the station, even when using an electronic/digital tuner. When using a

dial tuner with a capacitor, this effect is known as hysteresis, and refers to the fact that a capacitor is not perfectly identical in tuning when going up or coming down to a frequency. It seems that even some digital tuners show this difference, so if you can't find your station when tuning up to it, try tuning down to it from a higher frequency and see if that works.

Improving The Sound

After I got my system to work fairly well for all radios I use in the house, the next step was to get a better sound. The radio in the living room uses a loop antenna as a long wire connected to only one feed line, which made the reception of some of the commercial stations worse. As a result, I constantly had to change how the antenna was connected to the radio and found that alligator clips made this quite easy (**Photo D**).

At this point, the only option left to improve the signal to all my radios was to put out more power. In looking around for a more powerful FM transmitter, I found a number of kits and pre-built units at Ramsey Electronics (http://ramseyelectronics.com). I bought the FM25B kit, which could tune to interstitial frequencies and transmit with up to 25 mW of power. Since the small transmitter was much less than 1 mW, I figured this would be more than enough. (Also, the FCC rules and regulations are pretty strict about using the FM frequencies and they really frown upon those who interfere with anyone else trying to listen to licensed broadcasts!)

I put the kit together in one evening and had it transmitting. I tried a fairly free standard frequency at 107.1 MHz, but the radio in the kitchen, while able to lock onto my station, did not receive it very well. I tried a number of different antenna arrangements for the transmitter, including a longwire, one side of the 80-meter dipole, and one side of the 2-meter J-pole (**Photo E**). This last one seemed to work the best. If I increased the output to about 75 percent of max, all radios worked fine. Unfortunately, at least five of my neighbors might have been able to hear my broadcasting! Luckily, a problem I had encountered earlier showed me how to fix this.

Troubleshooting Leads To Solution

My transmitting system was set up as described for about a month, then we had a big electrical storm. When I turned on the transmitter the next day, it could only be received by a very close radio.

Photo D. Here you see one feed wire to the radio, tuned to 88.20 MHz.

After troubleshooting for a while I determined that the problem was with the final transistor. I contacted Ramsey Electronics again and they helped me verify my theory about the final transistor, the only surface-mount part.

While waiting for the new part from Ramsey (which worked like a charm when replaced), I used my downtime wisely and built a converter cable to go from the output (cable connector) to a BNC connector so I could use the 2-meter J-pole as the antenna (**Photo F**). When I hooked this up and changed the frequency to 88.2 MHz—which all the radios

Photo E. The Ramsey FM25B to the longwire antenna.

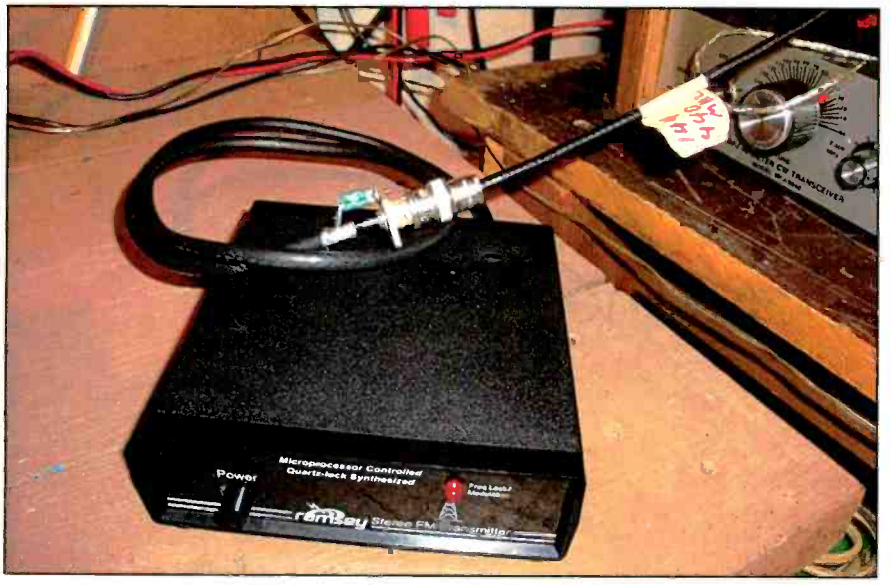


Photo F. The FM25B to the J-pole antenna.

could hear even with the little transmitter—all signals were solid. At this point I lowered the output to almost full counter-clockwise, which I figured was about 1 mW.

With the output now set to somewhere around 1 mW, and using 88.2 MHz, even a good radio outside the house doesn't get noticeable interference when tuned to either 88.1 or 88.3 MHz. This is a much better arrangement and I was able to hook up the living room FM receiver correctly to the loop antenna, using both input leads. The two radios in the house that cannot tune 88.2 MHz both work fine when set to 88.3 MHz, yet a car radio about one house away no longer experiences noticeable interference on 88.3 or 88.1 MHz, and is even able to receive very weak stations on those frequencies.

A Successful Home FM Transmission

As you can see, not only is it possible to pick up the radio programs you lost because they moved to HD radio, you can also get the "radio" experience from all sorts of wonderful special programming you'll find on the Internet. All you need is a little FM transmitter like the one from Arkon, or possibly a more powerful one from Ramsey Electronics, plus some antenna experimentation, and you can put your favorites stations back "on the air" again, at least in your own home.

If you need antennas ideas, you can refer to my previous article in *Pop'Comm* ("Sometimes the Best Antenna Is Not the Best Antenna," September 2003) for suggestions on reducing the quality of your receiving antenna if you're receiving too many stations.

I hope you'll try setting up your own FM transmitter, and that you'll enjoy many hours of your lost music re-found!

Scanning "Vacationland": Focus On Maine

by Ken Reiss
radioken@earthlink.net

Driving on the roads in and around our 23rd state you'll see this nickname adorning the license plates. While it conjures images of carefree kicking back for some outdoor family fun—which you can certainly find in abundance—the state has its serious side, too. And it's serious business protecting those roads.

It was in 1921 that the State of Maine formed its first State Highway Police, with a mere 34-member force. A horsemanship test was actually required as a part of the process for appointment, although many officers were actually issued Harley Davidson Motorcycles instead. Today, the force is 341 officers strong and is the largest police force in the state. Maine's interstate and highway system is their jurisdiction, but the force is also responsible for providing complete police protec-

"It was in 1921 that the State of Maine formed its first State Highway Police, with a mere 34-member force. A horsemanship test was actually required as a part of the process for appointment although many officers were actually issued Harley Davidson Motorcycles instead."

Maine's Cape Elizabeth Lighthouse is certainly scenic, there's no question about that. This lighthouse is just one of dozens located throughout the state. (Photo by Bernie McCann, used under Creative Commons license)

Frequency Of The Month

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

Let's pick **154.710** as our frequency this month. Have a listen in the state of Maine, or wherever else you may be, and let me know what you hear (or don't). We'll enter your name in our drawing. Please be sure to indicate the frequency in the subject line or outside of your envelope for correct routing!

Send your entries via email to radioken@earthlink.net or via postal mail to Ken Reiss, 9051 Watson Rd. #309, St. Louis, MO 63126. Of course your general questions and comments are welcome too!

The most recent winner of our drawing is **Kenny Loatman** of **Bridgeton, New Jersey**. Congratulations, Kenny!

Most of the major cities in Maine are in the southern part of the state. The state police are responsible for much of the policing outside of metro areas, which leaves a lot of territory to cover.

The original Maine State Police uniform patch was placed on a green army uniform that served as that agency's official duds when it was formed in 1921.

tion in many areas of the state. There's also a host of support services for smaller police departments, including detective, child abuse, major crime, underwater recovery, crisis negotiation, and tactical force. Two Cessna 182 (propeller) aircraft make up the air wing and are used for traffic enforcement, search and rescue, and transportation of officials throughout the New England area.

In 2004, the Consolidated Communications bureau was established, not under the direct control of the state police, but as a separate entity under the state's Public Safety Division. The bureau operates four regional communications centers at Augusta, Gray, Orono, and Houlton that provide most of the dispatch operations for the state police, fire, and emergency services, the warden service, drug enforcement agency, the Turnpike Authority, fire marshals, and marine and environmental protection services. Each center also provides dispatch for dozens of fire, rescue, local police, and ambulance services. The major cities operate their own systems, but otherwise much of the communications appears to run through these regional systems.

For those of you who are lucky enough to visit this beautiful part of the country (or for the even luckier ones who live there), this month, "ScanTech" serves up a smorgasbord of frequencies used by the agencies that work—and sometimes play—in "Vacationland." Enjoy!

Maine Frequencies

Statewide

Frequency	Tone	Description
154.71	CSQ	Statewide Emergency
154.695	CSQ	Statewide Car-to-Car
156.15	CSQ	Zone-1 Dispatch (South) - Did Use 192.8 PL
154.65	CSQ	Zone-2 Dispatch (Central & Turnpike) - Did Use 192.8 PL
154.905	CSQ	Zone-3 Dispatch (North) - Did Use 192.8 PL
154.665	CSQ	Zone- 4 Dispatch (Houlton)
154.935	CSQ	Tactical/Radar
155.475	CSQ	N.L.E.E.F.
156.045	CSQ	Troop G - Turnpike Patrol
154.665	CSQ	Aircraft Speed Enforcement
154.92	192.8 PL	C.I.D.
155.445	192.8 PL	C.I.D.
155.505	192.8 PL	C.I.D.
460.225		Mobile Extenders
42.12	CSQ	Zone-to-Zone
154.77		State Police
154.785		State Police
154.785		State Police
154.8		State Police
154.8		State Police
154.845		State Police
154.89		State Police
155.445		State Police
155.85		State Police
156.03		State Police
156.09		State Police
158.73		State Police

Troop B

Frequency	Tone	Description
156.15		Gray Dispatch

Troop E

Frequency	Tone	Description
154.905		Dispatch
154.935		Car-to-Car
155.46	82.5	Tactical

Zone 1

Frequency	Tone	Tag
154.655	192.8 PL	Law Dispatch
156.15	CSQ	Law Dispatch

Zone 2

Frequency	Tone	Tag
154.65	CSQ	Law Dispatch
452.35	71.9 PL	Law Talk
452.5	71.9 PL	Law Talk
460.15		Law Talk

Zone 3

Frequency	Tone	Tag
154.905	CSQ	Law Dispatch
154.905	192.8 PL	Law Talk
155.46	82.5 PL	Law Tac

Penobscot County (Bangor Area)
Penobscot, County of

Frequency	Tone	Description
153.74	107.2 PL	Fire Dispatch (Sheriff COMM2 Secondary)
153.74	100.0 PL	Fire Dispatch (Sheriff COMM2 Secondary)
153.74	114.8 PL	Fire Dispatch (Sheriff COMM2 Secondary)
155.49		Sheriff Tactical 1 Dispatch/ Primary (includes Eddington, Hermon, Holden, Orrington, Veazie Police)
154.875	100.0 PL	Sheriff Tactical 4
155.31	118.8 PL	Police - East Millinocket, Medway, Millinocket
465.475	664 DPL	Penobscot RCC - Point-to-Point link for 155.31 MHz

Bangor, City of

Frequency	Tone	Description
154.28	023 DPL	Fire
154.22	203.5 PL	Fire Tactical
154.31		Fire Statewide
155.55	203.5 PL	Police Dispatch/Primary
154.695	192.8 PL	Police Statewide Car-to-Car
155.61	123.0 PL	Police Secondary
159.135	146.2 PL	Police Car-to-Car
155.25	146.2 PL	Police Car-to-Car/Special Operations
153.965	114 DPL	BAT Community Connector Buses

Brewer, City of

Frequency	Tone	Description
154.415	186.2 PL	Fire
155.58		032 DPL Police Dispatch / Primary
153.77		Emergency

Carmel, Town of

Frequency	Tone	Description
154.025	192.8 PL	Fire

Dexter, Town of

Frequency	Tone	Description
153.74		136.5 PL Fire - Dispatch
156.21		123.0 PL Police - Dispatch/ Primary (includes Newport Police)
154.845		Police - Talkaround
154.965		Police -
453.0875		Police - Tactical
458.0875		Police - Tactical
158.835		Utility District

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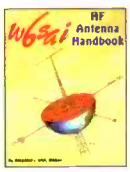

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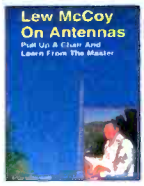

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Dixmont, Town of

Frequency	Tone	Description
153.74	100.0 PL	Fire
158.895		Fire

Eddington, Town of

Frequency	Tone	Description
153.74	114.8 PL	Fire

Hampden Town of

Frequency	Tone	Description
155.88	114.8 PL	Police and Fire Dispatch

Hermon, Town of

Frequency	Tone	Description
154.13	100.0 PL	Fire

Lincoln, Town of

Frequency	Tone	Description
153.74	94.8 PL	Fire
153.8	114.8 PL	Police Dispatch/Primary (Shared with Fire)

Newport, Town of

Police use the Dexter frequency.

Frequency	Alpha Tag	Description
154.4	Newport FD	Fire Dispatch
154.085	Newport PD	Police

Old Town and Orono, Towns of

Frequency	Tone	Description
155.775	136.5 PL	Old Town and Orono Fire
155.415	114.8 PL	Old Town and Orono Police Dispatch
155.475		Old Town Nationwide Law Enforcement (Car-to-Car)
155.625		Old Town and Orono Police (Backup Repeater)

Old Town, City of

Frequency	Alpha Tag	Description
153.86	Old Town PW	Public Works

Orrington, Town of

Frequency	Alpha Tag	Description
153.935	PD/FD/PW	Police Car-to-Car (Shared with Fire and Public Works)

Patten, Town of

Frequency	Tone	Alpha Tag	Description
153.74	77.0 PL	Cnty Fire	Fire

Penobscot Nation

Frequency	Tone	Description
153.875		Indian Island Fire Department Paging
155.91		192.8 PL Police Dispatch/Primary

University of Maine at Orono

Frequency	Tone	Description
155.115	100.0 PL	Police Dispatch/Primary
155.25	100.0 PL	Police Tactical
158.76		Police (Encrypted)

Veazie, Town of

Frequency	Alpha Tag	Description
153.875	Veazie FD	Fire Local

Portland Trunked system

Simulcast	866.0625	866.2875	866.3125
	866.5375	866.5625	866.7875
	867.28750c	867.78750c	868.28750c
	868.78750c		
Scarborough	855.9875	856.2625	856.4625
	857.2125	857.4625	857.7375
	858.2125	858.4625	

Cumberland County (Portland Area)
Cumberland, County of

Frequency	Tone	Description
155.625		Sheriff
160.455		Sheriff Detectives
160.545		Sheriff Detectives
453.05		Sheriff UHF Link for 155.625 MHz
155.1	173.8 PL	Emergency Management
155.565	173.8 PL	Emergency Management
155.685	173.8 PL	Emergency Management
155.955	173.8 PL	Emergency Management
155.37	173.8 PL	Emergency Management
155.76		Emergency Management/Civil Defense

Bridgton, Town of

Frequency	Tone	Description
154.235	192.8 PL	Fire

Cape Elizabeth, Town of

Frequency	Alpha Tag	Mode
154.025	CapeE FD Pri	FM
155.145	CapeE PD Pri	FM
158.745	CapeEPubWrks	FM

Casco, Town of

Frequency	Tone	Description
154.415	100.0 PL	Fire

Cumberland, Town of

Frequency	Tone	Description
154.01	127.3 PL	Fire
158.925	192.8 PL	Police
155.37		Police

Falmouth, Town of

Frequency	Tone	Description
155.79	192.8 PL	Police - Dispatch
154.0625		Police
155.52		Police
453.475		DPW ?

Freeport, Town of

Frequency	Tone	Description
156.135	127.3 PL	Fire Dispatch
154.385	192.8 PL	Fire
158.85	192.8 PL	Police
155.88		Police

Gorham, Town of

Frequency	Tone	Description
154.4	103.5 PL	Fire
154.31		Fire Statewide
153.875	110.9 PL	Police
155.265		Schools
154.04		Public Works
159.135		Public Works/Fire Police

Harrison, Town of

Frequency	Alpha Tag	Mode
154.16	Harrison FD	FM

Naples, Town of

Frequency	Tone	Description
155.01	123.0 PL	Fire

New Gloucester, Town of

Frequency	Mode
154.16	FM

Pownal, Town of

Frequency	Tone	Description
153.86	127.3 PL	Fire

Raymond, Town of

Frequency	Tone	Description
154.445	82.5 PL	Fire

Scarborough, Town of

Frequency	Tone	Description
154.13	192.8 PL	Fire
155.775	156.7 PL	Fire
154.31		Fire Statewide
160.125	192.8 PL	Police
155.52		Police
155.475		Police Nationwide
153.965	192.8 PL	Public Works
153.995		Public Works
155.025		Community Services

Sebago, Town of

Frequency	Tone	Description
154.355	67.0 PL	Fire

South Portland, City of

Frequency	Tone	Description
154.43		192.8 PL Fire
155.61		192.8 PL Police
154.085		Police Region 2
460.1	565 DPL	Police UHF Link for 155.61 MHz (Munjoy Hill)
159.105		Public Works

Westbrook, City of

Frequency	Tone	Description
154.37	173.8 PL	Fire
154.31		Fire Statewide
460.6125		Fire UHF Mobile Link to 154.37 MHz
155.13	173.8 PL	Police
155.7		Police Detectives
156		Public Works

All Trunked Radio Systems in Cumberland County

System Name
Industrial Communications and Electronics (Portland)
Portland Public Safety

Kennebec County (Augusta)
Kennebec, County of

Winthrop Communications Center Fire Dispatch includes Fayette Fire, Readfield Fire, Mt. Vernon Fire/Rescue, Vienna Fire, Wayne Fire/Rescue.

Frequency	Tone	Description
154.145		Fire Dispatch (Winthrop Communications Center, Lakes Region Mutual Aid)
159.09	606 DPL	Sheriff
155.475	192.8 PL	Sheriff - Nationwide Law Enforcement
155.805	612 DPL	County EMA
160.14		State EMA

Delta Ambulance

Frequency	Tone	Description
155.115	103.5 PL	Delta Base (Augusta)
155.4	167.9 PL	Delta to Inland Hospital

Albion, Town of

Frequency	Tone	Description
155.925	79.7 PL	Fire

Augusta, City of

Frequency	Tone	Description
154.4 162.2 PL		Fire
155.19		162.2 PL Police

Belgrade, Rome and Sidney, Cities of

Frequency	Tone	Description
155.085	141.3 PL	Fire

Chelsea, Town of

Frequency	Tone	Description
155.835	162.2 PL	Fire
159.3375		Fire
151.475		Fire

China and Vassalboro, Cities of

Frequency	Tone	Description
154.22	114.8 PL	China Fire Department
155.6025	114 DPL	China Fire Department

Pop'Comm July 2009 Reader Survey Questions

In keeping with our cover story, this month we'd like to ask you about marine communications' place in your hobby. Please use the Reader Survey Card and circle all appropriate numbers. We'll pick one respondent at random for a free one-year subscription, or extension, to *Pop'Comm*, so don't forget your address. Thanks for participating.

How often do you listen to marine communications?
- Never, I'm nowhere near water 1
- Occasionally, I'm landlocked but I tune them when I travel 2
- Fairly frequently, the bands are pretty busy with them 3
- Very often, they're a big part of my scanning 4
- All the time, I'm always on or near the water 5

Do you own a marine radio transceiver?
- Yes 6
- No 7

If not, do plan to purchase one?
- Yes 8
- No 9
- Not sure 10

Do you own a water/weather resistant or water/weather-proof scanner?
- Yes 11
- No 12

If not, do you plan on purchasing one?
- Yes 13
- No 14
- Not sure 15

How important is this feature to you?
- Not at all 16
- Somewhat 17
- Pretty Important 18
- Crucial for my type of scanning 19

March Survey Highlights

In our March survey we asked how the downturn in the economy affected our readers and their hobby experience. As in all things, there's good news and bad. Unfortunately, close to half (41 percent) of the respondents said things have been tougher for them this year. A lucky segment of the group (nearly 10 percent) is actually doing better, and everyone else is holding their own. Here's the good news: the vast majority (86 percent) is as engaged or more so in the hobby despite the economy. In the past three months, close to half of the respondents went ahead with their hobby-related purchases, dire predictions notwithstanding. For the coming year, about 40 percent of readers intend to hang back and see what happens, 22 percent intend to spend their usual allotted budget, and a full third hear opportunity knocking and are taking advantage of the sale prices. It's that savvy reaction that'll turn the downturn right side up. And for that 15 percent of readers who really have to tighten their belts, may things turn around for you soon.

The winner of a free subscription or extension to *Pop'Comm* this month is Louis U. Disinger of Santa Claus, Indiana. Congratulations, Louis!

Clinton, Town of

Frequency	Tone	Description
154.13		173.8 PL Clinton Fire Dept.
154.31		Fire Tactical Statewide
155.775		Services

Colby College

Frequency	Tone	Description
151.895	151.4 PL	Security
151.715	151.4 PL	Grounds

Farmingdale, Pittson, West Gardiner

Frequency	Tone	Description
154.22	167.9 PL	Dispatch

Gardiner, City of

Frequency	Tone	Description
154.25		Fire
159.21	192.8 PL	Police

Litchfield, Town Of

Frequency	Alpha Tag	Description
151.33	AugustaDisC1	Augusta Dispatch Center Ch-1
154.19	LitchfieldFT	Litchfield Fire Tac
154.265	LitchfieldFG	Litchfield Fire Ground

Monmouth, Town of

Frequency	Description
154.055	Police/Fire/EMS

Oakland, Town of

Frequency	Tone	Description
155.085	141.3 PL	Fire
158.91	103.5 PL	Police
155.535	103.5 PL	Police

Sidney, Town of

Frequency	Type	Description
158.79	RM	Fire - Dispatch

Waterville, City of
Comm and fire base are simplex
Portables and mobiles for FD are on the repeater

Frequency	Tone	Description
154.205	151.4 PL	Fire
155.7	506 DPL	Police
155.625	179.9 PL	Police Car-to-Car
150.79	151.4 PL	Special Emergency
154.1	114.8 PL	Public Works

Winslow, Town of

Frequency	Tone	Description
151.28	127.3 PL	Fire/Rescue
159.195	127.3 PL	Fire/Rescue Special Emergency
155.625	179.9 PL	Police
155.79	162.2 PL	Police
154.115	179.9 PL	Police Car-to-Car
153.8	162.2 PL	Public Works / Police Car-to-Car at Night

Winthrop, Town of

Frequency	Description
154.995	Fire/EMS
154.86	Police
155.175	Schools

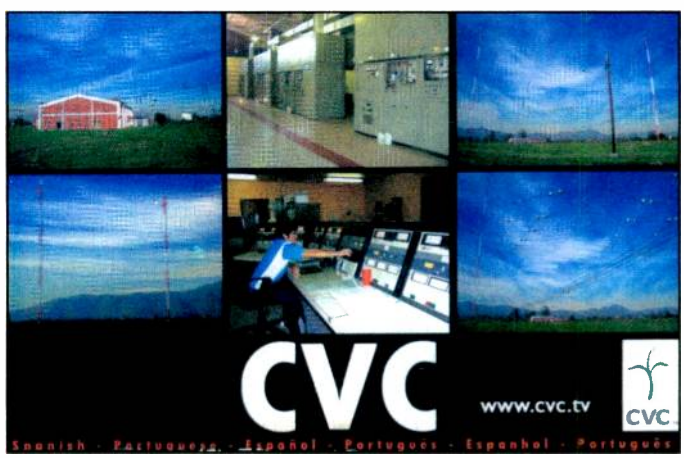
Where Have All The Signals Gone? Gone To 7200 (And Elsewhere) Every One, Plus More Changes Tracked

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

"A new broadcaster, Zimbabwe Community Radio, has begun transmissions on shortwave and, like the others, is in opposition to the Mugabe government."

We're well into the A-09 broadcast season now and I'm sure you've all noticed that many broadcast signals between 7100 and 7199 have disappeared. That's because communication regulatory agencies around the world have agreed that those 100 kHz should be assigned exclusively for amateur radio use. The first broadcasters you'll hear on the 40/41 meter band will normally be at 7200. It's going to be interesting to see whether some stations didn't make the change right away. Certainly the majority did vacate the area, leaving the rest of the band busier as a result.

There is still more action on the Zimbabwe radio front. A new broadcaster, Zimbabwe Community Radio, has begun transmissions on shortwave and, like the others, is in opposition to the Mugabe government. They are broadcasting into Zimbabwe from a site in the UAE (likely Dhabbaya) on 5995. The one hour broadcast is scheduled from 2000 to 2100—a shade too early in the day for anything but exceptional reception here. ZCR devotes its airtime to covering various economic, political, and social issues that the state-owned broadcaster ignores.



Voz Christiana sent this colorful QSL to Bob Combs in New Mexico for his reception of their 15410 frequency.

I'm getting word that Radio Belarus has closed down, apparently due to budget problems. Nothing official has shown up on the Web yet; the official Radio Belarus site still lists 7210, 7255, and 7390 as in use and, indeed, reports of activity on those frequencies have since been noted. So let's leave things up in the air for the moment, until we see how things shake out.

Is Angola gone? Well, the country is still there but Radio Nacional on 4950 has been missing lately, and the 25 meter band outlet that used to be well heard at times has been missing for years—in fact, it isn't even listed any longer. The only other option is 7217, which no one in the U.S. hears. So, if 4950 is really gone then the shortwave situation there barely retains a pulse.

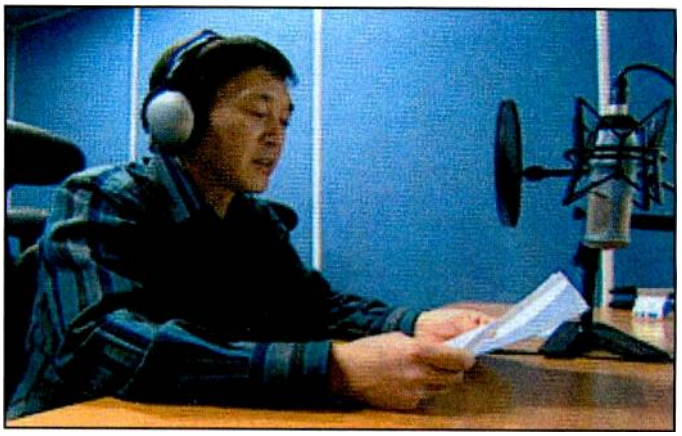
Radio Teilfis Eireann was on shortwave again, on a brief, test basis, with a transmission beamed from Meyerton, South Africa. Word is that this test might result in RTE beginning a regular service for Africa. However, RTE has not expressed much enthusiasm for shortwave in decades. We'll see.

Reader Logs

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

Here are this month's logs. All times are in UTC. Double capital letters are language abbre-

An RFE/RL QSL confirming reception of its Radio Liberty broadcast via Thailand. (Thanks Bob Combs, NM)



This is Kim Seong Min, founder of Free North Korea Radio, in the station's Seoul studio, transmitting via Gavar, Armenia, on 7530. (Thanks Rich D'Angelo, PA)

viations (SS = Spanish, RR = Russian, AA = Arabic, etc.). If no language is mentioned English (EE) is assumed.

ANGUILLA—Caribbean Beacon/University Network, 6090 at 0635 with Melissa Scott preaching. (Maxant, WV)

ARGENTINA—RAE, (p) 6060 at 1015 in JJ with SS music and 11710.7 at 0142 with *DX Special* pgm and loggings from various sources, including my own. (Alexander, PA) 15345 with news in SS at 1805. (Maxant, WV)

ASCENSION—BBC South Atlantic Relay, 7160 with vocals at 0410 and 13590 with DJ hosting vocals at 0600. (Maxant, WV)

AUSTRALIA—Radio Australia, 6020 at 0913 in EE/Pidgin. (Yohnicki, ON) 6020-Shepparton at 1240 with discussion and 11945 at 0820 with *Pacific Break* pgm. (Wood, TN) 6020 at 1010, 7240 at 1435, 11650 with weather at 2130, 13690 at 2345 on children who disappear, 15230 at 2245 on lowering the voting age and 15515 at 0335 on colder fall weather. (Maxant, WV) 6080-Shepparton in Pidgin at 2020. (Ng, Malaysia) 11880 with news at 1705. (Brossell, WI) 12010-Darwin at 2235 on international banking and 12080-Brandon at 2226 reporting on the fire situation, //12010. Also 15560-Shepparton at 2340 on Australia and the world economy. (Ronda, OK) 13630 at 2148 with pops, and 17795 at 2335 with news items. (MacKenzie, CA)

ABC Northern Territories Service: 2310-Alice Springs at 1243 with M/W about reading. (Strawman, IA) 2325-Tennant Creek at 1124 with strongest signal of the three. (Wilkner, FL) 2485 at 1241 on politics in PNG. (Ronda, OK)

HCJB-Australia, 11750-Kununurra, at *0729 sign on and into youth program. (Wood, TN) 15400-Kununurra with EE ID and into CC at 1030. (Ng, Malaysia) 15525-Kununurra at 2235 with Bible quotes. (Maxant, WV)

AUSTRIA—Adventist World Radio, 17610-Moosbrunn at 1450 ending pgm in (I) Afar, into IS loop and off at 1500. (Ronda, OK)

BANGLADESH—Bangladesh Betar, 7250 at *1228 with flute IS, more flutes and muffled talk at 1230. Hard to make out any more due to weak, muffled audio and low modulation as well as ham QRM. (Alexander, PA)

BELARUS—Belarus Radio, 7360 with vocals heard at 2120. (Maxant, WV)

BOLIVIA—Radio Mosoj Chaski, Cochabamba, 3310 at 0916 with vocals and talk in QQ. (D'Angelo, PA) 1010 with indigenous music. (Wilkner, FL)

Radio Santa Ana, Santa Ana de Yacuma, 4451.2 at 0030 under an EE voice UTE. (Wilkner, FL)

Radio Yura, Yura, 4717 at 1045 with *flauta andina* and one ID. (Wilkner, FL)

Radio Tacana, Tumupasa, 4781.3 at 1030 with a weak signal. (Wilkner, FL)

Radio Fides, La Paz, 6155.3 at 1035 with SS talk, short music breaks, ID. (Alexander, PA)

BOTSWANA—Voice of America Relay, 4930 at 0320 discussing parliamentary system in Kenya. (Parker, PA) 12080 in (I) Hausa at 1709. (Brossell, WI)

BRAZIL—(All broadcasts in PP) Radio Educadora, Limeria, 2380 at 1157 with W ancrs, ID and maybe into news. (Taylor, WI)

Radio Muncipal da Cachoeira, 3375 (p) at 1020 with domestic music, mentions of Brazil but no formal ID noted. (Wilkner, FL)

Radio Immaculada Conciecao, Campo Grande, 4744.9 at 0346 with lively ballad, M with ID, pgm previews, more vocals. (Taylor, WI) 0420 with M talk, CODAR QRM. (Parker, PA)

Radio Alvorada, Londrina, 4865 at 0335 with M ancr, W singing. (Parker, PA) 0345 with M talks. (Ronda, OK)

Radio Clube do Para, Belem, 4885 at 0325 with reverb over rock. (Parker, PA) 0703 with M ancr in overdrive with Brazil party music. (Wood, TN)

Radio Difusora Acrena, Rio Branco, 4885 at 0328 with M talk, ad string. (Ronda, OK)

Radio Anhanguera, Anhanguera, 4905 at 0154 with snappy music and very brief anmts by W. (Parker, PA)

Radio Difusora, Macapa, 4915 at 0526 with M ancr with Jimmy Buffett song. (Parker, PA) 0620 with uptempo songs. (Wood, TN)

Radio Capixaba, Vitoria, 4935 with M singing at 0315. (Parker, PA)

Radio Nossa a Voz, Osasco, 4974.8 at 2330 with M talks, poor. (Parker, PA)

Radio Brazil Central, Goiania, 4985 monitored at 0351 with pop vocals, M ancr and time checks. (D'Angelo, PA) 0515. (Parker, PA)

Radio Aparecida, Aparecida, 5035 at 2225 with M/W reading various items with music bridges between. (Parker, PA)

Radio Indonfidencia, Belo Horizonte, 6010 at 2236 with talk, IDs, light PP pops. (Alexander, PA)

Radio Record, Sao Paulo, 6150 at 2321 with various fast-talking M ancrs, ID, jingles. (D'Angelo, PA)

Radio Nacional Amazonia, 6185 at 2222 with talks. (Brossell, WI) 11780 at 0320 with talks, promos, anmts, and short music breaks. Abruptly off at 0329. (Alexander, PA) 0745 with Latin jazz past TOH. (Wood, TN)

Super Radio Deus e Amor (ex-Radio Tupi), 11765 at 0424 with long talk by M. (Ronda, OK)

0555 with preacher, several IDs at 0602 with frequency and website mention, //9565. (Alexander, PA)

BULGARIA—Radio Bulgaria, 7400 at 2108 with talks in FF. (Brossell, WI)

CANADA— Radio Canada International, 6100 in CC at 2218. (Brossell, WI) 9610 at 1515 on last year's Olympics and 9755 at 2325 with DJ hosting music. (Maxant, WV)

Radio Cultural Amuata broadcasts from this building in Huanta, Peru. It's on 4955. (Thanks Rich D'Angelo, PA)

CBC Northern Quebec Service, 9625 monitored at 1420 with *Sunday Edition*. (Maxant, WV)

CFRX, Toronto, 6070 at 1245 relaying CFRB with several IDs and "news-talk 10-10" slogan. (Wood, TN) 1415 with medical call-in show. (Maxant, WV)

CKZN, St. John's (Newfoundland), 6160 at 0014 with interview, CBC Radio ID. Audible until Radio Nederland sign on at 0158. (Ronda, OK) 2320 with interview. (Maxant, WV)

CHU, Ottawa, 3330 at 2235 and 7850 at 2255 with time signals. (Maxant, WV)

CHAD—Radio Nationale Tchadienne, 4905 at 0535 with FF and local language, ancr with interview with vocalist and several examples of her singing tribal vocals. (Taylor, WI) 0536 with woman in FF and news about Cameroon, ID 0542 and into local music. (Alexander, PA)

CHILE—CVC-La Voz, 17680 in SS with M ancr and music, ID at 2300. (MacKenzie, CA)

CHINA—China Radio International, 7259-Urumqi at 2333 in SS. (Brossell, WI) 7290-Shijiazhuang at 1056 with traditional CC music, several "Goverit Radio Kitaya" IDs, f/by W in RR. (D'Angelo, PA) 9570 via Albania at 0040 with comments on texting devices now popular there. Also 11970 via Canada at 2330 on how financial crisis is affecting education in China and 13700 via Canada in SS at 2250. (MacKenzie, CA)

China National Radio/CPBS: PBS, Urumqi, (t) 3990 at 0250 in (l) Uighur with 2 W talking, brief music. Off at 0300. (Taylor, WI) Voice of the Strait, Fouzhou, 4900 at 1240 in listed Amoy. (Strawman, IA) 4940 at 1248 with M in (l) Mandarin. (Ronda, OK) PBS Xinjiang, 4980-Urumqi in (l) Uighur at 0005 but too weak for any details, gone by 0020. (Strawman, IA) 0015 with W in (l) Uighur, later M and then alternating between music selections. (Ronda, OK) 0040 in (p) (l) Uighur with deep-voiced M and two W talking. (Parker, PA) 5945-Beijing with CC weather at 1115. (Ng, Malaysia) 7215-Shijiazhuang at 2332 in CC. (Brossell, WI) 7220-Xi'an at 2350 poor in ham QRM with pgm in VV. Off at 2357. (Ronda, OK) 7245-Beijing at 1350 in EE with W giving weather. (Strawman, IA) 9810 at 1158 carrying China Business Radio. (Alexander, PA)

COLOMBIA—La Voz del Guaviare, San Jose de Guaviare, 6035 heard at 0240 with ballads, SS anmts, IDs. Off with NA at 0303. (Alexander, PA)

CROATIA—Croatian Radio, Deanovic, (p), 3985 in Croatian at 0233 with W ancr talking. (Taylor, WI)

CUBA—Radio Havana Cuba, 6060 at 0545 on sports in Cuba. (Maxant, WV)

CYPRUS—Cyprus Broadcasting Corp., 9760 at 2220 with long conversation in Greek. Off in mid-sentence, per schedule. Only on Friday-Saturday-Sunday. (Ronda, OK)

CZECH REPUBLIC—Radio Prague, 5930 at 2335 on Obama's upcoming visit to Prague. Also 9955 via WRMI on the unusual number of babies being born on Highway C-5. (Maxant, WV)

DJIBOUTI—Radio Djibouti, 4780 at 0407 with vocals, W in AA with ID at 0430. (D'Angelo, PA)

ECUADOR— HCJB Global, 3220-Pifo, ID as "Radio HCJB" at 1000. (Wilkner, FL) 9745 at 0325 in slow English to Africa. (Ronda, OK) 11920 in PP at 2333. Also 12040 in German heard at 2324. (MacKenzie, CA)

HD2IOA, Guayaquil, 3810-lsb at 0652 with time pips and SS anmts. (Wood, TN)

EGYPT—Radio Cairo, 6255 at 2203 with W and EE news and so-called "unbiased news about Islam." (D'Angelo, PA) 6290 in AA at 2235. (Brossell, WI)

ENGLAND—BBC, 3255 via Meyerton at 0317 on Gitmo detainees. (Ronda, OK) 0320 on financial crisis, the future of Tibet. (Parker, PA) 0401 with news, ID and TC at 0406. Also 3380 via Meyerton at 0434 with M in PP, //7205. 7205 at *0427 sign on with instl music with ID but saying "no program on this channel at the moment." Opened with Big Ben and into PP. (D'Angelo, PA) 3255 via Meyerton at 0427, 0430 with full ID and pgm preview. (Taylor, WI) 5875 Cyprus Relay at 0335 in Dari service, M/W alternating comments. (Strawman, IA) Also 6020 Oman Relay at 2200 with CC talk on 50th anniversary of China's occupation of Tibet and 11835 Singapore relay at 1355 with "BBC Bangla" ID and off at 1400. (Ng, Malaysia) 6085 with *Newsworld* at 0405. (Yohnicki, ON) 6110 Thailand Relay at 1308 in (l) II. (Brossell, WI) 7435 Cyprus Relay at 0034 in Dari, then Pashto. They don't use their usual continuity across the top of the hour (time pips, Big Ben) that they use for most other languages. (Taylor, WI) 7395 via Tashkent at 0145 with religious instrumentals. (Maxant, WV) 9740 Singapore Relay at 1345 with news and actualities. (Strawman, IA)

FEBA Radio, 9550 via Rwanda in AA at 1939. (Brossell, WI)

CVC, 15745 via Julich with phone-in pgm at 1619. (Ronda, OK)

EQUATORIAL GUINEA—Radio Nacional, Malabo, 6250 with abrupt sign on at 0605 with SS talk, IDs, short breaks of Afro-pop. Irregular operation. (Alexander, PA)

ERITREA—Radio Bana (p) 5100 at 0412 with M in Trigrinya, HOA vocals. (D'Angelo, PA)

Voice of the Broad Masses, 7175 at *0356 with IS, M ancr with multiple ID languages, then into Amharic. (D'Angelo, PA) 7210 at *0355 with Program One and IS/ID sequence, talk at 0400. (Alexander, PA)

ETHIOPIA—Radio Ethiopia, 9705 at *0259 sign on with electronic keyboard IS, Amharic talk at 0300, HOA music at 0302. Threshold signal on 5890 at 0334. (Alexander, PA) 9705 at 1455 talking about Allah. (Maxant, WV)

Radio Fana, 6110 at *0257 sign on with IS, opening ID and into light jazz and HOA music. Covered by Albania at 0327 and by BBC at 0400. (Alexander, PA) 0400 in Amharic after Tirana signs off. (Ronda, OK)

Voice of the Tigray Revolution, 5950 at 0420 in Tigrinya under Family Radio. (D'Angelo, PA) 5980 at *0254 with IS, talk at 0300, HOA music at 0301, //5950 weak. (Alexander, PA)

Help Wanted

We believe the "Global Information Guide" offers more logs than any other monthly SW publication (Nearly 540* shortwave broadcast station logs were processed this month!). Why not join the fun and add your name to the list of "GIG" reporters? Send your logs to "Global Information Guide," 213 Forest St., Lake Geneva, WI 53147. Or you can email them to gdex@wi.rr.com. Please note that attachment files do not always go through. See the column text for formatting tips.

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

Lake Uzungol (or a photo of it) graces this Voice of Turkey QSL received by Paul Gager, Austria.

FRANCE—Radio France Interna-tional, 7315 at 0415 with *Africa Reports*. (Parker, PA) 0424 with several EE features. (D'Angelo, PA) 11615 at 1630 with EE ID and into pops. (Brossell, WI) 11725 at 0727 with world news. (Wood, TN) 11830 via South Africa in CC at 2340. (MacKenzie, CA)

GERMANY—Deutsche Welle, 9655 Rwanda Relay at 0045 in (p) German. (Strawman, IA) 9775 Rwanda Relay in GG at 0024, //11690. (MacKenzie, CA) 11690 via South Africa at 1912 with a report on neo-Nazis and 11725 Rwanda Relay in GG at 1912. (Brossell, WI) 1950. (Maxant, WV) 17700 Sri Lanka Relay in RR at 0115. (Ng, Malaysia)

GREECE—Voice of Greece, 7475 with Greek vocals at 2250. (Maxant, WV)

GUATEMALA—Radio Buenas Nuevas, 4799.8 at 0225 with M in SS, children singing, call-in. (Parker, PA) 0420 to 0437* close. (Alexander, PA) 1116 with religious pgm and full ID. (Wilkner, FL)

HONDURAS—Radio Luz y Vida, Santa Barbara, 3250 at 0101 with extended SS talk. (Strawman, IA) 0322 in SS, into songs at 0325. (Ronda, OK) 1120 in EE and SS. (Parker, PA)

Radio Misiones Intl, Tegucigalpa, 3340 at 0647 with soft Christian pops. (Wood, TN) 0743 lively SS music, some contemporary Christian music. (Anderson, PA)

INDIA—All India Radio, 4920-Chennai with EE news at 1230. (Ng, Malaysia) 6010-Thiruvananthapuram in Hindi at 1248 and 5990-Bangaluru in (l) Sindi at 0135. (Strawman, IA) 5010-Thiruvananthapuram in Hindi at 1245, 9435-Bangaluru with news at 1430 and 9870-Bangaluru in Hindi at 0130. (Ronda, OK) 9445 at 1950, 9705 at 2245 and 11620 at 2115. (Maxant, WV) 9870-Bangaluru in (p) Hindi at 1320 and 11585-Delhi in (p) Hindi at 1333. (Brossell, WI)

4790-FakFak in II at 1251, also with pops (Strawman, IA) 4790 in II at 1125. (Taylor, WI) 1340 with telephone interview, 1357 SC1 theme, ID and into network news. (Ronda, OK)

Voice of Indonesia, 9525v at 1335 with EE talk on economic development there. Closing EE and into Malay at 1403. (Alexander, PA) 1445 with songs in (l) Malaysian and off at 1502. Another date there was IS at 1257, ID and into EE news at 1300. (Ronda, OK)

IRAN—Voice of Islamic Republic of Iran, 15545 in AA at 1349. (Brossell, WI)

ISRAEL—Kol Israel, Yavne (p) 11595 at 1637 with man giving speech in Farsi, brief anmt, ME-style music and an interview. (Taylor, WI)

Galei Zahal, 6973 at 0504 with talks in Hebrew. (Brossell, WI)

ITALY—Italian Radio Relay Service, 7290 via Slovakia with only an open carrier at 2037. *World of Radio* in progress at 2042. IRRS closing anmts at 2059, anthem and then off at 2101* (Alexander, PA)

JAPAN—Radio Japan/NHK, 11665 at 2322 with classical music. (Strawman, IA) 13650-Yamata with "easy" JJ lesson at 0015 and 15195-Yamata with talk in JJ at 0205. (Ng, Malaysia) 13650 in JJ at 2257. (Barton, AZ) 13650 in Thai at 2313, 17605 in JJ at 2300, 17810 in II at 2330. (MacKenzie, CA) 17810-Yamata in II at 2335 and into Mandarin heard at 2340. (Ronda, OK)

Radio Nikkei, 3925 with jazz at 1218. (Strawman, IA) 9760 in JJ at 0420. (Ronda, OK)

KUWAIT—Radio Kuwait, 11990 at 1810 on religious education in Kuwait schools. (Maxant, WV) 1832 with EE news. Also on 9855 at 1924 in AA. (Brossell, WI)

LIBERIA—ELWA, Monrovia, 6070 at 2257, audible only after Romania closes. Poor under a strong CFRX. NA at 2301 and off. (Alexander, PA)

LIBYA—Radio Jamahiriya/Voice of Africa, 17725, via France, with AA talks at 1440. (Maxant, WV)

LITHUANIA—Radio Vilnius, 7325 with world news in EE monitored at 2335. (Brossell, WI)

MADAGASCAR—RTV Malagasy, 5010 from *0250 with abrupt sign on, local and Euro-pops, IS at 0256, anthem at 0258 f/by a short anmt in Malagasy at 0301, then local music and talk. (Alexander, PA) 0412 with lively Afro-pop. (Ronda, OK)

MALI—RTV Malienne, Bamako, 5995 at 0755 to 0801 close. Vernacular talk and flute IS at sign off. Weak co-channel QRM from Australia at their *0758 sign on. (Alexander, PA) 2248 poor, with high-pitched string and flute music, rapid fire FF talk, Afro-pops. FF ID at 2300. (Ronda, OK) 2250 with M in FF hosting pgm of highlife vocals. (D'Angelo, PA) 2258 with highlife music through top of the hour. Splatter from Cuba on 5990. (Strawman, IA)

MAURITANIA— Radio Mauritanie, Nouakchott, 4845 at 0612 in AA with Koran. (Wood, TN) 2322 in AA. (Brossell, WI) (p) at 0524 with M doing a long AA vocal. Also 7245 at 0856 with AA vocals and talk until news at 0900. (D'Angelo, PA)

MEXICO—Radio Transcontinental/XERTA, Mexico City, 4800 with W, gansta rap, rock and show pops. M with ID over a Chuck Mangione horn instl monitored at 0442. (Parker, PA)

Radio Educacion, Mexico City, 6185 heard at 0755 in SS with talk, vocals. (Maxant, WV)

Radio Mil, Mexico City, 6010 at 1103 with continuous Latin vocals and ID, SS anmts. (D'Angelo, PA)

This Month's Winner

To show our appreciation for your loggings and support of this column, each month we select one "GIG" contributor to receive a free book. Readers are also invited to send in loggings, photos, copies of QSL cards, and monitoring room photos to me at *Popular Communications*, "Global Information Guide," 25 Newbridge Rd., Hicksville, NY 11801, or by email to gdex@wi.rr.com. The email's subject line should indicate that it's for the "GIG" column. So, come on, send your contribution in today!

This month's prizewinner is **Rick Barton** of **Phoenix, Arizona**, who receives a Radio Free Asia coffee mug, courtesy of our friends there. Add some coffee and that'll help keep him awake during those early morning DX sessions!

St. Paul Cathedral in Tirana, Albania, is the subject of this Radio Tirana QSL. (Thanks Paul Gager, Austria)

MOLDOVA/Pridnestrovie—Radio PMR, 6240-Grigoriopol, at 2230 with news in EE. (Brossell, WI)

MOROCCO—Radio Medi Un, Nador, 9575 monitored at 2342 with lively AA songs, persistent, rapid flutter. (Ronda, OK)

NETHERLANDS—Radio Nederland, 5860 via Tinang with II service. Closed at 2256. (D'Angelo, PA) 11655 Madagascar Relay at 1827 on elections in Kenya. Also 11805 via South Africa heard at 1917 with *Newsline*. (Brossell, WI)

NEW ZEALAND—Radio New Zealand International, 6170 at 1305 with Pacific news. (Brossell, WI) 1505 with national news at the top of the hour. 9765 at 1005 with NZ weather, pgm schedule, 11725 with national news at 0505, 15720 discussing increase in minimum wage and 17675 at 2240 with south island news and weather. (Maxant, WV) 15720 at 2350 with two M with news and comment. (MacKenzie, CA) 9765 at 0933 with a report of an aircraft going down, and 11725 at 0600 with ID, news. (Yohnicki, ON)

NIGERIA—Voice of Nigeria, 9690 at 1445 in EE and 15120 at 1800 on religions there. (Maxant, WV)

Aso Radio, 15180 via Samara, monitored at *1600 with sign on, African music, opening anmts, talk in (p) Hausa. (Alexander, PA)

NORTH KOREA—Voice of Korea, 6285 in FF at 1125. (Maxant, WV) 15180 in SS at 0010. (MacKenzie, CA)

OPPOSITION—Sound of Hope (to China), 9450 via Taiwan at 1530 in Mandarin with ancr, theme-like music and alternating M/W ancrs. (Taylor, WI)

Radio Mada (t), 5895 via unknown site, (to Madagascar) *0400 sign on with anthem and talk in unid language. Poor in noisy conditions. (Alexander, PA)

Voice of Peace, 7165 at 0401, difficult under ARO splatter. (Strawman, IA)

Ethiopia Adera Dimtse Radio, (to Eritrea), 11835 via Nauen at *1700–1730* with local HOA and open anmts. Amharic talk. Poor to fair. Active only on Saturdays. (Alexander, PA)

Voice of Oromo Liberation Front, (to Ethiopia), 11760 via Germany at *1610 in listed Oromo, //9695. Sunday, Tuesday and Thursday only. (Alexander, PA) 1645 in (p) Oromo. (Brossell, WI)

Voice of Oromo Liberation, (to Ethiopia), 11810 via Germany at *1700 sign on with talk in (l) Oromo and ID. Active only on Sundays and Wednesdays. (Alexander POA)

Radio Xoriyo Ogadenia (to Ethiopia), 9485 via Samara at *1700–1730* with HOA open music, one minute of Koran, Somali talk. Very weak on //7539. Monday and Friday only. (Alexander PA)

Voice of Oromiya Independence (to Eritrea), (t) 9680 via Julich at *1700–1730* in (l) Oromo. Saturdays only. (Alexander, PA)

Radio Oromiya Independence, (to Eritrea) 9680 at 1732–1759* in (l) Oromo with some Afro-pops. Weak. Fridays only. (Alexander, PA)

Voice of Peace and Democracy, (to Eritrea), 7165 via Ethiopia at *0356–0432* with talk in Tigrinya, some HOH music. Mon-Wed-Fri only. (Alexander, PA)

In Times Past...

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

MEXICO—Radio Huayacocotla, Huayacocotla, Mexico, XEJNOC, on 2390 kHz heard at 0131 on February 17, 1966, domestic service in SS with 500 watts. (Dexter, WI)

Voice of Biafra Intl, (to Nigeria), 15665 via WHRI at *2100–2200* with local music, many EE IDs. Fridays only. (Alexander, PA)

SW Radio Africa, (to Zimbabwe), 11745 via Madagascar at 1753 with EE discussion. (Ronda, OK) 1756. (Brossell, WI) 1804. (D'Angelo, PA)

Voice of Democratic Eritrea-Ethiopians for Democracy, (to Ethiopia), 11835 via Nauen heard at *1700 with HOA at sign on, ID, talk in Amharic. (Alexander, PA)

Voice of the People, (to North Korea), 3912 in KK at 1222, 6600 at 1155 with M in KK, //6518. (Barton, AZ)

Furusato no Kaze, (to North Korea), 9880 via Darwin at 1450–1459* with W in JJ, chimes in background, some choral music. Off at 1459. (Ronda, OK)

Denge Mesopotamia, (to Iraq), 11530 via Belgium, at 1335 with M talking in Kurdish. (Ng, Malaysia)

Democratic Voice of Burma, 5955 via Germany with W in BB at 2340. (Ng, Malaysia)

Wang Shi Sheng (to China), 9930 via Palau at 1327 with chant-like music, MW in Mandarin. (Ronda, OK)

PALAU—T8WH, 15680 with *Gospel Closure* at 0300. (Ng, Malaysia)

PAPUA NEW GUINEA—Radio West New Britain, Kimbe (New Britain), 3235 at 1222 in Tok Pisin to 1230 close. (Taylor, WI)

Radio Bougainville (p), 3325, Buka (North Solomons) at 1030. (Wilkner, FL)

Radio East Sepik, Wewak (New Guinea), 3335 at 1240 in Tok Pisin. American/Australian pop. Off abruptly at 1312. (Taylor, WI)

Radio East New Britain, Rabaul, (New Britain), 3385 at 1316 in Tok Pisin with M talk, US/Australian country songs, EZL, talk about local events. Off abruptly in mid-song at 1312. (Taylor, WI) 1312 with soft choral things, C/W selections in EE. (Ronda, OK)a

PERU—(All in SS) Ondas del Huallaga, Hunaco, 3329.5 at 1045 with rapid conservations. Had been off for four days. (Wilkner, FL)

Radio Huanta 2000, Ayacucho, 4746.9 at 1030. (Wilkner, FL) 0445 with excited talking. (Strawman, IA)

Radio Vision, Chiclayo, 4790 at 0416 with usual preacher addressing congregation over a distorted PA system. (Parker, PA)

La Voz de la Selva, Iquitos, 4824.5 at 1025 with long talk by W. (Wilkner, FL)

Radio Sicuani, Sicuani, 4826.5 at 1025. (Wilkner, FL)

Radio Maranon, Jaen, 4835.4 with music heard at 1115-1130. (Wilkner, FL)

Radio La Hora, Cusco, 4857.4 with M talk over music at 0010. (Wilkner, FL)

Radio San Antonio, Ucayali, 4940 (t) at 1100. Did not seem to be the distorted Venezuelan. (Wilkner, FL)

Radio Madre de Dios, Puerto Maldonado, (t) 4950 at 0125 with W talk. (Parker, PA)

Radio Cultural Amuata, Huanta, 4955 at 0009 poor with talk by M, then 2M talking. (Ronda, OK) (p) 0057 with "Cultural" ID, boisterous M ancr at 0110, brief music and off. (Parker, PA)

Radio Manantial, Huancayo, 4990.9 at 0000 with M talk and in/out fades. (Wilkner, FL)

Radio Libertad, Junin, 5039.2 at 1030 with lively Andean flutes over DJ talk. (Wilkner, FL)

Radio Bolivar, Ciudad Bolivar, 5460.1 with music at 0010. (Wilkner, FL)

Radio Tawantinsuyo, Cusco, 6173.8 weak at 0000. (Wilkner, FL)

PHILIPPINES—Radio Veritas Asia, 9615 in (l) Mandarin at 1130–1155* and off with EE ID. (Alexander, PA) Closed with ID at

The German service staff at the Voice of Turkey. (Thanks Paul Gager, Austria)

One of Radio Ukraine International's recent QSLs. (Thanks Paul Gager, Austria)

1156. (D'Angelo, PA) 11935 in (l) Karen at 0018, into Tamil at 0030. (Ronda, OK) 15530 at 0100 with EE ID and into Telegu language. (Ng, Malaysia)

KFBS, 12090 in EE. Sudden sign off at 1258 with KFBS and FEBC IDs. (MacKenzie, CA)

PIRATES—MAC Shortwave, 6925am/u, variously, at *1557, 1628, *1658, *1749, 2109, 2130, 2158, *2230, 2354, *2230, 2234, *2322 and 2354. Often signs on with Radio Prague IS, sometimes with Paul Harvey news segments, *Paul Star Show*, Commander Bunny, oldies rock. Wide variety of stuff. macshotwave@yahoo.com for reports. (Zeller, OH)

WBNY, 6925u at 1426 very poor with some talk by Commander Bunny, one mention of Al Fansome. (Zeller, OH)

Radio Free Speech, 6913.5 at 1850 with a repeat of an earlier program featuring a *Chicken Man* episode, the Story Lady, "Twilight Zone" and songs. (Hassig, IL)

WTCR, 6925u at 0120 soft pop. Strong with good audio. Said to QSL via Box 1, Belfast, NY. (Hassig, IL)

Channel Z Radio, 6934.5 at 2338 with various rock things. Said this was a long-distance transmission. QSL via channelzradio@gmail.com. (Hassig, IL)

WNKR Relay, 6925 at 2116 somebody relaying this Euro pirate playing rock. Appeared to have transmitter trouble. Off at 2132, on again and off again at 2134. (Zeller, OH)

WQAAZ, 6925u at *2334–2346* with rock and parody commls. Possible address wqaaz@mail.com. (Zeller, OH)

Ann Hofer Live, 6925u at 2045 with Ann playing her usual cover tunes. (Lobdell, MA) 2143 with her playing guitar and singing soft pop. (Hassig, IL)

93Q, 6925u at 2224 with dance music. (Hassig, IL)

WEAK, 6925u at 0006 with mostly obscure rock. Many IDs making fun of their "weak" signal. Gave weakradio@gmail.com for reports. (Zeller, OH)

Radio Playback Intl (Euro), 6874 at 0245 with weak pops. Formerly on 6850. (Alexander, PA)

Reflections Europe (p) (Ireland), 6295 at 2218 with religious music but very weak with adjacent channel splatter from Egypt-6290 and occasional RTTY. Sundays only. (Alexander, PA)

POLAND—Radio Polonia, 11657 via Germany at 1400 with IDs in RR/EE, then into RR. (Ng, Malaysia)

PORTUGAL—RDP International, 9455 in PP at 0050 with vocals. (MacKenzie, CA) 0135 with music and W talk. (Maxant, WV) 11635 at 1635 with live sports call in PP. (Brossell, WI)

ROMANIA—Radio Romania International, 6115 at 2155 giving their email address before EE close at 2155. (Ng, Malaysia) 2323 with *Report of the Day*. (Brossell, WI) 9610 at 2315 saying Romania has fewer banks than other nations. (Maxant, WV)

RUSSIA—Voice of Russia, 6180 in JJ at 1300, QRM from Voice of Korea-6185. Also 7260-Vladivostok with *New and Views* at 1515. (Ng, Malaysia) 6185-Samara in RR at 1300, 7240-Armavir with *Moscow Mailbag* at 0510, //7335 via French Guiana. Also 11610-Moscow in AA at 1703. (Brossell, WI) 6240 with EE news at 0406. (Yohnicki, ON) 7335 with Enrique Caruso vocals at 0550. (Maxant, WV) 9855-Vladivostok on vitamins at 0411. Also 9900-Samara at 1335 with choral selections, then talk in (l) Pashto/Dari at 1338. (Ronda, OK) 12010-Samara at 2328 in EE. (MacKenzie, CA)

Magadan Radio, 7320 in RR at 2335. (Brossell, WI)

Radio Rossii, (p) 7200-Yakutsk in RR at 1214. (Taylor, WI)

RWANDA—Radio Rwanda, 6055 with M in vernacular monitored at 0525. (Maxant, WV)

SAO TOME—Voice of America Relay, Pinheira, 4960 in Hausa at 0520. (Parker, PA) 6080 at 2112 but poor with EE talk in studio. (Ronda, OK)

SEYCHELLES—BBC Relay, 9410 monitored at 1943 with pgm on yachting. (Brossell, WI)

SIERRA LEONE—Cotton Tree News, 11875 via Ascension at 0733 with CTN News in EE, vernacular at 0740. (Alexander, PA)

SOUTH AFRICA—Channel Africa, 7230 at 0550 on Obama, 9475 with talk and vocals at 0510 and 15235 at 1710. (Maxant, WV) 7390 at 0340 on aid groups in Sudan. (Ronda, OK) 7390 on the Nobel Peace Prize at 0344 and 15235 in FF at 1640. (Brossell, WI)

Radio Sondergrense, 3320 at 0311 with pop songs in EE, talks in Afrikaans and 7185 in Afrikaans at 0500 sign on. (Ronda, OK) 7185 at 0508. (Brossell, WI)

SPAIN—Radio Exterior de Espana, 7275-Nobeljas with SS talk and music at 2145. (Ng, Malaysia) 9640-Nobeljas with rap and ID at 1930. (Brossell, WI)

SUDAN—Sudan Radio TV, 7200 at 0409 to 0427* with AA discussion, frequent mentions of Sudan, brief news items at 0424, carrier cut at 0427. (D'Angelo, PA)

Radio Dabanga, 7315 via Wertachtal at *0429 opening with music at 0430, AA ID and anmts, then news with several IDs. (D'Angelo, PA) 9830 via Germany at 0515 with AA talk, IDs but very weak. Better on 7315. 13800 not heard. (Alexander, PA)

Miraya FM, 15650 via Rimavska Sobota *1500 with group singing, time pips, ID in EE, then into AA. (D'Angelo, PA) 1608 with AA talk, EE from 1615–1654. (Alexander, PA)

SWAZILAND—Trans World Radio, 3200 poor at 0302 with M talk buried in noise. Also 3240 with M in (l) Shona at 0311 and 4775 at 0401 with short talks in German between hymns. (Parker, PA) 3200 at 0402 with W in German, choir selections, //4775 was good. (D'Angelo, PA) 3240 ending Shona at 0330 and into Ndau pgm. Also 5995 at 0413 talk in listed Chewa, off 0415 per sked. (Ronda, OK) 4755in (l) Lomwe at 0347. (Brossell, WI) 9720 at 1927 in (l) Moore language. (Brossell, WI)

SWEDEN—Radio Sweden, 5850 at 2250 with offerings by Bob Dylan and interview with same. Also 6010 via Canada monitored at

0350 on drinking there. (Maxant, WV) 9895 at 2049 on animal behavior during earthquakes. (Brossell, WI)

IBRA Radio's *True Light* pgm, 5900 via Petropavlovsk-Kamchatka, poor in Mandarin at 1205. (Ronda, OK)

SYRIA—Radio Damascus, 9330 at 1844 in GG with local music, into FF at 1900. 12085 not heard this date but 12085 noted at 1840 on another date with strong carrier but low modulation. 9330 not heard on this date. (Alexander, PA) 12085 at 2112 with EE news with lots of anti-Israel items, W vocals and more features. (D'Angelo, PA)

TAIWAN—Radio Taiwan Interna-tional, 7185-Koohu at 1212 with alternating ancrs in Mandarin. (Taylor, WI) 1235 with CC talk. (Ng, Malaysia)

TANZANIA—Radio Tanzania-Zanzibar, 11735 at 1800 with "Spice FM" news to 1809, local music and Swahili talk. (Alexander, PA)

THAILAND—Radio Thailand, 9535-Udon Thani, at 2042 with M/W and EE news, ID, gongs and into Thai at 2045. (D'Angelo, PA) 9725-Udon Thani at 1420 on OPEC oil prices and their effect on SEA (Barton, AZ) 12095-Udon Thani at 0044, EE pgm with comls, wide variety of features, weather, chimes, gongs, NA and into Thai. (Ronda, OK) 0045. (Maxant, WV) 0058 ending EE and into Thai at 0102. (Alexander, PA)

TURKEY—Voice of Turkey, 5960 at 2310 on a water fair festival. (Maxant, WV) 6165 in TT at 2140 and 11735 *Let's Learn Turkish* (Ng, Malaysia) 12035 monitored at 1335 with world news in EE. (Brossell, WI)

UGANDA—UBC/Radio Uganda, 4976 at 0407 with M heavily accented EE and music, muffled audio. (Strawman, IA; Ronda, OK) 0415 with EE discussion, W with pop vocal and jingle ID. (D'Angelo, PA)

UKRAINE—Radio Ukraine Intl, 5850 with local vocals at 2255. (Maxant, WV) 7440-Lvov at 0345 with chorals. (Ronda, OK) 7510 on sexism in Ukraine. (Brossell, WI)

USA—Voice of America, 7575 at 1304 on the Middle East. (Wood, TN) 1345 with *Earth and Sky*. Also 9320 Sri Lanka Relay at 1210 with news. (Ng, Malaysia) 9760 Philippine Relay at 1550 and 11610 Philippine Relay at 2310 on stem cell research. (Strawman, IA) 2248 with news, weather for US and Asian cities, editorial about Zimbabwe and human rights. (D'Angelo, PA) 2340 with world news, also 15385 in CC at 0005. (MacKenzie, CA)

Radio Free Asia, 7470 via Mongolia (p) at 1234 in unid Asian language, TS at 1300 then more talk. (Ronda, OK) 7540 via Tadjikistan in CC at 2320, Also 7550 Tinian Relay in (l) Tibetan at 2340. (Strawman, IA) 9440 in Mandarin at 1527. (Taylor, WI) 15550 via Northern Marianas in CC at 2330 and 15565 via Vladivostok in VV monitored at 2354. (MacKenzie, CA)

Radio Marti, 5980-Greenville in SS at 1235. (Wood, TN)

Radio Free Afghanistan, 9990 Sri Lanka Relay at 1120 in unid language with talks, short instl breaks, "Radio Azadi" IDs. Poor in noise by 1331* close. (Alexander, PA)

Family Radio/WYFR, 6240 via Moldova in EE at 2148 to 2200 close. (D'Angelo, PA) 7175-Petropavlovsk-Kamchatka with EE phone-in at 1415. (Ronda, OK) 7175 via Irkutsk in VV at 1208 and 9280 via Yunlin, Taiwan, in Mandarin at 1507. (Taylor, WI)

Adventist World Radio, 11675 via Guam with *Wavescan* at 1530. (Ng, Malaysia) 15240 at 1951 with local vocals and anmts in EE. (Brossell, WI)

KJES, Vado, 11715 with W preaching and child accompanying. ID in EE/SS, children singing, into SS sermon heard at 1504. (D'Angelo, PA)

Sudan Radio Service, 17745 at 1500–1530 with *Let's Talk* pgm with a radio drama and talk of women's rights and equality in Sudan. (Alexander, PA)

VATICAN—Vatican Radio, 7250 at 2110 discussing miracles. (Maxant, WV) 0753 alternating AA talk. Closedown anmts and IS before carrier off at 0808. (D'Angelo, PA) 7335 in RR at 0343. (Brossell, WI) (t) 11740 at 0717 with seeming African news. (Wood, TN)

VIETNAM—Voice of Vietnam, 5975 with VV talk at 0040. (Ng, Malaysia) 7220 (p) -Son Toy in Mandarin at 1220. (Taylor, WI) 9839.9 with Asian news in EE by M at 1235. (Strawman, IA)

ZAMBIA—Radio Zambia, 5915 at 0351 with W in vernacular and vocals. (Ronda, OK)

CVC/The Voice-Africa, 4965 with Bible quotes at 0350, 7160 at 0515 in EE and 13650 at 1530 giving website info. (Maxant, WV) 7160 at 0415 with EE talk, gospel songs. (Ronda, OK) 0520 with riddles and mentions of their website oneafrica.com.

ZIMBABWE—Radio Zimbabwe/ ZBC, 3396 at 0305 in EE and vernacular, mellow ballads and Afro-pop with brief talk in between. (Taylor, WI) 0356 with anthem-like vocal group, ID at 0400 and news in vernacular. Also 4828 at 0410 with lively non-stop highlife vocals and pops. Transmitter break from 0446-0453. (D'Angelo, PA) 0325 with traditional unaccompanied African chorals. (Ronda, OK)

And...that's it! Let's hear it for the following folks who factored in this time: Brian Alexander, Mechanicsburg, PA; George Zeller, Cleveland, OH; Peter Ng, Johor Bahru, Malaysia; Jerry Strawman, Des Moines, IA; Rich D'Angelo, Wyomissing, PA; Rick Barton, Phoenix, AZ; Jim Ronda, Tulsa, OK; Stewart MacKenzie, Huntington Beach, CA; Robert Brossell, Pewaukee, WI; Joe Wood, Greenback, TN; Robert Wilkner, Pompano Beach, FL; Michael Yohnicki, London, ON; William Hassig, Mt. Prospect, IL; Chris Lobdell, Tweksbury, MA; Charles Maxant, Hinton, WV; Mark Taylor, Madison, WI and Richard Parker, Pennsburg, PA. A gigantic thanks to each one of you!

Until next time, 73 and good listening!

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

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

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

UTC	Freq.	Station/Country	Notes
0000	9570	"China Radio International, via Albania	
0000	9775	Deutsche Welle, Germany, Rwanda Relay	GG
0000	15180	Voice of Korea, North Korea	SS
0000	13650	Radio Japan	
0000	9575	Radio Medi Un, Morocco	
0000	4845	Radio Mauritanie, Mauritania	AA
0000	11935	Radio Veritas Asia, Philippines	Karen
0000	4319u	AFN/AFRTS, Diego Garcia	usb
0030	7435	BBC, Cyprus Relay	Pashto/Dari
0100	11710	Radiodifusion Argentina al Exterior	
0100	5025	Radio Rebelde, Cuba	SS
0100	17700	Deutsche Welle, Germany, Sri Lanka Relay	RR
0100	4955	Radio Cultural Amauta, Peru	SS
0100	9455	RDP International, Portugal	PP
0100	12095	Radio Thailand	Thai
0100	6200	Radio Prague, Czech Republic	
0100	5860	Radio Farda, USA, Sri Lanka Relay	Farsi
0130	7395	CVC International, via Uzbekistan	
0130	7235	VOIRI/Voice of Justice, Iran	
0200	11780	Radio Nacional Amazonia, Brazil	PP
0200	4985	Radio Brazil Central	PP
0200	6035	La Voz del Guaviare, Colombia	SS
0200	4780	Radio Buenas Novas, Guatemala	SS
0230	3985	Croatian Radio	Croatian
0300	4755	Radio Imaculada Conciecao, Brazil	PP
0300	4930	VOA Relay, Botswana	
0300	4885	Radio Clube do Para, Brazil	PP
0300	6110	Radio Fana, Ethiopia	Amharic
0300	9745	HCJB Global, Ecuador	EE/SS
0300	9704	Radio Ethiopia	Amharic
0300	3340	Radio Misiones International, Honduras	SS
0300	5010	Radio Madagascar, Madagascar	Malagasy
0300	4790	Radio Vision, Peru	SS
0300	3240	Trans World Radio, Swaziland	vernacular
0300	3320	Radio Sondergrense, South Africa	Afrikaans
0330	6010	Radio Sweden, via Canada	
0330	4775	Trans World Radio, Swaziland	vernacular
0330	7390	Channel Africa, South Africa	
0330	7335	Vatican Radio	RR
0330	4965	CVC-The Voice, Zambia	
0400	7315	Radio France International	
0400	3255	BBC Relay, South Africa	
0400	7110	Radio Ethiopia	Amharic
0400	7210	Voice of the Broad Masses, Eritrea	Amharic
0400	5950	Voice of the Tigray Revolution, Ethiopia	Tigrinya
0400	4780	Radio Djibouti	AA
0400	4800	Radio Transcontinental, Mexico	SS
0400	9855	Voice of Russia	
0400	6240	Voice of Russia, via Moldavia	
0400	7200	Sudan Radio TV Corp.	AA
0400	4976	UBC-Radio Uganda	
0400	5915	Radio Zambia	vernacular
0400	3396	Zimbabwe Broadcasting Corp.	vernacular
0400	4828	Zimbabwe Broadcasting Corp.	vernacular
0430	7205	BBC, South Africa Relay	PP
0430	7315	Radio Dabanga, Sudan, via Germany	AA
0430	6165	Radio Nationale Tchadienne, Chad	FF
0430	5865	RT Algerienne, Algieria	FF
0500	6090	University Network, Anguilla	
0500	4915	Radio Difusora Macapa, Brazil	PP
0500	4905	Radio Nationale Tchadienne, Chad	FF
0500	6060	Radio Havana Cuba	
0500	6973	Galei Zahal, Israel	Hebrew
0500	7240	Voice of Russia	
0500	4960	Voice of America Relay, Sao Tome	
0500	9720	Radio Victoria, Peru	SS
0500	5446	AFN/AFRTS, Florida	usb
0530	5005	Radio Nacional, Equatorial Guinea	SS
0600	6250	Radio Nacional, Equatorial Guinea	SS
0600	13590	BBC Relay, Ascension	
0700	6185	Radio Educacion, Mexico	SS
0700	11740	Vatican Radio	
0730	11875	Cotton Tree News, Sierra Leone, via Ascension	
0800	9690	Voice of Nigeria	Hausa
0900	3310	Radio Mosoj Chaski, Bolivia	SS
1000	6060	Radio Nacional, Argentina	SS
1000	4747	Radio Huanta 2000, Peru	SS
1015	6155	Radio Fides, Bolivia	SS
1030	4717	Radio Yuri, Bolivia	SS
1030	4825	La Voz de la Selva, Peru	SS
1100	3250	Radio Luz y Vida, Honduras	SS/EE
1100	6010	Radio Mil, Mexico	SS
1100	3325	Radio Bougainville, Papua New Guinea	Pidgin
1100	5040	Radio Libertad, Peru	SS
1100	6600	Voice of the People, South Korea	KK

UTC	Freq.	Station/Country	Notes
1100	9910	Trans World Radio, Guam	Mandarin
1130	6160	CKZN, Canada (Newfoundland)	
1130	9615	Radio Veritas Asia, Philippines	Mandarin
1130	2310	VL8A, Northern Territories SW Service, Australia	
1200	4900	Voice of the Strait, China	CC
1200	4790	Radio Republik Indonesia (Fak Fak)	II
1200	3925	Radio Nikkei, Japan	JJ
1200	3235	Radio West New Britain, Papua New Guinea	Pidgin
1200	7200	Radio Rossii, Russia	RR
1200	9320	Voice of America Relay, Sri Lanka	
1200	5980	Radio Marti, USA	SS
1200	7470	Radio Free Asia, USA, via Mongolia	unid
1200	7220	Voice of Vietnam	Mandarin
1200	9840	Voice of Vietnam	
1230	3385	Radio East New Britain, Papua New Guinea	Pidgin
1230	3335	Radio East Sepik, Papua New Guinea	Pidgin
1300	6110	BBC, Singapore Relay	Indonesian
1300	11835	BBC, Singapore Relay	
1300	9870	All India Radio	Hindi
1300	9525v	Voice of Indonesia	various
1300	15545	Voice of Islamic Republic of Iran	AA
1300	11650	KFBS, Northern Marianas	RR
1300	5770	Myanmar Defense Forces Station, Myanmar	BB
1300	9335	Voice of Korea, North Korea	
1330	11585	All India Radio	Hindi
1330	11530	Denge Mesopotamia, via Belgium	Kurdish
1330	12035	Voice of Turkey	
1330	9930	Xi Wang Zhi Sheng, via Palau	Mandarin
1400	6070	CFRX, Canada	
1400	9625	CBC Northern Quebec Service, Canada	EE/FF, vern.
1400	9425	All India Radio	EE, Hindi
1400	17725	Radio Jamahirya/Voice of Africa, Libya	
1400	11675	Polish Radio, via Germany	RR
1400	9725	Radio Thailand	
1400	11735	Voice of Turkey	
1400	11715	KJES, New Mexico	
1430	17610	Adventist World Radio, via Austria	Afar
1430	15650	Miiraya FM, Sudan, via Slovakia	
1430	15140	Radio Sultanate of Oman	AA
1500	9450	Sound of Hope, Taiwan	CC
1500	9440	Radio Free Asia, USA, Northern Marianas Relay	Mandarin
1500	11657	Adventist World Radio, Guam	
1500	17745	Sudan Radio Service, USA, via Portugal	
1500	13650	CVC International, Zambia	
1500	15560	RDP International, Portugal	PP
1600	15745	CVC, via Germany	
1600	11615	Radio France International	
1600	11635	RDP International, Portugal	PP
1600	15235	Channel Africa, South Africa	FF
1630	11595	Kol Israel	Farsi
1630	11760	Voice of the Oromo Liberation, via Germany	Oromo
1700	11880	Radio Australia	
1700	12080	VOA Relay, Botswana	Hausa
1700	11680	Radio Jordan	
1700	11745	SW Radio Africa, via Madagascar	
1700	11610	Voice of Russia	AA
1800	15120	Voice of Nigeria	
1800	11655	Radio Nederland, Madagascar Relay	
1800	11990	Radio Kuwait	
1800	11735	Radio Tanzania, Zanzibar	EE/Swahili
1900	9550	FEBA Radio, England, via Rwanda	AA
1900	9445	All India Radio	
1900	11725	Deutsche Welle, Germany, Rwanda Relay	GG
1900	11690	Deutsche Welle, Germany, via South Africa	
1900	9830	Radio Jordan	AA
1900	11805	Radio Nederland, via South Africa	
1900	9410	BBC Relay, Seychelles	
1900	9640	Radio Exterior de Espana, Spain	
1930	15240	Adventist World Radio via South Africa	
2030	9535	Radio Thailand	Thai
2030	9895	Radio Sweden, via Madagascar	
2100	7400	Radio Bulgaria	
2100	11970	China Radio International, via Canada	
2100	11620	All India Radio	
2100	15665	Voice of Biafra, via WHRI	EE/vernacular
2100	12085	Radio Damascus, Syria	EE, others
2100	7510	Radio Ukraine International	
2100	7250	Vatican Radio	
2100	9580	Africa No. One, Gabon	FF
2100	15190	Radio Africa, Equatorial Guinea	
2130	6100	International Radio of Serbia	
2200	12010	Radio Australia	
2200	15525	HCJB Global, Australia	
2200	17680	CVC-La Voz, Chile	SS
2200	6255	Radio Cairo, Egypt	
2200	7275	Radio Exterior Espana, Spain	SS
2200	5850	Radio Ukraine International	
2200	11610	Voice of America, Philippines Relay	
2230	9760	Cyprus Broadcasting Corp.	wknds, Greek
2230	13700	China Radio International	SS
2230	6290	Radio Cairo, Egypt	AA
2230	6240	Radio PMR, Moldova	EE, others
2230	6070	ELWA, Liberia	
2230	5850	Radio Sweden	
2300	6150	Radio Record, Brazil	PP
2300	9755	Radio Canada International	
2300	7250	China Radio International	SS
2300	11920	HCJB Global, Ecuador	PP
2300	7475	Voice of Greece	Greek
2300	17810	Radio Japan	Indonesian
2300	17605	Radio Japan, via Ascension	JJ
2300	15720	Radio New Zealand International	
2300	5995	Radiodiffusion du Mali	FF
2300	12010	Voice of Russia	
2300	6115	Radio Romania International	
2300	9610	Radio Romania International	
2300	5960	Voice of Turkey	
2300	15565	Radio Free Asia, USA, via Russia	VV
2300	9445	Far East Broadcasting Company, Philippines	Cambodian
2330	17795	Radio Australia	
2330	5930	Radio Prague, Czech Republic	
2330	7325	Radio Vlnius, Lithuania	
2330	5955	Democratic Voice of Burma, via Germany	BB
2330	15550	Radio Free Asia, USA, Northern Marianas Relay	C

New, Interesting, And Useful Communications Products

by Staff

Genesis Radio G40 SDR Transceiver Kit

The new Genesis Radio G40 is an affordable monoband 40 meter, all-mode, 5 watt software-defined radio transceiver designed by YU1LM and produced and distributed as a kit by VK1AA. It offers a frequency range of 7000–7095 kHz utilizing sound card with 96-kHz sampling rate (a sound card with sampling rate of 192 kHz would extend the frequency range to 6953–7140 kHz; frequency range can be extended even further, to 5–7.7 MHz, with external LO). Receiver sensitivity for S/N = 10 dB and bandwidth 500 Hz is between –118 to –120 dBm without RF preamplifier, or from –128 to –133 dBm with RF preamplifier. (Note: receiver sensitivity is sound-card dependent and a high-quality card is strongly recommended.) It supports SSB/CW/FM/Digital or any other modulation-generated mode with quadrature I/Q modulation signals, determined by the software. RF output power is 5 watts, and power supply requirements are +13.8V/100–250 mA on receive and 1.7A on transmit.

The Genesis G40 is tested with the following freeware transmitting software: PowerSDR SR40, PowerSDR-IQ, MØKGK, and Rocky with one or two sound cards. Minimum PC configuration required is P4 1 GHz with 128 Mb RAM and SDR-suitable sound card.

Genesis G40 kit parts are classic through-hole components (not SMT). PCB dimensions: 150 x 195 mm. Retail price is $149. For more information visit www.genesisradio.com.au.

The Genesis Radio G40 is a monoband 40 meter, all-mode, 5 watt software-defined radio transceiver kit that uses through-hole components. It retails for $149.

MFJ 75, 35, and 15 Amp Switching Power Supplies

MFJ offers heavy-duty switching power supplies for powering HF mobile amplifiers or HF and VHF/UHF rigs and accessories. The MFJ-4275MV is compatible with amplifiers with a power requirement of up to 75 amps and delivers 75 amps maximum and 70 amps continuous. It's highly regulated with a load regulation better than 1 percent. Ripple voltage is less than 12 mV peak-to-peak at rated load. It plugs into any 110-VAC wall outlet. MFJ's switching power supplies offer the company's HashSQUASH Filtering System, which eliminates RF hash that can be a problem in switching power supplies. They also offer short-circuit, overload, and over-temperature protection systems, as well as auto restart after a fault, power on and fault LED indicators. Voltage is adjustable from 4 to 16 VDC from the front-panel control. Front-panel meters with backlight let you monitor voltage and current simultaneously. The MFJ-4275MV retails for $399.95.

The MFJ-4235MV model has an output of 30 amps continuous and 35 amps surge (retail $179.95); the MFJ-4215MV has an output of 13 amps continuous and 15 amps surge (retail price is $99.95).

For more information, to get a free catalog, or to find your nearest dealer, contact MFJ at 300 Industrial Park Road, Starkville, MS 39759; Phone: 800-647-1800; Web: www.mfjenterprises.com.

The MFJ-4275MV heavy-duty switching power supply delivers 75 amps maximum and 70 amps continuous.

Platinum Tools' All-In-One Modular Plug Crimp Tool terminates RJ45, RJ11/12, and RJ22 (handset) plugs to solid or stranded cable from most manufacturers.

Platinum Tools

Platinum Tools has introduced its All-In-One Modular Plug Crimp Tool (P/N 12503). The All-In-One is designed for a broad range of telecom and network, security, residential structured wiring, whole house and custom install A/V, as well as professional and commercial A/V applications. The tool combines a rugged design with the convenience of terminating all popular plug configurations used in voice, data, and A/V installations.

Steel framed with PVC handles and rust resistant black oxide finish, the lightweight (12 ounce) All-In-One terminates RJ45, RJ11/12, and RJ22 (handset) plugs to solid or stranded cable from most manufacturers. Three separate crimp cavities (4, 6, and 8 position) are designed to provide precise, repeatable, and reliable terminations and the ratcheting mechanism ensures that optimal pressure is applied. In addition, replaceable cutting blades (P/N 12503BL-C) allow the user to strip round (Cat 3-6) and flat (silver satin) cables.

The All-In-One Modular Plug Crimp Tool is now shipping with an MSRP of $29.95. For more information, visit www.platinumtools.com, call (800) 749-5783, or email info@platinumtools.com.

New Products For Mobile Communications From Callpod

Callpod, a creator of mobile devices and software, has expanded its product line with several new offerings, including the following:

The Fueltank charger ($69.95) can simultaneously charge two small electronic devices, no outlets necessary. It's powered by a rechargeable lithium ion battery that has more than seven times the capacity of a standard mobile phone. The Fueltank utilizes device-specific adapters, allowing users to customize it to meet specific needs. Its voltage regulator senses the amount of power required to charge devices, and LED fuel capacity indicators display when the charging indicator button is pressed. Fueltank will charge devices multiple times without refueling. Compatible with cell phones, iPods, Bluetooth headsets, PDAs, digital cameras, navigation units, mp3 players, digital readers and portable gaming systems, it weighs less than 8 ounces and is ideal for traveling (not for use with notebook computers or other large electronic devices).

The company's Chargepod (from $39.95) is a versatile 6-in-1 charger that simultaneously charges popular portable devices including Blackberrys, iPods/iPhones, Palm Treos, in addition to hundreds of other cell phones, PDAs and portable gaming devices. Devices can be charged at home, in the car or while traveling.

And after your phone is charged up you'll feel more secure with Keeper ($0.99), an application that provides a secure password storage system for the iPhone and other mobile devices. Because information entered into iPhones and similar devices is not secure, and remains unsecure when synced and transferred to a user's PC or Mac, it can be easily stolen. By adding military-grade encryption (128-bit AES), Keeper secures the user's information on both the iPhone and computer. In addition, it facilitates import/export/backup of data, lets users share data between PC/Mac, multiple iPhones, and offers real-time search, and self-destruct mode.

For more information on these and other Callpod products, visit www.callpod.com.

Callpod's Fueltank will charge devices such as cell phones, iPods, Bluetooth headsets, digital cameras, and navigation units multiple times without refueling, making it ideal for traveling.

Enjoy The Old Ball Game The Old-Fashioned Way—On AM Radio

by Bruce A. Conti
BAConti@aol.com

"Amazingly Oliu isn't the first blind baseball announcer. Blind announcer Don Wardlow provided color for the minor league New Britain Red Sox radio coverage in the 1990s, and ended his radio career with the Charleston River Dogs of South Carolina..."

There's nothing else quite like listening to the boys of summer on the radio. Of all the professional sports, baseball is the most perfect fit for radio, especially AM radio with night games allowing for skywave reception of broadcasts from ballparks across the country. As players take their positions on the field and the first batter steps up to the plate, it's easy to imagine being there when the umpire shouts, "Play ball!"

Home Team Advantage

Listening to local announcers who are passionate about their home teams adds a level of intensity to the game that's missing from national radio and TV network coverage. When watching nationally televised baseball games, real fans like to mute the television audio and turn on the radio to catch all the excitement as called by the home team experts. Many radio announcers are in fact well-credentialed former players for their respective home teams, while some are simply ardent longtime fans.

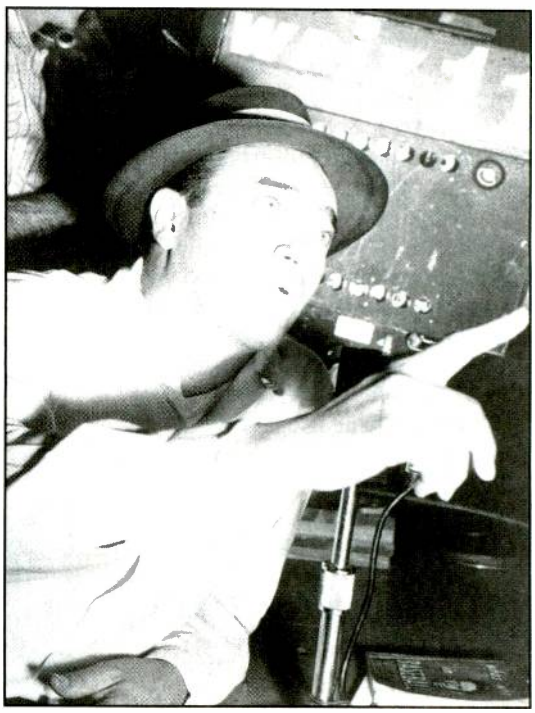
For instance, Ron Santo, starting all-star third baseman for the ill-fated 1969 Cubs, now provides illustrious commentary for the WGN network coverage. Alan Ashby's baseball career spanned 17 years playing for Cleveland, Houston, and Toronto before he retired to become the color commentator for the Blue Jays on "Team 590" CJCL broadcasts, which are carried by a transcontinental Canadian network of AM and FM stations. Professional sports broadcaster Joe Castiglione is now in his 27th year as the familiar radio voice of the Red Sox. Now here's an interesting coincidence: Suzyn Waldman, ironically a former Bostonian perhaps following the footsteps of Babe Ruth, is now the color person for Yankees radio and the first woman to hold a full-time position as a Major League Baseball radio announcer.

The Spanish-language radio announcers come with impressive credentials as well. Atlanta Braves radio analyst Fernando Palacios of "Viva 105.7" WWVA-FM once played for the Caguas Criollos and Arecibo Wolves of the Puerto Rico winter league. Enrique Oliu, the color man for Spanish broadcasts of Tampa Bay Rays baseball on "Genesis 680" WGES, also happens to be blind. (Amazingly Oliu isn't the first blind baseball announcer. Blind announcer Don Wardlow provided color for the minor league New Britain Red Sox radio coverage in the 1990s, and ended his radio career with the Charleston River Dogs of South Carolina, proving that the combination of baseball and radio is indeed a grand slam.)

But don't just listen for the home team announcers, though. It actually can be a lot of fun to listen to an opposing team's commentators for a different perspective on the game.

Radio Stations Broadcasting Baseball Games

Check out our list of radio stations that broadcast Major League Baseball games. The flagship



Listening to baseball on the radio is both exciting and nostalgic, and many of the best announcers have earned a place in broadcast history. Here's one of the greats, Mel Allen, the legendary "Voice of the New York Yankees," in a 1955 photo. (Courtesy Library of Congress, New York World-Telegram & Sun Collection)

radio station for each team is listed first in italics, followed by key affiliates received over long distances at night. Select additional FM and low-power AM radio stations are included only to show the extent of some networks. While the Atlanta Braves network claims to be the largest in baseball, the New York Yankees Radio Network is widely prolific with affiliates as far away as Florida and Alaska. And, not to be outdone, some Boston Red Sox and Seattle Mariners games are carried on "Sports 1242" radio in Japan.

Complete network listings and announcer bios are available online from the flagship radio station websites, baseball team websites, or the mlb.com official site of Major League Baseball, but also keep this list handy as a quick reference while scanning the radio dial. If your favorite team is out of range on AM radio, the live play-by-play of all games is also relayed nationwide on XM satellite radio.

Baseball Worldwide

For year-round coverage of baseball news from around the globe, catch "World Baseball Today" on WRMI *Radio Miami International* at 9955 kHz shortwave. The WRMI program features reports from over 20 baseball organizations worldwide, including China, Cuba, Japan, and the Philippines, as well as

Stations Carrying Major League Baseball

Arizona Diamondbacks
620 KTAR Phoenix
1400 KSUN Phoenix (Spanish)
1540 XEHOS Hermosillo (Spanish)

Atlanta Braves
640 WGST Atlanta
620 WJDX Jackson, MS
850 WRUF Gainesville, FL
940 WMAC Macon, GA
1630 WRDW Augusta, GA
105.7 WWVA-FM Canton, GA (Spanish)

Baltimore Orioles
105.7 WJZ Baltimore
980 WTEM Washington, DC
1310 WGH Newport News, VA

Boston Red Sox
680 WRKO Boston
850 WEEI Boston (alternate)
550 WDEV Waterbury, VT
1080 WTIC Hartford, CT
1150 WWDJ Boston (Spanish)
1242 JOLF Tokyo, Japan (Japanese)
1250 WGAM Manchester, NH
1440 WRED Westbrook, ME
93.3 KJAX Jackson, WY
103.7 WEEI-FM Westerly-Providence, RI

Chicago Cubs
720 WGN Chicago
1260 WNDE Indianapolis, IN
1290 KKAR Omaha, NE
1450 WMVA Martinsville, VA
1650 KCNZ Cedar Falls, IA

Chicago White Sox
670 WSCR Chicago
1200 WRTO Chicago (Spanish)
1600 KGYM Cedar Rapids, IA

Cincinnati Reds
700 WLW Cincinnati
580 WCHS Charleston, WV
950 WXLW Indianapolis, IN

Cleveland Indians
1100 WTAM Cleveland
1460 WBNS Columbus, OH
1590 WAKR Akron, OH

Colorado Rockies
850 KOA Denver
650 KGAB Orchard Valley-Cheyenne, WY
1350 KABQ Albuquerque, NM

Detroit Tigers
1270 WXYT Detroit
97.1 WXYT-FM Detroit

Florida Marlins
790 WAXY Miami
1140 WQBA Miami (Spanish)

Houston Astros
740 KTRH Houston
1010 KLAT Houston (Spanish)

Kansas City Royals
610 KCSP Kansas City
980 KMBZ Kansas City
580 WIBW Topeka, KS
860 KKOW Pittsburg, KS
1640 KFXY Enid, OK

Los Angeles Angels
830 KLAA Orange, CA
980 KFWB Los Angeles
800 XESPN Tijuana
1330 KWKW Los Angeles (Spanish)

Los Angeles Dodgers
790 KABC Los Angeles
930 KHJ Los Angeles (Spanish)
620 XESS Ensenada (Spanish)

Milwaukee Brewers
620 WTMJ Milwaukee
550 WSAU Wausau, WI

Minnesota Twins
1500 KSTP St. Paul-Minneapolis
1400 KMNV St. Paul (Spanish)
570 WNAX Yankton, SD
790 KFGO Fargo, ND
1140 KSOO Sioux Falls, SD

New York Mets
660 WFAN New York
1280 WADO New York (Spanish)

New York Yankees
880 WCBS New York
590 WARM Scranton, PA
600 WICC Bridgeport, CT
620 WVMT Burlington, VT
630 WMFD Wilmington, NC
790 WPRV Providence, RI
1010 WQYK Tampa, FL
1080 KUDO Anchorage, AK
1100 KWWN Las Vegas, NV
1160 WSKW Skowhegan, ME
1180 WHAM Rochester, NY
1270 WTSN Dover, NH
1340 WBRK Pittsfield, MA
92.7 KASR Conway, AR
92.7 WQBU Garden City, NY (Spanish)
97.7 KOTM Ottumwa, IA

Oakland A's
860 KTRB San Francisco
1640 KDIA Vallejo, CA (Spanish)

Philadelphia Phillies
1210 WPHT Philadelphia
1150 WDEL Wilmington, DE
1480 WUBA Philadelphia (Spanish)

Pittsburgh Pirates
104.7 WPGB Pittsburgh
1160 WCCS Homer City, PA
1270 WCBC Cumberland, MD

St. Louis Cardinals
550 KTRS St. Louis
1470 WMBD Peoria, IL

San Diego Padres
1090 XEPRS Rosarito-Tijuana
860 XEMO Tijuana (Spanish)

San Francisco Giants
680 KNBR San Francisco
670 KPUA Hilo, HI
1170 KLOK San Jose, CA (Spanish)
1360 KUIK Hillsboro, OR
1420 KKEA Honolulu, HI

Seattle Mariners
710 KIRO Seattle
550 KTZN Anchorage, AK
1040 CKST Vancouver, BC
1080 KTXX Portland, OR
1240 KSAM Whitefish-Kalispell, MT
1242 JOLF Tokyo, Japan (Japanese)
1490 KBRO Bremerton, WA (Spanish)

Tampa Bay Rays
620 WDAE Tampa-St. Petersburg
680 WGES St. Petersburg (Spanish)

Texas Rangers
1080 KRLD Dallas
1270 KFLC Ft. Worth (Spanish)
1660 KRZI Waco, TX

Toronto Blue Jays
590 CJCL Toronto
600 CKAT North Bay, ON
960 CFAC Calgary, AB
990 CKGM Montreal, QC
1040 CKST Vancouver, BC

Washington Nationals
1500 WFED Washington
1390 WZHF Arlington, VA (Spanish)

WEEI passed out this "K" sign for fans to display when Boston Red Sox pitchers struck out opposing batters.

winter leagues in the Dominican Republic, Mexico, Puerto Rico, and Venezuela, just to name a few. Learn about potential foreign prospects before they get picked up by the major league scouts.

¡Se va, se va, se va, home run! (In English, that's going, going, going, home run!) Listening to games broadcast in Spanish, whether from radio stations in Cuba, Venezuela, or in the United States, you'll hear English words and phrases unique to baseball mixed into the play-by-play. Terms such as foul, home run, and strike typically won't be translated into the announcer's language.

Listen for "béisbol" coverage from *Radio Rebelde* out of Cuba on 600, 670, 710, and 1180 kHz, the most powerful among many AM frequencies, plus 5025 kHz shortwave. Venezuela professional baseball games often reach the United States via YVKS *Radio Caracas Radio* broadcasting at 750 kHz with 100 kW of power. The following list of Venezuela winter league teams (equipos) may help with identification of broadcasts from YVKS Caracas and other Bolivarian radio stations.

Equipos de la Liga Venezolana

Aguilas del Zulia
Bravos de Margarita
Cardenales de Lara
Caribes de Anzoátegui
Leones de Caracas
Navegantes de Magallanes
Tiburones de La Guaira
Tigres de Aragua

Games are most frequently heard by long-distance listeners on 750 YVKS Caracas, 1020 YVRS Mundial Margarita, 1070 YVMA Mundial Zulia, and the Unión Radio Deportes network. Consult the *2009 World Radio TV Handbook* for a complete list of Venezuela AM radio stations, any of which may broadcast games.

Broadcast Loggings

Now here's what long-distance listeners are hearing in addition to baseball games in this month's selected logs. All times are UTC.

600 CMKV Radio Rebelde, Urbano Noris, Cuba, at 0157 baseball coverage with a player passing the ball (la pelota) to another player of the same team. Surprisingly good and atop co-channel WICC. (Chiochiu-QC)

612 4QR Brisbane, Australia, at 1130 ABC Radio's "Around Australia" interviewing controversial pastor Rick Warren on Christianity in U.S. presidential politics. Fair to very poor signal. (Park-HI)

612 RTM A, Sebaa-Aioun, Morocco, at 0549 Islamic prayer; peaking to a fair signal level. (Beu-TX)

750 YVKS Caracas, Venezuela, at 0145 Venezuelan baseball topping co-channel WSB Atlanta for a couple of minutes. (Chiochiu-QC)

783 Radio Mauritanie, Nouakchott, Mauritania, heard at 0544 Islamic prayer at low audio level but with a strong carrier. (Beu-TX)

819 ERTU Batra, Egypt, at 0058 a fair signal at peaks with apparent drama or story of some type. Musical interludes possibly for dramatic effect. Parallel 6290 kHz, which was actually a couple of seconds ahead. (Wood-MA) At 0248 fair with Middle Eastern flute music. 0300 time marker (5 pips + 1 higher pitch) and ID. (Conti-NH)

950 WJKB Moncks Corner, South Carolina, at 0015 "Classic country on Saturday Night at the Memories" and WJKB AM 950 ID. Good signal with slight fading. (New-GA)

972 Libyan Jamahiriya, Sirte, Libya, at 0053 good with a speaker in Arabic, then North African instrumental music through the hour with a brief voice-over announcement by a woman, parallel 1053 kHz. (Conti-NH)

980 KFWB Los Angeles, California, at 0857 heard with syndicated talk radio, a departure from the usual all-news format. Good ID at 0900, "KFWB News 980." (Barton-AZ)

981 ERA Athens, Greece, at 0406 heard with a woman singing a slow ballad, parallel 7475 kHz. Weak to a fair peak. New log. (Barstow-MA)

1089 TalkSport, United Kingdom, at 0451 English news/talk peaking to fair signal level. (Beu-TX)

1100 WZFG Dilworth, Minnesota, "The Flag" at 0400 running 50 kW non-directional due to flood emergency, heard under WTAM. I rotated my portable DX440 radio 90 degrees and heard coverage of crisis in Fargo area with am1100.tv website and "24/7 emergency coverage for Red River Valley" announcements. Then the radio was rotated back to hear "Coast to Coast AM" on WTAM. Later heard WTAM announce that some listeners would get interference from WZFG due to the emergency. (Hassig-IL) Received email QSL for reception report in 6 hours, signed Jim Offerdahl, CE. Address: jim@offerdahlbroadcast.com. Minnesota QSL #19. (Martin-OR)

1287 Galei Zahal, Ramle, Israel, at 0246 instrumental music parallel 6973 kHz; poor to fair at times. (Barstow-MA)

1296 SNBC Reiba, Sudan, at 2339 a man in Sudanese Arabic with "Sudan" mention, language verified by Sylvain Naud via RealDX. (Black-MA)

1370 KGNO Dodge City, Kansas, at 0432 while listening to an unidentified relay of China Radio International that yielded to oldies music and a good solid ID at 0450, "AM 1370 KGNO." I would expect at 230 watts this station to just be able to get out of Dodge, but to make it all the way to Arizona? (Barton-AZ)

1380 KTKZ Sacramento, California, at 0458 ID and Web address, "KTKZ Sacramento" into talk and mixing with an unidentified country music station. (Barton-AZ)

1404 ERA Komotini, Greece, at 0344 parallel 1494 and 1512 kHz; in weak to fair. New log. (Barstow-MA)

1422 Radio Algérienne, Algiers, Algeria, at 0045 a good signal over co-channel DLF Germany; woman in French and light vocal parallel 252 kHz longwave. (Conti-NH)

1512 ERA Chania, Crete, Greece, at 0342 with a slow song on guitar, parallel 1404 and 1494 kHz. In good with slop at times from 1510 WWZN Boston. (Barstow-MA)

1540 KMPC Los Angeles, California, heard at 0800 with Latin music and ID on the hour as "Radio Korea, KMPC Los Angeles," then into pop music and announcer in Korean. (Barton-AZ)

1550 WRHC Coral Gables, Florida, at 1059 briefly atop sunrise skip jumble; "This is WRHC, 1550 AM, Coral Gables, Florida," and ID in Spanish. (Conti-NH)

1550 WMRE Charles Town, West Virginia, heard at 1000 on a good signal; "You're listening to Sports Talk 1550, WMRE Charles Town, West Virginia," and Fox Sports News. (Conti-NH)

Thanks to Roy Barstow, Rick Barton, Mike Beu, KD5DSQ, Chris Black, N1CP, Bogdan Chiochiu, William Hassig, Patrick Martin, Bert New, Dale Park, and Steve Wood. I hope you've enjoyed this mid-summer review of baseball on the radio. Looking ahead to the fall classic, *ESPN Radio* will be broadcasting the World Series. May the best team win (as long as it's the Red Sox).

For now, 73 and Good DX!

WJR 760am

This Month In Broadcast History

75 Years Ago (1934)—The Federal Communications Commission (FCC) officially replaced the Federal Radio Commission (FRC).

50 Years Ago (1959)—"Battle of New Orleans" by Johnny Horton was the number one song on 1550 KOBY San Francisco.

25 Years Ago (1984)—The Bible Broadcasting Network commenced broadcasting on radio station WYFH Charleston, South Carolina, later expanding to a network of FM stations in the south plus 1280 VSB2 Hamilton, Bermuda. Controversial radio talk show host Steve White took flight from 920 WHJJ to cross-town rival 550 WGNG in Providence, Rhode Island, in the aftermath of a dispute over his former station's broadcast policies. After years of dominating the airwaves, 760 WJR fell to second place with easy listening 97.1 WJOI the new number one station in Detroit according to the spring Arbitron ratings.

A Mariner's Dozen—12 Antennas For Marine Frequencies

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

After you've had a chance to read this month's cover feature and digest all the information Gordon West, WB6NOA, has provided in his extensive overview of the marine frequencies, your thoughts will naturally turn to how to better receive the signals you'll find there. To help you out, we'll show you how to build 12 (yes, 12) different designs for directional antennas for these frequencies. Be sure to check applicable FCC and maritime regulations, but these antennas will work just fine as transmitting antennas also.

For this column, we're going to divide the maritime VHF bands into three sections and offer up two different kinds of antennas designed for two different coax impedances for each of these three band segments. **Photo A** shows one of the two-element versions, and **Photo B** the higher gain three-element version. Be aware, though, that higher gain may not be the answer if you want to cover most of a harbor, or both directions along a coast. The two-element Yagi has 4 to 5 dB of gain and a broad pattern. The three-element Yagi has 6 to 7 dB of gain and narrower beam with a null off the back.

We'll also cover both 50 and 75 ohm versions. Most scanners are quite "happy" with 75 ohm antennas, and you also get to use RG-59 and RG-6 coax that's often available from old satellite TV systems and cable TV drops. Most transmitters are designed for 50 ohm coax, but 75 ohm coax typically has less loss than 50 ohm, which is why the cable TV systems have standardized on 75 ohm coax. You'll note that the elements are a bit farther apart with 75 ohm coax; that's because I'm using the structure of the Yagi elements themselves to impedance match the driven element to the coax. With just small changes in its length, the same driven element is used on all 12 versions of these "Maritime Antennas."

The elements can be almost any metal rod material 1/8 inch to 1/4 inch in diameter, but for the driven element it's nice to have something you can solder to. I often use bronze welding rod or solid copper wire (#10 to #12 works). For the bronze welding rod I'll use a bit of copper or brass hobby tubing to splice two pieces together when the elements get this long.

Figure 1 shows lengths and spacings for our design, and **Figure 2** shows the basic design for the driven element used on all 12 versions. Use

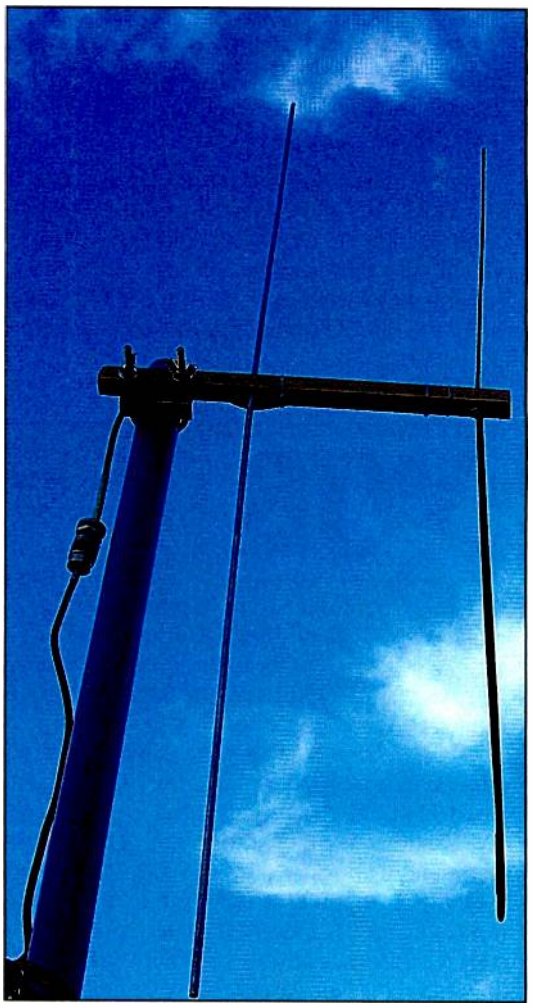


Photo A. The two-element model of the Maritime Yagi.

the "B" dimensions for the length of the driven element. The width of the loop on one side is about 1 to 1 1/2 inches wide, though this is not a critical dimension. Refer to the tables below for the element lengths and spacings.

Antenna Dimensions (in inches)

140 MHz (usable for 135–145 MHz)

	50 Ohm	75 Ohm
2 Element		
A	42.0	43.0
B	38.0	39.0
D	8.5	12.0
3 Element		
A	42.0	42.5
B	38.0	39.0
C	36.0	35.0
D	9.0	11.0
E	25.0	24.0

150–160 MHz

	50 Ohm	75 Ohm
2 Element		
A	38.0	39.0
B	35.5	35.5
D	7.0	10.0
3 Element		
A	38.0	39.0
B	35.0	35.5
C	32.5	31.0
D	7.0	10.0
E	22.5	23.5

160–170 MHz

	50 Ohm	75 Ohm
2 Element		
A	35.5	36.0
B	33.0	33.0
D	7.0	9.5
3 Element		
A	35.5	36.0
B	33.0	33.0
C	31.0	30.5
D	7.5	10.0
E	21.0	23.5

For the boom I usually use 1/2- or 3/4-inch-square wood. A quick coat of polyurethane or varnish will protect the wood from the weather when you finish. PVC pipe can be used, but I'm not personally a fan of PVC plastic as my boom material. The elements can be held in place with a drop of your favorite glue.

A FAQ Break: Coax Attachment

Perhaps the most common question concerning these families of "Cheap Yagis" is how to attach the coax. As you can see in **Photo C**, the shield of the coax gets connected to the long part of the J-shaped driven element, and near its center. The center wire of the coax gets connected near the bottom tip of the J, as shown in **Figure 2**. A few cable ties, a few turns of electrical tape, and once upon a time, even some bread ties have all been used to hold the coax to the boom. Again the coax is soldered directly to the driven element with your favorite connector at the other end of the coax.

Photo B. The three-element model of the Maritime Yagi.

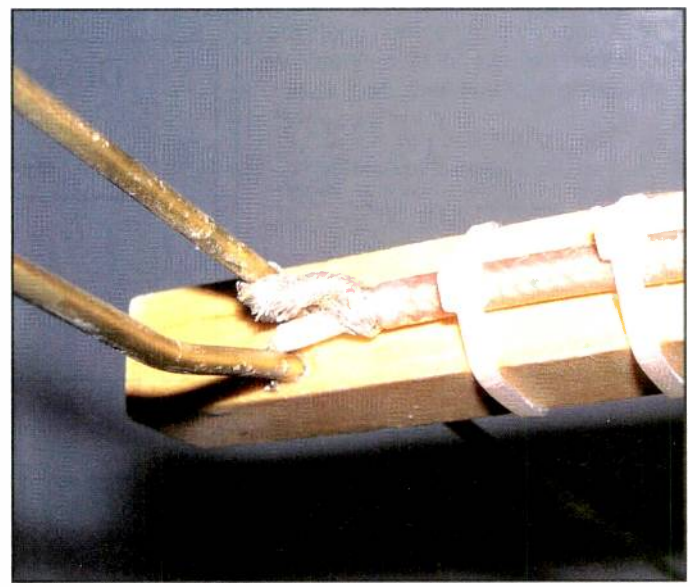


Photo C. Coax attachment.

Mounting

These antennas work great inside attics. This keeps them out of the weather and they'll last 20-plus years. If you plan to mount them outside, some RTV type sealant can waterproof the end of the coax. You don't want water wicking back down the coax braid.

Photo A shows the antenna mounted on a plastic pipe. It's great for photos, but not for bad weather. If you plan to use a metal mast, I suggest having a longer piece of wood for the antenna elements and keeping that first element at least 6 inches away from a metal mast.

Most maritime radio activity utilizes vertically mounted antennas, so mount these Maritime beam antennas with their

elements also mounted vertically for best reception.

Use

In **Plot 1** we have the typical antenna plot for the two-element versions. This plot is very similar for all six versions of the two-element antennas. You have a good 180 degrees of coverage, and even the back of the antenna is not entirely "forgotten."

Plot 2 shows the typical antenna plot for the three-element versions. The three-element Yagi works better when you have a smaller area of interest or need that extra bit of range.

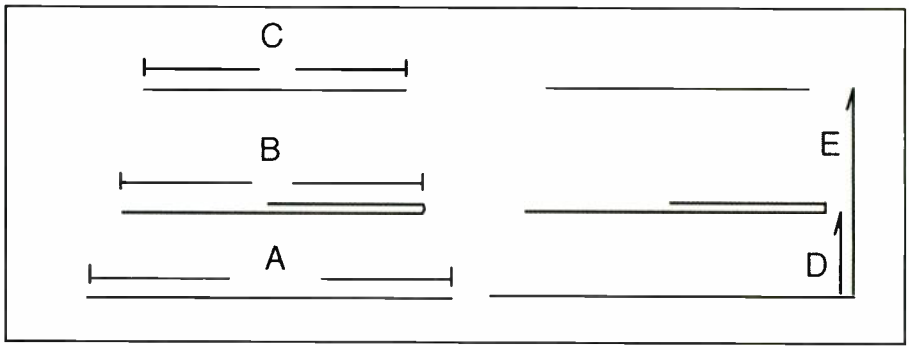


Figure 1. Dimensions for the Maritime Antennas.

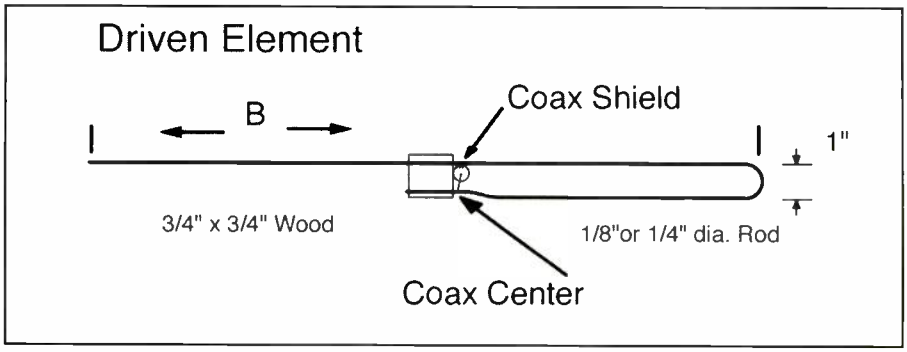
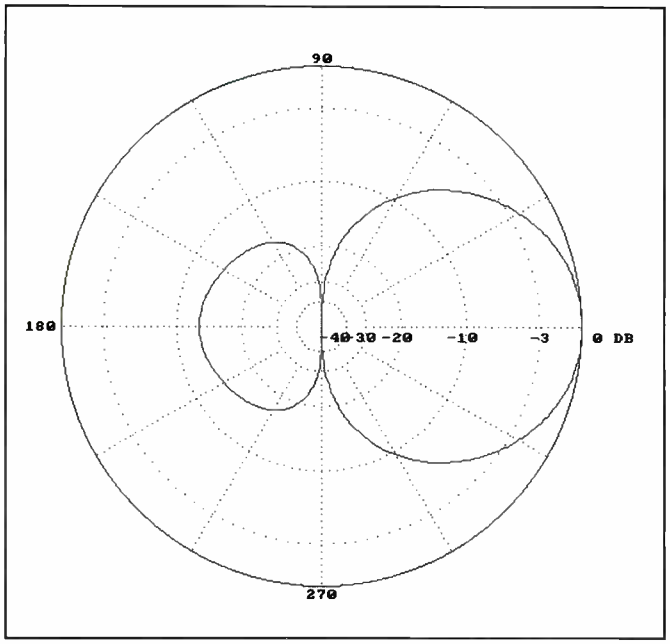
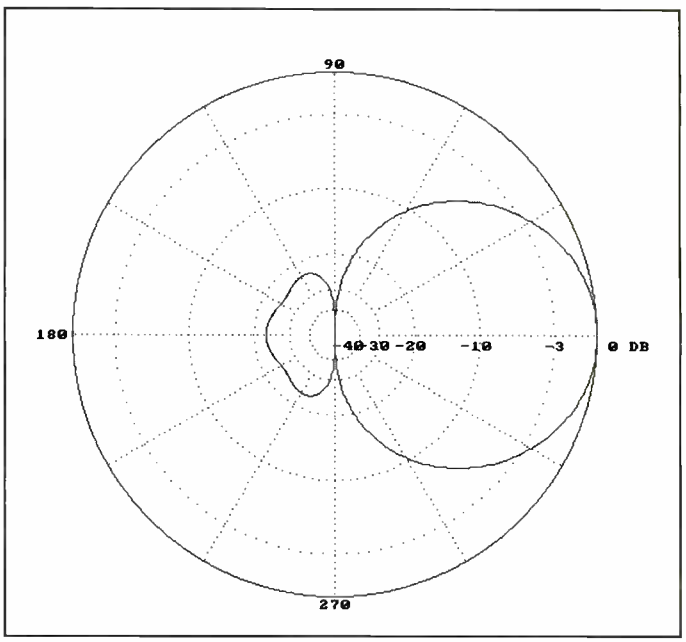


Figure 2. Driven element used on all 12 versions.



Plot 1. Beam pattern of the two-element Yagi.



Plot 2. Beam pattern of the three-element Yagi.

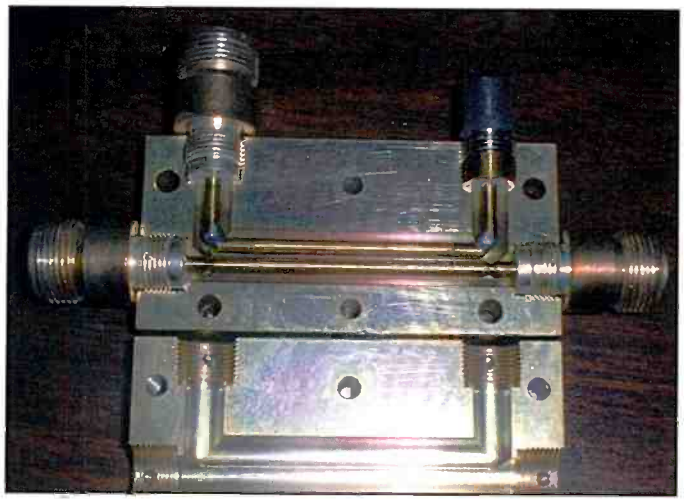


Photo D. Commercial directional coupler.

Photo F. Non-linear meters.

Letters, Letters, We Get Letters

Pop'Comm reader Richard asks, "Why does the SWR on my antenna change when I change my power?"

First, I really wonder what has been tripping this question, I received three virtually identical emails about SWR and power levels in the last few weeks. Well, Richard, there are several things that can change the SWR of an antenna, as follows:

Power

I think we can safely eliminate one problem that would change the SWR of an antenna: The megawatts (hihi) you're running have ionized the air into a big ball of plasma around your antenna. Plasma conducts electricity so the antenna appears longer than it really is.

Harmonics

Many CB amplifiers do a poor job of suppressing harmonics. And as an amplifier is driven closer and closer to its power limits, it puts out more and more harmonics. While your antenna may be well tuned at 27 MHz, what does the tuning look like at 54 MHz? 76 MHz? 108 MHz and the other harmonic frequencies? A poorly designed rig or amplifier can make the antenna look like it has a poor SWR, but it's really the garbage from the final amplifier that's being reflected back.

Inexpensive Design

In **Photo D**, I show a precision directional coupler and in **Photo E** the printed circuit board directional coupler out of a low-cost CB SWR meter. Note the differences in the precision used in the construction. Also the CB meter really has two directional couplers, one for Forward and one for Reflected power.

So how good is the directional coupler in your SWR meter? One quick test is to pick an antenna or a frequency where you have a modest SWR. An SWR of 2 is better than an SWR of 1.1 for this test. Measure the SWR normally. Now reverse the coax connections to the meter. This time calibrate Reflected to full scale, and read SWR on the Forward position. If they are identical (yeah, sure) then you have a pretty good meter. But most of the time there will be a 10- to 20-percent difference between the two readings.

Linearity

In **Photo F** we see the meter face from a typical SWR meter. See how 1 watt is almost 1/3 of the scale? Yet the last watt is just a tiny sliver. I also pointed out one of the detector diodes in **Photo E**, and these diodes are not linear (that is, they compress readings as power levels increase). Unless you have two diodes in your SWR meter that are carefully matched electrically, meaning they compress identically, your SWR reading will vary with power.

Photo E. Printed circuit board directional couplers.

You really just want to tune the antenna to as low an SWR as practical. If that SWR is 1.1 or 1.15, it may be good for bragging rights, but it's not going to make much difference in how far you talk. With most SWR meters, precision is like trying to read thousandths of an inch with a yard stick.

Again, we welcome your questions, suggested construction projects, and possible topics for future columns. Drop me an email at wa5vjb@cq-vhf.com or you can visit www.wa5vjb. com for other antenna projects. I always look forward to hearing from readers. ■

One For The Monitoring History Books, Plus Scanning Software To Enhance Your Shack

by Dan Srebnick, K2DLS
k2dls@arrl.net

When I'm in the shack, the scanner is frequently on. I live 25 miles south of the tip of lower Manhattan, so the attic-mounted discone antenna has no trouble pulling in signals from all around the metropolitan New York City region. My monitoring time is divided between the VHF/UHF amateur frequencies—both simplex and repeaters—and listening to public safety, marine, and aviation comms. I don't want to miss anything important, so my scanner of choice includes P25 digital decoding. There are a few local municipalities that have made the switch to digital trunking.

Any longtime scanner listener knows that, most of the time, the scanner traffic heard is relatively routine. Traffic stops, license checks, and ambulance and fire dispatch calls are frequently heard. Some days, however, the scanner comes

When US Airways Flight 1549 made a textbook-perfect emergency landing on the Hudson River this past January, all manner of craft rushed to the scene to assist. The US Coast Guard Cutter *Ridley* (not pictured) seemed to be managing command and control during an event that demonstrated communications interoperability at its best. (FDNY Photo Unit)

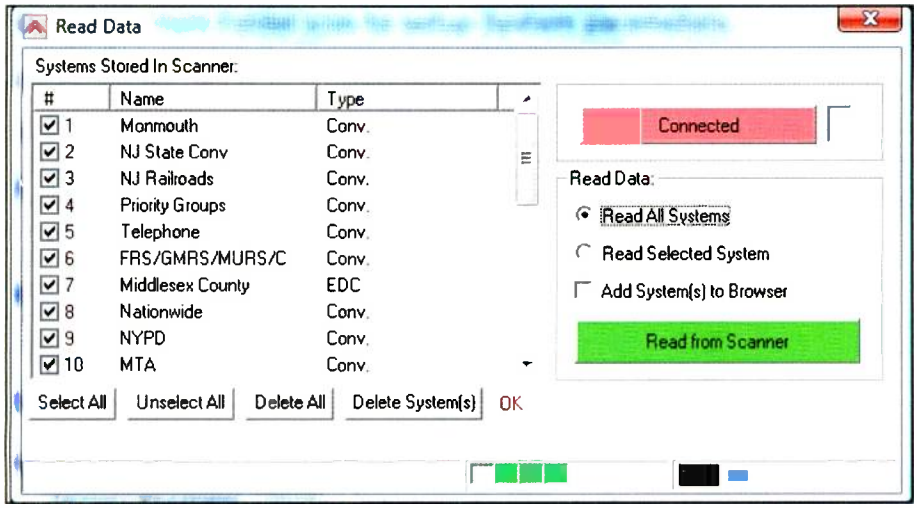


Figure 1. The Butel software immediately recognized the systems programmed into my scanner, and by selecting the "Read from Scanner" button I could populate the browser with my systems (see text).

alive and the inside scoop on a hot story is revealed. So it was on the afternoon of January 15, 2009, when Captain Chesley B. Sullenberger III, of US Airways Flight 1549, made an emergency landing in the Hudson River. This modern day American hero decisively glided his stricken plane into a perfect water landing not far from the site of the former World Trade Center and saved the lives of all 155 aboard.

The radios came alive. NYPD Citywide 1 could be heard coordinating shore-based responders along the riverfront. I also found a lot of activity on 157.075 MHz, Marine Channel 22A. On this frequency, the responding US Coast Guard operation held court. The cutter *Ridley*, which seemed to be managing command and control on the scene, was in communication with NYPD aviation units, FDNY fireboats, and other craft on the scene (see **Photo**). Interoperability worked, and without the fancy digital upgrades and conversions that some would try to sell as necessary. All it takes is mutually agreed upon frequencies programmed into the radios, in advance.

The *Ridley* is an 87-foot patrol boat assigned to Sector Long Island Sound. Its primary missions include Search and Rescue, law enforcement, and defense operations. It was in contact with Coast Guard resources responding from around the area which helped establish a 500-yard, later expanded to 750-yard, security perimeter to aid the salvage operation.

Kudos to Captain Sullenberger, the US Airways flight crew, New York's Finest and Bravest, the responding ferry boat crews, the US Coast Guard, and to the passengers themselves. The American spirit will continue to be inspired by this dramatic event, undoubtedly making its way into the history books as an example of sorely needed good news in this time of great difficulty for our nation.

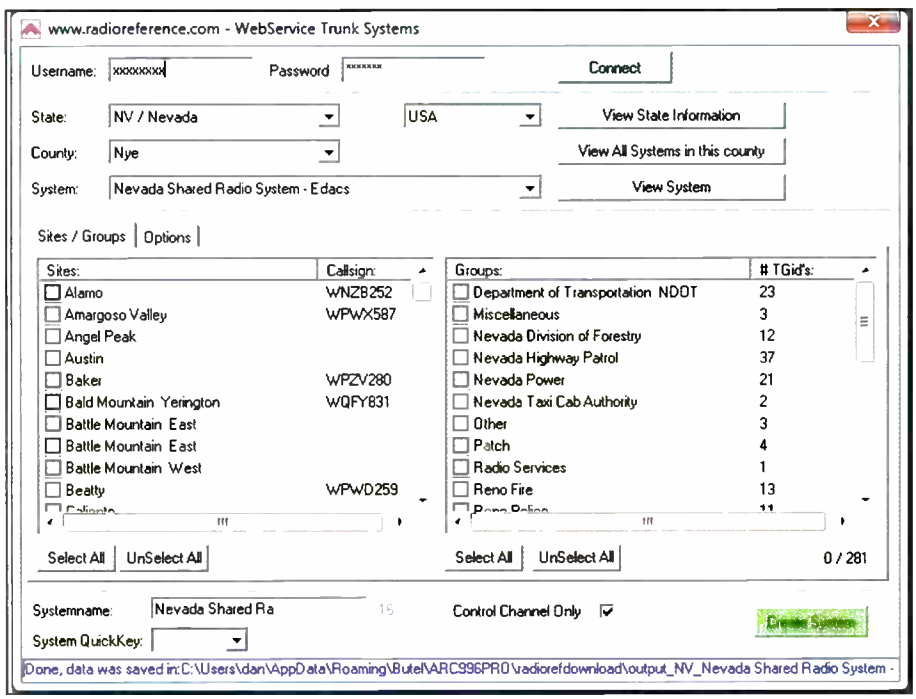


Figure 2. Make your next trip interesting by taking your scanner and downloading some systems for your destination before you depart.

Software Preparedness

Back in the shack, I've been using a Uniden BCD996T P25-capable scanner for the last couple of years. The 996 replaced a scanner that was a human generation older, the venerable RadioShack PRO-2004. The 2004 was a remarkable scanner in its day and several modifications were published that involved either adding or removing a diode to add channel capacity, increase scanning speed, and tune in on AMPS telephone calls.

The 996 offers a completely different paradigm around memory management. It doesn't have memories. Instead, the scanner has the concept of systems. Systems can be conventional or trunked, analog or digital. So while one could attempt to use the front panel keypad of the 996 to program it, you would not get too far too fast.

Uniden provides the Uniden Advanced Scanner Director (UASD) software free of charge with its programmable scanners. This software functions well within its limitations. One of those limitations concerns the ability to simply import and export frequency lists. While browsing some of the lists on the RadioReference.com website, I concluded that such a capability would save me hours of retyping or manually cutting and pasting frequency and system information. One of the guys I talk to on the radio during the morning commute had mentioned that he liked the Butel software.

Butel Software (www.butel.nl) in The Netherlands offers an amazing array of scanner programming tools. According to the front page of the company's website, it support packages for GRE, Uniden, AOL, and RadioShack scanners. The software is customized to take

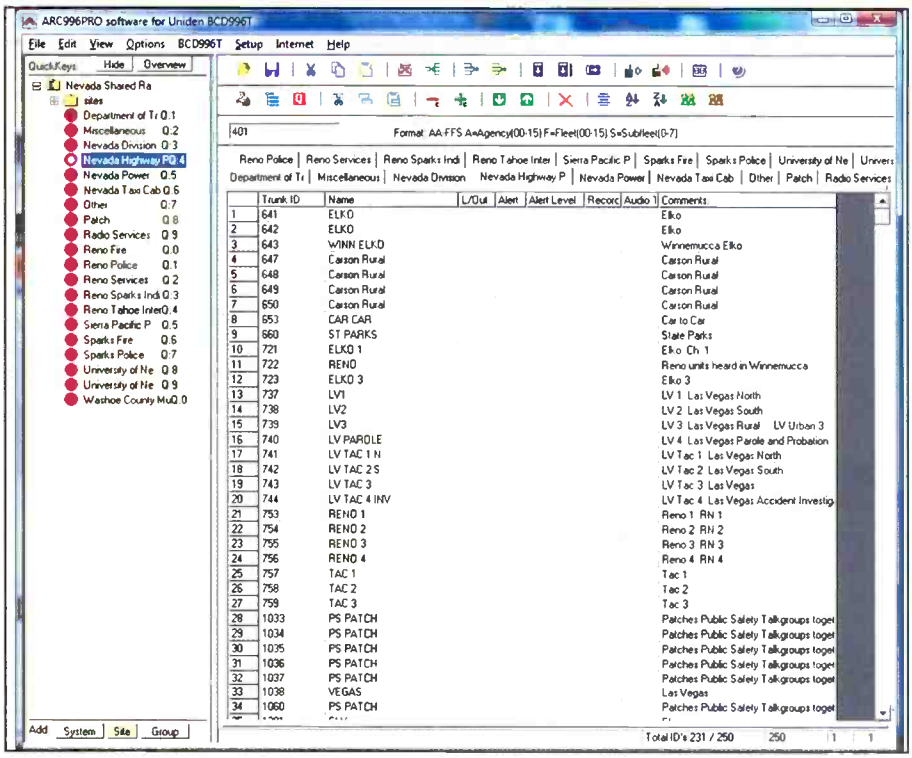


Figure 3. Here's the imported Nevada trunked system and an expansion of the tab showing the talkgroups for the Highway Patrol.

advantage of the features (and idiosyncrasies) of each model radio. Through the assistance of Butel's Gommert Buysen, I obtained ARC996PRO software for the Uniden BCD996T and put it through its paces.

The version I tried is v2.20. It runs under Windows and specifically supports Vista. The website has some helpful and detailed notes around installing under Vista. When this column was written, the Butel website indicated that it was necessary under Vista to select "Run this program as administrator" under the Privilege Level caption of the compatibility properties for the ARC996PRO software. Microsoft removed the need for all programs to run as the administrative user in Vista and it is one of the security improvements that Vista offers. Butel has now removed this requirement and the Vista installation instructions on the website are to be updated to reflect this change.

Getting Started

ARC996PRO gives you at least a couple of ways to get started. In my case, I had an already operational and programmed scanner. The software was able to autodetect that my scanner is connected to COM5, so configuration was a breeze. I could either import the UASD databased into the ARC996PRO software or simply download the contents of the radio memory into the software. I chose to do the latter, as shown in **Figure 1**. The imported systems are then displayed in the browser, which is a tree showing all systems and their corresponding groups of frequencies. It provides a convenient one-glance view of the contents of your scanner's memory.

Programming a trunked system with many frequencies and talkgroups can be a tedious proposition. Butel makes it easy. Select the "Internet" menu at the top of the screen, then RadioReference, and then trunked. The system selection screen is displayed, and after entering your RadioReference.com login credentials (subscription required), the system of your choice can be downloaded to the radio without any data entry necessary on your part. **Figure 2** gives you a hint of the power of this feature and shows a configuration for the Nevada Shared Radio Systems trunked EDACS network.

The browser is a nice feature of the ARC996PRO software and allows you to use an interface that could be best described as a hybrid of the approaches taken by Windows Explorer and a standard spreadsheet. I added the downloaded Nevada configuration into the browser and opened the tab for the Nevada Highway Patrol. This is where the power of the software becomes readily apparent. Imagine the investment of time to manually key in all of this system data. With Butel and RadioReference.com, more time is spent listening and less time typing. **Figure 3** shows the end result of the import.

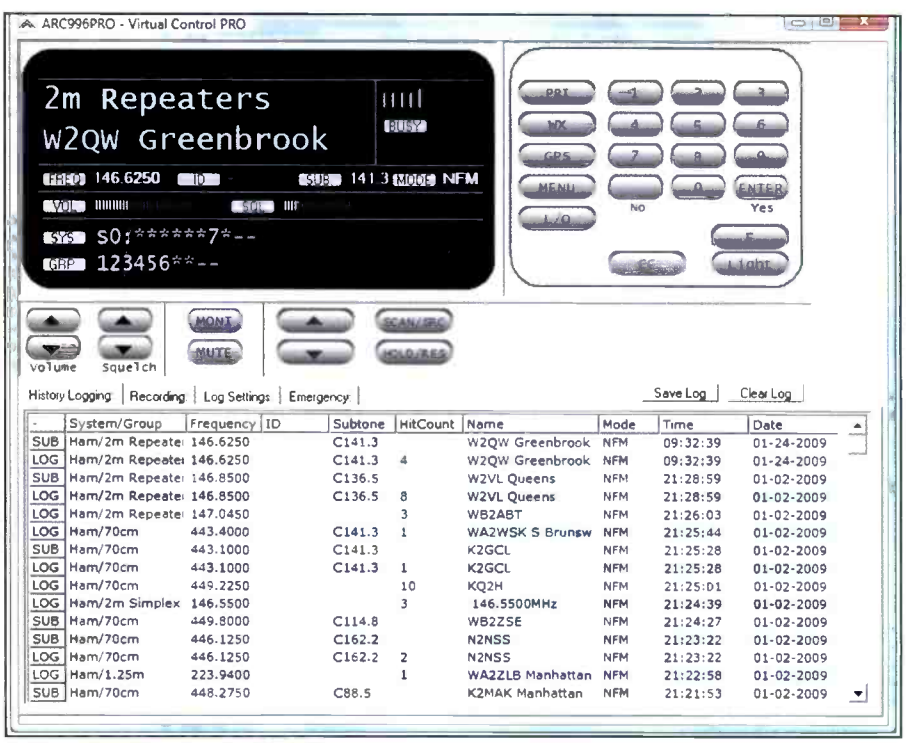


Figure 4. The Virtual Control interface of the ARC996PRO software, connected to my BCD996T scanner.

You need not get your data only from RadioReference.com. If you have a favorite radio-related website that publishes frequency lists, Butel provides a simple interface to cut and paste frequencies from a Web browser window or a text document directly into the frequency tables of the browser. If you've ever used a spreadsheet, you'll immediately feel at home. Lists can also be imported and exported in CSV format, which enhances the spreadsheet paradigm with a familiar portable data format for taking data in and out of the scanner management software.

Scanner Control

The Butel software also offers a control interface. After your scanner is programmed, the operation features can be controlled through the software's Virtual Control interface (F12). Complete computer control of scan, volume, squelch, and keypad entry is available. There's a logging feature that I like to keep running. This tells me how active various frequencies or talk groups are and is also useful for determining which CTCSS tones are being transmitted. A screenshot of the Virtual control interface is shown in **Figure 4**.

It Records

The Virtual Control interface also allows your computer's hard drive to store recordings of received systems. This requires an audio connection from the scanner to a sound card input on your PC. The .wav recordings will be organized for you in the manner of your choosing. You can have one file per frequency, per talkgroup, per day, or per hour. This is terrific for unattended monitoring of frequencies that can be reviewed later at your leisure. Never miss another big event because of work or family responsibilities. The recording capability allows you to select the sampling rate. The higher the sampling rate selected, the better the recording quality. However, the higher the sampling rate selected, the larger the resulting audio files. Make sure that you have plenty of hard disk space if you'll be using this feature regularly.

Some Anomalies

The software works well, but any software package has its own set of quirks. Some of my observations include:

• The set recording volume button on the recording screen does not seem to do anything. This may be a Vista issue as the volume mixer architecture has changed a bit since Windows XP.

• When loading a save profile, every once in a while I saw the error "File not compatible, or saved in newer format." If I proceeded, everything worked fine. At some point, the error ceased to occur.

• The "Find" function is useful to help find a frequency entry, but the user still has to scroll through the spreadsheet to see the highlighted search result. I found this to be non-intuitive and would have preferred that the screen update automatically to display the found item.

Update Central

And speaking of updates, Butel offers them free for its software. As new features are introduced or bugs fixed, your initial purchase of the software entitles you to no-cost lifetime updates; although, as with any lifetime offer, remember that no piece of equipment, nor anyone other than Duncan McCloud, the great Highlander himself, lives forever.

As I write this piece, the 3.0 version of the software is in beta and will likely have been released by the time this magazine is in print. The primary enhancement is support for the UHF rebanding that's taking place in the U.S. A bandscope option will also be added. Butel also now offers "Scanner Station" software, which was slated to be shown at the Dayton Hamvention, and allows for remote control via the Internet of up to eight Uniden scanners. This software features the company's ScannerOverIP solution that includes live streaming capability. It's bound to be popular within the intelligence agencies, which can deploy a scanner farm in a remote part of the world and use the Internet for command and control.

What's In Your Shack's Stack?

If the stock software for your scanner doesn't allow for simple frequency management and lacks import/export tools, or you have a desire for sophisticated logging and recording functionality, take a look at Butel's offerings. List price for the ARC996PRO software is $69.95. Resellers include HRO, Universal Radio, and Scanner Master. There's a standard version available for $39.95 if you don't need the logging and recording features.

ARC996PRO is a welcome addition to my software stack and has helped to increase my listening pleasure. What radio control software are you using in your shack? Let me know via email to k2dls@arrl.net. ■

Mass Notification Systems: Distributing Vital Information

by John Kasupski, KC2HMZ
kc2hmz@verizon.net

"The incident at Virginia Tech and the subsequent improvements made to the school's [Mass Notification System] points out one indisputable fact: When a disaster happens or is about to happen, communications is the key to being able to alert everyone concerned in time to avert death, injury, and loss of property."

This month we will take a look at a method of communicating that incorporates computers, personal communications devices, and more traditional means of mass communications such as public address systems to disseminate vital information during emergencies. It's a method of communication that's already in widespread use in government agencies, businesses, colleges and universities, and the military. If this technology is something you've never heard of, it's my pleasure to introduce you so you can start spreading the word about mass notification systems (MNS).

Many of you will recall what is now generally referred to as the Virginia Tech Massacre. This incident on April 16, 2007, consisted of two separate attacks approximately two hours apart on the Virginia Tech campus in Blacksburg, Virginia, during which a student who may have been suffering from a social anxiety disorder called selective mutism used a pair of handguns to kill 32 of his fellow students before committing suicide.

An independent report issued in the aftermath of the incident questioned the timeliness and way Virginia Tech notified campus constituents after the initial dorm shootings. The report noted that "the protocol for sending an emergency message in use on April 16 was cumbersome, untimely and problematic when a decision was needed as soon as possible."

Virginia Tech's internal reviews agreed that enhancements needed to be made to the emergency alert system on campus and implemented changes. Virginia Tech's new MNS enables the school to contact faculty members and students via email, text messages, cell phones, and online instant messages sent to computers.

The incident at Virginia Tech and the subsequent improvements made to the school's MNS points out one indisputable fact: When a disaster happens or is about to happen, communications is the key to being able to alert everyone concerned in time to avert death, injury, and loss of property. The problem in these situations is that time usually does not allow for individual contact with everyone concerned. Those in authority at schools, government/military facilities, hospitals, and businesses must contend with issues common to emergency management from a facility standpoint; that is, managing the situation and saving lives, preserving data, properly shutting down critical systems, etc. Very often in an emergency situation, so much time is spent trying to communicate that it draws people away from these primary responsibilities. Those so tasked seldom have time to contact every nurse's station, classroom, dormitory, or office in every building they're responsible for.

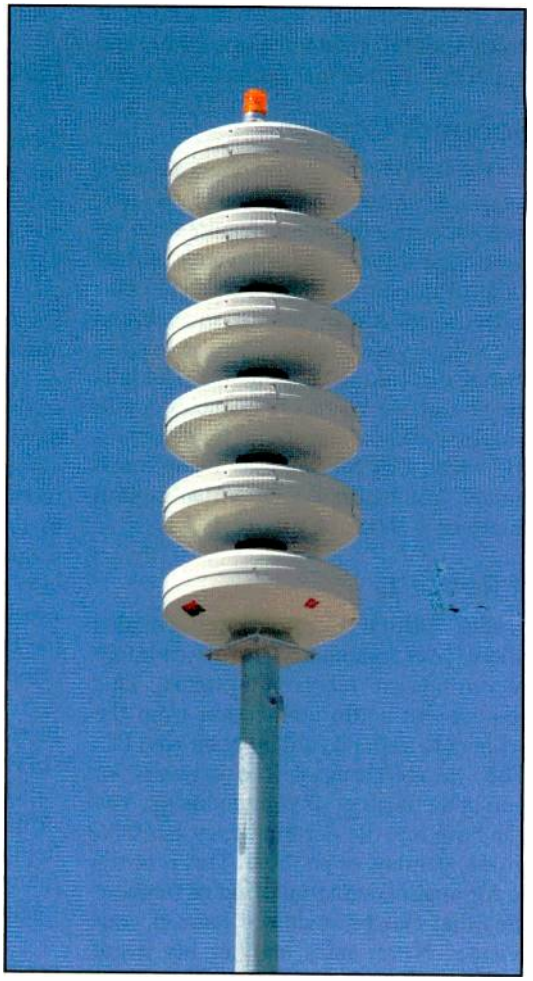


Photo A. One of the low-tech components of the MNS at Edwards Air Force base. (USAF photo)

Further complicating matters is that no crisis situation remains static. As an incident progresses, there will be new information that needs to be disseminated. To have the best chance for a safe outcome and to be able to provide real-time information during emergencies, preparedness is key, and mass notification systems are an invaluable

tool. With them, people can receive messages in many forms, including:

- A pop-up notice on a desktop computer
- An audio message broadcast over a public address system
- A visual electronic wall display
- A call on a landline phone
- A text message to a cell phone, wireless PDA, or pager

MNS can also employ more traditional methods of emergency alerting. For example, **Photo A** shows a 40-foot-high pole, mounted with speakers and flashing yellow light on top. Edwards Air Force base has five of these poles in the housing areas and five more on the main base. The Edwards system is solar powered and is a key component of the base's emergency notification methods.

When an emergency is imminent, electronic mass notification enables officials to send word of the situation to everyone concerned with a single action, thus freeing up the rest of their time to deal with the issues at hand. An MNS can contain many different predetermined messages tailored specifically to the recipients based on who needs to know what. The information that goes to a hospital administrator doesn't have to go out to every doctor, nurse, and orderly in the building, for example.

Mass Notification Systems In Practice

The largest user of MNS is the Federal government. The systems have been mandated in most United States Department of Defense (DOD) facilities since 2004. The requirement was added in April 2002 to the DOD's United Facilities Criteria (UFC) and also applies in all new DOD construction as well as in leased buildings, additions, and temporary structures.

One example of a DOD implementation is at the Marine Corps Base Quantico, Virginia. The MNS system on the base is subscription-based. Military and civilian personnel, family members, volunteers, and any one else potentially impacted by base events can register contact information. The MNS then sends important base traffic, weather, and force protection condition (FPCON) information to base personnel and the affected neighboring population. The information disseminated is unclassified and authorized for release to the public. The Quantico system also supplements other methods for disseminating information, such as the MCB Quantico website and the base Public Affairs hotline, and does not supersede guidance provided to military personnel through the normal chain of command.

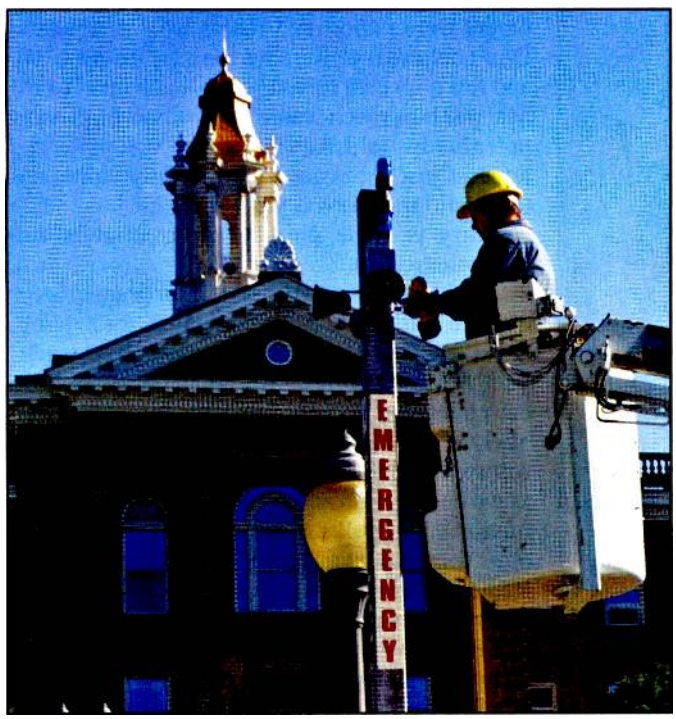


Photo B. A worker installs emergency speakers on Western Illinois University's campus during August 2008.

The great benefit of this system is that, basically, nobody gets missed. Whether personnel are on or off base, no matter where they are, or what they're doing, it's possible for them to receive this vital information.

The second largest group of MNS users is educational facilities. **Photo B** shows a worker on the campus of Western Illinois University installing emergency speakers on one of the school's 51 emergency callboxes. The speakers are part of the University's emergency notification process, the WIU Emergency Alert System (WEAS), an MNS that also uses voice, text, and email alerts sent to each student and employee in the event of an emergency, in addition to sirens and public address. Students and employees can enter their contact information on the university's website, as well as download an "FAQ" document in PDF format that answers frequently asked questions about the system there.

Educational institutions are interested in MNS not only because of the natural concerns about security, but also because parents generally want to know what measures are in place to protect students. Parents are often added to the list of recipients of messages sent by mass notification systems as well. As has so often happened in the past, parents who become aware of an emergency may proceed to the wrong place, such as a main school building rather than a place to which the students may have been evacuated. Parents may also reach out to each other by cell phones or other means (a fact which is also true of students), and in the absence of good information, rumor mills start cranking out misinformation, resulting in additional confusion and anxiety in situations that call for calm and clarity. The use of mass notification systems nips this problem in the bud and simplifies matters for everyone concerned.

MNS Providers

There are numerous companies currently offering MNS. One of them, a privately held company called MIR3 headquartered in San Diego, California, says that it has been in the notification business since 1999 and claims more than 5,000 customers, including colleges and universities and local, state, and federal government entities, as well as 87 of the Fortune 100 companies. MIR3 provides them with technology for IT alerting, business continuity and disaster recovery and has also recently added a new wrinkle called Recorded Response, an option that allows emergency managers to not only notify recipients of threatening events, but also to collect responses in a recorded-voice option in addition to traditional response options. MIR3 says that one of its customers used this feature in July 2008 to aid in disaster recovery after a 5.8 magnitude earthquake struck Southern California.

Saving Lives En Masse

Now that you're aware of what MNS is and what its benefits are, your mission is to go forth and spread the word about these systems and their capabilities. One of the purposes of MNS is to save lives, and who knows, it might someday be *your* life that one of these systems saves!

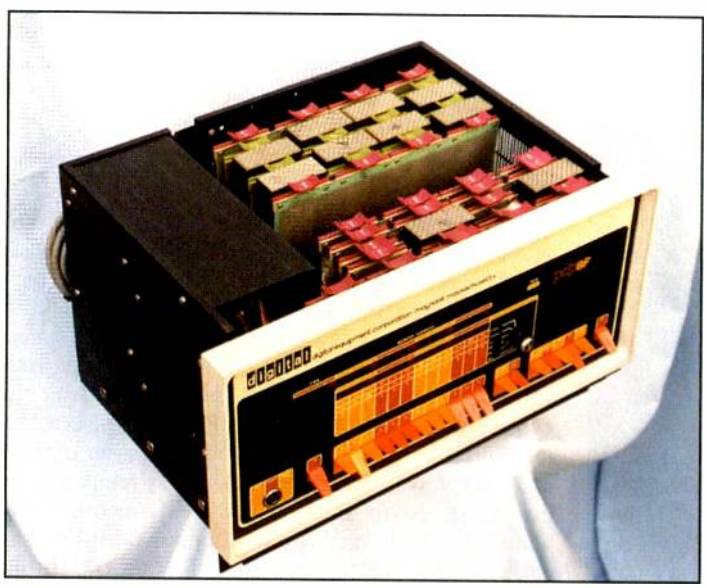
Until next time, remember—preparedness is the only option!

Processors And Prophecy: Was Louis E. Frenzel, W5TOM, The Nostradamus Of Amateur Radio?

by Kirk Kleinschmidt, NTØZ
kirk@cloudnet.com

Who among us hasn't sat in front of the television at one time or another, eerily transfixed by the prophecies of ancient seers such as Nostradamus and Cayce? Ominous predictions, voiced by a narrator with a commanding baritone voice and backed by a soundtrack that could double for any suspense thriller, pinned us to the boob tube, nerves tingling, hair standing on end. During commercial breaks we began to breathe regularly and wondered how anyone so far back in time could predict "the future" with such startling accuracy.

Such was my experience last week as I read *Computers and Ham Radio*, by Louis E. Frenzel, W5TOM (not the current holder of W5TOM), of Houston, Texas, in the March 1969 issue of *Ham Radio* magazine, which was subsequently acquired by *Pop'Comm*'s publisher.



This DEC PDP-8/F minicomputer, shown here with its cover removed, is similar to the PDP-8/S referenced by W5TOM in his insightful 1969 article in *Ham Radio* magazine. In the late '60s the PDP-8 was just about the most computing fun a ham could have for less than $10,000! See text for more information. (Image from the collection at www.oldcomputers.arcula.co.uk/entry.htm provided courtesy of Anthony Audsley, of Somerset, UK, photographer and webmaster of The Old Computer Hut website)

"W5TOM's futuristic vision saw great advances in ham radio contesting for those lucky enough to have the most powerful PCs...Frenzel saw the computer competing in the contest by itself!"

In his five-page article, Frenzel showed readers—in an era that featured Vietnam, Woodstock, and Neil Armstrong—an uncanny understanding of the role personal computers and computer technology would play in present-day ham shacks. The fact that he did this more than a decade before what we've come to know as the feeblest beginnings of the "personal computer revolution" is doubly amazing.

These days, the convergence and symbiosis of radio and computers is almost a done deal. With the development of digital signal processing for the masses in the '80s and '90s (earlier DSP technology was developed for the military, etc.), computers were radios, and radios were computers. Don't believe me? Remove the case from any PC and fire it up next to your radio's antenna. You'll hear just how much "radio" is involved in all computer hardware! Likewise, if you look under the hood of just about any commercially built amateur radio transceiver, you'll see just how much circuitry is made possible by computers and microcontrollers.

Again, we take all of this stuff for granted these days. In addition to using computers for logging, noise reduction, frequency synthesis, and modulating/demodulating more digital modes than you can count (and let's not forget the Internet), radio has long since entered into a truly digital era, with software-defined radios poised to take ham radio as we know it into an exciting and even uncertain future. If you'd like to see what's in store for all of us someday soon, check out the radios at Flex Radio Systems (www.flex-radio.com).

In fact, I plan to cover software-defined radios in a future column, now that SDR technology is inexpensive, especially in kit form, and can be enjoyed by everyone. But this month I'd like to excerpt portions of W5TOM's (NostraTOMus?) amazing article from the past, and in doing so,

I'll provide some useful links to modern software and hardware that essentially fulfills his ancient visions!

Computers In 1969

Before we get specific, let me remind you that 1969-era computers were big, slow, and prohibitively expensive. The "desktop" computer Frenzel referenced in the article was a version of the Digital Equipment Corporation (DEC) PDP-8. It was about the size of a file cabinet drawer, had less computing power than today's talking greeting cards, and cost about $10,000! And that's without peripherals such as keyboards, paper tape readers, and teleprinters. Forget about CRT screens!

Compared to new cars and top-of-the-line ham rigs, the PDP-8 was astronomically expensive. In an era when $2,000 could buy the best Collins HF transceiver or a brand new car, the PDP-8 was just under Ten Grand. In 2008 inflation-adjusted dollars, it would cost $58,000! And there were no graphical user interfaces like Windows or OSX, either. Heck, even DOS or UNIX would have been wild luxuries. The PDP-8—with its whopping 4 kB of RAM—had to be programmed in "binary machine code," so you had to be a real computer weenie to use it (perhaps you worked at Bell Labs?).

W5TOM reminded us that previous (pre-1969) computers used relays and vacuum tubes, and that most modern computers were *fully transistorized*, with the most sophisticated units using *integrated circuits*! He predicted the $5,000 personal computer, followed by the $1,000 PC. At that point, he prognosticated, regular use in the ham shack wouldn't be "too fantastic." Indeed!

There are many information sources on the PDP-8 and other "pre-revolution" machines that paved the way for what we now use every day. Start your search at www.pdp8.net.

The Morse Code Keyer

First in W5TOM's list of predictions was the computer's use as a Morse code keyer. "The I/O typewriter," he said, "could be used, as in teletype operation, to send letters and numbers." The computer program would recognize the characters typed in by the user and generate the appropriate dots and dashes to key the transmitter. He predicted speed selection and, for the really deluxe setup, the first memory keyer.

"The computer's extensive memory would permit storage of complete words and sentences that could be called for by the operator from the keyboard," he said. "In fact, entire conversations could be canned, including the CQ and initial response, with name, signal report and location." And after predicting the very systems we use today in CW keyboards and memory keyers, he voiced what may have been the first evidence of "digital regret," ending that section of the article with: "How about that? Almost takes the joy out of living." Wow!

Receiving and decoding CW signals was also predicted, as were the external circuits to accommodate speed, spacing, weighing, etc. CW reception by computer, he said, was "a really beautiful application that would ensure perfect, typed copy for every radio contact with no operator CW skill required."

Even with the present state of computer technology, sending perfect Morse code is a lot easier than receiving it, but an amazing new piece of software called CW Skimmer, coded by Alex, VE3NEA, uses DSP and SDR techniques—like the

waterfall display on every PSK31 screen—to decode *every* CW signal in the radio's passband *simultaneously*. It's amazingly accurate, and has already begun impacting the world of CW contesting and DXing. See more at www.dxatlas.com/cwskimmer.

RTTY, With A Twist

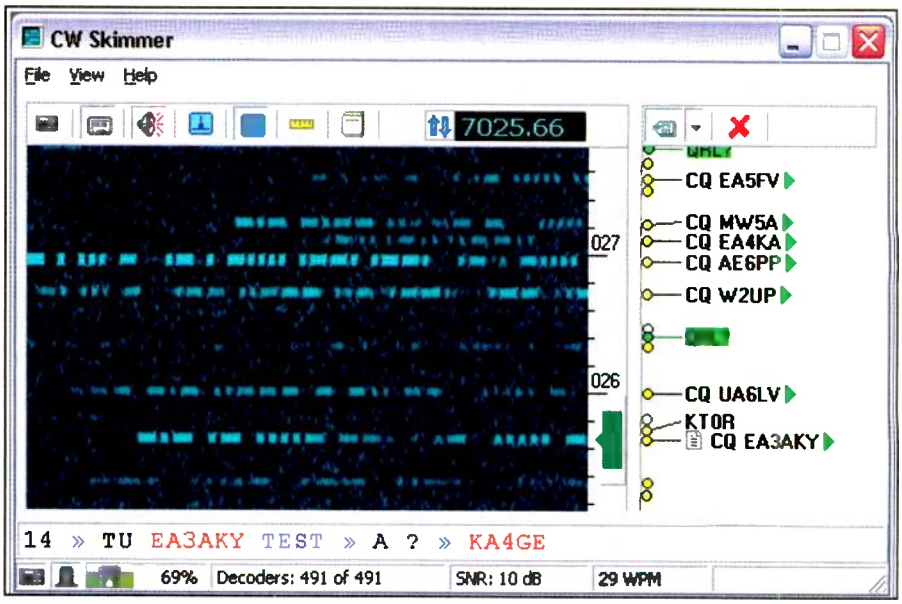
Predicting the computer's coming place in the radioteletype world wasn't a big stretch, even in 1969, but W5TOM's twist was truly forward-thinking. "With the proper control program," he wrote, "the computer could perform CW-to-RTTY and RTTY-to-CW conversions so the two modes could cross-communicate." Way cool—and at least one modern radio, Elecraft's amazing K3 transceiver, can do it, no external computer required! With the K3, you can "send RTTY" with your attached keyer paddle, and the transceiver displays the decoded and received RTTY on the rig's main LCD! K3 users have already begun working occasional RTTY DX with this method. See more at www.elecraft.com/k3.

Computer Logbooks

Perhaps because 1969-era computers were making great strides as bookkeepers, at least in medium and large businesses, envisioning them as willing radio log keepers was only natural. Frenzel imagined that modern radios would send frequency and mode data to the PC logger in real time, and he saw that the computer would willingly tabulate and organize all the data that goes into a modern radio log. "At the end of the day," he said, "the operator would simply call for a log printout, and the I/O typewriter would type all log data in a predetermined format...which could be filed as required by law."

He didn't mention anything about storing gazillions of QSOs in long-term storage, perhaps because disk and tape drives weren't yet practical for individual use, and that 4 kB of RAM wouldn't hold much of a historical log!

When it comes to QSLing, W5TOM was right on the mark—and even a bit giddy! He said, "If the computer's memory system was extensive enough, it could store information from the *Callbook* and, upon completion of a contact, it would automatically type out a QSL Oh—too much." Too much, indeed! Printed *Callbooks* have come and gone, and *Callbooks* on CD-ROMs will undoubtedly be next. To see the present and the future, visit www.qrz.com.



What can simultaneously copy and display a whole bunch of Morse code signals across a large part of the band without breaking a sweat? CW Skimmer, of course! This modern marvel of digital signal processing can turn your high-end PC sound card and software-defined radio into a virtual staff of experienced Morse code ops! It's almost scary watching it work. For more info, see www.dxatlas.com/cwskimmer.

Contesting

W5TOM's futuristic vision saw great advances in ham radio contesting for those lucky enough to have the most powerful PCs. In addition to most non-Internet-based contesting chores, such as logging and dupe-checking (even Al Gore hadn't envisioned the Internet in 1969), Frenzel saw the computer competing in the contest *by itself*! "When the contest was all over," he said, "the operator [human] would call for a neatly typed printout of all contest activity. Fantastic? But entirely feasible. Contest scores by computer should be sky high." You betcha! And that's why almost nobody contests without them today.

I've lamented "excessive computer involvement" in DXing and contesting in the past, but I must admit to being interested in a radio contest *by and for* computers! Such a contest would stretch the state of the art in DSP, SDR, and artificial intelligence (AI), and would be loads of fun for the respective human control operators who "assist" the computer ops and look for trouble. Well, it turns out that I haven't been the only one thinking along those lines. Apparently the CQ World Wide Contest Committee has been discussing a similar idea at length and is preparing to announce the addition of a new "Xtreme" category to the CQ World Wide DX Contest, sponsored by our sister magazine, effective this fall. This would allow hams using remote stations, Internet-connected remote receiving sites, multi-channel CW decoders, fully-automated "robot" stations, and other new technologies that don't fit into traditional CQWW categories to compete in a class of their own and field-test these technologies under "xtreme" band conditions. Complete details are in the June issue of *CQ* magazine and on the *CQ* website at www.cq-amateur-radio.com.

As far back as the mid-1980s, AEA Technology made a cartridge for Commodore 64 PCs that simulated a Morse code DX contest. You could call CQ with your connected keyer paddle and the computer would play the part of the DX station. Your CW sending had to be reasonable or the other "operator" wouldn't understand you! Conversely, as you "tuned" around the band you'd hear other stations working contest contacts and calling CQ. You could work them, and the whole shebang was a fun way to improve your CW skills and train you to handle contest operation. It was called Doctor DX, and I've been hoping someone would make a suitably enhanced modern version.

There is an older DOS-based CW "pileup trainer" called PED.exe, written by JE3MAS. It's somewhat like Doctor DX. You can download it at http://je1cka.jzap.com/ped. If anybody knows about additional software of this type, please send me an email!

Computerized Operating Assistance

Even without an Internet, W5TOM saw the PC as a tireless helper that could control your rig and even your station rotator. The computer could even "recognize the location of your man during the contact, compute the distance to the station and its local time. The bearing angle would also be calculated under computer control." Not bad for 1969!

Was LoTW Envisioned Decades Ago?

Even though I've been tinkering with computers for more than 25 years, I thought the Logbook of the World (LoTW) and other "electronic QSL" services were pretty radical when they were first announced a few years back. Apparently, W5TOM had no trouble envisioning them even before there were personal computers!

He foresaw a large, centralized QSL bureau under computer control, where printed cards were replaced by punch cards (data storage cards back in the days before affordable magnetic media). "While not as individualistic and colorful as printed cards," he noted, "the confirmation would be just as valid and easier for a computer to handle. Much of the paperwork headache associated with QSL bureaus could be delegated to the computer." As it has been!. See https://p1k.arrl.org/lotw/faq for the modern version of Louis' computerized QSL bureau.

Sage Advice

Like most seers, W5TOM in some ways questioned his own predictions of the future—predictions that have all come to pass! He said, in closing, "It is not a question of technical feasibility, but rather of whether we should do it at all. Is it just too fantastic? We could do it right now. But maybe you don't want a computer to operate your station even if you could afford it. Then again, the prestige and convenience may be just what you are looking for. Besides, you will still operate your station yourself by controlling the computer. Or would you?"

I'm not sure whether Louis Frenzel, W5TOM (perhaps the original W5TOM), is still with us. If anybody knows, please send me a brief email about that as well. I must admit to being curious about the ham who foresaw amateur radio's computerized future so clearly, so long ago. ■

Noise Alignment Techniques For Vintage Receivers

by Peter J. Bertini
radioconnection@juno.com

"Lab-grade broadband noise generators are available, but they would be overkill for our needs, unless found very cheaply on the surplus market or at a ham fest. On the other hand, it wouldn't be too hard to make our own."

The past month life's non-radio aspects have been taking far too much of my time, so this column is going to be a bit shorter than I'd like—my apologies. It will conclude next month with a construction project for a very useful service instrument for your vintage shop. But, for now, let's discuss what needs to be done.

Oscillator Pulling

Let's consider a common alignment problem we've all encountered. Anyone who's attempted to align the upper shortwave band on early consumer radios has probably noticed that's very difficult to find the true peak—whether by watching the AGC level or audio level—when adjusting the RF trimmer. This is due to unwanted interaction between the RF tuning and the oscillator's frequency.

Here's the drill we've all gone through: As the RF stage is peaked for maximum on a weak signal using the shop's signal generator, the oscillator simultaneously is pulled off frequency. A simple alignment becomes a tedious merry-go-round of endlessly rocking the main tuning control back and forth to compensate for the *oscillator pulling* as we peak the RF stage tuning. In use, a stronger nearby signal can detune a weaker signal that was being listened to. Sigh. The weakness in these radios was in the converter stage, where a single tube served as both oscillator and mixer. While there isn't much we can do to improve the inherent limitations that accompanies vintage technology, we can make our lives a bit easier on the test bench. There has to be a better way, and there is!

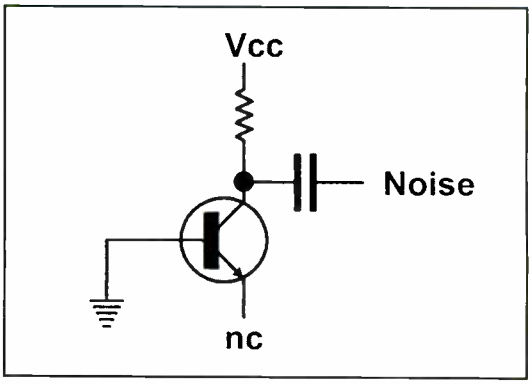


Figure 2. A PN semiconductor junction biased into its avalanche breakdown region will generate a broadband noise spectrum. The example shown uses the base-to-collector junction for a noise source.

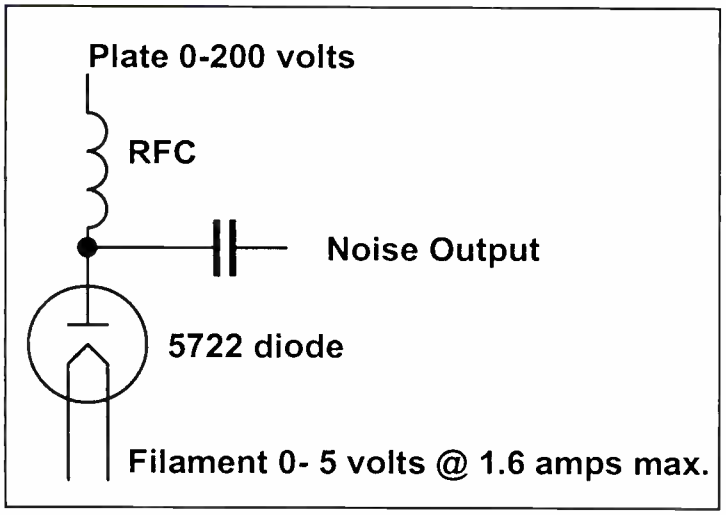


Figure 1. The 5722 vacuum tube diode was an early source of wideband noise.

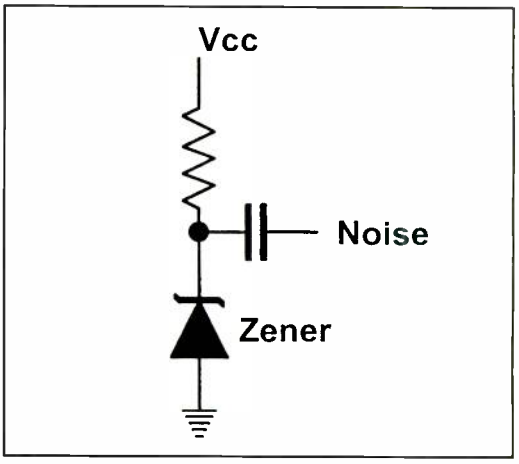


Figure 3. A Zener diode is an ideal noise generator. Many commercial generators use special Zener diodes to generate noise into the microwave regions.

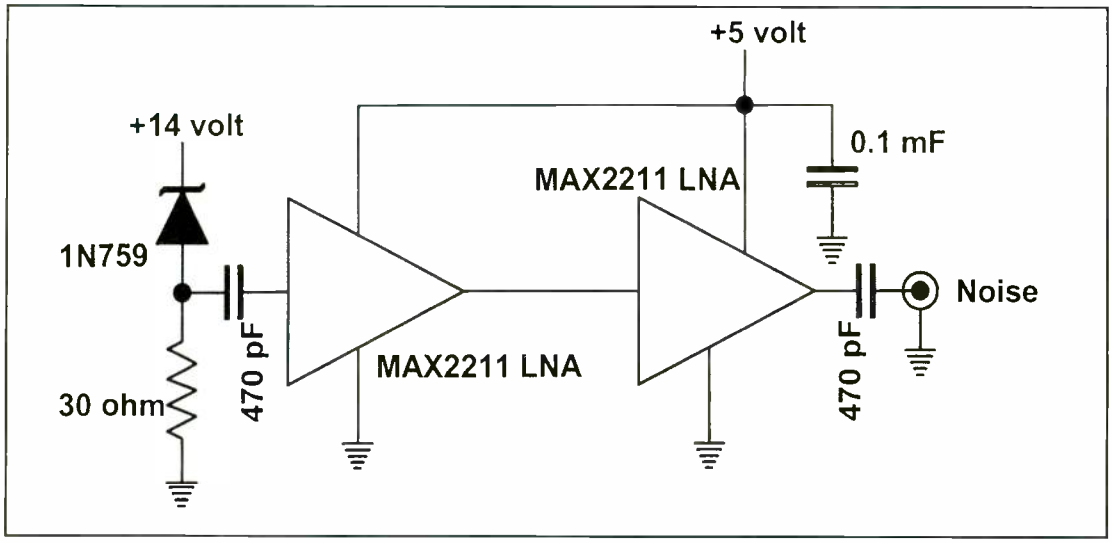


Figure 4. Two cascaded Maxim amplifier ICs amplify the Zener noise level in this circuit, suggested in an application note for the MAX 2211 LNA device.

The amount of oscillator shift is usually pretty small, and it usually isn't enough to cause concern regarding dial calibration. The dial markings for the upper shortwave ranges were often at best done at 1 MHz or 500 kHz markings, thus a few kHz error wouldn't be resolvable on most dial scales. Besides, these sets often drifted many kHz over several hours of usage due to temperature changes. But, if the oscillator *pulls* (unwanted change in frequency due to an external influence) several kHz, it will be enough to put the signal far enough outside the IF stage band pass to severely attenuate the signal. Better (more expensive) designs used separate tubes for the oscillator and mixer to improve isolation and limit unwanted interaction.

Peaking On Noise

Vintage communications receivers often included an *antenna trim* control on the front panel. This control allowed the operator to peak the receiver *front end* for best sensitivity by compensating for minor alignment or tracking errors. Many operators learned that in the absence of a signal the trimmer could be peaked for maximum hiss on the speaker using atmospheric background noise picked up by the antenna. So, why not hook up an antenna and use this technique for peaking the RF tuning on the upper shortwave bands? After all, the atmospheric noise is broadband, and small shifts in the oscilla-

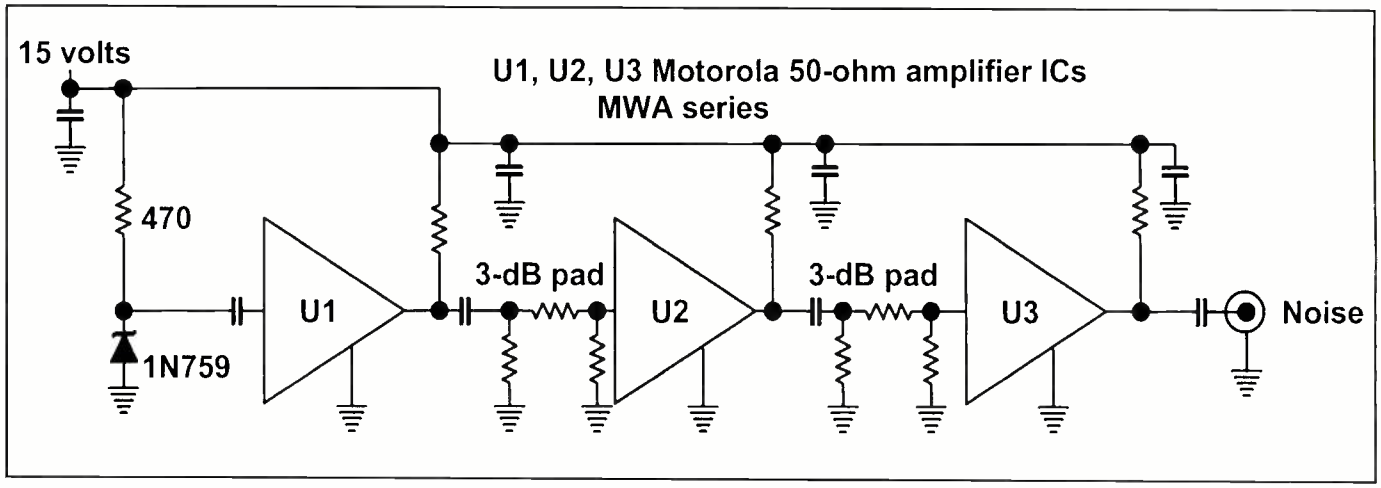


Figure 5. A more advanced noise source using three Motorola MWA-type amplifier devices with 50 ohm pads between stages. This circuit has not been tried; therefore many parts values are not shown.

tor's frequency would have no effect on the noise level within the IF band pass.

Ah, but here's the rub! Very few of those early converter tubes, even with an RF stage ahead of them, had noise floors that were below the atmospheric floor. In other words, the atmospheric noise is usually too weak to serve our needs.

Noise Generator

What we need is a piece of test equipment that will generate broadband noise over a very wide frequency range. And one that generates a strong, variable noise source that covers from audio to over 30 MHz. Lab-grade broadband noise generators are available, but they would be overkill for our needs, unless found very cheaply on the surplus market or at a ham fest. On the other hand, it wouldn't be too hard to make our own.

Noise Sources

The crudest forms of broadband noise generators would be motors with commutating brushes, or a battery and electro-mechanical buzzer. The interrupting contacts generate broadband noise across the HF radio spectrum, just like an early primitive spark transmitter! But, the noise levels are not easily adjustable, nor reliable. **Figure 1** shows a 5722 vacuum tube diode noise source. The 5722 tube needs a variable filament power supply, up to 1.6 amps; this sets the filament's operating temperature for maximum *shot noise* generation. These devices are obsolete and cumbersome to use. A more modern approach makes use of the broadband *avalanche* noise generated when a PN diode junction is reversed biased. **Figure 2** shows how two junctions in a NPN transistor can be reversed biased into the avalanche breakdown region to generate wideband noise. A more common approach is seen in **Figure 3** where a Zener diode is used as a noise source.

A much more eloquent and modern approach is shown in **Figure 4**. This circuit is taken from a Maxim applications note. Two Maxim MAX2611 very low noise amplifier (VLA) packages are used to amplify the avalanche noise to a usable level. The application note suggests noise amplitude that is level (within 10 dB) to over 100 MHz. An additional VLA could be cascaded to increase the noise amplitude if needed. I'd suggest adding 6 dB fixed pads between the stages to eliminate interaction between the various nodes. You don't have to use Maxim devices. Similar amplifiers are also available from Motorola and Mini Circuits Labs. I'd suggest something similar to the circuit shown in **Figure 5**, but proceed at your own risk; I have tried to duplicate it in my home shop.

Next Month

I'm experimenting with some simple circuits that I think will be the answer to our needs, but the final version wouldn't make this month's column deadline! My goals are for a circuit that uses commonly available through-hole mounted components, which can be put together in an evening for a few dollars cost.

Until next time, keep those old tubes glowing, and those soldering irons warm!

The Rigs Of Summer—Wet Specs And Water-Wise

by Gordon West,
WB6NOA
WB6NOA@arrl.net

Handheld radios have varying degrees of "waterproof-ness." Some must be kept dry, some survive spray, still others may go swimming with you. With warmer weather taking hobbyists and their equipment outside more, let's look at the related specs you should understand.

If you provide communications with your local fire department, a *weatherproof* rating for your HT will likely keep the insides dry. Scout leaders may encounter some light rain out on the trail, and a handheld rated as *waterproof* should do just fine. When you provide communications for your local swift water rescue team, or work with the US Coast Guard Auxiliary, the best choice is an HT that meets *submersible* industry JIS and IEC ratings standards.

Spec Specifics

JIS stands for Japanese Industry Standard and IEC stands for International European Community specification, and meeting their ratings requires passing a similar number of graduated water intrusion test levels.

Before you head out on the water, make sure your HT is going to survive some waves!

"IEC specification 529 is gaining more acceptance in Europe, which is a major market for many U.S. manufacturers, and is more defined in terms of the actual test," explained Paul Fraser, a handheld radio technician, while at the this year's Consumer Electronics Show.

IEC specification 529 has many levels of water protection. Here's what they refer to:

IPX1 protected against 10-minute rainfall
IPX3 protected against spraying water, 10 liters/min
IPX5 protected against direct water spray, 12.5 liters/min
IPX6 protected against heavy ocean spray, 100 liters/min
IPX7 protected against water intrusion, during 30-minute immersions, less than 3 feet under
IPX8 protected against water submersion, 30 minutes continuous, "about" 6 feet under, but each manufacturer has additional ratings

The IPX spray tests, up to IPX6, are considered "dynamic" tests, where water is either splashed or sprayed around the handheld under test. The intensity of the spray test might be IPX1 and IPX2, similar to falling rain; or, for IPX5, 6, and 7, a powerful spray jetted onto the product from specific angles.

Meirion Buck of Adaptaflex Ltd. (www.Adaptaflex.com), a laboratory specializing in how IP ratings apply to equipment under test, explains: "For IPX6, the flow rate is 100 liters per minute for a duration of at least three minutes. This is a dynamic test that may vary quite considerably; an IPX4 rating is equivalent to water from a garden hose at typically 10 liters per minute for five minutes, through 180°, whereas an IPX6 is closer to a fire hose delivering 100 liters per minute for three minutes."

Most scanners and ham radio equipment are simply classified "weatherproof," with no stated IPX rating. As you'll soon read, there *are* several ham radio handhelds that specifically meet IPX7 static immersion tests. There are no ham radio handhelds rated for IPX8.

"Understanding IP ratings is extremely important, especially IPX8, which should be qualified with a pressure rating in barometric pressure," says Buck. He illustrates his point using an IPX8 rating at 15 bars for 30 minutes, which is an equivalent depth of 150 meters. No ham handheld could ever survive unless encased in one of those handy clear flexible plastic enclosures.

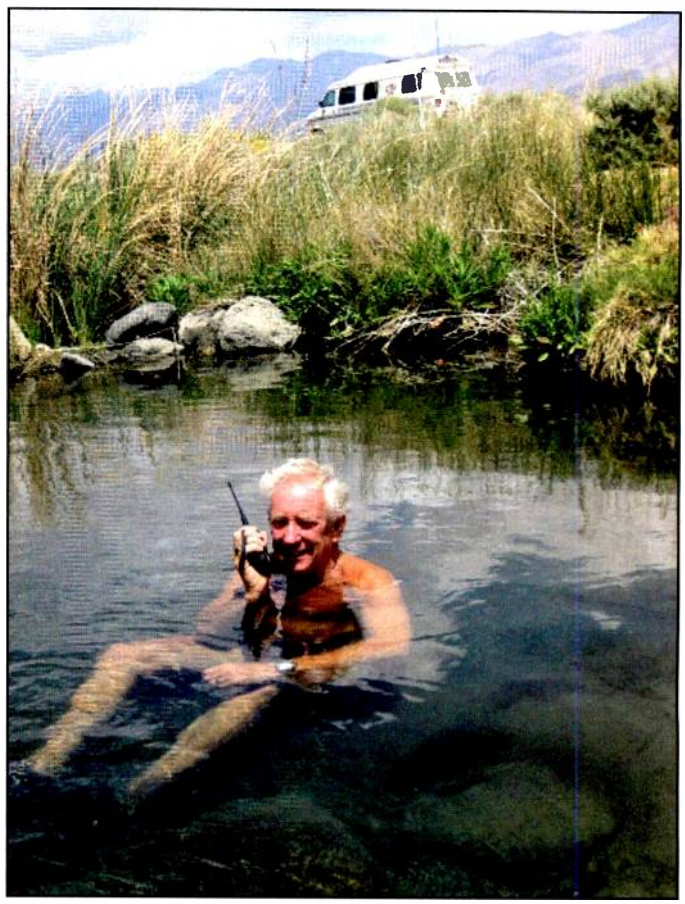
For the marine electronics industry, radio equipment meeting IPX7 is considered submersible, capable of staying under water for 30 minutes or less, but only to maximum depth of three feet. This means if you lose your IPX7 submersible handheld in a lake, and dive to the bottom to retrieve it, it will very likely surface waterlogged. Naturally, the ability of a handheld radio to survive an accidental, brief immersion is critical to boaters. Companies that build marine VHF handheld radios will likely use the same watertight mold for certain pieces of ham radio handhelds.

As far as the big manufacturers of these radios go, you're in familiar (albeit soggy) territory. Standard is Yaesu, ICOM Marine is ICOM, and Alinco is Alinco and Kenwood, Kenwood, naturally. Kenwood is built around tough land mobile radio specifications. ICOM Marine and Standard Vertex marine each have marine VHF handhelds that will not sink to the bottom when dropped overboard, they float! Sorry, no floating ham radios yet!

Only ICOM, Yaesu, and Alinco market specific pieces of ham radio equipment that meet JIS7/IPX7 submersible ratings (see "The Water Warriors"). They back up their *submersible* qualifications with warranty repair if their units, in warranty, should ever incur water ingress from a brief immersion, no deeper than three feet. Ham radio handheld equipment, *not* listed as IPX7 likely meets *weatherproof* protection IPX ratings from 1 to 4.

Care, Maintenance, And That Pesky Battery Compartment...But So Worth It

"Any handheld rated as weatherproof may instantly die if submerged in water," says William Alber, WA6CAX, a land mobile radio technician/installer and avid ham operator.



Gordo tests the Yaesu VX-7R in the 110-degree Keough Hot Springs, near Mammoth, California, posing in front of his Communications Van on old Highway 395. The radio did fine!

The Water Warriors

If you're in the market for a new rig you can trust in the wettest environments, check out these offerings from a few familiar names (prices are "approximate cost"):

New Alinco DJ-V single band for 2 meters, 222 MHz, and 70 cm, submersible ($150)
ICOM D-STAR IC-92AD dual band, submersible ($579)
Yaesu VX-170/177 single band, submersible ($125)
Yaesu VX-6R tri-band, submersible ($245)
Yaesu VX-7R quad band, submersible ($275)
Yaesu VX-8R (new, as advertised) APRS quad band, submersible ($370)

"Weatherproof handhelds *must* have all rubber plugs in place to keep spray or light rain from getting on the insides," adds Alber.

If you own a weatherproof handheld and/or a pocket scanner or FRS/MURS equipment, make sure all rubber plugs are in place, especially the top plugs for the speaker/mic connection. Any salt water getting into an open DC input jack will quickly create electrolysis, and the stray current corrosion will quickly disintegrate the tiny DC input contacts.

Any type of handheld, *including submersibles*, should be immediately dried off after a water encounter. As fast as you can, open up the battery compartment, remove the battery, and blow dry both the battery and the compartment with a hair dryer on medium.

There may be a slight compromise in a handheld's submersible rating when it comes to the battery compartment, however, but there is an easy way to tell if *your* submersible HT will holler for help when you're treading water during the hurricane. Simply pop open the battery compartment to check if the battery lid has a rubber O-ring seal. If it does *not*, water will get into the battery compartment, and if it's *ocean* water, the battery will be dead in about a minute. So how is this considered "submersible"? Likely the radio electronics inside are bone dry, thanks to the O-ring to seal out water down to three feet. But if the battery cover is not O-ring protected, this is an easy area of water intrusion—submersible or not! I've seen handhelds survive, but the battery pack internally shorts out after an encounter with ocean spray. A replacement battery might get you back on the air if the equipment itself was not damaged by saltwater.

Low-Cost Submersible

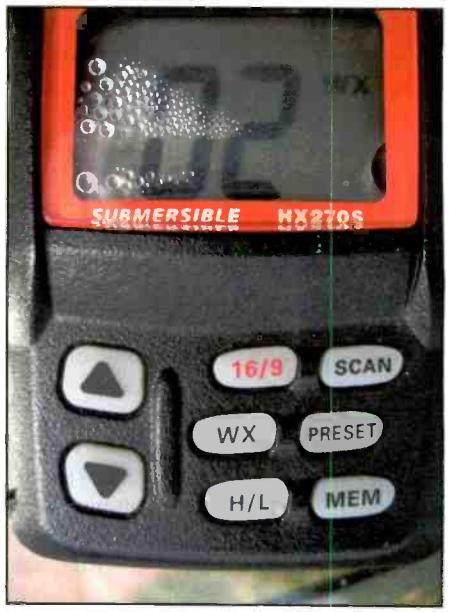
If you're a member of the US Coast Guard Auxiliary, you should be aware that the NTIA (National Telecommunications and Information Administration), the government radio counterpart to our FCC, has issued a notice that amateur radio equipment is no longer permitted on the Coast Guard Auxiliary repeater frequencies, just outside the 2 meter ham band. The NTIA has determined the equipment that complies with FCC certification standards for specific applications *will* meet the requirements for narrow-band operation, FCC Part 80/Part 90 compliant.

Radios that are FCC Part 80/Part 90 compliant are *not* keyboard frequency programmable, unlike amateur products that may be frequency adjusted via the keypad. Part 80/Part 90 handheld and mobile equipment must be programmed using custom software, usually available to authorized radio dealers, and in some cases, available to US Coast Guard Auxiliary technical personnel.

The fully submersible Standard Horizon HX370S, 5 watt, 55-channel marine VHF handheld may also include pre-programmed 2 meter ham wideband and Coast Guard Auxiliary narrow-band repeater channels, all for under $150! The equipment is pre-programmed with your local Coast Guard Auxiliary VHF channels, as well as your favorite local 2 meter channels. Coast Guard Auxiliary Communications Chief Bill Scholz, W1HIJ, puts it all together for you. You must show Coast Guard Auxiliary membership, and indicate Coast Guard Auxiliary frequencies and authorization for those frequencies in your local area. Also, list the ham frequencies you want programmed wide band in the extra channel memories on this unique submersible handheld.

Visit www.standardhorizon.com for more information and a how to find a dealer for the US Coast Guard Auxiliary marine/2 meter/submersible handheld.

Standard Horizon's low-cost HX370S is a 5 watt, 55-channel marine VHF handheld that can be pre-programmed with local Coast Guard Auxiliary VHF channels and local 2 meter channels for Auxiliary members.



This marine radio still works after a day in the wet bottom of an inflatable boat. The moisture is condensation on the LCD plate and it disappeared after an hour in the sun!

Sometimes you may luck out with a rainwater encounter by removing the battery and letting the equipment dry out in the sun. If you detect moisture forming on the inside of the LCD display screen, it's time to take some corrective action. Using a small Phillips (usually) screwdriver, separate the handheld body from the rear enclosure gasket, and let the trapped inside moisture dissipate in the bright hot sun. The display may magically clear up.

After drying out a handheld after a rain incident, check the battery for voltage, reinsert the battery, and turn the radio on. It will most likely receive and transmit as normal, but be aware that you may soon need to replace the sealed battery pack.

An encounter with saltwater is another matter. If your handheld was *turned off* and the saltwater episode was brief, fish it out of the drink, remove the battery, and if saltwater is pouring out of the open jacks it's time for a fresh water rinse. Any salt deposits left on a circuit board will quickly eat up the copper traces, and sometimes a fresh water rinse will restore it to somewhat normal operation, if you're lucky. If the radio was *turned on*, however, any encounter with saltwater usually spells death for your ocean-going HT.

But if you purchased your equipment, rated as IPX7 submersible, the likelihood of water encounter survivability is at its greatest, with manufacturer warranty (within the warranty period) as your backup. ■

The Church Rummage Sale UHF Television Station And Other Minor TV Tales

by Shannon Huniwell
melodyfm@yahoo.com

"Plainly visible in glorious black & white was a squirt gun twirling at 16 rpm on a wooden dowel stuck into a hunk of Play-Doh...Whenever the sides of the pistol came into view, a crudely lettered station identification, WGUN 45 TV, could be read."

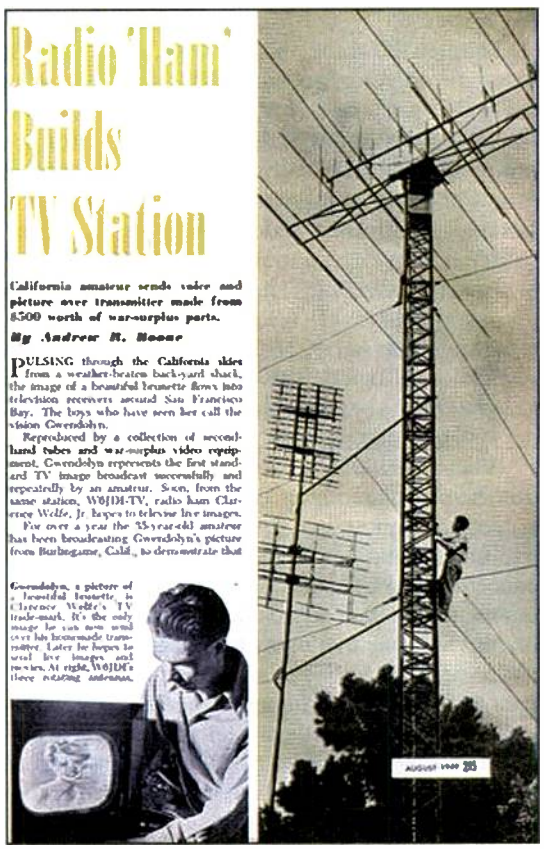
Anyone who can stand those insistent TV commercials for kooky adhesives, bra strap adjusters, effortless exercise equipment, and other valuable stuff inexorably glued to the catchphrase "shipping and handling," might just enjoy at least one of the two video stories herein. (But that's not all...If you read this entire article right now, I'll throw in a few extra graphics and captions for free!)

My father charged me nothing for a well-meaning TV pirate's saga supposedly set in Virginia during the late 1970s. That'll be the main transmitter in this column's literary broadcast. I do admit being pretty skeptical about his story at first, but a related test-pattern image supplied by one of the viewers caused me to take the bait.

Before aiming my investigative scope at what my dad remembered as the tale's WGUN 45 TV, I'd initially like to flesh out this month's column with some television history that comes from a more verifiable source than Sid Huniwell's archives. Even dear old dad admits the supporting "facts" in his informational arsenal can be roughly the broadcast history equivalent of plot lines from that quirky *X-Files* TV show.

San Francisco's First Television Station—A Do-It-Yourself Project With Coffee Can Cameras

Proof of the above subtitle comes from the reputable *Popular Science* magazine. Its August 1949 issue offers the amazing expose of one Clarence Wolfe, Jr., also known by his video amateur callsign, W6JDI-TV. With years of ham radio experience (he was licensed while still in elementary school) but no formal electronics training, Wolf managed to beat KPIX-TV 5 (San Francisco's first commercial telecaster) to the California airwaves by half a year. He accomplished this with a meager $500 worth of "secondhand tubes, war-surplus [radar] equipment" and lots of homebrew ingenuity. Wolfe's cleverness jumped into high gear when he was deciphering how to mount an old 16mm movie lens, small tubes, and circuitry into some kind of affordable package suitable as a television camera. He decided on three 1-pound coffee cans soldered end-to-end with the lens mounted on the lid of the first can in the lineup.



Radio 'Ham' Builds TV Station

California amateur sends voice and picture over transmitter made from $500 worth of war-surplus parts.

By Andrew R. Boone

PULSING through the California skies from a weather-beaten back-yard shack, the image of a beautiful brunette flows into television receivers around San Francisco Bay. The boys who have seen her call the vision Gwendolyn.

Reproduced by a collection of second-hand tubes and war-surplus video equipment, Gwendolyn represents the first standard TV image broadcast successfully and repeatedly by an amateur. Soon, from the same station, W6JDI-TV, radio ham Clarence Wolfe, Jr. hopes to televise live images.

For over a year the 23-year-old amateur has been broadcasting Gwendolyn's picture from Burlingame, Calif., to demonstrate that

Gwendolyn, a picture of a beautiful brunette, is Clarence Wolfe's TV trade-mark. It's the only image he has ever used on his homemade transmitter. Later he hopes to send live images and movies. At right, W6JDI's three existing antennas.

For some six decades, this *Popular Science* article on W6JDI-TV's owner/operator was among the only documents chronicling a truly remarkable television figure and his greatest electronic triumph: getting a TV signal on the air for just $500 and doing so months before any commercial broadcasters in his San Francisco area could fire-up their video outlets. Thomas Wolfe, Jr. certainly deserves to be recognized as a TV pioneer and an extraordinary ham!

When the *Popular Science* author, Andrew Boone, visited W6JDI-TV, he noted Wolfe's programming consisted of a static picture of a pretty brunette who viewers—mainly a handful of other San Francisco-area hams able to adapt their TV sets to snag signals in the 429 MHz area—dubbed Gwendolyn. When Wolfe sent her aloft on those ultra high frequencies, consumer UHF-TV that would begin with Channel 14 at 470 MHz (Channel 14) was still several years away.

Boone described how the unusual ham station got its electromagnetic waves into the ether: "The [dipole] antenna array [consists of] short lengths of aluminum tubing 1-inch in diameter. Half carry power, the other half serve as reflectors." This design allowed Wolfe to directionalize the output and generate a hefty gain away from the Pacific Ocean and towards the most populated communities near his Burlingame, California, city-of-license. Though his scratch-built audio/video transmitter could only manage 50 watts at the antenna jack, "in the favored direction," Boone said, "field strength is equivalent to 5,000 watts."

Wolfe's debut telecast took place in May 1948 from "a weather-beaten back yard shack." Wolfe started his transmitter humming and Boone described the scene: "This is W6JDI-TV, broadcasting the image of a girl on 429 mc, [Wolfe] said into a microphone suspended above his battered desk. Do you see her?" For six months the skilled ham offered the CQ without any response.

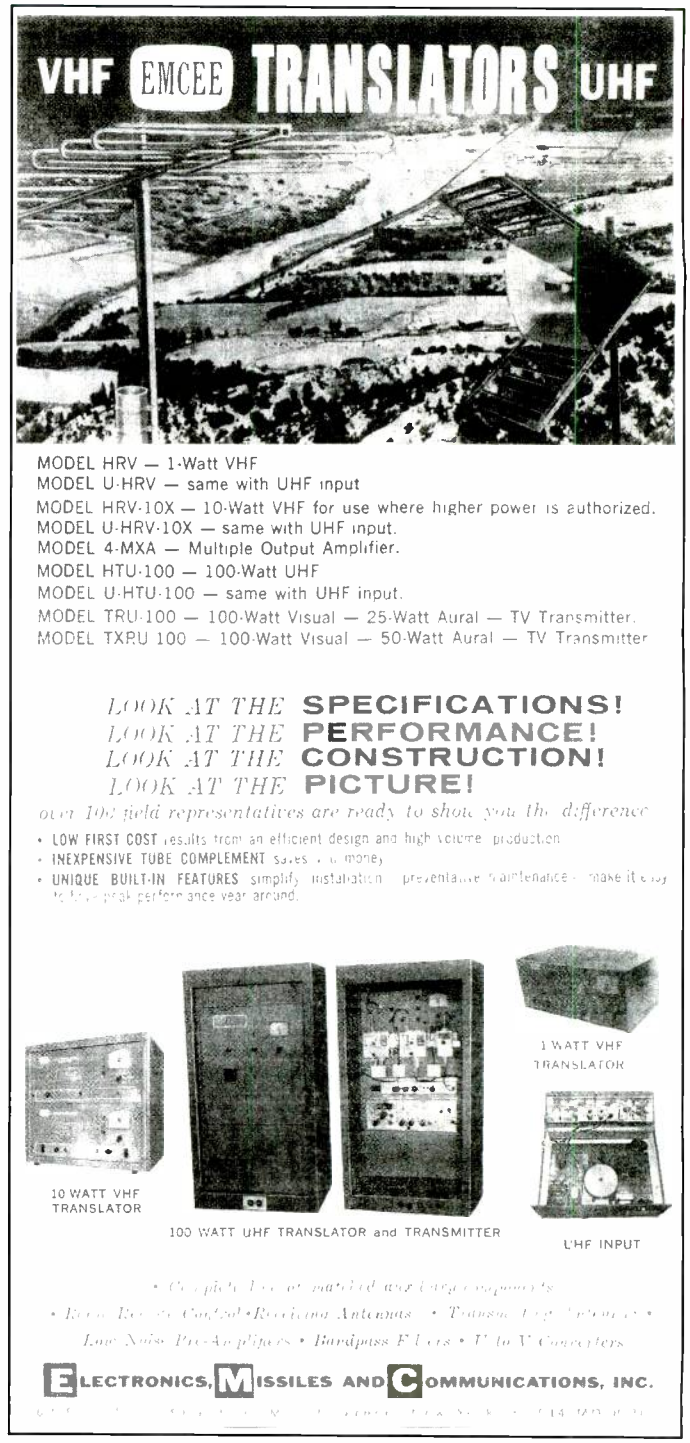
Through the grapevine, however, a few other Bay Area amateur radio operators got wind of Wolfe's experiment and figured out how to jerry-rig Army Air Corps surplus radio altimeters to the antenna terminals of their family television sets (sort of like pre-production UHF converters) in an attempt to see what their fellow hobbyist was showing. One of these fellows—a ham in Berkeley, California—fiddled with his black box's fine tuning sufficiently to be able to notify Wolfe, "Gwendolyn is coming in clear and beautiful!" That's how the young woman in the photograph pasted inside W6JDI-TV's monoscope tube television camera got her name. Her transmission also earned Wolfe the distinction of being "the first ham on the air with a standard (525 interlaced lines per picture and 30 pictures, or image blinks, per second) television picture."

When *Popular Science* visited Wolfe's remarkable TV station, he was planning to use more coffee cans to house his new homebuilt iconoscope camera concoction capable of handling live images and output from a movie projector. He expressed concern that FCC rules barred hams from presenting "entertainment" in either audio and/or video form. Displaying a prescient view, one that many television critics hold today, Wolfe observed that "a good deal of the...fare used on...TV stations runs no risk of entertaining anybody."

This unsung but authentic television pioneer continued enjoying his hobby for decades past Gwendolyn's last telecast (sometime in the 1950s) and passed away in 2002 at the age of 89.

"There's An Awful Weird Show On UHF!"

Okay, here's the story, which might be more urban-legendary than honest as a country mile. Even so, it sounds plausible enough and is certainly fun to tell. My father remembers hearing shreds of this saga around 1980 from a bored engineer whom he met after dropping in unannounced at some little AM in west-central Virginia. Dad traveled extensively for his employer and, while on the road, made a habit of spending free time in radio and TV stations rather than frequenting drinking establishments. He especially liked visiting small broadcast operations



Undoubtedly, the pictures transmitted by any of Electronics, Missiles, and Communications, Inc.'s VHF or UHF TV translators or transmitters were clearer than this image, a copy of an ad in 1963's *Broadcasting Yearbook*. Back then, the Mount Vernon, New York, electronics company offered both translators (which receive an over-the-air TV signal from a "mother" television station on one channel and then transmit, or "translate," it over another channel) and transmitters (with no "receive" function) in various denominations from 1 to 100 watts. One and 10 watt units were used for straight VHF, VHF-to-VHF, or UHF-to-VHF work, while the 100 watt boxes saw UHF-to-UHF translation, VHF-to-UHF translation, or UHF transmitter duty. Even seemingly laughably low-power TV transmitters could perform surprisingly well with a high-gain antenna and decent tower (or simple pole) height.

where folks didn't mind sharing a part of their workday or night chatting shop with somebody from out of town.

Dad thinks the fellow who conveyed this tale was part of the modest contingent of local hams responsible for tracking down a mysterious sight on their TV sets. Reportedly, the strange signal was discovered on a Saturday afternoon in January by some unidentified but curious kid who wondered what he'd see when clicking his family's television dial onto every channel from 2 through 83. As the little light illuminating the TV tuner's tiny numerals shined through the translucent plastic number 45, the picture tube's UHF snow cleared dramatically. Plainly visible in glorious black & white was a squirt gun twirling at 16 rpm on a wooden dowel stuck into a hunk of Play-Doh mounded upon an old "kiddies" record player turntable. Whenever the sides of the pistol came into view, a crudely lettered station identification, WGUN 45 TV, could be read.

Apparently the youngster quietly gazed at this image for several hours before his mother walked in and noticed her son's head oscillating back and forth in unison with the odd program. Adding to the enigma was music that accompanied the toy gun. Tracking on another turntable at the very perimeter of the camera's purview was what my father's second-hand account identified as "an unmercifully scratchy Baja Marimba Band album." (For those not familiar with this 1960s instrumental group, suffice it to say it was kind of the dollar store version of Herb Alpert's Tijuana Brass.)

On more than one occasion, the record would run its course, leaving an incessant "bump-skip" as Channel 45's audio portion. Coupled with her boy's stiff neck, that auditory indignity caused the concerned mom to do what many people resorted to when stumped in those pre-Google days: she phoned her local radio station to see if they knew anything about what was happening on Channel 45. And thanks to the DJ having quickly routed the call to the station engineer, who'd nicely equipped his shack with a late model console TV and rotor-fitted/tower mounted VHF/UHF antenna, a bona fide electronics professional soon became aware of the notorious WGUN 45 TV, too.

Who Ya Gonna Call? GUN-TV Busters!

The confounding UHF outlet was still emitting its goofy fare when the helpful engineer gathered a core group of his ham buddies and state broadcast engineering association colleagues to hunt for Channel 45's source. One out-of-towner in the bunch brought along a field strength meter that'd work in 660 MHz territory. With hot coffee and frosted donuts for energy and the radio station van as roving ham headquarters, the team sniffed out WGUN 45 TV by about lunchtime. They found it in a two-car garage next to a well-maintained mid-century ranch home on a hill overlooking town.

The engineer, responding to the excited directives of his crew monitoring the RF meter's needle, parked his vehicle. The gang exited the van and pointed to a pole affixed to a railing of the garage's second story stairway balcony. On that mast were three sturdy UHF corner reflectors linked to a run of beefy coaxial cable tucked through a slightly opened window. One of the more energetic guys, donut in hand and on a sugar high, ascended the stairs. "Hey," he yelled down to his pals, "You won't believe it, but I see a commercial TV transmitter in there!"

A couple of them quickly joined their associate on the balcony landing. Incredulous, they relayed a report to their three less adventurous and more portly counterparts.

A more compact unit than the tube-laden early 1960s rig powering the obscure WGUN 45 TV near Lynchburg, Virginia, this VSB-brand solid-state UHF-TV transmitter also boasts 10 watts of picture, but hails from the 1980s. Until the recent move to digital, hundreds of analog translators of this ilk were in service providing (mostly) rural over-the-air viewers with programming they'd otherwise never see. When low-power television was authorized in the 1990s, such units became very useful for LPTV broadcasters looking for an affordable means of transmission.

"It looks like a 100 watt UHF unit. And there's the camera and tripod shooting the spinning gun we saw!" one guy announced.

"What the...?!" was all the third fellow could offer.

There wasn't a soul in the upper room with the rogue transmitter, but moments after hearing the ad hoc signal detection association's commotion, a well-dressed man opened the side door of the nearby house and coolly inquired, "May I help you gentlemen?" His suspicions vanished after hearing an apology and an explanation of why they appeared to be snooping. "Ah," he said, "You'd probably like to speak with my son, the budding electrical engineering genius."

"You Got It At Church?"

What the signal trackers heard during the next hour or so made enough of an impression on them for it to be remembered and relayed, several years later, to my dad, then to me, and now onto the pages of *Pop'Comm*. I'm not sure where to start other than to describe the chain of events that concluded with the plug being contritely pulled on the 100 watt unlicensed TV station in hopes that the FCC wouldn't get wind of it. Not that Commission officials would have lost much sleep worrying whether or not WGUN 45 TV caused much harm to America's broadcast structure. Arguably the little UHF's biggest impact was not in causing annoying interference to viewers, but rather giving some exercise and a little excitement to some middle-aged guys.

Anyway, it seems the Genesis of WGUN 45 TV can be traced back to the early 1960s when an enthusiastic Christian envisioned churches evangelizing spiritually lost pockets of the U.S. via religious television programming. That dream led the wealthy pilgrim to attend a National Association of Broadcasters convention, where a representative of Electronics, Missiles and Communications, Inc., convinced him of the viability of low power UHF-TV translator stations that could simulcast—in daisy chain fashion—or "translate" programming on one UHF-TV channel after receiving the "mother signal" of another TV station.

The benefactor got a deal on a dozen of EM&C 100 watt UHF Translator/Transmitter units and then, in a pilot program

designed to test the effectiveness of Gospel presentation, offered them to interested churches in the Mid-Atlantic states. One recipient was a house of worship in west-central Virginia. Two or three months after taking delivery on the generous offer, however, the "outreach committee" that had enthusiastically sought the equipment realized a complex FCC application would also be required. More naivety evaporated when the church folk admitted that nobody in the congregation had known enough about television operations to understand the shortcomings of running a UHF-TV translator from deep within the pleasantly bucolic valley where the little church was wedged.

When a consultant suggested they needed to consider a remote set-up complete with video program and transmitter control lines, the bottom dropped out of their TV outreach project. Acquiring and maintaining some remote, hilltop transmission tower site seemed quite daunting and dampened the committee's initial vision of live telecasts direct from the sanctuary and from a new wing known as the "Friendship Room" where a stage would have facilitated the airing of inspirational skits performed by the church's youth group.

Fast forward 15 years...to the still-crated UHF transmitter and related gear covered with dust and assorted Christmas pageant props in a storeroom at the back of the stage. Over that time, the membership had changed. Only a handful of old-timers recalled anything about the UHF-TV dream of 1963. By the middle of the Johnson-era, outreach took the form of a Sunday morning broadcast over the local radio station. And starting in the mid-1970s, a videotape of the 8:30 a.m. service got rushed to the community's cable-TV outfit for presentation two hours later. Both developed into traditions that continue today.

There was no more talk of reviving the church-owned television station idea. In fact, the last time it was even a topic of conversation was when the Trustees, under pressure from the youth pastor's wife who wanted more storage space for backdrops and other stuff used in plays, voted to donate the whole UHF-TV transmission package to the rummage sale committee. And so, just before its annual November "Pre-Holidays Craft Fair and Garage Sale Extravaganza," the committee chairwoman enlisted her husband and a couple of the younger guys to lug the translator/transmitter crate and shop-worn carton filled with antenna elements and coiled black cable to the front of the stage. Just then, the sale chairwoman noticed the church's head trustee milling around the baked goods table.

"What kind of price should we put on that TV equipment?" she asked.

"I dunno," he shrugged, "Take whatever you can to get rid of the darn thing."

Our budding video pirate happened to be home from college where he was studying electrical engineering. His grandmother wanted to go to the sale and he "was volunteered" to drive. Once in the Friendship Room, the young man immediately spotted some interesting circuitry, metering, and tubes peeking through the crate slats. The chairwoman noticed his fascination and made her move. "We'll make you a bargain on this, this...TV electrical thingy."

"Hmm," he mused, "I might be able to mine some good parts out of this. How much is it?"

"How much do you have?" she asked sweetly.

"Only about five bucks."

"Son," she beamed, "you just bought yourself this valuable whatever it is here. And don't forget to take this other carton of electric stuff, too. You can have it for one price. Kind of like our 'buck-a-bag'

My father somehow managed to come up with a picture of this tacky but uniquely rare television logo. He reports taking the snapshot of WGUN 45 TV's official squirt gun after being shown the obscure pirate television station's World War II-era Colt .45 caliber icon by an engineer who helped track down the source of the clandestine UHF broadcast. Reportedly, when the tech suggested that the unauthorized signal needed to cease, its embarrassed founder immediately complied and handed over the plastic pistol as a token of surrender. Notice that it's resting on what is now a very vintage Tapecaster-brand audio tape cartridge (or "cart") machine.

special, only we don't have any bags big enough for all this."

Without missing a beat, she yelled to her husband to assemble a crew to squeeze the crate into the grandmother's car. When they realized it just wouldn't fit, the husband was ordered to "find somebody with a truck and deliver it to the buyer's house...pronto!" The shipment arrived that afternoon and was jockeyed to the aforementioned room over the garage where the origins of WGUN 45 TV's clandestine broadcasts were later discovered.

Birth Of A Station

The college kid set out to strip his prize for parts when he noticed a tag on the back of its metal cabinet. "Electronics, Missiles, and Communications, Inc.," the thing read. At first, he figured it might be some Cold War rocket telemetry system that the government had planned to use at anti-ballistic missile installations hidden in church steeples. Then he spied the fine print: "Model TXRU 100 watt visual – 50 watt aural UHF Television Transmitter." In a tiny box on the silver emblem, "45" was stamped next to the words, "Channel Designation." That made him recheck the gear in the cardboard container. "This must be the makings of a small TV station!" he thought aloud after finding a boxy little video camera among the accessories in the carton. "Maybe I can make it operate. Not bad for five dollars!"

His plans to put Channel 45 on the air for fun were solidified after he confided in one of his professors. The instructor earned pin money during summer break as an RF engineer at Richmond TV operation and told him what to look for when hooking together the various components for TV transmission. The man drew him a series of how-to diagrams. "You can't do much damage just experimenting with 100 watts of mid-band UHF in your rural neck of the woods," the prof said with a chuckle, "but don't air anything that's off color—even if it's only in black & white!"

The student returned to his dorm room in deep contemplation. Several times, his roommate shouted "HELLO?" then gave up and turned up the volume on a cassette tape deck playing Jim Croce's "Bad, Bad, Leroy Brown." The blaring music shocked the future UHF pirate out of his trance and gave him a eureka moment: he'd brand his fledgling station Channel 45 after the Croce lyrics about a bad boy and his gun (he was apparently still in a trance as the actual lyrics refer to "a .32 gun in his pocket for fun"). A dime-store squirt gun and some letters liberated from magazine ads provided the station logo.

Assembly of the rig began as soon as he returned home for the month-long Christmas vacation. By December 20th, the antennas were installed and everything else was plugged into the proper receptacles. His family watched in amazement as he sat them down in front of their big Sylvania television set that night to witness a picture broadcast live from their garage's second floor. Everybody agreed it was remarkably clear. "Any boy able to transmit a TV image using some things bought at the church rummage sale," his grandmother beamed, "must certainly be learning a lot at the university!"

Within a month of that well-received debut, however, WGUN 45 TV went dark, instantly becoming a fun footnote of television history. It's believed that its equipment was sold, circa 1988, at a garage sale held by the pirate's parents. Legend has it that another unauthorized UHF-TV signal on Channel 45—this one with goofily distorted audio and playing VHS tapes of Deputy Dawg cartons—showed up around that time somewhere in the air near Roanoke, Virginia.

And so ends another "Shannon's Broadcast Classics" in *Pop'Comm*...

How To Beat The Solar Minimum: Morse Code

by Tomas Hood,
NW7US, nw7us@arrl.net

In October 2008, I came across the website of the Straight Key Century Club (www.skccgroup.com). This club, also known as SKCC, is the fastest growing group of straight key Morse code operators in the world. First organized in January 2006, SKCC membership has grown rapidly to include thousands of members from all corners of the globe. The club promotes the use of manual keying devices (or, more simply, "keys') when encoding letters, numbers, and punctuation in International Morse code.

A manual key, also known as a straight key, is the human interface that allows the operator to make and break an electrical circuit in the dots and dashes. The International Morse Code is sometimes referred to as "CW" in amateur radio jargon because a continuous wave (CW) is turned on and off with the elements of the Morse code characters. The SKCC promotes the use of CW in the most original tradition of using only those keying devices that are controlled and powered by the human touch.

Morse code uses a standardized sequence of short and long elements to represent the letters, numerals, punctuation, and special characters of a given message. The short and long elements can be formed by sounds, marks, or pulses, in on or off keying and are commonly known as "dots" and "dashes" or "dits" and "dahs." The speed of Morse code is measured in words per minute (WPM) or characters per minute, while fixed-length data forms of telecommunication transmission are usually measured in baud or bps.

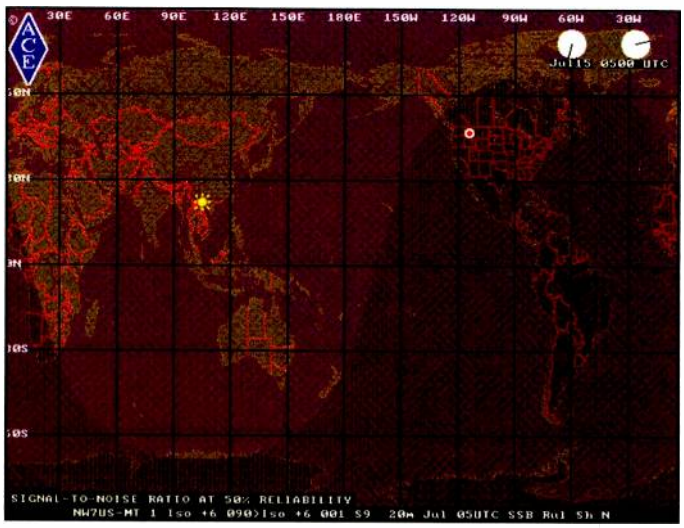


Figure 1. The non-existent signal footprint on the 14 MHz amateur radio band, using 1 watt single-sideband voice. This indicates that it is pretty hopeless to expect a 1 watt SSB signal from Montana to reach anywhere using a no-gain isotropic antenna during July 2009. (Map created by NW7US, using ACE-HF Pro, version 2.05; http://hfradio.org/ace-hf)

Why is it called "Morse code"? This character encoding was devised by Samuel F. B. Morse, the creator of the electric telegraph. This Morse code came in two flavors in the beginning. One was in use by the railroads of America, and is known as American Morse Code, and a unified, internationally used version (adopted by radio operators) from that time is now known as the International Morse Code. Now, when most people refer to Morse code or CW, they mean the international version.

Why Morse Code?...It's Fun

Because my first love as an amateur radio operator is my manually controlled Navy Flameproof World War II Signal Key (see http://cw.hfradio.org/ for a photo of this key), I decided to join the SKCC, which is free. I was assigned my membership number and went to the website to explore more about the club. What I discovered was that I was really missing out on a lot of fun.

The club offers a great number of great events, from short "sprints" (where you try to work as many other SKCC stations as possible during a given time period, often several hours) to weekend events that promote "ragchew" QSOs where you have conversations beyond the short exchange of the SKCC number and name, location, and signal report. There are plenty of incentives, too. What is unique and enjoyable about this is that the SKCC rules ensure that everyone is on a level-playing field. Only manual keys are allowed. No electronic or computer-driven CW. Only straight key operation is allowed.

Why would this be fun? I'll give you an analogy. A few years ago, I lived on the Olympic Peninsula in Washington State. One of the nearest towns where I could shop for food and other necessities was Port Townsend, located on the northeastern shore of the Peninsula. This

Victorian-styled port town features an active marina, and on sunny, breezy weekend days was the center of boating.

The bay was filled with dozens of boats, piloted by captains intent on navigating a course around the bay, hoping to win a weekend contest. But these were not motorized boats. There were no speedboats, there were only sailboats. Sails-only, these boat owners were using "ancient" wind-powered technology to enjoy their race around the bay. What fun could they possibly have, using such old technology, when one could use a motorboat and speed around the bay?

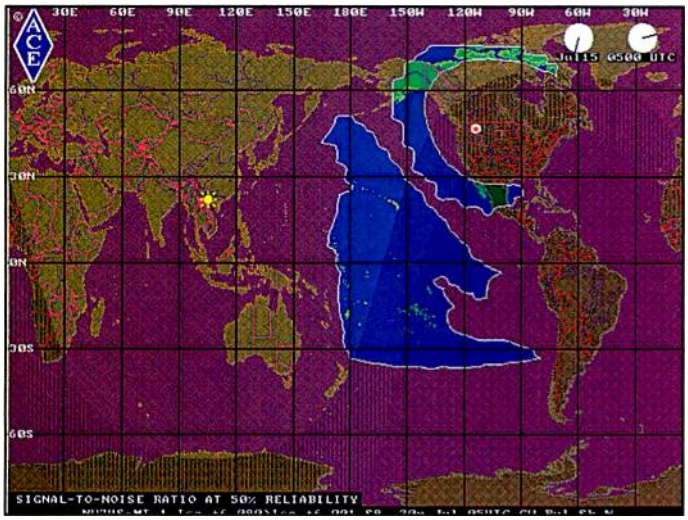


Figure 2. The useful signal footprint on the 14 MHz amateur radio band, using 1 watt CW. This indicates that a 1 watt CW signal from Montana can be used to communicate over a good part of the Pacific region, using a no-gain isotropic antenna during July 2009. (Map created by NW7US, using ACE-HF Pro, version 2.05; http://hfradio.org/ace-hf)

The same question gets asked regarding using the "old" technology of a straight key, tapping out Morse code in the CW mode on amateur radio bands. Why would that be fun? It must be, though, if numbers are any indication. For instance, the report from CQ headquarters is the number of CW logs submitted for the 2008 CQ World Wide DX contest has exceeded the number of phone logs for the first time in more than 20 years. There was a total of 5,013 SSB logs and 5,272 CW logs submitted for the 2008 running of the event, for a total of 10,285 logs. It's the first time since 1986 that more CW logs have been submitted than single-sideband (SSB) logs. The logs contained the callsigns of more than 50,000 different amateur stations making at least one contest contact.

So, why use CW, now that it's no longer required for obtaining an FCC-issued amateur radio license? Isn't it so antique that it's useless in today's modern world?

...It's Efficient

One of the many driving goals when getting on the radio is to communicate with a distant station. If you cannot hear the distant station, or if your signal is not heard by the distant station, then radio is useless. The science of radio signal propagation is in part the search for efficient communications between two stations. Often when people talk about radio reception, signal

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

Ionosphere: A collection of ionized particles and electrons in the uppermost portion of the Earth's atmosphere, which is formed by the interaction of the solar wind with the very thin air particles that have escaped Earth's gravity. These ions are responsible for the reflection or bending of radio waves occurring between certain critical frequencies, with these critical frequencies varying with the degree of ionization. As a result, radio waves having frequencies higher than the Lowest Usable Frequency (LUF) but lower than the Maximum Usable Frequency (MUF) are propagated over long distances.

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

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

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

The Sunspot Number is calculated by first counting the number of sunspot groups and then the number of individual sunspots. The Sunspot Number is then given by the sum of the number of individual sunspots and 10 times the number of groups. Since most sunspot groups have, on average, about 10 spots, this formula for counting sunspots gives reliable numbers even when the observing conditions are less than ideal and small spots are hard to see. Monthly averages (updated monthly) of the Sunspot Numbers show that the number of sunspots visible on the sun wax and wane with an approximate 11-year cycle.

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

Optimum Working Frequencies (MHz) - For Jul7 2009- 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	21	21	21	20	19	17	16	14	13	12	12	11	11	13	15	16	17	18	19	19	20	20	21	21
NORTHERN SOUTH AMERICA	27	27	27	25	23	21	19	18	16	15	14	14	13	16	18	20	22	23	24	25	26	27	27	27
CENTRAL SOUTH AMERICA	26	24	22	20	18	17	16	15	14	13	13	15	16	17	20	21	23	24	26	26	27	28	28	27
SOUTHERN SOUTH AMERICA	22	16	15	14	13	13	12	12	12	12	11	11	11	15	17	19	21	23	24	25	26	27	26	25
WESTERN EUROPE	12	11	10	10	9	9	13	12	11	10	10	12	15	16	17	18	19	19	19	19	18	17	16	15
EASTERN EUROPE	9	9	8	8	12	14	13	12	11	10	10	9	13	15	17	18	18	18	17	16	15	14	10	9
EASTERN NORTH AMERICA	24	24	24	23	23	22	20	18	17	15	14	14	15	17	19	20	21	22	23	23	24	24	24	24
CENTRAL NORTH AMERICA	14	14	13	13	13	13	12	11	10	9	9	8	8	9	10	11	11	12	12	13	13	13	14	14
WESTERN NORTH AMERICA	7	7	7	7	7	7	7	6	6	5	5	4	4	4	5	5	6	6	6	7	7	7	7	7
SOUTHERN NORTH AMERICA	22	22	22	22	21	21	19	17	16	15	13	13	12	13	15	16	17	19	19	20	21	21	22	22
HAWAII	18	18	18	18	18	18	18	18	16	15	14	12	12	11	10	10	11	13	14	15	16	16	17	18
NORTHERN AFRICA	16	15	13	12	12	12	13	13	12	11	10	13	15	16	17	18	19	19	20	20	20	19	19	18
CENTRAL AFRICA	17	16	14	13	13	14	13	12	11	11	10	12	15	16	17	18	19	19	20	20	20	20	20	18
SOUTH AFRICA	15	14	13	13	12	12	13	17	16	15	15	15	17	19	20	21	22	22	23	21	19	18	17	15
MIDDLE EAST	13	12	12	13	15	15	13	12	11	10	10	9	14	16	17	18	19	19	19	19	18	17	16	15
JAPAN	19	19	20	19	19	19	18	18	17	16	15	14	13	13	13	14	13	12	12	14	15	16	17	18
CENTRAL ASIA	19	20	20	20	19	19	19	18	17	16	15	13	12	12	13	15	16	16	15	14	13	14	16	18
INDIA	17	17	18	18	17	16	15	13	11	10	10	9	9	9	9	9	8	8	8	10	13	15	16	16
THAILAND	16	18	19	20	19	19	18	17	16	15	13	12	11	11	13	15	16	17	16	14	14	13	12	14
AUSTRALIA	28	28	29	29	29	28	28	27	25	22	20	19	17	16	15	14	14	13	13	12	15	21	24	26
CHINA	18	18	19	19	19	19	18	17	16	14	13	12	11	10	13	15	15	14	13	13	13	15	16	17
SOUTH PACIFIC	28	28	28	27	26	25	22	17	15	14	13	13	12	12	12	12	11	11	11	19	23	25	26	27

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

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

strength is touted as the most useful factor in getting a signal from the transmitter to the receiver. However, since the problem of reception is more complex than a simple power issue (just pump more watts into the antenna), the better way to get a handle on the problem is to use the Signal-to-Noise Ratio (SNR) measurement of a radio circuit (the radio circuit is the path between, and including, the transmitter and receiver). The SNR is a real measure of effectiveness. With it, we can better understand how effectively a signal can get from point A to point B.

On an abstract numerical basis, the SNR is inversely proportional to the width of the slice of frequencies in which we're detecting our signal. This slice is also known as the bandwidth that we are receiving, and that bandwidth contains the intelligence we're trying to detect. A slice that's 10 Hz wide (we can also call this a 10 Hz channel) would give an SNR power advantage of 23 dB (decibels), or is 210 times greater in strength than the level of inherent noise in a 2100 Hz channel (a typical bandwidth for SSB voice communication).

In simplified terms, that means that a signal that's transmitted with 1 watt in a very narrow 10 Hz-wide channel is 210 times more efficient than a 1 watt (fully modulated) SSB signal. **Figure 1**, created by ACE-HF PRO (http://hfradio.org/ace-hf/), illustrates the "footprint" of an SSB signal that originates at my home QTH in Montana during one hour of a day in July. Notice how there is no expected signal footprint anywhere beyond my location. A 1 watt SSB signal, during the solar cycle minimum, is pretty hopeless. **Figure 2** illustrates the footprint of a CW signal with the same output power level, the same antenna, and during the same month of analysis. Notice how I can reach much of the Pacific region if I switch from SSB to CW, using the same power level and antenna? **Figure 3** shows a 100 watt SSB signal, which results in about the same coverage as the 1 watt CW signal. But, notice a drastic improvement in area coverage if I use a 100 watt CW signal (**Figure 4**)!

These four example area coverage maps were based on using a no-gain isotropic antenna at both ends of the circuit. Imagine the improvement you would get on your signal between your radio and a distant radio if you change your antenna so that you would have a gain of 23 dB. That's like going from 5 watts to just over 1 kW! The same effect is possible simply by changing the bandwidth of your communications mode.

When we talk about using modes like CW, we're interested in how effective that mode is compared with other modes. We want to find the most efficient modes possible and concentrate our signal propagation efforts on those modes. Over great distances, the signal will experience loss. The more "power" it has, the more chance we'll "hear" it on the receive side of that long journey.

There's another advantage of using CW over other modes. The typical amateur radio operator using the CW mode manually copies Morse code "by ear." The bandwidths commonly employed in receivers for CW operation are between 250 Hz and 500 Hz. It has been postulated and supported by research that the human brain acts like a special digital signal processor (DSP) filter, giving a weak signal detected in a 250 Hz bandwidth an even better SNR than what is actually available at the speaker.

That's why Morse code as a mode of operation will continue to be one of the viable options for weak-signal communications. In addition to the ability for us operators "to DSP" a CW signal more efficiently than one using a mode like SSB on the same path with the same power and other operating parameters, there are modes based on CW that utilize the power of computer processing technology and other hardware advances. There is Coherent CW, High Speed CW, and other narrow-bandwidth digital modes that are proving to greatly increase the SNR of an already weak-signal transmission.

Beat The Propagation Blues With Morse

If you're interested in overcoming the odds inherent in the propagation of your communications, consider learning Morse code or increasing your skill in using CW. How? I strongly recommend using the "Koch" method, a method of CW training developed by a German psychologist called Ludwig Koch back

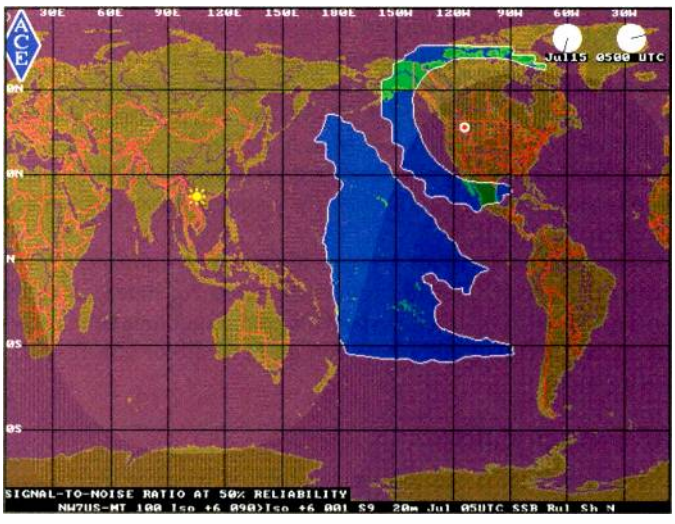


Figure 3. The useful signal footprint on the 14 MHz amateur radio band, using 100 watts on SSB. This indicates that a 100 watt SSB signal is about the same as using a 1 watt CW signal from Montana, given the same parameters during July 2009. (Map created by NW7US, using ACE-HF Pro, version 2.05; http://hfradio.org/ace-hf.

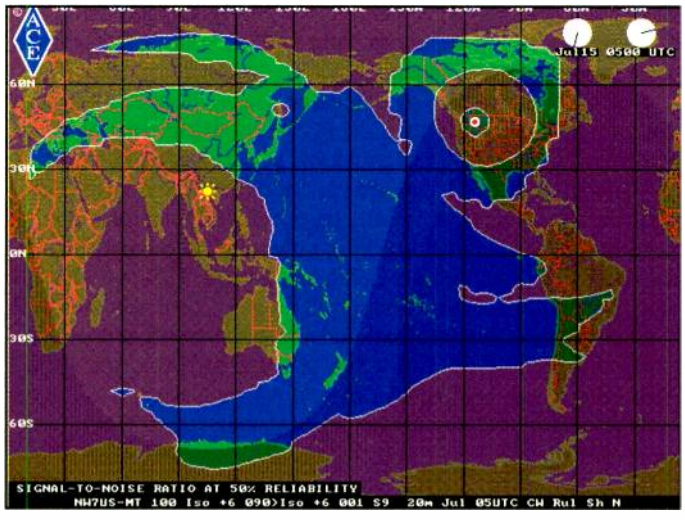


Figure 4. The useful signal footprint on the 14 MHz amateur radio band, using 100 watts on CW. Notice the much greater area of coverage of this CW signal over that of a 100 watt SSB signal, given the same parameters during July 2009. Clearly, in all cases, CW is much more effective for communications during this solar cycle minimum. (Map created by NW7US, using ACE-HF Pro, version 2.05; http://hfradio.org/ace-hf)

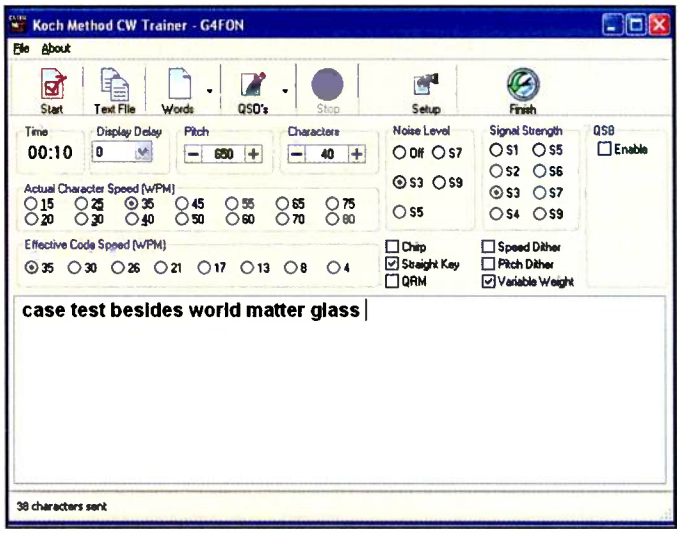


Figure 5. Screen capture of the great training aid created by G4FON, the Koch Method CW Trainer - G4FON. This program provides an excellent method to learn the International Morse Code, or CW. (Source: G4FON)

in the 1930s. The Koch method is not only useful for learning code if you have not yet done so, but, it's very effective in improving your speed and skill if you're already using CW.

There is a proven and highly recommended training aid that uses the Koch method of learning Morse code. It's the free software, created by G4FON, Ray Goff, simply called, "Koch Method CW Trainer - G4FON" (see **Figure 5** for a screen shot of the software). Browse to www.g4fon.net and look for the menu option that takes you to the "Koch CW Trainer." The version current at the time of writing this article is version 9.

For details on how the Koch method works, check out David Finley, N1IRZ,'s article at http://cw.hfradio.org/koch_1.html. Once you've acquired the skill to work CW at 20, 30, or even 40 WPM (yes, it's very possible for nearly anyone using the Koch method), you can apply your skill to your DXing efforts on the weak-signal subbands on VHF and HF.

One more thing: are you interested in a challenge? Since you can gain such an advantage over SSB by using narrow-bandwidth modes like CW, imagine what you can accomplish with low-power operation? Low-power operation, known as "QRP," typically uses 5 watts of output power or less. If you have a high-gain antenna, and are using CW or other narrow-bandwidth digital mode, you can compete with the typical SSB station running the typical 100 watts of output power. Check out the QRP Amateur Radio Club International at www.qrparci.org, and the North American QRP CW Club at www.arm-tek.net/~yoel. Also, check out my page at http://cw.hfradio.org. This is an exciting activity: Using a whisper of power, you can still work the world.

Current Solar Cycle Progress

Last month, I wrote that "The 12-month smoothed 10.7-cm flux centered on August 2008 is 6.2." That was incorrect, as that was actually the A_p recorded for August 2008. The 12-month smoothed 10.7-cm flux centered on August 2008 is 68.6.

The Dominion Radio Astrophysical Observatory at Penticton, BC, Canada, reports a 10.7-cm observed monthly mean solar flux of 69.2 for March 2009. The 12-month smoothed 10.7-cm flux centered on September 2008 is 68.4. The newly released predicted smoothed 10.7-cm solar flux for July 2009 is 71 (with a 6 point margin, higher or lower).

The Royal Observatory of Belgium reports that the monthly mean observed sunspot number for March 2009 is 0.7. The lowest daily sunspot value of zero (0) was recorded on March 1–5, March 8–25, and March 27–31. The highest daily sunspot count was 8 on March 6 and March 7. The 12-month running smoothed sunspot number centered on September 2008 is 2.2. The forecast for July 2009 calls for a smoothed sunspot count of 10 to 13.

The observed monthly mean planetary A-Index (A_p) for March 2009 is 4. The 12-month smoothed A_p index centered on September 2008 is 5.8. Expect the overall geomagnetic activity to be varying greatly between quiet to minor storm levels during July.

Propagation At A Glance
Distances Possible Via Sporadic-*E*

Here's a general guide to the distances possible with single-hop, double-hop, and multi-hop sporadic-*E* (E_S) propagation:

45–70 MHz

Single-hop E_S
Minimum range 300–400 miles
Optimum range 900–1,300 miles
Maximum range 1,350–1,500 miles

Double-hop E_S
Minimum range 1,750–1,900 miles
Optimum range 2,000–2,600 miles
Maximum range 2,750–3,100 miles

Triple-hop E_S
Optimum range 3,000–4,000 miles
Maximum range 4,300 miles

Multi-hop E_S
Maximum distance record: ~ 7,750 miles (12,500 km) - 48.2597 chE2 Iran received via multi-hop E_S by N5HV New Mexico N5JHV

88–108 MHz

Single-hop E_S
Minimum range 350–500 miles
Optimum range 900–1,300 miles
Maximum range 1,350–1,500 miles

Double-hop E_S
Optimum range 2,000–2,500 miles
Maximum range 2,700–3,100 miles

HF Propagation

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

stations located in tropical or equatorial areas may be possible well into the hours of darkness. For distances between 800 to several thousand miles, expect exceptionally strong signals. Multi-hop signals will be observed.

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

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

Forty-one and 49 meters offer domestic propagation during daylight hours and somewhat during the night. The tropical bands (60, 75, 90, and 120 meters) are not noticeably affected by the solar flux, but are degraded during geomagnetic storminess. Through the summer, expect these bands to be more challenging, though less this year than last 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 sporadic-*E* (E_S) season for the Northern Hemisphere will be quite active through July. Usually these E_S openings are single-hop events with paths up to 1,500 miles, but July's E_S events, like June's, are often double-hop. Look for HF openings on the higher frequencies, as well as on low-VHF, throughout the day. Don't forget to check during the night hours, too.

I'd Like To Hear From You

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

I hope to hear from you. Send a letter or an email.

Until next month,

73 de NW7US, Tomas Hood

A Quadrabliffit Quandary

by Bill Price, N3AVY
chrodoc@gmail.com

"Seriously, I know that any moron can just read the 90-page manual, which explains how to program the display using terms like 'batch,' and 'veebelfitzer,' and 'quadrabliffit arrays.'"

It's way past time, but I've got some "prize-books" to put in the mail (and I'm very late at doing it). My "lighted-letter-board" design contest first drew a great entry by Jerry, K5JLW, a Texan who came up with a variation that sends large lighted dits and dahs upon pressing the appropriate key; and more recently, one from Robert Raynor from Long Island, who came up with a design so clever I should send him *two* books (and a pair of reading glasses). His design combined the idea of the well-known seven-segment LED, used in digital numeric displays—with the traditional light-bulb sockets that I had struggled with before I gave in and learned the code. I'm hoping that my feeble memory will have me putting books in the mail tomorrow morning from the Cowfield County Post Office. A tip of my rumpled hat to both of these first-class designers.

It's been a quiet week at my HPJIE*. Quiet because I've spent most of my time sitting and thinking. Wondering. Wondering, that is, how to make these marvelous new digital displays (I wish they were as simple as those designed by Robert Raynor), which might someday tell me which direction my 30-foot satellite uplink dish is pointing.

The dish, which according to its manual should have completely worn out in 1998, has been pretty well maintained and with the exception of its controllers (three, so far) has served us well. The controllers—when they work—allow the user to enter the name of a satellite, press a button, say a prayer, and watch as giant motors, greasy jackscrews, chattering relays and not-so-trustworthy limit-switches aim the dish precisely at a waiting satellite orbiting the Earth some 26,000 miles away.

The first controller (which I believe used *Nixie* tubes for displays—forerunners to seven-segment LEDs) failed unceremoniously in the mid-'90s. A replacement was no longer available. Its overpriced custom-designed-and-built replacement failed shortly after its manufacturer skipped town, as did its *next* overpriced custom-designed-and-built replacement. Both these costly replacements were designed and installed using many obscure and esoteric wiring practices and voodoo. The drawings and wiring diagrams that were supplied with both replacements were made using special fading ink, hieroglyphics, cuneiform writing (little wedge-shaped symbols pressed into Gruyere cheese).

For a fee, a younger and more agile engineer friend climbed all over (and inside) the dish, analyzed the gadgets that tell a controller just how many rotations the azimuth, elevation, and polarization shafts make, and got me in touch with a nice company that makes digital displays which, when properly connected to these gadgets, were supposed to allow me to know where the dish is pointing.

I know that a few of you actually understand dual-quadrature output optical encoders and programmable digital displays. I hope you're proud of yourselves. I don't. Come to think of it, when I look back at Jerry's plans for lighted "dit and dah" board, I probably should have called him and asked how these #@$%! things \work. I bet *he* understands these things perfectly!

My boss saw me sitting under the dish in a lawn chair, staring into one of the many contactor/control boxes that make the dish move. After a while, he asked if I were okay.

"Yup. Just trying to figure why it doesn't do what it ought to." I told him.

I eventually discovered that the digital display *will* display the count of the little encoder gadgets if I take them down from the dish and hold them in my hand and turn the little shafts *really slow*. But the motors turn the shafts *really fast*, and somewhere, somehow, the little displays want to be programmed so that they can keep up with the little encoder gadgets when they're turning really fast. (Something tells me I'll be telling you more about this next month.)

Seriously, I know that any moron can just read the 90-page manual, which explains how to program the display using terms like "batch," and "veebelfitzer," and "quadrabliffit arrays." I know that almost everyone else in the entire universe fully understands these terms and could probably have these things working in a matter of moments. Alas, I am more comfortable with "knobs" and "switches" and "dits" and "dahs."

I guess I'm looking for a way to maintain a modicum of dignity and still tell their tech support guy that I've read the book about 10 times, tried every command, entered every possible value, rate, veebelfitzer, and quadrabliffit array, yet still have no clue which of the terms relate to my application and would he consider stopping by someday to show me which buttons to push if I buy him a nice lunch.

**High-Paying Job In Electronics*

Bill was considering yet another contest to find someone who can make the displays work, however our legal department is concerned with the high-voltage and heights involved and told him he's on his own.—ed.

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