



45635

POPULAR COMMUNICATIONS

MAY 2007

Can You Hear Him Now?

A Portable Shack That Keeps You Radio Ready!

- Your Life: Worth A \$10 FRS Radio? pg. 30.
- New HD Radio Receivers pg. 38

Welcome To
The Neighborhood:
A Special Tour Of
HF Propagation
Page 12

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**PLUS: Build An 800-MHz Antenna •
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Showcase: Cobra's 29 LTD
Classic CB • The Cleveland Dreamer**

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 DVS-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 (1.89-1000 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!



Wideband Receiver

VR-120D

- Wideband Coverage: 0.1-1299.995* MHz AM/FM/Wide-FM
- Rugged outdoor-ready case construction
- Ultra-long battery life
- BNC-type antenna connector
- Straightforward 4-button operation
- Versatile 640-channel memory system



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 100kHz
- Full Illumination For Display And Keypad
- Convenient "Preset" Operating Mode
- Front-end 20 dB Attenuator



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For the latest Yaesu news, visit us on the Internet:
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Specifications subject to change without notice. Some accessories and/or options may be standard in certain areas. Frequency coverage may differ in some countries. Check with your local Yaesu Dealer for specific details.

Universal Radio — Quality equipment since 1942.

ICOM® R75



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

ICOM® PCR1500 R1500



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

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

ICOM® PCR2500 R2500



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

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

FREE

ICOM UT-121 APCO 25 Board included!
A \$248.00 value included **FREE** with your R2500 or PCR2500 purchase valid to June 30, 2007.

Special Note: Prices shown for the R1500/PCR1500 and R2500/PCR2500 reflect the \$20 Icom mail-in rebate valid to June 30, 2007.



R3

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



R20

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

More info on website. **Call**



R5

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



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

www.universal-radio.com

◆ Visit our website or request our free 112 page catalog for other exciting ICOM products.

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

- Visa
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- JCB
- Prices and specs. are subject to change.
- Special offers are subject to change.
- Returns subject to a 15% restocking fee.
- Prices shown are after mfg. coupons.

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radio inc.**

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On The Cover

This KC-135 stratotanker from MacDill AFB, Florida, performs a routine mid-air refueling. Perhaps it's routine in peacetime, but today isn't quite routine. How portable and on-the-go-ready is your radio shack? Will you be able to monitor even these basic, routine comms, or talk across town or around the world in an emergency if you're powerless? This month we show you a unique portable power station that could work for you. Check out "Power + Radio = Your Ticket To Radio Fun" on page 8. (Photo by Larry Mulvehill, WB2ZPI)

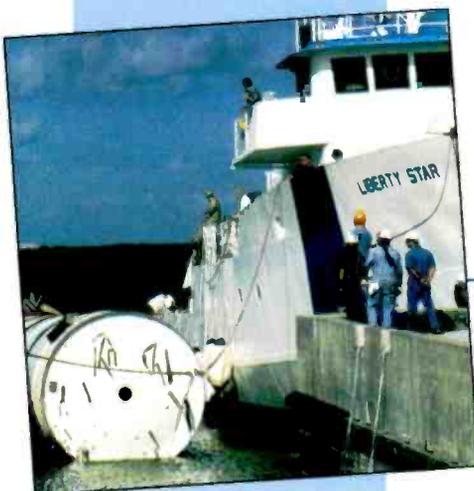
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8



30



68

Tap into secret Shortwave Signals

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

MFJ-462B
\$189⁹⁵

Plug this self-contained MFJ Multi-Reader™ into

your shortwave receiver's earphone jack.

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

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

Eavesdrop on the World

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

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

Super Active Antenna

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

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

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

Indoor Active Antenna

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

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

Compact Active Antenna

Plug this compact MFJ all band active antenna into your receiver and you'll hear strong, clear signals from all over the world, 300 KHz to 200 MHz including low, medium, shortwave and VHF bands. Detachable 20" telescoping antenna. 9V battery or 110 VAC MFJ-1312B, \$15.95. 3/16x1/4x4 in.



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

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

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

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

High Performance Modem

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

Easy to use, tune and read

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

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

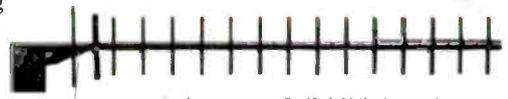
It's easy to read -- front-mounted 2 line 16 character LCD display has contrast adjustment.

Copies most standard shifts and speeds. Has

MFJ AutoTrak™ Morse code speed tracking.

Use 12 VDC or use 110 VAC with MFJ-1312D AC adapter, \$15.95. 5/16x2 1/2Hx5/16D inches.

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



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

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

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.

MFJ Shortwave Headphones



MFJ-392B 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.

MFJ-392B \$24⁹⁵

Eliminate power line noise!



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

MFJ Antenna Matcher

Matches your antenna to your receiver so you get maximum signal and minimum loss. MFJ-959C Preamp with gain control boosts weak stations 10 times. 20 dB attenuator prevents overload. Select 2 antennas and 2 receivers. 1.6-30 MHz. 9x2x6 in. Use 9-18 VDC or 110 VAC with MFJ-1312, \$15.95.

High-Gain Preselector

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

Dual Tunable Audio Filter

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

MFJ-1026 \$189⁹⁵

MFJ-959C \$109⁹⁵

MFJ-1045C \$79⁹⁵

MFJ-752C \$109⁹⁵

High-Q Passive Preselector

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

Super Passive Preselector

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

MFJ Shortwave Speaker

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

MFJ-281 \$12⁹⁵

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 \$49⁹⁵ Ship Code A

MFJ Antenna Switches

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.

MFJ-1704 \$69⁹⁵



MFJ-1702C \$29⁹⁵

Morse Code Reader

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

MFJ-461 \$89⁹⁵



MFJ 24/12 Hour Station Clock

MFJ-108B, \$21.95. Dual 24/12 hour clock. Read UTC/local time at-a-glance. High-contrast 5/8" LCD, brushed aluminum frame. Batteries included. 4 1/2Wx1Dx2H inches.



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Driven To Distraction

Over the years we've discussed in these pages the fine art of going mobile with our CBs, ham radios, scanners, and FRS/GMRS transceivers. I say "fine art" because it is, indeed, an art of sorts. You just don't (or *shouldn't*, at least) "install" a radio of any kind in a vehicle without some prior planning. For instance, you need to know how you'll route the antenna and power cables, will you see the display and radio's controls, and will the microphone cable interfere with driving the vehicle. And while in a moving vehicle you certainly don't operate the radio if your gut tells you it's dangerous, right?

Today's vehicles, as we've also said many times in the past, aren't exactly radio friendly when it comes to installation or even operation. It's truly pretty darn close to a cockpit of sorts where the primary focus of the pilot is, as it always has been, to drive the vehicle and get safely from here to there. That's an admirable concept—safe driving—because if we end up going home with crutches, or worse, we'll most certainly play the coulda-shoulda game: "Only if I had waited a moment for that 18-wheeler to pass through the intersection before making that important call on the repeater!"

Well, as it turns out, there's help on the horizon. You might not like the "help," but don't touch that dial, because it's coming anyway—if it's not already there where you live.

We live in an over-regulated and litigious society (the hallmark of a people on the doorstep of The Institution with Rubber Rooms) that, frankly, while still the greatest free country in the world, gets laughed at by the *rest* of the free world more times than I care to count. (Getting laughed at once in a while is okay; I get laughed at, especially when I wear my white gym socks with those funky black shoes.) It's when you're laughed at *most* of the time that's *should* be cause for concern.

My first non-commissioned officer laughed at one of the "dumb" questions I raised about some goofy regulation, then he quipped, "Sonny, this is the Army: you can't get out of bed and walk across that parking lot without breakin' some rule or regulation, so just get used to it do your best—don't do anything stupid."

But that was the Army, for Heaven's sake, and also many days ago. You'd *think* our actual *civilian* society would be a little less regulated, but apparently it's not so. More government for a people who can't think for themselves!

Seemingly out of nowhere several states have introduced bills aimed at distracted drivers. The "driving while cellular/distracted" laws are catching on around the country. Trouble is, the wording is such that your mobile operation could be in jeopardy!

The ARRL's regulatory guru, Dan Henderson, N1ND, has found a total of 11 legislative actions all over the country that, since we are responsible operators—and drivers—deserve our examination and comment. The ARRL says, "Bills introduced in Montana and New Mexico have been sidelined for now, but related measures—more than one in some states—remain alive in Georgia, New Jersey, Oregon, Texas, Vermont, Washington, and Wyoming." Interesting, too, is that they don't specifically exempt hams.

The Georgia legislation, House Bill 5, describes driving while using a wireless communication device as "distracted" and assesses one point on your license! It goes even further, including any "wireless communication device, personal digital assistant, radio or citizens band radio."

I always wonder who crafts such toothless legislation. Are they on something that I could use when suffering from a bad head cold and sinus pain? Or are they just, well, stupid? A cop anywhere—anywhere—can ticket you for distracted driving if you clean off your outside mirror while driving or if you pick your nose. The theory, of course, is that it should have been done before you put the vehicle in motion.

Montana's tabled House Bill 233 addresses "the use of electronic communication devices, or any other activity that causes the driver to become inattentive." How long have folks been driving in Montana? They got cars when the rest of the world did, so wouldn't you think that the "any other activity" distraction clause would already be on the books for a while? They could simply add, "using a cell phone or other portable electronic device while under motion" to their current motor vehicle statutes and be done with it in five minutes or less. Too easy.

Same for New Jersey with Assembly Bill 1966 that takes the "distracted driving" penalty to another level by making it illegal for a driver to engage in "any activity unrelated to the actual operation of a motor vehicle in a manner that interferes with the safe operation of the vehicle." That, in reality, could be virtually anything from waving to your kid as she gets on the school bus to giving *the hand* (my favorite practice) to an inconsiderate doofus.

Have you ever driven in New Jersey? I do every day, but it's not the *Jersey* drivers that bother me, really. (Most of them are actually New Yorkers looking for greener pastures; they've just moved a grand total of 15 miles and got those NJ plates!) So what activity would a New Jersey driver engage in that would interfere with the safe operation of the vehicle? Most are talking on the cell phone; and from my observations, they're not the required *hands-free* cell phones. The real problem here in Jersey is for legislators to get drivers to actually *hold the steering wheel* instead of waving their hands *as they talked*, even with the hands-free phone. If lawmakers could do that, they'd be doing many other drivers a big favor!

The existing law in New Jersey already allows an officer to ticket drivers for inattentive/distracted driving. Just add a line or two and move on to the property tax issue! I think the only reason the Jersey hands-free law works for lawmakers is because it legally frees drivers' hands to flip off others with impunity.

Moving way across the country to the Northwest, there's Oregon's House Bill 2482 and Senate Bill 293 that would make it a crime to operate a vehicle "while using a mobile communication device" without a hands-free accessory. If you get in an accident and there's property damage, injury, or death your license can be suspended and you're also likely in for a prison sentence.

(Continued on page 77)

SANGEAN

A WORLD OF LISTENING



This is the table-top stereo that the market has been waiting for. This visually stunning piano black wooden cabinet isn't just redefining the table-top category it is paving a new path.

Its features start with the ability to play MP3's and Windows Media Audio (WMA) formats from a slot load CD but takes it further by offering SD/MMC and USB flash connections that provide the flexibility no other table-top offers. For those of you who still listen to radio, it provides the AM & FM reception and sensitivity that Sangean is famous for, 20 memory presets, and the RDS text services that displays artist, song title, and other text information provided by your favorite FM stations.

Add to all this the stunning Hi-fi sound produced by the 3W + 3W amplifier that pushes 2 3" Polypropylene speakers and dual front facing bass ports. Featuring the Sangean AcoustiCase™ technology and a 3D audio projection technology, the speakers produce an unmatched level surround performance and bass response and clarity in a table-radio. For the custom sound that many listeners covet you have the ability to adjust bass and treble controls providing 14 full steps and is sure to have a range that will provide for optimal listening enjoyment whether for music or talk radio.

WR-3

WR-3 Digital AM/FM/CD/SD/MMC/USB Wooden Cabinet Table-Top Radio With MP3 Playback

- Slot-in CD MP3 playback.
- SD/MMC card / USB MP3 playback.
- FM/AM bands.
- Radio Data System (RDS) with radio text, program type, station name, and auto clock time (where available).
- Alarm & Sleep timer.
- Search & Manual tuning.
- Full Menu Display.
- Record out socket.
- External type 'F' antenna terminal.
- Rotary volume control.
- Full-function IR remote-control.
- 3D audio effect.
- Aux-in
- Stereo headphone (3.5mm)
- Dimensions (W X H X D): 14" X 4 3/4" X 9 1/3"
- Weight: 10lbs. 14 oz.

Sangean America, Inc.

2651 Troy Avenue, South El Monte, CA 91733

Tel: 888.SANGEAN Fax: 626.579.6806

e-mail: info@sangean.com

www.sangean.com

OUR READERS SPEAK OUT

Each month, we select representative reader letters for "Our Readers Speak Out" column. We reserve the right to condense lengthy letters for space reasons and to edit to conform to style. All letters submitted must be signed and show a return mailing address or valid e-mail address. Upon request, we will withhold a sender's name if the letter is used in "Our Readers Speak Out." Address letters to: Harold Ort, N2RLL, Editor, Popular Communications, 25 Newbridge Road, Hicksville, NY 11801-2909, or send e-mail via the Internet to popularcom@aol.com.

Avid Homeland Security Reader!

Editor's Note: The following letter was originally sent to columnist Rich Arland, who wanted to share it with us.

Dear Rich:

Thought I would drop you a line about *Popular Communications*. Last Thursday my March issue showed up in the mailbox. I jumped in and read your column, and as usual it was a good one. I do travel quite a bit, usually with an HT and nowadays the Elecraft KX1 or Melt Solder AT Sprint 3. I have more problems with the AT Sprint due to it not being packaged like a commercial radio.

This morning I was at the mailbox and there was the February issue—just kind of late, but wow your article was right on! You did as good a job that could have been done in the magazine! I read it twice. When I was taking the ARRL Level 3 Amateur Radio Emergency Communications course my course mentor was from the Eastern part of the U.S. When I listed all the equipment in my kit he came back and informed me that ARRL responders don't carry firearms. My kit normally has an S&W 44 Mag in it unless I am going to a city, in which case it is exchanged for a 1911 model. The kit also has a .458 rifle if I am going to the bush.

I hope you will continue to write about being prepared in "Homeland Security" as the average American doesn't have a clue! Keep up the good writing and I will keep reading!

Frank Henrikson, KLØSW
Soldotna, Alaska

Say What?

Dear Editor:

I enjoyed the March 2007 issue of *Pop'Comm*. From page 6 the fun began at "Our Readers Speak Out" where the Editor corrects a reader in his spelling of the code, when he says "MOROSE" (a person that hates work... hmmm, how many trillions of those are around here?) instead of "MORSE," which is also wrong. Please Harold don't feel all alone since even the infamous FCC used the term "Morse code" for telegraphic communications of years

past. WE HAMS NEVER, EVER TOOK A "MORSE CODE" TEST, WE HAMS, DEAR LEARNED BROTHERS, TOOK A "CONTINENTAL CODE" TEST, which is totally different and even more complicated than the other. So I ask respect for this Paleolithic form of communications and do not write "MORSE," "MOROSE," or "MoonShine," but "CONTINENTAL CODE" in its headstone. Great issue!

Luis M. Méndes, N2GK1
Via e-mail

Dear Luis:

I looked and looked, but didn't find that "morose" meant anything but a sullen or gloomy disposition (an adjective) or marked by an expression of gloom, or even pessimistic. Let's use it in a sentence. I've heard that some hams are feeling morose about the FCC's decision to eliminate Morse code testing in the United States.

Bombarded by Propaganda

Dear Editor:

Congratulations on your article "Cuba: Communism's Last Stand In the West, And Lots Of Interesting Radio Listening" (*Pop'Comm* February, 2007). I am not Cuban, but I reside in Miami, and I am bombarded by propaganda from both sides (Cuban government and exiles). Regarding Radio Marti, my understanding is that its reception is limited to certain areas of the Island. TV Marti, with a larger U.S. taxpayer's budget, is viewed only by Cuban Government monitors.

Dave, W4DN
Via e-mail

Just Like Computers

Dear Editor:

I just got my March issue and read W4WJ's letter on DTV sets. I am a former TV serviceman, too, and note the absence of good information as to what TV sets include. Most are now sold by department stores, not by TV shops, which are few in number these days (I closed mine in 1969). TV sets are used until they fail, then they're "pitch type" items. Pretty soon, one will have to buy one every two years, like computers.

John Anderson, KØBKL
West Point, Iowa

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News, Trends, And Short Takes

U.S. Budget Plan Would Cut Most VOA English Radio Programs

The new U.S. budget proposal would eliminate most of Voice of America's English broadcasts, as well as radio programs in 12 other languages. The U.S. Broadcasting Board of Governors said programs in some other languages would be expanded and that there would be an increase in total spending on international broadcasting in President Bush's 2008 budget plan. Under the proposal, VOA would eliminate all 14 hours per day of VOA News Now English broadcasting, but would continue English-to-Africa programs and the Special English broadcasts that use a limited vocabulary. The proposed budget calls for increased VOA broadcasting to North Korea, Cuba, and Venezuela.

The plan also seeks the elimination of VOA broadcasts in Cantonese, Uzbek, Croatian, Greek, Georgian, and Thai. Albanian, Serbian, Bosnian, Macedonian, Hindi, and Russian radio would also be cut, but those services would continue television programming. Other services would be reduced. Any cuts would have to be approved by Congress. A similar bid to cut English radio programs was made in the proposed 2007 budget. That budget has never been approved.

UK Media Regulator Ofcom Considering DRM+ Tests On 55 To 68 MHz

UK media regulator Ofcom has announced that it will consider applications to test DRM+ on the 55- to 68-MHz band following interest from London-based WRN after Ofcom had held a public consultation on this band, which had attracted little interest. DRM+ is the extension to the DRM (Digital Radio Mondiale) system, which was originally intended to be the digital radio replacement for LW, MW, and SW at frequencies below 30 MHz. DRM+ will allow transmissions up to 120 MHz with wider channel bandwidths, which will allow higher bit rates and hence higher audio quality. It is envisaged to primarily be used in the FM band.

WRN has already trialed DRM on the 26-MHz band, but this band is not very well suited to carrying radio stations because it is subject to sporadic-E interference when there is significant sunspot activity, which allows radio signals to travel over long distances and interfere with local transmissions due to the weird and wonderful propagation mechanisms that occur at lower frequencies.

France Currently Testing DAB+ And DRM+

Following authorization from the French communications regulator, the CSA, a Band III DAB+ trial is currently being held in Paris, along with a trial of DRM at 26 MHz in Lyon and a DRM+ trial in Band I (below the FM band, which is Band II).

However, the trial only seems to be a "pseudo-DAB+" trial, because the signal being transmitted is not DAB+, and nor are the receivers being used DAB+-enabled. What seems to be happening is that the transmission company operating the multiplex is transmitting services using the T-DMB standard and it

is using T-DMB receivers as well. (T-DMB is a DAB-based system that was designed to enable mobile TV that can also carry radio stations and is identical to DAB+ in terms of the technologies it uses.)

XM Radio Online Available With Windows Vista

XM Satellite Radio has announced that XM Radio Online will be included in the U.S. version of Microsoft's new operating system, Windows Vista. Windows Vista will offer XM Radio Online as part of its digital music hub. XM Radio Online delivers more than 80 radio channels, including commercial-free music, the Oprah & Friends talk and lifestyle channel, "The Bob Edwards Show," "Opie & Anthony," stand-up comedy, and children's programming.

Web users can sign up for a free three-day trial of XM Radio Online. Unlimited listening is available for \$7.99 a month. Those who subscribe to XM Satellite Radio for the car, home, or portable listening can enjoy XM Radio Online for no additional charge.

VOA Launches Daily Radio Broadcasts To Somalia

The Voice of America (VOA) has begun a new daily radio broadcast in the Somali language to the Horn of Africa. A group of Somali broadcasters at VOA's headquarters in Washington, D.C., will team up with freelance reporters in Africa and elsewhere around the world to provide millions of Somali speakers with accurate, up-to-date news and information. The new half-hour VOA program will air seven days a week and will include world news as well as news of Somalia and the entire Horn of Africa region. The broadcast will also offer music and discussion features that will allow leaders and ordinary listeners alike to express their opinions on topics of interest.

VOA's Somali-language service is being funded by a grant from the U.S. Department of State. The new service will supplement VOA's current broadcasts to the Horn of Africa in Anharic, Afan Oromo, and Tigrigna. VOA previously broadcast in Somali between 1992 and 1994. The VOA Somali broadcast will air on AM, FM, and shortwave radio at 1600 UTC and repeat at 1700 UTC. The 1700 UTC broadcast will also air on HornAfrik (88.8 FM), a VOA-affiliated station. The programs will also be available live and on demand on the service's website. Shortwave times/frequencies are 1600 to 1630 UTC on 13580, 15620, 1431 kHz, and 1700 to 1730 UTC on 13580, 15620 kHz.

All India Radio Starts DRM Test Transmissions

India has started testing Digital Radio Mondiale (DRM) transmissions from its Khampur, Delhi, transmitter site. The government is importing a number of DRM receivers for testing their quality under Indian conditions. The tests are currently at 0330 to 1230 UTC on 6100 kHz. ■

Power + Radio = Your Ticket To Radio Fun

At Home, On-The-Go, Or In An Emergency, Here's One Way To Go With Portable Power

by Harold Ort, N2RLL, Editor

Our surveys have told us that most of you (about 75 percent) like to build things, and about the same number of you like to experiment with portable power generation, so this month we'll take a look at a small, yet fairly beefy, power unit and radio shack on wheels that I put together in one afternoon, with help from the great folks at Alinco, ACDelco, Vector Mfg, and Midland Radio Corporation.

The key to any radio "station"—scanner, ham, CB, GMRS, or whatever—is power; that means sufficient power to run the station on a camping trip or in an emergency, independent of 110 VAC. I always think of our radio shacks as tremendous links to the outside world when the chips are down (or *power lines* are down, which where I live occurs more frequently than it should because we still insist on stringing our wires 1930s style instead of burying them underground!). For those of us without the Big Bucks required for a whole-house emergency generator, or for folks who travel and have the room for a large household portable cart in the SUV this one's for you.

Think Big—And Small!

For my personal portable power unit I shopped around for a "box" that would house a sealed lead-acid battery of sufficient amps to power an Alinco DX-70TH at low power for an extended period. What's an extended period, you ask? Over the years I've taken detailed notes on our power outages in this area of New Jersey, and over a two-year period it's down and out for about three hours every eight months on average.

I could care less about TV, air conditioning, hair dryers, curling irons, and running a PC (which is on back-up power anyway). I'm more concerned about hav-



Here's the ACDelco M27MF maintenance-free battery that fits snugly in the ElectroMate's case. This battery, and others by AC Delco, will also give you outstanding service when used with a solar system or simply trickle charging it with a 110-VAC charger. The ElectroMate includes a "smart" trickle charger, but you can buy a good one at Sears or The Home Depot. I used a similar Delco battery for a simple hand-truck project a few years ago. It's still running strong! These AC Delco batteries (check them out at www.acdelco.com) have a rugged polypropylene case that, as AC Delco says, will "...stand up to vibration and shock."

ing enough light to get by for a day or so and running the Alinco DX-70TH for an occasional portable QSO, listening to international shortwave broadcasters (a bonus with the Alinco—and it does an absolute superb job on it, I might add!), utility stations in sideband, and the MW broadcast band.

By the way, the excellent selective receive section of the Alinco DX-70TH (150 kHz to 30 MHz and 50 to 54 MHz!) and the extreme versatility of this great rig with its overall user-friendly nature, in my opinion, makes it an *outstanding* value for the money (current MSRP is \$1074). Of course the "street price" is considerably less. With 100 memory channels, detachable face plate, and a multitude of other user-friendly features, the Alinco DX-70TH is a pleasure to use and is ideal for

newcomers to the amateur HF spectrum.

Finding a reasonable, sturdy container for the ACDelco M27MF battery (battery list price \$13.60) wasn't difficult, but remember, your portable station can be what *you* want it to be in terms of portability, power sizing, and accessories. This particular ACDelco "Voyager" battery also features a very visible built-in hydrometer that allows you to see the state of charge. But the thoughtful folks at ACDelco provided a simple chart called "H.U.P.—Hours Of Usable Power" to help.

On low power the Alinco will draw approximately 8 amps (25 amps on full power). The ACDelco chart (based, of course on a fully charged battery) shows that at 5 amps you'll get about 18.6 hours of use (the Midland handheld CB draws a



The status lights on the ElectroMate show a full battery charge, but as with all other power units, always take an independent voltage reading.



The Midland 75-822, shown here monitoring Channel 19, is a perfect fit! It's a full-power 40-channel handheld (and mobile) CB that once again demonstrates its versatility for all kinds of communications needs and fun.

couple of amps on transmit, so the talk time is quite sufficient!). Fifteen amps will give you about five hours of usable power; 25 amps, about two and a half hours.

I used the ACDelco battery in the ElectroMate with just the Alinco rig on transmit (low power) for an entire weekend, with about two total hours spent on transmit and the rest listening. The battery still showed 13 volts when I checked it with a meter (not relying on the ElectroMate's status lights) after about 48 hours! Remember you must always consider all the accessories you're running off the battery; you'd be surprised at how those amps can add up if you're not careful. It's always better to transmit less and listen more!

The Vector ElectroMate 1000, which is a discontinued product, can still be found on the Internet for \$250 to \$300. It's basically a self-contained, wheeled, portable power unit that includes (if you're fortunate to get one with all the accessories) a 12-VDC fluorescent light, 1000-watt AC inverter, "smart" battery charger for 110 VAC, and tire inflator. You provide the type-27 deep-cycle battery.

The ElectroMate 1000 has two AC outlets, two DC outlets, and built-in battery status lights (again, don't rely on status lights; always use your own small voltmeter). That type-27 ACDelco battery weighs in at about 55 pounds, but includes a very convenient carrying strap/handle and fits perfectly into the container.

Connect the power cables and you're in business. Add the battery to the 52-pound, 18-1/2 x 17 x 19 1/4-inch ElectroMate and you need its heavy-duty wheels!

Don't Fuss

Don't end up in the looney bin looking specifically for the ElectroMate 1000. Just get a good, solid wheeled container. My recommendation is to stay away from an all-metal cart or very inexpensive wheeled boxes with cheap, tiny wheels. With a little patience, you'll find what's right for you! You can also use the XPower 1500 or similar wheeled, heavy-duty power unit. Remember, if your station is going to be mostly for monitoring, you'll need far less battery power than I used.

Run out to The Home Depot or a good local hardware store and get a portable, wheeled cart, caddy or whatever you want to call it and "roll your own," so to speak. Make sure whatever battery (or batteries) you decide to use in the box have adequate room for you to connect your cables, and ensure it's not going to bounce around when you roll the cart.

Always remember: NO battery is explosion-proof, a even sealed one. Don't charge the unit indoors and keep it away from sparks or open flame. The container must be properly vented for your safety!

I lucked out finding the ElectroMate 1000 and perhaps you will, too. But, if not, a similar wheeled cart-only, cables,

and grommets will set you back about \$100—well worth it depending on how sturdy the cart is and how far you want to go accessorizing it. Strap-in a separate power inverter and that's more money, of course. My equipment runs on 12 VDC, but you might not need the inverter, saving another \$100.

A couple of gel-cell batteries will keep you up and running—at least in the monitoring mode with the Alinco—for hours on end! With the Midland 75-822 40-channel handheld CB you can monitor—and talk—when necessary for several days from a full charge on a good battery (just make sure you've checked the specs to give you an adequate ratio of talk versus stand-by time!).

Attaching The Alinco

I had a couple of those old RadioShack radio hump mounts in the garage and figured they were ideal to hold the Alinco DX-70TH. I use the Alinco exclusively on low power with the provided power cable, not cutting the eight-foot-long DC power cable—simply connecting quality lugs to the ends—with the excess cable tucked away in the box, just in case. In situations like this, Murphy's Law says that once you cut the power cable, you'll need at least eight or 10 more inches of it the following week. A better connection is routing the cable directly to the terminals on the power unit. If you're just using the radio on low



The Alinco DX-70TH bolted securely to the old RadioShack hump mount, which is strapped to the ElectroMate's inverter. Of course, you can fashion your portable unit in any number of ways, including on a homebrew assembly between the handles of a similar wheeled cart. Either way, the Alinco gives users plenty of transmit power even on the LOW power setting: 10-watts SSB, FM and CW; 4 watts AM; and on 6 meters 10-watts SSB, FM, and CW; 4 watts AM. And with that shortwave and mediumwave coverage, it doubles as a superb receiver!

power and mainly for receiving, you can also use a heavy-duty fused cigarette lighter plug.

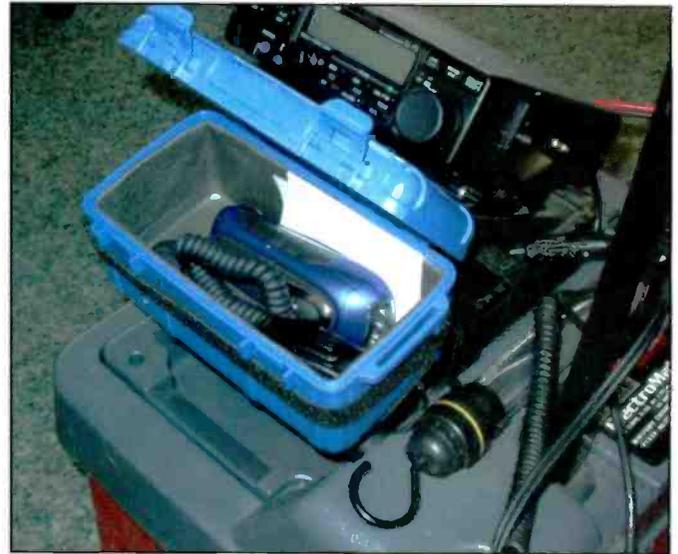
My portable antennas are a homebrew 20-meter dipole and a Super Antennas 10-Band MP 1 Rotatable Dipole, which works VERY well as a shortwave listening/DXing antenna (we'll review this great antenna in an upcoming *Pop'Comm!*). For now, check it out at www.superantennas.com.

I've used the DX-70TH with and without a "proper" ground while portable. You can, too, but you run the risk of getting RF where you don't want to get RF! The best bet is to use an adequate ground rod with the shortest possible heavy-duty cable between it and the rig. Of course this won't work if you're using the transceiver at your base location; there use your existing ground bus (you *do* have one, don't you?) that connects your other equipment—power supply, scanner, etc.—and you're in business.

Your Mileage May Vary

Remember, this article is how the Alinco DX-70TH, Midland CB, and ElectroMate worked for me. Your choice of mounting, portable cart, and battery is practically limitless. I'd be interested in your similar portable homebrew projects, whether for CB, ham, scanning, or GMRS (or *all* of these great radio tools).

Personally, I was working DX (Russia, Puerto Rico, Germany, Poland, and all over South America) with both antennas, and having a great time listening to worldband radio during the recent snow and ice storms that plagued the northeast. But it shouldn't take the threat of an ice storm or tornado to turn radio folks into ultra-ready folks. It's something we should be doing all the time! ■



*I fastened an OtterBox 3500 container to the front of the old hump-mount assembly. Inside is a small LED crank flashlight, personalized quick-start condensed instructions for the Alinco DX-70TH, which I made from its well-written instruction manual, and the DX-70TH's microphone. OtterBox makes outstanding containers of all types, including a fantastic laptop case that we'll be reviewing in *Pop'Comm*. Check them out at www.otterbox.com.*



The Alinco DX-70TH mounted to the old RadioShack vehicle hump mount, which is secured with hook and loop-type strapping to the inverter. With a little patience and ingenuity you'll homebrew a similar—perhaps even better—mounting system.

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



Bearcat® BCD396T Trunk Tracker IV

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

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

Frequency Coverage:

25.0000-512.0000 MHz., 764.0000-775.9875 MHz., 794.0000-823.9875 MHz., 849.0125-868.8765 MHz., 894.0125-956.0000 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 birds. **Memory Backup** - If the battery completely discharges or if power is disconnected, the frequencies programmed in the BCD396T scanner are retained in memory. **Manual Channel Access** - Go directly to any channel. **LCD Back Light** - A blue LCD light remains on when the back light key is pressed. **Autolight** - Automatically turns the blue LCD backlight on when your scanner stops on a transmission. **Battery Save** - In manual mode, the BCD396T automatically reduces its power requirements to extend the battery's charge. **Attenuator** - Reduces the signal strength to help prevent signal overload. The BCD396T also works as a conventional scanner to continuously monitor many radio conversations even though the message is switching frequencies. The BCD396T comes with AC adapter, 3 AA nickel metal hydride batteries, belt clip, flexible rubber antenna, wrist strap, SMA/BNC adapter, RS232C cable, Trunk Tracker frequency guide, owner's manual and one year limited Uniden warranty. Not compatible with AGEIS, ASTRO or ESAS systems. Order on-line at www.usascan.com or call 1-800-USA-SCAN.

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Bearcat BCD396T APCO 25 Digital scanner with Fire Tone Out.....	\$519.95
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Bearcat Sportcat 230 alpha display handheld sports scanner.....	\$184.95
Bearcat 278CLT 100 channel AM/FM/SAME WX alert scanner.....	\$129.95
Bearcat 248CLT 50 channel base AM/FM/weather alert scanner.....	\$104.95
Bearcat 244CLT 30 channel base AM/FM/weather alert scanner.....	\$94.95
Bearcat 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
Bearcat 350C 50 channel desktop/mobile scanner.....	\$96.95
AOR AR16BQ Wide Band scanner with quick charger.....	\$199.95
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AOR AR8200 Mark IIIB Wide Band handheld scanner.....	\$594.95
AOR AR8600 Mark II Wide Band receiver.....	\$899.95
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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., 894.0125-956.0000 MHz., 1240.0000 MHz.-1300.0000 MHz.

The handheld BC246T Trunk Tracker 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 birds. **Attenuator** - You can set the BC246T attenuator to reduce the input strength of strong signals by about 18 dB. **Duplicate Frequency Alert** - Alerts you if you try to enter a duplicate name or frequency already stored in the scanner. **22 Bands** - with aircraft and 800 MHz. The BC246T comes with AC adapter, 2 AA 1,800 mAh nickel metal hydride batteries, belt clip, flexible rubber antenna, wrist strap, RS232C cable, Trunk Tracker frequency guide, owner's manual and one year limited Uniden warranty. For more fun, order our optional deluxe racing headset part #HF24RS for \$29.95. Order now at www.usascan.com or call 1-800-USA-SCAN.



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Welcome To The Neighborhood! Here's A Special Tour Of HF Propagation!

The day I finally received my FCC-assigned callsign, and with it the new privilege to transmit on the shortwave frequencies, I was as excited as a young boy called to open his Christmas presents. With great anticipation I sat before the Kenwood TS-520S that I'd installed in my bedroom-turned-radio room. I'd strung a long wire antenna from the outside of the radio shack window on the second floor of the apartment, out to a distant tree, about an acre distant. With trembling hands, I turned the radio on and adjusted the various knobs, carefully following the tune-up instructions.

Once the transmit tubes warmed up, I nervously flipped the TUNE switch, actually putting out a real radio signal. It wasn't too long before all of the adjustments were made and the radio was ready for me to make contact with other hams. Boy, this was the moment I'd waited for—the day that I could finally talk to the world by shortwave radio!

I made sure that my writing paper and pen were ready, and then I did it: I started sending my "CQ CQ CQ DE KA1VGL KA1VGL KA1VGL KN" by slowly working my old World War II Navy signaling key. My adrenaline rushing, I listened to the rushing hiss and pops, hoping to hear the replying Morse code of some distant station. And I waited.

I knew that it could take a few calls, as I realized that my short call might not have been heard by a station simply tuning around, looking for someone to "chat" with. With renewed courage, I sent out another call.

This time, I heard it! Someone was actually sending a string of Morse code, right on my frequency! Once the shock was over, I frantically started writing the characters as I heard them, "KA1VGL," and my heart raced! It really was a response to my call! I was able to get a hold of my senses, and copied the rest of the returning transmission, seeing that it was another East Coaster, based on the callsign. The station returned it to me, by sending the ending, "KN."

It was my turn to respond. With a rush of emotion, I was about to start my first-ever QSO on shortwave radio! I began to transmit. I started feeling proud, and the words seemed to easily flow out of my fingers as I tapped out each letter, running my key at about five words a minute. What a feeling!

Just as I started to say, "My name is..." I forgot my name. As a matter of fact, I forgot the English language. I couldn't think at all, for that matter! I couldn't even remember what I was thinking, forget about the ability to spell any words! All I could do at that moment was panic and reel in confusion. I also realized that I had left the other person to wonder what happened to my transmission. Where did I go?

It seemed like an eternity passed before I remembered my name. And it took a few more long moments to gather my wits enough to start trying to send coherent Morse code. Amazingly, it was only a few seconds of panic, and I regained my confidence enough to finish sending my first full transmission. The

other station calmly responded, and we ended up having a fine conversation. My first shortwave QSO was a success!

Now YOU Can Experience The Same Thrill!

Because of the FCC ruling effective on February 23, 2007, that eliminates Morse code testing for *all* levels of amateur radio licenses, and extending limited HF operating privileges to all Technicians, the shortwave spectrum is now open for many new radio hobbyists. If you're a Technician-class operator and are used to the world of VHF and above frequencies, you're now invited to come "down" into the shortwave spectrum where you can work the whole world without repeaters or satellites. If you haven't yet ventured into ham radio, now is the perfect time to finally get your license to work the world! No longer do you have to learn Morse code in order to qualify for any level of amateur radio license.

This column provides a look at current solar conditions that play a role in how HF communications work. You'll also find a

ACE-HF Pro

The illustrations for this month's column are derived from the propagation prediction program ACE-HF Pro, available at <http://hfradio.org/ace-hf/>. ACE stands for "Animated Communications Effectiveness," a coverage display technique originally developed for U.S. Navy submarine communications. I used the ACE-HF Pro System Simulation & Visualization program to illustrate how useful propagation predictions can be to you, as you begin your new journey into the world of shortwave radio two-way communication.

ACE-HF's advantage is that the effects of solar phenomenon and the day's passage may be easily understood. ACE-HF shows when the HF bands will be open in different areas of the world. More accurately, the program is known as system simulation and visualization software—a powerful tool for an amateur radio operator that allows you to simulate a radio signal path between two points. The simulation includes the most current propagation modeling, and visually provides the results of your analysis.

The new Version 2.05 of ACE-HF has been called the "Cadillac of propagation programs." That name isn't surprising since the design derives from the professional ACE-HF NETWORK software for government and commercial HF network operators in use by the military and commercial groups. The new edition of ACE-HF has many new features for the radio amateur, but is also specifically designed with features useful to a shortwave radio listener. (See <http://hfradio.org/ace-hf/> for my various reviews and application notes for ACE-HF Pro, version 2.05.)

wealth of information on how things work on HF. You don't have to be "in the dark" as you venture into your new HF privileges. With the information from this column and others in this magazine, and with the propagation prediction programs available, you can easily master the art of worldwide communication.

Are you growing bored with simply scanning the local scene on VHF and UHF? Are you itching to not just *hear* shortwave radio signals, but to be an active participant in worldwide communications? Why not take the trip from VHF into the HF neighborhood? You'll find it a most exciting and rewarding experience. As the new solar cycle develops, (we'll talk about that in a moment) even more of the world will open up to you.

What's more, Cycle 24 is expected to be a once-in-a-lifetime record-level cycle, with higher-than-average activity levels. You may never again have such a great opportunity to experience worldwide communication around the clock, day after day, on bands like 10 meters. Solar Cycle 24 is expected to peak in about four to five years from now. So grab a license study guide, prepare for the exam, and then go take your amateur radio test at your local radio club. Set up a simple dipole antenna and a reasonably featured HF transceiver. Arm yourself with propagation prediction software program like ACE-HF Pro (see sidebar), which I used for these illustrations, and begin exploring the world of HF as it begins to open up for you.

Visiting The New Neighborhood

Moving your operations from VHF down to HF requires an understanding of the nature of radio signal propagation on shortwave. The way a VHF or UHF radio signal propagates is not the same as HF radio signal propagation; VHF and above is typically limited to line-of-sight (LOS) propagation.

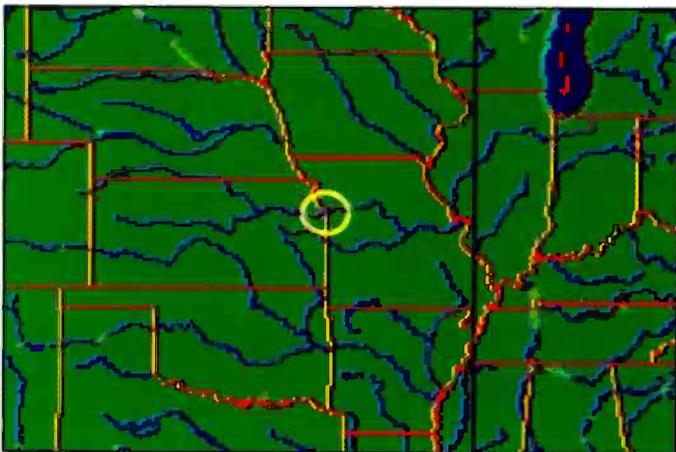


Figure 1. Typical line-of-sight circle of a VHF signal from a 1,000-foot tower in Kansas City.

Using a typical handheld VHF transceiver, an operator may be able to communicate with someone up to a mile or so away. **Figure 1** is an LOS circle plotting of a typical VHF signal from a 1,000-foot tower height, just to show how limited VHF LOS propagation is. Of course, by using repeaters or a satellite, the range of VHF-and-up can be greatly extended. In addition, VHF propagation can include modes that will extend the range of a VHF signal well over 1,000 miles. But those modes require special conditions that are typically rare.

VHF transmissions through LOS distances may theoretically be made just beyond the Earth's horizon. Such signals are

Table. Theoretical Line-of-Sight Distance Limits

(Radii from transmitter to the horizon of a spherical Earth)

TX Height	LOS Distance (miles)
10	3.7
100	11.5
1000	37

relatively unaffected by atmospheric effects, but are heavily attenuated by the Earth's surface and are readily blocked or diffracted by terrain or structures. Thus, traditional VHF television transmissions, for example, must be radiated from antennas on very high towers, and even then they only cover a limited geographical area. LOS distances to the horizon increase with the height of the transmitter, of course, as shown in the "Theoretical Line-of-Sight Distance Limits" table above.

In contrast, the HF neighborhood is marked with propagation modes that make it possible for a signal to travel around the world. The key to this worldwide propagation is the ionosphere.

The Ionosphere

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

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

Atoms in the ionosphere absorb the incoming solar radiation, causing them to become highly excited. When an atom is bombarded with enough of this energy, an electron may be knocked away from its orbit, producing free electrons and positively charged ions.

At the highest levels of the Earth's outer atmosphere, solar radiation is very strong, but there are few atoms to interact with, so ionization is minimal. As the altitude decreases, more gas atoms are present so the ionization process increases. At the same time, however, an opposing process called recombination begins to take place in which a free electron is "captured" by a positive ion if they get too close to each other. As the gas density increases at lower altitudes, the recombination process accelerates since the gas molecules and ions are closer together.

Because the composition of the atmosphere changes with height, the ion production rate also changes and this leads to the formation of several distinct ionization regions, known as the *D*, *E*, *F*₁, *F*₂, and *F*₃ layers. (Yes, an outer *F*₃ layer has been discovered, and so far it seems that, when present, it's most dense over the equatorial region during the peak of the day). The breakdown between layers is based on the density of ions and what wavelength of solar radiation is absorbed in that region most frequently.

When a radio wave enters the ionosphere, it's possible for it to be bent away from the denser, and higher, area of electrons. The amount of bending, or refraction, is dependent on the fre-

quency of the wave and the density of the ionosphere the radio wave is traveling through. Think of how a pencil might look if you place it into a glass of water. When you view the pencil through the side of the glass, it appears to bend right at the boundary between the air and the water. This is caused by the same phenomenon. Light is being refracted by the difference in density of the mass it is traveling through.

The higher the frequency, the more energy that wave has, making it more likely to pass through to the next higher region. When an electromagnetic wave enters the *F* layer, the same thing takes place. The radio signal rides the free electrons of this layer, and if the frequency of the signal is high enough, it will pass through the layer out into space. Otherwise, it will be gradually refracted back away from the higher and denser layers of electrons to be sent back toward Earth.

This is the way HF radio signals are propagated over vast distances, even around the world. All of this depends on how ionized the gases become in these various layers, and how dense each layer is, as well as the strength, angle of incidence, and frequency of the radio signal. Ionization depends on the direct energy from solar radiation.

When we look at the daily measurements of the 10.7-centimeter solar flux, we find that the higher the index, the more ionized these various layers become. In turn, the more densely ionized the ionosphere, the higher the shortwave frequency that propagates by refraction. When the flux is low, the ionosphere is weaker and only the lower shortwave frequencies will be propagated. Of course, there are many variations during the day, between regions in daylight and darkness, and from season to season.

All this science can be daunting if you're new to HF radio operation. You may even be tempted to give up at this point, but please don't. HF operation is exciting, and if you're armed with the right information and tools, and have an adequate HF operating station, you can reap many hours of HF enjoyment.

A Tour Of HF Operation

Let's take a tour of the HF "skyscape." If you're a shortwave radio listener (SWLer), you've been listening to signals coming in from around the world. Perhaps you've tuned to the ham radio bands and compared the range of what

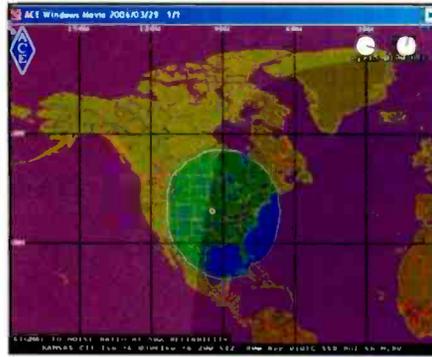


Figure 2. Eighty-meter SSB reception from Kansas City.

you've heard with what you'd hear on your VHF/UHF scanner radio. For example, **Figure 2** shows voice reception on the 80-meter band for a listener located in Kansas City, Missouri. Compared to the limits of LOS propagation as seen in Figure 1, the area of propagation covers most of the United States. You can clearly see the advantage of joining the ranks of licensed amateur radio operators who can now enjoy HF communications more easily than ever. As a General class licensee, you can enjoy 80-meter conditions to talk with your neighbors in any part of the coverage area.

Techs Using Code

If you're a Technician class licensee, you're still limited to using Morse code (CW) on 80 meters. However, since there is no longer a Morse code *test requirement* for any license class, it's easier to upgrade to a license class that has voice privileges on 80 meters as well as the other HF Ham bands.

Figure 3 shows CW reception on the 80-meter band during the same month and using the same antenna as Figure 2. Now the reception area is extended greatly; most of North and Central America is

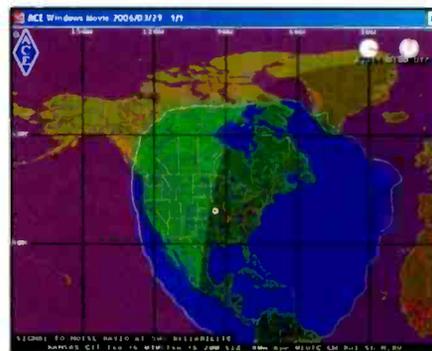


Figure 3. Eighty-meter CW reception from Kansas City.

in the coverage area. This is one of the reasons many amateur radio operators favor CW or other digital modes. Using CW, you're able to communicate over a greater range.

But we are not limited to 80 meters. If we venture to an even higher frequency band, to 40 meters, say, we see quite a change in CW reception, as illustrated in **Figure 4**. Now, you can talk with stations in Europe!

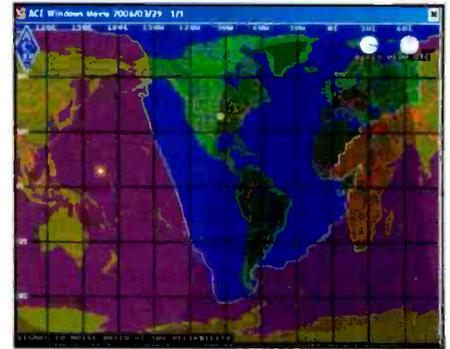


Figure 4. Forty-meter CW reception from Kansas City.

Notice that my maps are covering April/May, 2007. We are at the bottom of the current solar cycle (Cycle 23), which is a period of minimal solar activity. The ionosphere is weak, and the rumor is that HF is dead when the cycle is at this low point. This map clearly shows that HF is alive and well. You simply have to know what frequencies are useful during any given time. You could try to figure that out by simply tuning around. But, there's a whole lot of HF spectrum to tune around on. It is much easier to use a software program like ACE-HF Pro to analyze any radio circuit, for any month and under any solar condition.

Techs On 10 Meters!

If you're a Technician class radio operator, the new FCC rules allow you voice transmissions in the HF spectrum, but only on a segment of 10 meters. Because 10 meters is so high in frequency (it's just below VHF and the lowest VHF band of 6 meters), propagation of these radio signals is limited because the ionosphere is just not energized enough during this part of the approximate 11-year solar cycle.

While there are modes of propagation on 10 meters that provide regional coverage, *worldwide* coverage is often non-existent on 10 meters *right now*. However, as the new solar cycle (Cycle 24) ramps up, and the sunspot activity

increases, you'll see a steady improvement on 10 meters.

By the peak of Cycle 24, the smoothed sunspot count could reach 130. **Figure 5** shows CW reception on 10 meters for the station in Kansas City, but with a smoothed sunspot number (SSN) of 130. Now the whole world opens up! Signals from all of South America, Africa, the Far East, and even Australia can be heard!

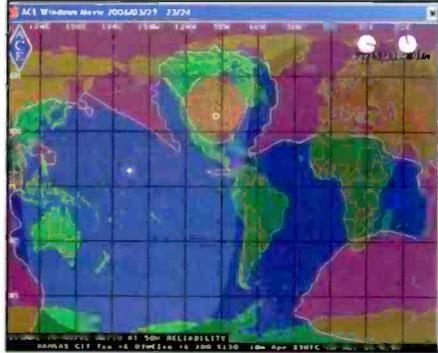


Figure 5. Ten-meter CW reception from Kansas City.

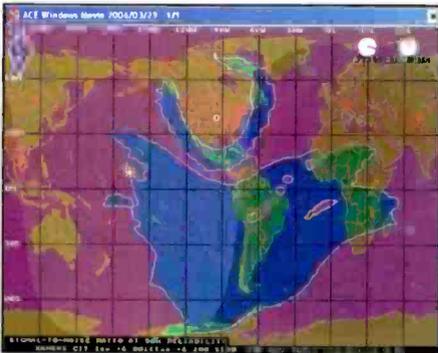


Figure 6. Ten-meter SSB reception from Kansas City.

I fondly remember working stations in the Mediterranean, Asia, Europe, and the South Pacific, while operating on 10 meters in my car. I was using a 25-watt transceiver and a 10-foot whip antenna finely tuned to 28.4 MHz. I enjoyed conversations all day long while driving from Connecticut, up into Canada, and then over to Montana. I took the trip right after the peak of Solar Cycle 22, when the ionosphere was highly energized and the nights were filled with aurora.

Using ACE-HF Pro to drill into a specific radio circuit (a circuit consists of the two end stations and the radio-signal path between the two stations), I analyzed the path between my location in western Washington State to Kansas City. **Figures 7, 8, and 9** illustrate how propagation greatly varies as you change shortwave bands.

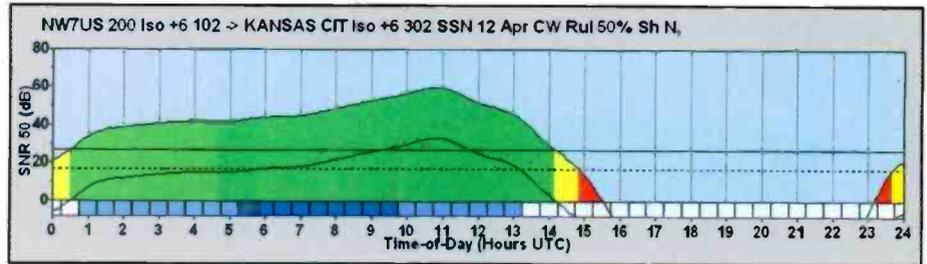


Figure 7. Signal-to-noise ratio on 80 meters CW, with an SSN of 12.

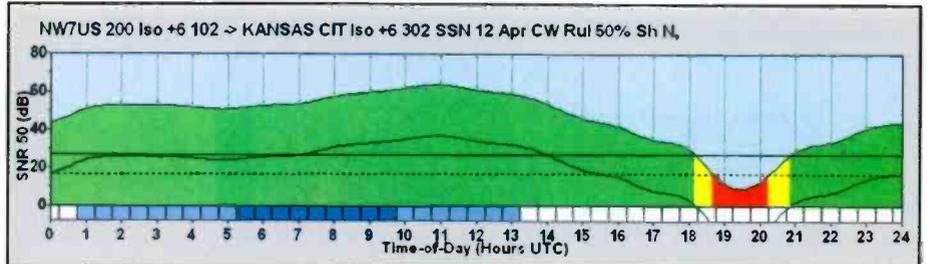


Figure 8. Signal-to-noise ratio on 40 meters CW, with an SSN of 12.

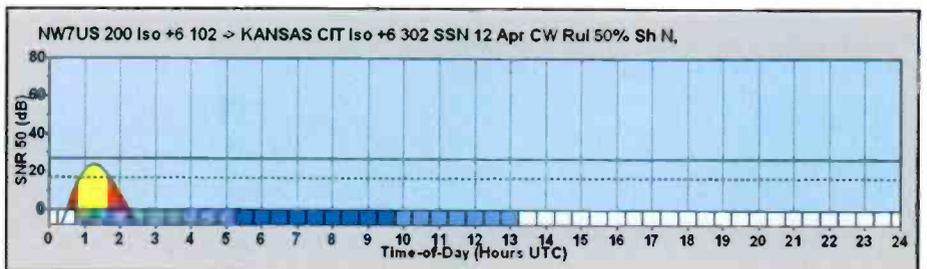


Figure 9. Signal-to-noise ratio on 15 meters CW, with an SSN of 12.

Figure 7 is the circuit on 80 meters between my station (NW7US) and a Kansas City station. By 1400 UTC, conditions get rough, and then the circuit is dead until about 0100 UTC. However, if I move up to 40 meters, as shown in **Figure 8**, I should be able to communicate with a Kansas City operator until about 1800 UTC, and can pick up that conversation again around 2100 UTC. Wow! Nearly around-the-clock communications can be realized!

Looking at **Figure 9**, I note that using 15 meters between my station and Kansas City is hopeless. The ionosphere is just not energized enough to support these higher frequencies.

Let's See What's Open

Just to check what range of frequencies would work during the entire 24 hours of a day in April/May 2007 on my NW7US-to-Kansas City circuit, I ran the signal-to-noise ratio (SNR) analysis chart. **Figure 10** is the result, showing in green those frequencies that are "open," while the yellow shows those frequencies

that would be "marginally open." The red shows those frequencies that are not able to propagate on this circuit. Interestingly, I note that a frequency at or near 10 MHz would be the most consistent on this cir-

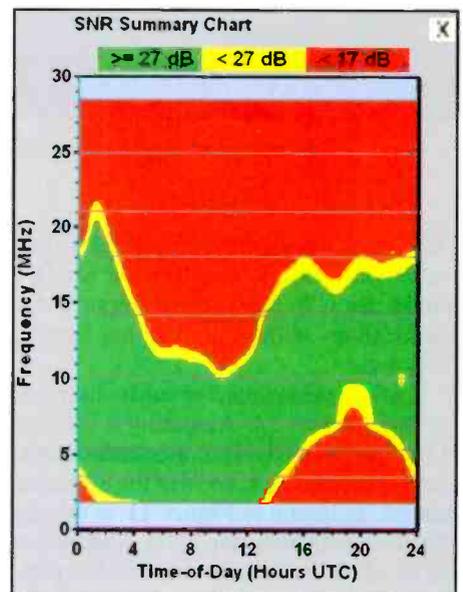


Figure 10. Here's a signal-to-noise Summary Chart for CW, with an SSN of 12.

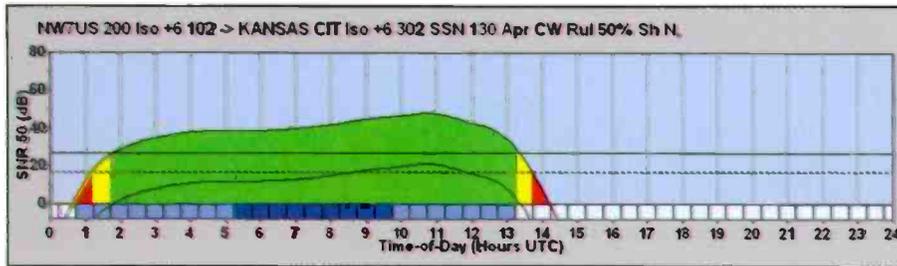


Figure 11. Signal-to-noise ratio on 80 meters CW, with an SSN of 130.

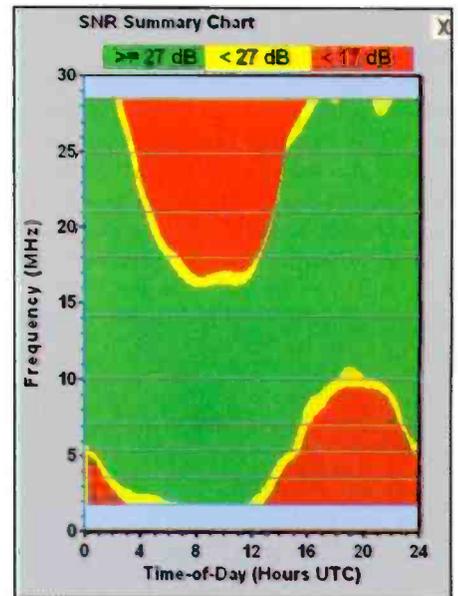


Figure 15. Signal-to-noise ratio Summary Chart on CW, with an SSN of 130.

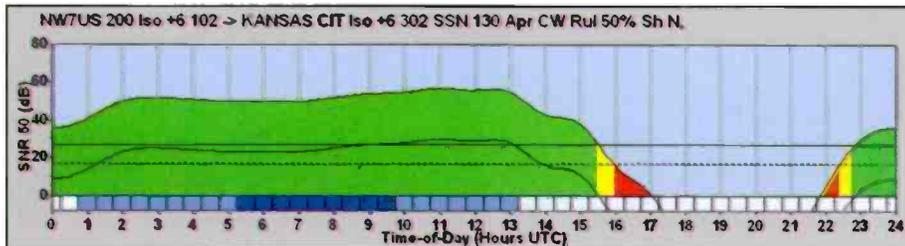


Figure 12. Signal-to-noise ratio on 40 meters CW, with an SSN of 130.

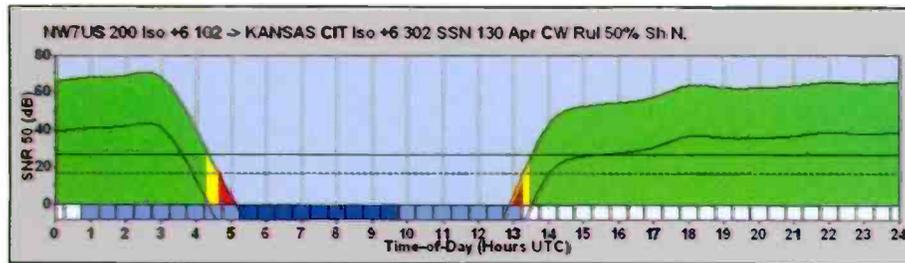


Figure 13. Signal-to-noise ratio on 15 meters CW, with an SSN of 130.

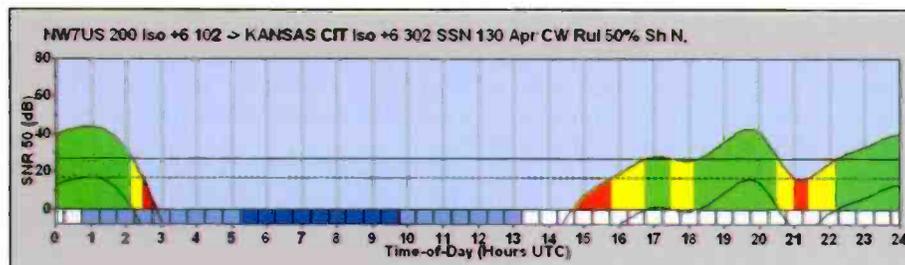


Figure 14. Signal-to-noise ratio on 10 meters CW, with an SSN of 130.

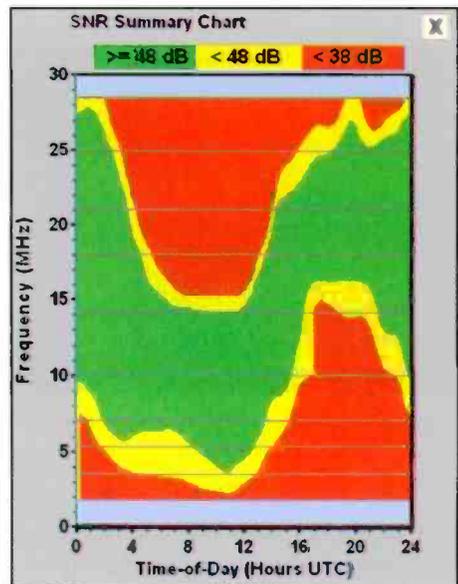


Figure 16. Signal-to-noise ratio Summary Chart on SSB, with an SSN of 130.

circuit. Since there is an amateur radio allocation on 10 MHz (the 30-meter band), I could use CW for nearly 24-hour communications with stations in the Kansas City area.

Let's travel in time, forward to the peak of Solar Cycle 24. Assuming a SSN of 130, I run an analysis of the same circuit. Isn't it interesting to see that the 80-meter circuit, as shown in Figure 11, is actually "worse" than during a low solar activity level? Even 40 meters shows this phenomenon (Figure 12), with generally weaker signal strengths than during the solar cycle minimum.

But, let's move up to 15 meters (Figure 13). Now we can see that the band becomes solid from 1400 UTC until about 0400 UTC. What a band!

To closely analyze 10 meters for this solar cycle peak, I created Figure 14. Clearly, 15 meters is the band of choice, though 10 meters does provide a few openings during the day.

As before, I want to look at the 24-hour operating picture, so I created the SNR chart for a SSN of 130, using CW, shown in Figure 15. Then, to compare how the same circuit would fare if I used voice (SSB), I created Figure 16. Clearly, CW

has an advantage, as you can see by the larger area of green. The green area shows the working frequencies on a given frequency for a given time of day.

Just to see where else I could enjoy openings during April/May 2007, I ran a Circuit Group analysis, which produced the Circuit Group report shown in Figure 17. Again, green represents the "open" frequencies. The numbers in each colored square are the SNRs. At 0200 UTC, this chart shows me that I can work stations from Alaska down to Mexico, and out to Hawaii, on 40 meters. I could work Australia on 17 meters. Running the same



Figure 17. Here's a Circuit Group with signal-to-noise ratio on CW, with an SSN of 12 at 0200 UTC.



Figure 19. Here's a Circuit Group with signal-to-noise ratio on CW, with an SSN of 130 at 0200 UTC.

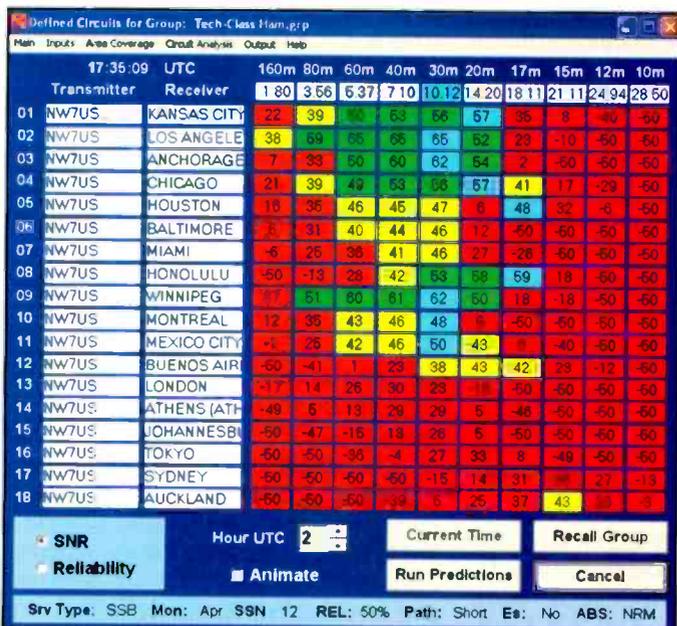


Figure 18. Here's a Circuit Group with signal-to-noise ratio on SSB, with an SSN of 12 at 0200 UTC.



Figure 20. Here's a Circuit Group with signal-to-noise ratio on SSB, with an SSN of 130 at 0200 UTC.

report, but using SSB instead of CW, I produced **Figure 18**. Again, it is very clear that CW has the advantage, when all other parameters are the same.

But, what will happen when we travel forward in time, again? Using an SSN of 130, I run the same analysis for CW and SSB at 0200 UTC. Notice in **Figures 19** and **20** how much more open are the higher bands, and that SSB can be enjoyed on many more circuits.

These Circuit Group charts can be animated so that they move from hour to hour, showing you how conditions change each hour on each circuit. This is one of the many reasons I've chosen ACE-HF Pro for my radio operations planning, and not just for ham radio, but also for shortwave radio listening. Since I have so little hobby time, I want to maximize my experience.

Using ACE-HF Pro as an aid to this planning really makes my hobby time more enjoyable and rewarding!

In upcoming issues, I'll dig deeper into HF communications and radio propagation. I'll also explore and report on space weather events. This HF "skyscape" is an exciting place to operate. Stay tuned to this column, and come join the fun on shortwave as a licensed amateur radio operator!

HF Propagation

As we move away from the winter shortwave season into the longer days of summer, the overall trend in shortwave propagation is the opening up of the higher frequencies into many areas of the world. However, these openings can be variable in

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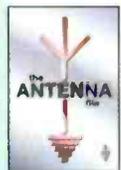
RSGB & Newnes, 2002 Ed.

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strength, subject to fading, and could be short-lived. The cause of this change is complex. The length of daylight over a region of the ionosphere, the intensity of the solar radiation, and the density and height of the various layers of the ionosphere all affect the propagation of the shortwave frequencies we're interested in. Winter daytime propagation over a given path could sustain higher frequencies than the same path during the summer daytime, while the summer nighttime frequencies will be higher than the winter nighttime frequencies on that same path.

On the higher HF frequencies (16 through 11 meters), fairly good daytime openings should be possible on north/south paths during May. Sixteen meters will be the best bet out of the higher bands, not only because of propagation, but also because more international broadcasters will still use this band around the clock.

Most DX signals, and the strongest signals, will be found on the middle and lower HF bands. Look for peaks in signals around the hours of sunrise, again just before sunset, and into the late evening. Daytime paths are best when they terminate in areas where it is night. This enhances propagation to remote parts of the world and lengthens the DX window. Twenty-five and 22 meters will have more stable signals than those on 19 meters, especially on north/south paths, again around the hours of sunrise and sunset.

Thirty-one meters again becomes one of the strongest and most reliable bands, though you will find it congested. Look for Europe and Africa early in the morning through late morning, then north/south openings during the day if the solar activity is low (otherwise the D-layer absorption will wipe out the band). As sunset approaches, look for South Pacific, then Asia as the sun sets.

During the night, 41 through 60 meters should provide good openings from Europe, Africa, and the east. Some DX should be possible on 75 through 120 meters, but signals are expected to be mainly weak and covered by seasonal noise. Static levels also increase noticeably during May, and signals may sound weaker on DX openings during the daylight hours.

Current Cycle 23 Progress

The Dominion Radio Astrophysical Observatory at Penticton, BC, Canada,

reports a 10.7-centimeter observed monthly mean solar flux of 83.5 for January 2007. The 12-month smoothed 10.7-centimeter flux centered on July 2006 is 80.3. The predicted smoothed 10.7-centimeter solar flux for May 2007 is 75, give or take about 15 points.

The Royal Observatory of Belgium reports that the monthly mean observed sunspot number for January 2007 is 16.9, a jump up from December's 13.6. The lowest daily sunspot value recorded was 7 on January 26 and 27. The highest daily sunspot count was 30 on January 8. The 12-month running smoothed sunspot number centered on July 2006 is 15.3. A smoothed sunspot count of 11, give or take 11 points lower to 12 points higher, is expected for May 2007.

The observed monthly mean planetary A-Index (Ap) for January 2007 is 5, much quieter than December's 15 (this number is adjusted up from the reported 14 in last month's column). The 12-month smoothed Ap index centered on July 2006 is 8.7. Expect the overall geomagnetic activity to be varying greatly between quiet to disturbed during most days in May.

Got A Question Or Want To See Something Covered In Your Column?

You can join in with others in discussing space weather, propagation, and LF, MW, shortwave, or VHF listening, at <http://hfradio.org/forums/>. Be sure to check out the latest conditions, as well as the educational resources about propagation, which I have put together for you at <http://prop.hfradio.org/>. I also provide a WAP/WML resource for wireless devices. If you want the latest propagation information like the solar flux, Ap reading, and so forth using a cell phone or other WAP device, check out <http://wap.hfradio.org/>, the wireless version of my propagation site.

Please let me know about any interesting propagation that you have noticed. Do you have questions about propagation? I look forward to hearing from you. Happy signal hunting! ■

Note: This month's propagation forecast charts were not printed because of space limitations. The charts would resemble last month's charts, with some very slight frequency variations.

Capitol Hill And FCC Actions Affecting Communications

FCC Chairman Taken To Task For Rural BPL Remarks

FCC Chairman Kevin J. Martin was chastised by the American Radio Relay League earlier this year for "telling the U.S. Senate Committee on Commerce, Science and Transportation that broadband over power line (BPL) technology is the answer to broadband deployment in rural areas," according to a press release on the League's website.

Martin and the other four FCC commissioners testified during the committee hearing, "Assessing the Communications Marketplace: A View from the FCC." The ARRL said that, "In his prepared remarks, the chairman described BPL as a 'potentially significant player due to power lines' ubiquitous reach, allowing it to more easily provide broadband to rural areas.'" The League went on to say,

...in joint comments to the FCC in 2003 on the then-pending BPL rule making proceeding, the National Rural Telecommunications Cooperative (NRTC) and the National Rural Electric Cooperative Association (NRECA) cited studies indicating BPL would "not be a viable solution for most Americans in truly rural areas any time soon." The organizations said that "many rural Americans are served by power lines that are many miles long with as few as one or two consumers per mile."

ARRL Chief Executive Officer David Sumner, K1ZZ, criticized Martin for repeating "specious BPL industry claims" that "suggest BPL has anything to offer rural dwellers," according to the League.

"The assertion that BPL can 'more easily provide broadband to rural areas' is one of the big lies about BPL," Sumner said. "It has been debunked time and time again, and it is beyond comprehension to hear it parroted by the federal government's senior telecommunications regulator at this late date."

Sumner said Martin's remarks "should demonstrate to the committee why legislation is needed to force the FCC to use technical studies, rather than outdated industry propaganda and wishful thinking, as the basis for making BPL-related decisions," the League reported.

The ARRL said Martin "was the only one of his colleagues to mention BPL in their Senate committee testimony. The chairman also cited United Power Line Council (UPLC) 'reports' that there are now at least 38 trial BPL deployments plus 7 commercial trials."

The ARRL believes that Martin "apparently derived his BPL deployment figures by counting the dots on a UPLC map since updated. The most recent edition, dated January 19, 2007, appears to indicate just 25 BPL trials, but that list includes some systems that do not appear in the BPL industry database. The map also shows nine commercial deployments, including one in Pennsylvania believed to have been shut down."

The FCC's "High-Speed Services for Internet Access: Status as of June 30, 2006" report indicates the number of high-speed lines grew by nearly 13.5 million in the first six months of 2006. "Of that number, nearly 640 were listed as 'power line and other,' an increase of some 14 percent in that category but about half the overall growth in high-speed services," the ARRL said.

"These latest FCC figures underscore just how far out of touch the Commission itself is with marketplace reality,"

Sumner said. "How much longer will the Commission continue to tout BPL as a viable consumer broadband option in the face of its own contrary data?"

Morse Code Test Officially Eliminated In February

The FCC officially eliminated the Morse code requirement for all levels of amateur radio licenses on February 23. The Commission had announced in December 2006 that the code tests would be eliminated, but at the time had not ascribed an effective date.

For details on the rules changes or to fully understand the new privileges resulting from the FCC's Report and Order (R&O) in the "Morse code proceeding," WT Docket 05-235, visit http://hraunfoss.fcc.gov/edocs_public/attachmatch/FCC-06-178A1.pdf.

Website Offers Details On TERT Program Initiative

Details about the National Joint Telecommunicator Emergency Response Taskforce Initiative (NJTI) have been posted on an Internet website that includes step-by-step instructions on how to develop a Telecommunicator Emergency Response Taskforce (TERT) program in any state.

The website gives visitors access to sample forms and the latest information on key contacts, including state coordinators. To access the NJTI website, visit www.njti-tert.org/.

FCC Reduces Fines Against Radio Amateurs

The FCC agreed in January to significantly reduce fines against two radio amateurs.

A \$10,000 fine ordered in the case of Robert A. Spiry, KD7TRB, of Tacoma, Washington, was lowered to \$1,500 after he satisfied the Commission of an inability to pay the original fine. The Commission cited Spiry, a Citizens Band operator who became a radio amateur, for unauthorized operation on 11 meters that "involved the use of uncertificated equipment and an illegal RF power amplifier. The alleged violations occurred in 2002, and the FCC affirmed the fine in an October 2004 Forfeiture Order (NOF). Responding to an FCC Notice of Apparent Liability in 2003, Spiry admitted the violations but said he'd sold his CB equipment and had obtained an amateur radio license," according to the *ARRL Letter*, citing the FCC.

In another action, the FCC reduced a fine against Mark A. Clay, N8QYK, of Huntington, West Virginia, for operating an unlicensed FM broadcast station. In its Memorandum Opinion and Order (MO&O) dated Jan. 29, the Commission reduced its original forfeiture amount from \$1,000 to \$250. The FCC Columbia, Maryland, field office initially proposed a \$10,000 fine. The Enforcement Bureau subsequently reduced it to \$1,000, but Clay had sought to have the FCC dismiss the fine altogether, based on his inability to pay. The FCC opted to reduce it instead. Clay holds a Technician class amateur radio license. ■

New Low Cost HF Rigs— And Great Prices, Too!

Now That Morse Code Is No Longer A Test Requirement, There's No Excuse For Not Upgrading. Here's What's New!

by Gordon West, WB6NOA

Ham radio history and testing for U.S. amateur licensees wanting to upgrade has changed with the stroke of the FCC's pen. The Commission's Report and Order (R&O) in WT Docket 05-235 eliminated Morse code examinations on February 23, and volunteer examiners throughout the country reported huge upgrade sessions.

VE teams will see many applicants within the next few months with the following upgrade ambitions:

- Technician class operators wishing to test for General class, obviously without a code test required.
- Applicants with no license wishing to take *both* written exams to go from no license to General class license.
- Technician class operators, licensed before March 1987 wishing to do a paperwork upgrade with *NO* test involved.
- Technician class operators who hold a current Certificate of Successful Completion of Element 3, General Class, wishing to turn in their valid CSCE for the General class ticket.
- New applicants wishing to get into ham radio because they heard there was no longer a code test required.
- Generals wishing to upgrade to Extra class and who want to beat the upgrade rush!

No-Code Technicians Get Plenty!

That same Report and Order also awarded Technician No-Code licensees "instant upgrade" to original Technician Plus high-frequency privileges with voice, code and data on the



Here's the Kenwood TS-2000, a step-up rig going for \$1,350.



You can also spend \$10,000 for a Big Rig—the ICOM IC-7800, which ICOM appropriately calls "the ultimate ham radio."

lower portion of 10 meters, plus CW only on 15 meters, 40 meters, and 75 meters. They get the privileges outlined in the accompanying **Table** below.

"We are soon to start Morse code learning classes on high frequency, and most everyone agrees that the elimination of the code TEST will actually *encourage* new high-frequency operators to have fun learning and practicing CW," said long time active ham on the HF bands, William Alber, WA6CAX. "So for those hams who feel strongly about all ham operators needing to know the code on high frequency, we suggest starting up a code class on the air," added Alber. He suggests split operation on 40 meters with voice code instructions offered in the new, expanded General class band near 7175 kHz, listening down for Technician and General class operators sending CW back on the CW lower portion of the 40-meter band.

The Cost Of A Good New Rig

Acquiring a top-quality, high-frequency rig for Technician and General class HF operation could cost under \$250 for used

Table. Frequencies/Privileges For No-Code Techs

28.3–28.5 MHz-voice-SSB
28.0–28.3 MHz-CW and all data modes
21.025–21.2 MHz-CW only
7.025–7.125 MHz-CW only
3.525–3.600 MHz-CW only

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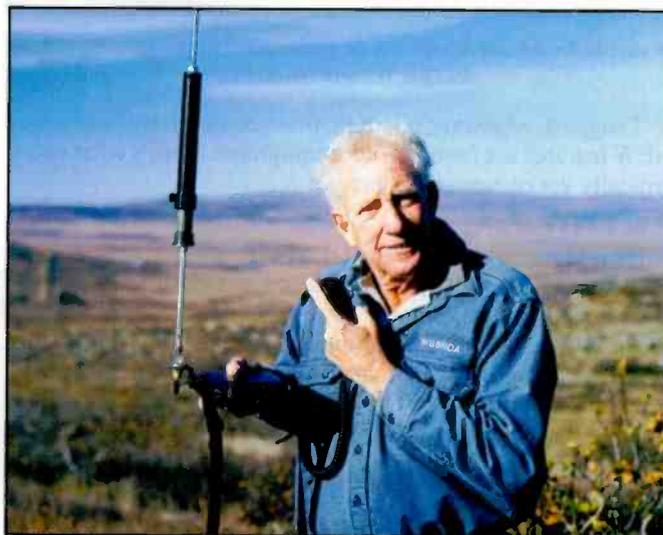
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The least expensive in this category, the ICOM 718, sells new for under about \$550. Just add 12 VDC and an antenna and it's perfect for digital modes!

gear, and under \$550 for a brand new 100-watt, 100-memory channel radio. And all the major manufacturers offer new high-frequency transceivers below—and even well below—\$999.

If you're considering used equipment, purchase it from a ham or a radio store that guarantees it's working and trouble free. If it has tubes in the finals, see if you can wrangle some spares. Generally, when you buy used ham equipment from a fellow ham, if they tell you it's working fine, it is. The same thing goes when buying used gear from a store; most stores will even give you a used equipment 10-day trial or 30-day guarantee.



Here's your favorite ham radio writer (and ours!) using his favorite radio, the Yaesu portable FT-817, in Alaska on 20 meters, working the lower 48 with 5 watts of power!

Be cautious when buying used equipment from a non-ham or a seller who's not familiar with the equipment history. Sometimes you can make out like a king at a garage sale, but other times you may end up with a rig that even Marconi couldn't fix!

Typically, used ham equipment three or four years old sells for half of its original new price. If it's eight to 10 years old, it will generally sell for 35 percent of its original purchase price.



Ten-Tec's Argonaut V has the benefits and features of IF-DSP in a modern 20-watt HF all mode transceiver. Power is adjustable from 1-20 watts output. (Photo courtesy Ten-Tec).



The Alinco DX-70 with its remote head. It uses a large remote cable for the connection between the radio's main body and head. (Photo by Bill Alber, WA6CAX)



A simple dual-band dipole can be constructed for under \$20. (Photo by Don Wilson, N9ZGE)

I suggest, whenever possible, that you buy NEW and enjoy NEW features not found in older equipment. Here's what you'll typically get on newer equipment:

Bold LCD readouts

- All solid-state with 100 watts OUTPUT
- 100 memory channels store frequency and mode
- Digital signal processing for noise reduction
- Digital signal processing for notch filtering
- Modern microphone jack that accepts Heil mics
- SSB squelch control
- Intermediate frequency shift
- Receive pre-amp or attenuator
- Speech compressor
- Built-in VOX
- Automatic tuner control

These are newer features that you won't find on a Kenwood 520, a Yaesu 101, or an ICOM IC-720, all seen selling used for around \$300.

The lowest priced 100-watt, 100-channel HF transceiver is the ICOM IC-718. It has all these features and can be seen selling new for \$550. This ICOM is a favorite among first-time HF rig buyers because of its powerful transmitter, sensitive and selective receiver, and straightforward operating controls with big rig features like built-in

DSP, built-in CW keyer, and adjustable noise blanker. Best of all, it sports a big speaker and a major-sized amber LCD display.

Over at Kenwood, its entry-level HF 100-watt, 100-channel rig is the TS-570D with 16-bit DSP AF signal processing, big LCD display, digital filter selection, and a built-in automatic antenna trimmer for multi-band dipole operation. This Kenwood has been seen selling for under \$830.

At Yaesu, there are plenty of HF rigs going for under \$999, including the FT897D, selling for around \$859, and the FT-857D, seen for a little above \$725. Both of these rigs also include 6 meters, 2 meters, and the 440-MHz bands. That's remarkable—HF plus weak signal SSB (and FM) operation on 6 meters, 2 meters, and 440 MHz! (ICOM also offers this feature with its ever-popular IC-706 MKII G, seen selling for under \$950.)

Additionally, Yaesu offers a portable, the FT-817, seen selling in the \$650 range, but its low power output makes it a spe-



Check out your favorite ham radio dealer; they've got live on-the-air rigs so you can hear them in action!



The mid-priced Kenwood TS-480 with detachable head sells for around \$914 new!

cialized rig for the seasoned ham, not necessarily for the beginner. The same thing goes for the exquisite Elecraft and Ten-Tec transceivers: they're value-packed pieces of equipment, ultra-state-of-the-art, but best appreciated by the experienced ham who has owned other rigs before.

Alinco offers the beginner high-frequency operator the DX-70TH compact mobile high-frequency transceiver, including 6 meters, for around \$750. Its best feature is the removable remote head. If you want a slightly larger base-type high-frequency rig, consider the Alinco DX-77T, seen selling for around \$675 and which has one of the nicest receivers you can lay ears on.

Want More?

Kenwood, Yaesu, ICOM, Ten-Tec, Flex Radio, and Elecraft all offer 100-watt advanced-feature HF transceivers for the seasoned ham operator looking for a more specialized HF transceiver. But, truth be told, listening on the air to a transmission from a \$1,250 step-up HF radio and the least expensive ICOM \$550 radio, I'd be hard pressed to hear any big difference in the S-meter reading. But the more money you spend on your first HF transceiver, the more refinements you will have in the receiver section, including the addition of an automatic tuner.

A simple \$25 home-brew dipole will lead to worldwide DX signals that could only be beat with a beam. Just add 12 volts



Alinco's DX-77 with its big speaker—and great sensitive and selective receiver—is seen selling for around \$675.

at 20 amps (a \$100 power supply), some coax, and a home-brew dipole to that brand new ham equipment (with a year's equipment warranty!) and your new "entry level" signal on HF will sound just like the pros'!

Get Started Now!

If you've got questions on upgrading, visit the American Radio Relay League at www.arrl.org; the W5YI Group at www.w5yi.org; CQ Amateur Radio at www.cq-amateur-radio.com; and, of course, *Pop'Comm's* website at www.popular-communications.com.

See you on the air—and at the Dayton Hamvention! ■

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'Tis The Season...

No, not *that* season! It's the season for skip—reception of radio signals at distances far further than are normally possible. Spring is the prime season for skip, although some forms of it can occur at almost any time of the year. Let's take a look at how this happens and how you might be able to hear a bit of it, if you're in the right place at the right time.

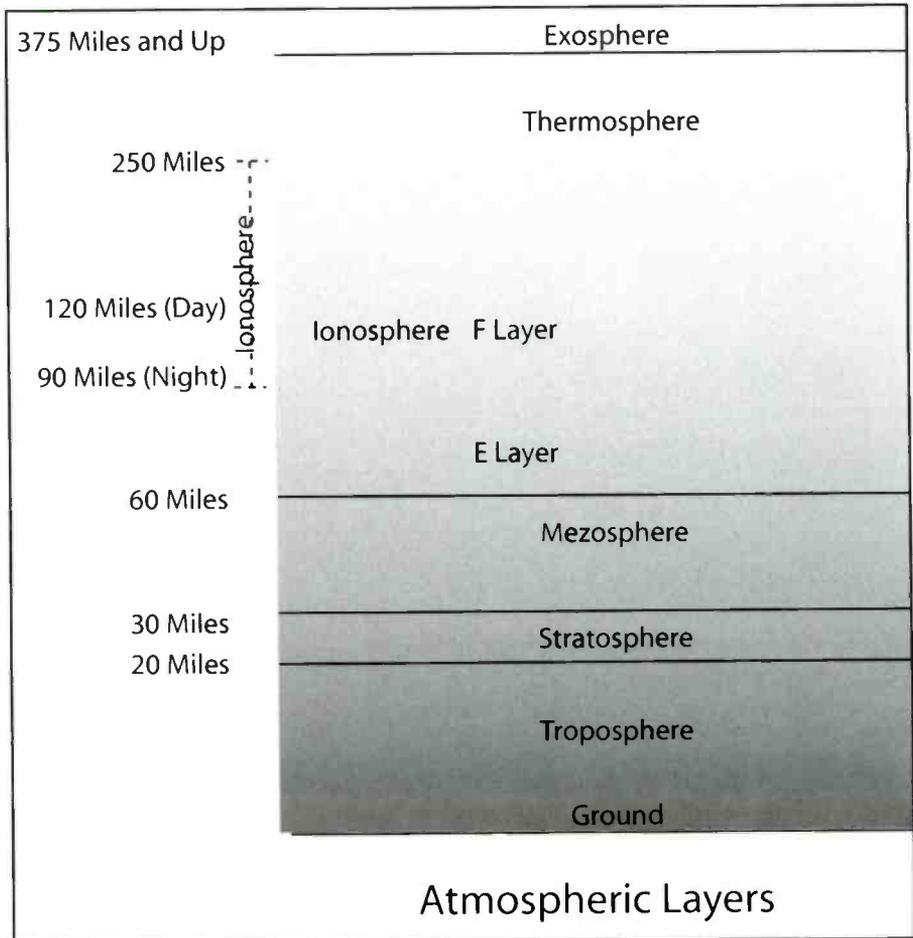
For the most part, the VHF and UHF ranges that we listen to on our scanners are pretty much limited to the infamous "line of sight," meaning that a relatively clear path between the transmitting and receiving antennas must exist for communications to take place. But lower frequencies—shortwave, in particular—commonly bounce off layers of the atmosphere and return hundreds of miles away. This makes possible the long-distance, almost worldwide communications that both hams and many commercial two-way services use. The aviation industry still makes a lot of use of HF when planes get over the horizon, although there's now a move toward satellite communications. The maritime industry's large ocean-going ships are almost all equipped with satellite systems, except in less developed parts of the world.

Frequencies Chosen For When Things Are Normal...

The VHF/UHF ranges were chosen for their particular lack of this feature. You don't really want to have fire engines in Phoenix mistakenly responding to a fire call given by Los Angeles. Using frequencies that don't travel beyond the horizon, and then deliberately spacing apart the users of those frequencies, helps to minimize one department from having to listen to another. Frequency management is a tough job, even when conditions are normal.

When Things Aren't Normal...

When conditions aren't normal, however, all sorts of strange things can begin to happen. They occur with little warning and can disappear almost as quickly and unexpectedly as they appeared. A strange



The layers of the atmosphere for weather purposes and for radio purposes don't exactly match. The most interesting to us are the ionosphere's E and F layers, as well as the troposphere. The ionosphere makes shortwave communications possible at nearly any time of the year, while VHF/UHF communications using the ionosphere are much rarer.

dispatcher will suddenly appear on your local police frequency. Or a different sounding tone might appear on a fire dispatch channel. Or a tone for a fire dispatch might appear someplace where there shouldn't be one. Or a dispatcher with a strange accent will appear (this one can actually take a while to notice because you might just think they hired someone new).

What that catches my ear the fastest is strange call letters or unit calls; a channel that only a moment ago was dispatching car 2303 will suddenly have a call (usually in a different voice, but even that can go unnoticed at first), for 5 David 3 or the ubiquitous 1 Adam 12). A closer look at a signal strength meter, if one is available, might reveal that the second dispatcher is slightly weaker (or sometimes stronger). It happens more

regularly than you might think, and sometimes over amazing distances.

Technically speaking, radio frequency propagation is the correct term for what's occurring. Skip is simply one of the ways that this happens, but there are other ways too. All result in signals traveling much further than expected. Of course, sometimes (such as in ham applications) this is exactly the effect we're after, but in the public safety world of VHF/UHF communications, it's generally not a good thing and is perceived as interference.

I recall talking to a Missouri State Patrolman years ago who was complaining that sometimes Winnipeg Manitoba was so strong that the Show-Me Staters would have to call Winnipeg from their cars and ask them to relay to the Missouri

Troop that they were in service, or out of service, etc. I would imagine that could result in some tense moments under the wrong circumstances. (Of course, most state patrols in those days operated in the VHF-Lo region; Missouri still does, but Winnipeg has moved to a higher frequency.) Now even the state patrols are trying to get funding for statewide 800-MHz trunked systems, because of some advantages offered by trunking and also to leave the more common propagation of VHF-Lo behind.

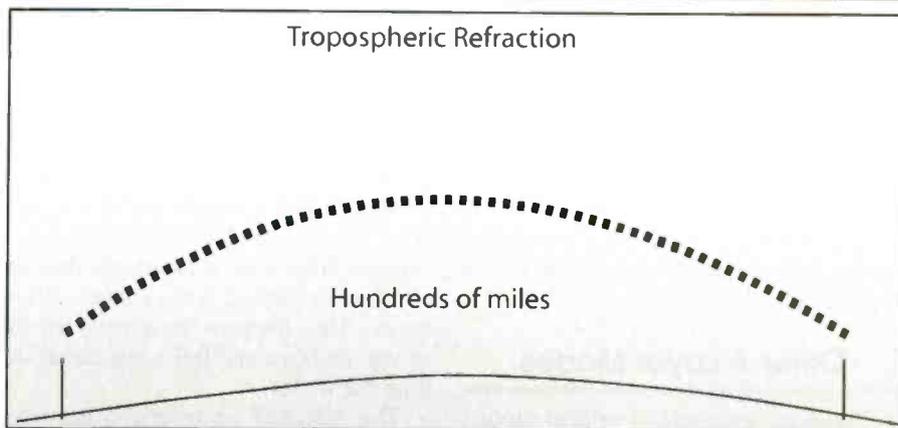
But not all propagation is confined to VHF-Lo. Lots of signals can be caught from a state or two away on the VHF-Hi band, and while not quite as common, even UHF signals can behave in strange ways. I've never heard any 800-MHz propagation, but that doesn't mean it's not there. I just don't go looking for it.

How Do We Get From Point A To Point C?

There's a variety of methods that can cause a signal to travel beyond its normal range. Keep in mind that not all of these methods occur with the same regularity, and that most are frequency dependent. But first, we need a little refresher course on the atmosphere. Don't worry, there's no test...until the end.

The atmosphere is divided into several layers. The layer closest to the ground is the troposphere. It's the layer that we live in. The troposphere extends to about 20 miles above the surface of the Earth, so even on airline flights, most of us will never get out of the troposphere.

The troposphere can bend signals a bit, meaning that instead of going straight through to the higher layers of the atmosphere, the signal is bent, or refracted, in some other direction. It's very similar to the bending of light that makes a magnifying glass work, except there's no lens, and the bent stuff is radio energy instead



Tropospheric refraction, which is due to changes in air density, is largely responsible for much of the long-distance communications heard above 30 MHz. Many hams who specialize in these modes use SSB or CW with horizontal antennas (beam antennas laid on their sides like a TV antenna) to maximize distance. Communications over 1,000 miles are possible, but entirely dependent on conditions.

of light. This is called tropospheric refraction, or "tropo" for short. This refraction effect is responsible for most of the long-distance signals we see at frequencies above 150 MHz. It's not really a bouncing of signals, but a bending of signals.

The Ionosphere And Sporadic-E Skip

Starting at about 60 miles above the Earth is the beginning of the ionosphere. It's the ionosphere that gives us true skip of signals back to Earth. While still technically a refraction, it's sometimes called a reflection, and it may be easier to think of it that way. Shortwave operators use this layer all the time, but it does sometimes cause VHF signals to bounce back, too. The ionosphere is divided up into sub-layers. The ones of particular interest to us are the *E* and *F* layers.

E refraction, or sporadic-*E* (*Es*) as it's often called, is kind of a mystery. No one is quite sure what causes it, but it can occur at almost any time. And it's called sporadic for a reason—it's very unpredictable and spotty when it does happen.

Frequency Of The Month

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

Our frequency this month is **50.070 MHz**. This is actually a 6-meter amateur beacon (multiple transmitters worldwide). If you have multimode capabilities, try CW or SSB to see what you might hear. You may well not hear anything, and that's fine. Let me know that, too.

Send your information to the addresses given at the end of the column. Make sure you note the frequency in the subject of the e-mail, or on the front of the card/envelope so it can be entered for our drawing.

Typically, *Es* refraction produces a "first hop" distance of about 500 to 1,000 miles, but multiple hops can and do occur. With multiple hops, and in favorable conditions, amazing distances are possible, although for most scanner listeners, with the narrow FM signals that we listen to, the first hop is about all we'll be able to detect. People who look for multiple hop openings tend to have special equipment

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and antennas and often work in Morse code, or upper sideband modes.

Es is somewhat seasonal (early spring is most likely), but it can occur at any time. It regularly works at frequencies up to 50 MHz, so the VHF-Lo band and the amateur 6-meter band are good places to watch. However, it's possible for *Es* skip to happen at frequencies as high as 200 MHz.

Other E-Layer Modes

There are a couple of related modes that also take place in the *E* layer. One is called ducting, and if you think about a furnace duct, you'll be very close to envisioning how this method works. A duct, or pipe if you will, is formed in the atmosphere under certain weather conditions, but most often just ahead of an approaching cold front. The duct is caused by layers of air of different temperatures affecting with the radio wave slightly differently.

Sometimes this pipe or duct can conduct VHF signals over very long distances. There's a fairly common duct that forms between southern California and Hawaii, covering a distance of about 2,500 miles. Frequencies as high as 2 GHz have been used through ducts.

The down side to ducting is that it is fairly "narrow" geographically. You might have an excellent opening from San Diego to Hawaii, but only a few miles north in Los Angeles or Orange county there may be nothing. In other words, you have to be under one end of the pipe or nothing happens. The signals heard via ducting can be very strong, and can last for several hours... or not. There may also be openings available, but no signals traveling to take advantage of them.

Tropospheric enhancement is another *E*-layer phenomenon and is caused by a temperature inversion in the lower atmosphere. Under normal circumstances, as you go higher in altitude, the air temperature gets cooler. A temperature inversion is caused when a layer of warmer air covers a layer of colder air. Only a few degrees difference is necessary, but the effect is enhanced with greater differences. This happens frequently in the spring, summer and fall—just about any time but winter.

The effect of an inversion can vary greatly. A weak inversion may only strengthen signals 50 or 60 miles away, but a strong inversion can cause signals from hundreds of miles away to blast in. Look for signals in the early evening that can last almost all night, fading away as the sun warms the upper air in the morning.

The F Layer

Finally, we come to the *F* layer. The *F* layer starts about 90 miles above the Earth at night and at about 120 miles during the day extending up to 250 miles. It provides a lot of the long-range communications of shortwave and can work at very high frequencies as well.

The *F* layer itself is divided into layers: *F1* and *F2*. *F1* is not particularly interesting for VHF/UHF, but *F2* propagation can result in some long-distance signals, and is also the only one of the VHF propagation methods caused by sunspots. It's also primarily a lower frequency phenomenon and really only affects the VHF-Lo band; you won't get *F2* signals on the VHF-Hi band. But you can get some very long distances if you're in the right place at the right time, and on the right frequency. Once again, it's a

good reason to watch the VHF-Lo band and 6-meter ham band.

What You May Hear— Whether You Want To Or Not

When something is opening up by any of these methods, you'll start to hear signals on your scanner that don't "belong" there. Usually, they'll be weaker than the signals you're used to listening to on those frequencies. Under extremely good conditions, your radio can pretty much go crazy with all sorts of signals that you don't normally hear.

If you're interested in finding the openings, keeping a few ham frequencies in your scanner on several different bands is a big help. Try to find repeater frequencies that are not active in your area if you don't want to listen to the traffic. The presence of an unexpected signal will be a sign that you should start looking elsewhere to see what you can find.

Once you notice an opening, it can be a lot of fun to search up and down the band and see if you can identify any other signals that are from distant stations, and where they are from. Sometimes a call-sign will be given, which is the easiest way to identify the location of the station, but more often you're on your own. Once in a while, if it's a station not too far away, a road or town location might help pinpoint the area. If it's coming from some distance, good luck!

What if you don't want to listen to the skip? Bummer. Tone squelch helps considerably if the station you're trying to hear uses it. This is one of the reasons that tone squelch, or its digital counterpart, is so popular on the VHF bands. If the station doesn't use tone squelch, or your radio is not so equipped, about the only other option is to turn up the squelch. It can get to the point where you squelch out a lot of the local signals though, so that might not be acceptable. Take comfort in knowing that this is a temporary situation, and will be better in a few hours.

Share Your Catches

Don't forget to send in whatever you hear, including reports about those signals coming at your location from some distance away. As usual, your questions, comments, and pictures of your shack are welcome. Send all to Ken Reiss, 9051 Watson Rd. #309, St. Louis, MO 63126, or via e-mail to radioken@earthlink.net.

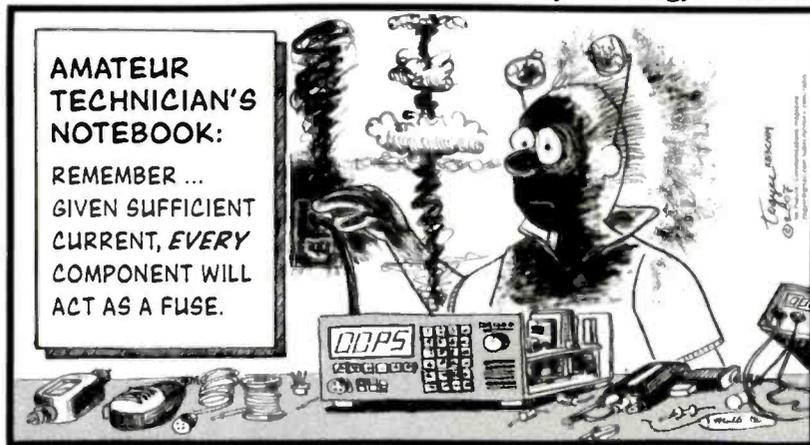
Until next month, good listening! ■

SPURIOUS SIGNALS

By Jason Togyer KB3CNM

AMATEUR TECHNICIAN'S NOTEBOOK:

REMEMBER ...
GIVEN SUFFICIENT
CURRENT, EVERY
COMPONENT WILL
ACT AS A FUSE.



A Low-Cost, Easy-To-Build Antenna For 800 MHz

The antennas we're going to cover this month are from a family of easy-to-build Yagi antennas we affectionately call "Cheap Yagis." Their booms are just a length of wood a 1/2 wide, and the elements are made from 1/8-inch diameter wire. Hobby tubing, aluminum ground rod wire, or #10 to #12 copper wire can be used. Brass or bronze welding rod also makes nice elements.

The cheapest element material is the ground rod wire available at RadioShack, (#15-035). About \$5 will get you enough aluminum wire to build about a *dozen* of these antennas. Similar aluminum wire is also available from many hardware stores. For the driven element you really want something that can be soldered to. I strongly suggest using the bare copper wire or the brass welding rod for your driven element.

When mounted inside your attic, these antennas last for years and years. I have a couple in my attic that will be old enough to vote shortly! Their low cost also makes them great for portable operations and field trips. If you plan to mount these antennas outside, however, they'll need a little protection. A coat of spar varnish works great, clear spray paint works as well, too. Or if you want to use a color, I recommend a light gray color. Light gray helps the antenna blend into the sky; it's the same camouflage technique the satellite dish companies use. Another camouflage technique is to paint it the same color as the house and mount it near your trim.

Three Different Versions— One To Fit Just About Any Need

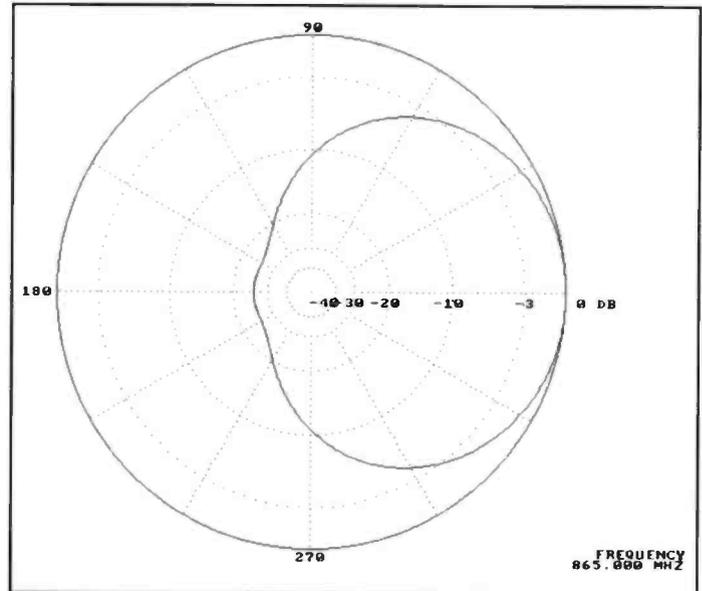
The Four-Element Antenna

Plot 1 is the antenna pattern produced when this antenna is mounted with the element pointing up and down (vertically polarized). This antenna will have good reception over nearly 180 degrees. Gain floats over the 840- to 900-MHz band between 7.5 and 8.5 dBi, so if you're on the edge of a metropolitan area, this antenna pattern will cover just about the entire city. Just point the antenna at the center of the city. Remember, though, more antenna gain is not always a good thing when you want to pick up a wide area.

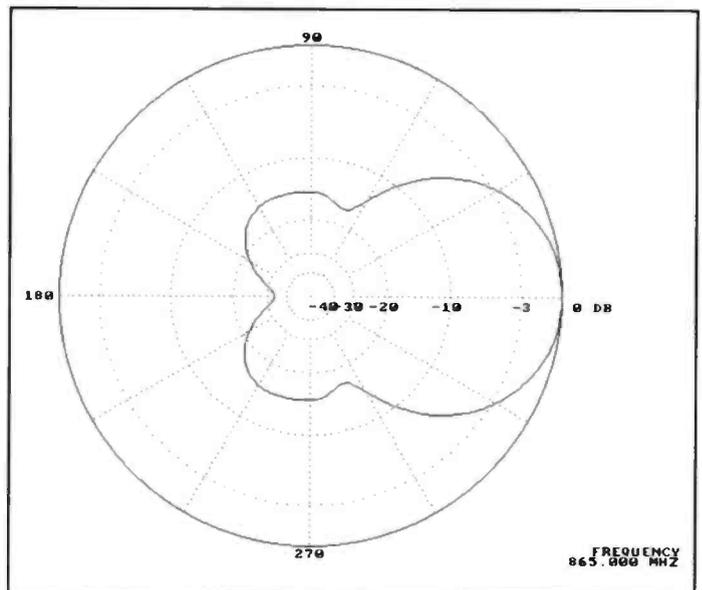
The four-element Cheap Yagi (see **Photo A.**) has another unusual characteristic: It really doesn't "care" if you solder on 50-ohm or 72-ohm coax. While 72-ohm coax works a bit better at the low end of the band, with 50-ohm coax the antenna will work a bit better at the high end of the band. Now you can recycle some of that surplus low-loss, 72-ohm coax you have stashed away in the garage.

The Six-Element Antenna

Plot 2 is the antenna pattern produced with the element pointing up and down again, or vertically polarized. The pattern has tightened up a bit. Gain runs 10–11 dBi, and the beam has tightened up considerably.



Plot 1. Vertical plot of the four-element Yagi.

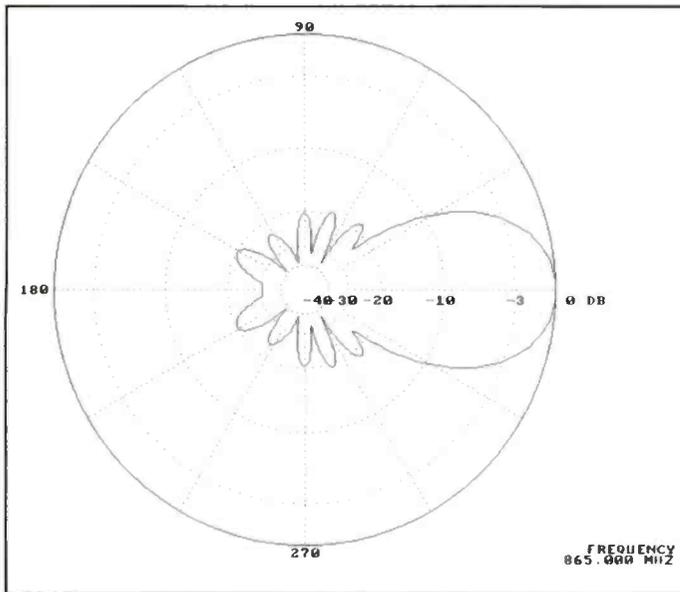


Plot 2. Vertical plot of the six-element Yagi.

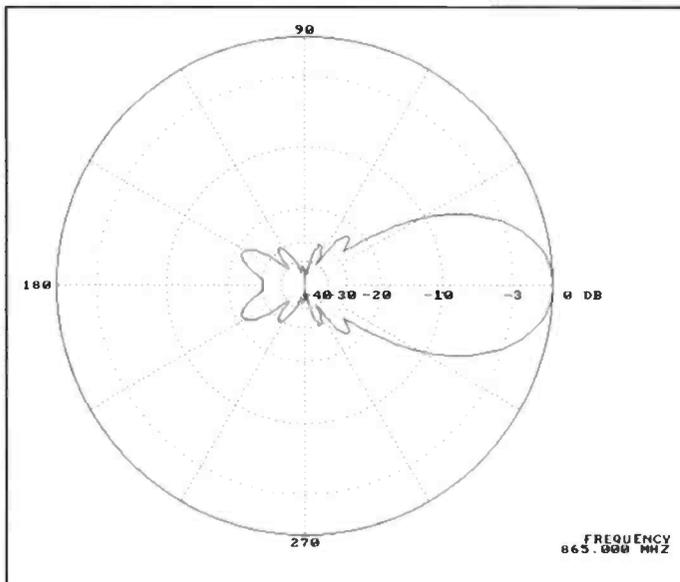
The 10-Element Antenna

Plot 3 shows how the pattern has *really* tightened up. This is the antenna to use if you're mainly interested in one station a long way off, or if you live way out in the suburbs. (see **Photo B.**) Gain peaks near 865 MHz at about 14 dBi, but the antenna has better than 12-dBi gain from 840 to 890 MHz.

I'm sure you've seen a lot of antenna plots in other articles or in advertising and that these plots seem a bit strange with more



Plot 3. Vertical plot of the 10-element Yagi.



Plot 4. Horizontal plot of the 10-element Yagi.

lobes around the sides than you would usually expect. This is because they're usually showing you the *horizontal* plots rather than the *vertical* plots; horizontal plots look a lot cleaner.

The Yagis and dipoles just don't radiate much signal in the direction of the element tips. So, here's that same 10-element Cheap Yagi, but shown as a horizontal polarization plot (see **Plot 4**). It looks better, but since few 860-MHz services are using horizontal polarized antennas it doesn't help much.

The Driven Element

In the accompanying **Figure 1** and again in **Photo C** you can see how the coax is attached to the driven element. I like to use copper or brass for the driven element and just solder the coax directly to the antenna. A direct solder connection really improves reliability.

The loop in the J element needs to be about 1/2 inch wide, but this is not a critical dimension. Yes, the coax is slightly off-



Photo A. The four-element Yagi.

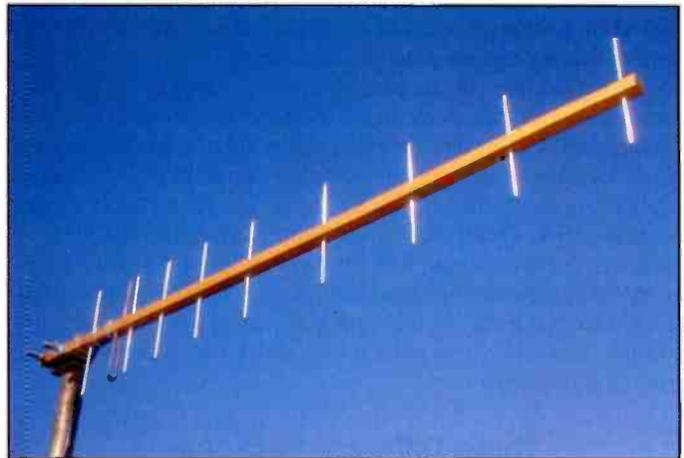


Photo B. The 10-element Yagi.

Analog In The Bag

If I may indulge in a short aside, a bit of history goes with this version of our Cheap Yagi antenna.

Back in the Analog Bag-Phone days, a good friend was paying some big roaming charges when he used his phone from his country house. With one of these antennas he was able to point his signal back into the Dallas area and pick up a Dallas cell site. No more roaming charges.

Right now over a thousand of these antennas are being used in India. This time, though, helpful folks go into far-flung villages, put one of these antennas about 10 meters off the ground, and again connect up a vintage Bag-Phone. Next they point the antenna at a cell site 10 to 20 miles away, bringing phone service to villages that have never before had a telephone.

For those of you who may be a bit young to remember, the cell phones of the 1980s came in a cloth bag, and with their Gel-Cell batteries weight about five pounds! Ahh, the good old days when cell phones had coax connectors and you could play all kinds of antenna games with your cell phone. We even hooked a cell phone up to a four-foot grid dish once upon a time.



Photo C. Attaching the coax to the driven element.



Photo D. TV rabbit ears make great scanner antennas.

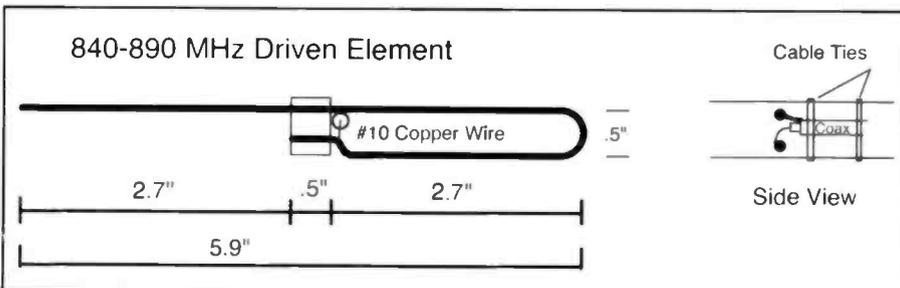


Figure 1. The driven element for all three versions.

center to the element, and the coax appears to be shorting out the element, but I can assure you that this has been allowed for—this simple driven element works great. (See the sidebar, “Analog In The Bag,” for some related tidbits.)

Rabbit Ears Antennas For Scanning

While you can't always put up an outside antenna, here's an indoor antenna that works better than those short whips

they usually put on the back of a scanner. Use a cheap set of TV rabbit ears like the ones shown in **Photo D**. They make great scanner antennas!

For listening to the 30- to 50-MHz band the elements should be pulled all the way out. For the VHF and UHF bands, the antenna seems to work best when the elements are about 12 to 18 inches long. In both cases placing the elements at 45 degrees works best. And the cheap ones usually seem to work better than the amplified rabbit ears! As an indoor-but-almost-outdoor antenna, just setting the rabbit ears

up in the attic and adding a length of RG-59 coax can extend your range.

Into The Mailbag...

Looks like *Pop'Comm* reader Steve, NØCRS, was staying a step ahead of me. After reading the last column on TV accessories for your scanner, Steve passed along how well TV rabbit ears work on his scanner.

Wow, that's efficiency, a glowing report from a reader *before* the article was published!

Next Time

I have an easy-to-build filter project that helps those handheld scanners work much better on the shortwave bands. So if you like to listen to BBC, VOA, and other broadcasters, this will help you pull in those weak ones. And as always we will cover more technical questions from our readers.

See you in July! ■

Antenna Dimensions

Ref.	DE	D1	D2	D3	D4	D5	D6	D7	D8	D9	D10
4 element	Length	6.5	**	6.0	5.5						
	Spacing		0	2.5	3.5	6.0					
6 element	Length	6.5	**	6.0	6.0	6.0	5.5				
	Spacing		0	2.5	3.5	6.0	9.0	12.1			
10 element	Length	6.75	**	6.0	6.0	6.0	6.0	5.75	5.75	5.75	5.5
	Spacing	0	2.5	3.5	6.0	9.0	12.0	15.0	18.0	21.25	25.5

Ref Reflector Element
 DE Driven Element
 ** See Figure for the Driven Element dimensions
 Same Driven Element on all three versions

Your Life: Worth A \$10 FRS?

Millions Of These Little Radios Are Out There—Here's How To Use Them To Save Your Life

by Ron McCracken, KG4CVL/WPZX486

No doubt you heard and read about the three ill-fated Mt. Hood climbers. Just days before Christmas they tragically lost their lives trying to scale the unforgiving north face of that rugged mountain. Three families were devastated by the deaths of these young men. Could an FRS radio have helped?

Children lost dads. Wives lost husbands. Parents lost sons. Those are only the most obvious costs. It's hard to comprehend the true scope of any such loss to extended family, friends, and colleagues. Two of the men remain unaccounted for on the mountain, so their bereaved families still await closure in their terrible ordeal.

"...no radio of any type is an absolute guarantee of rescue. However, without any radio along, you have no chance at all of using it to summon aid."

Saddest of all, perhaps, is the strong possibility that an inexpensive \$10 FRS radio might have made all the difference in the outcome of this tragedy. And, this case is not unique.

Just weeks before, in the same area, a young family became lost, and then stranded, in their car on a mountain logging road. After several days, the husband tried to walk out for help. Again, you've undoubtedly learned of the fate of his trek. Again, an FRS radio might well have altered that sad outcome.

FRS—A Channel For Help

Even the best FRS radios offer only short-range communications. However, in both of these instances short-range communications might have made all the difference. In the horrendous weather conditions that faced rescuers on Mt. Hood, they may well have passed within yards of the missing climbers and never known it. FRS radios would have enabled communications as searchers came within range. And in the dense forest with its limited visibility that surrounded the young father, an FRS radio might have linked him to ground searchers when they neared.

More importantly, repeated air searches were mounted in both cases. The young family was finally rescued because an airborne searcher caught a chance glimpse of their car as the

Ron McCracken is a past Chairman and CEO of REACT International, Inc., and Popular Communications "REACT In Action" columnist.



FRS radios, such as this Midland GXT-500, can be invaluable in an emergency. When shopping around, get one that allows you to use AA alkalines instead of only a rechargeable pack.

aircraft flew almost directly overhead. With their all-band radios, military air crews would have had a good chance of picking up distress calls much earlier from an FRS radio, had the family had one.

On Mt. Hood, at the search elevation, FRS range would have been ideal. Again, military chopper crews overhead with all-band radios might have picked up distress calls early on from the stranded climbers who needed their help so desperately.

If Only...

Radio operators know that distance, terrain, and weather affect their equipment's performance profoundly. Early in FRS annals, another injured climber called for help on his radio. The FRS distress call carried some 40 miles to a yard where playing children heard it and alerted their parents. Speedy medical evacuation resulted, saving the climber who was seriously injured in a fall down a cliff.

FRS proved its safety value again in Yellowstone National Park when another climber ran into trouble. His FRS radio signal carried much farther than normal and was picked up below

FRS Safety Tips

FRS is short-range, but saves lives.
FRS radios are cheap life insurance.
AA alkaline batteries give longer FRS service.
FRS with NOAA weather radio adds to safety.
Learn and teach correct distress call technique.

by a radio operator some distance away. FRS brought another happy ending to that emergency.

Katrina was disaster of a massive scale. What a difference a few FRS radios could have made for victims of that tragedy. Again, military air crews had all-band radios aboard their choppers. "Had some on rooftops had FRS radios, rescuers could have triaged victims from the air," a Red Cross volunteer amateur operator explained. "Those in most urgent need of evacuation could have been airlifted out first to receive critical medical attention. Instead, rescuers could only pick up people randomly as they discovered them. Consequently, many with serious medical conditions or severe injuries paid with their lives," he lamented.

No Guarantees, But...

Needless to say, no radio of any type is an absolute guarantee of rescue. However, without any radio along, you have no chance at all of using it to summon aid. Given how inexpensive FRS radios are today, and their proven value in past emergencies, it seems very wise indeed to carry one for added safety. They're an extremely worthwhile precaution.

FRS radios are particularly good investments since they can also be used for so many routine purposes. We often see shoppers using them in "big box" stores to keep in touch. Kids use them to pass "secret" messages among themselves. This in itself is a huge safety benefit since most family members will be familiar with the radios' operation. An emergency is no time to be hunting for the On button.

Size is another advantage of FRS. They take up little space—they're about the same size as a cell phone. And, like cell phones, they just keep getting smaller. For climbers, hikers, fishermen, hunters, etc., both are well worth carrying. But the more remote the area, the more valuable FRS becomes. If you can't

see a cell tower anywhere about you, or if you're in a remote area, your cell phone won't likely work.

Two Radios In One

Your FRS radio is really *two* distinct radios in one case. Channels 8 to 14 are exclusively FRS channels. Channels 15 to 22 are exclusively GMRS (General Mobile Radio Service) channels, and require an FCC license. Channels 1 to 7 are "shared" by the two radio services. Thus, FRS Channels 8 to 14 will give you the clearest routine FRS communications with minimal interference.

As noted, an FCC license is required to operate on GMRS Channels 15 to 22. Please be a responsible FRS operator and avoid those GMRS channels, unless you hold an FCC GMRS license. The GMRS radio operators will appreciate your consideration. That courtesy can pay huge dividends since they may be instrumental in saving your life some day in an emergency.

Choose Well

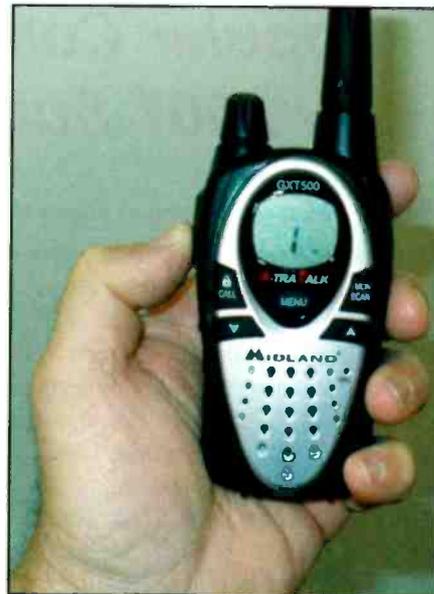
Any FRS radio is a good safety asset. Some newer FRS radios also offer NOAA weather radio built in. That makes them *three* radios in one. The NOAA weather information can be invaluable to you, so consider it carefully. If you spend a lot of time in the back country, a better FRS radio with NOAA reception will be a safety plus.

Look also for FRS radios that operate on AA batteries. You are likely to get longer battery life from those than AAA batteries. That can be vital in an emergency. Be sure to carry extra, fresh batteries with you. Alkaline AAs are much preferable to rechargeables, especially for possible emergency needs.

When you're shopping for one, however, *don't* be taken in by outrageous marketing claims. **WARNING:** Ignore the range claims made on FRS radio packaging. At most, count on only 50 percent of what the package states.

Getting Help

FRS-1 (with no tone code enabled!) is the FRS call/distress channel, established internationally by gentlemen's agreement. It is your primary FRS radio lifeline in an emergency. It's everyone else's, too. Please respect that specific designated use of FRS-1 for your own and the safety of all others.



FRS-1 is, by gentlemen's agreement, the emergency channel. Use it wisely and listen there in order to help others in need.

Before you ever head out, leave a detailed "trip plan" with family, including destination, route, planned stops, en route phone numbers, supplies, planned arrival time, etc. Note in your trip plan that you have an FRS radio along with you. That will assist greatly in any search. Be certain others in your party also know how to use the radio, in case you are unable to do so.

In an emergency, before you even key the mic, plan your distress message. Jot it down, if possible. Keep it brief. Keep it the same. Repeat it *three* times slowly on FRS-1 so anyone hearing you can piece it together if reception is poor. Broadcast "just the facts":

WHERE exactly you are. This is the most critical element. Stay aware of your surroundings whether on foot or in a vehicle. Note landmarks, crossroads, trail markers, etc. They may save you.

WHAT is wrong. Injuries, medical reactions, etc.? Help rescuers get the right aid on the way fast.

WHO you are. This confirms to monitors that they have contacted the person/s they are seeking.

Monitoring is much easier on batteries than transmitting. Monitor between your periodic distress broadcasts. Use the scan feature on most FRS radios. It will detect traffic on a channel and stop. Interrupt the conversation to give your distress message.

In a true life and death emergency you can also air your distress message

Popular Communications May 2007 Survey Questions

For me, the most important aspect of our radio hobby is:

Being able to monitor my local police and emergency services.....	1
Listening to international broadcasters for news and entertainment.....	2
Having fun with amateur radio on HF.....	3
Having fun with amateur radio on VHF/UHF.....	4
Building antennas and other projects.....	5
Using my PC or notebook in conjunction with a "black box" receiver.....	6
Monitoring utility communications.....	7
DXing the broadcast band.....	8
FM/TV DXing.....	9

I'm mainly interested in reading this in *Pop'Comm* (mark all that are appropriate):

The regular columns.....	10
Letters to the editor.....	11
Frequencies for SW broadcasts.....	12
Frequencies for utility stations.....	13
Equipment reviews.....	14
Opinion/editorials.....	15
Classic radio articles.....	16
Construction articles.....	17
Humor.....	18
Radios and computers.....	19
Ham radio.....	20
Military monitoring.....	21
Aircraft monitoring.....	22
Emergency power generation.....	23
Citizens Band.....	24

On a scale of 1 to 10, with 1 being the lowest rating, I feel the state of the radio hobby in general is:

10.....	25
9.....	26
8.....	27
7.....	28
6.....	29
5.....	30
4.....	31
3.....	32
2.....	33
1.....	34

Topics I'd like to learn more about include (mark all that apply).

Computers and related hardware.....	35
Computer software.....	36
Podcasting.....	37
Internet Radio Listening.....	38
HD Radio.....	39
Geocaching.....	40
Other.....	41

on GMRS. Channel 20 is the one to use. Again, it is the GMRS call/distress channel, by gentlemen's agreement. It will give a stronger signal than FRS-1, but it will consume more battery energy, so be careful with those lengthy distress transmissions!

Always air your distress message in series of three to help monitors copy it. Remember, you may be unable to hear their replies, or their questions. They must rely entirely on your skill. Put every bit of it to work. Increasingly, volunteer REACT Teams and other radio groups are monitoring FRS-1 to even further enhance its safety value (see "REACT In Action" elsewhere in this issue).

A Nice Bonus— Neighbors Helping Neighbors

Everything about FRS outlined here that can help to save you on the road or in the wilderness works at home too. If severe weather disrupts phone service, your FRS radios will enable you to contact neighbors. Your radios can help you check on one another, especially seniors and those with medical needs. Talk to your neighbors about setting up an FRS community radio network. For more tips on this safety aspect of FRS radio you can visit www.NationalSOS.com and www.REACTintl.org.

For The Skeptics

If you still have qualms about the safety value of FRS, consider the travelers stranded in their vehicles on a New Mexico highway in frigid, white-out conditions during this past winter's blizzards. A surprised farmer heard their concerned exchanges on his FRS radio. He soon determined that they were near his farm.

While his wife monitored the radio for his own safety, he ventured out into the terrible weather, found and led the travelers back to the farmhouse—all 44 of them! They became grateful house guests for the next several days until the highway could be re-opened. Fortunately, one was a truck driver whose rig was loaded with food, and 44 hungry souls made short work of it!

Another FRS happy ending. Yet think how tragic that incident could quickly have become had it not been for those inexpensive FRS radios. Yes, your FRS radios really *do* have a safety potential beyond anything you likely imagined. ■

Radio Fun And Going Back In Time

Q. Who came up with the terms Positive, Negative, and Neutral when referring to electronics and electricity?

A. The Greek natural philosopher Thales of Miletus was the first we know of to discover and study static electricity. Then around 1600 William Gilbert in England discovered that static electricity would attract small, light things. He was the one who identified things as "electrified" or "charged."

The French scientist Charles Dufray, in 1733, discovered that there were two different kinds of static, but he never developed terms for them. It was Benjamin Franklin who, in describing his experiments, first used the terms "positive" and "negative" for static charges. He also used the term "neutral" for something having neither a positive or negative charge.

Q. We are told that Earth will one day be sending settlers off to inhabit space colonies and other planets. What kind of communications will those settlements have?

A. Well, in order to get up into space and build the colonies, we're going to need fairly sophisticated communications, as we've already seen in the space program. The thinking, by those who are doing that sort of planning, is that we'll have the same things going on in space as we have on Earth: radio, TV, and other types of communications will originate from stations on the colonies. If a signal can be generated on Earth it can probably be generated on space colonies. There will just be more choices on more channels.

Programming will also be beamed in from Earth or other colonies by laser. There will be a thriving business in copying and recording programming because of freight costs for prerecorded material. (One can hope, I suppose, that there will be an improvement in the quality of the programming, but that would be wishful thinking given what the increased number of cable channels has brought us.) Telephone systems may be a little different, but should be capable of reaching Earth from at least the nearby colonies.

It's also going to change the whole idea of DXing and contesting as well. Since other planets, galaxies, or colonies may be several light years away, QSOs will take a lot more time. We'll figure that any antenna or transmitter that can't get us off the planet is for short-range work.

How's that for a look into the crystal ball?

Q. In the Viet Nam War during Operation Linebacker II (December 18-29, 1972) there were a lot of planes flying in a lot of different directions while bombing Hanoi and Haiphong. Did this cause any special problems in communications?

A. Well, with 129 B-52s coming from different bases and 100 or so support aircraft like EB-66s and EA-6s jamming enemy radar, F-4s dropping chaff, and F-111s striking surface-to-air missile sites, things did get pretty busy. One of the "problems" was finding enough callsigns to go around. B-52s usually fly in cells of three, and the cells have a color-related callsign. The bombers in one cell would have callsigns like Red 1, 2, and 3. With 43 bomber cells in the air, and on the air, at the same time they quickly ran through the usual callsigns. They got clear down to Ebony, Scarlet, and Bronze. The thoughts of crews aboard bombers with callsigns of Peppermint, Fuchsia, and Ash were not recorded for us.

Q. Who said "You see, wire telegraph is a kind of a very, very long cat. You pull his tail in New York and his head is meowing in Los Angeles. Do you understand this? And radio operates exactly the same way: you send signals here, they receive them there. The only difference is that there is no cat"?

A. It is usually attributed to Albert Einstein. Nobody, however, has found an exact source for the quote.

Q. When was the transistor invented?

A. Breakthroughs are thought to come in a great bang when actually they come as slow improvements on those things that we already have and are trying to make better. One example is the transistor, for which most people credit Bell Laboratories in the early 1960s.

In January 1952 *Scientific American* carried a letter from Lee deForest complaining about an article that had appeared in the August 1951 issue, "The Future in Electronics," by Louis N. Ridenour. Mr. deForest's problem with the article was that a three-electrode tube amplifier could not be replaced by transistors because of the transistors' lack of frequency range.

In a response to deForest's letters, Dr. Ridenour admitted that transistors might not be "just around the corner," but that they were coming. Ridenour, however, proposed that when production of transistors was improved sufficiently to meet the already-existing military needs the improvements and new developments (at that time unforeseen) would affect things like consumer radio and TV. In retrospect, 10 years really wasn't all that long to wait for those unforeseen improvements. ■

Looking Back...

Five Years Ago In *Pop'Comm*

They're still cranking out the instant news and emergency information from IncidentPage.net. We featured them in our May 2002 *Pop'Comm* on page 65, and they've since added lots of features to their services and are well worth checking out! That same year, Gordon West, WB6NOA, wrote one of the best articles we've read on mobile antennas. His "Radio Resources" column was titled, "Lost Your Whip? We Know Why!"

Ten Years Ago In *Pop'Comm*

Sangean's ATS-909 receiver was our featured product spotlight in May 1997. The company's portable receivers are excellent for folks on the go—especially today when preparing and packing for emergencies. New from R.L. Drake was the SW2 receiver, which featured 100 programmable memory channels and 32 preprogrammed memories!

Twenty Years Ago In *Pop'Comm*

New was the 70XLT handheld scanner from Uniden Bearcat that featured a whopping 20 programmable channels and 10-band coverage. Anyone remember the Radio Shack (Realistic, actually!) PRO-32 handheld scanner. It was handheld, but a bit on the large size. With 200-channel memory and "keyboard access to 23,684 VHF and UHF frequencies" it was state-of-the-art in 1987. (Who counted all those frequencies, anyway?)

FRS: Your Key To REACT, And May Is REACT Month!

Pssst! Got an FRS radio? Know some others with FRS radios? Congratulations! You can be on the way to becoming REACT volunteers. Are you keen to put those FRS radios to work for the safety of the public? That is the prime goal of REACT Teams worldwide. REACT volunteers use their radios to help others in emergencies. They also use their radios to help prevent or minimize emergencies at local events by providing safety communications.

Sound interesting? Your next step then is to visit www.REACTintl.org and click on "Teams and Councils." Click on your state on the map and that will give you a list of REACT Teams active in your area. For our readers in other countries, you can click on your nation in the list at the left of the page. Contact the nearest Team by e-mail or telephone to get details about location, date, and time of Team meetings.

If there's no Team nearby to join, you and your friends can form one. Just request a Team Charter Application. The information you need to do that appears at bottom of the same webpage, or you can call 1-866-REACT-9-9.

FRS: REACT's Newest Workhorse

REACT Teams use various types of radios in their work, and FRS radio is the newest. Your local Team may well be using



FRS already. It's ideal for short-range communications at parades, Special Olympics, fairs, walkathons, etc. If the Team is not already using FRS, your radios may be able to contribute a brand new element to its operations.

Your FRS radio experience likely means that you've been bitten by the radio bug. As you serve with your REACT Team you'll probably want to try GMRS, CB, ham radio, too. For now, that can wait. Meanwhile, your FRS radios will offer many valuable benefits to the Team, both up front and behind the scenes. They'll also bring you great satisfaction as you discover how much FRS can contribute to safety.

REACT Teams in many locations now monitor FRS-1*, the



Honolulu REACT (HI) members have it rougher than most. They get to combine their love of 'motors' with their love of radio in serving their community. Several Honolulu REACTers hold cross-memberships in the Motorcycling Amateur Radio Club so the two groups work together. This Honolulu REACTer parks his 'motor' to handle traffic during one of that city's Mid-Pacific Road Runner Club events. REACTers use GMRS, CB, 2-meters and 70 cm radios to safeguard the 800 to 1000 weekly participants and keep traffic moving. (Photo by Rob Roberts).

“REACT is celebrating its 45th anniversary this year and May is REACT Month.”

unofficial FRS call/distress channel. At local events, this safety service enables attendees and participants to contact REACTers in the case of an injury or other emergency. REACTers can also reverse the system to notify those who have FRS radios of weather hazards or other safety concerns—all using FRS-1 with *no* privacy tone enabled.

Great Time To Join

REACT is celebrating its 45th anniversary this year *and* May is REACT Month. Those are two more good reasons to get into gear and make your move. Join or form a REACT Team now. Your addition to the REACT family will give us all further cause for celebration.

Those FRS radios you bought just to keep tabs on the kids have a whole lot more potential than perhaps you realized. Did you know FRS has already saved many lives? And it can save more. You can be part of making that happen. Contact your nearest REACT Team or REACT HQ today, and put your FRS radios to work for your community's safety. You'll be glad you did.

Leadership Is...

REACT International Region 3 Director John Knott and REACT International Awards Committee Chair Mike Cauley knows FEMA (Federal Emergency Management Agency) means business about its new, required NIMS (National Incident Management System) courses. FEMA now requires volunteers to take its ICS-100 course. John and Mike didn't stop at that, though. In the space of four days, the two REACTers aced the ICS-100 course, plus six others in the NIMS series FEMA offers. They set a REACT record for speedy completion of so many NIMS courses. Their achievement will hopefully inspire other eager REACTers to overtake them. Stay tuned.

There's More

Other REACT leaders are in the same league. Frank Jennings, past Board

Chairman of REACT International, has tallied 38 NIMS certificates since their inception; Tom Currie, Training Committee Chair, holds 44 (Tom leads the way in that department). Don Tarbet, editor of *The REACTer*, a REACT membership magazine, has 14 NIMS courses to his credit. All these fellows are encouragements to other REACTers to excel.

Teams, Too

Oklahoma County REACT (OK) reported recently that its members were 100 percent NIMS-compliant. Every member of OKC now holds at least the ICS-100 certificate. This means that every OKC REACT member is qualified to respond to a FEMA-declared disaster. OKC REACT is no stranger to disasters, having assisted police substantially following the Murrah Federal Building bombing over a decade ago.

And now, Las Vegas United REACT (NV) advised that its members too were now 100 percent NIMS-compliant. That means a great deal to Emergency Management officials. They know that they can call upon these REACT volunteers in a disaster, secure in the knowledge that the FEMA requirement has been satisfied. Again, the leadership these Teams have shown will prompt other Teams to match their records.

Off And Running

Canada's newest REACT Team, Chatham-Kent REACT (ON), is marking its first REACT Month. Only a few months old, Chatham-Kent REACT can boast 16 members already. The new Team is in demand for its radio communications and the safety they offer at local events. Chatham-Kent REACT has, in its short lifetime, provided safety communications for the Chatham-Kent Highland Games, the Gregors Crossing Medieval Fair, and the Upper Canada Heritage Days. Quite an auspicious beginning that will encourage other new Teams this REACT Month.

SOS Drills Coming

Heads up. An SOS Drill using FRS radio may be coming soon to your neighborhood. Air Capital REACT in Wichita, Kansas, was first in the nation to announce that it will conduct an SOS Drill during REACT Month. Close on its heels came Las Vegas United REACT (NV)

with word that it, too, would be mounting an SOS Drill in its community. REACT Lake Simcoe (ON) became the first Canadian REACT Team to declare that it would engage in a REACT Month SOS Drill there. At press time, Penobscot REACT (ME) was hopeful that it would be the first Team in Maine to undertake an SOS Drill. Check with your local REACT Team about its plans and timing for an SOS Drill.

Join The Celebration

We did we say that May is REACT Month, right? And that 2007 is REACT's 45th Anniversary. What a combination. REACT Teams worldwide have lots to celebrate. REACTers will have even more to celebrate if you opt to join a Team, or form one if none exists near you.

Whatever type of radio you have, or even if you have none at this point, your REACT Team will welcome your interest and help you develop your radio skills. You, too, can be part of exciting radio activities like those described in these columns. Sign up during this REACT Month. ■

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The New HD Radio Digital Broadcast Receivers— Plus HD Radio's Future

by Bruce A. Conti, BAConti@aol.com

Digital broadcasting represents the most significant advancement in radio since FM stereo, producing CD-quality audio on FM and "FM-quality" audio on AM. Over 150 AM and 800 FM radio stations in the United States are licensed to broadcast hybrid in-band on-channel (IBOC) HD radio, where a digital signal is transmitted on the sidebands simultaneously with the analog signal on existing AM and FM broadcast frequencies.

Now, even more digital programming is available to listeners via secondary HD2 digital channels contained *within* the IBOC signals, helping to further drive demand for digital receivers. Manufacturers have responded with several new HD radio digital broadcast receivers introduced over the last year. Most have similar features, but some stand alone with innovative and unique elements of design that challenge the ordinary clock radio.

Digital Radio Receivers

The Receptor HD Radio from Boston Acoustics was the first widely available digital broadcast receiver and was highlighted in the June 2006 *Popular Communications* overview of HD radio. It features remote control, 20 station presets, a detached satellite speaker for full stereo sound, headphone/auxiliary output, auxiliary input for an MP3 player or other analog audio source, alarm clock, and a capacitor power back-up to save preset and clock settings during a brief power outage. An external seven-foot dipole antenna is included for improved reception. The Receptor HD also displays FM Radio Broadcast Data System (RBDS) information. It lists at \$299.99 from local dealers or Boston Acoustics online (www.bostonacoustics.com).

The Accurian Tabletop HD Radio represents the first entry into the digital broadcast arena by RadioShack. It features remote control, 24 station presets, and includes external AM and FM antennas for improved reception. It lists at \$199.99 at RadioShack (www.radioshack.com).

The SoundWorks 820HD is new from Cambridge SoundWorks. It features remote control, auxiliary audio input, alarm clock, a telescopic whip FM antenna and external AM loop antenna. It lists at \$299.99 from Cambridge SoundWorks showrooms and online (www.cambridgesoundworks.com).

Author's Note: DXers who've been keeping track of call-sign changes may have noticed the FCC list missing from Popular Communications over the last couple of months. Not to worry. The FCC has not released a new list of call-sign changes since last published in the March 2007 edition of "Broadcast Technology." As soon as a new list is released, we will relay the info to you.



Watch for clearance sales as the company has been consolidating storefront locations in favor of a stronger online presence.

The Radiosophy Multistream HD receiver is brand new from the company formerly known as Riveradio, a relative newcomer, founded in 2004 with a mission to create intelligent radios reflecting the marriage of digital and radio technology. Like the others, it features remote control, station presets, an alarm clock, and external AM/FM antenna jacks. However this receiver includes some unique design aspects that make it more versatile than the average tabletop radio. The actual receiver is portable, docking to its own stereo speaker stand or operating off 12 volts DC, and can be powered by an optional car adaptor. The receiver has RCA line outputs and TOS-link optical outputs for connection to a car or home audio component system. A USB port provides for easy software upgrades directly off the Internet via your computer. It lists at \$269 from Radiosophy online (www.radiosophy.com).

New this year from Sangean is the HDR-1 tabletop radio and HDT-1 rack-mount component tuner. The HDR-1 tabletop model has all the popular features: remote control, 10 AM and 10 FM station presets, FM RBDS display, auxiliary input for an MP3 player, an alarm clock, AM loop and FM telescopic whip antennas. It's capable of receiving hybrid and full digital transmissions. The HDT-1 component tuner is designed to coexist with any rack-mount component audio system, and thus does not include the amplifier and speakers. It's a basic receiver component with external antenna jacks, line outputs, a remote control, and features an auto preset function that keeps track of your



The Boston Acoustics Receptor HD with detached speaker, remote control and 20 station presets.

Trading Places: Canada Swaps AM For FM

The following AM radio stations in Canada either switched to FM, mostly in the past year, or are in the process of switching. An AM station is allowed to simulcast FM for up to three months after the new FM station signs on the air.

Callsign	Location	Old AM	New FM
CBRB	Banff, AB	860	96.3
CFXE	Edson, AB	970	94.3
CHAT	Medicine Hat, AB	1270	94.5
CKWA	Slave Lake, AB	1210	92.7
CKKC	Nelson, BC	880	106.9
CJAV	Port Alberni, BC	1240	93.3
CJCI	Prince George, BC	620	97.3
CKCQ	Quesnel, BC	920	100.3
CKXR	Salmon Arm, BC	580	91.5
CBRU	Squamish, BC	1270	98.3
CBA	Moncton, NB	1070	106.1
CBNG	Glovertown, NL	1090	101.5
CHNS	Halifax, NS	960	89.9
CKEC	New Glasgow, NS	1320	94.1
CHER	Sydney, NS	950	98.3
CHUC	Coburg, ON	1450	107.9
CJRL	Kenora, ON	1220	89.5
CFPS	Port Elgin, ON	1490	97.9
CKPR	Thunder Bay, ON	580	91.5
CBL	Toronto, ON	740	94.1
CFCY	Charlottetown, PE	630	95.1
CHTN	Charlottetown, PE	720	100.3
CFVM	Amqui, QC	1220	99.9
CMJD	Chibougamau, QC	1240	93.5
CBJ	Chicoutimi, QC	1580	93.7
CKRS	Saguenay, QC	590	98.3
CHLT	Sherbrooke, QC	630	102.1
CHLN	Trois Rivieres, QC	550	106.9

The following AM stations have submitted applications for FM, pending approval. Despite the rush to FM, not all applications are guaranteed immediate approval.

CKOV	Kelowna, BC	630	103.1
CHQB	Powell River, BC	1280	94.1
CFDR	Dartmouth, NS	780	88.9
CFAB	Windsor, NS	1450	92.9
CKLC	Kingston, ON	1380	98.9
CKPT	Peterborough, ON	1420	99.3
CJRC	Gatineau, QC	1150	104.7

favorite stations. Sangean HD radios are available from Universal Radio (www.universal-radio.com) with a list of \$249.99 for the HDR-1 tabletop model and \$199.95 for the HDT-1 component tuner.

Polk Audio offers the I-Sonic Entertainment System, a high-end tabletop model that includes a CD/DVD player and optional satellite radio. The I-Sonic promises a full 360-degree stereo listening experience from its four internal speakers, plus a deep bass response with Polk's exclusive Power Port technology. It has dual RCA and stereo mini input jacks for connection to an MP3 player or other analog sources. Remote control, 30 station

"After a slow start, 'high definition' is finally taking off on FM, but digital broadcasting on AM seems to be stuck on the launching pad."

presets, and alarm clock complete the I-Sonic, which lists at \$599 from Polk Audio (www.polkaudio.com).

With products at the very high end is Audio Design Associates (ADA), known for its professionally installed home theater systems. ADA now offers an HD Radio Tuner Module as an option designed specifically for its line of component tuner systems and home theater suites. This year ADA plans to introduce another model for use with any component system: the HDMT-1 HD Radio Tuner. Perhaps most interesting in the ADA product line, at least from the broadcast technology perspective, is the HD-Pro Dual HD Radio Monitor designed for professional use. Features a broadcast engineer would appreciate include balanced and unbalanced analog outputs, TOS-link optical out. Ethernet or optional RS-232 remote controls, alarms to warn of audio problems, and the capability to monitor time alignment between analog and digital for hybrid transmissions. Check out the complete line of ADA products at www.ada.net.

The State Of Digital Broadcasting

After a slow start, "high definition" is finally taking off on FM, but digital broadcasting on AM seems to be stuck on the launching pad. These days FM radio stations are heavily promoting HD radio, including the HD2 secondary channels. For example, check out the intro at www.hdradioboston.com to discover what's "in-between the stations" on HD2 in Boston. There's "The Over Easy Café" adult folk rock on 92.9 WBOS



The sleek Accurian HD receiver from RadioShack.



The Cambridge SoundWorks 820HD with remote control.



The innovative Radiosophy Multistream HD receiver docked in its speaker stand.



The 1-Sonic 360-degree stereo receiver with remote from Polk Audio.

HD2, "Old Skool Hip-Hop" on 94.5 WJMN HD2, "The Irish Channel" on 96.9 WTKK HD2, "Classic Country" on 102.5 WKLB HD2, "Nothin' But the '70s" on 105.7 WROR HD2, and "Smooth Jazz" on 106.7 WMJX HD2. Just type "HD radio" and the name of your city into your favorite Internet search engine, visit www.hdradio.com to use the HD radio station finder, or check the FCC online database at www.fcc.gov/mb for digital radio stations in your area.

AM Anxiety

On the flip side, AM digital broadcasting continues to struggle with bandwidth and interference issues. Bill Harms, a radio enthusiast and DXer in Maryland, recently reported, "In the Washington D.C.-Baltimore area, four out of the six AM stations which have had IBOC (digital) are now not using it. 730 WXTR, 980 WTEM, 1450 WOL, and 1500 WTWP

"...AM digital broadcasting continues to struggle with bandwidth and interference issues."

have turned off their digital transmissions, leaving only 570 WTNT and 600 WCAO broadcasting HD Radio."

In particular, 1500 WTWP had been experiencing problems with implementation of hybrid IBOC HD radio, where both an analog main channel and digital sidebands are transmitted simultaneously through the same transmitter and antenna system. A persistent background buzz could be heard in the analog signal regardless of whether the digital signal was on or off. Although unconfirmed as the cause of the WTWP noise, implementation of the wide bandwidth required for digital has proved problematic for the narrow bandwidth of AM transmitters and tuned directional antennas. Multiplexed transmitter sites, where AM radio stations share the same antennas, are an even bigger challenge for engineers.

In addition, AM digital broadcasting is limited to daytime operation, or 6 a.m. to 6 p.m. during the shorter daylight hours of winter, because of the potential for significant nighttime skywave interference to stations on adjacent frequencies. Is this an indication of a weak future for AM radio? A look at what's happening to AM outside the United States might provide some clues.

In The Rest Of The World...

In Canada, a growing number of AM radio stations are exchanging their licenses for FM (see "Trading Places"). Furthermore, Canadian officials are said to be investigating IBOC digital FM, taking into account the apparent failure of out-of-band terrestrial Eureka digital stations currently on the air. Not all is lost to FM though, as some AM stations have

taken advantage of newly opened dial positions. For instance, 1250 CHWO Toronto upgraded to 50 kW on 740 kHz after station CBL vacated the clear channel frequency in favor of FM, and CKDO Oshawa, Ontario, moved from the crowded frequency of 1350 to a clear 1580 kHz after CBJ departed AM.

An all-out campaign promoting HD radio is underway in Brazil, but just as in the United States, FM will likely be the primary beneficiary. The Brazilian Alliance for Digital Radio was formed last year to support the expansion of HD radio, with 16 FM stations already broadcasting digital to an estimated potential audience of over 30 million listeners.

The Netherlands is moving forward with IBOC digital, as the Radio Communications Agency recently announced that AM radio stations may now submit applications for hybrid and all-digital operation using the Digital Radio Mondiale (DRM) system, the European version of IBOC digital.

In England, the debate is heating up over whether analog AM should be phased out completely in 2010, replaced by all-digital DRM on AM and out-of-band terrestrial Eureka digital which has gained considerable popularity among broadcasters and listeners there. National networks, such as TalkSport and Virgin Radio, are among those favoring an end to analog AM broadcasting, while locally oriented stations remain concerned about the effect on community service. Neighboring Ireland is preparing for all-digital DRM to replace analog AM on 252 and 567 kHz, though a timetable has yet to be announced.

Although the outlook may not be favorable, with the debate over what to do with AM radio ongoing worldwide,



The Sangean HDR-1 tabletop digital radio.



Front and rear views of the Sangean HDT-1 component audio tuner.



Front panel of the ADA professional dual HD receiver.



ADA professional dual-HD receiver rear panel.

don't expect analog AM to fade away anytime soon.

Antenna Atavism

While digital AM struggles, FM is not without technical issues. It's worth noting that all the HD radio models mentioned above require some type of external antenna, and with good reason. In-home digital reception can be tricky, especially in fringe areas. The first impressions of veteran FM/TV DXer Keith McGinnis are typical, regardless of receiver model. In a report to the Boston Area DXers, McGinnis said,

I've had the Sangean HDT-1 Tuner for about a month and a half or so. My impressions are that it is pretty sensitive and selective on analog FM, close to my modified Yamaha T-85. On FM HD I have no problem decoding all the Boston HD FM stations as well as other HD FM stations out to about 45 miles or so with an APS 9b outdoor antenna at roughly 35-ft. With the supplied indoor dipole I had trouble getting anything beyond 30 miles or so in HD on FM.

One nice thing is that it has RDS for analog FM, which is very sensitive, on par with my outboard RDS unit and associated software on the T-85. The AM side of the tuner is pretty much a bust, only fair to good on the analog side of things using a variety of longwires and loops including the supplied loop. The only excellent HD AM signal was 1030 WBZ (I'm about 6 miles from the transmitter). Both 1260 WMK1 at about 9 miles and 1430 WXKS about 15 miles distant were fine with an outside wire or a larger loop but both had trouble with the supplied loop. In fact WXKS wouldn't decode most of the time with the supplied loop. After

using this tuner my gut feeling is that HD FM will work but will still have coverage problems. HD AM? Well let's put it this way; if it survives everyone will have to have a 40-ft wire antenna somewhere on their property.

The Yamaha T-85 analog FM receiver is considered a classic among DXers, which in comparison says a lot about the

"In-home digital reception can be tricky, especially in fringe areas."

Sangean HDT-1 Tuner. Whether or not the average listener will understand how to manipulate antennas to lock in a digital signal remains to be seen. In all fairness to HD radio, the IBOC hybrid mode of simultaneous analog and digital transmissions is temporary, providing for a smooth transition from analog to digital for both broadcasters and listeners. Eventually radio stations will convert to all-digital signals, which may alleviate some of the reception problems.

What Have You Found?

In the meantime, feel free to let us know about your experiences with digital radio. What HD radio signals are you able to receive? Send in your digital logs, including notes about signal quality, programming, and receivers and we'll feature them in a future edition of *Popular Communications*. Until then, 73 and good DX! ■

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

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

UTC	Freq.	Station/Country	Notes	UTC	Freq.	Station/Country	Notes
0000	5960	China Radio International, via Canada		0300	4780	RT Djibouti	FF
0000	6055	Radio Exterior de Espana		0300	4965	The Voice-Africa, Zambia	
0000	11665	Radio Prague, Czech Republic, via Ascension		0300	3200	Trans World Radio, Swaziland	vernacular
0000	7400	Radio Bulgaria		0300	7305	Vatican Radio	
0000	7190	Voice of America Relay, Thailand	CC	0300	5915	ZBC - Radio Zambia	
0030	6145	Radio Japan		0330	6065	HCJB, Ecuador	
0100	6020	China Radio International, via Albania		0330	6035	Radio Budapest, Hungary	
0100	9580	China Radio International, via Cuba		0330	3250	Radio Luz y Vida, Honduras	SS
0100	4486	Frecuencia VH, Peru	SS	0330	11915	Voice of America Relay, Sao Tome	various
0100	11805	La Voz, Chile	SS	0345	4775	Trans World Radio, Swaziland	various
0100	4780	Radio Cultural Coatan, Guatemala	SS	0400	7120	BBC Relay, South Africa	
0100	5830	Radio Ukraine International	UU	0400	5910	Marfil Estero, Colombia	SS
0130	10330	All India Radio	Hindi	0400	6140	Radio Lider, Colombia	SS
0130	5014	Radio Altura, Peru	SS	0400	9575	Radio Medi Un, Morocco	EE/FF
0130	6110	RAI International, Italy, via Ascension	II	0400	4950	Radio Nacional, Angola	PP
0130	5915	Vatican Radio		0400	5025	Radio Rebelde, Cuba	SS
0200	6010	La Voz de su Concencia, Colombia	SS	0400	9905	Radio Nile, Netherlands, via Madagascar	
0200	3279	La Voz del Napo, Ecuador	SS	0400	7100	V of Broad Masses, Eritrea	Tigrinya
0200	4985	Radio Brazil Central	PP	0400	7150	Voice of Russia	
0200	9560	KBS World Radio, South Korea		0430	7545	Kol Israel	
0200	6045	Radio Romania International	FF	0430	4990	Radio Apinte, Suriname	DD
0200	5890	Radio Thailand		0430	9970	RTBF International, Belgium	FF
0200	11710	RAE, Argentina		0430	9705	Voice of Ethiopia	Amharic
0200	5980	Radio Budapest, Hungary		0500	9515	Bible Voice Broadcasting, England, via Germany	Sat/Sun
0230	6973	Galei Zahal, Israel	HH	0500	9630	CBC Northern Service, Canada	
0230	7230	Radio Slovakia International	Slovak	0500	7285	Deutsche Welle, Germany	
0230	3320	Radio Sondergrense, South Africa	Afrikaans	0500	5030	Radio Burkina, Burkina Faso	FF
0230	6010	Radio Sweden, via Canada		0500	6000	Radio Havana Cuba	
0230	7125	Russian International Radio, via Moldova	RR	0500	3340	Radio Misiones, Honduras	SS
0230	7240	Voice of Russia	RR	0500	5005	Radio National, Equatorial Guinea	SS
0230	6175	Voice of Vietnam, via Canada		0500	4777	RTV Gabonaise, Gabon	FF
0300	3345	Channel Africa, South Africa		0530	4770	Radio Nigeria	
0300	7555	KJES, New Mexico		0530	6020	Radio Victoria, Peru	SS
0300	4780	Radio Buenas Nuevas, Guatemala	SS	0600	7170	Radio Romania International	Romanian
0300	7270	Radio Cairo, Egypt		0600	9600	Radio UNAM, Mexico	SS
0300	4925	Radio Capixaba, Brazil	PP	0600	4835	RTV do Mali	FF
0300	9515	Radio Romania International		0700	6115	Radio Union, Peru	SS
0300	4810	Radio Transcontinental de America, Mexico	SS	0700	6185	Radio Educacion, Mexico	SS
0300	4976	Radio Uganda		0700	9525	Star Radio, Liberia, via Ascension	
0300	4052	Radio Verdad, Guatemala	SS	0730	9765	Radio New Zealand International	
0300	4790	Radio Vision, Peru	SS	0800	5020	Solomon Is. Broadcasting Corp.	
0300	7200	Republic of Sudan Radio	AA	0900	9930	KWHR, Hawaii	
0300	9780	Republic of Yemen Radio	AA				

UTC	Freq.	Station/Country	Notes	UTC	Freq.	Station/Country	Notes
0900	5035	Radio Aparecida, Brazil	PP	1500	15560	RDP International, Portugal	PP
0900	4885	Radio Clube do Para, Brazil	PP	1530	21570	Radio Exterior de Espana, Spain	SS
0900	3310	Radio Mosoj Chaski, Bolivia	SS	1530	11990	Radio Kuwait	AA
0900	6138	Radio Santa Cruz, Bolivia	SS	1530	15205	Voice International, Australia	
0930	6035	La Voz de Guaviare, Colombia	SS	1600	17630	Radio France International, via French Guiana	SS
0930	4919	Radio Quito, Ecuador	SS	1600	13675	Radio Austria International, via Canada	
1000	4824	La Voz de la Selva, Peru	SS	1600	17850	Radio Exterior de Espana Relay, Costa Rica	SS
1000	4805	Radio Difusora Amazonas, Brazil	PP	1630	12035	Deutsche Welle Relay, Portugal	FF
1000	9900	Radio Veritas Asia, Philippines	CC	1700	15235	Channel Africa, South Africa	
1000	4717	Radio Yura, Bolivia	SS	1700	9420	Voice of Greece	Greek
1030	4815	Radio Buen Pastor, Ecuador	SS	1730	17810	United Nations Radio, via Ascension	
1030	4835	Radio Maranon, Peru	SS	1730	11695	Voice of the People, via Madagascar	
1100	6020	Radio Australia		1800	11725	Deutsche Welle Relay, Rwanda	GG
1100	4909	Radio Chaskis, Ecuador	QQ	1800	17680	La Voz, Chile	SS
1100	5009	Radio Cristal/Radio Pueblo, Dominican Republic	SS	1800	7130	Polish Radio, via France	
1100	3925	Radio Nikkei, Japan	JJ	1800	15355	Radio Japan	JJ
1100	9525	Voice of Indonesia	various	1800	15345	RT Marocaine, Morocco	AA
1130	2310	ABC No. Territories, Australia		1800	15630	Voice of Greece	Greek
1130	9740	BBC Relay, Singapore		1830	15365	Radio Canada International	
1130	9920	FEBC Radio, Philippines	unid	1830	11830	RAI International, Italy	II
1130	9590	Radio Australia		1830	15229	Voice of America Relay, Morocco	FF
1200	7811	AFRTS, Florida		1900	15140	Adventist World Radio, via South Africa	unid
1200	6350	AFRTS, Hawaii		1900	15475	Africa Number One, Gabon	FF
1200	6285	KCBS, North Korea	KK	1900	9870	BSKSA, Saudi Arabia	AA
1200	3325	Radio Bougainville, Papua New Guinea		1900	12080	Voice of America Relay, Botswana	FF
1200	3325	Radio East Sepik, Papua New Guinea	Pidgin	1900	15120	Voice of Nigeria	
1200	4605	Radio Republik Indonesia, Serui (Papua)	II	1930	17760	Radio Taiwan International, via Florida	CC
1200	6075	Radio Rossii, Russia	RR	2000	11845	Adventist World Radio, via South Africa	various
1200	6080	Radio Singapore International		2000	13780	Deutsche Welle Relay, Rwanda	FF
1200	9965	Voice of Hope, Palau	CC	2000	9335	Radio Farda, USA, via Sri Lanka	Farsi
1200	7175	Voice of Russia	unid	2000	9855	Radio Kuwait	AA
1200	7280	Voice of the Strait, China		2030	11735	Radio Tanzania-Zanzibar	Swahili
1230	12065	Bible Voice, England, via Russia	unid	2100	12045	Radio Exterior de Espana	SS
1230	12020	Voice of Vietnam	VV	2100	17895	Radio Nederland Relay, Bonaire	DD
1300	7330	BBC via Russia	CC	2100	11705	Radio France International	FF
1300	9580	Radio Australia		2130	11655	Radio Nederland, via Madagascar	DD
1300	9990	Radio Liberty, USA, via Kuwait	unid	2130	12085	Radio Damascus, Syria	various
1300	9935	RS Makedonias, Greece	Greek	2200	9580	Africa Number One, Gabon	FF
1300	9950	Shiokaze, Japan		2200	11620	All India Radio	
1300	6160	Voice of America Relay, Philippines	CC	2200	5975	BBC, via French Guiana	
1300	5075	Voice of Pujiang, China	CC	2200	11820	BSKSA, Saudi Arabia	AA
1330	12025	FEBA Radio, England, via UAE	unid	2200	9704	La Voix du Sahel, Niger	FF
1330	9525	Polish Radio, via Germany		2200	9550	Radio Havana Cuba	SS
1330	15700	Radio Bulgaria	PP	2200	6165	RNT Tchadienne, Chad	FF
1330	11810	Radio Jordan	AA	2215	6180	Cyprus Broadcasting Corp	Greek
1330	12065	Radio Nederland, via Uzbekistan	unid	2230	7420	Radio Belarus	
1330	13790	V of Islamic Rep of Iran	AA	2230	5930	Radio Prague, Czech Republic	
1400	7105	BBC Relay, Thailand		2230	4845	RT Mauritanie, Mauritania	FF
1400	15240	Radio Sweden Int, Via Canadav	Swedish	2230	12130	Trans World Radio, Guam	
1400	12050	Radio Cairo, Egypt	AA	2300	7270	Nei Menggu PBS, China	Mongolian
1400	15690	RDP International, Portugal	PP	2300	11950	Radio Cairo, Egypt	
1400	11690	Radio Jordan		2300	9675	Radio Cancao Nova, Brazil	PP
1400	12035	Voice of Turkey		2300	13680	Radio Nacional, Venezuela, via Cuba	SS
1430	13830	Croatian Radio	Croatian	2300	15345	RAE, Argentina	SS
1430	15140	Radio Sultanate of Oman	EE/AA	2300	5950	Radio Taiwan International, via Florida	CC
1500	17630	Africa Number One, Gabon	FF	2330	7345	Radio Prague, Czech Republic	
1500	17770	Channel Africa, South africa		2330	7300	Voice of Turkey	TT
1500	17725	Radio Jamahiriya/V of Africa, Libya, via France	various				

New, Interesting, And Useful Communications Products



Sangean's new DT-200VX FM Stereo/AM/TV receiver sells for MSR \$64.99 and has several refinements over the company's DT-200V.

Sangean's DT-200VX FM Stereo/AM/TV Audio Digital Tuning Personal Receiver

Following on the success of the Sangean DT-200V, Sangean has just released the DT-200VX. The DT-200V and new DT-200VX are the same in some ways, including the black case, belt clip, set of ear buds, external antenna, large LCD display, and built-in speaker. But the DT-200VX adds a clock, backlight, and deep bass boost. Sangean also made the case smaller and the LCD larger. It has integrated the speaker and headphone selector switch with the mono/stereo switch and restructured the 19 memories to be used on any band and in any order, in addition to providing a memory seeking function.

For more information on the DT-200VX, with an MSR of \$64.99, visit www.sangean.com or contact the company directly at Sangean America, 2651 Troy Avenue, South El Monte, CA 91733; Phone 888-SANGEAN. Be sure to tell them you read about the new DT-200VX in *Popular Communications*.

New Heil Sound Microphones

Heil Sound has announced the introduction of three new versions of its popular PR 20 Spotlight Series Microphone: the PR 20W (White), the PR 20P (Pink Pearl), and the PR 20R (Red).

The PR 20P Pink Pearl was developed as a breast cancer awareness project with the Susan G. Komen Foundation. Emblazoned with the pink ribbon on a pink pearl finish, 10 percent of the retail sale price and a minimum guaranteed donation

of \$6,800 will be donated to the charity Susan G. Komen for the Cure for the purpose of raising the awareness of breast health and breast cancer.

"Our own family has been affected by this terrible disease, and this is our way of helping raise the awareness of breast cancer," says Sarah Heil, Vice President of Heil Sound. "Early detection is the key to beating this thing and if we can help through being proactive in the Amateur Radio industry, then the Pink Pearl will have been a success."

The MSR price of the PR 20W, PR 20P, and PR 20R is \$179. Full specifications may be found at the Heil Sound Web site (www.heilsound.com) or call 618-257-3000.



Heil Sound's three new versions of its popular PR 20 Spotlight Series Microphone: the PR 20W (White), the PR 20P (Pink Pearl), and the PR 20R (Red) are \$179 each. →

Siber Systems' RoboForm2GO Automated Password Entry Application For USB Drives

Siber Systems, Inc., announced it has incorporated the power of computer password and digital identity storage/management with a portable and increasingly popular platform: the USB drive. Through its new and small (3MB) software application, RoboForm2Go, Siber Systems has provided USB drive users with a way to keep their passwords, identities, and banking and credit card information off computer hard drives. This is new alternative features one-click login to websites and easy access to contacts, bookmarks, and encrypted text notes.

Simply load RoboForm2Go onto an existing USB drive, plug it into any USB port, and you can automatically log into online



Load RoboForm2Go onto an existing USB drive, plug it into any USB port, and you can automatically—and safely—log into online accounts, fill in online forms as needed, or access your address book.

accounts, fill in online forms as needed or access your address book. Your personal information never even appears on a client PC; it is kept strictly on the USB drive. Once the drive is removed, all traces of RoboForm are removed from the PC. RoboForm2Go can confidently be used at Internet cafes, libraries, convention halls, airports, universities, even at work—anywhere people have a computer with USB port

Siber Systems' RoboForm2Go password/identity manager application is priced at \$39.98 and is currently available for downloading from the RoboForm website. The product is also available as an OEM product for USB drive manufacturers. To purchase RoboForm2Go, or for more information, visit www.robiform.com.

New Gamber-Johnson Dodge Charger Mounting Package

Gamber-Johnson, manufacturer of mobile docking stations announces the release of its newly available low-profile mounting accessory package designed specifically for the Dodge Charger Police Vehicle.

As law enforcement agencies increasingly adopt the Dodge Charger as a fleet vehicle, mounting systems need to adhere and perform to the compact technology advancements such as remote siren-heads and radios now being utilized in the vehicle. In cooperation with several Minneapolis/St. Paul-based public safety departments, Gamber-Johnson gained field-tested product performance approval.

"Law Enforcement agencies require solutions which offer enhanced function-

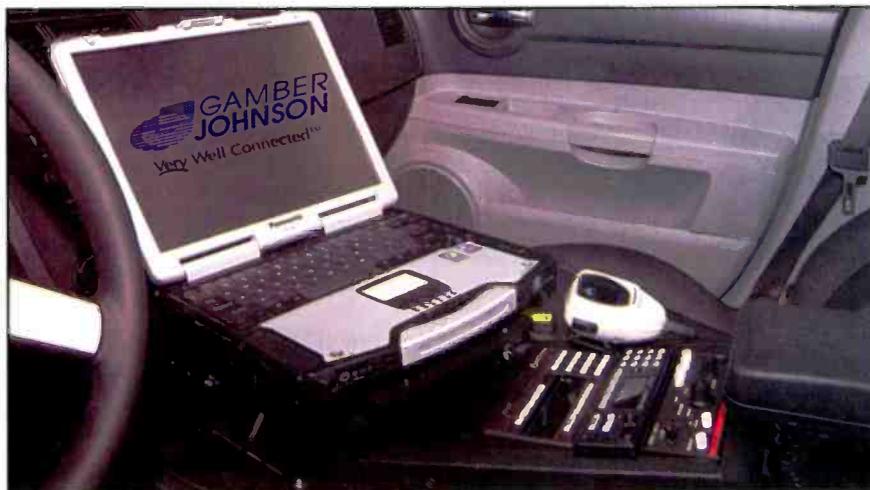
ality without compromising personal safety, and this was the basis behind the design. The new Dodge Charger Police Package enables optimal computer positioning without obstructing vision or blind spot zones. Additionally, the console box's slanted design sits low between the seats and allows clearance for easy radio viewing," explains Jennifer Guerndt, Gamber-Johnson product manager.

The need for a performance-driven console box adhering to the Charger's unique in-vehicle design served as the impetus behind Gamber-Johnson's newly available low profile console box. Now, with the introduction of the Dodge Charge Police Package, law enforcement can benefit from a heavy-duty, space-saving low profile total solution designed specifically for this vehicle's cabin.

For added convenience, each component of the Dodge Charger Police Package is purchased separately. Available components include:

- Leg Kit (Item No. 7160-0007) which can be used with any Gamber-Johnson top plate to replace the existing factory installed top plate.
- Low profile console box (Item No. MCS-LOWBOX)
- Computer mounting system enabling flexible positioning and ample clearance (Item No. DS-POLE-CTR)
- Universal dual steel cup-holder (Item No. MCS-CUPHOLD2)
- Heavy-duty flip-up armrest (MCS-ARMREST5)

Customers of all sizes—state and local governments, field service organizations, and mobile professionals—use Gamber-Johnson's vehicle mounting systems and docking stations. For more information on this system and others, contact Gamber-Johnson at www.gamberjohnson.com.



The new Gamber-Johnson Dodge Charger equipment mounting package.

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Your Personal Security Is Your Responsibility—Here's How To Be Proactive

We're rapidly approaching the peak travel season in the United States and abroad. With recent developments involving extremist Islamic terrorists targeting Western interests and personnel wherever they can find them, our topic this month is personal security.

One underlying theme that has been consistent throughout the last few years in this column is that your security and the security of your family are *YOUR* responsibility and no one else's. You cannot delegate your own security or that of your family to the police, the federal government, or any other organization. All law enforcement agencies are reactive. You need to be proactive to ensure the safety of all concerned. It's your, plain and simple.

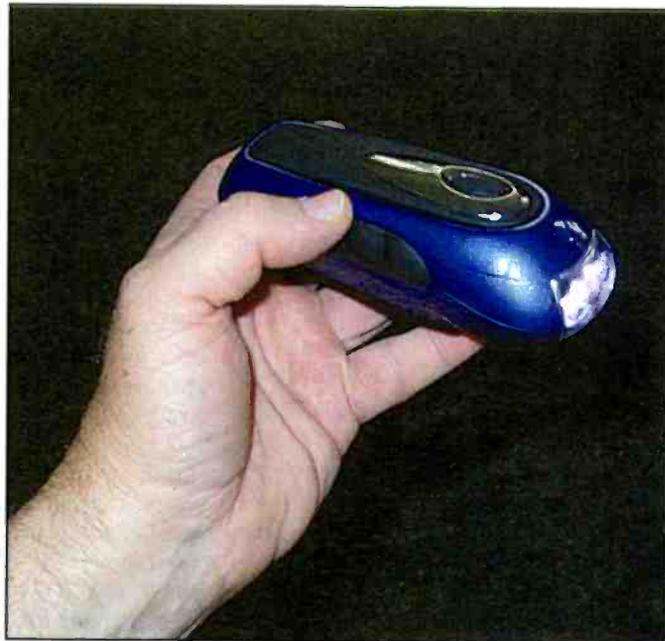
What's Changed Over Time? Not Much, Really

For over five years I lived and worked in England. My wife and I were stationed at RAF Lakenheath and RAF Mildenhall, respectively. We lived off base in the local community and our children went to British schools. Regularly we were exposed to IRA terrorism against the British government. Bombs seemed to be the preferred IRA weapon. I vividly remember having to explain to our four children why they couldn't go on a field trip to London the day after two bombs went off in the British capital.

As military members, my wife and I were constantly reminded that travel around the UK and Europe had to be in civilian clothes. At all costs, we were to maintain a low profile when traveling. Things haven't changed much in over 20 years.

Recently Scotland Yard uncovered and disabled a plot by Islamic terrorists to kidnap and decapitate Muslim soldiers serv-

The portable Oregon Scientific WR103NX All Hazards alert radio features a non-volatile memory, so there's no need to reprogram those SAME (Specific Area Message Encoding) numbers if the battery runs out. Oregon Scientific is on the Web at www.oregonscientific.com. The WR103NX currently sells there for \$49.95.



A pair of small crank-type LED flashlights like this one can be found for under \$18. We picked up two this past Christmas.

ing in the British Royal Army! Of course, there would be video shown worldwide after the fact! It's no small leap to include American tourists into this mix. After all, just being an American makes you a target, like it or not.

What You Don't Know Can Kill You!

In some instances ignorance is bliss. This is not one of those instances. Knowing the threat and recognizing that you and your family are the target can go a long way toward keeping all of you safe. My job is to provide pertinent information on how to stay one step ahead of the game. And, yes, it involves radios, too.

What follows is an excellent laundry list of individual protection measures adopted by the U.S. Department of Defense and the State Department for use by their personnel when traveling at home and abroad. You can apply these measures to your own personal lifestyle.

Basic Reminders

- Safeguard your company ID badge, driver's license, passport, and important papers. Do not leave these items in a vehicle or in your hotel/motel room. (This goes for radio gear, too!)
- Keep a low profile and protect your identity.
- Report any suspicious activity to local law enforcement personnel.
- Provide your family and office with a copy of your itinerary.

Air Terminals

- Pass through security checkpoints quickly; have ID and radio licenses ready for security personnel to inspect.
- Hand-carry your radio equipment/laptop computer through security checkpoints.
- Once through the checkpoint, proceed to an open area or lounge away from baggage check/lockers if possible, sit with back against a wall if possible. Be alert.
- Use concealed bag tags.
- Spend as little time as possible inside airports.
- Do NOT leave your belongings unattended.
- Report any unattended luggage or personal bags to airport security personnel immediately.
- Remain alert; be aware of your surroundings, be vigilant.

Hotels/Motels

- Choose an inside room whenever possible and avoid taking a street level room.
- Sleep away from street side windows.
- Leave lights or radio on when room is vacant; pull curtains/blinds.
- Do not keep your radio equipment and/or laptop computer "on display" in your room; ditto with antennas.
- Do not use your name when answering a telephone call.
- Vary entry/exit points.
- Keep possession of room key/key card at all times.
- Do NOT accept deliveries to your room unless previously arranged.
- Do NOT give your room number to strangers.
- Prepare an escape plan in case of emergencies.
- Do NOT use in-room hotel safes.

Automobiles/Vehicles

- Alternate/vary parking spaces.
- Remove any portable radio gear and antennas and store them in the trunk after parking.
- Lock car when unattended.
- Look for tampering; check under vehicle, be alert when opening door.
- Keep gas tank at least half full.
- Alter routes and avoid choke points whenever possible.
- Drive with the windows up and doors locked.
- Keep valuables in the trunk or take them with you.

At All Times

- Vary eating establishments.
- Alternate shopping locations.
- Avoid crowded areas.
- Remain alert and aware of your surroundings when exiting bars, restaurants, etc.
- Vary departure times and routes to routine places; avoid establishing any sort of pattern.
- Learn how to use the local phone system and carry "telephone change" or phone card.
- Obtain emergency phone numbers for police, ambulance, and hospital.
- Locate the U.S. Embassy and other safe locations where you can find refuge or assistance.

Bomb Incidents

- Be suspicious of unusual objects found around the house, office, and automobile.
- Check mail and packages for:
Unusual odors

- Too much wrapping
- Bulges, bumps, or odd shapes
- No return or unfamiliar return address
- Incorrect spelling or poor typing
- Items sent "registered" or marked as "personal"
- Protruding wires or strings.

• Isolate suspect letters or packages and contact appropriate authorities.

- Clear the area **IMMEDIATELY!**
- Above all: Always Be Alert.

I know that this list of things to do sounds a bit melodramatic and many would consider it over the top, but in this day and age, you cannot be too careful. Be prepared and you'll reduce the risk of you and your family becoming headlines.

Licenses/ID

As Americans, we enjoy freedoms that other people can only dream about, which is why 90 percent of the rest of the world wants to move to America. Other countries even dramatically restrict or, in some cases prohibit, private ownership of radio equipment. I know that might be hard to believe, but it's true. Many dictatorships and other types of repressive governments feel that information must be strictly controlled. Owning a short-wave receiver or scanner could, at the very least, result in confiscation of your equipment. You might even find yourself the subject of attention at the local constabulary and end up facing

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a magistrate to answer charges as to why you have a piece of prohibited equipment/contraband in your possession.

Learn about the laws of the land regarding radio equipment. The American Radio Relay League (ARRL) at www.arrl.org has information on many countries' rules and regulations and the method by which you can obtain a reciprocal license for the countries you intend to visit. Once you have the necessary paperwork in place, safeguard it like you would your passport and ID.

And don't flash your radio gear around. It makes you a target. That \$250 handheld scanner you have represents an entire year's wages in some parts of the world. Don't think for one minute that your little scanner won't disappear if you leave it unattended or strut around with it on your belt. Public display of your radio

gear (hanging a scanner/surveillance receiver and/or VHF handheld) on your belt and strutting around listening to the local radio chatter can also mark you as a target. Be discrete, leave your radio gear in your hotel room or vehicle trunk, out of sight, and become a tourist.

Most of this is just common sense, which is why we're going over the basics of personal security again. Use your head, don't be obvious, and don't become a target.

The Valentine's Day Storm Of 2007

It's been a week since this storm hit the Wyoming Valley in northeast Pennsylvania. It took the city of Wilkes-Barre four days to get a snowplow down our street. Although the official total of

snowfall was recorded at the Avoca airport as 12 inches (but who lives at the airport?), I recorded 14 inches in downtown Wilkes-Barre. The response by the city, Luzerne County, and the Pennsylvania Department of Transportation (PenDoT) was less than spectacular. There are currently senate hearings underway to point the finger and lay the blame for the poor response at all levels of government within the state of Pennsylvania.

I'm sure you heard about it. We had I-78, I-80, and I-81 all shut down for miles in each direction in northeast Pennsylvania for several days. Travelers were stranded in their vehicles for hours. The PA National Guard was mobilized to bring help to stranded motorists during the worst of the storm.

This was the worst storm ever recorded in the month of February in this area. It should serve as a reminder and a warning to anyone traveling during the winter months to have their vehicle serviced regularly, keep the gas tank filled, drive on the top half of the tank, and keep blankets/sleeping bag and emergency rations (power bars, bottled water, candy, or even MREs) in their trunk.

Also always have jumper cables handy in case your battery dies so you can get a jump-start from another vehicle. Keep up with the latest road/weather conditions by tuning to NOAA Weather Radio, the Weather Channel on cable, and monitoring local weather broadcasts on TV and radio. Keep a tarp, nylon parachute cord, spare change of clothes and extra jacket, hat, and gloves in your vehicle if you intend to travel more than a few miles from home. Don't forget a flashlight (or two); I like the newer LED flashlights which are easy on batteries and provide a lot of light.

And, As Always...

Last, but certainly not least, be sure you have a handheld scanner, a CB, GMRS/FRS handie-talkie, and/or ham rig available for communications. Okay, go ahead and pack your cell phone, but remember, in the event of a wide-scale weather emergency there's always a chance that the cellular system will be impaired at the very least. The system will be saturated and calls will be dropped or not processed at all. Ergo, comm gear.

Well, back outside to shovel some more snow/ice. In the meantime, what are YOU doing to remain prepared? Until next time, remember our mantra: Preparedness is not optional. ■

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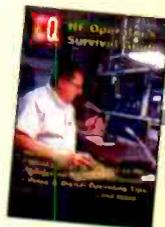
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Cobra's 29 LTD Classic— A Big CB Designed For Pros

Cobra says its 29 LTD is “back by popular demand,” as a “Classic.” Ah, yes, the wonderful world of marketing! Regardless, the Cobra 29 LTD has been around a long time, as has the 25 LTD, which has also been re-introduced into the CB marketplace.

I remember the early days of CB when the radios had 23 channels (or less in some cases) and were as large as the dozen-box of Dunkin' Donuts or a modern inkjet printer—and twice as heavy! The 29 LTD Classic isn't *far* from that description; it weighs in at over five pounds and measures a whopping 2 1/4 x 8 5/8 x 7 1/4 inches (HWD). Try mounting *this* radio in your Elantra or Corolla. Chances are you'll opt for a much, much smaller CB, unless you're driving a pickup or SUV, which millions of Americans are doing these days.

In an age when ham radios have remote mounting heads (detachable face-plates) allowing you to put the butt-size portion of the radio in the trunk or under a seat, the 29 LTD Classic still commands quite a following. Why? Glad you asked.

Drive On!

Cobra says this CB radio is the, “Number one choice of professional drivers.” No wonder; they've got plenty of room in the cab! Matter of fact, Cobra reports that the “new” 29 LTD Classic includes a *nine-foot* mic cord that Cobra boasts, allows “for easy reach anywhere within the cab.” But being a stickler for checking out manufacturers' claims, the first thing I did was pull out the mic from the box. It's a hefty-looking mic (and sounds good on the air, by the way), but fully stretched out, the mic cord is about six feet long end to end. I wouldn't recommend stretching your cord that much. Even in a Big Rig, I don't envision much need for a “nine-foot” mic cord; after all if you're going to be that far from the radio you can't change channels or even read the display!

Honestly, *if* I wanted to use this CB in our Sonata, it could be done. Not by actually *mounting* it anywhere (simply



The 29 LTD Classic is quite a hefty radio, designed primarily for professional drivers and folks with room in their vehicles for a larger-than-life radio!

because there just isn't room—if you find a place that's safe and easy to access, please let me know!), however, but perhaps by using one of those angled hump mounts strapped to the passenger seat, or even on the floor. But then where's my wife going to sit? Certainly not in the back seat!

I did, though, use the 29 LTD Classic extensively for this review while mobile stationary in several areas along the New Jersey Turnpike and around town. There's a new term: mobile stationary. Well, you get the idea!

The front panel is thoughtfully arranged to allow an operator easy access

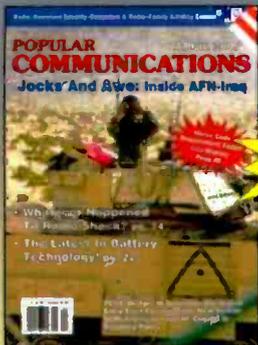


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2 Yrs <input type="checkbox"/> 51.95	2 Yrs <input type="checkbox"/> 71.95	2 Yrs <input type="checkbox"/> 91.95
3 Yrs <input type="checkbox"/> 74.95	3 Yrs <input type="checkbox"/> 104.95	3 Yrs <input type="checkbox"/> 134.95

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to the controls, two of which I'd personally do away with, because in my experience I rarely use them: the "Deltatune" and "Dynamike" rotary controls.

The Dynamike, is actually nothing more than a mic gain control. I keep it at full bore because in a CB radio—at least for me—having a mic gain control on an AM-only radio like the 29 LTD Classic is like having a brightness control on your vehicle's headlights. And the Deltatune control allows the operator to tune the received signal a bit up or down for slightly better clarity of some received stations. I look at it this way: If I'm mobile, especially in a Big Rig, the last thing I'm worried about is some goofy operator that's slightly off frequency; there's no time to fiddle with the control while negotiating traffic and four-wheelers that don't know how to drive! Most stations I've talked to over the years (except sideband, of course) are pretty much on frequency anyway.

One welcome improvement over the older 29 LTD is the microphone connector placement. It's moved from the side to the front, allowing easier mounting and in-dash mounting possibilities for professional drivers. Good move, Cobra!

Talk The Talk, And...

Regarding performance, the 29 LTD Classic is a gem of a radio. There's instant Channel 9 access and a large and bright red channel indicator that's visible in any light (I could even see it without my glasses—a miracle in itself!). I found the switchable NB/ANL (noise blanker/auto noise limiter) to be somewhat useful, especially with nearby crackling from power lines and intermittent noise generators in the vehicle. It's not a cure-all for noise by any means, but does help.

For my tests I used a Wilson mag-mount antenna that I hadn't played around with for a couple of months. Signal reports from three locations along the 'Pike were exceptional and audio reports were equally impressive. One driver asked if I was running barefoot.

Received audio was very good, indeed. The speaker is bottom-mounted, which is okay if you're in a big rig or SUV, perhaps, but you do have the option of connecting an optional speaker to direct the audio where you want.

Many operators rely on meters for relative signal strength. Gone, I'd say for the most part, are the days when died-in-the-wool CB ops would wrangle over the air



Here's the mic cord stretched to the limit of about six feet. The radio was propped against a chair leg for our quick test (don't do this to your mic cord!).

over differing meter readings, comparing one day's reading to the previous. Bottom line: Can you hear the other station clearly? Good, talk on!

But if you do like meters, the 29 LTD Classic's meter is an analog-type, located just above the front-mounted mic jack. It's well lighted and it's easy to see the vertical white needle as it swings to the right with a received signal. But reading the actual "S" numbers/calibration is another matter. But, frankly, does it really matter anyway? Like I said, can you hear the other stations clearly?

But you can't talk—or be heard—if your standing wave ratio (SWR) is high. The 29 LTD Classic has a built-in SWR meter with easy and straightforward operation, but viewing the SWR scale at the top of the small meter is a challenge. Set up your antenna, route the cable, and tune to Channel 20 (the middle of the band). Then, with the S/R/F SWR CAL button in the "CAL" position, key the mic and adjust the "SWR CAL" control located near the channel selector until you get full right deflection of the needle.

The instructions say to turn the knob until the needle is aligned with the small calibration indicator, but it's difficult to see, despite the well-lighted display window. Keep holding the mic button and switch the S/RF SWR CAL button to "SWR" and there's your relative SWR reading. Since actually seeing the numbers on the top scale of the meter is somewhat difficult, just know that you're hoping for little, if any, deflection of the needle to the right.

If the needle moves near the middle of the window (or beyond!) you've got an antenna/cable problem that needs immediate attention before you start using the radio. Perhaps the PL-259 connector is damaged or not securely connected to the radio, or maybe there's another antenna on your vehicle interacting with your CB antenna. The list of things causing a high SWR isn't exactly endless, but with just a few minutes of your time and patience, you'll remedy the problem so that needle barely moves when checking the SWR.

If you're still getting a high SWR after performing some basic antenna checks, dust off your trusty stand-alone SWR/RF meter and check out the system. I've found that sometimes there's quite a difference between meters, especially those built-in and outboard ones!

My SWR was nearly perfect using the Wilson antenna, which was mounted in the center of the vehicle's roof. Remember, with CB we're only "talking" about what an old-timer CBER once told me was "flea power" so, you don't want to waste any of your signal because of a goofy antenna system.

...And For The Rest Of Us

I'd certainly consider the 29 LTD Classic if I drove a Big Rig or had a large SUV—not so much for the many bells and whistles, but frankly for the outstanding audio both on transmit and receive. Remember, there's also nothing wrong with using a mobile CB at home with a good 12-VDC power supply and outdoor antenna. With all those bazillions of CBs out there in the public's hands (attics and garages, actually!) should the need arise for folks to have quick, affordable, and easy communication with the outside world in any type of emergency, your 29 LTD Classic is ready to serve you and your family!

The Cobra 29 LTD Classic shines brightly where it should: performance.



The radio's front panel controls are thoughtfully arranged even for folks with large fingers.

Audio is outstanding from the large speaker and operating the 29 LTD Classic is a breeze. Sure it would require some expensive initial manufacturing costs, but I'd think it would be quite a selling point to have a detachable face plate on this radio.

Now only if Cobra could get drivers to adhere to item "D" in their extract of the FCC's CB rules on page 28 of the instruc-

tion manual, "Profanity is not allowed." Some things never change, but if you're a driver with some room for a great CB, consider the 29 LTD Classic, which sells for \$119.95 from Cobra Electronics. Contact the company at www.cobraelectronics.com or you can call 773-889-3087. Please tell them you read about it in *Popular Communications*. ■

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Good Luck Hearing This Kurdish Opposition Station! Plus Zimbabwe Returns To SW

Another of those Kurdish opposition groups has put yet another next-to-impossible-to-hear station on the air. This one is called The Voice of the Kurdistan Democratic Party and is now active on 3930 in the 3-MHz ham band. It's reportedly operating from 1630 to 1800 and 0330 to 0500. KDP seems to be a breakaway group, formerly a part of the Kurdish Democratic Party of Iran. The only thing to be added at this point is "good luck to us!"

Different Preachers

U.S. religious station KAJI has been technically upgraded and is now operating out of a new studio in Dallas. KAJI expanded its schedule to 24 hours, running from 1300 to 2100 on 9480 and 2100 to 1300 on 5755. The University Network broadcasts of Dr. Gene Scott seem to have been discontinued, replaced by a passel of different preachers.

Other Worldwide SW News

Zimbabwe, rumored earlier to be planning a so-called international service, has at least returned to shortwave after being absent for a while. The Zimbabwe Broadcasting Corporation (ZBC) is showing up on its former frequency of 3396 and can sometimes be found around 0300 when the wind is blowing in your direction.

Radio Cristal/Radio Pueblo is still active from the Dominican Republic on 5009 around 1100. Oddly, though, no one is hearing this one during our evening hours, so it may be that it is only active during the morning—perhaps for drive time in Santo Domingo, if there is such a thing.

Dunamis Shortwave is the name of a new religious station in Uganda, and it should be on the air by now. It's expected to operate on 4750 (watch out for Radio Peace from the Sudan) using a mere 1 kW. So don't expect a speaker-rattling signal—we'll be lucky to get even a tickle out of this one.

HCJB World Radio has changed its name to HCJB Global so as not to exclude its missionary work from the name. It won't matter much to us SWLs, since we only use the call letters in referencing the station.

Some time back we reported that Bangladesh was going to revamp its government shortwave service. If that's the intention the effort seems not to have even begun yet. Word comes that officials at Bangladesh Betar are still bemoaning the sad state of their technical situation. So far as we can discover 7185 remains the single frequency in use, from 1315 to 1730 and 1815 to 2000, which amounts to less than six hours of activity per day. Recently, however, 4750 has been getting some occasional use.

Two Elusive Mexicans

Here's a reminder to keep checking for two elusive Mexican stations that are trying hard to get noticed: XEXQ/Radio



Radio Free Asia

Radio Free Asia (RFA) began in March 1996. The purpose of RFA is to provide a forum for a variety of opinions and voices from within specific Asian countries. As a "surrogate" broadcaster, RFA also provides news and commentary while broadcasting only in local languages and dialects, most broadcasts include news of specific local interest.

RFA can be heard in Mandarin, Cantonese, Uyghur, and the Wu dialect, Tibetan (Uke, Amdo, and Kham), Burmese; Khmer to Cambodia, Korean to North Korea; Lao; and Vietnamese.

RFA's main broadcast center is in Washington, DC with offices in Asia, and correspondents throughout the world. Please listen to our programs often and learn more from our website at www.rfa.org.



Radio Free Asia has issued the 12th of its QSL card designs. This latest one commemorates the Chinese Year of the Pig.

Universidad, San Luis Potosi, on 6045 and XEYU/Radio UNAM, Mexico City (different university), currently testing on a fraction below 9600. Also, a few folks are finding hints of the extremely difficult Radio Bahrain at various times on 6010 (in EE) and 9745 (in AA). Both channels are, of course, in almost constant use by other broadcasters.

Reader Logs

Remember, your shortwave broadcast station logs are always welcome, but *please* be sure to double or triple space items, list them by country, and include your last name and state abbreviation after each log. Also much wanted are spare QSLs 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? Your 15 minutes of fame awaits!

Here are this month's logs. All times are in UTC. Double capital letters are language abbreviations (SS = Spanish, RR = Russian, AA = Arabic, etc.). If no language is mentioned English (EE) is assumed.

ANGOLA—Radio Nacional, 4950 in PP heard at 0322. (DeGennaro, NY)

ANGUILLA—Caribbean Beacon/University Network, 11775 with Dr. Scott at 1925. (Maxant, WV)

ARGENTINA—RAE, 11710 at 0200 sign on in SS with lots of great Argentine music. (Linonis, PA) 0304 opening in FF, with their DX program at 0345 and into SS at 0400 just before the carrier was cut. (D'Angelo, PA) 15345 in FF at 2047. (Charlton, ON) 2327 in SS. (MacKenzie, CA)

Help Wanted

The "Global Information Guide" consistently presents more shortwave broadcast loggings than any other monthly SW publication! (A whopping 584 shortwave broadcast loggings were processed this month!*) Why not join your fellow SWLs, let us know what you're hearing, and also become eligible for our monthly shortwave book prize! Send your logs to Gerry Dexter, "Global Information Guide," 213 Forest St., Lake Geneva, WI 53147. Or e-mail them to gdex@genevaonline.com (please see the column text for basic formatting tips.) Come join the party—we look forward to hearing from you!

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

ASCENSION ISLAND—BBC Relay, 7160 at 0555. (Wood, TN) 15400 at 2159, British Airways easing restrictions on wearing religious medals. (Wood, TN) 17830 at 2010 and 17885 in Hausa at 1950. (MacKenzie, CA) 21470 with news of Africa at 1545. (Jackson, PA)

AUSTRALIA—Radio Australia, 6020, 9580 at 1230 and 15515 at 0205 on security, then into sports and soccer commentary. (Maxant, WV) 6020-Shepparton at 1103, 9580-Shepparton at 1127 and 9590-Shepparton at 1129. (DeGennaro, NY) 9580 at 1356 with ID, frequencies. (Charlton, ON)

A Guide To "GIG-Speak"

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

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

AMERICAN FORCES

Radio and Television SERVICE



Here's the card AFRS now issues for reception of its various outlets. The reverse side has room for the frequency, site, date, and time. (Thanks Rich D'Angelo, PA)

9580/9590 at 1200. (Jackson, PA) 11880 at 2017 on Somalia fighting. (Brossell, WI) 17795 at 2340. (MacKenzie, CA)

ABC Northern Territories Service, 2325-Tennant Creek with Latin rock at 1048. (Foss, Philippines)

Voice International, 15205 at 1550 with Christian music and religious talk. (Jackson, PA)

BOLIVIA—Radio Yura, Yura, 4717 at 0955 with CP music. SS anmts, ID. (Alexander, PA) 1008. (DeGennaro, NY)

Radio Mallku, Uyuni, 4796.4 in QQ at 1024. (DeGennaro, NY)

Radio Santa Cruz, Santa Cruz, 6134.8 in SS heard at 0948. (DeGennaro, NY)

La Voz de Bolivar, Bolivar, 5460 in SS at 1049. (DeGennaro, NY)
Radio San Jose, San Jose Chiquitos, 5580 with two men talking at 1127. (DeGennaro, NY)

Radio Pio Doce, Siglo Viente, 5952.5 at 0956 with SS talk, "Pio Doce" jingles. Good but needs ECSS-USB to avoid WYFR on 5950. (Alexander, PA)

BONAIRE—Radio Nederland Relay, 6165 to close of EE transmission at 0056. (Gay, KY) 11730 in DD at 2230. (Barton, AZ) 15315 in SS at 2340. (MacKenzie, CA) 17895 in DD with cabaret music and a radio drama at 2147. (Wood, TN) 6165 in DD at 2317, 15315 at 2000 and 17810 at 2046. (Charlton, ON)

BOTSWANA—VOA Relay, 12080 in FF at 2036. (Brossell, WI) 1917 in FF. Also 17895 on Somalia at 1813. (Charlton, ON) 1945. (MacKenzie, CA)

BRAZIL—(All in PP) Radio Nacional Amazonia, 6180 at 0042. (Yohnicki, ON) 6185 at 2300. (Charlton, ON) 11780 at 0030. (MacKenzie, CA) 0905. (DeGennaro, NY) 2215-2230. (Wood, TN)

Radio Nacional, Macapa, 4915 with dance music at 0531. (Wood, TN) 1033. (DeGennaro, NY)

Radio Aparecida, Aparecida, 5035 with religious talk and music at 0335. (DeGennaro, NY) 9630 at 1958. (Charlton, ON)

Radio Educacao Rural, Campo Grande, 4755 with man-woman talk at 0255. (DeGennaro, NY)

Radio Guarujá Paulista, Presidente Prudente, 5045 with religious message at 0341. (DeGennaro, NY)

Radio Clube do Para, Belem, 4885 with up-tempo music heard at 0501. (Maxant, WV)

0531. (Wood, TN) 0648. (Wood, TN) 0907. (DeGennaro, NY)

Radio Capixaba, Vitoria, 4935 at 0318 with religious talk. (DeGennaro, NY)

Radio Brazil Central, Goiania, 4895 at 0618 with lots of accordion and close harmonies. Rare here. (Wood, TN) 0929. (DeGennaro, NY) 11815 with national news at 2150. (DeGennaro, NY)

Radio Difusora Roraima, Boa Vista, 4875 with music and commls at 0310. (DeGennaro, NY)

Radio Educadora, Braganca, 4825 at 0913. (DeGennaro, NY)
Radio Caiari, Porto Velho 4785 at 1012 with religious talk and crowd response. (DeGennaro, NY)

Radio Alvorada, Parintins, 4965 at 0926 with talk, commls, songs. (DeGennaro, NY)

Radio Cancao Nova, Cachoeira Paulista, 4825 at 0529 with inspirational music, preaching. (Wood, TN) Similar at 2217. (DeGennaro, NY) 9675 at 2300. (Charlton, ON)

Radio Senado, Brasilia, 5990 at 0930. (DeGennaro, NY)

Radio Difusora do Amazonas, Manaus, 4805 at 1040 with talk, commls, event anmts. (DeGennaro, NY)

Radio Anhanguera, Goiania, 4915 at 0913. (DeGennaro, NY)

Radio Cultural Ondas Tropicais, Manaus, 4824.5 heard at 1047. (DeGennaro, NY)

Radio Educacao Rural, Tefe, 4825 at 1108. (DeGennaro, NY)

Radio Congohas, Congohas, 4775 with music, ID at 0910. (DeGennaro, NY)

BULGARIA—Radio Bulgaria, 7400 at 0023. (MacKenzie, CA) 0320. (Maxant, WV) 15700 in PP at 1345. (Brossell, WI)

Radio Marabu, 5775 via IRRS-Italy at 2215 with pops. GG talk, also some EE. Many IDs to past 2240. (Alexander, PA)

BURKINA FASO—Radio Burkina, 5030 at 2315 with FF talk, Afro-pops, phone talk, anthem at 0000 sign off. University network was not on the frequency. (Alexander, PA) 2341 with highlife vocals, FF rap, ID and s/off anmts, anthem to 0003 close. (D'Angelo, PA)

CANADA—RCI, 6100 at 2140 with FF discussion. (Maxant, WV) 9515 with CBC relay at 1400. (Jackson, PA) 9770 at 2146. (Wood, TN) 15365 with sports news at 1834. (Charlton, ON)

CBC Northern Quebec Service, 9625 heard at 0500 sign on. (Maxant, WV)

CHU, Ottawa, 7335 with EE/FF time anmts at 0120. (Maxant, WV)

CHILE—CVC/Voz Cristiana, 6070 in SS at 0940 and 9635 in SS at 2224. (DeGennaro, NY) 11805 in SS at 0101 and 17680 in SS at 1830. (Charlton, ON)

CHINA—CRI, 5960 via Canada at 0015. (Branco, NY) 6005 via Canada at 0101, 6020 via Albania at 0022, 9580 at 0112 and 12035 via Moscow in AA at 1910. (Charlton, ON) 6020 via Albania at 0113 and 9640-Kashi in SS at 2221. (DeGennaro, NY) 11820 in Cantonese at 0038, 12045 in Cambodian at 0010 and 13580 in CC at 0015. (MacKenzie, CA)

CPBS/CNR, 4460-Beijing in CC at 1230. (Barton, AZ) 7140 (t) in apparent Mandarin at 2300 and 7270-Hohhot, Nei Menggu PBS in listed Mongolian at 2333. (Taylor, WI) 7335 in CC at 0027, 11670 in CC at 0040, 11925 in CC at 0023 and 12045 in CC at 0017. (MacKenzie, CA) 9620-Beijing in CC at 1717. (Foss, Philippines)

Voice of the Strait, 7280 in CC at 1222. (Brossell, WI)

Voice of Pujiang, Shanghai, 5075 in CC at 1303. (Foss, Philippines)
Firedrake music jammer, 7445 covering RTI heard at 1348. (Brossell, WI)

COLOMBIA—La Voz de Guaviare, San Jose de Guaviare, 6035 in SS with ID at 0938. (DeGennaro, NY)

Marfil Estereo, 5910 with local romantic ballads and SS anmts at 0210. (Alexander, PA) 1028. (DeGennaro, NY) (p) at 1104 with long SS sermon. (D'Angelo, PA)

La Voz de su Concencia, Puerto Lleras, 6009.5 monitored at 0210 with ballads, SS talk, possible religious talk. Needs ECSS-LSB. (Alexander, PA)

CONGO (Dem. Rep.)—Radio Okapi, 11690 via South Africa at 0418 with talk in local language. Jingle IDs at 0422 and 0436. (D'Angelo, PA)

In Times Past...

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

CLANDESTINE—Voice of the Revolutionary Party for Reunification, 4115 at 1036 in Korean on 9/13/75. Believed to be based in Haeju, North Korea, and beamed at the South. (Dexter-WI)

CROATIA—Voice of Croatia, 7285 at 0033 in Croatian. (MacKenzie, CA) 0040 via Germany in Croatian. (Charlton, ON) 7285 via Germany ditto at 0157. (DeGennaro, NY) 13830 at 1430 with "Radio HRT" ID. (Brossell, WI)

CUBA—RHC, 6000 at 0539 on baseball and soccer. (Wood, TN) 6000 at 0131, 6060 in SS at 0120, 9550 in SS at 2237 and 6060 in SS at 0103. (Charlton, ON) 11760 in FF at 2145. (DeGennaro, NY) 11765 in FF at 2020. (Barton, AZ) 6180 at 0100. (Gay, KY) 9505 in SS at 2130 and 9550 at 2220. (Maxant, WV)

Radio Rebelde, Havana, 5025 in SS at 0520. (Maxant, W) 0923 and 9600 in SS at 1134. (DeGennaro, NY)

CYPRUS—Cyprus Broadcasting Corp., 6180 in Greek heard at 2223. (Brossell, WI)

CZECH REPUBLIC—Radio Prague, 5930 in FF at 0656 open. (Wood, TN) 2235 on Czech composers at 2235. (Maxant, WV) 6200 in SS at 0135. (DeGennaro, NY) 7345 at 2338. (Charlton, ON)

DJIBOUTI—RTV Djibouti, 4780 at 0259 with open carrier, 0300 with choral anthem, woman with ID, anmts and man with Koran recitation. (D'Angelo, PA)

DOMINICAN REPUBLIC—Radio Cristal International, 5009.9 at 1120 in SS with man on local subjects. (DeGennaro, NY) 2235 with local music and SS talk. (Alexander, PA)

ECUADOR—HCJB, 3220 in QQ at 1048. (D'Angelo, PA) 6125 in QQ at 0944, 9745 in QQ at 2204 and 15295 in PP at 1715. (DeGennaro, NY) 6065 and 9745 in SS at 0330. (DeGennaro, NY) 11700 in SS at 2306, 11920 in PP at 2310 and 12040 in GG heard at 2314. (MacKenzie, CA)

La Voz del Napo, Tena, 3279 in SS heard at 0242. (DeGennaro, NY) 0347. (Wood, TN)

Radio Chaskis, Otavalo, 4909.2 in QQ at 1105. (DeGennaro, NY) 1112 in SS. (Alexander, PA)

Radio Quito, 4919 with music and SS. ID 0922. (DeGennaro, NY) Radio Buen Pastor, Saraguro, 4815 in SS with religious talk at 1052. (DeGennaro, NY)

HD2IOA, Guayaquil, 3810 with time signals, SS anmts at 0411. (Wood, TN)

EGYPT—Radio Cairo/Egyptian Radio, 7270 to North America at 0259. (DeGennaro, NY) 0215, and 9990 at 2205. (Maxant, WV) 12050 in AA at 1425. (Brossell, WI) 1231 in AA. (Charlton, ON)

ENGLAND—BBC, 5975 at 2215. (Maxant, WV) 5975 via French Guiana with news at 2200. (Yohnicki, ON) 7120 South Africa Relay at 0404 with world news and 7330 via Vladivostok in CC at 1315. (Brossell, WI) 0400. (Branco, NY) 7330-Vladivostok via Russia at 1243. (Taylor, WI) 9740 Singapore Relay with news, ID at 1200. (D'Angelo, PA) 11665-Rampisham with sports at 1646 and 11675 at 2100. (Charlton, ON)

FEBA, 12025 via Dhabbaya (UAE) in an Asian language at 1340. (Brossell, WI)

Bible Voice, 12065 via Russia in an Asian language at 1242. (Brossell, WI)

EQUATORIAL GUINEA—Radio Nacional, Bata, 5005 at 2240 with group chants and local language. Went off monitored at 2257. (Strawman, IA)

FRANCE—RFI, 5900 via Irkutsk in CC at 1025 and 5995 French Guiana Relay in FF at 0107. (DeGennaro, NY) 7270 via Ascension in FF at 0410. (Brossell, WI) 7355 at 0615. (Maxant, WV) 11615-Issoudun at 1624, 11705-Issoudun in FF at 2104, 15160 via South Africa in FF at 1655 and 17630 French Guiana Relay in SS at 1601. (Charlton, ON)

GABON—Africa Number One, 9580 in FF at 2042. (Brossell, WI) 2232. (DeGennaro, NY) 15475 in FF at 1606. (Yohnicki, ON) 1850. Also 17630 in FF heard at 1550. (Charlton, ON) 1537. (Wood, TN)

RTV Gabonaise, 4777 at 0456 open in FF. (D'Angelo, PA) 0458. (Alexander, PA) 0545 in FF. (Wood, TN)

GERMANY—Deutsche Welle, 6075-Nauen in GG at 0222, 9720 Rwanda Relay in Indonesian at 2209 and 11690 Kigali (Rwanda) Relay heard at 2140. (DeGennaro, NY) 7240 via Sines at 0502, 11690-Kigali in GG at 2205 and 9885 Sri Lanka Relay in SS at 2149. (Wood, TN) 7265 via Irkutsk in GG at 1155 and 9830 Kigali Relay at 2039.



A beautiful QSL from the rejuvenated Radio Slovakia International. (Thanks Rich D'Angelo)

(Brossell, WI) 7285 at 0505 and 11695 at 2150. (Maxant, WV) 11690 Kigali Relay in GG at 0035. (MacKenzie, CA) 2135 to 2200 when into GG. (D'Angelo, PA) 11725 Kigali Relay in GG at 1820. Off at 1857. (Barton, AZ) 11690 Kigali Relay at 2102, 11725 via Kigali in GG at 1906, 12035 via Portugal in FF at 1630 and 13780 Kigali Relay in FF at 2017. (Charlton, ON)

GREECE—Voice of Greece, 7475 at 0345 and 9420 at 1910. (Maxant, WV) 1709. (Brossell, WI) 0721. (Wood, TN) 15630 at 1851. (Charlton, ON) (*All in Greek—gl'd*)

RS Makedonias, 9935 in Greek at 1335. (Brossell, WI)

GUATEMALA—Radio Verdad, Chiquimula, 4052.5, music and SS talks at 0346, ID 0400. (D'Angelo, PA) 0352. (Alexander, PA) 0358. (Brossell, WI)

Radio Buenas Nuevas, San Sebastian, 4799.8 in SS with hymns at 0305. (DeGennaro, NY)

Radio Cultural Coatan, San Sebastian, 4780 in SS at 1031 sign on. (Alexander, PA) 1034. (DeGennaro, NY) 1215. (Barton, AZ) 2327. (MacKenzie, CA)

HAWAII—KWHR, 9930 at 0834 with sermon, ID at 0859. (D'Angelo, PA)

HONDURAS—HRMI/Radio Misiones Int., 3340 with inspirational SS vocals heard at 0416. (Wood, TN) 0510 to 0557 close. (D'Angelo, PA)

HUNGARY—Radio Budapest, 6035 at 0345 with "Hungary Today." Also 6110 heard at 0200 with news in HH. (Linonis, PA)

INDIA—All India Radio, 4810-Bhopal at 1225 with HH vocals, apparent news at 1230. (D'Angelo, PA) 4860 at 1215. Also 5015 with similar programming and better signal. (Strawman, IA) 9425 in HH at 1320, 9820-Panaji (Goa) in HH at 1334 and 10330-Bangaluru in HH excellent at 1335. (Brossell, WI) 9425-Bangaluru in HH at 1438, 9820-Panaji in Sindi at 1334 and 11620-Delhi/Kingsway in EE at 1425. (Taylor, WI) 10330-Bangaluru in RR at 1715. (Linonis, PA) 0155 with HH and western music. Also 11935 at 1920. (Maxant, WV) 11620-Bangaluru in EE at 2155. (Wood, TN)

INDONESIA—RRI-Gorontalo, 3266.2 in II at 1055. Also RRI-Pontianak, 3976 with news in II at 1310 and 4605-Serui with local music at 1312. (Foss, Philippines) 9525 in CC at 1100. (Barton, AZ) 9680 in II at 1138. (DeGennaro, NY)

IRAN—VOIRI, 6120 at 0205. (Maxant, WV) 9510 in an Asian lang. at 1320. Close at 1330. Also 13790 in AA at 1352. (Brossell, WI)

ISRAEL—Kol Israel, 6280 with news at 0430. Also 7545. (Maxant, WV) 2340 in HH. (Charlton, WV)

Galei Zahal, 6973u in HH to Europe at 0024. (DeGennaro, NY)

ITALY—RAI Int., 6110 via Ascension in II at 0140, 11880 in PP at 2057 and 15250 in II heard at 1711. (DeGennaro, NY) 6120 in II with news at 0430. (Maxant, WV) 11830 in II at 1847. (Charlton, ON)



The pirate Radio Bunny issued this large QSL to Rich D'Angelo.

JAPAN—Radio Japan/NHK, 6110 via Canada with interview at 0530. (Maxant, WV) 6145 via Canada at 0028, 11665-Yamata in JJ at 2132, and 15355 via Gabon with JJ songs at 1844. (Charlton, ON) 11665 in JJ at 2304 and 13650 at 0005. (MacKenzie, CA)

Radio Nikkei, Tokyo, 3925 in JJ at 2133. (Foss, Philippines)

JORDAN—Radio Jordan, 9830 in AA at 2050. (DeGennaro, NY) 11690 with pops at 1418. (Charlton, ON) 11810 in AA at 1335. (Brossell, WI)

KUWAIT—Radio Kuwait, 9855 in AA at 2047. (DeGennaro, NY) 11990 in AA at 1554. (Charlton, ON)

LIBYA—Radio Jamahiriya, 7370 via France at 2338 with EE news. Cut at 0000 in mid-sentence. Voice of Africa feature at 1400, into EE at 1402. Barely audible by 1450 due to low modulation. (Alexander, PA) 17725-France in EE at 1500. (Jackson, PA) 1406 in EE. Also 17850 via France in AA at 1417. (Charlton, ON)

MALI—RTV du Malienne, 4835 with FF talk heard at 2235. (Brossell, WI)

MEXICO—Radio Educacion, 6185 with SS talk and music at 0037. (Charlton, ON) Classical music at 0748, over-modulated voice. (Wood, TN) Piano music and SS anmts at 0953. (DeGennaro, NY)

Radio Transcontinental, 4810, acoustic guitar at 1240. USB improves the signal. (Barton, AZ) 1258 in SS. (Brossell, WI)

MOROCCO—RTV Marocaine, 15345 with Koran heard at 1445. (Brossell, WI) 1719 in AA. (DeGennaro, NY) 1756. (Yohnicki, ON) 1905 in AA. (Charlton, ON)

Radio Medi Un, Nador, 9575 at 0726 in FF with FF/EE pops. (Wood, TN)

NETHERLANDS—Radio Nederland, 6165-Flevoland, at 0330 with talks about European countries. (Branco, NY) 9895 via Madagascar, in SS at 0055. (MacKenzie, CA) 2151 in DD. (Wood, TN) 2156 in DD. Also 11655 via Madagascar at 2133. (DeGennaro, NY) 1621. (Charlton, ON) 1915 in EE. (Maxant, WV) 12065 in an Asian language at 1343. (Brossell, WI)

NEW ZEALAND—RNZI, 17675 with local weather at 0705. (Barton, AZ) 9890 airing National Radio at 0600. (Maxant, WV)

NIGER—La Voix du Sahel, 9704 at 2112 in FF taking phone calls, tribal vocals. Off with choral anthem at 2301. (D'Angelo, PA)

NIGERIA—Radio Nigeria, Kaduna, 4770 heard at 0426 on with open carrier, drum IS, ID, anmts, prayer and music. (D'Angelo, PA) 0559 with news, ID at TOH. (Wood, TN) 2230 with highlife music. (Brossell, WI)

Voice of Nigeria, 15120 opening at 1700 with Afro-pops, ID, news. Some pgms have good audio; some are muffled with low modulation. (Alexander, PA) 1814. (Charlton, ON) 1945 on African oil production. (Maxant, WV)

NORTH KOREA—Pyongyang Broadcasting Station, 3250 in KK with classical piano and orchestra at 1515. (Foss, Philippines)

KCBS, 6285 in KK with martial music at 1213. (Brossell, WI)

OMAN—Radio Sultanate of Oman, 15140 monitored at 1433 with EE news, AA talk, pops, Koran. EE used to be 1400-1500 so sked change? (Alexander, PA) 1440 in AA. (Brossell, WI) 1658 in AA. (DeGennaro, NY)

OPPOSITION—Radio Nacional de la RASD, 6458 at 2245 with AA talk, local music, ID. SS at 2301 to 0000 when off with NA. Co-channel RTTY QRM. (Alexander, PA) *(They've moved again! Now on 6300).*—gld

Voice of Biafra Int., 7380 via South Africa at 2105 with religious music, opening ID and anmts, prayer, news about Nigerian corruption. Saturdays only. (Alexander, PA)

Radio Voice of the People, 11695 at 1700 sign on with multi-lingual IDs, pgms in EE and vernacular. Many frequency and ID mentions to close at 1753. (Alexander, PA) 1740 to 1755 close with usual anti-Zimbabwe talks and tribal music. (D'Angelo, PA)

Radio Farda, 9335 via Sri Lanka at 2025 with U.S. pops and anmts in Farsi. (Brossell, WI) 9585 in Farsi at 0500. (McGillvry, IL)

Radio Waaberi, 17660 via Germany with African music heard at 1339. (Brossell, WI)

Radio Liberty, 9990 via UAE in an Asian language at 1324. (Brossell, WI)

PAPUA NEW GUINEA (New Guinea Terr.)—Radio East Sepik (t) 3335 at 1203 with possible religious service in Pidgin and group singing. (D'Angelo, PA)

PERU—(All in SS) Radio Ancash, Huaraz, 4990.9 at 1023 with SS anmts, IDs, huaynos. (Alexander, PA) 1117. (DeGennaro, NY)

Radio Tarma, Tarma, 4775 at 1048 with Andean flutes. (DeGennaro, NY)

Radio Vision, Chiclayo, 4790 with SS DJ, religious messages heard at 0302. (DeGennaro, NY)

La Voz de la Selva, Iquitos, 4824.5 with SS pops, anmts, ID. Off at 0310 after anthem. (Alexander, PA) 0313 with religious service. (Brossell, WI) 1056 with local news, time check. (DeGennaro, NY)

Radio Maranon, Jaen, 4835.5 at 1038 with man hosting OA music, ID, TC and commls at 1047. (D'Angelo, PA) 1100. (DeGennaro, NY)

Radio Altura, Cerro de Pasco, 5014.4 at 0120 with commls, promos, OA music. ECSS-LSB recommended for best reception. (Alexander, PA)

Radio Victoria, Lima, 6020 monitored at 0534 with religious pgm. (Wood, TN)

Radio Huanta 2000, Huanta, 4755 at 1045 with "snake oil"-type comml anmts. (DeGennaro, NY)

Radio Madre de Dios, Puerto Maldonado, 4950 with music and talk at 1040. (DeGennaro, NY)

Reina de la Selva, Chachapoyas, 5486.6 with commls, notices, ID at 1053. (DeGennaro, NY)

La Voz del Rondero, Huancabamba, 6535.9 at 0145 with talk, OA music, ID at 0203 and off. (Alexander, PA)

Radio Atlantida, Iquitos, 4790 with live sports event at 0305. (Brossell, WI) 1046 with talk and OA music, commls and news. (D'Angelo, PA)

PIRATES—WORI (t) 6925u 2211-2233 off, also 2253 open to 2255 off and 2151 to 2154 some of these receptions were unclear on call letters. One time asking for reports to the FRN web site (Zeller, OH)

Radio Ice Cream, 6925u 1654 on to 1724, 1725 to 1755 off and 1910-1938 with rock, and host "Ice Cream Man," barking dogs. Belfast address anncd. (Zeller, OH) 1912 to past 1925. (Alexander, PA) 2000 with rock numbers closing at 2021 with Van Halen's "Ice Cream Man." (Burgess-MA)

Random Radio, 6925u, 0125-0152 close, 0052 on to 0055 close with pop and country, "news bulletin" about the assassination of Dr. King, sounded like WORI at times. Reports to FRN. (Zeller, OH) 2214-2218 close with big band jazz music, cigarette comml and FRN for reports. (D'Angelo, PA) 2158. Also heard at 2200-2218 with big band swing. (Hassig, IL)

Undercover Radio, 6925u, frequent rptns 1500, 1507 2041, 2115, 2116, 2120 with Dr. Benway, rock, reports to grasscutterrado



An engineer at WEWN makes some adjustments. (Thanks Charles Maxant, WV)

@yahoo.com. Merlin mailing address, story about a woman and Big Sur. (Zeller, OH) 0400 with story of adventures on Pacific Coast Highway. (Mcgillvry, IL) 2130 and 2345 with Big Sur story. (Hassig, IL) 0223 with Big Sur story and mention of using "1000 watts of mobile power." (Adams, FL) 1536. (Gay, KY)

MAC Radio, 6850 with Paul Star and oldies pop at 1730. (Alexander, PA)

Ironman Radio, 6925u with pop songs at 0137-0206. (Hassig, IL)

Take It Easy Radio, 6925u, 6950u variously at 2226, 2330, 0247, 0309, 0403 with Eagles rock, Merlin address, Dean Martin vocals. (Zeller, OH) 2213, 0100, 0145, 0215 with tolling bells, "Life of the Sea" song, "Desperado" hosting. (Hassig, IL) 0410 (p). (D'Angelo, PA) 0234 and 0244 Desperado smoking and drinking in the woods while transmitting, rock, salty language, claimed to be a pro Eagle and pro free radio station. (Burgess, MA)

WTCR, 6925u at 0040 IDing as WTCR and "Twentieth Century Radio," James Brown numbers and others. (Alexander, PA) 0102 with various rock things and Dave Letterman routine. (Wood, TN)

WBNY (t) 6925u at 1819, 2201, 2305 all the same or similar xmsns w/out ID but very consistent with WBNY's format. Several mentions of the rodent revolution. 0123 with rock and novelties, man anncr IDing as WBNY. (Zeller, OH)

Northwoods Radio, 6925u heard at 2042 with animal sounds and "broadcasting freedom from the Great Lakes." (Gay, KY)

Sunshine Radio, 6925u, variously at 1615, 1910, 1950 sometimes with Grasscutter Radio. Rock with woman anncr, sunshineradio@yahoo.com for reports and recommends the FRN website to learn more about pirate radio. (Zeller, OH) 2117 with rock and country. (Hassig, IL) 1955. (D'Angelo, PA) 1651 with rock oldies, woman anncr with echo. (Gay, KY)

Mystery Radio (Euro) 6220 at 2331 with rock and man anncr. (Zeller, OH) 0327 with dance club stuff. 0452 with dance party and disco. (Wood, TN)

Altered States Radio, 6925u at 0500 with *Outer Limits* music and rap. Merlin address. (Hassig, IL)

Captain Morgan, 6925u at 2031. (Gay, KY) 2225 with various selections, *Twilight Zone* theme. (Hassig, IL) 0216 with continuous track of song segments. Overmodulated at times. Still going at 0245. (Burgess, MA)

WHYP, 6925 with rock and pgm "Root Beer Madness" at 2104. (Gay, KY)

James Bond Radio, 6925u heard at 2026 with themes from 007 movies and "Bond, James Bond, stirred, not shaken." (Wood, TN)

Laser Hot Hits, 6925u believed to be a relay at 0800 with various

rock numbers, Merlin drop. Gave phone, fax and e-mail addresses and acknowledged several listener reports from Europe. (Alexander, PA) 0930 with DJ Mike Andrews, comml for *Echo* magazine, Euro and U.S. pop, Merlin address. Also at 2250 with soft rock. (Hassig, IL)

Radio Free Euphoria, 6857 heard at 2200 with "Captain Gonja." (Hassig, IL)

The Crystal Ship, 3276 at 0906 with "The Poet," anti-Republican themes. (D'Angelo, PA) 2350 with X-rated Christmas tune parodies. (Hassig, IL)

World Domination Radio, 6925u variously at 1529, 1549, 1620, and 1929 with rock and some talk of the rodent revolution. Also used WMDR call letters. (Zeller, OH)

KBLK, 6925u at 2200 with African American-sounding DJ ranting about white pirates, urban disco/dance, rap, anncd as "Voice of Black Oppression." Also at 2250 (Hassig, IL)

WTPR, 6925u at 2010 with pgm warning that if listeners tune away they face the horrible consequence of losing of air pressure in their tires. (Zeller, OH)

WHLR (or similar) 6925u at 2139 with rock, "Hey Joe." Apparently the same xmtr went right into a WBNY best. (Zeller, OH)

Ann Hofer Radio, 6925u at 2215 with a couple of older pop things. Causing QRM to KBLK broadcast. (Hassig, IL)

POLAND—Radio Polonia, 9525 at 1323 on breast cancer treatments. (Brossell, WI) 11850 at 1145 in presumed Polish to 1200 close. (Linonis, PA)

PORTUGAL—RDP Intl., 9795 in PP at 2040. (DeGennaro, NY) 15560 in PP at 1540. (Wood, TN) 15690 in PP at 1412. (Charlton, ON)

ROMANIA—Radio Romania Int., 6045 in FF at 0218. (DeGennaro, NY) 7170 signing on with IS and Romanian anmts at 0558. (Wood, TN) 9755 at 2140 on local cathedrals and the Orthodox Church there. (Wood, TN)

RUSSIA—Voice of Russia, 6240-Armavir at 0329 with news, "Stroll Around the Kremlin." (Wood, TN) 0147 in SS, 7125 via Moldova in RR at 0152, 7150-Armavir in RR at 0242, 7240-Armavir in RR at 0253, 7250 via Armenia at 0256 and 7350 via Vatican in RR at 0203. (DeGennaro, NY) 7125 in RR at 0235. (DeGennaro, NY) 0040. (MacKenzie, CA) 6240 at 0330, 7150 at 0445 with Russian classical music, 7250 at 0215 and 7350 via Vatican at 0355. (Maxant, WV) 7150 at 0400. (Mcgillvry, IL) 7175-Vladivostok in an Asian lang. at 1233. (Brossell, WI)

RWANDA—Rdf. Rwandaise, 6055 at 2045 with a variety of Afro-

This Month's Winner

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

This month's prize-winner is **Robert Charlton of Windsor, Ontario**. Bob will soon be enjoying a one-year membership in the North American Shortwave Association (NASWA) America's only all-shortwave broadcast club. As a member he receives the monthly *The NASWA Journal*, which is filled with articles, observations, comments, station schedules, QSL news, and member logs. If you're not a NASWA member you can get a sample copy of *The Journal* by sending \$3 to NASWA, 45 Wildflower Rd., Levittown, PA 19057.

• TO MAKE CHRIST KNOWN TO AFRICA •

ELWA

QSL on 11.425 mcs. at 0300 GMT

on January 11, 1961

Remarks: Thanks for your report.

BOX 192 • MONROVIA LIBERIA • SUDAN INTERIOR MISSION



Here's a goodie: ELWA on 25 meters in 1961! (Thanks Mike Adams, FL)

pops, U.S. and FF pops, DJ in FF and some occasional EE, IDs and phone calls. Off abruptly at 2102. (Alexander, PA)

SAO TOME—VOA Relay, Pinheira, 11915 at 0354 with brief features in local language, ID and news at 0400. (D'Angelo, PA)

SAUDI ARABIA—BSKSA, 9870 in AA at 1930. (Maxant, WV) 11820 in AA with Koran at 2246. (Charlton, ON) 2314. (Taylor, WI) 15205 in AA with Koran at 1702. (DeGennaro, NY) 15455 in AA at 1543. (Wood, TN)

SINGAPORE—Radio Singapore Int. 6080 at 1447 with news review of 2006. (Foss, Philippines)

SLOVAKIA—Radio Slovakia Int., 7230 at 0115 on relations with the Vatican. (Maxant, WV) 0246 with ID 0248. (DeGennaro, NY)

SOUTH AFRICA—Channel Africa, 3345 at 0304 with news, ID, pgm on precious metals. (D'Angelo, PA) 0402. (Strawman, IA) 0419, and 17770 at 1534. (Wood, TN) 7305 in FF at 0410. (Brossell, WI) 7390 at 0320, 9865 at 0515, 9870 at 0530. (Maxant, WV) 15235 at 1702. (Yohnicki, ON) 1708. (DeGennaro, NY) 1758, 17750 at 1517 and 17770 at 1512. (Charlton, ON)

Radio Sondergrense, 3320 at 0246 in Afrikaans. (DeGennaro, NY) 0406 with news, weather in Afrikaans, into pop. (Wood, TN)

BBC via Meyerton, 3255 at 0405 with news. (Strawman, IA)

SOUTH KOREA—Radio Korea Int., 5960 at 0200 sign on. (Linonis, PA) (via Canada—gld) 11810 in JJ heard at 0041. (MacKenzie, CA)

SPAIN—Radio Exterior de Espana, 6055 with SS/EE lessons at 0050. (MacKenzie, CA) 0118 in SS and 11625 in SS at 2128. (DeGennaro, NY) 6055 in EE at 0026, 15125 via Costa Rica in SS at 1611 and 15125 via Costa Rica in SS at 1836. (Charlton, ON) 6125 on shopping in the Caribbean at 2135. (Maxant, WV) 12045 with ME music to North Africa at 2300. (Barton, AZ) 21570 in SS at 1500. (Linonis, PA)

SURINAME—Radio Apinte, 4990 in DD heard at 0441 with pop. (Strawman, IA) 0445 with 50s pops. (Wood, TN) 0940 in unid language, then in DD. (DeGennaro, NY)

SWAZILAND—Trans World Radio, 4775 at 0338 open with hand bells IS, EE ID and into pgm in Lomwe language heard at 0340. (D'Angelo, PA)

SWEDEN—Radio Sweden Int., 6010 via Canada in Swedish at 0220. (Linonis, PA) 0230 with Scandinavian news. (Maxant, WV) 15240 via Canada in Swedish to NA at 1415. (Charlton, ON)

TANZANIA—Radio Tanzania-Zanzibar, 11735 at 1753 in Swahili, time signal at 1800 and news in EE from local Spice FM f/by Swahili rap. (D'Angelo, PA) 2040. (Charlton, ON)

TAIWAN—Radio Taiwan Int., 5950 via Florida in CC at 2145. (Maxant, WV) 2328, 11665 in FF at 2045, 15440 in FF via Florida at 2034 and 17760 via Florida in CC at 1934. (Charlton, ON) 11640 in CC at 0044. (MacKenzie, CA)

THAILAND—Radio Thailand, 5890 via U.S. at 0045. (Yohnicki, ON) 0200. (Linonis, PA) 0220. (Charlton, ON) 7260 at 1117 in an Asian lang. (Brossell, WI)

BBC Relay, 7105 heard at 1415. (Strawman, IA)
VOA Relay, 7190 in CC at 0037. (MacKenzie, CA)

TURKEY—Voice of Turkey, 5960 in EE at 2312, 7300 in TT at 2336 and 12035 in EE at 1403. (Charlton, ON) 6020 monitored at 0450. (Maxant, WV)

TURKMENISTAN—Turkmen Radio, 5015 at 1235 in presumed Turkmen, ME music and ID at 1259. (Brossell, WI)

UGANDA—Radio Uganda, 4976 at 0405 with EE news by man, ID. (D'Angelo, PA) 0407 with Afro-pops and African dialect. (Brossell, WI)

UKRAINE—Radio Ukraine Int. 5820 with student interviews at 0440. (Maxant, WV) 5830 in UU at 0117. (Charlton, ON)

USA—WYFR, 11875 via Ascension at 2327 with mailbag. (Wood, TN) 11985 via Ascension in FF at 2033. (Brossell, WI) 15195 via Ascension to Africa at 1940. (Maxant, WV)

Adventist World Radio, 11720 via UAE in listed Mandarin at 1433. Also 11845 via South Africa in FF and Yoruba at 2034. (Taylor, WI) 2029 with multi-lingual ID, "This is Adventist World Radio—The Voice of Hope." (Brossell, WI) 15140 via South Africa in unid lang. at 1926. (Charlton, ON) 15320 via Guam in VV at 2325 and 15370 via Guam at 2332. (MacKenzie, CA)

United Nations Radio, 9565 via Rampisham at 1736 on UNICEF fund raising efforts. (D'Angelo, PA) 17810 via Ascension at 1740. (Brossell, WI)

AFRTS, 5446.5u-Key West with soldier interview at 0345 and 12133.5u-Key West carrying NPR at 2205. (DeGennaro, NY) 6350u-Pearl Harbor at 1217 and 781u-Key West at 1206. (Brossell, WI)

VOA, 6040 Thailand Relay in CC at 1208 and 6160 Philippines Relay in CC at 1306. (Brossell, WI) 7295 Via Novosibirsk in Mandarin at 1425. (Strawman, IA) 9505 Philippines Relay in CC at 2244. (MacKenzie, CA) 11805 Philippines Relay in Indonesian at 0010. (Taylor, WI) 15220 Morocco Relay in FF at 1838 and 17895 Morocco Relay at 1845. (Charlton, ON)

VATICAN—Vatican Radio, 5885 at 1950 on family life in Gaza, 5915 at 0145 to Asia, 7305 at 0250 pleading for peace in the Holy Land and 7360 at 0320 on Christian history in the Sudan. (Maxant, WV) 7305 in SS at 0159. (DeGennaro, NY) 9645 with news items at 0734. (Wood, TN) 11625 heard at 2059. (Charlton, ON)

VENEZUELA—Radio Nacional, 11670 via Cuba in SS at 2202 with ID, address, music. (Wood, TN) 13680 via Cuba in SS at 2323. (MacKenzie, CA)

Observatorio Naval Cagical, 5000 with SS time anmts under WWV/WWVH at 0919. (DeGennaro, NY)

VIETNAM—Voice of Vietnam, 6175 via Canada with news at 0102. (Charlton, ON) 0234 with national news. (DeGennaro, NY) 12020 at 1244 discussing foreign investment in Vietnam. (Foss, Philippines)

YEMEN—Rep. Of Yemen Radio, 9780 at 1850 with country song, EE news at 1855. (Alexander, PA)

ZAMBIA—The Voice-Africa, 4965, Lusaka at 0325 with men talking, hymn. (DeGennaro, NY)

And so, once again, order is restored! A thousand thanks to the good guys who sent in their logs this time: William Hassig, Mt. Prospect, IL; George Zeller, Cleveland, OH; Rich D'Angelo, Wyomissing, PA; Chris Gay, Lexington, KY; Jerry Strawman, Des Moines, IA; Marty Foss, Guinayangan, Philippines; Charles Maxant, Hinton, WV; Brian Alexander, Mechanicsburg, PA; Joe Wood, Greenback, TN; Mike Branco, Islip, NY; Dean Burgess, Manchester, NH; Ciro DeGennaro, Fuera Bush, NY; Mike Adams, Lynn Haven, FL; Mark Taylor, Madison, WI; Arnold Zeck, Bayberry, NY; Stewart MacKenzie, Huntington Beach, CA; Mike McGillvry, Manito, IL; Robert Brossell, Pewaukee, WI; Robert Charlton, Windsor, ON; Rick Barton, Phoenix, AZ; Michael Yohnicki, London, ON and Jack Linonis and Joe Jackson, Hermitage, PA.

Thanks very much to each one of you. Until next month, good listening!

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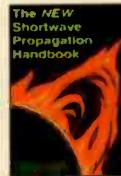
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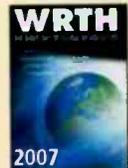


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Open-Wire Feed Line— Still Going Strong!

In an era when hams can choose from more than a hundred types of coaxial cables, I'm encouraged by the mail I get—and by the overall interest—in using open-wire feed line for its amazing low-loss characteristics. Back in the days before WWII, almost every ham used open-wire feeds, or even single-wire feeds! After the war, however, thanks to miles and miles of inexpensive surplus inventories of the black-jacketed stuff, coax became king.

King Of Convenience, But Definitely Not King Of Performance!

Many newcomers are amazed to discover—if they ever discover it—that coax isn't all that great in a great many applications, and that open-wire line, 450-ohm "ladder line," and even good ol' TV twinlead can kick its butt in the right applications.

The mysteries of coaxial cable are plenty, as are the myths and the misuses. Because coaxial cable is so handy and so readily available, and *usually* handles the job of getting our radio signals from the antenna to the rig (and vice versa), coax is often used improperly. Many beginners have only fuzzy ideas of how to use the stuff and only fuzzy ideas about things like impedance, velocity factors, wavelength, etc.

These "coaxial problems" are actually shared by hams everywhere. You might even have a real mess in your own backyard,

especially if you're using a single wire antenna on multiple bands. Coax works best for *matched* antennas at low frequencies with relatively short cable runs. For *multiband* wire antennas, especially those "tuned" by "antenna tuners," the performance can be more than dismal, ranging all the way up to unbelievably bad! There is a fix, however. Follow along and you'll discover how and why.

The traditional multiband dipole, the beginning ham's standard antenna, is fed with a random length of 50-ohm coax that's tweaked by an antenna tuner. Conventional wisdom says to put up as much wire as possible and let the tuner worry about matching the load on various bands. Even on bands where the antenna's SWR is quite high, and a lot of energy is reflected back and forth between the tuner and the antenna, *some* RF energy will be radiated.

Gooch's Paradox simply states, "RF gotta go somewhere." And indeed, it does. But it doesn't have to go *anywhere useful!* In the high-SWR conditions often found in typical multiband, tuner-fed dipoles, Gooch's Paradox might as well read, "RF gotta heat the feed line!"

For example, a standard 40-meter dipole (66 feet) fed with 50 feet of high-quality, low-loss coaxial cable will tune up on all bands, 40 through 10 meters. Tuning on some bands will be touchy, but you can work stations, DX included. But how much power is being wasted because of high SWR? The manufactur-

Feed Line Losses: A Graphical View

Seeing something in black-and-white can sometimes make all the difference. The graphs shown here show feed line losses for a 40-meter dipole fed with 75 feet of RG-58 coax and 600-ohm open-wire line as RF is applied from 6 to 8 MHz (the antenna is resonant at 7 MHz and an antenna tuner is used with both feed lines). You can clearly see that coax losses are low when the antenna is resonant, but quickly increase on either side of

resonance. When fed with open-wire line, however, SWR losses are minimal, and the antenna performs well at every frequency in the 6- to 8-MHz range despite being "non-resonant" over most of the span. This starts to get a bit complicated, but the performance difference can be amazing. The graphs were derived from a fascinating article written by Owen Duffy, VK1OD, which you can read in its entirety at www.vk1od.net/iobr/.

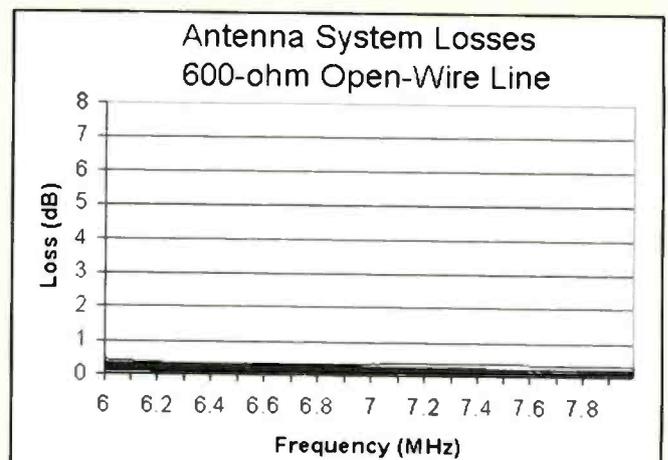
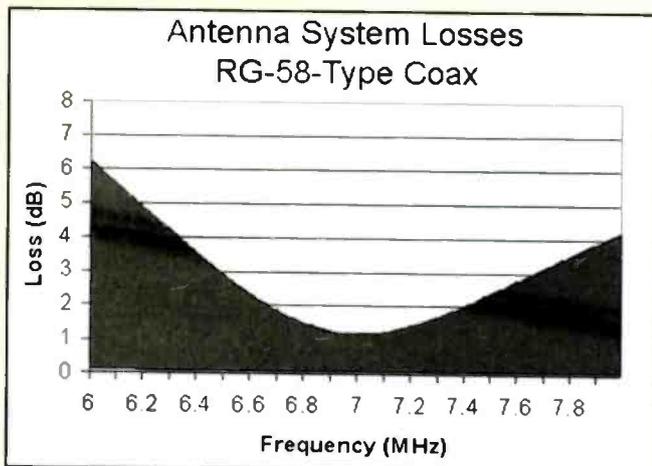




Photo A. Making your own 600-ohm open-wire line can be fun and educational—but it can also be tedious and frustrating! W7FG (see www.w7fg.net/) makes high-quality open-wire line and sells it for reasonable prices. When I moved, I uninstalled my big loop, which was fed with W7FG line, thinking I'd replace the used line at my new QTH. Upon inspection, however, the existing line was in perfect shape, Minnesota winters and all. So, I haven't had the need to buy more!

er's data sheet says our cable has 1.5 dB of loss per 100 feet at 100 MHz (loss increases with cable length and frequency). We're using only 50 feet with an upper frequency limit of 30 MHz, so our losses due to SWR mismatches should be minimal, right?

Wrong. Those loss figures are for *matched, resonant antennas*. With high SWR values, a lot of power (sometimes most of your power) can be lost between your antenna and tuner, even with a low SWR between your rig and tuner. As we'll see, losses increase in proportion to SWR, too. A 3-dB loss represents a 50-percent reduction in transmitted signal strength!

On 40 meters, our 66-foot dipole is a great match, and the antenna system wastes only about 0.2 dB. Not bad! On 15 meters, an odd harmonic of 40 meters, the match is also pretty good, guilty of an acceptable 0.8-dB loss. On 80 meters, however, feed line losses approach 14 dB. And on 160 meters, losses total a staggering 27 dB! If we start with a typical 100-watt output, we'll radiate about 3 watts on 80 meters and less than a 1/2 watt on 160! Instant QRP!

An Easy Fix

One way to reduce the feed line losses experienced while using multiband, non-resonant antennas is to ditch our "traditional" coaxial feed line and replace it with

ladder line, which, ironically, is even more traditional, having been the feed line of choice in ham radio's early days before the coax craze got started!

As shown in the photos, 450-ohm ladder line (parallel conductors separated by a plastic, ladder-like insulating material) replaces the coax cable we previously used to feed our dipole. Ladder line, also known as 450-ohm balanced line, was the norm in the days before coaxial cable (an unbalanced line). It may not be as convenient as coaxial cable, but when used with an antenna tuner designed to handle ladder line (most are), feed line losses for our 66-foot dipole stay blissfully below 0.3 dB on all bands, 40 through 10 meters! On 80 and 160 meters—big trouble spots when fed with coax—losses total 1.5 and 8.5 dB, respectively. That's a *tremendous* improvement!

Ladder Line Fundamentals

If ladder line were a magic cure-all, of course, we'd never use coax. If you're adventuresome, you can even make your own (see **Photo A**). Whatever you do, for best performance, a few ladder line tips are in order.

- Be sure your antenna tuner has a sufficient voltage rating. Tuning antennas with high feed line SWRs can create *very* high RF voltages inside your tuner.

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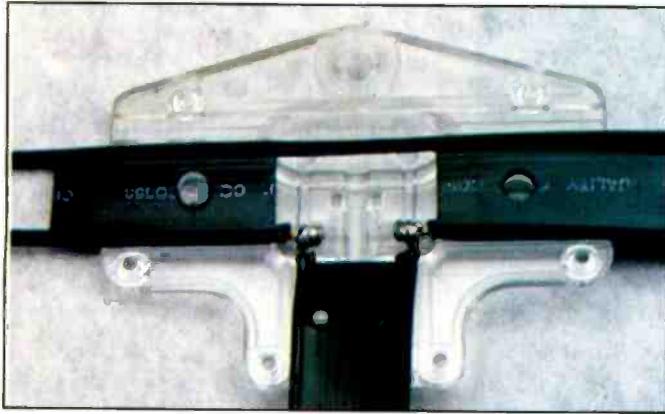


Photo B. Ten-Tec's Acrobat center insulator works with small-diameter coax or 450-ohm "ladder line" (shown in the photo), so if you don't want to make your own out of plexiglass or a piece of your mom's good Tupperware, point your browser to www.universal-radio.com/catalog/antsup/3720.html.

Resulting arcs and sparks can damage expensive equipment (especially on bands with the highest SWRs).

- When attaching balanced feeders to houses, structures, and towers be sure to keep the ladder line several inches away from metal (or metal-containing) objects. This can make bringing the line into the house a bit tricky.

- "Balanced" antennas designed specifically for ladder line feeders usually work better than their coax-oriented counterparts. MFJ makes several *balanced* antenna tuners just for feeding open-wire lines. Check out Model 974HB, for instance.

- Water, ice, and snow can affect (unbalance) ladder line. Keep things clear for best results, and be ready to tweak your tuner settings a bit if your feed line is iced up.

- If left flapping in the breeze, the soldered connection between your ladder line feeders and your dipole wires will probably fatigue and break rather quickly. Be sure to reinforce the junction with electrical tape, etc. or similar, or use a center insulator designed for ladder line, such as the Ten-Tec Acrobat, shown in **Photo B**.

- Ladder line can be hard to find. If your local ham store doesn't stock it, check the ham magazines for wire and cable suppliers. Some ops, especially QRPers, sometimes use 300-ohm TV twin-lead instead of 450-ohm line. It's a true balanced line, but reduced feeder spacing and lower-capacity insulation doesn't always produce acceptable results.

Signals In The Balance

If you can accommodate their eccentricities, balanced feed lines can provide an excellent compromise between convenience and cost. Simply install the longest center-fed dipole that's practical (make each side the same length) and feed it with enough ladder line to comfortably reach your station. With a decent tuner (the beefier the better), you'll put out a decent signal on a variety of bands, which is something you can't always say when using coax!

An updated look at balanced feed lines can be found in Paul Danzer's "Open-Wire Feed Line—A Second Look," in the April 2004 *QST*. A PDF can be found at www.arrl.org/tis/info/pdf/0404034.pdf. ■



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John Zondlo's *Discover DXing! How To Hear Distant AM, FM and TV Stations* (Third Edition)

If you're just getting your feet wet in the world of AM, FM, and TV DXing, this is the book to get you started—and keep you interested in this fascinating aspect of monitoring. The official news release from the folks at Universal Radio Research in Reynoldsburg, Ohio, says, "Here is your nontechnical introduction to hearing more AM, FM and TV stations..." The basics are certainly covered, with topics including propagation, seasonal conditions, equipment, antennas and reference materials.

I'll certainly agree that the 96-page book is written in a "conversational style" as Universal says, and you definitely won't be left asking a dozen questions at the end of each easy-to-read chapter. And when I say "getting your feet wet," I mean it; this detailed book cuts right to it. Joe or Suzy Radio-Newcomer won't even have to ask what DX means—it's defined right there in the Introduction!

Minor Subjective Criticism

In the business of writing and book publishing it's certainly not uncommon for an editor, writer, or even publisher to disagree on certain semantics and organization. We're all professionals, and because it's the nature of the beast, we can take a little of "I'd-do-it this-way-or-that-way." Which brings me to say that I would have opened the book with the AM DXing in Chapter 1, not chapter 10.

While TV-FM DX is a fairly popular hobby, the fact is most folks today would have to find room for and fire up and a separate TV—and connect an antenna of some sort—to do any serious TV DXing, while that trusty AM radio seems to me a more logical starting point for the book. But that's just me. My thought would be to grab a new reader's attention with a more familiar and easily accessible medium right up front and then get into TV DXing later on.

But regardless of where a topic is covered in this excellent book, it's covered in sufficient detail and in a very well written way.

A Great Reference

Still it's not a reason for skipping—so to speak—the TV-FM DXing section, because it's very well done and right on target! (I'm still one of the last holdouts in using an over-the-air TV and attic antenna anyway, although inevitably the digital camera is upstairs when a distant station rolls in on a vacant channel for 30 seconds, downstairs).

The TV section is very complete and explains E-skip, tropo, and other forms of propagation in a very clear and concise manner. It's actually a great reference for anyone who thinks he or she can readily explain these forms of signal propagation. BUT may resort to (shall we say) a lot of jargon and mumble-jumbo.

Discover DXing! How To Hear Distant AM, FM and TV Stations is only \$6.95 from Universal Radio in Ohio.



The section on "Tropo" puts it simply: "Tropo conditions are directly related to weather." Of course, author John Zondlo expands on that theme, but I use that just an example of the clarity and easy-read format of this book.

AM DXing

What I especially like about *Discover DXing!* is the listing of AM clear channel stations. In fact, get two of these books—one for your home DXing activities and the other for your glove compartment—for this reason alone.

How many times are you sitting (perhaps I'm speaking only of myself, but doubt it!) in the car while your significant other is shopping or "coming out in just a minute..." from work or whatever when you turn on the AM radio for the weather or news? Turn those few minutes—especially at sunset times—into a mini DXpedition. Is it possible that in the New York-area powerhouse WABC is off the air for a few minutes and you, lucky fellow, can catch KKOB in Albuquerque, New Mexico? You might not even know without the excellent station listing the book offers. All you need is a pen and notepad—or you can scribble off-air details on the inside back cover—if you happen to catch a rare DX moment like this one!

"The AM DXing: Best Bets For Hearing All States" chapter is fantastic, whether you're new at DXing or have been at it for a while. Remember that your memory is only as good as you think it is. That's why books like *Discover DXing!* are not just for newcomers, but also to give most of us old-timers an "Aha" moment when we look, for example, at page 62 and see that nostalgic QSL card from WRVA, Richmond, Virginia (seems like yesterday that I got mine). With Zondlo's book you, too, can relive such great memories, and many more!

And if you are an old-timer who knows everything about radio and TV DXing, take a moment and pull back from the lecturing of potential newcomers and buy them this inexpensive book from Universal instead. They'll be glad you did!

Discover DXing! How To Hear Distant AM, FM and TV Stations (Third Edition) is available for \$6.95 from Universal Radio, Inc., 6830 Americana Pkwy, Reynoldsburg, OH 43068-4113; Phone: 800-431-3939 (or 614-866-4267). Tell them *Popular Communications* sent you! ■

Costa Rica: Central American Democracy, Great Beaches, And Radio Heaven!



Table. Shortwave Radio In Costa Rica

Freq. (kHz)	Station
5030	University Network/Dr. Gene Scott, Cahuita
5054	TIFC-Faro del Caribe, San Jose (irregular/inactive)
5954	TIQ-Radio Casino, Limon (irregular/inactive)
6105	TIUCR – Universidad de Costa Rica, San Pedro de Montes de Oca
11870	University Network (Dr. Gene Scott), Cahuita

In addition Spain's government broadcaster Radio Exterior de Espana has a powerful relay station at Cariari active at various hours on one or more of these frequencies: 5965, 6040, 9675, 9765, 11815, 15125, 17850.

What does Costa Rica have that we don't have? No, it's not a trick question and there's no test at the end of this month's "World View" column. The short answer is: plenty. Simply put, it's Costa Rica! Here's a beautiful spot that's really not that far away for globe-trotting vacationers.

Even if you can't visit Costa Rica, you can *hear* it via the Web in many places. But since we're mostly interested in live shortwave *radio* action, check out the **Table above** for a list of commonly heard stations and their frequencies. If you don't see a station listed there that you know is active, by all means let us know and we'll tell folks about it right away. Brush up on your Spanish and have a listen!

But, believe it or not, radio is just a small part of what most people think of when they think "Costa Rica." If you're fortunate enough to make the trip to this country that's only a bit larger than West Virginia (or New Hampshire and Vermont combined—now *there's* a crazy thought!), there's the Monteverde Cloud Forest, a vast pristine wonderland, the rain forest, breathtaking views and adventures on Mt. Cerro Chirripo, the fifth largest peak in Central America, hiking, kayaking, and rafting, plus art galleries, museums, and dining in the capital city, San Jose. You'll also find romantic beaches on both the North Pacific and Atlantic Oceans and some of the most beautiful flora and fauna you'll ever see in the world (not that I've seen it firsthand, but the pictures and stories of those I know who have are nothing short of beautiful and inspiring).

Costa Rica has, wisely, devoted 25 percent of the country to national parks. Corcovado and Tortuguero National Parks, for

example, have hundreds of species of birds and wildlife. The latter is home to the annual nesting of the endangered green turtle.

Want something outside the norm? Try Manuel Antonio's wondrous jungle park. Want to "hang ten"? There's Witch's Rock Surf Camp in Playa Tamarindo. Are we there yet? That's a whole lot to do in such a small country, a place in Central America where the climate is ideal, a tropical and subtropical hideaway that, according to the country's official website, counts tourism as a "main source of income."

Did you know that the country is also comprised of islands, including the beautiful Cocos and Calero Islands? The National Park Service of Costa Rica takes great pride in preserving the tropical rainforest and living diversity of these islands. If you want to read a fascinating story about Cocos Island, check out www.isladelcoco.com/theisland.html for an article written by Fernando Cortes of the National Park Service.

Costa Rica, Light And Dark

Costa Rica is a parliamentary democracy and, as one historical website says, is "unlike anywhere in Latin or Central America." How true that is. Costa Rica declared independence from Spain in 1821 and today this democratic country enjoys a high standard of living. Interestingly the country hasn't had an Army since 1949, devoting those resources to culture, internal security, and educating its people. Public education is guaranteed by the constitution, and its literacy rate of 96 percent is the highest in Latin America.

Tuning In On U.S. Maritime HF Communications

In case the appearance of robins, flowers, and grass out there in your yard where the piles of snow used to be hasn't been enough of a clue, take note that you're now holding the May issue of *Pop'Comm*—another sure sign that spring is in full bloom here in the northern hemisphere.

The U.S. waterways will now be free of the ice that prevents safe navigation during the winter months, and the Great Lakes will begin to fill with recreational and commercial vessels. Their use of the HF spectrum will present utility monitors with that many more listening targets, supplementing the usual complement of military vessels, fishing boats, and other HF stations we listen to the year around. That makes this the perfect time to examine maritime HF communications.

Commercial Users

Among commercial users of the HF spectrum, the most powerful transmitters sending maritime traffic are undoubtedly the shore stations that provide various services to vessels at sea. The commercial company ShipCom LLC in Mobile, Alabama, is the only 24-hour provider of HF/VHF radiotelephone ship-to-shore voice service in the United States. Veteran utility listeners are undoubtedly familiar with the company's shore stations, especially WLO near Mobile, and perhaps KLB near Seattle, Washington as well. These stations are remotely controlled from Mobile, where operators are on duty 24-7, ready to deliver messages to and from vessels via e-mail, satellite, telex, fax, SSB, and VHF.

These stations can also do pretty much everything else you can think of, from furnishing weather reports to taking orders to have flowers delivered to that special someone ashore. The synthesized voice weather broadcasts and traffic lists that are familiar to many utility enthusiasts are transmitted on the hour, with the traffic lists following the weather broadcasts.

The weather broadcasts are for several different areas and each is sent several times a day. Unfortunately, they

change their weather schedules frequently, making it entirely possible for any list of times and frequencies I might include with this column to be outdated before it even appears in the magazine. Therefore, it's best to visit ShipCom's website for the current schedule and frequencies. The URL for this page is www.shipcom.com/frequencies.html. On that page you'll find the complete, current schedule for the weather broadcasts as well as voice guard channels and the channels used for calling, paging, and working, not to mention the frequencies for their AMTOR/SITOR/PACTOR services and simplex telex (used for e-mail).

U.S. Coast Guard Comms

Of course, ShipCom isn't the only source of weather information out there. The U.S. Coast Guard also transmits regularly scheduled broadcasts, and its schedules don't change nearly as often as ShipCom's, so I'm confident in providing the current times and frequencies for their WX broadcasts here. There are six USCG stations that transmit these broadcasts on HF. They are NMN (Virginia), NMG (Louisiana), NMC (California), NOJ (Alaska), NMO (Hawaii), and NRV (Guam). The broadcasts use upper sideband (USB) mode and feature the synthesized "Perfect Paul" electronic voice that's familiar to many listeners. The currently scheduled times and carrier frequencies for each of the six stations are as follows:

NMN broadcasts at 0330Z, 0515Z, and 0930Z on 4426.0, 6501.0, and 8764.0 kHz; at 1115Z, 1530Z, 2130Z, and 2315Z on 6501.0, 8764.0, and 13089.0 kHz; and at 1715Z on 8764.0, 13089.0, and 17314.0 kHz.

NMG broadcasts at 0330Z, 0515Z, 0930Z, 1115Z, 1530Z, 1715Z, 2130Z, and 2315Z on frequencies 4316.0, 8502.0, and 12788.0 kHz.

NMC broadcasts at 0430Z and 1030Z on 4426.0, 8764.0, and 13089.0 kHz, and at 1630Z and 2230Z on 8764.0, 13089.0, and 17314.0 kHz.

NOJ broadcasts at 0203Z and 1645Z on the frequency 6501.0 kHz.

NMO broadcasts at 0600Z and 1200Z on 6501.0 and 8764.0 kHz, and at 0005Z and 1800Z on 8764.0 and 13089.0 kHz.

NRV broadcasts at 0930Z and 1530Z on 6501.0 kHz, and at 0330Z and 2130Z on 13089.0 kHz.

If you're new to utility listening and would like to hear a sample of the "Perfect Paul" synthesized voice to help you identify these broadcasts, you can use a computer with a properly functioning sound card and speakers to listen to a 17-second wav audio file recording of this distinctive computer-synthesized voice. The file is small as sound files go—only around 140 kilobytes—so even if you're using a dialup connection to the Internet, it won't be too painful to listen to (visit www.navcen.uscg.gov/marcomms/cgcomms/vobr.a.wav for the sample).

More Sources Of Marine Weather Info

There are, of course, other sources of official marine weather information in the United States. For example, urgent navigational and weather information is broadcast over VHF channel 22A from over 200 sites covering the coastal areas of the United States, including the Great Lakes, major inland waterways, Puerto Rico, Alaska, Hawaii, and Guam. These broadcasts are announced on the distress/safety Channel 16 before they are made. Since, in U.S. waters, all ships over 20 meters in length are required to monitor VHF Channel 16, and must have radios capable of tuning to Channel 22A, this gives such critical information a pretty good chance of getting around to all the vessels larger than 20 meters long, provided that someone on board is paying attention to the radio like they're supposed to!

A similar procedure is used on mediumwave (MW) radiotelephone, where urgent marine information broadcasts are made over SSB frequency 2670.0 kHz after first being announced on the distress,

safety, and calling frequency 2182.0 kHz. Additionally, the Coast Guard broadcasts weather charts and ice charts via HF-FAX. The list of times, frequencies, and products available from the various stations that transmit HF-FAX is quite lengthy and does not lend itself well to publication in a magazine simply because of the wide number of products that are broadcast. That means I have to refer you to another Internet address to grab the information—and the USCG schedules have a separate text file for each station that broadcasts FAX transmissions. So as long as you have to get on the Internet and download something anyway, I may as well give you a really good reference, namely, the 392-kilo-byte PDF file available from the National Weather Service URL at www.nws.noaa.gov/om/marine/rfax.pdf.

That document, titled “Worldwide Marine Radiofacsimile Broadcast Schedules,” lists stations by WMO (World Meteorological Organization) region, in alphabetical order, by country and location. It lists times in UTC and frequencies by assigned frequency (because dedicated radiofax receivers used aboard ships use assigned frequencies). If you’re going to use your shortwave receiver in USB mode connected to your computer to receive and “decode” these FAX transmissions, remember to subtract 1.9 kHz to arrive at the carrier frequency you’ll need to tune your receiver to!

Last, but certainly not least, maritime safety broadcasts are also distributed as NAVTEX text broadcasts on the frequency 518 kHz. Recognized by the GMDSS, these NAVTEX broadcasts cover most coastal areas of the United States. Of course, I’ve just stepped firmly into the “Alphabet Soup trap”—at this point, you, as well as my editor, are ready to protest most vehemently my casual mention of the acronym GMDSS. “GMDSS? What’s GMDSS?,” you ask?

Global Maritime Distress Safety System

The Global Maritime Distress Safety System (GMDSS) is a system, agreed upon internationally, which specifies safety procedures, types of equipment, and communication protocols used to increase safety level and to make it easier to render needed assistance to ships, boats, and aircraft. Although GMDSS includes the word “system” in its name, it actually consists of several systems.

Some of these are relatively new, while others have been around for many years.

GMDSS provides several functions: alerting (including the ability to determine the position of a station in distress); SAR (search and rescue) coordination; the maritime safety information broadcasts that got us onto the subject of GMDSS to begin with; and bridge-to-bridge communications between individual vessels. Specific equipment requirements depend upon a vessel’s area of operation, rather than its tonnage, and the system provides redundant means of distress alerting and emergency power sources.

GMDSS has six components, which I’ll explain in due time, but allow me to list them all first: the EPIRB, NAVTEX, Inmarsat, HF Radios, SART, and DSC.

First, an EPIRB (Emergency Position-Indicating Radio Beacon) is a device designed to operate in conjunction with the COSPAS-SARSAT system.

There I go stepping into the “Alphabet Soup Trap” again. COSPAS-SARSAT is an international satellite-based search and rescue system, established by Canada, France, the United States, and Russia, which also jointly helped develop the EPIRB. To clear up the alphabet soup (and get me out of the trap), SARSAT is an acronym for Search And Rescue Satellite-Aided Tracking.

You *would* have to ask about COSPAS, wouldn’t you? COSPAS is an acronym for the Russian words *Cosmicheskaya Sistemya Poiska Avariynich Sudov*. For those relatively few readers who aren’t particularly fluent in Russian, that translates into a phrase that’s pretty much self-explanatory in English: “Space System for the Search of Vessels in Distress.”

The COSPAS-SARSAT system consists of four geosynchronous satellites and seven low-earth polar orbit satellites. The geosynchronous satellites provide continuous coverage of the entire Earth below 70 degrees latitude, although some locations have poor radio reception toward these satellites, and polar regions are not well covered. The low-earth satellites help fill in these gaps, providing periodic coverage of the entire Earth with an emphasis on polar regions.

The low-earth satellites operate in a store-and-forward mode, in that they store distress signals and forward them to the next ground station they over fly. These low-earth birds provide frequent coverage of the poles with approximately 100-minute orbits. Two of them are the COSPAS satellites provided by the for-

mer Soviet Union and currently operated by the Russian Federation. These orbit at a 1000-kilometer altitude. The other five are the SARSAT birds provided by the National Oceanic and Atmospheric Administration (NOAA) and orbit at a 850-kilometer altitude. The low-earth birds are monitored by 46 ground stations, while the geosynchronous satellites are monitored by 18 ground stations.

In an emergency (or when activated accidentally—be careful handling EPIRBs!), an EPIRB signals one of these satellites by transmitting a 5-watt signal for 0.5 seconds once every 50 seconds. Most EPIRBs sold since 1997 also include a GPS receiver so they can report precise GPS latitude-longitude information. The “406-MHz” channel is 170 kHz wide and centered at 406.05 MHz. The message is either a 112-bit “short” message or a 144-bit “long” message, both of which include 49 bits of identification plus position information. The satellite then relays the message to one of the ground stations, and the rescue coordination center with responsibility for the location from which the signal was received handles matters from there.

NAVTEX

The second component of GMDSS is NAVTEX, which, you’ll recall, is the bait, infamous for luring us into the “Alphabet Soup Trap” and getting us onto the GMDSS subject in the first place. NAVTEX is an international automated medium-frequency direct-printing service for delivery of navigational and meteorological warnings and forecasts, and urgent marine safety information to ships. NAVTEX stations in the United States are operated by the United States Coast Guard.

NAVTEX broadcasts are primarily made on 490 kHz and 518 kHz. The international NAVTEX frequency is 518 kHz USB. Regional transmission of NAVTEX uses 490 kHz specifically for broadcasts in local languages other than English. It is not used in the United States. NAVTEX-type Marine Safety Information (MSI) transmissions also take place on HF at 4209.5 kHz.

NAVTEX receivers that are approved for GMDSS contain an internal printer and cost between \$800 and \$1,500. Don’t let that price tag scare you away from monitoring 518 kHz with your receiver and an attached computer, though. The mode uses narrow-band direct printing (NBDP), seven-unit forward error correction (FEC



Photo A. This is a typical SART, or Search and Rescue Radar Transponder. See article text for a description of its function.

or Mode B) transmission and the CCIR-476 character set, with 100-baud FSK modulation and a frequency shift of 170 Hz. If that sounds familiar to you, it may be because the same type of transmission is also used in ham radio, under the more widely recognized name AMTOR. Therefore, any general coverage receiver capable of SSB reception at 518 kHz (or 490 kHz or 4209.5 kHz) can be used with your favorite software capable of decoding AMTOR.

Inmarsat

The third component of GMDSS is Inmarsat, International Mobile Satellite, which provides telephony and data services worldwide using special digital terminals. Some types of Inmarsat ship earth station terminals are recognized by the GMDSS: the Inmarsat B, C, and F77.

The Inmarsat B and F77 terminals pro-

vide ship-to-shore, ship-to-ship, and shore-to-ship telephone, telex, and high-speed data services, including a distress priority telephone/telex service to and from rescue coordination centers.

The Inmarsat C provides ship/shore, shore/ship, and ship/ship store-and-forward data and email messaging, the capability for sending preformatted distress messages to a rescue coordination center, and the Inmarsat C SafetyNET service. The Inmarsat C SafetyNET service is a satellite-based worldwide maritime safety information broadcast service of high seas weather warnings, NAVAREA navigational warnings, radionavigation warnings, ice reports and warnings generated by the USCG-conducted International Ice Patrol, and other similar information not provided by NAVTEX. SafetyNET works similarly to NAVTEX in areas outside NAVTEX coverage.

The F77 is meant to be used with the Inmarsat C, since its data capability does not meet GMDSS requirements. Inmarsat C equipment is now required to have an integral satellite navigation receiver, or to be externally connected to a satellite navigation receiver, to ensure that accurate location information can be sent to a rescue coordination center when a distress alert is transmitted. The F77 provides these capabilities, thus allowing the use of Inmarsat C terminals for GMDSS purposes.

Under a cooperative agreement with NOAA, combined meteorological observations and AMVER reports can now be sent to both the USCG AMVER Center and NOAA using an Inmarsat C ship earth station, at no charge.

Digital Selective Calling

Perhaps of more interest to utility listeners, the GMDSS includes HF radiotelephone and radiotelex equipment, with calls initiated by digital selective calling (DSC). Worldwide broadcasts of maritime safety information are also made on HF narrow-band direct printing channels. DSC is mainly intended to initiate calls. DSC calls can be made to individual stations, groups of stations, or all stations in receiving range. Each DSC-equipped ship, shore station and group is assigned a unique nine-digit Maritime Mobile Service Identity. DSC distress alerts consist of a preformatted distress message and are used to initiate emergency communications with ships and rescue coordination centers.

The FCC requires that all new VHF and MF/HF maritime radiotelephones type accepted after June 1999 have at least a basic DSC capability. VHF digital selective calling has other capabilities beyond those required for the GMDSS. For example, the USCG uses it to track vessels in some areas. It should be noted, however, that a DSC-equipped radio cannot be interrogated and tracked unless that option was included by the manufacturer and the user has configured it to allow tracking.

The HF frequencies 2187.5, 4207.5, 6312.0, 8414.5, 12577.0, and 16804.5 kHz have been reserved by the ITU as DSC distress and safety channels, along with VHF marine Channel 70. Voice transmissions are prohibited on these frequencies. The MF/HF channels are restricted to distress, urgency, and safety traffic because of the relatively low speed of transmission (100 baud). VHF DSC operates at 12 times the speed of MF/HF; accordingly, all priorities of call are allowed on the VHF channels. The ITU has also allocated a suite of HF channels dedicated to DSC commercial operations.

Search And Rescue Radar Transponder

Finally, there are the SART (Search and Rescue Radar Transponder) devices incorporated into GMDSS. SARTs are typically cylindrical, about the size of a person's forearm, and brightly colored (see Photo A). The SART may be triggered by any X-band radar within a range of approximately eight nautical miles (15 kilometers). Each radar pulse received causes it to transmit a response that's swept repetitively across the complete radar frequency band, creating a series of dots on a rescuing ship's radar display to assist in locating a survival craft or distressed vessel.

Other Maritime Listening

Beyond the extensive voice and data opportunities mentioned above, there are always the ITU (International Telecommunication Union) marine radiotelephone channels. The list of these is extensive, including both simplex and duplex channels in the bands near 4, 6, 8, 12, 16, 19, 22, and 26 MHz, and include some frequencies that are available on a shared basis with the fixed service or set aside as reserved for dis-

A Bit About IRCs

When I first began writing this column, I mentioned IRCs and tossed around a little IRC jargon. Not surprisingly, some confusion resulted since IRC conventions can be confusing.

The exclamation point you see in this column's example is used to indicate a "trigger" for a command issued to an IRC "bot." It's basically a signal to the bot that it is expected to respond to the command that follows, assuming that it is a valid command for that particular bot. So, the three commands for the NASA info referred to were:

```
!nasa  
!nasa 5  
!nasa all
```

You can also type "!nasa help" to see the brief help file associated with this command.

For those unfamiliar with IRCs, the acronym stands for Internet Relay Chat, a method of accomplishing multi-user real-time keyboard-to-keyboard chat over the Internet. This is done using *channels* (although the uninitiated sometimes call them chat rooms), the name of which generally begins with the pound-sign character (#) to indicate that it is the name of an IRC channel.

Everyone in a channel on any given network can chat with everyone else in the same channel on the same network at the same time. The #monitor and #popcomm channels are linked across more than one IRC network, so you can connect to either the zIRC network (irc.zirc.org) or the IRC-GLOBAL network (irc.IRC-GLOBAL.org) and join one or both channels to use either of the infobots for checking the launch schedule (the infobot on zIRC uses the nickname InfoMON, while the infobot on IRC-GLOBAL uses the nickname RoboEgg).

A "bot" is simply a computer program that connects to an IRC network, much like a regular user does, and then proceeds to provide some sort of service or function in the channel or channels in which it resides. The two infobots mentioned above are called that because what they provide is information. Both InfoMON and RoboEgg can not only retrieve launch schedules from NASA, they are also able to define interservice brevity codes (such as NATO fighter pilot jargon like "bingo" or "Winchester"), translate letters, numbers, and punctuation characters into Morse code (or Morse elements into their "decoded" equivalents), tell you the Internet Swatch time, tell you what country an ISO abbreviation belongs to, and sundry other stuff. I also run two other "bots" (HildaMetro on IRC-GLOBAL, Weather on ZIRC) which are weather bots capable of retrieving weather conditions and forecast information for practically any location on the planet.

tress/safety communications only. Because of this, publishing the entire list would require several pages in the magazine, and probably no amount of leverage would succeed in peeling our editor off the ceiling. Therefore, the best course of action is to point a web browser at www.navcen.uscg.gov/marcomms/high_frequency/rtchan.txt. There you will find a complete list of HF SSB maritime radiotelephone channels, which are used for communications to and from vessels and shore stations.

The traffic found on these channels can range from "strictly business" to highly informal (and sometimes profane) chitchatting between vessels. If you watch the readers' logs that accompany this column every month, you'll see that you never know what you might hear when you troll the maritime HF frequen-

cies. That's undoubtedly the very reason why some of the listeners enjoy tuning around in these bands!

Military and government vessels and fixed shore stations can also be found inhabiting the maritime HF frequencies. As far as the United States is concerned, this would primarily be in the form of the command, control, and communications of U.S. Navy and USCG ships and vessels, distress and safety communications, treaty enforcement, law enforcement, geological survey operations, and national marine fishery operations. In fact, according to the NTIA (National Telecommunications & Information Administration), the largest holder of HF frequency assignments in the federal government is the Department of the Navy with over 16,000 assignments, followed by the USCG with approximately 8,700

assignments. Not surprisingly, then, Navy and Coast Guard assets are frequently logged by monitors who troll the maritime HF frequencies. Ships of the U.S. Merchant Marine and the U.S. Army Transport Service can also be heard on HF.

NOAA And A Great Website!

Other agencies, including NOAA, the U.S. Department of Transportation (mainly through its subagency the U.S. Maritime Administration), and even NASA, also own and/or operate ships that can turn up on an HF frequency at any time, as well as on government-allocated frequencies.

In particular, NOAA operates a variety of hydrographic survey, oceanographic research, and fisheries research vessels. The vessels are operated by NOAA's Office of Marine and Aviation Operations. NOAA ships located in the Pacific are managed by the Marine Operations Center, Pacific (MOP), in Seattle, while ships located in the Atlantic are managed by the Marine Operations Center, Atlantic (MOA), in Norfolk, Virginia.

The ships are run by a combination of NOAA Commissioned Officers and wage marine civilians. The latter group includes the technicians who operate and maintain the ships' communications and navigation equipment. Should you happen to log one of NOAA's vessels and want to see where it's located, boot up your computer, fire up your Web browser, and visit <http://shiptracker.noaa.gov/>.

I recently visited there and selected the option "show all ships" and, soon enough considering I'm a notorious cheapskate and was using a dial-up connection to the Internet, I was rewarded with a map showing the current location of eighteen NOAA vessels. You can select any one of them from a list and see details concerning the ship's current cruise, as well as its course and speed, when its current mission began, and some details about weather conditions at the ship's current location. This information, particularly the location information, might come in handy later if you try to "QSL" the ship.

"What Does God Need With A Starship?"

In the movie *Star Trek V—The Final Frontier* this question is asked of an alien entity—something masquerading as



Photo B. The NASA recovery vessel M/V Liberty Star brings an expended Solid Rocket Booster to dockside following a Space Shuttle launch. (Photo courtesy NASA)

God—who has just asked for the use of a Federation starship. I've taken this opportunity to slip another *Star Trek* quote into one of my columns because I can hear people out there asking a similar question about NASA; namely, "What does NASA need with ships?" After all, NASA's job is to explore space, and you can't explore the solar system with a watercraft.

Well, NASA nevertheless owns two of the more sought-after listening targets on the HF bands, the *M/V Liberty Star* and the *M/V Freedom Star*. These are NASA's two recovery ships whose primary function is retrieving spent SRBs (Solid Rocket Boosters) following the launch of Space Shuttle missions. Operated by NASA Space Flight Operations contractor United Space Alliance, they've also been put to other uses; for example, towing the Space Shuttle's external fuel tanks from their assembly plant in New Orleans to the Kennedy Space Center in Florida. They've also been used to support research for NOAA as well as several universities.

Photo B shows the *Liberty Star* with a recovered SRB. It's just one of many ships you might hear if you listen to your HF receiver long enough *and* happen to be in the right place at the right time!

Making Life Easier For YOU!

While we're on the subject of space exploration, regular readers of this col-

umn may recall that not long ago I advised visiting NASA's webpages to look at the launch schedules periodically so you'll know when it will be most productive to listen for the launch-related HF communications these events produce. As this column is being written, I've just made it even easier to check on the current launch schedule by adding a script to two of my IRC "bots" (see sidebar), which adds three public commands to retrieve launch schedule information right over IRC instead of having to hunt it down on NASA's webpage. If you're in the #monitor or #popcomm IRC channels on either zIRC or IRC-GLOBAL, you can now type one of three commands to retrieve information from the NASA schedule.

The command "!nasa" will pull up the information on the next scheduled launch and send it to you as notice text. The information sent includes the scheduled date and time of the launch, some basic mission information, and a link to the NASA webpage that deals with that mission. The "!nasa 5" command does the same thing, except that it displays information on the next five scheduled launches, while "!nasa all" displays information on all the scheduled launches shown on NASA's launch schedule page. The output from the !nasa all command is sent as a private message rather than as notice text, because the volume of output can be relatively high if there are a lot of launches on the schedule.

The commands should be typed exactly as shown above: the exclamation point followed by either nasa, nasa 5, or nasa all (but without the quotation marks) and with no space in between the exclamation point and the letters in "nasa" (though you would use a space between "nasa" and "5" or "all" if using one of the latter two examples).

Getting back to the NASA launch schedules—once the infobot has shown you the launch dates, you can check back from time to time to see if there have been any changes to the schedule, and as a reminder for when you should start listening for related communications for a lunch within the next 24 hours.

So for those of you who don't like to navigate the NASA webpages, there's now an easier way for you to get launch schedule information on demand...and for the regulars in #monitor on the five linked networks, there's no longer any excuse for missing a launch because you didn't know about it!

Incidentally, I'd like to acknowledge with my thanks and a tip of the "Utility Communications Digest" the individual who created the script—identified in the script only as C. Lawrence with an e-mail address on yahoo.com. With so many trivial scripts in existence for IRC bots, it's truly a pleasure to have discovered a genuinely useful one in Lawrence's "NASA Launch Schedule" script.

Launches

One upcoming launch that I mentioned in a past column is no longer upcoming—not because it was cancelled, but because it took place and was successful. An unarmed Minuteman III ICBM was launched from Vandenberg AFB in California on February 7. According to the USAF news release about the launch, the missile carried a single unarmed re-entry vehicle, which traveled approximately 4,200 miles before hitting its predetermined target, which was, as I speculated in my column, at the Reagan Test Site located in the Marshall Islands.

For this month, there are currently no launches scheduled, but we can expect two in June. There's a scheduled Space Shuttle launch (STS-118) for June 28 to deliver the S-5 truss to the International Space Station. It will be the 22nd mission to the ISS and is scheduled for launch from Pad 39-A at the Kennedy Space Center.

In addition, the launch for the Dawn mission to study Ceres and Vesta, two minor planetoid bodies that reside in the asteroid belt between Jupiter and Mars, is slated for June 20. Dawn will blast off from launch pad 17-B at Cape Canaveral aboard a Delta II rocket, and will mark the first time a spacecraft will orbit two planetary bodies on a single voyage. Tune to 10780.0 beginning about 24 hours before the scheduled launch, listen for CAPE RADIO to announce net frequencies, and enjoy the listening!

On With The Logs...

Reader submissions for this column are welcomed and encouraged. Contact me at the e-mail address that appears at the beginning of this column, or send "snail mail" to John Kasupski, KC2HMZ, P.O. Box 681, Tonawanda, NY 14151-0681. See the text for formatting tips.

2872.0: Gander ATC wkg unheard A/C, in USB at 0609Z. (GV/CO)

2887.0: NY ATC wkg AMERICAN-62 and AMERICAN-68 with confusion as both were reading back status report at same time, in USB at 0108Z. (GV/CO)

2899.0: Shanwick Radio working Republic 282, good levels into eastern US, in SELCAL and USB at 0443Z: Gander Radio, Newfoundland, working various aircraft in SELCAL and USB at 0512Z. (JK/NY)

2971.0: Gander and Shanwick MWARA both working various flights, aircraft inaudible, in USB at 0521Z. (JK/NY)

3065.0: Link-11 data transmission at 1403Z. (MC/SC)

3370.5: USAF MARS Net w/AFF4TG, AFA4KJ, AFA4FD checking on digital capabilities, in USB then brief MFSK, heard at 0255Z. (SJ/KY)

3413.0: Shannon, Ireland VOLMET, weak but readable, in USB at 0720Z, and replaced by NY VOLMET in USB at 0730Z. (GV/CO)

3446.0: Unid. weak stations w/handsent CW, one repeating "GXW." in CW heard at 0840Z. (SJ/KY)

3485.0: New York Radio VOLMET w/good levels in USB at 0645Z. (GV/CO)

4146.0: Two unid. vessels in casual simplex QSO in Tagalog sprinkled w/fluently English, "working on it," and "don't want to have anything to do with him," "Paramaribo" (Suriname), plus occasional numbers, in USB at 0630Z. (SJ/KY)

4316.0: NMN (USCG Portsmouth, VA) with "Perfect Paul" synth OM maritime wx bc good levels in USB at 0431Z. (JK/NY)

4372.0: OTC and another USN vessel in Link-11 coordination net, in USB heard at 1454Z. (MC/SC)

4426.0: USCG NMN, non-synth OM with

storm warnings for LANT in USB monitored at 0533Z. (JK/NY)

4446.5: R01671 (CH-47D # 86-1671) clg T2Z3 (2-3rd AVN) in ALE USB monitored at 1339Z. (MC/SC)

4703.0: Link-11 data transmission at 1403Z. (MC/SC)

4721.0: ADW (Andrews HF-GCS) clg R26594 (UH-60L # 94-26594) in ALE USB at 2331Z. (MC/SC)

4722.0: Link-11 data transmission at 0022Z. (MC/SC)

5547.0: San Francisco Radio wkg AMERICAN06, difficulty getting SELCAL to work, in USB at 0440Z. (GV/CO)

5598.0: NY Radio wkg various A/C, secondary freq 3016.0, in USB at 0215Z. (GV/CO)

5610.0: Unid using speech inversion, can make out SS accent, in USB monitored at 0210Z. (GV/CO)

5616.0: Gander Radio working unheard A/C, weak and barely hearable, with SELCAL and USB at 0231Z. (GV/CO)

5696.0: CG1501 (HC-130H) passing status report of ops normal to CAMSLANT, in USB at 0057Z. Later reports being on final approach to CGAS Elizabeth City and secures guard, in USB at 0153Z: USCG 2104 (HU-25) working CAMSLANT after QSY from 8983.0, stated ETA to HOMEPLATE as 45 MIKES, in USB at 0113Z. (JK/NY)

5699.0: Unid USCG wkg CG-2135 (HU-25) in USB and ANDVT at 0104Z. (GV/CO)

5708.0: R26594 (UH-60L # 94-26594) clg ADW (Andrews HF-GCS) in ALE USB at 1905Z. (MC/SC)

5732.0: SERVICE CENTER radio check with OMAHA 69A at 2331Z. (MC/SC)

5778.5: R26329 (UH-60L # 91-26329) clg B1Z171 (1-171st AVN) in ALE USB at 1542Z. (MC/SC)

5851.5: G23552 (UH-60A # 81-23552) clg STPOPS (AASF, St. Paul) in ALE USB at 0027Z. (MC/SC)

6223.0: Two unid. stations in simplex QSO, seems to be Tagalog interspersed w/"cambio," sounded almost like a calm political discussion, one mention of "abortion," then off w/out ID, in USB at 0445Z. (SJ/KY)

6265.5: DSE05, HANJIN CALCUTTA, 27,365-ton South Korea-registered bulk carrier w/MMSI and abbreviated ID as "HJCC" followed by AMVER/PR, 120 mi SE of Houston, TX to arrive there in six hours, in SITOR-A at 1825Z: V7ET3, CROWLEY UNIVERSE, 9,082-ton Marshall Islands-registered Ro-Ro cargo ship w/AMVER/PR, 30 mi WNW of Havana, Cuba en route to Puerto Limon, Costa Rica, to arrive in 2 days, in SITOR-A at 0505Z. (SJ/KY)

6474.0: KSM, Maritime Radio Historical Society, Bolinas, CA w/test BC for new 4-MHz transmitter, fast machine-sent CW including e-mail address for reception reports, parallel weaker 4350.5, 12993.0 and 16914.0 kHz, in USB at 0010-0100Z. (SJ/KY)

6491.5: LOR, Argentine Navy, Puerto

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Belgrano, Argentina w/maritime wx in Spanish, ITA2 at 75 baud, 170-Hz shift at 0025Z. (SJ/KY)

6507.0: VMC, Charleville Meteo, Queensland, Australia w/maritime wx forecast, full ID at 1044Z s/off, in USB monitored at 1040Z. (SJ/KY)

6535.0: Dakar R. ATC, Senegal working BOLIVIANO 1001 and several other aircraft in English w/occasional French, USB at 0322Z. (SJ/KY)

6628.0: Santa Maria, Azores ATC working AVIANCA 012, KLM 742, USB at 0939Z. (SJ/KY)

6649.0: Quito R. ATC, Ecuador w/kg several aircraft w/position updates and SELCAL checks, USB at 0520Z. (SJ/KY)

6649.0: Santiago OAC w/kg various AC, QRM from EE/SS chatting boaters on same

freq, in USB at 0246Z. (GV/CO)

6666.5: Several Gulf of Mexico shrimp fishermen in casual English simplex QSO, complaining of buyers' practices, prices paid for shrimp, etc., incl some pretty salty language, USB at 1150Z. (SJ/KY)

6673.0: San Francisco OAC w/CANADA-044, in turbulence wanting new altitude, in USB at 0419Z. (GV/CO)

6761.0: RHINO 50 clg LIFTR 53 in USB at 2309Z. (MC/SC)

6768.0: V2a numbers station, good levels but bad audio, in AM at 0405Z. (GV/CO)

6786.0: Cuban ENIGMA M8a w/machine-sent CW cut 5N groups, very strong signal, at 0930Z. (SJ/KY)

6790.0: Link-11 data transmission at 2320Z. (MC/SC)

6798.77: Unid station, AM carrier with

modulated CW, sending VVVVV, 1-minute pause and short message. in AM/MCW at 0851Z. (GV/CO)

6881.0: USN MARS Net, NN0MUC calling NN0OEE, in SITOR-A at 0010Z. (SJ/KY)

6985.0: R26860 (UH-60L # 00-26860) clg T12 (12th Aviation Bn) in ALE USB heard at 1228Z. (MC/SC)

7361.5: R26954 (UH-60L # 02-26954) clg R26857 (UH-60L # 00-26857) in ALE USB at 2123Z. (MC/SC)

7527.0: JULIET 36 (MH-60J, CGAS Elizabeth City) p/p via SERVICE CENTER to E-CITY AIR regarding search for vessel NEW HOPE, in USB at 1423Z. (MC/SC)

7554.0: Cuban ENIGMA M8a w/machine sent CW cut 5N groups at 2020Z. (SJ/KY)

7747.0: Unid shrimp boaters in chitchat from the Louisiana Bayou- w/vulgarity, good

Glossary Of Utility Terms And Acronyms

AFB—Air Force Base

ALE—Automatic Link Establishment, a link control system that includes automatic scanning, selective calling, sounding, and channel selection, without human intervention using processor control.

AM—Amplitude Modulation

ANDVT—Advanced Narrowband Digital Voice Terminal, a secure voice mode used by the military.

ATC—Air Traffic Control

CAMSLANT—Communications Area Master Station Atlantic, the U.S. Coast Guard's primary HF radio station for the Atlantic region, located at Portsmouth, Virginia.

CAMSPAC—Communications Area Master Station Pacific, the U.S. Coast Guard's primary HF radio station for the Pacific region, located at Pt. Reyes, California.

COMMSTA—Communications Station, for example: COMMSTA Kodiak, a communications station of the U.S. Coast Guard, located at Kodiak, Alaska.

CGAS—Coast Guard Air Station

Cut Numbers—The use of letters in place of numbers when sending a long string of numbers, for brevity's sake. This is often done by "numbers" stations, such as sending one long dash instead of five normal dashes to indicate a zero, or the letter N instead of the number nine, etc.

CW—Continuous Wave (Morse code)

DE—The Morse code operating prosign DE, meaning "from," as in DE NMN, meaning from station NMN

D-Layer Absorption—A phenomenon where the sun's rays ionize the D layer of the atmosphere causing it to absorb, rather than propagate (reflect/bounce), radio signals at certain frequencies.

Duplex—A means of radio communication where a station can both transmit and receive at the same time.

EAM—Emergency Action Message, coded instructions commonly sent by U.S. military stations. Despite the name, they usually aren't emergency traffic at all.

EHF—Extremely High Frequency (30-300 GHz)

FAX—Facsimile, a transmission mode used to send maps, charts, and other non-textual material.

FEMA—Federal Emergency Management Agency, a part of the Department of Homeland Security.

FM—Frequency Modulation

Ham Station—A licensed station operating in the Amateur Radio Service under the control of an operator who is licensed to operate the station.

HF—High Frequency (3–30 MHz)

LINK-11—Also called TADIL-A for TACTical Digital Link, a secure digital data mode used by the military. Utilizes a 16-tone data modem to allow assets to share digital information, such as radar data.

M/V—Merchant Vessel

NAS—Naval Air Station

Propagation—The means by which radio signals get from one place to another; some forms are quite simple (such as line of sight) while others are much more complex (such as EME, or earth-moon-earth).

QRM—Man-made interference to radio signals

QRN—Natural interference to radio signals, such as the static crashes often heard due to thunderstorms

QSO—A contact between two or more stations

QSY—Change frequency.

QTH—Location

RTTY—Radio TeleTYPE

SELCAL—SElective CALLing, a method for activating a radio or data terminal at one station without disturbing other stations that are monitoring the same frequency.

Simplex—A means of radio communication where a station may transmit or receive at any given time, but not do both at the same time.

SITOR—SImplex Teletype Over Radio, a transmission mode used to transmit text messages over radio. There are two SITOR modes: SITOR-A (also called AMTOR) uses Automatic Repeat Request (ARQ); SITOR-B uses Forward Error Correction (FEC).

SWL—Shortwave Listener, a person who enjoys listening to shortwave radio stations.

UHF—Ultra-High Frequency (300–3000 MHz)

USAF—United States Air Force

USB—Upper Sideband

USCG—United State Coast Guard

USMC—United States Marine Corps

USN—United States Navy

UTC—Coordinated Universal Time, formerly known as Greenwich Mean Time, and also commonly referred to as ZULU time and abbreviated as in 1200Z.

UTE—Utility Station

Utility Station—Stations transmitting material that is not intended for reception by the general public and is not originating from an amateur (ham) station.

VHF—Very High Frequency (30–300 MHz)

VOLMET—Station that transmits aeronautical weather information. Comes from a French term that literally means, "flying weather."

levels, in USB at 0400Z. (GV/CO)

7811.0: US Armed Forces Radio, with commercials, ID, news, sports in USB at 0303Z. (JK/NY)

7887.0: M8a numbers station, in CW at 0632Z. (GV/CO)

7933.0: Unid. possible military net, several stations w/clear and scrambled tfc in Spanish. w/transmitter keying tones, in USB at 2230Z. (SJ/KY)

8097.0: Cuban ENIGMA M8a w/machine sent MCW cut 5N groups, very strong signal, at 1910Z. (SJ/KY)

8104.0: "Bellamy," station in the Caribbean Safety and Security Net w/live wx forecasts for the region, also responding to questions from individual vessels *SAILOR'S DREAM*, *ALESISO*, *ARGO*, *ARTEMIS*, *LEEWARD*. USB at 1240Z. (SJ/KY)

8171.5: R23943 (UH-60 # 84-23943) clg R00250 (CH-47D # 91-0250) in ALE USB at 2302Z. (MC/SC)

8184.5: G24387 (UH-60A # 85-24387) clg STPOPS in ALE USB at 2237Z. (MC/SC)

8379.0: HBDU. *MAERSK JENAZ*. brand new 39,228-ton Switzerland-registered container ship w/partial AMVER and INMARSAT ID, in SITOR-A monitored at 0308Z. (SJ/KY)

8385.5: Unid. vessel w/SELCAL QVXX (2010) for XSG, Shanghai R., China, no contact, in SITOR-A at 1735Z. (SJ/KY)

8388.0: 9VKJ. *TORM ANNE*. 45,507-ton Singapore-registered oil products tanker w/AMVER/PR, 400 mi ESE of NYC sailing SW, in SITOR-A at 1805Z; A8HJ8, *SAFMARINE ILLOVO*. 30,850-ton Liberia-registered container ship w/brief test, in SITOR-A at 2115Z. (SJ/KY)

8389.5: A8AZ2, *YM AMERICA* (former *MING AMERICA*, 46,785-ton Liberia-registered container ship w/brief message incl MMSI and abbreviated ID "MAME" to NMO, USCG, Honolulu, HI, in SITOR-A at 0110Z; 3FHB8, *AQUARIUS ACE*. 14,353-ton Panama-registered vehicles carrier w/AMVER/SP for departure from San Diego, CA en route to Japan, to arrive in 13 days, in SITOR-A at 0400Z. (SJ/KY)

8391.0: Two weak unid. stations in QSO, possibly in French, poor handsent CW at 2135Z. (SJ/KY)

8582.0: PWZ, Brazilian Navy, Rio de Janeiro. Brazil w/navigational warnings in Portuguese. ITA2 at 75 baud, 850 Hz, at 2235Z. (SJ/KY)

8690.0: Unid SS comms using phonetic alphas, in USB at 0108Z. (GV/CO)

8776.0: FOGHORN with EAM broadcast in USB at 2212Z. (MC/SC)

8868.8: Two males in simplex QSO in Mandarin Chinese, mentioned the United States, Spain, "several ran off, some here, some there"—probably ship captains out of band discussing their crews, in USB at 0135Z. (SJ/KY)

8912.0: Parkhill encryption followed by ground party w/kg OMAHA 14J (Cessna 550) in USB, at 2349Z. (MC/SC)

8971.0: PELICAN 71B (P-3C) clg FIDLE in USB at 2322Z. (MC/SC)

8977.0: HABITAT (U.S. Mil) working Unid station in USB and ANDVT, at 0344Z. (GV/CO)

8983.0: USCG jet 2102, a Dassault HU-25D Guardian, in QSO w/NMN, USCG CAMSLANT Chesapeake, VA re "Negative on ELT" (Emergency Locator Transmitter

used by aircraft) and "Search complete at this time, RTB." position 28.56N 080.21W, just E of Kennedy Space Center, FL, USB at 2210Z. (SJ/KY)

8983.0: CG 1707 (HC-130, CGAS Clearwater) departing Puerto Rico en route Miami requests guard from CAMSLANT, in USB at 1604Z. (MC/SC)

8983.0: USCG 2105 (HU-25) establishing

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radio guard with CAMSLANT, in USB at 2132Z; USCG 2120 (HU-25) establishing guard with CAMSLANT, in USB at 2213Z; USCG 2102 (HU-25) establishing guard with CAMSLANT for local trainer, in USB at 1807Z. (JK/NY)

8992.0: LL 98 (P-3C, VP-30) p/p via Andrews HF-GCS to VP-30 DUTY OFFICE to pass ETA to JAX, in USB monitored at 1610Z. (MC/SC)

9005.0: Link-11 data transmission at 1524ZZ. (MC/SC)

9010.0: Link-11 data transmission at 1503Z. (MC/SC)

9020.0: Link-11 data transmission at 1402Z. (MC/SC)

9023.0: WIZARD ALPHA (E-3 AWACS) with radio check in USB at 1239Z. (MC/SC)

9025.0: CHARIOT 01 (E-3 AWACS) ALE initiated call via Offutt HF-GCS to VIKING 3 OPS at Tinker AFB reporting WX radar fault and arranging for ivert to Curacao, in ALE and USB at 2016Z. (MC/SC)

9120.0: NIGHTHAWK 6 clear and ANDVT radio checks with NIGHTHAWK 7, in USB and ANDVT at 1408Z. (MC/SC)

9295.0: R23943 (UH-60A #84-23943) clg EAATS (Eastern Army Aviation Training Site, Muir AAF) in ALE USB heard at 1946Z. (MC/SC)

9234.5: Unid fishermen talking in EE

about hotel hookers, in USB monitored at 0128Z. (GV/CO)

9331.0: V2a numbers station weak w/deep fades, in AM at 0613Z. (GV/CO)

10188.0: Link-11 data transmission at 1658Z. (MC/SC)

10242.0: JULIET 03 (MH-60J, CGAS Elizabeth City) en route to Wilmington requests guard from CAMSLANT heard at 1405. (MC/SC)

10320.0: AFRTS feed from Pearl Harbor HI, w/deep fades, in USB at 0043Z. (GV/CO)

10385.0: Probable US MARS net, null PACTOR packets plus CW ID as XNET, 2150Z. (SJ/KY)

10429.0: Unid encrypted 75/850 RTTY, good levels here, at 0038Z. (GV/CO)

10895.0: Link-11 data transmission at 1616Z. (MC/SC)

10993.6: ANDVT followed by SECTOR KEY WEST w/kg unheard station in USB at 1654. (MC/SC)

11120.0: ARMAMENT passing data to ANDREWS HF-GCS, data burst lasted less than a minute so whatever it was, it was short, encrypted 75/850 data at 2327Z. (GV/CO)

11175.0: RU050 (C-130T, VR-55) p/p via Lajes HF-GCS to Norfolk ATOC, in USB at 1839Z. (MC/SC)

11175.0: MCCLELLAN HF-GCS running phone patch for EXPO 87 to EXPO OPS, conversation about landing times, in USB at 2024Z; ARMAMENT working PUERTO RICO HF-GCS, requesting data transfer, in USB at 2306Z; RAIDER 13 working MCCLELLAN HF-GCS for phone patch, in USB at 2349Z. (GV/CO)

11232.0: PEACH 33 (E-8 JSTARS) p/p via TRENTON MILITARY to PEACHTREE at Robins AFB, in USB at 1511Z. (MC/SC)

11494.0: SERVICE CENTER w/kg OMAHA 1MR (Bombardier Q400) followed by Parkhill encryption at 1701Z. (MC/SC)

12365.0: Unid maritime chat in GG w/both stations heard clearly even though not much signal strength, in USB at 0037Z. (GV/CO)

12479.0: 3FWT9, *MV SOUTHAMPTON STAR*, 9,709-ton Panama-registered refrigerated cargo ship w/AMVER/PR, 400 mi ENE of Jacksonville, FL sailing for next day arrival at Delaware Pilot St. in SITOR-A at 1652Z; 3FUV3, *NEREO*, 99,355-ton Panamanian-registered VENFLEET crude oil carrier w/AMVER/PR, 500 mi E of Miami, FL en route to Jose Terminal Pilot Station, Venezuela, to arrive in 3 days, in SITOR-A at 1705Z; VRXL6, *FEDERAL PROGRESS*, 36,445-ton Hong Kong-registered bulk carrier w/AMVER/PR, 620 mi E of NYC en route to Paranam, Suriname, to arrive in 6 days, in SITOR-A at 1706Z; C6QP3, *KYEEMA SPIRIT*, 113,357-ton Bahamas-registered crude oil tanker w/AMVER/PR, 520 mi E of Jacksonville, FL sailing SSE, in SITOR-A at 1905Z. (SJ/KY)

12482.0: V7ET7, *MAR CARIBE*, 9,410-ton Marshall Islands-registered Ro-Ro cargo ship w/AMVER/PR, 4 mi N of coast of Cuba en route to Port Everglades, FL, to arrive next

day. SITOR-A at 2205Z. (SJ/KY)

12486.5: WDC6644, *ALASKAN NAVIGATOR*, 193,048-ton US-registered crude oil tanker w/AMVER/PR, 125 miles WNW of San Francisco sailing NNW toward Port Angeles, WA, to arrive in three days, in SITOR-A at 2020Z; S6PW, *IZUMO*, 24,362-ton Singapore-registered container ship w/AMVER/PR, 250 mi WSW of San Diego sailing west, in SITOR-A at 2030Z; HBDF, *NORASIA SILS*, 39,425-ton Switzerland-registered container ship w/AMVER/PR, 800 mi W of Managua, Nicaragua, sailing WNW to destination Shanghai, China, arrival in 18 days, in SITOR-A at 2130Z. (SJ/KY)

12993.0: KSM sending freq list with good levels here, in CW at 0035Z. (GV/CO)

13206.0: Link-11 data transmission at 1738Z. (MC/SC)

13257.0: CANFORCE 2409 p/p via TRENTON MILITARY to 424 Squadron TIGER OPS, in USB at 1758Z. (MC/SC)

13993.0: USAF MARS Net, AFA4BP and AFA2FA passing email address, USB at 2045Z. (SJ/KY)

13993.0: USAF MARS stn AFA5EP conducting net without much luck due to condx, in USB at 2044Z. (GV/CO)

14362.0: NASCAR 85 w/kg JIATF-SOUTH with position report in USB heard at 1514Z. (MC/SC)

14364.0: Link-11 data transmission at 1632Z. (MC/SC)

14836.25: Unid. station w/machine sent CW, partial copy: Long string of VVVV then DE NAR303 RADCAL...DE SNICK RGR, followed shortly afterwards w/brief SITOR-B or 170-Hz Baudot, at 1801Z. (SJ/KY)

15034.0: Trenton Military VOLMET, good levels reading WX updates, in USB at 2328Z. (GV/CO)

16685.5: 9ANB, *PETKA*, 75,460 Croatia-registered bulk carrier w/AMVER/PR, exiting the mouth of the Gulf of St. Lawrence, Quebec, Canada en route to Port Kamsar, Guinea, to arrive in 11 days, SITOR-A at 1714Z. (SJ/KY)

16696.5: 3EFO9, *ATLANTIC DREAM*, 28,350-ton Panama-registered bulk carrier w/AMVER/PR, 400 mi NE of Bermuda sailing W to Delaware Bay Pilot Station, in SITOR-A at 1715Z; S6NK2, *EAGLE TACOMA*, 107,123-ton Singapore-registered crude oil tanker w/AMVER/FR for arrival at Texas City, TX. SITOR-A at 1754Z. (SJ/KY)

18864.0: E03A Cherry Ripe number station (Guam), weak but very readable, in USB at 2227Z. (GV/CO)

This month's reader logs were submitted by the following individuals, whose contributions are, as always, greatly appreciated: Glenn Valenta, Lakewood, Colorado (GV/CO), Steven Jones, Lexington, Kentucky (SJ/KY), Mark Cleary, Charleston, South Carolina (MC/SC), and your columnist, here in Tonawanda, New York (JK/NY). ■

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In Washington, it's House Bill 1214 that's a headache. It makes things such as "reading, manually writing or sending a message on an electronic wireless communications device" illegal. We know they're talking about sending and reading a text message, but could that "electronic wireless communications device" be construed to be an HD radio or satellite radio display? Or a GPS?

Let's not forget Wyoming and its House Bill 152, which is about those cell phones and prohibits using, "a cellular or satellite telephone while operating a motor vehicle" (without a hands-free device). But like they say on TV, wait, there's more! House Bill 284 goes further but, according to the ARRL, "...specifies drivers operating under an 'intermediate permit.'" The rub, at press time, is that neither has an exclusion for amateur operators, but *do* exempt CB from the law! Looks like one of our amateur legislative liaison folks somewhere let that one slip through the cracks.

The Lone Star State's Senate Bill 154 would make operating a motor vehicle while using a "wireless communication device" while underway illegal, unless it's equipped for hands-free operation. Pretty soon our President will be moving back to Texas and moseying along down some country road using a cell phone. Never mind, I can't say it.

In the Green Mountain State of Vermont they're lucky dudes with two bills. One would make using a cell phone (unless it's an emergency), illegal, although the offense is secondary to being initially stopped for another offense. But Vermont's House Bill 126 under the "distracted driving" section refers to, "any activity involving the use of one or both of the driver's hands if the activity is not necessary for the operation of the vehicle or any of its installed accessories." According to the ARRL it includes "activities ranging from smoking, eating or drinking" to "performing personal grooming," "interacting with pets or unsecured cargo," and "using personal communications technologies."

Have you been to Vermont? We love it there, but doggone, almost every driver I see is guilty as charged just by going to the market. There sits Fido (sometimes two or three Fidos) and you can bet your scanner that there's at least a conversation between the driver and the dogs going on! And would the Vermont legislators call an "installed accessory" a scanner because it only receives? Beats me, but then again it probably also beats them. Difference is, they're crafting the law.

We've already noted here in *Pop'Comm* that it doesn't matter whether your electronic device is hands-free or wired, because it's not so much the dialing, tuning, or fiddling with the controls that matters. Studies have shown repeatedly that it's the difference in how the human brain deals with a conversation on an electronic device, such as a cell phone or perhaps a ham or CB radio), as opposed to talking with a passenger, that makes even hands-free phones problematic. The result is nearly the same as driving intoxicated. And let's face it, the fewer of that kind of driver we have on the roads, the better, don't you agree?

Now, you and I both know that, as we've said before, when you're behind the wheel, driving is your primary job—not the coffee, donut, your wife's legs, the car radio, PDA, CB radio, ham rig, GPS, cell phone, cigarette, your nostrils, your pet monkey or cat, your hair, lips or ears, lunch, or newspaper. You get the idea. But every year thousands of otherwise law-

abiding people cause *serious* accidents because, well, they didn't understand this basic concept. We're all guilty. I know I am—radio or not. You are too, so don't kid yourself.

When was the last time you called CQ on the mobile rig? Or put out your two-cents of advice to that trucker on Channel 19 while on the interstate? How about changing stations on the car radio?

I'm not going to stand in a parking lot at the Dayton Hamvention and declare that use of a mobile radio of *any* kind should be regulated. But I do think we need to pay more attention to *how* we do our mobiling. Do we flaunt our hobby in all kinds of traffic by thinking, "I've done this for years with no accidents." Truth is, you'll never know how many near misses you've probably had or caused, or how much you weave and increase/decrease your speed while operating on the highway, but others—including the cops—*do* notice.

What's the answer? For starters, make sure your radio is securely installed; opt for one with a removable body/faceplate, and absolutely ensure that the mic cord isn't going to get tangled in the steering wheel. Don't mount your scanner or radio where it clearly is in your face—and the cops faces'. Sometimes the less conspicuous, the better.

If you're stopped, remember, the cop has some things I hope you don't have, including a gun, club, ticket book, and a back-up around the corner. There's nothing on your license that gives you license to give the cop a piece of your mind. Personally, I'd show my ham license, you CBers might want to belong to a respected organization like REACT, and it wouldn't hurt to have a copy of the FCC's Part 95 rules in the glove compartment.

Think about what you're doing when you're using that radio. Is the call necessary or can it wait until you're parked? Am I a bit older now than when I first became licensed? Are my reflexes and vision as good as they once were? Do I have an active role in what's going on in my state and community when it comes to helping lawmakers' staff work out this type of legislation?

With the use of cell phones and other electronic devices while driving skyrocketing—and people are going to them regardless of the laws—there *is* a need to do something so we all get home safely. But just how legislation will do the job, and also address the thousands of professional truck drivers out there using GPS, cell phones, CB and ham radio, is an unknown.

You can't regulate common sense. I'm not sure exempting a licensed service while not exempting CB operators or scanner users, for example, is the complete and right thing to do. Certainly some use could be made of the FCC license database in coordination with state licensing authorities to give some credibility to our radio services, but that still doesn't release us from our obligations as responsible drivers. Remember: our primary responsibility is to drive the vehicle. As they said when you first got licensed, it's a privilege, not a God-given right!

As for the cops whose job it is to enforce the law, even though the cops are exempt from these laws, I can't help wondering what happens when the officer driving down the road with a coffee in one hand and a donut in the other hits me in rear. In New Jersey it's probably my fault for being in the wrong place at the wrong time. ■

The Cleveland Dreamer



“That’s strange,” Rick Mitchell said out loud as he twisted his car radio’s tuning knob. Mitchell’s petite, but obviously pregnant wife, Lynne, instantly picked up on her husband’s concern and gazed suspiciously at the little under-dash-board-mounted FM converter she’d recently given to him as a Christmas gift. She wondered if it could be defective, or if they might be on a wild goose chase heading for some bogus radio station.

Originally from Ohio, the young couple was living in a Missouri college town about 80 miles east of Kansas City while Rick studied for a communications Masters degree. To earn a bit of extra cash, Mitchell pulled a weekend air-shift at the

local AM outlet and, just before spending the holidays back East with Lynne’s parents, had arranged to do some Friday night fill-in work from January through April at KDKD-FM in Clinton, Missouri.

A guy in one of his broadcasting classes heard about the opening from a friend of a friend and scribbled the KDKD program director’s name and number for Mitchell on a hastily torn scrap of notebook paper. Mitchell’s subsequent telephone interview for the position had been mysteriously brief. As soon as the Program Director learned that the applicant possessed radio experience, he cut the call short by stating when Mitchell would be needed, quoting the station’s hourly pay rate, and then quickly asking, “Okay?” Mitchell instantly agreed and didn’t think any further about the exchange until nearing the station’s community of license.

Can You Hear It Now?

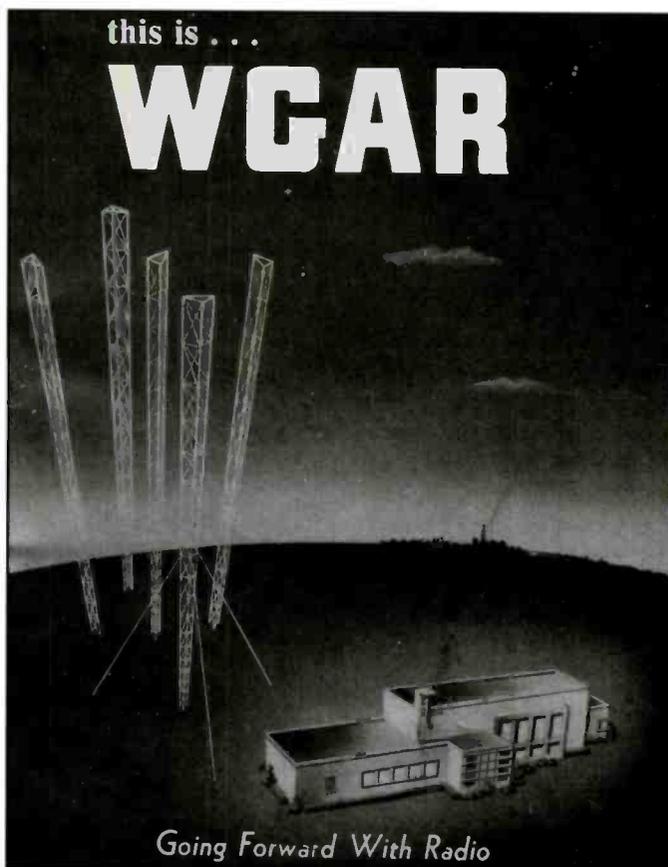
“I sure hope there’s such a thing as KDKD-FM,” he whispered to Lynne. Another five minutes elapsed without them being able to catch even a trace of the signal. Mitchell glanced at the piece of notebook paper. “Yup, the guy wrote down that the frequency is 95.3 megs, but there’s nothing coming in around there. Here’s hoping we aren’t going to be burning 60 miles round trip worth of gas for nothing.”

The pair kept traveling on Highway 13. A sign indicated that Clinton was only two miles away. Lynne decided to give the FM converter’s silver dial selector another try. Suddenly, some innocuous country-crossover ballad trickled from the speaker as the slide rule dial’s 95 got covered with the red tuner strip.

“That could be it,” Mitchell said with a sigh, a sense of relief in his prediction.

“Oh thank goodness, honey!” Lynne added when she and husband heard a station ID at song’s end.

“We probably won’t be getting too many record requests from the outskirts of town,” Mitchell shrugged, “but at least it’s a paying gig.” He followed her every word as she read the friend



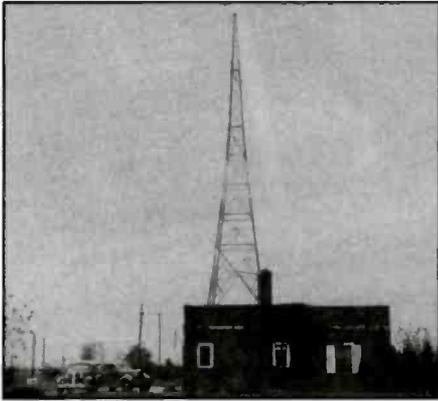
This 1947 artist’s rendition of WGAR’s proposed 50-kW transmitter site seems to place the station near the edge of the earth, with nothing but downtown Cleveland in the distance. Note that the person who did the sketch only treated one tower to a single set of guy wires!

of a friend’s driving directions from the main drag to the station. A few minutes later, their 1978 Datsun pickup came to a stop in front of the KDKD AM & FM studio/transmitter facility. They held hands on the walkway into the building. And once in the conspicuously vacant lobby/office, Lynne wouldn’t let go. Her spouse led the way in search of someone to greet them or at least show him the ropes prior to his imminent air-shift.

“Hello. Hello? Anybody home?” he called as they stepped cautiously down a short hallway. They slowed to avoid a trail of metal dotting the shopworn carpet towards the studios. “Transmitter parts,” Mitchell whispered to his wife.

What Happened In Clinton?

For context related to our story, it would be good to mention that KDKD-AM debuted in 1951 as a useful, garden-variety daytimer on 1280 kHz with 1000 watts. The Class “A” FM side was added in 1975 and effectively radiated 3 kW from an antenna (side-mounted on the AM stick) at 175 feet above Clinton’s average terrain. The frequency modulation arm had been estab-



A 384-foot Truscon brand self-supporting tower watches over WGAR's 1000 Harvard Avenue transmitter building. The snapshot is probably from late 1935 or early 1936.

lished primarily to provide night service to the Clinton area, roughly situated in the northwestern Lake of the Ozarks region.

When the Mitchells arrived in "kady-land" on that first Friday evening of 1980, KDKD had already signed-off for the night, leaving KDKD-FM to convey music, news/weathercasts, and a previously recorded high school basketball game, as well as very basic commercials from several Clinton businesses. On quarter hours, the log specified running a brief tape cartridge "sunder" announcement for an appliance store that sponsored an accompanying time and temperature check.

Unfortunately, though, only folks within a mile or so of the transmitter could receive this fare that night. The station's FM transmitter had blown a few key components and its "duct tape" repair generated an estimated 7 or 8 watts of effective radiated power. In those days, overnight replacement parts shipments to rural venues were practically unheard of, so in order to stay nominally on the air throughout the weekend, KDKD's engineer improvised a length of TV-grade coaxial cable and some alligator clips to run a signal from the little BNC-style output of a 15-watt McMartin FM exciter to the fat center conductor of rigid, 1-5/8 inch transmission line leading way out to the backyard and up the tower to the FM antenna.

"It's kind of like temporarily re-routing a broken water main with a straw from a McDonald's shake," Mitchell explained to his wife. The analogy came at 6:04 p.m., about three minutes after the fellow whom he relieved raced through some instructions, high-tailed it to his orange Chevy Vega, and then disappeared down the road.

Mitchell quickly familiarized himself with the program log and rolled the cushiest chair from the office into the FM studio so Lynne would be more comfortable. She'd already fingered through much of the record selection, gathering a bunch of hit singles and melodic albums with titles she knew her husband would like to play.

Hello Out There In Kady-Land?

No one called the station to comment on the music...or for any other reason. Anybody listening would have seen how much the couple enjoyed each other's company. Several times per hour, Mitchell credited Lynne with "finding some really nice tunes for your listening pleasure." And, as promised to whatever audience there might have been, during the quarter-hour before sign-off, he engaged her in a charming little back-and-forth about their hopes, plans, and dreams. Finally, he dedicated the oldie "Goodnight My Love" to her, spun that 45, and then read the sign-off announcement. There'd been a light in an upstairs window in the house across the way from KDKD. Lynne thought she saw it go out seconds after the sign-off.

"Maybe someone *was* listening, honey," she softly suggested in her characteristically encouraging way.

"Maybe so, baby," Mitchell smiled. "Maybe so, but we sure wouldn't have to wonder if anyone was out there in radioland if I was on the *Big 1220!*"

A 50,000-Watt Wish

As a Cleveland, Ohio, area native and Top-40 radio fan, our saga's main character possessed a dream: to one day be a part of the on-air staff at WGAR. The classic 50-kW "flamethrower" on the then-still prominent AM dial's 1220-kHz spot had been a favorite of Mitchell's for over a decade.

Though eight fulltime Canada-based standard broadcast operations shared the 1220 address with WGAR, that Cleveland facility was a far more powerful nighttime regular, blasting through any traces of the Canadian stations in at least a dozen states. Its sharpest directional null cut southwest to protect XEB, a 100,000-watt Mexican giant more than a thousand miles distant. No matter, even casual DXers could rattle off the Cleveland station's call.

Mitchell's fond memories of WGAR were spawned in the mid 1960s as his cheap two-transistor set was bathed in the nearby 50-kW pattern well past bedtime. "I hope you're not still awake and listening to that little radio under your pillow!" his mom would yell up the stairs. During his high school years, he and his friends enjoyed cruising their suburban community's main drag while dialed into cool DJs like Don Imus and Bob Vernon doing funny bits and spinning golden hits on 'GAR.

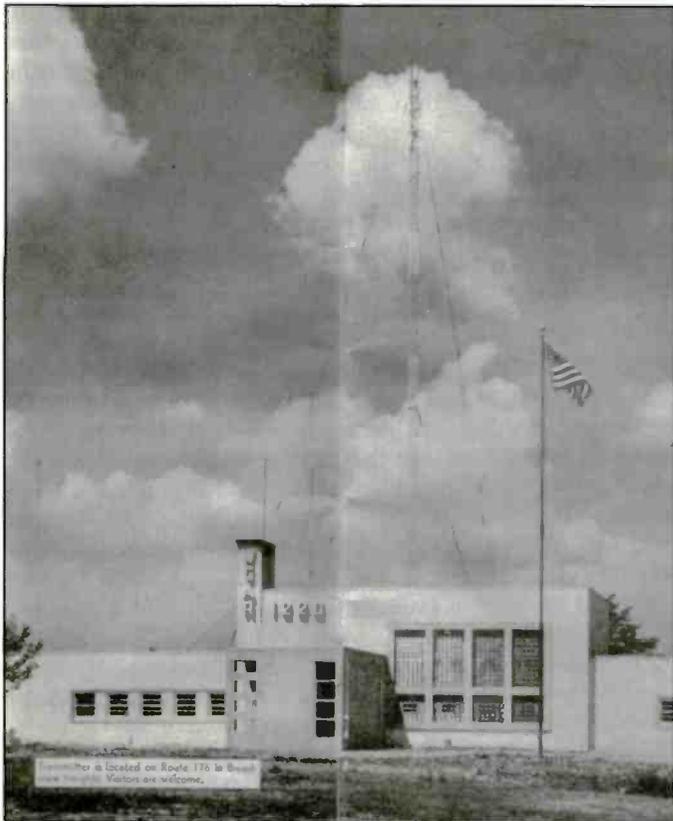
After falling in love with Lynne as a sophomore at an upstate New York college they attended, Mitchell DXed the Cleveland AM on a RadioShack Long Range TRF portable the first time he invited her to his dorm room. While songs like "Rock The Boat" by the Hues Corporation faded up and down the romantic mediumwave's audio hash, he shared with her his dream of someday being an announcer on a major broadcast venue like WGAR.

The WNAP/WCSO Connection

Yet nobody might have ever been influenced by WGAR had there not been someone at Springfield, Ohio's Wittenberg College who got hooked on radio in the early 1920s. According to facts dug up by Jan Lowry from *Broadcast Pro-File*, a member of Wittenberg's Department of Physics convinced college officials to budget for an experimental station. The resulting 8XAK was active during the 1921-1922 academic year. It was upgraded to "broadcast station" status just before the school's 1922 Christmas vacation when a 100-watt facility, dubbed WNAP, took to the air from Wittenberg's "Carnegie Science Hall."

About a year later, WNAP switched from 833 to 1300 kilocycles, then to 1090 in the spring of 1924. The following March, the school station rested at 1210 k.c. for a while. Though WNAP did not maintain a regular operating schedule, its owners thought it might be nice to secure call letters to signify the station's affiliation with Wittenberg College, Springfield, Ohio. As luck would have it, the callsign WCSO was available and was assigned to the non-commercial operation in 1925.

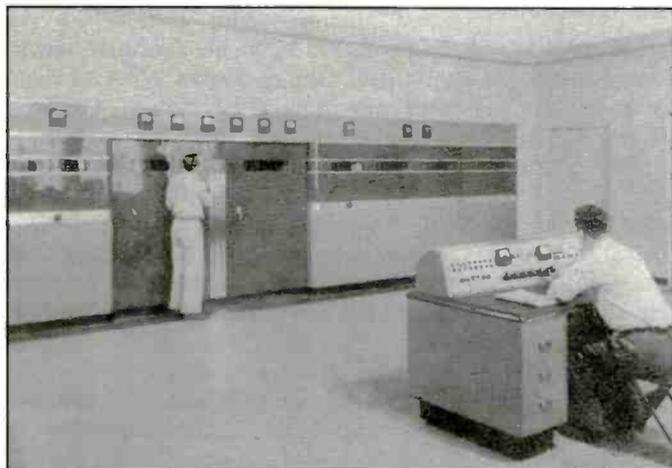
Jan learned that WCSO transmitted from two 120-foot steel masts, supporting a "T"-type wire antenna atop the



A rare 1947 photo of the Broadview Heights facility. WGAR had only been in the exclusive 50,000 watts club for a few weeks when this picture was taken. Imagine how happy WGAR's radio waves must have been to be flying off those five towers into that beautiful summer sky!

aforementioned science building. Not far from the roof, a new 1000-watt transmitter debuted on May 25, 1927, but on June 1 the FCC required it to reduce power output to 500 watts. The directive, probably an effort to reduce interference, included a mandate to shift WCSO to 1170 k.c.

College administrators received more instructions in 1928 when most broadcast outlets were required to participate in a



Every sound that arrived at transmitter master control via the equalized telephone line from the WGAR studios got carefully attenuated by a board operator engineer who then sent it a few more feet to the big RCA transmitter. There, a colleague would make certain the audio performed well in that beautifully housed 50-kW unit.



To the left of the WGAR transmitter engineer is a pair of power amplifier tubes. Each weighs over 350 pounds! This shot was probably snapped during the June 1947 installation of the Cleveland station's new RCA equipment. Besides the fact that interlocks would immediately shut down the transmitter if anyone opened the doors while it was running, the engineer's casual expression gives experienced RF folk the distinct impression that the picture was posed without any current flowing through the rig.

major frequency reallocation plan. Effective November 11, 1928, WCSO was to head to 1380 k.c. and share time with Pittsburgh's KQV. By mid-June of 1929, WCSO's dial position moved again, this time to 1450 where a share-time pact with WFJC in Akron was established.

Sometime in 1930, George A. Richards, a car dealer from Detroit, must have visited Wittenberg's president. After a few pleasantries, Richards probably pointed out that the College possessed an asset—namely its radio station—that it could easily do without. "Might Wittenberg use a bit of extra funding realized from the sale of WCSO?" he may have posed. However the question was phrased, the answer translated into the school selling its broadcast facility to George A Richards' newly formed WGAR Broadcasting Company.

On September 26, 1930, the FRC granted Richards the assignment of license and authorized a move of WCSO from Springfield to Cleveland, Ohio. In early December 1930, WCSO left the air at Springfield and reappeared 10 days before Christmas in Cleveland under the call WGAR.

WDBK/WFJC In The Mix

But what about the former WCSO's (now WGAR) Akron-based 1450 k.c. time share partner? That was my question, too, when I sent off a request for a *Broadcast Pro-File* about WFJC. (You can request a free *B-P* catalog featuring hundreds of historically researched stations. Send your request to *Broadcast Pro-File*, 28243 Royal Road, Castaic, CA 91384-3028.)

Jan uncovered for me that the Akron station's origins involved the M.F. Broz Furniture, Hardware, and Radio Company, located at 13918 Union Avenue in Cleveland. It founded a 100-watter on 1210 kilocycles, WDBK, which took to the air on May 15, 1924. A few months later, it went dark, but reappeared in March 1925 with a new license and new frequency: 1320 k.c. By 1927, WDBK relocated to the Bolton Square Hotel on Cleveland's Carnegie Avenue, and, via a play



"Yes, everybody is talking about Disc Jockeys," claimed 1947 WGAR promotional literature, "and folks around Cleveland are no exception. They have their favorites too—one of them being Record M.C. Stan Gee, a WGAR regular."

on the name of its owner, Mr. Broz, used the clever identification phrase, "BROZcasting from Cleveland."

Soon after raising WDBK's power to 250 watts in June 1927, Broz sold his radio interests to W. F. Jones, the owner of an Akron Ford dealership. Jones obtained the FRC go-ahead to move the station some 35 miles to Akron, to the third floor of the new *Akron Beacon-Journal* building at 140 East Market Street. The Ford man requested that the call letters WFJC, for **W. F. Jones Company**, replace the WDBK moniker before his newly reconstituted AM signed on at Akron in November 1927. Part of the FRC's okay was conditioned on WFJC sharing 1320 with WJAY Cleveland. Happily, for Jones, a power boost to 500 watts got tossed into the deal. November 1928 saw WFJC shifting from 1320 to 1450 k.c., where it was required to divide airtime with Wittenberg College's WCSO.

One Man's Radio Plan: Put Two Half Stations Together And Make The Whole Bigger

It's quite logical that, as the owner of a successful automobile agency, George A. Richards was acquainted with Ford dealer W.F. Jones. And in early 1930, Richards convinced Jones to concentrate on the car business and sell him WFJC. By late September, the transaction for Akron's NBC-Blue Network affiliate took place. Richards' plan was to gain control of the Akron end of northeastern



Here's what WGAR's master control board looked like at its Statler Hotel-based Cleveland studios. "Beam me up, Scotty!"

Ohio's 1450 time share, and then have the FRC cancel WFJC's license and delete its calls. This paved the way for Richard's new WGAR 1450 Cleveland (the erstwhile WCSO 1450 Springfield) to be licensed as a fulltime operation.

WGAR's December 15, 1930, debut occurred in studios on the 14th floor of the Statler Hotel Building, under two 100-foot towers and a counterpoise installed atop of the swanky structure located at 12th and Euclid in Cleveland. The station's new Western Electric model 6-B transmitter had a 1000-watt rating, but stayed throttled back to 500 watts until December 1932, when day power rose to 1 kW (while 500 watts were radiated after sunset).

The increase followed the transmitter being moved in 1931 to a new site at 1000 Harvard Avenue in Cuyahoga Heights Village, Ohio, where two towers and a "T"-type antenna were erected. This set up was replaced in early 1932 by a single wire vertical antenna. To celebrate WGAR's fifth anniversary in 1935, Richards commissioned the erection of a 384-foot Truscon half-wave vertical radiating antenna tower at his Cuyahoga Heights Village site.

Shuffling Networks And Dealing For More Power

Though mostly identified as a car sales magnate, the president of WGAR was no stranger to the radio business. In addition to his Cleveland broadcast property, Richards owned influential KMPC Los Angeles and larger-than-life WJR in his hometown of Detroit. No absentee owner, Richards was constantly investigating ways to increase audience and coverage for the outlets in his station chain. An example is the Motor City operation that

he upgraded from a Pontiac, Michigan, time-share operation to a full-fledged, Class A-1 clear channel, non-directional icon at Detroit.

For his Ohio listeners, Richards secured, in 1936, an affiliation with the Mutual Network, interweaving its most popular offerings with the best shows from NBC-Blue. All the while, however, he was negotiating with Columbia Broadcasting System for a commercial compensation deal attractive enough to result in WGAR dumping both NBC and Mutual to link solely with CBS in time for the fall 1937 programming season. During the following fall, WGAR ran Orson Welles' now infamous "War of the Worlds" Halloween broadcast that scared the wits out of Cleveland's gullible listeners. WGAR announcer Jack Paar (later to perfect the late night TV talk show genre on NBC) was on duty that evening and had to repeatedly ad lib assurances that Martians were not actually invading the Midwestern home front.

On the FCC front, Richards successfully petitioned the agency for a daytime power hike to 5000 watts day with a nighttime cutback to 1 kW. To that end, WGAR's transmitter site was fitted with a 485-foot Truscon stick and a 150-footer, which, in concert with the "old" 384-foot tower, served as a directional array for night use. A mandated move (due to the 1941 NARBA Treaty frequency reallocation plan) from 1450 to 1480 kilocycles allowed a winter 1943 nighttime power jump to 5 kW.

It's unclear whether this post-sunset okay was actualized at 1480, though, as in September of that mid-war year (when the FCC had halted, as an essential materials conservation effort, most new station construction), Richards managed to get the Commission to piggyback onto his 5 kW at 1480 k.c. night construction permit, a "modification" to reallocate WGAR to the clearer 1220 kilocycles spot. There, Richards figured, he'd stand a better chance of swaying FCC engineers towards his ultimate goal of powering the Cleveland outlet to its maximum potential.

The 1220 transition took place on June 4, 1944. When WGAR announced details of the D-Day invasion two days later, its signal originated from a new transmitter site at Broadview Heights and Aiken Roads, near Cleveland. Concurrent with the move, power was raised to 5000 watts full-time with directional operation all hours. Studios remained on the 14th floor of the Statler Hotel.

No doubt that, on May 26, 1947, word of a very important letter from Washington, D.C., reverberated through the WGAR headquarters. From the FCC, the letter simply let Richards know, "Your application seeking a construction permit for 50,000 watts at Cleveland, Ohio has been granted." Arguably, he already had a good idea that permission was imminent, as the installation of five 200-foot towers hooked to the latest RCA BTA-50F transmitter in a new \$350,000-plant at its Broadview Heights site was completed for a July 4th 1947 inauguration.

Commemorating that happy occasion, a *Time* magazine-sized booklet, titled *This Is WGAR: Going Forward With Radio*, was distributed to listeners, advertisers, and appliance/radio stores in the Cleveland region. At its upper left-hand corner, the publication had a small hole punched, through which a tasseled string could be hung on the tuning knob of the era's big console sets. Its introduction was headlined, *More Power To You*, and read,

From a very small beginning back in December 1930 with 500 watts, Cleveland's Friendly Station now serves [with 50 kilowatts] more than 2,000,000 radio listeners in Northeastern Ohio...On the air a minimum of 21 hours every day. WGAR is a part of your community and of every facet of its citizens' lives. To deserve your continued friendship through broadcasting programs you want to hear is our constant desire.

The booklet made it clear that George A. Richards and his associates were proud of WGAR's relatively quick rise from a couple of share-time "move-in" stations to a 50-kW legacy facility.

Unfortunately, Richards didn't have long to enjoy the big AM's status, nor complete his plans for the new WGAR-FM (which lit up during the summer of 1952). He died at age 62 at his Detroit home on May 28, 1951. Nominally, his widow stepped in to operate the Cleveland facility, but, behind the scenes, her attorneys were already talking to potential buyers for it and KMPC. Cowboy star, Gene Autry soon bought KMPC, but WJR interests were retained by the Richards' estate until 1964.

Nationwide Is On WGAR's Side

An organization begun in 1946 by the Ohio Farm Bureau to reach the state's agricultural community heard that WGAR was being shopped around. This outfit, People's Broadcasting Corporation, was an arm of Farm Bureau Insurance Companies and got into radio via operating WRFD Worthington, Ohio, just a few miles from the insurer's Columbus headquarters. Only a few days after New Year's 1954, People's Broadcasting acquired WGAR-AM/FM for \$1,750,000.

For nearly a decade, listeners didn't notice any abrupt changes, as WGAR chugged along profitably with a mix of CBS and local fare. By the early 1960s, however, traditional big, old-line network station audiences were fast eroding, with coveted Baby-Boomer ears turning to the Top-40 hit music/quick news/weather format then offered on Cleveland's WHK, WERE, and KYW (later WKYC). A switch from CBS to NBC occurred in April 1962. Within three years, NBC programming was dropped in lieu of ABC offerings, consisting primarily of hourly newscasts. That affiliation ended on December 31, 1967, giving a WGAR completely local flavor.

Meantime, WGAR's license was modified to reflect its ownership's corporate Nationwide Insurance re-branding. Nationwide Communications, Inc., prepared for the 1970s—and the decade's focus on a lucrative young adult marketplace—

by hiring Los Angeles radio managerial maven Jack G. Thayer to streamline WGAR and Nationwide's other broadcast properties. He began by filling the 1220 spot with an upbeat "Oldies Music" format, hosted by notable DJs like Don Imus. Under Thayer, WGAR-FM received a new call, WNCR-FM, and did a short, but arguably influential stint as a progressive rocker. ABC Entertainment Network news was installed at WGAR, augmenting local casts and bringing in some easy commercial revenue.

Thayer cut the AM's overhead costs by getting it out of the by-then anachronistic downtown Cleveland Statler (Hilton) Hotel venue, fitted with cavernous studios no longer needed in contemporary radio. Facilities more appropriate for DJ work were constructed at the Broadview Heights transmitter site. The revamp was christened "Broadcast Park."

That's the WGAR that Rick Mitchell, the fellow from our opening story, best remembers. "I was a 1220 fan through and through," he says. Its tight combination of jingles, commercial production, Top-40/Adult Contemporary hits—oldies as well as a roster of current tunes and future gold—plus compelling air-personalities made for exciting listening. For some reason—and I've heard other homesick Ohioan radio buffs express it, too—this fascinating aura was especially true the further one was from Cleveland.

Mitchells goes on to say,

After I got my first fulltime radio job, with a Maine AM/FM, Lynne and I would sometimes drive around Portland at night just to hear—on our car radio—WGAR jocks and newscasters mention names of places familiar to us. Racing through the scratchy ether, almost inaudibly and then louder, 1220 filled us with hometown pride no matter where my fledgling broadcast career took us—*town to town, up and down the dial*, as the WKRP television show theme admitted. It was my goal to be a part of the WGAR on-air lineup.

In 1978, they bought a new Harris MW-50 transmitter that seemed to give everyone there even more electronic punch. It was tailor-made for the special Harris System exciter WGAR used, during fall of 1982, to go AM Stereo. Of course, the competing Motorola system made the biggest splash—albeit never getting very many radio listeners very wet—in the industry's failed attempt to interest consumers in dual-channel amplitude modulation.

Letting A Legacy Lapse

Except once as an awe-struck teenaged visitor, Mitchell never made it to WGAR. Having finished grad school a few months prior to the station's AM stereo foray, he accepted an assistant professorship at a small western college. By then his daughter was an active toddler and Lynne was hinting that their youngster should have a brother. Always supportive, Mitchell's wife promised that they'd all be just fine even if he wanted to pursue a position at WGAR. After contrasting the opportunities, however, Mitchell clearly saw the advantages of tenured academia over the typical radio announcer's fickle fate. During one of his first days in front of the classroom, he told his broad-



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cast performance students that even the best air-personalities could get fired at a moment's notice. As the example, he cited WGAR's late 1983 replacement of its on-air staff with the satellite-delivered "Star Station" adult contemporary format.

When 'GAR switched to country music—again piped from a distant satellite service—a few months later, Mitchell told Lynne how thankful he was for having taken the college job. "I hate to think about me getting blown out of 1220 only months after we would have moved back to Ohio for a supposed dream gig," he sighed with an even greater sense of relief than he felt some years earlier when KDKD-FM finally popped into their Datsun radio.

The couple kept up with their cherished station's doings, however. They heard that Nationwide sold WGAR in 1990. Mitchell says, "the new people recast it as WKNR, an odd ode to a former 1960s Top-40 outlet in suburban Detroit. The calls meant nothing to Cleveland pop music fans, though. Next, these guys flipped it from country to oldies, and then to 'sports talk' a few months later."

Sold again in 1997, WKNR was traded to another radio group not long thereafter. In 2000, it went to religious broadcaster Salem Communications, received the calls WHKC, and took a "Christian Talk" format. Salem soon changed 1220's callsign to WHK, the name of one of the old WGAR's most ardent former competitors. Salem had bought the original 1420 WHK and co-opted the name for 1220 after selling 1420 in favor of the more powerful 1220 signal.

During this period, the old WGAR studios at its transmitter site were relocated to the 1420 digs at Independence, Ohio. Salem reacquired the 1420 operation, though, so gave it back its original WHK label and, in 2005, found the WHKZ call letters for 1220. These calls proved incredibly temporary, however, as Salem put in another FCC identification request a week later, landing the 1220 property as WHKW, "The Word."

Speaking Of Words...

Uh oh! Looks like I've more than used up my word count for this month! There's just room enough for me to invite you back for more classic radio next time, then to quickly say, *and so ends another day of broadcast history at Pop*Comm.* ■

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The Ghost Of Dayton's Past

Norm e-mailed me (I guess he's given up on reaching me via the SSB ham bands) and asked what (or who) I know with regard to licensing a small AM broadcast radio station. He knows that I am an occasional visitor to the FCC, and apparently assumes that because I darken their doorway from time to time I might know someone and casually say, "Hey—my friend Norm wants to apply for an AM broadcast license. Can you help him out?" and be met with "Sure—just have him call me and I'll take care of it."

I'm flattered that he thinks of me as inhabiting such a well-respected position. Actually, I make an occasional visit to the audio-visual department there and perform some routine maintenance to some equipment that my employer has located there (and on the roof). Any reader who suspects that I can pull any strings beyond those on the equipment tags in the storage rooms is engaging in wishful thinking. I *did* once see the chairman being driven away from the main entrance in his government car, and I *did* wave to him, but he returned the wave in a "Hi, whoever you are" sort of way. We were never on a first-name basis.

This is the first year that Norm will *not* be going to Dayton.

Some of you will be reading this as you fly toward Dayton, a town whose name stands for the Mother of All Hamfests. No one asks, "Hey, are you going to the ham radio convention in Dayton?" It's always "Are you going to Dayton?"

Radio equipment manufacturers and distributors go there and exhibit their wares, hoping that members of what's admittedly one of the most "frugal" groups of hobbyists might part with a dime ("What? And break a *quarter!*") on their products. Amateurs who produce some great little product for their fellow hams will be there, showing their widgets, hoping to recoup at least gas money and other trip expenses. Regular (and a few of what you might call "irregular") hams will be in attendance, some just wearing the obligatory baseball cap, but at least one will be wearing a metal hardhat and a miniature beam attached to it. On the two trips I made to Dayton, I kept my head fully covered with aluminum foil (under my hat, so no one would notice) so that I wouldn't mistake the stray signals there for the voices that normally guide my every move.

Norm and I once worked for the same equipment manufacturer. That thought alone might get some of you wondering just what kind of antics we would get involved in just during the work day, let alone afterwards and on our lunch hours. Actually, lunch hours were pretty routine—Ramen noodles and PB&J sandwiches at Norm's (he lived close, I didn't). One of us would walk Chump, the wonder Spaniel (who was always waiting with his leash attached, carrying the leather hand loop in his mouth) while the water boiled for the soup, tea, coffee, or whatever was on the menu. Even though Norm would scold Chump for begging, I have always been a sucker for a sad looking face and usually shared my sandwiches with him.

And what kind of things did we do at work? Generally I handled tech support and warranty items while Norm handled sales. Between the few moments we actually spent working, we would engage in projects, usually antenna-related and usually for

"On the two trips I made to Dayton, I kept my head fully covered with aluminum foil (under my hat, so no one would notice) so that I wouldn't mistake the stray signals there for the voices that normally guide my every move."

Norm's station, because of the two of us, he was the active ham. Luckily for us, there were literally hundreds of pounds of rejected and useless scrap material that served no purpose in the manufacture of marketable products, but was quite sufficient for our projects. One of Norm's better projects was a "doggie-barrier" to keep Chump safely in the back of his enormous station wagon. It was made entirely of scrap tubing and damaged hose clamps, and I dare say it even looked a little like something you'd buy in a store. Okay, a thrift shop.

And we got to make the annual pilgrimage to Dayton "on the company." Most every waking moment there was spent on either making the booth ready for customers, working in the booth answering questions, or sending—no, *taking*—customers to one of the dealers who stocked our products, introducing them to the staff there, and making sure they got what they wanted, and at a good price.

It was during these excursions that we could spend a moment or two sneaking around and seeing the manufacturer's and dealer's booths, saying Hi to industry friends, and downing an over-priced hot dog and soda from the vendors who held us captive to buy their food and drink. I may not have proof, but I think they are the same people who sell popcorn at movie theaters and hot dogs at baseball games. To say that their prices are high would be to say that, well, Dolly Parton is "shapely."

Somehow, we always found time to sneak off and browse the flea market for bargains. We also had a distinct advantage over others in attendance in that we could load our treasures into the big rental truck that carried our products and displays to Dayton and back to our headquarters. Those who had to fly home had to think twice about a large, heavy "bargain" that needed packing and shipping costs added to the price of their treasure.

"We all have a 'Dayton Moment' which will stand out above all others."

We all have a "Dayton Moment" which will stand out above all others. Mine (and probably Norm's, too) would be when an extremely high-ranking member of our company—wearing the same red and white striped vest which we all wore in the booth—was "buttonholed" by a kindly, but perhaps nearsighted, old gentleman who told him, "Young fella—I just wanna tell you that you guys are doing a heck of a job parking all these cars this year! Much better than those guys did last year. And these vests are better looking than last year, too!" ■

AR-ALPHA

Communications Receiver



- Multi-mode unit capable of receiving AM (synchronous), ISB, RZ-SSB, USB, LSB, CW, WFM including FM stereo, NFM, APCO-25 digital, and TV in both NTSC and PAL formats
- 6-inch TFT color panel can display received video signals or depict spectrum activity over a wide choice of bandwidths including a "waterfall" function to show signal activity over a specified time period

Welcome to the Future!

AOR proudly introduces the AR-ALPHA, the first in a new class of professional monitoring receivers!

Designed to cover 10KHz to 3.3GHz, with no interruptions, this receiver features a 6-inch color TFT display, five VFOs, 2000 alphanumeric memories that can be computer programmed as 40 banks of 50 channels, 40 search banks, a "select memory" bank of 100 frequencies, and a user designated priority channel. It includes APCO-25 digital and a DVR with six channels that can record up to a total of 52 minutes audio. Monitoring professionals will appreciate the world class engineering and attention to detail that makes the AR-ALPHA such an amazing instrument.*

- Composite video output on the rear panel of the unit
- Selectable IF bandwidths: 200 Hz, 500 Hz, 1 KHz, 3 KHz, 6 KHz, 15 KHz, 30 KHz, 100 KHz, 200 KHz and 300 KHz along with the ability to shift the IF.
- CTCSS and DCS selectable squelch functions
- DTMF tone decode
- Built-in voice-inversion descrambling
- CW pitch control, AGC, AFC
- Auto-notch feature
- User selectable spectrum display function from 250 KHz through 10 MHz in 1 KHz increments. Above 10 MHz bandwidth, it can display 20 MHz, 50 MHz, 100 MHz or 1 GHz, but above 20 MHz bandwidth, no audio will be available
- Resolution bandwidth is also user-selectable in increments of 1 KHz, 4 KHz, 32 KHz, 64 KHz, and 128 KHz.
- Fast Fourier Transform (FFT)
- Rear panel connections include 12 VDC power, RS-232C, USB 2.0, I/Q output with 1 MHz bandwidth, two antenna ports (one SO-239 and one Type N) and up to four antennas may be selected through the receiver's controls with the optional AS5000 antenna relay selector.
- Use desktop or with 19" rack mount

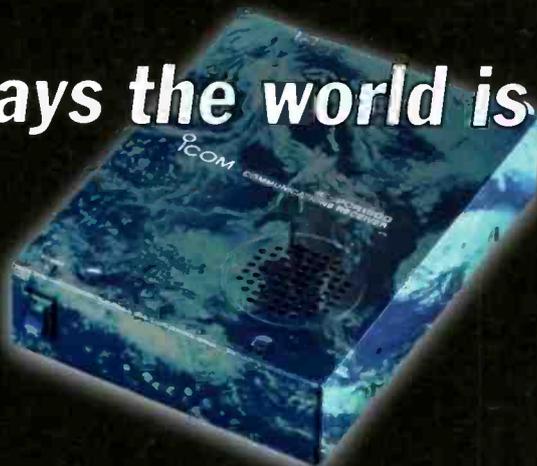
The AR-ALPHA redefines excellence in professional monitoring receivers. No wonder so many monitoring professionals including government, newsrooms, laboratories, military users and more, rely on AOR.



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*Specifications subject to change without notice or obligation.
Documentation required for qualified purchasers in the USA.

Who says the world is round?*



IC-PCR1500

- 0.01 ~ 3299.99 MHz***
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- Record and Save Audio as .WAV File
- USB Cable Connection
- Optional DSP



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- 0.01 ~ 3299.99 MHz***
- AM, FM, WFM, CW, SSB
- Single Receiver
- Mobile or PC Controlled

IC-PCR2500

- 0.01 ~ 3299.99 MHz*** (Main)
50 to 1300 MHz*** (Sub)
- AM, FM, WFM, CW, SSB
- Optional APCO 25 and D-STAR
- Dual Wideband Receivers
- Dual Watch PC window



IC-R2500



- 0.01 ~ 3299.99 MHz*** (Main)
50 to 1300 MHz*** (Sub)
- AM, FM, WFM, CW, SSB
- Dual Wideband Receiver
- Mobile or PC Controlled
- Optional APCO 25 and D-STAR
- Dual Receiver Diversity

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