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

45635

POPULAR COMMUNICATIONS

APRIL 2007

Jocks And Awe: Inside AFN-Iraq

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- Whatever Happened To Radio Shack? pg. 14
- The Latest In Battery Technology! pg. 22

PLUS: History Of Scanning–The Digital Entry Era • Coming Soon: New Station In Madagascar • *and* HF Comms In Troubled Times

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*Cellular blocked

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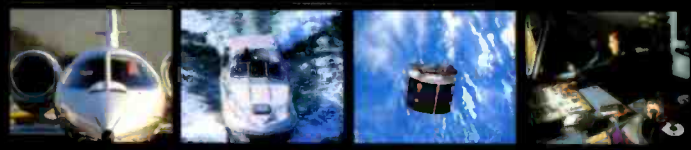

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ICOM PCR1500 R1500

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* **$499.95**

The Icom R1500 is similar to the above, but also includes a controller head for additional operation independent of a PC. *#1500* **$599.95**

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* **$729.95**

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FREE *ICOM UT-121 APCO 25 Board included!* A $248.00 value included FREE with your R2500 or PCR2500 purchase valid to April 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 Fast Scan TV. A second mono LCD display that can be used to conserve battery life. You get: 450 alpha memories, 4-step attenuator, bandscope, video and audio outputs and auto power-off. Comes with Li-Ion battery, charger, belt clip and BNC antenna. **Call**

R20

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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.**

R9500

This device has not been approved by the Federal Communications Commission. This device may not be sold or leased, or be offered for sale or lease, until approval of the F.C.C. has been obtained.

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

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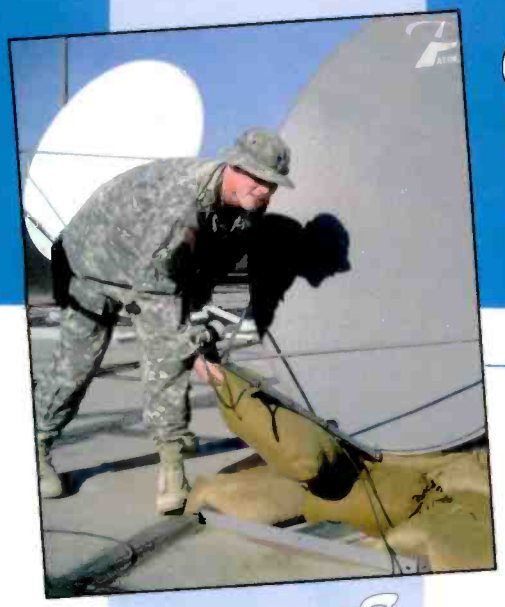

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On The Cover

With thousands of troops in Iraq—likely for the long-haul—AFN is there with news, entertainment and to offer some relief from the 24/7 business of soldiering in the 21st Century. Competing with troops' iPods isn't easy, but they do it—in a challenging environment. Read all about it in our special feature this month, "Jocks And Awe—AFN-Iraq Coming to You Live Form Baghdad," beginning on page 8.
(Photo by Larry Mulvehill, WB2ZPI)

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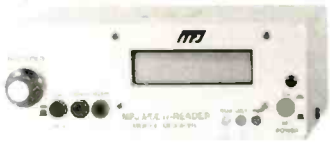

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Then *watch* mysterious chirps, whistles and buzzing sounds of RTTY, ASCII, CW and AMTOR (FEC) turn into exciting text messages as they scroll across an easy-to-read LCD display.

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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.

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Easy to use, tune and read

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

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

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

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

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

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

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$29.95

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

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

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

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

Super Active Antenna

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

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

MFJ-1024 **$149.95**

Indoor Active Antenna

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

MFJ-1020C
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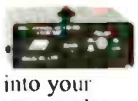
Tuned circuitry minimizes intermod, improves selectivity, reduces noise outside tuned band. Use as a preselector with external antenna. Covers 0.3-30 MHz. Tune, Band, Gain, On/Off/Bypass Controls. Detachable telescoping whip. 5x2x6 in. Use 9 volt battery, 9-18 VDC or 110 VAC with MFJ-1312, $15.95.

Compact Active Antenna



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

MFJ-1022
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Eliminate power line noise!

MFJ-1026
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Completely eliminate power line noise, lightning crashes and interference *before they get into your receiver!* Works on all modes -- SSB, AM, CW, FM, data -- and on all shortwave bands. Plugs between main external antenna and receiver. Built-in active antenna picks up power line noise and cancels undesirable noise from main antenna. Also makes excellent active antenna.

MFJ Antenna Matcher

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

MFJ-959C
$109.95

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

High-Gain Preselector

High-gain, high-Q receiver 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.

MFJ-1045C
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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.

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

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MFJ-956
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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.

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MFJ Shortwave Speaker

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

MFJ-281
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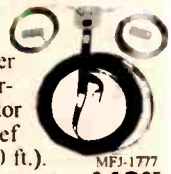
MFJ All Band Doublet



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

MFJ-461
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by Harold Ort, N2RLL

New FCC Book: If *We Did It, This Is How We'd Do It*

In a startling new book available from the Government Printing Office, complete with all the twists and turns you'd expect in a good book—even a government non-fiction book—the FCC has just released its first-ever anthology of its last 30 years. Some things we knew, some we didn't, and many are just now officially coming to light.

Since things aren't always what they seem, and hocus-pocus is a way of life inside, and near, the Beltway, it's prudent to take what we read in the book with the proverbial grain of salt. Nevertheless, one should think of this official release as much more than a money-making scheme by the Commission (something they're of course not entirely innocent of these past 30 years), but rather as a true confession of sorts; a "let's set the record straight—sort of."

What I especially like about the book, appropriately titled, If We Did It, This Is How We'd Do It—all 425 pages of it!—is the organization, overall clarity, and conciseness; something sorely lacking in most of the agency's official bureaucratic ramblings. The "Few Words From Kevin" on the Acknowledgements page were blurred and unreadable on my copy of the book, but his mug shot with that great big dollar-sign-turned-sideways grin was unmistakable, even holding the page at arm's length.

Take for example Chapter 4, simply titled, "The CB Era—What We Knew and When We Knew It," gives us the best insight into the mindset at the Commission right after WWII when they created the Citizens Radio Service, allocating the band 460 to 470 MHz as a licensed (no test required) personal short-distance fixed station and mobile service for the American public. The first paragraph states, "We wanted to give Americans something fun to do; after all the War was over and the country as a whole was ready to let the good times roll. We also wanted to continue to give a lot of business to those technology companies that had made wartime radio gear. This was our primary focus; business for our friends."

The idea of CB didn't catch on at the time, as evidenced by the number of (or lack thereof) licenses issued by the Commission at the time. Says the FCC in the book, "We were aware of the impending business disaster, but decided not to intervene; just let the rolling snowball take its course, wherever it leads."

And roll on, it surely did. In a major shuffle of the radio spectrum allocations the CB service lost a sizeable portion of that 460 MHz, and in September 1958 the Commission handed over a relatively unused portion of the then-amateur band located between 26.96 and 27.23 MHz to the American public as an unlicensed service. All along most of the radio community had figured the Commission just acted with impunity and ignorance of human psychology, but alas we learn that, according to the second paragraph in that chapter,

> ...we were pressured by an overzealous group of radio manufacturers that did see the potential of this new service, so after 15 long minutes of thinking we decided to rip-off licensed amateurs' frequencies, create Part 19 (the forerunner of Part 95), and empower manufacturers to produce two-way equipment that could be used at home and on the road. Given the intense pressure we were under at the time from this group we felt compelled to act quickly, and we did.

What I found particularly interesting is the Commission's now-public logic for making CB a "short-range" and "non-hobbyist" service right at the height of a particularly intense solar cycle, which permitted, by its very nature, long-distance "skip" conditions (remember, these were ham frequencies!) and then declaring it illegal to talk to stations beyond 150 miles. The next paragraph states,

> We were essentially living in a cocoon at the time and no one even dreamed that people would use CB as a hobby radio, much less to do everything from conduct business, chat beyond the specified time limits set forth in our regulations, and even resort to such tactics as linear amplifiers and antennas placed higher than we specifically stated in our very clear rules. We just didn't think the American people would behave badly; in retrospect, we misjudged the public on a grand scale. But we had a plan to bring everything under control.

The book continues on page 85, "...we knew that the restrictions on CB operation we had in place were for the good of America, but the Chairman just didn't realize that all people wanted to do was have fun."

The constant hand-wringing the Commission did over errant CB operators right through the 1970s is nothing compared to the most current mess they're in over BPL (Broadband over Powerline). Regular readers of this magazine recognize those three letters as a thorn in the sides of not just amateur operators, but other licensed users of our precious radio spectrum as well.

But of course the Commission is marching to the beat of some distant drummer and coddles the BPL industry as if it were their only child. Chapter 8, titled, "Burning Ham," delineates the shenanigans that got us to the point of the FCC's actually rewriting its own Part 15 rules to appease the BPL industry. Perhaps the third paragraph says it all,

> ...unnamed people at various levels of the Commission have been tight with many communications industry execs; this is nothing new, but knowing there's tons of money out there—not just to be made by the industry—but for us as well in our Good Old Boy Network, it was decided to hug and kiss the BPL executives and brush off interference complaints by the amateur community as so much whining about nothing. Indeed, there is cause for concern, but for now we're in it for the long haul and will further rewrite the rules to fit the scenario as we see fit. Like the President says, 'you're either with us or against us...,' and we're for big business getting bigger at all cost."

In the most recent rule-making act accomplished by the Commission, its recent "Report and Order" eliminates the Morse code requirement for all classes of amateur radio licenses.

In its report the FCC said,

> ...based on our review of the record in the proceeding and on consideration of the various comments on this issue, we believe that

(Continued on page 64)

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

News, Trends, And Short Takes

World Christian Broadcasting Targets Middle East From Madagascar

World Christian Broadcasting is building new shortwave radio towers in Madagascar, off the African coast, to supplement the broadcasts it has been making from Alaska for decades. When the Madagascar facility is ready, perhaps in 2008, Arabic-language broadcasts also will be beamed into the Middle East. World Christian Broadcasting is an independent company affiliated with Churches of Christ.

Space Life Search Turns To TV And Radio Signals

Astronomers plan to search 1,000 nearby stars for television broadcasts and other signals that could indicate extraterrestrial life, the Harvard-Smithsonian Center for Astrophysics has announced. The project, planned for early 2008, would use a new radio telescope to search for radio traffic similar to that found on Earth. Current efforts to find extraterrestrial life look for messages deliberately beamed across space—an approach that would miss any civilization that does not advertise its existence as Earth's does. The new effort would search a portion of the electromagnetic spectrum used on Earth for more mundane purposes like radar, television and FM radio broadcasts.

"We may pick up spurious signals from people that never meant for us to hear them and get an inkling that something's going on," said David Aguilar, director of communications at the Center for Astrophysics. The electromagnetic spectrum spans radiation from high-energy waves like gamma rays and X-rays to lower-energy microwave and radio waves, with visible light falling somewhere in the middle. A new low-frequency telescope under construction in the Australian Outback will be remote enough to avoid most terrestrial radio interference. The project will be able to detect Earth-like radio signals within a distance of 30 light years, which encompasses about 1,000 stars.

Short-Range FM Transmitter Devices Legalized In Ireland

Following in the steps of the UK's communications industry regulator, the Office of Communications (Ofcom), Irish regulator ComReg has announced that low-power devices, such as iTrip-type devices, can now be used in Ireland, subject to certain conditions. These devices may be used to wirelessly connect personal audio devices, such as MP3 players, to car radios. High consumer demand is expected for these types of devices, and ComReg's enabling provision will facilitate their use in Ireland.

This measure is one of a number of "interface requirements" contained in ComReg document 06/47R, which paves the way for a range of radio applications including, for example, Radio Frequency IDentification (RFID) devices in the 865- to 868-MHz band and new wireless services in the 1785- to 1805-MHz band to be licensed under the coordinated ComReg/Ofcom licensing scheme in 2007.

The use of RFID applications is expected to increase significantly over the next few years as, for example, retailers like supermarkets and their suppliers implement the technology in place of bar codes for automated stock control. The coordinated award of spectrum at 1785 to 1805 MHz in Ireland and Northern Ireland marks a new milestone in cooperation between ComReg and the Office of Communications Ofcom in the UK.

U.S. Satellite Radio Companies Announce 2006 Subscriber Figures

The two rival U.S. satellite radio broadcasters have both released their subscriber numbers for 2006. XM Satellite Radio added more than 1.695 million new subscribers in 2006, ending the year with more than 7.625 million subscribers. XM added more than 442,000 new net subscribers during the fourth quarter of 2006. Sirius Satellite Radio ended 2006 with approximately 6,024,000 subscribers, an 82-percent increase over the company's 2005 ending subscriber base of 3,316,560. Sirius added a record 2.7 million net subscribers in 2006.

End Of An Era In Finnish Broadcast History

The end of 2006 marked the end of an era in Finnish broadcast history. On December 31, YLE—the Finnish Broadcasting Company—transmitted its final shortwave broadcast. For half a century, shortwave radio was the only way to stay in touch with home, but YLE decided to close down all international shortwave broadcasts in favor of Internet, mobile, and satellite services. Replacing the shortwave broadcasts are an Internet service and mobile phone services as well as satellite distribution of all YLE radio channels. Jorma Laiho, Director of Corporate Technology at YLE believes few people will miss the shortwave service. However, he admits that older Finns abroad might protest at the closure of the service from the city of Pori that has kept them informed of events back home for so long.

WRN Renews Agreement With WorldSpace Satellite Radio

WRN, the UK-based radio and television transmission company, announced that WorldSpace Satellite Radio has renewed its existing satellite uplink station contract for its AfriStar satellite, which covers Western Europe, the Middle East, and all of Africa. Under the terms of the agreement, WRN will continue to manage WorldSpace's satellite uplink requirements for a number of channels transmitted on AfriStar and that are produced or aggregated in Europe and North America. These channels include BBC, CNN International, Virgin Radio UK, among others. ■

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.*

No Ham Radio For Mr. Jung

Dear Editor:

I enjoyed your piece on North Korea. One thing you forgot, however; North Korea is the only country in the world that has outlawed ham radio. Some places don't have many hams and some don't encourage us, but North Korea makes what we do every day with our radios illegal. Makes you glad to be an American with your own radio station.

Bob, AD7IL
Bandon, Oregon

Smoked!

Dear Editor:

Years ago, like Peter Bertini, I also put a dropping resistor in series with the power supply. I measured the current and from it I computed the necessary resistance value and wattage, while adding a conservative amount to the wattage rating. Was I in for a surprise when I applied power! Right away the resistor went up in smoke. Further investigation showed what went wrong. While the situation is not quite the same as described in Peter's recent column, the required power in his case may also be underestimated.

In my case, I had an old boat-anchor Hallicrafters SX28 receiver. I wanted to replace the vacuum tube rectifier with a couple of semi-conductor rectifier diodes. These diodes drop only a volt or so, while the vacuum tube rectifier dropped much more. So I decided to put a series resistor in series with the high-voltage winding (the filament voltages were okay, so I did not want to put the resistor in series with the primary winding).

I measured the DC current, which equals the average AC current supplied by the high-voltage windings, determined the required voltage drop to simulate the effect of the vacuum rectifier, and from there got the required resistance and wattage, and yet things burned.

What happened was that the SX28, like many other pieces of electronic equipment, uses a capacitor-input filter. In such equipment, the AC current is not sinusoidal but occurs in narrow, high-intensity spikes at the crest of each half-wave. This is especially true if low-resistance semi-conductor diodes are used.

In Peter's application, he put the resistor in series with the primary. The relative amount of spiking is less than in my case, because the part of the current supplying the filaments is sinusoidal and the use of a vacuum rectifier with its equivalent resistance would spread out the length of the spike and diminish its peak value, but still the current has spikes.

Now, here is the potential problem if you measure this current: many AC current meters, such as the old analog mechanical ones, assume that the current is sinusoidal and, based on the average value of the measured current, they compute and display the rms value, which would be about 10 percent higher if the current is really sinusoidal. Measurement with such a meter can seriously underestimate the computed power dissipation if the current is spiked.

If we would use a more expensive, true rms meter to measure the current, and base our computations on its readings, we would see this higher value and obtain the correct wattage values.

I should also note that in my case, where I wanted to replace the vacuum rectifier, the computed resistor value, even when I used one with much higher wattage, gave disappointing results: The resistor limited the value of the current spikes, which prevented the input capacitor of the filter to charge up to the peak value of the AC voltage each time, and the resulting voltage drop was higher than I anticipated. This also tended to limit the current spikes, but still the problem with the spikes exists.

So, unless you have a true rms meter, you need to be conservative in your wattage computations. I must also add that the Dale resistors mentioned in the article require a heat sink of some kind, such as mounting on a metal chassis if running at full power.

Guy Olbrechts, NY7O
Via e-mail

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A publication of

CQ Communications, Inc.
25 Newbridge Road
Hicksville, NY 11801-2953 USA

Offices: 25 Newbridge Road, Hicksville, NY 11801. Telephone (516) 681-2922. FAX (516) 681-2926. Web Site:<http://www.popular-communications.com/> Popular Communications (ISSN-0733-3315) is published monthly by CQ Communications, Inc. Periodical class postage paid at Hicksville, NY and additional offices. Subscription prices (payable in U.S. dollars): Domestic—one year $28.95, two years $51.95, three years $74.95. Canada/Mexico—one year $38.95, two years $71.95, three years $104.95. Foreign Air Post—one year $48.95, two years $91.95, three years $134.95.

U.S. Government Agencies: Subscriptions to Popular Communications are available to agencies of the United States government, including military services, only on a cash with order basis. Requests for quotations, bids, contracts, etc. will be refused and will not be returned or processed.

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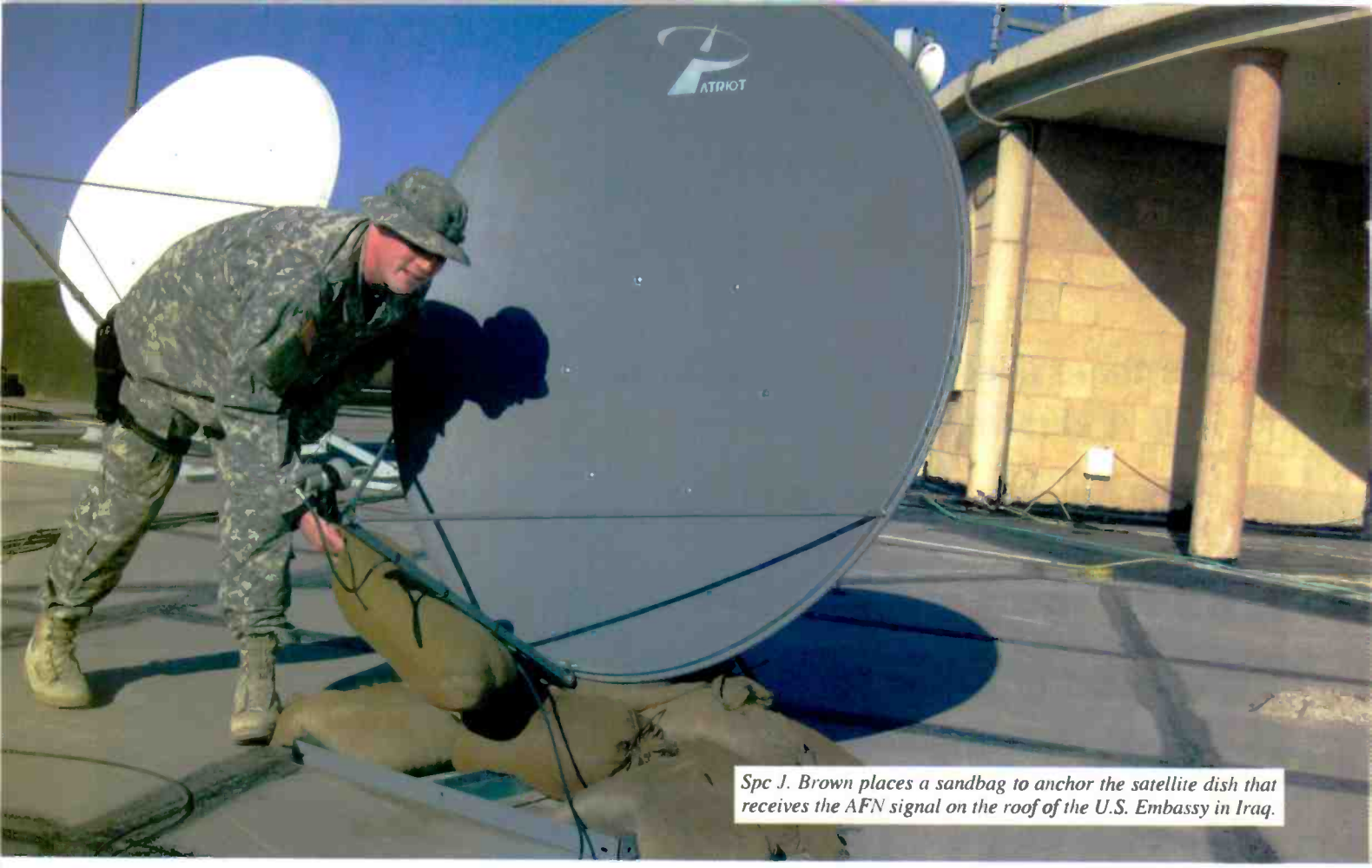

Spc J. Brown places a sandbag to anchor the satellite dish that receives the AFN signal on the roof of the U.S. Embassy in Iraq.

Jocks And Awe— AFN-Iraq, Coming To You Live From Baghdad

The Challenges Of Entertaining Our Troops From A War Zone

by Sgt. Frank Pellegrini

Dec. 23, Baghdad, the morning show. DJ Sgt. Micah Miller knows that it's the time of year when everybody's got an extra-soft spot for the troops over here and for slices of home like American Forces Network radio. Somebody from NBC is due in the booth soon to film Miller while another reporter catches some soldiers listening to his show.

"They're focusing on being deployed during Christmas," Miller says. "They want to know if AFN helps. And what AFN's actually doing."

Well, today, AFN-Iraq is going easy on the Christmas music.

"It cuts both ways for these guys," Miller says. "I had an uncle serving in Korea who actually got into a huge bar fight because of a Christmas song that depressed a couple of people in the bar. He has a scar to this day from that fight. So I'm not big on playing a lot of Christmas music, because some people just get more depressed when they hear it."

Not that culture-war types have anything to complain about. Miller has been saving up holiday news and facts ("those Christmas lights have been catching trees on fire since 1895"), and he's been pushing his preferred brand of "well-disguised command information." He works operational-security messages into an off-the-Internet bit about the "Top 5 ways your computer can get you fired" and deploys the pill-popping misadventures of "Fallout Boy" bassist Pete Wentz as a holiday-aware (but un-preachy) anti-suicide message: "Anytime you've got a fascination with death, get help right there—don't let it get to the 'I'm taking a whole bunch of sedatives' phase of your life, because it's never pretty."

Sgt. Pellegrini is a member of the 356th Broadcast Operations Detachment. He served as an Army print journalist during the invasion of Iraq in 2003 and has a background in civilian journalism.

Staff Sgt. Christopher McDonald, chief of technical engineering for AFN-Iraq, inspects the transmitter that his team recently installed on the top floor of the U.S. Embassy in Iraq. The transmitter greatly improved radio reception in Baghdad's International Zone. (All photos by Maj. Gary Sheftick)

Sgt. Matthew Jones checks a cable going to the antenna for Freedom Radio on the roof of the U.S. Embassy in Iraq.

But Miller keeps the Christmas fare light, preferring Weezer's "The Christmas Song" to Nat King Cole's memory-inducing standard. More often than not, tuning into 107.7 "Freedom Radio" during the four hours of "Micah in the Morning" gets you the same sound on December 23 as it would on any other day: some news, some banter, a few jokes, and lots of what Miller calls "Top 40 with an edge." There's rock from the likes of Red Hot Chili Peppers, Republica, and 30 Seconds to Mars, a little rap, but not too much. The music's hip enough for the young but tolerable for everybody else.

Such are the ways a military DJ in Baghdad goes about his trickiest mission: pleasing everybody, without offending anybody, or boring everyone.

It's safe to say that every member of the 356th Broadcast Operations Detachment, as they made the rounds of friends and family explaining that they'd be spending their year in Iraq manning the airwaves at AFN-Iraq, heard one thing again and again:

"Oh, like *Good Morning, Vietnam*."

Well, sort of.

Even *Good Morning, Vietnam* wasn't really like *Good Morning, Vietnam*. The star of that movie, morning-show DJ Adrian Cronauer, remains the only Armed Forces Network jock even remotely famous for being an AFN DJ (fellow alums Pat Sajak and Johnny Cash made their names after serving). But he regularly reminds graduating classes at the military public-affairs academy Defense Information School that if he'd pulled even half of Robin Williams' antics, well, he wouldn't have been on the air—or in the Air Force—for very long.

Yet for military broadcasters, the movie, and the mission it depicted, still conjures a vision of the best radio gig in the world: a captive, deserving, wildly appreciative audience, predictable demographics, and a dearth of other entertainment options.

But since then it's gotten more complicated. For starters, thirty-odd years after Vietnam, the all-volunteer armed forces at war are no longer dominated by uneducated young men. The Forward Operating Bases and International Zone offices of Iraq are filled with a mix of all backgrounds and all ages.

"It's not just a military of young men anymore," said 58-year old Sgt. 1st Class Jim Ayers, proving the adage himself. "There are a lot of old fogeys like me out here too."

Then There's The Music

The sound of American popular music in wartime is no longer the relatively homogenous mix of the past, with Jimi Hendrix, The Doors, and the Rolling Stones. The same entertainment and cultural equation that has besieged radio over the past several decades (diversity + technology = the splintering of the audience) has made its way to the war zone, too. Troops here have MySpace pages and Xbox consoles. Thanks also to AFN, they also have cable television and MTV. The British forces here have their own station with its own flavor and there's even an Iraqi station in Baghdad that plays hip-hop.

Most significantly, today's deployed troops have brought all their favorite music with them. "Everyone's got their iPods," says Miller, wincing at the little word. "They carry around what-

ever music they want. It's kind of hard to compete."

None of this was unknown when the 356th was preparing to deploy during the spring and summer. The unit didn't lack for experienced jocks. Miller spent five years as a small-town jock in Idaho and a few months spinning for the Army in Somalia. "The whole Black Hawk Down thing happened literally as we were packing our bags. Definitely a heightened sense of holy crap," he recalls. "By the time we got there they were already drawing down." Another DJ, Staff Sgt. Dave Howell, who experimented earlier in the fall with an R&B show called "Urban Renewal," was on the AFN airwaves in Korea and Japan earlier in his career.

Ayers, the unit's top enlisted soldier, is the granddaddy of them all. Possessed of a voice you can feel in your combat boots, Ayers was on the air for the Air Force in Germany when Cronauer was having his heyday in Saigon, then parlayed it into a decades-long, major-market run in West Coast civilian radio. Along the way, he'd gone from airman to marine to soldier, and is coming to the end of a 35-year military career. This year in Iraq is his swan song, Ayers says, the last big adventure before the porch in West Texas.

The last stewards of the station AFN-Iraq, a BOD (Broadcast Operations Detachment) out of Houston, had set a pretty high standard. Spc. Kristen King had conjured Cronauer's ghost by attracting a discernible following (and some U.S. media attention) as the host of a mid-morning "Country Convoy" show. Ayers had walked away from civilian radio a few years back ("just burned out on it") and didn't even plan to be on the air. But by the time the 356th arrived in Baghdad in mid-July, he had made all the phone calls and read all the surveys, and he had big plans to make AFN-Iraq sound like "real radio," a military station that would rock the military's world.

Unfit For Duty

When he arrived in the combat zone, he found his radio station unfit for duty. The preceding unit explained that the station's satellite uplinks were broken, reducing AFN-Baghdad to a phantom outfit: Germany picked and played the music, and the 356th DJs would phone in their song intros and banter over long-distance lines. Technically it worked, but it sound-

Please Stand By

AFN has been delivering its "little bit of home" to U.S. troops stationed around the world since 1942, by a variety of means. During World War II, AFN borrowed British equipment to broadcast to U.K.-based American troops preparing to invade Nazi Germany. The first AFN broadcasts of Vietnam were delivered by "flying studios" aboard U.S. Navy planes.

These days, it's all via satellite. AFN-Iraq sends its own raw 70-MHz signal to an up-converter, which beams it up at an 11- to 15,000-Ku band to a dedicated "bird" in the sky, which beams it back down to Mannheim in Germany, where AFN there beams it back up to the bird. The 18 FOBs (Forward Operating Bases) in Iraq can then downlink AFN-Iraq's radio signal, along with all the TV channels on the modern troop's beefed-up programming menu, and broadcast it out to the troops with individual transmission towers.

But a series of technical difficulties, mostly having to do with power, have plagued AFN-Iraq's current crew from the day they arrived. "The studio had been having one or two outages a day, on average," recalled Staff Sgt. Chris McDonald, head of AFN-Iraq's maintenance team. "The equipment was not properly protected as far as power conditioners and voltage regulators. So all that on and off, on and off, the voltage spikes—the first thing that went was the SPAWAR [Space and Navel Warfare] up-converters."

For reasons known only to the company, the contractor's 48-hour response time to get the AFN uplink operational slipped to nearly a month before technicians even made the trip from Balad Airbase north of Baghdad. The initial delay was compounded by a return trip for an uninterruptible power supply—to prevent the uplink from going down again! "At that point we were back on air," says McDonald, "but the UPS was only enough for the satellite equipment. Every time we lost power, the rest of the studio would go dark, and all the systems would have to be rebooted and recalibrated." More digging eventually yielded a massive 30-amp, 6000-watt UPS for the rest of the studio.

Next, the techs tackled a different kind of infrastructure problem: coverage in their own backyard. The main transmitter in Baghdad was an FM 1000-watt transmitter with a monster antenna mounted on a tower at Camp Victory, serving a complex of Baghdad FOBs spread across about 15 miles. But in the International Zone, where AFN-Iraq's DJs worked and lived—not to mention their high-ranking bosses—the signal was too weak to be heard except on car radios near the IZ's edge.

A 50-foot telescoping antenna designed for combat use was ordered, along with the necessary satellite decoder and an FM 100-watt transmitter. But where to put it? McDonald and his crew needed not only a lofty perch, but one they could have regular access to since the Iraq dust makes regular maintenance a must. The best bet was the roof of the U.S. Embassy. But securing the antenna's guy wires by traditional means (drilling in bolts) was a no-no on the palace's flat roof. (It does rain in Iraq, you know.)

Eventually the contractor for the embassy grounds, Kellogg Brown & Root, found some pre-made cement blocks listed at 150 pounds each. But McDonald knew something was wrong when they provided a crane to get them up on the roof.

"They turned out to be about 500 pounds each," he said A few bent pry-poles and an industrial-strength dolly (the kind they use to move safes) later, the first ring of guy-wires were lashed to the blocks and definitely not going anywhere. The outer ring of wires "had to be tied to the ducts, the ornamental roof trim, anything we could find," said McDonald.

Six months into the 356th's tour, the antenna is still standing. AFN-Iraq is on the air at the embassy, and everything's on a generator and backed up for maintenance changeovers.

One last piece of the puzzle is its new AudioVault. This computer-and-software combination McDonald calls "an MP3 player on steroids" represents the electronic heart—and much of the music library—of the AFN-Iraq operation. But months of power-outage shutdowns have taken its toll on a hard drive that was six years old to begin with. It crashes several times in any given show, the DJs report, sending them scrambling for a CD while they reboot all over again. A new 500-gig system is on the way.

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Price schedule effective January 2, 2006 AD #010206 © 2006 Communications Electronics Inc.

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Sgt. Matthew Jones points out the microwave dish that sends the Freedom Radio signal from the roof of the AFN-Iraq studios to Mannheim, Germany. From Germany the signal is relayed to forward operating bases in Iraq and Kuwait.

Sgt. Andrew Brucker hosts "Country Convoy" on Freedom Radio from 2 to 6 p.m. weekdays.

"For Miller, Brucker, and Campsey, it's more about letting the soldiers, sailors, airmen, and marines here forget about it all for a little while."

ed lousy. Not only that, there was no reliable signal in the International Zone where AFN-Iraq's station—a collection of trailers nestled in the bottom of a parking garage—was located. The station was an unknown even in its own backyard.

Several rounds of repairs, retoolings, and rewirings later (see sidebar "Please Stand By"), AFN-Iraq was back on the air with an entertainingly innuendo-laced "Morning Madness" with Miller and Spc. Adrianna Mozzo leading things off and Ayers himself anchoring the afternoons with the '70s-centric, fun-for-all-ages, "Good Time Rock 'n' Roll Radio Show." The station settled on a newswoman in Sgt. Misha King, a honey-voiced former print journalist who'd volunteered for a second Iraq tour in as many years. By fall, Ayers felt confident enough to surrender the mic and go back to minding unit business, and he put Miller in charge of the staff.

Two months later, Miller still feels sometimes like he's starting from scratch. "I think our various technical problems have greatly reduced our listeners," he says, and the station is down to three jocks a day. (The 356th's other mission, the labor-intensive daily TV newscast "Freedom Journal Iraq," continues to employ the bulk of the unit's broadcasters.) The lack of extra personnel has the station going to satellite feed at night and sometimes on the weekend.

Nobody Puts Down Their iPods For Satellite

But Freedom Radio marches on. Miller, the mainstay, is now alone from 6 to 10 a.m. ("I miss being able to play off Adrianna, but it can be nice knowing exactly what comes next," he says, grinning.) Sgt. Andrew Brucker is carrying on "Country Convoy" from 10 a.m. to 2 p.m., and learning to put his western-Pennsylvania shtick to endearing use. Staff Sgt. Linda Campsey, serving up classic rock from 2 to 6 p.m., tries to make "a personal connection" with those young men and women who could use another mother out here, while letting her ex-hip-

Sgt. Micah Miller injects a bit of humor into his "Morning Madness" show as afternoon DJ, Staff Sgt. David Howell, stands by and Staff Sgt. Linda Campsey checks audio levels.

pie, wild-child side run loose a little—just the kind of thing Miller is looking for to make the second half of the 356th's year a rebirth to remember.

"I want to polish up the shows a lot. We have music, we have some talking, but we don't have a lot of, 'Hey, I want to tune in, I want to catch that tomorrow,'" he says. "I'm trying to get everybody on the team to add a little bit of personality, a little bit of information, things that people can't get on their iPods," he says. "Maybe some humor, maybe some news. Something."

Yet while the crew continues to search for that "something"—the same bit of listener-addicting magic that every radio station from Baghdad to Boston is in an endless struggle to find—there is one easy thing about working at AFN-Iraq: You never have to wonder who you're trying to please.

"People ask me how Iraq is, I say 'I'm the wrong person to ask,'" says King, the newswoman who supplies two minutes of local news after every top-of-the-hour AP feed. "We have it pretty easy here. We're not the ones out there pounding the streets. But we take care of the guys out there pounding the streets. We entertain them, and we tell them what they need to know."

For King, that means "news they can use," delivered by culling through translated Iraqi news coverage to give soldiers a sense of what impact they're having on the country they're risking their lives for. For Miller, Brucker, and Campsey, it's more about letting the soldiers, sailors, airmen, and marines here forget about it all for a little while.

AFN-Iraq's target audience is the weary infantryman, back in the hooch after surviving another patrol. It's the mechanic, elbow-deep in a dust-clogged Humvee engine at the motor pool. It's also the desk jockeys, who came all the way to Iraq to fight a guilty feeling they weren't doing really meaningful work. So AFN-Iraq's DJs, who know that feeling, don't lack for motivation. To them, audience size isn't just a number, or a possible Christmas bonus—it's their purpose in life this year.

The good news is even when it feels sometimes like no one's listening, in this high-wired, custom-playlist, splintered-audience world, the audience is always a little bigger than you think.

Miller gets a regular phone request for "Lips of an Angel" by Hinder from an Iraqi woman in Baghdad (alt-rock is very popular with the locals). And a few months ago, an iPod-owning wife back home, getting a slice of Baghdad on the Web from AFN-Iraq's website (www.mnf-iraq.com), sent out a very special birthday request to her deployed husband. He didn't happen to be listening, so she sent him this e-mail afterward:

> Although I was intent on asking the afternoon DJ to play "Thunder Road" for you, I decided at the last minute that "Born to Run" was a better way to go. You can imagine my surprise when Sgt. Ayers said, "You're not going to believe this." Just a moment later I heard the blazing ramp of "Born to Run," already queued up. Like a wonderful and comforting favorite uncle, Sgt. James Ayers gave me that feeling that things are not just meant to be, but that they are also going to be all right somehow, even between Baghdad and New York.

Try getting your iPod to do all that.■

Sgt. Misha King reads the news live on Freedom Radio a few minutes after the hour as Sgt. Andrew Brucker prepares to play the next "Country Convoy" tune.

Whatever Happened To

Change Is Inevitable—Especially In The World Of Technology—But We Sure Miss The Days Of Free Batteries And Catalogs!

by Shannon Huniwell

"If he ever sets foot in this studio again, he'd better pray that I'm not here! Tell him he's fired! *F-I-R-E-D!*" shouted the frantic owner of a rural 3000-watt FM station. The frazzled proprietor of that bare-bones frequency modulation operation was nearly beside himself after discovering that one of his two part-time weekend announcers had "borrowed" three of the station's four microphones.

The perpetrator, who typically did the Saturday and Sunday sign on-to-noon air-shifts, figured that the mics wouldn't be missed because the FM often cruised along on the remainder of the weekend with a solo beginner-level board operator reading weather forecasts, tracking some easy-listening LP albums, doing time checks, and spinning discs containing syndicated fare like "American Top-40," "Powerline," and "Country Crossroads." The guilty employee's plan was to simply "appropriate" the microphones long enough for use at a musical gig that some rock band buddy arranged at the last minute.

"Did he say where his so-called band was going to be playing?" the station owner questioned the other part-timer.

"No, Boss. He just mentioned it was some funky bar out of town. I thought he had permission to take the mics and stuff."

"And stuff? Don't tell me he took microphone cables, too!"

"Uh, yeah, Boss, but I bet he'll bring it all back tomorrow. I think that's what he said, anyway."

"Dagnabbit all! What am I going to do tonight? Uh, oh, that's right. Tonight is supposed to be our remote at the Grange Hall."

Three months earlier, the head of the local Grange organization's "shindig fundraising committee" inked a $500 deal for the modest FM to run a live broadcast from the Grange Hall during the now likely disastrous evening in question. To prepare for the radio fundraiser, Grange members had been busy selling basic $5 ads, sponsorships, and greetings from Grange friends that would be aired on the special program. They managed to rack up orders for a couple hundred such announcements, meaning the Grange could easily pay the station *and* pocket decent bucks. Live music was to be provided by a half dozen country & western groups, each slated to perform for about an hour. With the abundant radio advertising revenue, admission charge, 50-50 raffles, and refreshment sales, the event had promised to be an enjoyable—and pretty profitable—benefit.

The station owner looked at the big studio clock and nervously chanted, "4:47, 4:47."

"The remote starts at six, don't it, Boss?"

"Yeah, and where in the heck am I going to find a broadcast quality microphone with an XLR plug and cable around here at 4:47—make that 4:48—on a Saturday afternoon?"

<*melodyfm@dreamscape.com*>

Pre-Tandy Radio Shack advertising focuses on getting a catalog into the hands of the early 1960s' legion of stereo buffs, CBers, tape recording enthusiasts, electronic experimenters, and kids practicing code for their ham test. Interestingly, the ad mentions Radio Shack as having "sporting goods," inventory not now recalled by even the most senior "Shack" shoppers.

Had it not been for the barely audible sound of Paul Muriat and the Orchestra's "Love Is Blue" seeping through the monitor speaker, the control room would have been bathed in deadly silence while the FM owner continued frantically cogitating. Just after the album tracked into the next cut, his employee practically whispered a suggestion, the only possible solution that came to mind.

"Uh, how about RadioShack?" he sheepishly offered.

"*Radio Shack?*" his employer repeated with a bit of sarcasm in his agitated tone. "*Radio Shack?* I doubt they'd have mics

Solid-state "modules," such as a low-power guitar amp, auto burglar alarm, and wireless phono oscillator, were popular mid-1960s Radio Shack electronic hobbyists' items and only required knowledge of a screwdriver and hook-up wire. Most of these Hershey Bar-sized units cost less than five bucks. For the more adventurous, the company offered electronic project books and "surprise paks" of components like transistors—a 100-piece bag of semiconductors for $2.98!

and cables we could use with our Marti remote transmitter," the station licensee stated. "But it's better than anything I can think of at this point. It's worth a shot, anyway. Call Arnie over at the hardware store and tell him not to close up until I get there."

An instant later, the broadcaster's car had negotiated all of the puddles in his station's long, gravelly driveway and was double-timing it towards the community's modest downtown. The Radio Shack there was actually a Radio Shack Dealer franchise, as opposed to an official company owned unit, and shared space with the franchisee's main business, a hardware & appliance store.

"Arnie, I got a real problem," he admitted while barely inside the store's old oak framed door.

The bells dangling from a length of bailing wire strung above the door's glass were still jingling when Arnie gestured, "Right this way, Ed. Your DJ tells me you need some gear to do the Grange show tonight, and I think I just might have what you want."

The men strode past a patch of GE and Emerson TV sets, through a nicely arranged stand of bright white Kelvinator and Norge and almond-colored Westinghouse refrigerators, stoves,

Here's how readers of Popular Mechanics-type magazines were enticed to send for Tandy's leathercraft catalog. This modest classified is from 1960.

and washing machines, by several bright blue pegboard walls of hand tools, and over to a counter sporting a Radio Shack logo and a colorful cornucopia of transistor portables. From behind another pegboard partition, this one sprouting rows of bagged and bubble-packed small electronic parts, Arnie produced a dusty box bearing the inscription "Realistic Super Omni Directional Dynamic Microphone."

"That might do the trick *if* it has the proper connector," hoped the station owner.

"Well, let's see," Arnie said as he slid the mic out of the carton. "Is this what you need for your remote transmitter?"

"By doggies, Arnie, that's an XLR termination on that mic! That's the one! If you can get me a cord to hook to it and go to my remote unit, we're cooking with gas!"

But while one end of the cable tightly packaged in the microphone box had the requisite female XLR connector, the other side was fitted with a consumer-grade standard audio plug. When the broadcaster realized that, he moaned, "So very close, but that thing won't hitch to the XLR female on our remote input."

"Don't give up yet, Ed," preached the Radio Shack man. Issuing a lengthy "hmmmm," he studied the pegboard wall. An intense minute later, he plucked off an obscure little bag. Its stapled on, salmon-toned cardboard label identified the contents as "standard audio plug female-to-XLR male." "I bet that'll work, Ed," Arnie smiled.

"Amazing! Absolutely amazing that you've got these things! You're probably the only source for broadcast mics and cables within 75 miles of here."

"Uh, to be honest, Ed, I didn't even know what an XLR plug was until your DJ phoned me," Arnie explained. "When I took on the Radio Shack dealership, a bunch of inventory I never figured I could move came with the franchise and were among the initial shipment of the more popular items, like CB transceivers, Archer TV antennas, those 9-volt pocket transistor portables, and a crystal radio kit or two that sell well around our area. That mic and adaptor you've got in your hands have been gathering dust for years. Hey, I probably shouldn't tell you that, though. With the important remote broadcast and all tonight, I could have held out for big, big money!"

Arnie laughed. In fact, he never put a price on the microphone and plug nor would he accept any cash. "Think of it as one poor old local entrepreneur helping another," the shopkeeper noted in a stubborn, though friendly, fashion. "Come on, let me lock up the store! It's 15 minutes past closing time and me and the wife have plans to go to some fancy Grange shindig we hear might be a bit of fun. If you don't let me get out of here now, I'll be reduced to listening to it on the radio!"

A Great Deal!

Arguably, Arnie the Radio Shack dealer had just conducted the smartest business deal anyone needing advertising could have

The Radio Shack logo became the inspiration for this AM radio, circa 1970s. Typically, the 9-volt rectangular battery to power it came to the buyer as a freebie. Into a bag with the radio, sales slip, and battery often went a battery card, with which the bearer could get a complimentary battery of his or her choice—every month. Some big city Radio Shack regulars had a wallet full of these battery cards and amassed an impressive stash by hitting up each Shack in their region.

engineered. Starting that evening, and for a long time thereafter, his station owner buddy "bonused" plenty of freebie commercials to the hardware store/Radio Shack's regular ad schedule. And that Realistic mic sounded so crisp that several more were special ordered for the FM studios. Also from the *Radio Shack* dealer, and providing reliable service at the station, came dozens of replacement parts, like resistors, switches, diodes, and capacitors used in revitalizing everything from the production room board to the 10-watt exciter in the Gates FM-1C transmitter.

Things at the Grange affair finally quieted down around midnight. Before wrapping up the remote broadcast, the station owner took a few remaining minutes of airtime to summarize the microphone saga. He thanked Arnie, and then gave special kudos to his loyal station employee who suggested where to get a mic in the middle of nowhere. The few folks still listening at that hour probably noticed that the part-timer sounded pleased while delivering a final weather report just before cutting the transmitter's high voltage. He decided to stick around a while, do a little cleaning, and maybe see if his boss wanted him to pull a double Sunday shift to replace the "fired" colleague.

Exhausted, but relieved to have been able to meet his station's important contractual agreement with the Grange, the FM owner packed up his remote gear, including that Radio Shack mic, and happily made his way back to the rain-rutted driveway. As luck would have it, while attempting to hop from his car to a reasonably dry stretch of parking lot, he dropped the microphone into a puddle deep enough to have its own submarine base. Fishing it out was a cold, messy process.

The part-timer opened the lobby door just in time to see his employer walking in small steps toward the building while vigorously shaking the water from the slender silver Realistic mic. Considering that sight, the youthful announcer blurted out the only thing he could think of to say, "Hey Boss, I didn't know you was a Catholic."

Expending A Little Shoe Leather Walking Through Radio Shack History

Okay, a cowhide connection doesn't enter our story until at least four decades after Radio Shack's 1921 debut. But we'll lace up that important tie later. Fascinated by the burgeoning amateur radio hobby, New England brothers, Milton and Theodore Deutschmann opened a Boston-based shop filled with the gadgetry "ham" operators and wireless enthusiasts liked. Rather than coin a completely new name for their enterprise, the Deutchmann's co-opted a key term used by the genre's most serious practitioners: shipboard radiotelegraph personnel who worked in their vessel's cluttered little electronic communications room or "Radio Shack."

The early-1920s founding allowed Radio Shack to grow up with the then-fledgling broadcasting industry. As more stations hit the air, shifting the focus from dots and dashes to voice and music, the market expanded exponentially. By 1939

During the late 1990s, my well-to-do and wonderfully frivolous Aunt Melissa asked my Dad what he had on his Christmas list. He'd just seen this "mity-thin FM Stereo-Mate" in a Radio Shack flyer and made his wish known to her. "Ah ha! My dear sister came through!" he announced with glee on Christmas morning. The radio came with a battery charger (for the internal battery) and was only as thick as needed to accommodate the sub-miniature headphone plug. Like many Radio Shack "gimmick" products, its novelty faded, causing the little receiver to be relegated to its original box.

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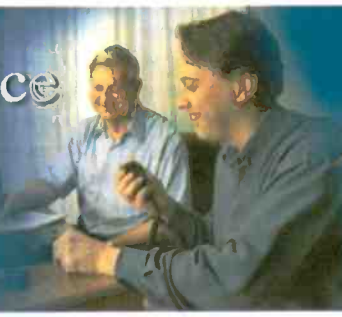

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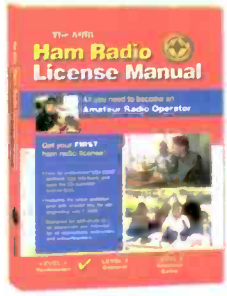

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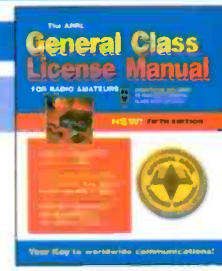

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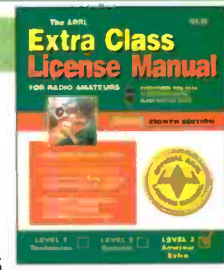

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At $29.99 in 1970s money, the TRF long-range, tuned RF circuit AC/DC portable was an expensive AM portable. Still, the selective, three-ganged capacitor-equipped radio proved a favorite with broadcast band DXers.

the brothers began publishing catalogs that extended Radio Shack's wares beyond experimenters' parts and solidly into the realm of ready-to-use consumer electronics. More importantly, these advertising flyers expanded the firm's distribution possibilities from Eastern Massachusetts to anywhere with postal service.

Corporate press cites 1947 as the year Radio Shack "entered the growing high-fidelity market and opened the nation's first audio showroom that provided comparisons of speakers, amplifiers, turntables and phonograph cartridges." So successful was this approach that, in 1954, company officials decided to contract with small electronics makers to manufacture a line of radios dubbed with the private-brand "Realist." But a lawsuit from someone else claiming the moniker quickly led to the label being recast as "Realistic." Arguably, this identity better served the company's desire to associate its receivers and tuners with the more life-like high-fidelity sound just starting to attract the average radio buyer.

Free Catalog

Central to Radio Shack's brochure barrage was its tactic of issuing not only a main catalog for a given year, but also subsequent updates to further entice electronics buffs. Part of the fun in receiving the promotional booklets was in never knowing how many extra mailings there'd be or when to expect them.

Often the emphasis of Radio Shack magazine advertising surrounded a "subscription" coupon for its catalogs. The April 1960 edition of *Science and Mechanics* exemplifies this. On page 20 of that issue, Radio Shack urged readers to make the following request:

> Please send me, FREE and POSTPAID, your latest Electronic Catalog. Also send me every new issue for the next 12 months—a full year's subscription FREE.

The company touted "the most complete lines of electronic equipment in America—stereo, hi-fi, ham radio, LP records, tapes, optical goods, and scores of others. Over 100,000 items; everything for the amateur, the pro, the devotee or just the interested." Sporting 312 pages, the catalog promised even those who might be, "just the interested" a lot of goodies to consider. For example, it offered a "Radio Shack transistor battery radio. Only 2-5/8 x 4 1/4 inches in size. Weighs less than 10 ounces. Built-in speaker and ferrite antenna. Conelrad [civil defense] markings, handsome molded case. A $19.95 value—Only $9.95."

That reasonable price resulted from "the Shack's" penchant for finding private-label contractors who would produce a useful product with decent components and cheap labor. From the mid-1950s onward, this often meant finding a hungry partner in Japan. The mail order operation and nine Radio Shack retail outlets were doing business in the Kennedy era, but, what a contemporary Radio Shack retrospective calls, "hard times due to poor operating practices," tossed the firm on the precipice of bankruptcy.

A New Era

Enter Charles D. Tandy. In 1919, Tandy's father, Dave, along with his friend Norton Hinckley, had opened a leather company that marketed shoe parts in the Dallas-Fort Worth region. Years later, as a Navy man in World War II, Charles Tandy had noticed that leathercraft, such as wallet kits and belt-making material, "was being used as a therapeutic tool for patients in military hospitals and by servicemen in recreation and rehabilitation centers." He convinced his father that leathercraft should be Hinckley-Tandy's main push. Hinckley didn't agree, though, so, in 1950, he broke off with the part of the firm that specialized in shoe repair components; the Tandy part catered to leathercraft hobbyists.

Within five years of the split, Tandy Leather Company assets included 67 stores and a mail order arm with combined annual sales of eight million dollars. Charles sold his family's business to Boston-based American Hide and Leather, a once promising organization that soon

Here's one of the stars of this month's column. Famous mic maker, Shure Brothers, Inc., produced this professional-quality Realistic microphone for Radio Shack. When identical units—bearing the Realistic sticker—began appearing at TV news conferences and photo ops, showing up on the scene with a $30 microphone became quite acceptable in the electronic media world.

While in my freshman year in college, I bought this AM Stereo Tuner from a Radio Shack near campus. At the time, I was dating a sophomore who was the all-night weekend announcer at a regional station running Motorola's C-Quam AM stereo system. Perhaps as an ode to young love and loyalty, I thought it'd be wonderful to hear him dedicate a tune to me, left and right, as opposed to mono. I should have known that—like most stereo FM operations—the station only ran music (and not the DJ) in stereo. Anyway, the guy transferred to another school and, not long thereafter, into another relationship. AM stereo didn't last either, so the tuner went back in its carton.

found itself floundering under a string of unwise acquisitions. Because the Tandy division kept it from complete collapse, in 1959, Charles convinced the board to let him run what soon became the publicly traded Tandy Corporation.

Four years later, he directed his firm to pay about $300,000 for the financially troubled Radio Shack chain. It didn't take long for leather to take a back seat to electronics. The catalogs got even larger and stores started popping up in so many locales that Radio Shack could eventually brag, "95% of Americans lived or worked within a 5-minute drive of a Radio Shack outlet."

"I Learned More In Radio Shack Than In Private School!"

Pop'Comm reader Bob Canorro picks up an interesting nuance of the story. In the fall of 1967, his parents enrolled him in Westford Academy, a tiny private high school newly established in the basement of a West Hartford, Connecticut, office building. He remembers absolutely hating everything about that academic year—except for the Radio Shack he noticed next door at 39 South Main Street. Canorro recalls,

My folks made me go to the private school because they figured it'd help me make better grades. Instead, it made me mad to be separated from all of my friends back home. The first day of school I was so nervous and lonely that I felt like either throwing up or running away. During lunch break, I ventured up from the subterranean classrooms in order to scout escape routes. That's when I spotted the adjacent Radio Shack and found myself first gazing through its huge front window and then cautiously stepping inside.

Those were still the "get lost kid, you can't come in here without your mother or father" days, so I wasn't too sure a 13-year-old with no folding money would be welcome in a store that appeared to have expensive grown-up stuff. Much to my surprise, the sales clerk greeted me and invited questions. "Just looking today," I replied as politely as possible without wanting to seem like a nerd. From the looks of the other staff and customers, though, the place appeared to be a safe harbor for nerds, or at least a haven for people hoping to jump on the electronics hobby bandwagon.

What sticks in my thoughts is the sun pouring through the picture window and making the colorful things in the display case seem larger than life. A neatly arranged row of gray, plastic, 100-milliwatt Archer walkie-talkies come to mind. I think they were "crystalled" to CB Channel 14 and sold for $9.95.

The sound room is also a vivid memory and possessed a secure feel, accented by the brightly equalized audio carrying a mellow Herb Alpert & the Tijuana Brass song from reel-to-reel tape deck to Realistic tube amplifier to walnut-cased speakers to my ears. A salesman in a tweed jacket and smoking a pipe pointed to the shelves of stereo components and smiled, "Pretty fine reproduction, wouldn't you say son?"

I nodded approvingly, waited a few minutes so that I could look deliberative, nod again, and gracefully walk towards the back of the store where bins and pegboards held items both unfamiliar and fascinating to me. One section featured bagged kits with promising outcomes the likes of a Hobbyist's One Tube Radio, Wireless Mic/Transmitter, 2-Transistor AM Radio, and Electronic Organ. Even the cheapest kit, the Wireless Mic at $2.98 cost about $2.50 more than my pockets boasted.

That's why I was thrilled to come across a pile of light green circuit boards pregnant with transistors, diodes, and resistors—an unadvertised special reportedly ripped from some newly refurbished government electronic device—offered for a dime a piece. I selected one,

It wasn't uncommon for Radio Shack graphic designers to put an evocative line drawing in the company advertising and on product packaging. Note the happy little concert grand pianist gracing the box for Radio Shack's Realistic Model SA-100B Solid State Stereo Amplifier. This peppy 10-watt amp was manufactured in Japan and made for a nice entry-level unit that could be mated with a budget minded audiophile's turntable and headphones, or maybe connected to a pair of small speakers.

though had no knowledge why it might be better than any other, and then happy to be a paying customer, walked towards the check-out counter.

To my amazement, the clerk complimented my decision, noting that the chosen circuit board was dotted with three germanium diodes—any one suitable for serving as the main component in a crystal radio. On the paper bag about to tote my shrewd purchase, the guy even drew a quick schematic for such a receiver. Then he threw in a catalog and free plastic magnifying lens.

I left the place as a true Radio Shack fan and over the decades have probably spent a couple thousand bucks at various Radio Shacks from Connecticut to California. My favorite possessions from there are the unique items marketed to introduce new technologies or must-have electronics, things like Realistic CB transceivers, the 1977 model TRS-80 personal computer, a late-1980s credit-card sized FM radio, 1970s Radio Shack logo AM transistor radio, and mid–1980s AM stereo tuner.

I loved to get the big catalogs and colorful newsprint flyers, see pictures of the latest items Radio Shack was publicizing, and then see them in real life at the store. I don't know how to explain that fun experience other than saying that the real thing was often surprisingly smaller than the catalog picture, even though the advertising spread usually include fine print

Labeled, "Radio Shack Fresnel Lens 4X Magnifier-Japan," this promotional piece represents the type of useful giveaway that motivated many hobbyists, do-it-yourselfers, parsimonious people, and just plain curious folk to head into their local Radio Shack. Once there, corporate officials figured the store's interesting inventory would prompt immediate sales. The magnifier is numbered #64-444, likely indicating it came from a batch of such items produced in 1964.

indicating, "shown actual size." Radio Shack fast became a big part of my life and gave me a hobby that I've enjoyed ever since.

Wishing "The Shack" Were Back

Canorro's only lament about his favorite store is one I have also heard from my dad and other *Pop'Comm* subscribers. They long for the chain's pre-cell phone days. The company's website admits it decided, around 1995, to shift Radio Shack from a radio/electronics hobbyist store to one that targets "the consumer small components markets, focusing on wireless phones." This occurred on the heels of the company's getting out of the home computer market that it helped create. The final versions of Tandy/Radio Shack computers were essentially IBM-compatible, but they were losing sales to machines made by aggressive competitors like Hewlett-Packard, Dell, and Gateway.

In a sense, Radio Shack/Tandy computers were victims of their own initial success. Affectionately dubbed by pioneer geeks as the "TRASH-80," Tandy's late 1970s/1980s TRS-80 (and successors), which were "one of the first [lines of] mass produced personal computers," became iconic for an entry-level and quickly obsolete genre. Nobody who has witnessed the past several decades' decline in the numbers of young people who get into CB, shortwave, AM DX, or ham radio can fault Radio Shack (or RadioShack, the firm's current camel case handle) for largely exiting its radio/audio hobby and novelty electronics roots.

Quite honestly, a recent visit to the local RadioShack was my first in about two years. I figured the dog-eared battery card (part of a wildly successful 1960s through early 1990s Radio Shack promotional campaign designed to pull customers with the promise of a free battery each month) I produced for the sales clerk would be a real conversation piece. Much to my disappointment, the college-age employee had neither heard of the give-away plan, nor seemed particularly interested in company history.

A bit suspicious, but polite, he walked me over to the remaining radio and TV "parts and gizmos" inventory. The selection was certainly minimal compared to typical pre-1990 Radio Shack norms. Even so, the company should be applauded for continuing to carry things like solder, wire, a few electronics tools, pocket radios, a kit or two, and several drawers of diodes, resistors, heat sinks, and other small parts.

Starting in 2000, RadioShack became a major supplier of RCA products. I figured the famed identity would be evident all over the store, but the clerk there said the RCA sales agreement ended around 2004. To replace RCA's presence, RadioShack introduced private-branded consumer electronics with the Presidian and Accurian labels. Not long ago the company also brought back its old Optimus brand.

My father, who peruses every RadioShack he sees in his travels, tells me that if one looks diligently enough, it's sometimes still possible to find a new-old stock Science Fair radio kit, Micronta meter, Realistic amplifier, or Archer UHF-TV antenna. In fact, the current RadioShack website predicts nostalgic "Shack" shoppers might just "see a few generations of packaging variations on slower moving products." My dad cites that as reason enough to set foot in your local RadioShack.

And so ends another *Pop'Comm* radio reminiscence journey with your columnist, Shannon... ■

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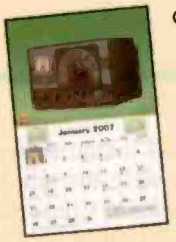

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The Latest In Battery Technology From CES

New AA Cell With Remarkable Chemistry, And Much More!

by Gordon West

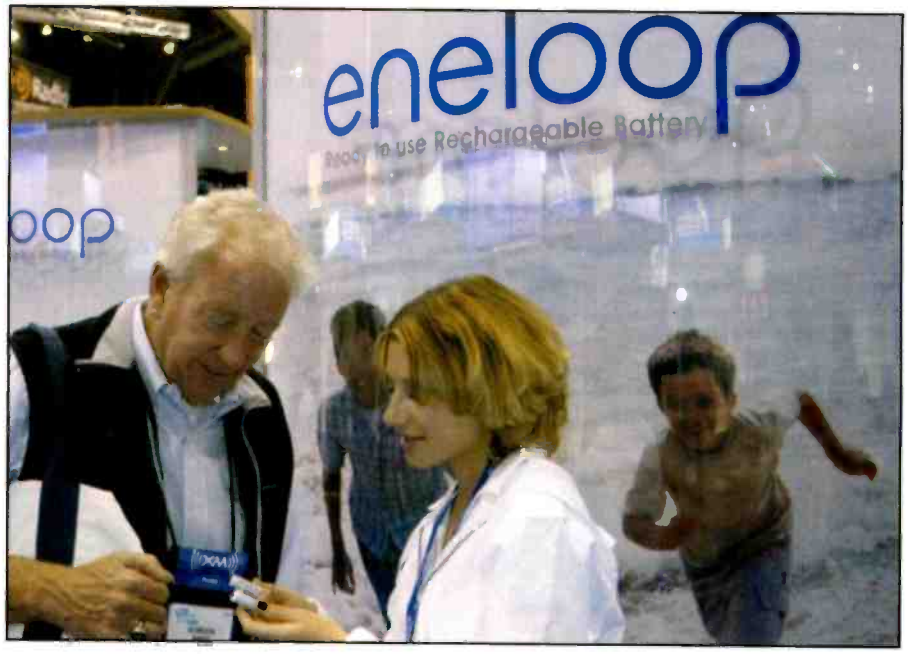
The AA "penlight" batteries (remember those?) were the talk of the 40th Annual Consumer Electronics Show (CES) show in Las Vegas in January. The rechargeable AA battery is the first choice among manufacturers of portable entertainment systems, pocket scanners, wireless remotes, and wireless weather sensors—and nearly everything else where users demand a common cell for a quick battery change.

"When the American Red Cross deploys disaster units in an emergency, we carry literally hundreds of alkaline AA battery cells to keep portable electronics operational," said attendee Larry Wilson, K6SCH, checking out battery chemistry on the CES floor.

Your typical high-quality *alkaline* AA battery cell yields 1.5 volts and approximately 2000 mAh (milliamp hours) of battery capacity. Alkaline AA cell manufacturers are quick to point out that the 2 amps (2000 mA) of capacity is normally *not* listed on the side of the cell because high-current devices might not make it to 2 Ah (amp hours), yet low-current devices could actually *exceed* 2 Ah of operation. "But the alkaline AA battery is always in demand at emergency scenes because so much equipment can run on the alkaline disposable AA cell," added Wilson.

One of the first rechargeable AA cell chemistries was Nickel Cadmium (NiCd). This AA cell chemistry has been around for over 20 years, and is only un-popular at the city dump. Cadmium and mercury must be disposed of properly. About 1000-mAh energy density may be pulled from the inexpensive, hardworking NiCd AA cell. Then technology improved.

Nickel Metal Hydride (NiMH) is the latest AA cell chemistry, offering up to 2800-mAh volume energy density (capacity) at about 1.2 volts. So with twice the volume energy density, the NiMH battery has become the favorite, especially among two-way radio and scanner users.



Here's Gordo talking with Rachel Riegert of eneloop.

The Smartcharger

However, unlike NiCd, these batteries with higher-energy density became more sensitive to how they were recharged in the field, so the invention of the "smartcharger" lead to safer battery replenishment without overcharging. "If battery users properly recharge the rechargeable battery they might obtain up to 1,000 recharges before the battery gets weak," said Ron Witek, president of Batteryhouse, speaking about the new chemistry in the Camelion brand of battery cells he carries.

Many battery manufacturers at CES displayed rechargeable cell fast chargers, but with a caution that fast charging almost any type of NiMH chemistry may shorten battery recharge life.

"This four-pack of AA cells are into their *fifth* year of operating and recharging AM/FM radios, and they have lasted this long because I *never* give them a fast charge," said Kim Lee of DynaBatt Company. He cautioned that quick charg-

"Many battery manufacturers at CES displayed rechargeable cell fast chargers, but with a caution that fast charging almost any type of NiMH chemistry may shorten battery recharge life."

ing AA cells to the point that they get physically hot may indeed bring them up to 90-percent recharge in under an hour, *but* has decreased the number of charging cycles by maybe 25 times. Do this regularly to AA cells that may be recharged up to 500 times and your battery pack won't last for more than a year!

Even though you might not regularly use your programmable handheld radio scanner, you *know* you will need to recharge the batteries even though you faithfully unplugged the pack from the scanner five months ago, making sure NOTHING would draw any current to pull the batteries down. The nature of NiCd and NIMH is 10 percent monthly discharge, just within their own chemistry; in other words, they discharge just sitting idle.

A Breakthrough!

At last, from Sanyo, comes a rechargeable AA battery that won't go flat, on its own, when not in use. Sanyo calls it the "eneloop" rechargeable battery. It's precharged and ready to use right out of the pack! At the CES show, Sanyo was showing self-discharge computer plots illustrating how its *regular* 2500-mAh NiMH battery would rapidly lose charge capacity after six months, but the new eneloop battery at six months held 90 percent of its original charge, and after a year, 85 percent of the initial charge. The company also demonstrated a digital camera lasting four times as long in picture-taking mode that with a regular name-brand alkaline battery.

Another company in attendance, called VINIC, pointed out that storing your equipment with its rechargeable batteries in a cool location will dramatically prolong charge retention. Leaving your rechargeable batteries in a hot car markedly decreases their "freshness."

The eneloop AA cells may be ordered with compact rechargers that will reject an *alkaline* cell, protect eneloop NiMH from overheat, and provide charge-time protection. Sanyo also offers a USB travel charger that plugs directly into the USB port on your computer; two cells may be trickle-charged from your computer's USB port.

An Energizer representative advised battery users not to necessarily shop for a battery that indicates maximum AA size mAh ratings. "The higher the AA cell mAh rating, the more run time you can get out of your device with each charge. However, the higher the mAh rating, the *fewer* number of charges you will get out of the batteries over their lifetime," said Tom Stevens, working in the Energizer booth at CES. He also showed graphs illustrating how a one-hour fast charger nearly halved the life of the battery and severely reduced the total running time of the equipment being powered.

"An 8- to 12-hour recharge is the best thing you can do for most rechargeable batteries," he added, pointing out that any battery getting hot in recharging is losing a portion of its ultimate life.

W&W Manufacturing, the well known two-way radio and ham radio battery experts, showed the UC-1 universal charger with specific cups to fit most two-way radio handhelds. The company was

Looking at this small assortment of rechargeable batteries helps you realize that the days of only alkalines or NiCds are long gone!

quick to point out some of the unique readouts on its charging stations, giving battery-savvy radio operators an inside look at how their battery pack is holding up. Its booth was buzzing with activity throughout the show, including curious battery importers eyeballing the new W&W Manufacturing "X3" battery analyzer/conditioner. This great unit weights in at 6.5 pounds. Check it out at www.ww-manufacturing.com.

Plenty of other CES battery manufacturers were there with some remarkable accessories, including:

GN Electric—temperature-monitoring chargers
Vinergy Company—zero-mercury-battery content
Kingneed—pocket LCD battery load and analyzer
Uniross—85-percent one-year AA battery capacity
Digipower—universal automobile charger adapter
Duracell—NiMH no-hot-battery charger
ETI—chargers for USB notebook
Unitech—heavy-current or light-current AA rechargeable cells
PowerBoy—high-capacity 2700-mAh rechargeable cells

And nearly every battery company's pick for the longest-lasting, best non-rechargeable lithium battery: the Energizer L 91.

When it comes to new battery technology, we saw it all at CES! And in the next few short years you know you can count on advances in technology to provide consumers—including us radio hobbyists—a multitude of new, efficient battery power!■

Many manufacturers now sell a fast charger with batteries included.

W&W Manufacturing's "X3" battery analyzer/conditioner. This great unit weighs in at 6.5 pounds.

by R.B. Sturtevant, AD7IL

Radio Fun And Going Back In Time

Q. We are so used to the idea of radio intercept operators flying around and giving people on the ground intelligence about the enemy in combat areas, but when did this idea get started?

A. During World War II there were a few intercept operators that "hitchhiked" along on other types of flying missions, but during that period most radio intelligence came from ground stations.

During the Korean War, Project BLUESKY was the first airborne reconnaissance program run by the new U.S. Air Force. BLUESKY took off in late 1952. The 15th Radio Squadron, Mobile flew in modified C-47s, which skirted along the battle line between North Korean/Chinese and UN/South Korean forces, picking up radio signals deep behind enemy lines.

They would drop a parachute canister to the 2nd Detachment of their unit on the island of Cho-do, some 40 miles north of the 38th parallel in the northern Yellow Sea. The 2nd Detachment evaluated the wire recordings (tape recorders were unknown at this time) and hard copies, then the information was passed on by secure radio.

After the cease fire was declared the ground, operations of the 2nd Detachment were moved to the island of Paengnyong, south of the 38th parallel.

Q. What were our country's first efforts in radio interception for intelligence?

A. During World War I we were very concerned about Mexico, after the famed Zimmerman Telegram offering German help if Mexico would invade the American southwest to help keep America out of the European War. One of the intelligence gathering operations set up by the Army was using Signal Corps soldiers in the Radio Intelligence Service, America's first effort in that area.

Stationed along the border with Mexico, the RIS troops monitored the airwaves for signals going to Berlin or German submarines in the Gulf of Mexico. Using field strength meters and hand-turned directional antennas, the RIS copied coded message traffic coming from Chapulticpec, near Mexico City. All the traffic was coded, but the operators were told that it was giving the code breakers some valuable information. Living in tents, the only "real action" the RIS ever saw was when operators would leave rattlesnakes on the desks or in the equipment for their oncoming shift relief.

Q. Speaking of Radio Intercepts, is it true that the radiotelephone conversations between Roosevelt and Churchill were the most secure communications in the world at the time and the Germans couldn't break them?

A. Yes and no. They were the most secure form of radio communications available, but the Germans could listen in very well. The A3 Scrambler system was based on 1920s technology and run by AT&T in New York. The Deutsche Post had a special intercept post, located in a former youth hostel on the Dutch coast, to descramble the system and they listened in frequently. General George Marshall had his doubts about the system's security, so when he wanted to alert the Hawaii and the Pacific Coast of possible attack on December 7 he used coded telegraph, *which arrived after the attack on Pearl Harbor.*

To develop a more secure system the military began working with Bell Labs in the early 1940s and came up with an entirely new system. They transferred voice into digital data and sent it via radio in that format. Anyone listening in without the correct gear would hear a buzzing sound much, like the theme song of a popular radio program. This led to the nickname for the system of "the Green Hornet," although it was officially called SIGSALY and represented the first steps into spread spectrum and digital technology.

After July 15, 1943, SIGSALY went to work for the Allies—and Churchill and Roosevelt started holding truly private conversations.

Q. Signal intercept work sounds like pretty easy duty. All you have to do is listen to the radio and record whatever comes over it. Have we ever lost anyone doing that kind of work?

A. Signal intercept is actually one of the most dangerous games we play with actual and potential enemies. During the Cold War we lost more than 200 crewmembers when Recon Aircraft were shot down. Recon planes, unless escorted by fighters, are completely defenseless. The aircraft used for these missions are quite often large and slow so they can't even run away from their adversaries.

Sometimes their loss makes the headlines, as in the Air Force RC130 shot down near Turkey in 1957, Francis Gary Powers who went down in 1960 and cost us a Peace Summit, the U2 we lost over Cuba in 1962, and the Navy P3 Orion knocked down in 2001 by the Chinese. But mostly these silent warriors, like crews aboard nuclear submarines, go in harm's way without much fanfare, and their loss goes noticed by only a few. We owe them more than we will ever know.

Looking Back...

Five Years Ago In *Pop'Comm*...

Still relevant is Peter Bertini's article from our April 2002 *Pop'Comm*; "Restoring Imported Mechanical Filters," and new was Kenwood's "FreeTalk" GMRS handheld transceiver. And another one bit the dust: Radio Norway International was the shortwave news of the day as it axed shortwave.

Ten Years Ago In *Pop'Comm*...

New back in '97 was AOR's AR5000 Cyberscan and AR3000A. And new from ICOM was the R-10, a continuous coverage scanner that tuned 500 kHz to 1300 MHz. Dr. Leuter had a very enlightening article in April '97 titled, "Scientists Discover Evidence Of RF Geo-Electromagnetic Emissions Preceding Earthquakes," a must-read if you're even remotely concerned about your planet, but beware what you find out.

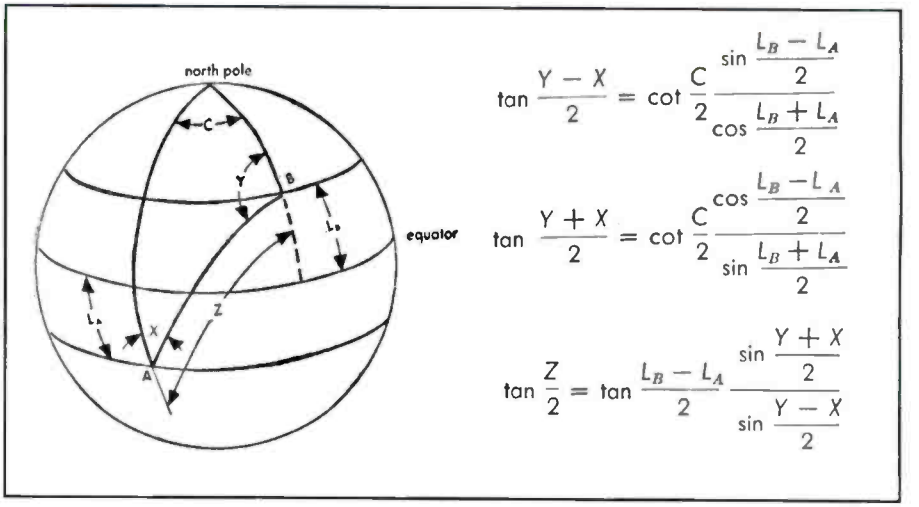
Twenty Years Ago In *Pop'Comm*...

Back in '87, Midland's new CB was a pretty huge walkie talkie: the 75-764, typically selling for around $60 (advertised in April '87 by National Tower Company). It was a three-channel radio with Channel 11 crystals installed! Few people have ever heard of Roger Babson, but former editor Tommy Kneitel did an excellent article on this gentleman who thought he could defy gravity!

by Bruce A. Conti, BAConti@aol.com

Great Circles: The Long—And Short—Of Broadcast DXing

We talk about it a lot, but just what is broadcast DXing? Put simply, it's the art and science of receiving broadcast signals over long distances, often over greater distances than intended. Have you ever wondered just *how* distant are those DX signals? In case you have, this month "Broadcast Technology" investigates the long and short of it.



Algebra and trigonometry are used to determine the Great Circle distance between two points on the surface of a sphere.

The Great Circle

The shortest distance between two points on the surface of the Earth is called the Great Circle path. This is the path from transmitter to receiver that radio waves are presumed to follow under normal conditions. While there are many modes of propagation, such as atmospheric ducting via FM *E*-skip and AM gray line, or even rarer cases of long-path reception from the opposite direction, only the normal short-path is investigated for the purposes of this discussion.

So now what exactly is a Great Circle? Again, quite simply put, it's the circle created by cutting a sphere in half, and it's the largest circle possible that can be created by slicing a sphere, thus phrase "Great Circle." The Great Circle distance is the shortest distance between any two points on the circumference of the Great Circle.

For a better understanding, try this experiment. Mark two points on the surface of a Styrofoam ball. Then cut the ball in half, with the cut passing precisely through each of the two points. You now have a Great Circle, and the shortest path between the two points lies along the edge of the circle.

Determining Distance

The Great Circle distance might be easy to visualize, but it's much more difficult to calculate. Determining the distance between two points on the surface of a sphere requires advanced algebraic equations and trigonometric functions. Well, okay, maybe it's not too advanced for an engineer or high school mathematics student armed with a scientific calculator, but dealing with x, y, and z unknowns, cosine, sine, and arctangent angular components, and three dimensions could be intimidating enough to cause some of us to tune out rather quickly.

Adding to the complexity is that the Earth is not a perfect sphere. Our planet is actually an ellipsoid, slightly "squished" at the poles with an equatorial radius (distance from the center to the surface at the equator) of approximately 3,963 miles and a polar radius of 3,950 miles. Fortunately there are easier solutions to the problem that even an engineer would appreciate.

A whole world of Great Circle software is available on the Internet, created by dedicated mathematicians, scientists, and radio hobbyists. Just enter "Great Circle" into your search engine to begin exploring the possibilities. "Lat-Long Distance Estimates" freeware by Gary Darby (www.delphiforfun.org/ Programs/ Math_Topics/Lat-Long%20Distance.htm) is one particular approach that's simple to use. Estimated distance can be obtained by using the formula for a perfect sphere and by an algorithm representing the ellipsoid shape of the Earth for a more accurate calculation. Coordinates for the transmitter and receiver locations can be entered in degrees, minutes, and seconds, or as decimal equivalents. Results can be obtained in miles, nautical miles, and kilometers.

Simplified Solution

Remember the distance formula from algebra and geometry? For a relatively short distance, let's say a couple hundred miles, the distance derivation of Pythagorean's Theorem can be applied for a quick and easy, yet relatively close, estimate ignoring the curvature of the Earth. Given the coordinates of two points, the straight-line distance between the two points is the square root of the sum of the squares of the change in x and y coordinates.

For longer distances, a single cosine function is applied to account for the change in east/west distance per degree longitude at different latitudes. In other words, the distance between longitudes at the equator is greater than between the same longitudes closer to the poles, so an angular component is applied to provide a better estimate for the surface of a sphere. Thus, given the coordinates (latitude x and longitude y) of two points in decimal form, estimated distance can be calculated as follows:

$$D = \sqrt{x^2 + y^2}$$

$$x = 69.093\ (latB - latA)$$

$$y = 69.093\ (longB - longA)\cos(latA/57.3)$$

A simplified equation derived from the Pythagorean Theorem for estimating Great Circle distance.

```
WLS                IL CHICAGO                        USA
  Unlimited

  Licensee: RADIO LICENSE HOLDING XI, LLC

  890  kHz      Licensed
  Domestic Station Class:  A   Region 2 Station Class (corresponds to W. Hemisphere):  A
  Coordination Status: Canada: -                Mexico: -                  Region 2: -
  File No:      BL-19860731AL      Facility ID No.: 73227
  CDBS Application ID No.:  90727

  41°  33' 21.00" N Latitude              Power:    50.0   kilowatts (kW) Unlimited
  87 °  50' 54.00" W Longitude (NAD 27)
```

Partial screenshot of FCC AM query data for radio station WLS.

Identify Location 1 as closest to a pole, Location 2 closest to the equator. Subtract Latitude 1 from Latitude 2, multiply the result by 69.093 to convert from degrees to miles, let the result equal x.

Next subtract Longitude 1 from Longitude 2, multiply by 69.093, and call the result w.

Now let's include the angular component. Divide Latitude 1 by 57.3 (or multiply by $2\pi/360$) to convert from degrees to radians.

Then calculate the cosine of the result, multiply by w, and let that result equal y.

Lastly, plug the values for x and y into the familiar distance formula to get the final answer in miles. Don't forget to enter negative numbers representing east and south. Any negative numbers will be eliminated by the squaring of x and y in the distance formula.

Keep in mind that the resulting distance is only an estimate with a roughly 10-percent margin of error. It may not be perfect, but it's good enough for remote DXpeditioning or where a computer isn't available.

What if coordinates are given in degrees with minutes and seconds? Conversion to a decimal is straightforward. Just like a clock, there are 60 seconds in a minute and 60 minutes in a degree, so it's no different than converting time to a decimal.

Let's use the coordinates for radio station 890 WLS Chicago: 41°33'21"N Latitude, 87°50'54"W Longitude. First for our estimation purposes, round off seconds to the nearest minute. For 30 seconds or greater, add one minute and drop the seconds. For less than 30 seconds, simply drop the seconds altogether; so 41°33'21"N becomes 41°33'N, and 87°50'54"W rounds to 87°51'W. To change minutes to a decimal, divide the minutes by 60. Thus for 41°33'N divide 33 by 60 to get a decimal equivalent of 41.55°N, and for 87°51'W divide 51 by 60 to get 87.85°W.

Finding Coordinates

Thanks to the Internet and Global Positioning System, determining your own coordinates is a snap. Most personal GPS units will provide coordinates for your location. On a handheld, cell phone, or car with GPS, check the menu for display options if coordinates aren't readily available. Coordinates for your location can also be obtained on the Internet, through Tiger Map or Google Earth among others.

Finding transmitter coordinates may require extra effort, depending upon the location. The FCC online database is an excellent source of coordinates for radio stations in the United States and Canada, as well as much of North and South America. Go to www.fcc.gov/mb. In the "MB Shortcuts" box on the right, select "AM Query" or "FM Query" from the pull-down menu, then click "Start Shortcut" to get to the query page.

You may search for a partial or specific callsign, or request data for a frequency or location. For example, type XE into the callsign box, and select a single frequency of 1390. Choose "Submit Data" to get a list of search results, and you will receive a list of all Mexican radio stations with an XE callsign in the FCC database on 1390 kHz. Select the specific radio station of interest from the list to view coordinates and additional data.

One note of caution: Much of the FCC data about radio stations located outside the United States and Canada is either outdated or missing, and the database is limited to the Americas. The *World Radio TV Handbook* is the next best source of transmitter site coordinates. Check both the *WRTH* national mediumwave and international shortwave listings as some radio stations broadcast from shared transmitter sites. The online *European Medium Wave Guide* at www.emwg.info contains coordinates for most AM radio stations in Africa, the Middle East, and Europe. As a last resort, consult the index of a world atlas for a list of cities and towns with coordinates that are good enough to estimate distance.

Now, For The "Long Of It"

As any of our astute *Popular*

Communications readers would know, it's common to receive AM broadcast band signals over long distances at night. Although distances will vary with ionospheric conditions, some general observations can be made for various receiver locations. Reception in the range of 1,000 miles is common, 2,000 to 3,000 miles maximum, especially for a land-locked receiver location some hundreds of miles from the seacoast.

The high conductivity of saltwater significantly enhances reception of transoceanic signals at a seashore receiver location, easily doubling that of a land-locked location, with possible reception in the range of 6,000 miles. In rare instances with highly directive Beverage antennas and/or under exceptionally ideal conditions, saltwater-path reception distances over 8,000 miles have been achieved at coastal sites.

Broadcast Loggings

This month's selected logs include Great Circle "ellipsoid" distances calculated by the Darby "Lat-Long Distance Estimates" freeware. All times are UTC.

549 Chaîne 1, Les Trembles, Algeria (35°17'N 00°34'W), at 0331 an Arabic vocal heard at very low audio level on fat carrier; best during fades of stronger-than-usual 550 WDEV. 3730 miles. (Connelly-MA)

580 WIBW Topeka, Kansas (39°05'N 95°47'W), heard at 0325 mixing with KUBC from Colorado, with KU college hoops and spots for Kansas Lottery and Sonic Drive-Ins. Clear ID at 0400 "on 580, WIBW Topeka." This 50,000-watter not often heard well in Arizona. 971 miles. (Barton-AZ)

585 RNE1 Madrid, Spain (40°28'N 03°52'W), at 0324 parallel 621 kHz with teletalk, woman in Spanish; surprisingly good right next to local 10 mV/m 590 WEZE. 3401 miles. (Connelly-MA)

600 WMT Cedar Rapids, Iowa (42°04'N 91°33'W), at 0634 "Newsradio 600 WMT" ID into Coast to Coast AM. Decent signal with fading. 719 miles. (New-GA)

612 RTM A, Sebaa-Aioun, Morocco (33°54'N 05°23'W), 2245–2300 fair with lively North African music (Arabic vocals, horns, drums) and apparent ID by man in Arabic at 2300 UTC. 3502 miles. (DeLorenzo-MA) At 0512 a cappella male Arabic vocal, then talk; good. 3541 miles. (Connelly-MA)

660 KTNN Window Rock, Arizona (35°54'N 109°08'W), at 0600 country music, Navajo music, "KTNN, Arizona, AM 660" and "KTNN Window Rock" IDs into CNN news. Decent, steady signal (S7) on top of the mix in the null of WFAN in New York, NY. 1464 miles. (New-GA)

700 HJCX Cali, Colombia (03°28'N 76°30'W), at 0205 English contemporary light rock vocals, announcements in Spanish; mostly under nulled WLW. 2719 miles. (Conti-NH)

702 2BL Sydney, Australia (33°57'S 150°53'E), at 1501 an Aussie-accented woman with news, mentioned "This is ABC Radio," into possible promos before fading out. 5087 miles. (Park-HI)

750 YVKS Caracas, Venezuela (10°29'N 67°00'W), at 1000 loud and clear over WSB with national anthem; into news in Spanish at 1003; many "RCR" IDs. Heard on Grundig S350 barefoot. 2158 miles. (DeLorenzo-MA)

765 RSR Option Musique, Sottens, Switzerland (46°39'N 06°44'E), heard at 0305 a French male vocal and cocktail-lounge style piano; good. 3695 miles. (Connelly-MA)

820 WAIT Willow Springs, Illinois (41°56'N 87°45'W), at 2330 religious programming and sign-off message: "Relevant Radio" and "WAIT Willow Springs, Illinois...join us tomorrow

morning." Decent signal in a mix of stations. 606 miles. (New-GA)

1030 KTWO Casper, Wyoming (42°51'N 106°13'W), heard at 1220 with ID and Mike Reagan show, spots for Honda of Casper. Mixing with presumed unidentified Mexican signal. 685 miles. (Barton-AZ)

1053.07 Libyan Jamahiriya, Tripoli, Libya (32°50'N 13°00'E), at 2345 fading up to loud and clear; Koranic recitations, carrier off at 2352 leaving *TalkSport* UK alone. 4483 miles. (Conti-NH)

1098 V7AD Majuro, Marshall Islands (07°09'N 171°12'E), at 1120 "Take My Breath Away" by Berlin; man talking in probable Marshallese and playing local adult contemporary music; at 1131 sign-off mentioned "Repubelika Marshall Islands," then in English, "This is V7AD 1098 AM..." followed by a pause, national anthem, and open carrier. First time I've heard the callsign and frequency mentioned. Fair to very poor; interference from 1100 KFAX. 2292 miles. (Park-HI)

1300 WOOD Grand Rapids, Michigan (42°45'N 85°39'W), at 0530 a spot encouraging Salvation Army donations, "at woodradio.com." Weak signal fading in and out of the mix. 626 miles. (New-GA)

1300 XEP Ciudad Juarez, Chihuahua, Mexico (31°43'N 106°27'W), heard at 0100 with ID and slogan "Radio 13!" Very eclectic music with Bee Gees, Depeche Mode, and the uncut "The End" by the Doors. 368 miles. (Barton-AZ)

1340 WWNH Madbury, New Hampshire (43°10'N 70°55'W), at 0606 DX Test with Morse code cutting through the mix in the null of WGAU in Athens, GA. 932 miles. (New-GA)

1431 Radio Sawa, Arta, Djibouti (11°31'N 42°50'E), at 2326 Mideast dance music; poor to fair in WXKS slop. 6860 miles. (Connelly-MA)

1521 BSKSA Duba, Saudi Arabia (27°20'N 35°45'E), at 0340 a man in Arabic and segments of pop-style Arabic music; good, strongest high-band transatlantic signal by a wide margin. 5756 miles. (Connelly-MA)

1548 Voice of Russia, Grigoriopol, Moldova (47°14'N 29°24'E), 2210–2230 fair; Serbo-Croatian program, woman anchoring news/feature with brief instrumental interludes, 2224 flute instrumental, parallel 5940 kHz. 4587 miles. (Conti-NH)

1620 KOZN Bellevue, Nebraska (41°11'N 96°00'W), at 0242 ESPN Radio with sports scores, news and information, "1620 The Zone, Omaha's ESPN Radio." Good signal with static on top of the mix. 855 miles. (New-GA)

1700 XEPE Tecate, Mexico (32°32'N 116°49'W), at 0530 Mexico tourism ad in accented English, "Tecate, Baja California" ID into talk program in English; poor in USB mode through KBGG, WEUP, WQBY206, and an unidentified NYC area HAR/TIS NOAA relay. Long sought after, first Pacific coast DX in decades, thanks to tips via mIRC #mwdx. 2549 miles. (Conti-NH) At 0457 with high school sports coverage, Escondido Cougars vs. Mission Hills Grizzlies, "on Cash 1700." 2623 miles. (Park-HI)

Thanks to fellow broadcast DXers Rick Barton (34°04'N 112°08'W), Mark Connelly, WA1ION (42°32'N 71°13'W), Mark DeLorenzo (41°42'N 70°09'W), Bert New (33°51'N 83°25'W), and Dale Park (21°18'N 157°44'W). My coordinates (42°43'N 71°31'W).

For now, 73 and good DX! ■

by Ken Reiss, radioken@earthlink.net

History Of Scanning—Part II
The Digital Entry Era

A couple of months back we looked at the evolution of scanning right up to the beginnings of the programmable scanner. Those early programmables required complicated codes or special cards that could only be used one time, but they did allow for changing the frequency of the scanner without a $5 to $10 investment for a new crystal.

In the late 1970s, the electronics were getting sophisticated enough to allow for digital entry from a keypad, which marked a real turning point in scanner development.

Look Ma—No Handhelds!

Somehow, in digging up pictures and information for this month's column I managed to avoid the handheld category completely. We'll take a look at the evolution of the handheld soon in the third and last act of our history of scanning! Until next month, Good Listening!

BC300: *This was another early model from Bearcat, released prior to Uniden's buyout. It was one of the first receivers to have service search so that you could search specifically for Police, Fire, Air, etc. activity. It also boasted 50 channels in five banks.*

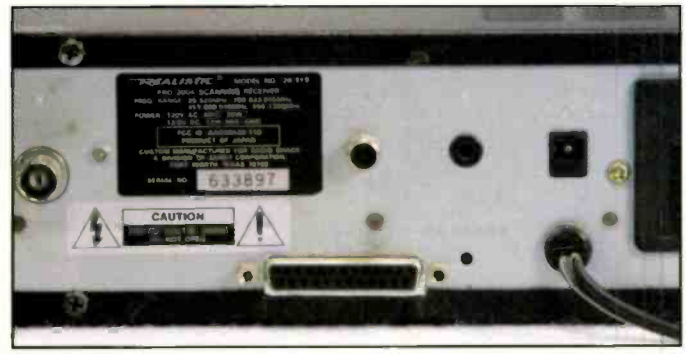
Comp 100: *In our last stroll down memory lane we left off with the beginning of programmable scanners. Radio Shack's first entry in this realm was the Comp 100, which allowed channels (16 of them) to be programmed by entering a code that was looked up in a book. Without the book, the radio was virtually useless, but it saved buying a $5- to $7-crystal every time you wanted to change frequencies.*

PRO-2002: *Not to be outdone, Radio Shack quickly offered a product with 50 channels as well. Instead of the service search function, this was the first scanner that had search ranges (more than one!) that could be programmed. The S1–S5 on the banks switches represent search ranges that could be enabled or disabled.*

PRO-2001: *In the late '70s Radio Shack and Bearcat both had a number of breakthrough receivers. This is the first digital entry model that I was aware of then, although Bearcat had some out prior to this one. It had sixteen channels, but the keypad allows for direct entry of the frequency.*

BC800XLT: *Another breakthrough happened with the introduction of this device. For the first time a scanner covered the 800-MHz public safety bands. Prior to that time, an agency on 800 MHz was virtually immune to scanner listening.*

PRO-2004: *This represented another major innovation: 200 channels, as opposed to the 16 or 50 that were common. The 2004 was also the first scanner to lend itself to modifications of the circuit by "hackers."*



PRO-2004 (rear view): *One of the innovations that came out of the 2004 was the idea of hooking it to a computer. The interface was difficult to install for the faint of heart, but it could be done with a bit of patience and a soldering iron. With the interface, the radio could be reprogrammed by a computer in just a few minutes, as opposed to hours of painstaking keypad entries.*

PRO-2005: *The PRO-2004 quickly gave way to the PRO-2005 (shown) and later the PRO-2006, which looked virtually identical. These receivers were the mainstay of the scanner world for a long time. Sporting 400 channels combined with an efficient receiver, and later with the availability of computer control, made this a hard combination to beat. Then the Electronic Communications Privacy Act of 1986 made it illegal to manufacture and sell a receiver that received or could be easily modified to receive cellular frequencies. But on the PRO-2006 you only had to snip one diode to get them, so the receiver was discontinued. They can still be found on eBay, however, and command a premium price with some scanner enthusiasts.*

FRG9600: *All of the major ham and commercial radio manufacturers also made communications receivers that covered the VHF/UHF range. The Yaesu FRG9600 was one of the first that came from the factory with a built-in computer interface, although software was nowhere to be found until ScanCat came along. This is an excellent receiver, but a terrible scanner without computer control. Coverage on the FRG9600 is continuous, but starts at 60 MHz, leaving out the VHF low band completely.*

MVT-8000: *During the height of the silliness associated with the banning of cellular-capable scanners, many enthusiasts imported receivers for personal use from Europe or Japan. This is a Yupiteru MVT-8000, an excellent receiver that featured full coverage. Its small size made it easy to mount almost anywhere.*

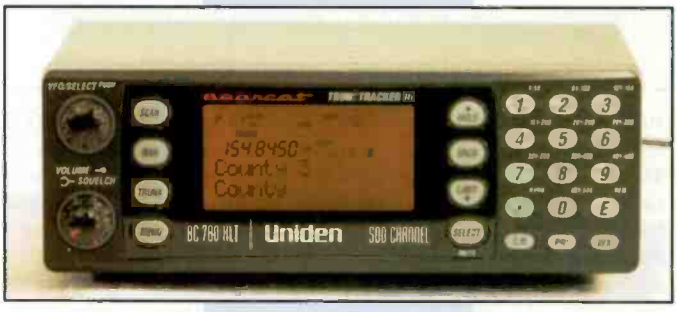
AR-3000: *Another entry into the communications receiver market was AOR with the AR-3000. This unusual design was almost perfect for mobile applications and many of them were used that way.*

Another innovative product from the same time period (also starting coverage at 60 MHz) was this Standard receiver. It was not a great scanner, but it was unusual in that it had a spectrum display capable of a 1-MHz sweep. The spike in the center represents the current active channel, and spikes on either side of that represent active signals. It was a great tool for finding new activity, and it was very easy to mount in a mobile installation.

BC8500: *The next generation of scanner from Uniden is represented by this BC8500, although there was one prior (the BC890) that used this same cabinet design. More than a real leap forward in scanner technology (except for compliance with the ECPA), the 890 and 8500 represented the first real Bearcat entries since Uniden had taken over the company. Both receivers were quite popular, and the 8500 was actually a fairly decent performer.*

PRO-2036: *No, you're not crazy—it's déjà vu. Radio Shack began selling Uniden radios that were almost identical to their Uniden-labeled counterparts. This PRO-2036 is essentially an 8500 with some cosmetic changes. It's also one of the first Radio Shack scanners released without a "PROGRAM" button!*

PRO-2067: *Trunking quickly became the buzz word in the scanner industry, and this PRO-2067 was one of several receivers that allowed for the reception of multiple trunking protocols. It took a long time to get trunking coverage at all, but once it was unveiled others followed suit quickly.*

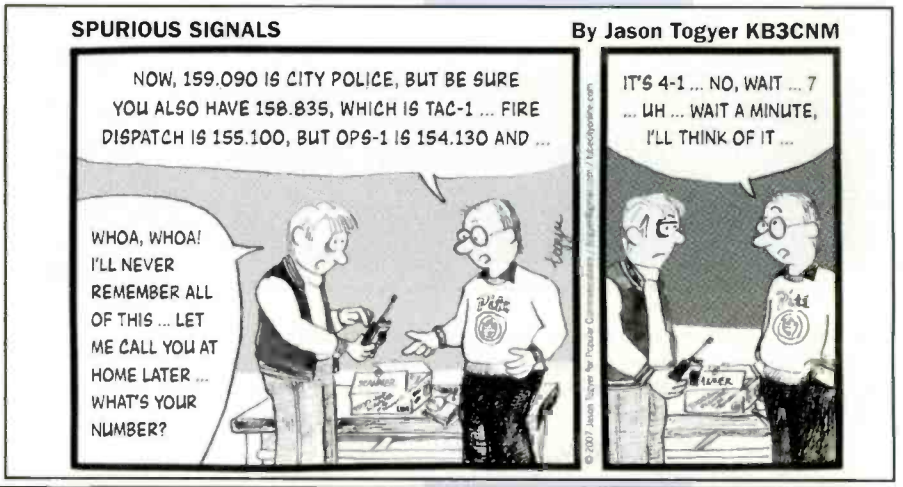


BC780: *The Uniden BC780 not only allowed trunking coverage, but for the first time it also included an option for digital (later APCO-25) reception. It sometimes takes a while but it seems that the scanner industry eventually catches up to the features and coverage of the two-way industry that we're trying to monitor!*

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*.Let's have a listen to **167.3375** this month and see what you hear (if anything). This channel is often used with low-power transmitters, so don't give up too soon. Let me know what you hear, or if you don't hear anything.

Send your questions and entries to Ken Reiss, 9051 Watson Rd. #309, St. Louis, MO 63126.



Popular Communications April 2007 Survey Questions:

I'm a licensed amateur operator

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

My reaction to the FCC's decision to eliminate Morse code as part of US amateur exams is:

Anger because it's an amateur tradition....3
Displeased because I had to study the code to get my license....4
It doesn't bother me one way or the other....5
Displeased because it's a lowering of the standards to get a license....6
Pleased because I think it's about time it was eliminated....7
Pleased because I believe it will bring more people into the hobby....8
Pleased because now I can upgrade much quicker....9

To acquire my current license I was required to take a Morse code exam

Yes....10
No....11

I'm proficient in sending/receiving CW at this level:

About 5 wpm....12
Between 5 and 8 wpm....13
Eight to 10 wpm....14
Ten to 15 wpm....15
Fifteen to 20 wpm....16
Twenty to 25 wpm....17
Twenty-five to 30 wpm....18
Above 30 wpm....19

I regularly use Morse code on the amateur bands

Yes....20
No....21

When I tested for the code I did so:

Reluctantly, only because it was a requirement....22
Because of the requirement, but also because I enjoy CW....23

The last time I simply copied Morse code on any frequency was:

A few minutes ago....24
A couple of days ago....25
Last week....26
Last month....27
A few months ago....28
More than a year ago....29
Never....30

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

The Season Of Lights

Even now, during the very bottom of the current solar cycle (remember, a solar cycle is approximately 11 years in length, from minimum to minimum), the sun unleashes enough plasma into interplanetary space to cause occasional aurora events. When solar plasma rides the solar wind to collide with the Earth's magnetosphere, and then rains down along the magnetic flux lines of the Earth's magnetic fields, aurora-mode propagation comes alive. The more intense the aurora, the more likely VHF radio signals will be reflected via the *E*-layer ionospheric clouds formed by the aurora.

Of course, when such conditions occur to make VHF come alive, HF radio propagation might become diminished or even non-existent. During times of minor to severe geomagnetic storm activity, the ionosphere loses its ability to refract HF. At the same time, however, high geomagnetic activity causes auroral sub-storms that create areas of ionization capable of reflecting VHF signals.

Auroral observations over the last 100 years reveal that peak periods of radio aurora occur close to the equinoxes—that is, during the months of March and April, and again in September and October. Of the two yearly peaks, the greater peak, in terms of the number of contacts reported, seems to occur during October. However, some of the strongest levels of geomagnetic storms are in the spring. The yearly minimum activity occurs during the months of June and July, with a lesser minimum during December.

How It All Happens

As has been discussed in this column in past issues, the "Northern Lights" (and also the "Southern Lights") are created when the solar wind and solar plasma interacts with gasses and the Earth's magnetic field (the magnetosphere) in the upper atmosphere. Solar plasma comes into our atmosphere by riding the solar wind from the sun. Geomagnetic storms develop when strong gusts of solar wind or coronal mass ejections (CMEs) hit the Earth's magnetosphere in just the right way.

It's possible to "shoot" a VHF signal off the auroral clouds that form during such times. This is known as aurora-mode propagation (Au). Veteran radio hobbyists also know that HF propagation is affected by aurora, as is the propagation of broadcast band (AM) station signals in the mediumwave spectrum.

The magnetosphere is filled with electrons and protons that are normally trapped by lines of magnetic force that prevent

The Ap Index And Understanding Propagation Terminology

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

Classification of A-indices is as follows:

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

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

Ionosphere: A collection of ionized particles and electrons in the uppermost portion of the Earth's atmosphere, which is formed by the interaction of the solar wind with the very thin air particles that have escaped Earth's gravity. These ions are responsible for the reflection or bending of radio waves occurring between certain critical frequencies, with these critical frequencies varying with the degree of ionization. As a result, radio waves having frequencies higher than the Lowest Usable Frequency (LUF) but lower than the Maximum Usable Frequency (MUF) are propagated over large distances.

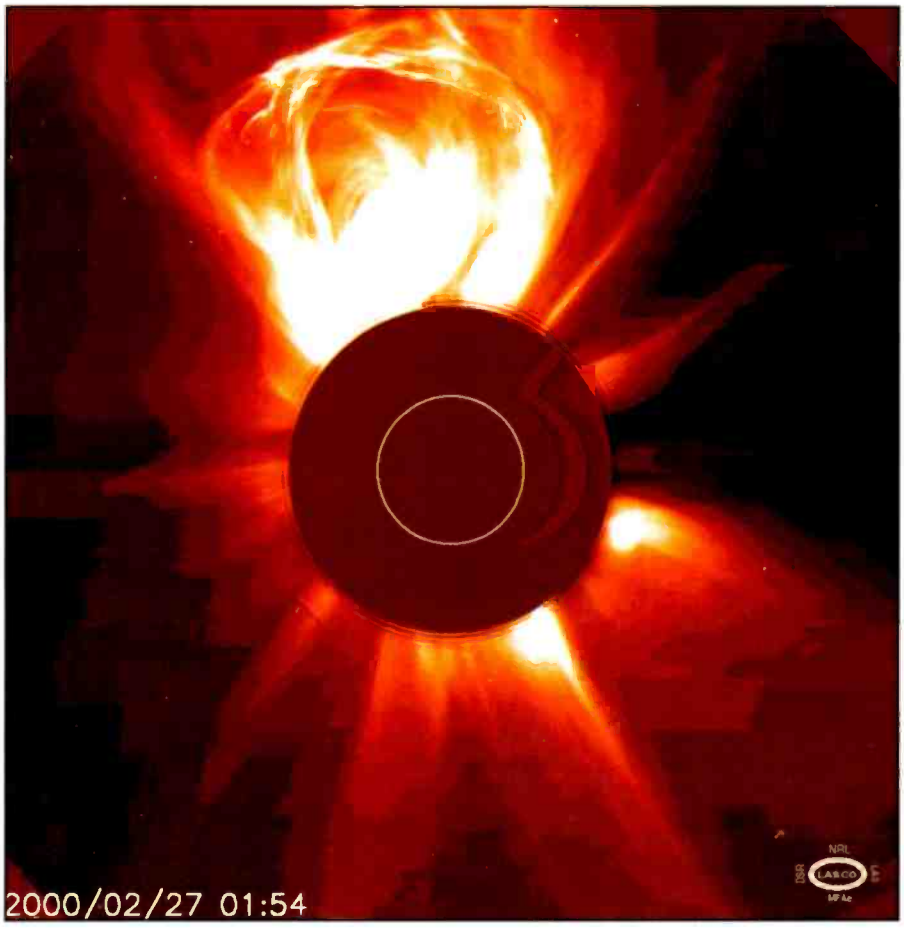
Smoothed Sunspot Number (SSN): Sunspots are magnetic regions on the Sun with magnetic field strengths thousands of times stronger than the Earth's magnetic field. Sunspots appear as dark spots on the surface of the Sun. Temperatures in the dark centers of sunspots drop to about 3700° K (compared to 5700°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

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

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

The sunspot number is calculated by first counting the number of sunspot groups and then the number of individual sunspots. The "sunspot number" is then given by the sum of the number of individual sunspots and 10 times the number of groups. Since most sunspot groups have, on average, about 10 spots, this formula for counting sunspots gives reliable numbers even when the observing conditions are less than ideal and small spots are hard to see. Monthly averages (updated monthly) of the sunspot numbers show that the number of sunspots visible on the sun waxes and wanes with an approximate 11-year cycle.

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



This picture taken on February 27, 2000 shows a coronal mass ejection (CME), an enormous bubble of magnetic plasma erupting into interplanetary space. Direct light from the sun is blocked in this picture of the event, with the sun's relative position and size indicated by a white half circle at bottom center. The field of view extends two million kilometers or more from the solar surface. Near the minimum of the solar activity cycle CMEs occur about once a week. Though this CME was clearly not headed for Earth, strong CMEs are seen to profoundly influence space weather and trigger aurora. (Credit: SOHO Consortium, ESA, and NASA)

them from escaping into space or descending to the planet below. When solar plasma penetrates into our atmosphere, the plasma breaks loose some of those trapped particles, causing them to rain down deeper into the atmosphere. When this happens, gasses in the atmosphere start to glow under the impact of these particles. Different gasses give out various colors (think of a neon sign and how the plasma inside the glass tube, when excited, glows with a bright color).

These precipitating particles mostly follow the magnetic field lines that run from Earth's magnetic poles and are concentrated in circular regions around the magnetic poles called "auroral ovals." These bands expand away from the poles during magnetic storms. The stronger the storm, the more these ovals will expand. Sometimes they grow so large that people at middle latitudes, like California, can see these "Northern Lights."

When active aurora is seen in the auroral zone, a strong magnetic disturbance is usually also observed there. These disturbed magnetic fields often are much stronger than those of a geomagnetic storm, but are strictly local, fading away quickly as one moves toward the equator. This suggests that the currents that disturb the magnetic fields flows somewhere nearby, probably near the auroral arcs.

The Norwegian physicist Kristian Birkeland (whose portrait appears on Norwegian currency) carefully observed auroral disturbances and concluded that the currents flow parallel to the ground, along the auroral formation. Because electrical currents must flow in a closed circuit, and because these magnetic disturbances seemed to be caused by processes taking place in distant space, Birkeland proposed that the currents came down from space at one end of an arc and returned to space at another end.

In 1910 Birkeland performed a series of experiments to reproduce many of the characteristics of the aurora that he observed during his expeditions. He placed an electromagnetic sphere, coated with fluorescent paint, inside a vacuum chamber and projected a beam of electrons at the sphere, which enabled him to view the trajectories of streaming electrons. Birkeland was able to accurately reproduce how solar wind would make its way into the Earth's magnetic poles and was able to simulate the auroral ovals near the Earth's magnetic poles.

It wasn't until 1954 that auroral electrons were actually observed by sensors aboard a rocket launched into an aurora by Meredith, Gottlieb, and Van Allen, of Van Allen's team at the University of Iowa. The Van Allen team discovered the Earth's radiation belts, now known as the Van Allen Belts.

Further Research

Continuing research has revealed that aurora is caused by the large-scale interaction between the Earth's magnetic field and the solar wind. The magnetic field around the Earth, appropriately called the magnetosphere, is distorted by a flow of charged particles, mainly protons and electrons, which flow away from the sun. This flow is the solar wind, which also contains magnetic field lines.

On the windward side, the side mostly facing the sun, a bow shock is formed, while on the leeward, opposite side, the magnetosphere is dragged out into a long tail. This magnetosphere acts as a giant shield around the earth, blocking the solar wind particles. However, there are distinct regions in the magnetosphere where solar wind particles may enter the Earth's upper atmosphere. Solar wind particles can enter directly via the dayside cusps or, having been trapped in the plasma sheet around the Earth, they can enter via the enclosed magnetic field lines at the polar auroral oval on the nightside.

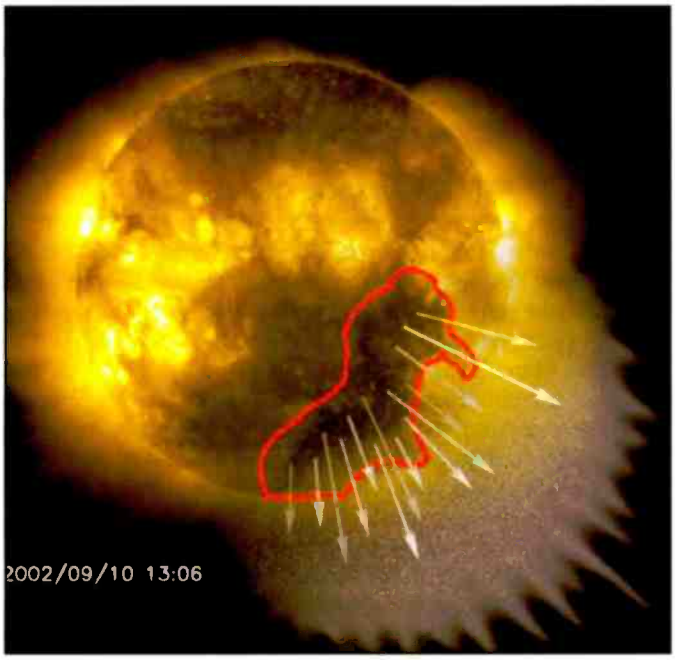
In 1961 Dr. Jim Dungey of the Imperial College, United Kingdom, predicted that cracks might form in the magnetosphere when the solar wind contained a magnetic field that was oriented in the opposite direction to a portion of the Earth's field. He postulated that the two magnetic fields would interconnect through a process known as *magnetic reconnection* and form a crack in the shield through which the electrically charged particles of the

Optimum Working Frequencies (MHz) - For April 2007 - Flux = 74, Created by NW7US

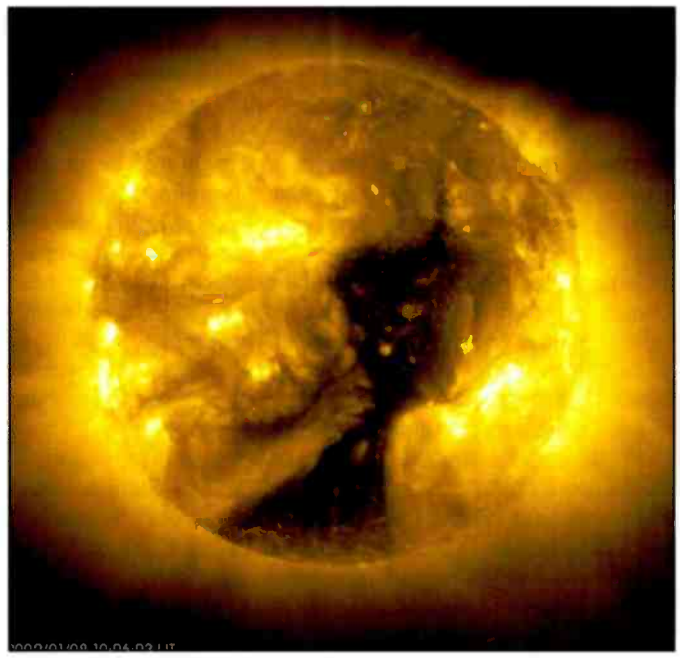
UTC TO/FROM US WEST COAST	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CARIBBEAN	22	21	21	20	18	16	15	14	13	12	11	11	10	13	15	17	18	19	20	21	21	22	22	22
NORTHERN SOUTH AMERICA	27	27	27	24	22	20	19	17	16	15	14	14	13	15	18	20	22	24	25	26	26	27	27	27
CENTRAL SOUTH AMERICA	28	25	23	21	19	18	17	16	15	14	13	15	14	17	20	23	25	26	28	28	29	29	29	28
SOUTHERN SOUTH AMERICA	26	23	21	19	18	17	16	15	14	13	13	12	14	14	17	20	22	24	26	27	28	29	29	28
WESTERN EUROPE	14	12	9	9	12	14	10	10	9	9	10	14	16	17	18	18	18	18	18	18	17	17	16	15
EASTERN EUROPE	9	9	8	8	12	14	15	13	9	9	12	14	15	16	17	17	17	17	16	16	15	13	10	9
EASTERN NORTH AMERICA	24	24	23	21	19	17	16	15	14	13	12	12	13	17	20	21	23	24	24	25	25	25	25	25
CENTRAL NORTH AMERICA	14	13	13	12	11	10	9	9	8	7	7	7	6	8	10	11	12	13	13	14	14	14	14	14
WESTERN NORTH AMERICA	7	7	7	7	6	6	5	5	4	4	4	3	3	3	4	5	6	6	7	7	7	7	7	7
SOUTHERN NORTH AMERICA	23	22	22	21	20	18	17	15	14	13	12	12	11	12	15	17	19	20	21	22	22	23	23	23
HAWAII	19	19	19	19	19	18	18	16	15	13	12	12	11	10	10	9	11	13	15	16	17	18	18	19
NORTHERN AFRICA	13	12	11	11	10	9	10	10	9	9	9	14	16	17	18	18	19	19	20	19	18	17	15	14
CENTRAL AFRICA	16	15	14	13	12	13	10	9	9	9	10	14	16	17	18	18	19	19	19	19	20	19	18	17
SOUTH AFRICA	17	16	15	14	14	13	14	13	12	12	11	11	16	19	21	22	23	23	24	24	24	22	20	19
MIDDLE EAST	10	10	9	10	14	15	14	11	9	9	12	14	15	16	17	18	18	18	18	16	14	13	12	11
JAPAN	20	20	20	19	19	18	17	15	12	11	11	10	10	9	9	11	10	10	9	12	15	17	18	19
CENTRAL ASIA	20	20	20	19	19	18	17	15	12	11	11	10	10	9	9	14	16	14	14	13	12	13	16	19
INDIA	16	16	16	16	16	16	15	14	13	10	9	12	12	9	9	8	8	8	8	10	13	14	15	15
THAILAND	17	19	19	19	18	18	17	15	12	11	10	10	9	9	12	15	17	16	15	14	13	12	12	14
AUSTRALIA	26	27	28	29	29	28	27	25	22	21	19	18	16	15	15	14	15	15	14	13	15	19	22	24
CHINA	19	19	19	19	18	18	17	15	13	10	10	9	9	9	13	12	11	10	10	9	9	14	16	18
SOUTH PACIFIC	29	30	30	29	29	28	26	23	21	19	18	16	15	15	14	13	13	12	13	20	24	26	28	29

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

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



Coronal holes appear as dark areas of the corona when viewed in ultraviolet light. This large hole, observed on September 10, 2002, had a direct impact on Earth. Coronal holes are often the source of strong solar wind gusts that carry solar particles (plasma) into space. This coronal hole was responsible for the moderate geomagnetic storm that triggered aurora on September 11, which was visible from the higher latitudes on Earth. (Credit: SOHO/NASA)



This ominous, dark shape sprawling across the face of the active sun is a coronal hole. A coronal hole is a low-density region of the sun extending above the sun's surface where the solar magnetic field opens freely into interplanetary space. During periods of low activity, such as now, coronal holes typically cover regions just above the sun's poles. This one, however, one of the largest seen in the current solar activity cycle (Solar Cycle 23), extends from the south pole (bottom of this image) well into northern hemisphere. Shown in false-color, this picture of the sun taken January 8, 2002, was made in extreme ultraviolet light by the EIT instrument on board the space-based SOHO observatory. (Credit: SOHO EIT Consortium, ESA and NASA)

solar wind could flow. Then, in 1979, Dr. Goetz Paschmann, of the Max Planck Institute for Extraterrestrial Physics, Germany, detected these cracks using the International Sun Earth Explorer (ISEE) spacecraft.

Recently, the Imager for Magnetopause to Aurora Global Exploration (IMAGE) satellite, along with the four-satellite Cluster constellation that flies far above IMAGE, revealed the direct correlation between a proton aurora (non-visible) and the flow of ions through these cracks.

All this takes place within an area known as the *auroral oval*. This is comprised of rings of roughly a 1500-mile radius, centered on the Earth's geomagnetic poles (not on the geographical pole, nor even magnetic poles). The geographic North Pole is located at 90 degrees North latitude and is the point where the lines of longitude converge. The magnetic North Pole is located roughly at 73.5 degrees North latitude and 100 degrees West longitude, near Resolute Bay, Canada. This is the point where magnetic medians converge.

The geomagnetic pole, however, which is the center of the auroral oval, is located at the northwest tip of Greenland at 78.5 degrees North latitude and 69 degrees West longitude. It is the northern axis of the mathematical field of closest fit to the actual magnetic field of the Earth. Using this geomagnetic pole, we define a set of latitude and longitude coordinates, known as the geomagnetic coordinates.

The auroral oval during average solar activity lies in a ring between about 70 and 75 degrees North geomagnetic latitude, and can grow during geomagnetic storms and shrink during very quiet geomagnetic activity periods, extends farther south on the nightside than on the dayside. That means that as the Earth rotates beneath the aurora, a given location will be nearer the oval at night than during the day.

In the early 1970s scientists recognized a connection between the component of the interplanetary magnetic field (IMF) that lies along Earth's magnetic axis (known as B sub z, or B_z) and Earth's changing seasons: The average size of B_z is greatest each year in early spring and autumn. So why do the storms increase in strength and number during spring and autumn?

As the sun rotates (one full rotation occurs about every 27 days), the plasma spewing out from it forms into a spiral shape known as the "Parker Spiral" (named after the scientist who first described it). This solar wind carries with it an interplanetary magnetic field, which constantly expands away from the sun in this spiral. Think of one of those rotating lawn sprinklers with jets of water shooting away from the center, where you can see a bending or curving of the water lines. As the Earth moves around the sun, these spiraling solar winds sweep into Earth's magnetosphere. How the IMFs in the solar wind interact with the magnetic field lines of the magnetosphere is the key to geomagnetic storms and aurora.

At the magnetopause, the part of our planet's magnetosphere that fends off the solar wind, Earth's magnetic field points north. If the IMF tilts south (i.e., B_z becomes large and negative) it can partially cancel Earth's magnetic field at the point of contact. This causes the two magnetic fields (Earth's and the IMF) to link (think of how two magnets link with one magnet's south pole connecting with the other's north pole), creating a magnetic field line from Earth directly into the solar wind. A south-pointing B_z opens a window, through which plasma from the solar wind and CME can reach Earth's inner magnetosphere, bombarding the gasses of the upper atmosphere.

Earth's magnetic dipole axis is most closely aligned with the Parker Spiral in April and October. As a result, southward (and northward) excursions of B_z are greatest then. This is why aurora is most likely and strongest during the equinoctial months. When we are in the peak of a solar cycle and in the year or so after a peak, solar activity is very high. The amount of solar wind and plasma is large at this point in the cycle, causing very dramatic and spectacular auroral light shows.

When the molecules and atoms are struck by solar wind particles the stripping of one or more of their electrons ionizes them to such an extent that the ionized area is capable of reflecting radio signals at very high frequencies. This ionization occurs at an altitude of about 70 miles, very near the *E* layer of the ionosphere. The level of ionization depends on the energy and amount of solar wind particles able to enter the atmosphere.

While correlations exist between visible and radio aurora, radio aurora could exist without visual aurora. Statistically, a diurnal variation of the frequency of radio aurora contacts has been identified that suggests two strong peaks, one near 6 p.m. and the second around midnight, local time.

VHF auroral echoes, or reflections, are most effective when the angle of incidence of the signal from the transmitter, with the geomagnetic field line, equals the angle of reflection from the field line to the receiver. Radio aurora is observed almost exclusively in a sector centered on magnetic north. The strength of signals reflected from the aurora is dependent on the wavelength when equivalent power levels are employed. Six-meter reflections can be expected to be much stronger than 2-meter reflections for the same transmitter output power. The polarization of the reflected signals is nearly the same as that of the transmitted signal.

A Good Indicator

The planetary K (Kp) index is a good indicator of the expansion of the auroral oval and the possible intensity of the aurora. When the Kp is higher than 5, most readers in the northern states and in Canada can expect favorable aurora conditions. If the Kp reaches 8 or 9, it is highly possible for radio aurora to be observed by stations as far south as California and Florida.

Look for aurora-mode propagation when the Kp rises above 4, and look for visual aurora after dark when the Kp rises above 5. The higher the Kp, the more likely you may see the visual lights. But, you don't have to see them to hear their influence on propagation. Listen for stations from over the poles that sound raspy or fluttery on frequencies above 28 MHz, possibly up as high as 440 MHz.

Sometimes aurora will enhance a path at certain frequencies, other times it will degrade the signals. Sometimes signals will fade quickly, then come back with great strength. This is because the radio signal is being refracted off the more highly ionized areas that are lit up. These ionized areas are always changing in their size and density. This directly affects how well a radio wave will be reflected–or more correctly, refracted–by the ionized area. The more densely ionized the "reflector" is, the higher the frequency of radio wave that can be reflected. Of course, there area a set of other variables that affect how well a radio wave will be propagated by reflections off of these ionized areas, including the angle of incidence of the radio wave in relationship to the ionized area, the size and shape of the area, and how quickly the area changes in density and size, or even if the area moves out of the way of the radio wave path.

Expect an increase in geomagnetic storms, and auroral activity, as we move from March through April. I have a wealth of links at http://prop.hfradio.org/ that provide up-to-the-minute aurora information and data. On my webpage, you can also watch the B_z as it changes from positive (northward) to negative (southward) during the Earth's passage through the solar wind stream.

HF Propagation

As we move into spring in the Northern Hemisphere we experience better DX openings from around the world on HF. This is because the sun is mostly over the equator, creating equal day and night periods in both hemispheres. The Vernal Equinox at the end of March marks the day when the hours of daylight and darkness are about equal around the world. This creates an ionosphere of similar characteristics throughout more of the world than is possible during other times when it is summer in one hemisphere and winter in the other, and there are extreme differences in the ionosphere.

This equalization of the ionospheric which takes place during the equinoctial periods (autumn and spring) is responsible for optimum DX conditions and starts late in February and lasts through late April. The improvement in propagation is most noticeable on long circuits between the Northern and Southern Hemispheres. During this season conditions are optimal for long-path as well as short-path openings, and during gray line twilight periods associated with sunrise and sunset.

April is one of the hottest months for DX. The seasonal change plays out on HF with activity moving up from 41 meters and down from 11 meters. Propagation on the higher HF frequencies (19 through 11 meters) begins to suffer late in April and into the summer months due to lower MUFs (maximum usable frequencies) in the Northern Hemisphere. MUFs peak very late in the day during summer. Summertime MUFs are lower due to solar heating which causes the ionosphere to expand. An expanded ionosphere produces lower ion density, which results in lower MUFs.

Short-path propagation between countries in the Northern Hemisphere will drop out entirely at this time. Higher-frequency propagation peaks in the fall. April and May are fall months in the Southern Hemisphere making long-path DX possible. Short-path propagation from South America, South Pacific, and other areas south of the equator will be strong and reliable when open. However, these do not happen every day on the higher frequencies.

From April to June, excellent propagation occurs on both daytime and nighttime paths. The strongest propagation occurs on paths that span areas of both day and night, following the MUF. During April, peaking in May and still in June, 16 meters may offer 24-hour DX to all parts of the world, with both short- and long-path openings occurring—sometimes at the same time! If you hear a lot of echo on a signal, you might be beamed in the wrong direction. Try the opposite azimuth. Thirty-one through 19 meters are more stable as nighttime bands, with propagation following gray line and nighttime paths.

Low-band propagation is still hot on 41 meters, with Europe in the evening and Asia in the mornings. Occasional DX openings will occur on 90 and 75 meters around sunrise.

VHF Ionospheric Openings

On VHF, many different types of propagation modes can appear once or twice during this month. Combination propagation modes may be possible on VHF now, making for some

exciting openings. An increase in transequatorial (TE) propagation is typical during this month. Sporadic-*E* (*Es*) will become more common as we move into late spring and summer. There are times when *Es*, TE, and F_2-layer propagation modes will link, providing strong DX openings on VHF between North America and New Zealand, Australia, or other areas.

The best time to catch a TE opening across the geomagnetic equator is between 8 and 11 p.m. local daylight time. These TE openings will be north-south paths that cross the geomagnetic equator at an approximate right angle.

Widespread auroral displays can occur during April, bringing with them unusual ionospheric short-skip openings on the VHF bands. The best times for these to occur are during periods of space weather storminess. Look for days with Kp and planetary A (Ap) index figures (typically, the Kp should be over 5).

Because we're nearly at the end of the current Solar Cycle 23, we're not going to see major solar flares with resultant CMEs, so we won't see many days where space weather will cause geomagnetic storms. However, these storms are also caused by high-speed solar wind that streams out of coronal holes and by the plasma that escapes the sun from these holes to ride the solar wind until the plasma hits the Earth's magnetosphere. I expect a possible minor geomagnetic storm once or twice this month.

Meteor showers provide an opportunity for observing VHF/UHF meteor scatter propagation DX. Most meteor showers are at their best after midnight. After midnight, you're on the leading edge of the Earth and you're meeting the meteors head-on. Before midnight, you're on the trailing edge of the Earth and the meteors have to catch up to you. As a result not only are more meteors seen in the pre-dawn hours, but their impact speeds encountering the Earth's atmosphere are much higher and the meteors are generally faster and brighter. This causes greater ionization, which is what you use to refract a radio signal. Look for TV and FM broadcast "pings" (short bursts of reception) during these events. If you are an amateur radio operator, look for 6- and 2-meter openings off of the ionized meteor trails.

The Lyrids Meteor Shower!

The Lyrids, a major meteor shower, should take place from mid- to late-April. The unpredictability of the shower in any given year always makes the Lyrids worth watching, since we cannot say when the next unusual return may occur. If this year's event is average or better (30 to 60 good-sized meteors entering the atmosphere every hour), meteor-scatter openings could occur on the VHF bands.

Again, check out my links at http://prop.hfradio.org/ for up-to-the-minute aurora information and data. Also, check out our sister publication *CQ VHF* for details regarding VHF propagation through the spring and summer.

Current Cycle 23 Progress

The Royal Observatory of Belgium reports that the monthly mean observed sunspot number for December 2006 is 13.6, a fairly large jump back down from the one-month spike during November. The lowest daily sunspot value recorded was zero (0), on December 18–23, and December 28–29. The highest daily sunspot count was 34 on December 1. The 12-month running smoothed sunspot number centered on June 2006 is 16.3. A smoothed sunspot count of 10, give or take about 8 points lower to 12 points higher, is expected for April 2007.

The Dominion Radio Astrophysical Observatory at Penticton, BC, Canada, reports a 10.7-centimeter observed monthly mean solar flux of 84.3 for December 2006. The 12-month smoothed 10.7-centimeter flux centered on June 2006 is 80.6. The predicted smoothed 10.7-centimeter solar flux for April 2007 is 74, give or take about 13 points.

The observed monthly mean planetary Ap index for December 2006 is 14, up from the trend of an Ap staying between 8 and 9 since May. Last month's figure was adjusted from 8 to 9. The 12-month smoothed Ap index centered on June 2006 is 8.3. Expect the overall geomagnetic activity to vary greatly between quiet to active during most days in April, especially as we are near the Spring Equinox.

Got Comments Or Questions?

You can join in with others in discussing space weather, propagation, and LF, MW, shortwave or VHF listening, at http://hfradio.org/forums/. You may have noticed that my website was down for over a month, from the end of October through December. This was caused by a series of issues all happening at the same time! First, it appeared that the server hardware was overheating. Second, it appeared that a hacker broke into the server and was using it for illegal activity. Third, I decided to upgrade the entire server, hardware and software. It took over a month to complete the project! Thank you for being patient during that time.

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 don't hesitate to write and let me know about any interesting propagation that you've noticed. Do you have questions about propagation? I look forward to hearing from you. Until next time, happy signal hunting! ■

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

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

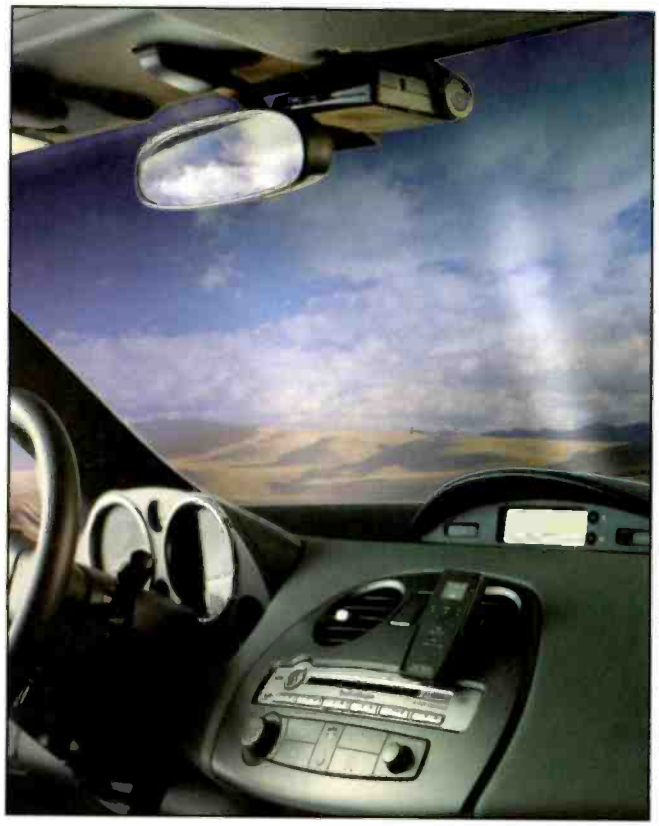
AA, FF, SS, GG, etc. are abbreviations for languages (Arabic, French, Spanish, German). Times given are in UTC, which is five hours ahead of EST, i.e. 0000 UTC equals 7 p.m. EST, 6 p.m. CST, 4 p.m. PST.

UTC	Freq.	Station/Country	Notes
0000	7315	Voice of Russia	PP
0000	6055	Radio Exterior de Espana, Spain	
0000	11690	Radio Vilnius, Lithuania	Lithuanian
0000	7205	Radio Republica, US, via England	SS
0000	7545	Kol Israel	HH
0000	9590	China Radio International	SS
0000	4319	AFRTS, Diego Garcia	usb
0030	5890	Radio Thailand, via USA	
0030	7285	Voice of Croatia, via Germany	Croatian
0030	9800	China Radio International	SS
0030	4717	Radio Yuri, Bolivia	SS
0030	7400	Radio Bulgaria	
0100	9490	Radio Sweden, via Canada	Swedish
0100	13650	Voice of Korea, No. Korea	FF
0100	12020	HCJB, Ecuador	SS
0100	6110	Radio Budapest, Hungary	HH
0100	11800	RAI Int., Italy	
0100	6035	La Voz del Guaviare, Colombia	SS
0100	6200	Radio Prague, Czech Republic	SS
0130	6195	Voice of Russia	SS
0130	4780	Radio Cultural Coatan, Guatemala	SS
0130	11780	Radio Nacional Amazonia, Brazil	PP
0200	4790	Radio Vision, Peru	SS
0200	4810	Radio Transcontinental, Mexico	SS
0200	3249	Radio Luz y Vida, Honduras	SS
0200	4052.5	Radio Verdad, Guatemala	SS
0200	6973	Galei Zahal, Israel	HH
0200	11710	RAE, Argentina	
0230	9715	Radio Romania International	FF
0230	3320	Radio Sondergrense, South Africa	Afrikaans
0230	9665	Voice of Russia, via Moldova	
0230	9520	Radio Free Europe, via Hungary	RR
0230	4815	Radio Buen Pastor, Ecuador	SS
0230	9795	Radio Budapest, Hungary	
0230	4800	Radio Buenas Nuevas, Guatemala	SS
0230	4885	Radio Clube do Para, Brazil	PP
0300	6175	Voice of Vietnam, via Canada	SS
0300	7305	Vatican Radio	
0300	4976	Radio Uganda	
0300	5015	Radio Altura, Peru	SS
0300	7390	Channel Africa, South Africa	
0300	15720	Radio New Zealand Int.	
0300	3279	La Voz del Napo, Ecuador	SS
0300	4780	RT Djibouti	AA
0300	9704	Radio Ethiopia	unid
0300	9915	BBC Relay, Cyprus	AA
0300	3255	BBC via South Africa	
0300	7270	Radio Cairo, Egypt	
0300	6180	Radio Canada International	SS
0300	11745	Voz Cristiana, Chile	PP
0330	3240	Trans World Radio, Swaziland	vern
0330	5820	Radio Ukraine International	UU
0330	5960	Radio Japan/NHK, via Canada	JJ
0330	5915	ZNBC-Radio Zambia	unid
0330	7465	Radio Tirana, Albania	
0330	9790	China Radio Int., via Cuba	
0330	7335	CHU, Canada	FF/EE
0400	9780	Republic of Yemen Radio	AA
0400	5025	Radio Rebelde, Cuba	SS
0430	7350	Voice of Russia	
0430	6020	Voice of Turkey	
0430	7220	Radio Liberty, USA, via Morocco	RR
0430	9745	HCJB, Ecuador	SS
0500	9685	Channel Africa, South Africa	
0500	7255	Voice of Nigeria	
0500	5005	Radio Nacional, Equatorial Guinea	SS
0500	4777	RTV Gabonaise, Gabon	FF
0600	4835	RT Malienne, Mali	FF
0600	5035	Radio Burkina, Burkina Faso	FF
0700	6185	Radio Educacion, Mexico	SS
0830	6010	Radio Inconfidencia, Brazil	PP
0900	5885	Vatican Radio	Latin
0900	12133.5	AFRTS, Florida	usb
0900	4991	Radio Apinte, Suriname	DD
0900	4919	Radio Quito, Ecuador	SS
0900	4915	Radio Nacional Macapa, Brazil	PP
0930	15295	Voice of Malaysia	Malay
0930	6190	Deutschlandfunk, Germany	GG
0930	6160	CKZN, Newfoundland	
1000	6350	AFRTS, Hawaii	usb
1000	4824	La Voz de la Selva, Peru	SS
1000	3925	Radio Nikkei, Japan	JJ
1000	6010	La Voz de su Concencia, Colombia	SS
1000	6139.8	Radio Santa Cruz, Bolivia	SS

UTC	Freq.	Station/Country	Notes
1000	5681	La Voz del Campesino, Bolivia	SS
1020	7285	Radio Thailand	TT
1030	7265	Deutsche Welle, via Russia	GG
1030	11920	REAI Int., Italy, via Singapore	II
1030	9810	CPBS, China	CC
1100	5020	Solomon Is. Broadcasting	
1100	4835	Radio Maranon, Peru	SS
1100	7235	Radio Singapore International	Malay
1100	6010	Radio Mil, Mexico	SS
1100	5875	BBC, via Cypress Creek, SC	
1100	4909	Radio Chaski, Ecuador	SS
1100	7280	Voice of the Strait, China	CC
1100	4905	Xizang PBS, Lhasa (Tibet) China	TT
1100	5910	Marfil Estereo, Colombia	SS
1130	12020	RDP Int., Portugal	PP
1130	5009	Radio Pueblo, Dominican Republic	SS
1130	9740	BBC Relay, Singapore	
1130	5010	All India Radio	Hindi
1130	6020	Radio Australia	
1130	4890	NBC, Papua New Guinea	
1200	9815	RDP International, Portugal	PP
1200	9430	FEBC International, Philippines	CC
1200	9965	Voice of Hope, Palau	CC
1200	11740	Radio Japan/NHK via Singapore	CC
1200	6250	Pyongyang Broadcasting Station, No. Korea	KK
1200	15545	Voice of Islamic Rep. of Iran	AA
1200	15700	Radio Bulgaria	FF
1200	15715	Christian Voice, USA, via Germany	AA
1230	12020	Voice of Vietnam	
1230	11580	KFBS, Saipan, No. Marianas	CC
1230	13665	Radio Rossii, Russia	RR
1230	9630	Radio New Zealand Int.	
1230	11530	Voice of Mesopotamia, via Moldova	Kurdish
1300	7405	Radio Marti, USA	SS
1300	6035	BBC Relay, Thailand	
1300	6185	China Huay Broadcasting Station	CC
1300	9580	Radio Australia	
1400	9440	Radio Slovakia International	
1400	15140	Radio Sultanate of Oman	
1400	12579	AFRTS, Diego Garcia	usb
1400	13675	Radio Austria Int, via Canada	
1430	13765	Vatican Radio	Hindi
1430	13780	Deutsche Welle Relay, Sri Lanka	GG
1430	13750	Radio Havana Cuba	SS
1440	13730	Radio Austria Int.	GG
1500	11970	Radio Romania International	Romanian
1500	15435	BSKSA, Saudi Arabia	AA
1500	11905	Sri Lanka Broadcasting Corp.	EE/Hindi
1500	17770	Channel Africa, South Africa	
1530	15240	Radio Sweden	
1530	9310	Vatican Radio, via Uzbek	
1530	13605	All India Radio	Swahili
1600	13750	Radio Nacional Venezuela, via Cuba	SS
1600	11680	Trans World Radio, Guam	
1600	12005	RT Tunisienne, Tunisia	AA
1600	11690	Radio Jordan	
1600	11855	RAI International, Italy	II
1600	12025	Radio Free Asia via No. Marianas	CC
1600	15160	Radio France Int., via South Africa	
1600	11615	Radio France International	
1600	9935	RES Makedonias, Greece	Greek
1600	11990	Radio Kuwait	AA
1620	17649	VOA Relay, Morocco	
1630	17755	Radio Exterior de Espana, Spain	SS
1630	15410	Radio Farda, USA, via England	Farsi
1630	11890	Radio Okapi, Congo, via South Africa	FF
1630	17680	Voz Cristiana, Chile	SS
1630	15580	VOA Relay, Botswana	
1700	15345	RTV Marocaine, Morocco	AA
1700	9895	Radio Nederland Relay, Madagascar	DD
1700	11695	Radio Voice of the People, via Madagascar	
1700	15630	Voice of Greece	Greek
1700	15275	Deutsche Welle, Germany, Rwanda Relay	FF
1700	15475	Africa No. One, Gabon	FF
1730	9565	UN Radio, USA, via England	
1730	15120	Voice of Nigeria	
1730	12050	Radio Cairo, Egypt	AA
1730	15570	Radio Rebelde, Cuba	SS
1800	11510	Voice of Russia via Armenia	
1800	17630	Radio France Int., Relay, French Guiana	SS
1830	9990	Radio Cairo, Egypt	II
1900	9265	WMLK, Pennsylvania	
1930	9400	Kol Israel	HH
2000	11735	Radio Tanzania-Zanzibar	Swahili
2000	17705	Radio Nacional Venezuela, via Cuba	SS
2000	15540	RDP International, Portugal	PP
2000	13735	Voice of America Relay, Sao Tome	
2000	17810	Radio Nederland Relay, Bonaire	
2000	15400	BBC Relay, England, via Ascension	
2000	9525	Voice of Indonesia	II
2000	11625	Vatican Radio	
2030	9630	BBC Relay, Seychelles	
2030	11665	Radio Taiwan Int., via Florida	FF
2100	9855	Radio Kuwait	AA
2100	11620	All India Radio	Hindi
2100	9660	BBC, via Australia	
2100	15345	Radio Nacional, Argentina	
2100	6245	Radio Zamaneh, US to Iran	Farsi
2130	7190	RT Tunisienne, Tunisia	AA
2130	9705	La Voix du Sahel, Niger	FF
2200	7320	Radio Jamahiriya, Libya, via France	EE/FF/AA
2200	7450	RS Makedonias, Greece	Greek
2200	6165	RN Tchadienne, Chad	FF
2200	15515	Radio Australia	
2230	11910	Radio Japan/NHK	JJ
2230	7115	Radio Japan/NHK, via UAE	JJ
2230	9675	Radio Cancao Nova, Brazil	PP
2300	9665	Radio Marumby, Brazil	PP
2300	6090	University Network, Anguilla	
2330	7300	Voice of Turkey	
2330	9575	Radio Medi Un, Morocco	FF
2330	4845	Radio Maruitanie, Mauritania	AA
2330	7320	Radio Vilnius, Lithuania	
2330	9565	Radio Tupi, Brazil	PP
2330	7345	Radio Prague, Czech Republic	

by Harold Ort, N2RLL

New, Interesting, And Useful Communications Products



The Cobra XRS R9G remote, including a GPS locator with red light and speed camera database, has an MSRP of $449.95.

New Cobra Radar/Laser Detector With GPS Locator

Cobra Electronics announced the launch of the first-to-market, easy-to-install wireless remote controlled radar/laser detector with GPS locator. The product's design makes the new device virtually invisible, helping to deter theft. The devices, models XRS R7 and XRS R9G, feature a wireless main detector unit and a remote control display unit. The XRS R9G offers the added benefit of a GPS locator. The locator includes a red light and speed camera location database, which will be continually updated as locations change and are added.

Both the GPS locator and the main radar/laser detector unit mount behind the rearview mirror at the top of the windshield, providing a discreet appearance and also improving detection range. All components are installed inside the vehicle, protecting them from the elements and engine heat. The lithium-ion rechargeable batteries allow the pocket-size remote to operate up to 40 hours and include a two-hour quick charge option. The product's IntelliLink 2.4-GHz wireless remote-controlled design makes it possible to customize mounting locations and easily remove it from the car.

Other features include the full-color Extreme Bright DataGrafix video display with alert screens, such as car battery voltage, signal strength and an eight-point digital compass; IntelliMute, a speed-sensing Auto Mute system to prevent false alerts; Voice Alert, which clearly annunciates signals and alerts being detected; SmartPower to automatically shut off the unit when the vehicle's ignition is turned off; and StrobeAlert, which alerts the driver of approaching emergency vehicles.

The XRS R7 user-installable remote radar detector has an MSRP of $349.95. The XRS R9G, including a GPS locator with red light and speed camera database, has an MSRP of $449.95. These radar detectors will arrive in major retailers in the second quarter of 2007.

For more information, contact Cobra Electronics directly at 773-889-3087 or online at www.cobraelectronics.com. Please tell them you read about their new products in *Popular Communications*.

New MFJ Speaker/Microphones For HTs

MFJ Enterprises now has what they call the "perfect size" speaker microphone for tiny HT radios. It measures 2 1/2 x 1 3/8 x 1/2 inches (HWD) and fits in the palm of your hand. The MFJ-295I, with PTT switch, 3.5-mm earphone jack and long curly, retractable cord fits ICOM and compatibles; the MFJ-285K fits Kenwood and other compatibles; the MFJ-285Y fits Yaesu R-series and others. All these sell for $15.95. The MFJ-285R fits VX7R series radios, and sells for $19.95.

The new MFJ-296, at $21.95, is a new deluxe speaker microphone that has a volume control knob allowing the user to set it for a super quiet room or noisy environment, like a hamfest or banquet.

The new MFJ-296.

For more information contact MFJ Enterprises at www.mfjenterprises.com or call 800-647-1800.

Cobra's New NAV ONE 2100

Portable, plug-and-play navigation is available through Cobra Electronics with its newly launched NAV ONE 2100. The NAV ONE 2100 offers features and user-friendly interfaces in

Cobra's NAV ONE 2100 is traffic-ready with up-to-the-minute traffic content available.

a compact, portable design. The device includes the exclusive My Favorite Brands feature, which provides over 600 brands accessible at the touch of a button. Once drivers select their favorite brands from categories, such as restaurants, large retail chains and famous coffee shops, the companies' brand icons appear on the map to show their locations.

The NAV ONE 2100 is traffic-ready with the up-to-the-minute traffic content available. The optional traffic receiver and subscription delivers personalized traffic data for 50 major metropolitan areas throughout the United States via four color-coded levels of traffic flow information. Cobra's Compare Routes feature lets the driver choose from two on-screen routing options to get you around traffic. The new device also offers an SD memory card expansion slot for future feature expansion.

Other features include an ultra-bright color display in a 3.5-inch touch-screen; millions of points of interest; the widest temperature usability range on the market (allowing functionality in conditions ranging from -4 to 158 degrees Fahrenheit); recognizable, easy-to-use graphics; and high-quality mapping. The NAV ONE 2100 will be available at an MSRP of $349.95 at leading retailers in May of 2007. The optional real-time traffic feature is $99.95 with an annual traffic service subscription fee of $59.99 a year.

For more informtion contact Cobra Electronics at 773-889-3087 or online at www.cobraelectronics.com.

OtterBox 1930/1931 Rugged Cases For BlackBerry Handsets

OtterBox is offering rugged cases to accommodate BlackBerry handsets from Research In Motion, allowing access to phone and data functions right through the case. The OtterBox 1930 fits the BlackBerry 8700 Series and the OtterBox 1931 model fits the BlackBerry 7200 Series handsets. The cases provide a water-resistant access to keypad, scroll wheel, escape button, power button, mute button, and programmable side button.

The OtterBox for your BlackBerry.

Constructed of a polycarbonate/ABS shell for maximum strength and durability, cases provide grip and drop protection with innovative rubber overmolding. The LCD is protected from scratches and drop damage with a rigid screen cover, and acoustic membrane vents allow sound transmission while keeping the case sealed. Easy open plug provides access to sync/charge jack and headphone jack. The molded rubber inside the cases cradles the BlackBerry handset and an o-ring seals it from exposure. Otter's recently designed compound (lockable) latch provides easy opening and secure closing. Optional accessories include a standard swivel belt clip and a refurbish kit.

For more info visit www.otterbox.com or call 888-695-8820. ■

by Richard Fisher, KI6SN

Capitol Hill And FCC Actions Affecting Communications

Editor's Note: Since we believe that understanding this issue is crucial to our radio hobby, we're devoting Richard's entire column this month to the Commission's recent "Report and Order" regarding the elimination of Morse code as a testing requirement in the United States.

FCC "Report and Order" Explains Morse Elimination Decision

The Federal Communications Commission has released a "Report and Order" explaining the issues and conclusions that drove its decision to eliminate the Morse code requirement for all classes of amateur radio licenses. A public notice issued by the FCC December 15, 2006, announced the Commission's ruling to drop the code examination, sending a shockwave through the amateur community.

The "R&O" details the specific Part 97 changes being implemented. The effective date for Morse elimination is February 23, 2007.

According to Commission documents,

...based on our review of the record in the proceeding and on consideration of the various comments on this issue, we believe that because the international requirement for telegraphy proficiency has been eliminated, we should treat Morse code telegraphy as we do other communications techniques.

In this connection, we note that our Rules do not require individuals to pass a practical examination to demonstrate some degree of proficiency in non-telegraphy communications techniques. rather, individuals demonstrate knowledge of other communication techniques and technical qualifications by passing written examinations composed of questions that prove that the examinee possesses the operational and technical qualifications required for the privileges authorized by the operator license.

The FCC continued in its "R&O" that it believes,

...therefore, that written examinations are sufficient to determine whether a person is qualified to be issued an amateur radio operator license. Accordingly, we conclude that the public interest will best be served by eliminating the telegraphy examination requirement as a separate examination requirement in the amateur service. To achieve this result, we will amend Section 97.501 of our Rules to eliminate the requirement that an individual demonstrate five wpm proficiency in telegraphy in order to qualify for a General or Amateur Extra Class operator license.

The American Radio Relay League, which had opposed Morse's *complete* elimination from amateur licensing requirements, reacted through statements by the organization's president and chief executive officer. "While the Commission's decision to delete the Morse code requirement for an Amateur Extra Class license departs from the ARRL's recommendation, it is helpful to have the matter resolved so we can move forward," said ARRL President Joel Harrison, W5ZN.

ARRL CEO David Sumner, K1ZZ, said, "Now that the debate is over, we can focus on learning Morse code simply for its own sake." According to the League's *ARRL Letter*,

Sumner pledged that the League would maintain its traditional support of Morse code as an operating mode and would continue to offer Morse training materials as well as such incentives as bonus credit for CW contacts in ARRL-sponsored operating events. ARRL's Hiram Percy Maxim Memorial Station W1AW will keep its schedule of Morse code practice and bulletin transmissions.

In its "R&O," the FCC said that

...in reaching this decision, we note that one of the fundamental purposes underlying our Part 97 rules is to accommodate amateur radio operators' proven ability to contribute to the advancement of the radio art. The Commission has previously stated that an individual's ability to demonstrate increased Morse code proficiency is not necessarily indicative of his or her ability to contribute to the advancement of the radio art, and the record before us shows that many commenters agree.

In the NPRM (Notice of Proposed Rule Making), the Commission expressed its belief that eliminating the telegraphy examination requirement would encourage individuals who are interested in communications technology, or who are able to contribute to the advancement of the radio art, to become amateur radio operators.

A number of commenters agree that the Morse code requirement "keeps individuals that would enhance the hobby from getting a license," and that there is "no relationship between an individual's knowledge of Morse code and that individual's knowledge of radio regulations and practices and skills necessary to operate an amateur station." Other commenters, while not disputing that telegraphy can and will continue to be a way to communicate, point out that amateur radio operators exchange messages using telegraphy only "if they choose to do so," and that "...interest and participation (in use of Morse code) should be voluntary, as it is with other sub-specialties in the amateur service.

Continuing, the FCC stated that,

...another fundamental purpose underlying our Part 97 rules is to enhance the value of the amateur service to the public, particularly with respect to providing emergency communications. Based on the record before us, we are not persuaded to depart from the pending proposal by the argument that telegraphy proficiency should be required because amateur radio stations may provide or assist with emergency communications.

The Commission previously addressed the essence of this argument, and concluded that most emergency communication today is performed using voice, data, or video techniques, and that most amateur radio operators who choose to provide emergency communications do so using voice or digital modes of communication because information can be exchanged much faster using these modes rather than telegraphy. As a result, we find that requiring an individual to demonstrate Morse code proficiency as a license qualification requirement is unrelated to licensees' ability to provide or assist with emergency communications.

The FCC concluded that,

...that these considerations outweigh arguments that a telegraphy requirement is justified because telegraphy is "historically and traditionally unique," and that telegraphy ability, as demonstrated by passing a test, has "fundamental and enduring value" to the amateur radio community. We also disagree that a Morse code proficiency testing requirement must be retained "to insure the continued quality pool of amateur radio operators," or because the telegraphy examination "is the only part of the licensing procedure that cannot be simply memorized." The record is devoid of a demonstrated nexus between Morse

"...we conclude that the public interest will best be served by eliminating the telegraphy examination requirement as a separate examination requirement in the amateur service."—FCC

code proficiency and on-the-air conduct. As a result, we concur with the observation that "maintaining the code requirement does not purge amateur radio of bad operators. Education and self-policing does."

"As noted in the record," the FCC said, "the claim 'that code requirements help eliminate *bad apples* from the radio hobby has not proven correct in the past and is not a viable argument for the present, or future.'"

"Finally, we disagree with commenters who support eliminating the telegraphy requirement for the General Class operator license, but advocate retaining it for the Amateur Extra Class operator license," the "R&O" stated. It explained,

The ARRL and others argue that the telegraphy requirement for the Amateur Extra Class operator license should not be eliminated because the Amateur Extra Class license ought to represent "the ultimate in achievement in both technical and operating skills in Amateur Radio," and "the number of radio amateurs who have achieved this ultimate license class clearly demonstrates that a 5 words-per-minute telegraphy requirement is not a significant deterrent to those who aspire to it." We nevertheless believe that the public interest is not served by requiring facility in Morse code when the trend in amateur communications is to use voice and digital technologies for exchanging messages.

The Commission said, "rather, we believe that because the international requirement for telegraphy proficiency has been eliminated, we should treat Morse code telegraphy no differently from other amateur service communications techniques. This reasoning applies equally to the General Class and the Amateur Extra Class operator licenses."

"We are not persuaded," the FCC said, "that the Amateur Extra Class being the highest license class is a sufficient reason alone to retain a requirement that we conclude is otherwise inappropriate and unnecessary. We also note that our action here does not preclude Amateur Extra Class licensees, or for that matter, other amateur service licensees from pursuing and/or continuing to pursue Morse code proficiency should they so desire." ■

by Peter J. Bertini, radioconnection@juno.com

Zenith Bandswitch Repairs: Understanding Zenith Bandswitch Mysteries!

Shortwave listening was already a popular pastime up to and during the WWII years. Many early radios included shortwave reception; many of these were inexpensive five-tube table sets, and even very elaborate consoles. Often the most difficult restorations I've come across involve these radios' bandswitches. Trying to make sense of the associated maze of wiring and coils and the confusing schematics can be a tedious task indeed!

My luck has been running from bad to worse, and in the past several months I've encountered several sets that had been "modified" using "band aid" fixes to hide more serious problems made by previous owners. I've spent hours troubleshooting, only to discover RF stage coils with open windings and bandswitch wiring that has been surreptitiously hacked by persons unknown. The sets did play, but with greatly reduced performance.

The most recent example crossing my path was a customer's Zenith 7S232A chassis. Despite being a rust bucket, its saving grace was that it could be used in a Zenith Walton tombstone cabinet—a large tombstone that has been elevated to near cult status thanks to its numerous appearances as a prop in the popular 1970s CBS series about a family with the same name. My nine-tube model 9S232 Zenith Walton (see **Photo A**) is a handsome radio, and perhaps the most valuable radio in my collection, but I'll admit its desirability is driven more by market forces than performance or looks!

Photo A. The author's 9S232 Zenith Walton tombstone radio.

Photo B. Twisting two short lengths of insulated wire together can make a quick, inexpensive low value capacitor. These are called "gimmick capacitors" in the trade.

Troubleshooting Zenith Bandswitch Assemblies

Let me digress and show how I go about troubleshooting Zenith bandswitch problems. This column is going to be a bit more brand-and-model-specific than normal, but hopefully this information will serve you well when you're faced with similar problems. Unfortunately, hands-on experience is the best way to learn, especially when armed with an ohmmeter to trace the actual circuit paths through coils at the different bandswitch positions. The schematics can seem very confusing, but once you work with these sets for a while, and trace things out, you'll begin to understand with more clarity how they work and just what's going on.

I restored the electronics, tested the tubes, and yet the radio remained very insensitive on all the bands. Take a look at the schematic shown in **Figure 1**. For our discussion, we'll be covering the components to the left of the 6A8A tube. When the bandswitch is set for the AM broadcast band, antenna coil 1 and antenna coil 2 serve as a double-tuned preselector for the AM band. The two coils are lightly *top-coupled* using a wire *gimmick* capacitor mounted on the tuning capacitor; this hand-made part can be seen in **Photo B**. It is simply the capacity provided by twisting two scraps of cloth insulated wire together, perhaps a few pF at most.

Zenith engineers favored designs that delivered the ultimate in image and spurious signal rejection on the AM band, while compromising shortwave performance (image rejection) by using only a single tuned RF stage on those bands. Even some

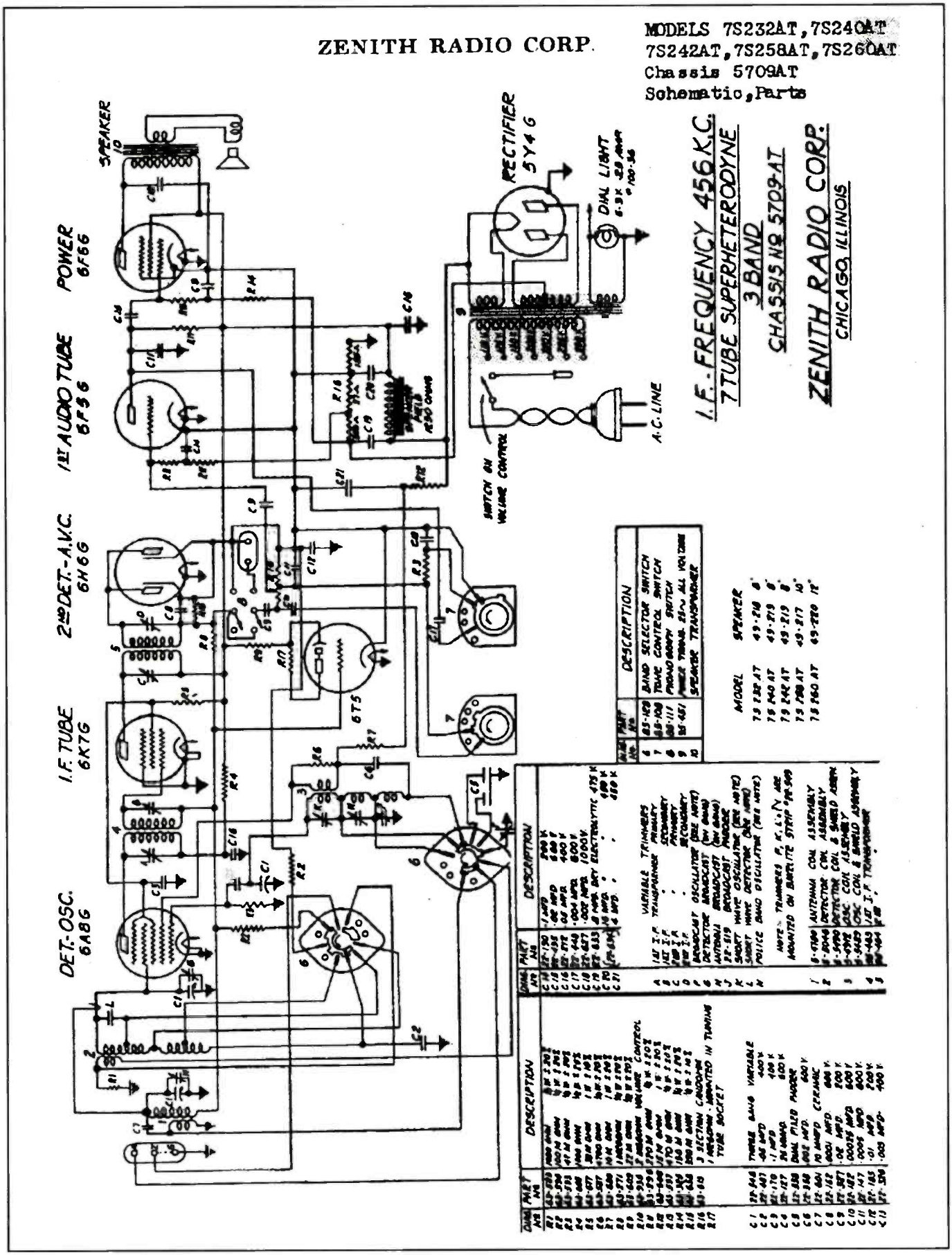


Figure 1. This is the schematic drawing for the Zenith model 2S232A chassis.

later Zenith sets with RF stages used passive coupling between the RF plate and mixer grid on the SW bands, while using a second tuned RF stage on the BCB!

Getting back to our 7S232 chassis, note that on the AM band the antenna coil primary of coil 1 is bandswitched to the **G** (ground) and **A** terminals on the back of the set. An ohmmeter should read the primary winding resistance (about 23 ohms) of coil 1 on those terminals if everything is working properly. Coil 1 is only used for the AM band, while coil 2 is used for the AM and SW bands. When the radio is set to either of the two SW bands, the resistance of the primary winding for coil 1 (about 1 ohm) can be measured across the **A** and **Z** terminals. See **Figures 2A and 2B**.

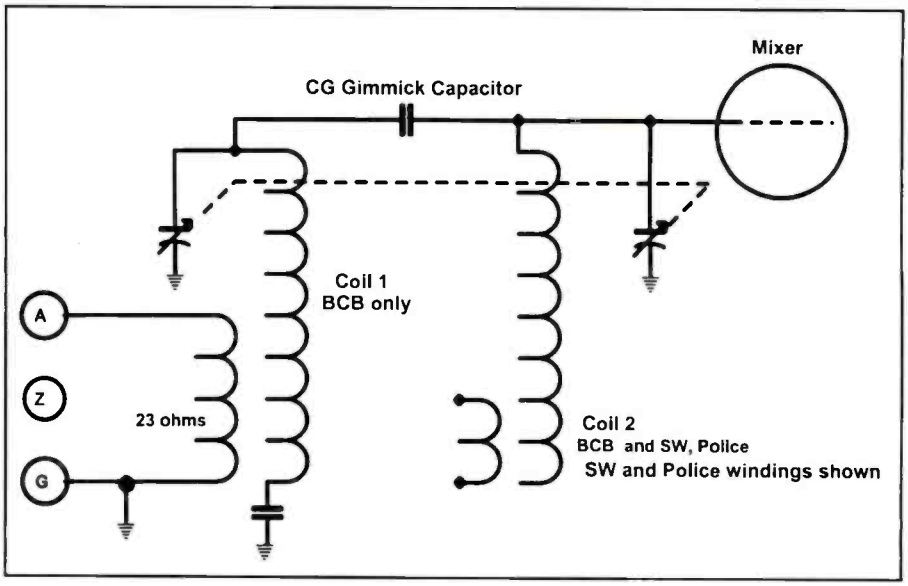


Figure 2A. This drawing shows how coil 1 and coil 2 are bandswitched to provide extra preselection on the AM broadcast band. Note that this is a greatly simplified schematic; many components and leads are not shown for clarity!

Early Antennas—Longwires

I've had a few e-mails asking about how antennas should be connected to antenna terminals that are marked with cryptic **A**, **Z**, and **G** legends. Let me clear up this mystery before going further (see **Photo C**). I'm sure many of you have wondered how best to connect an antenna to those mysterious terminals.

The **G** terminal should be connected to a good ground. A ground rod is best, but cold water pipes or similar will do in a pinch. A popular vintage antenna was a simple long wire, usually strung from the house roof ridge to a nearby pole or barn. Sixty feet of wire strung horizontally high and in the clear, with a vertical 30-foot lead-in works well. The horizontal run works like a capacitive hat, lowering the antenna frequency, while the vertically polarized lead-in favors the low angle of distance stations. The antenna lead-in is connected to terminal **A**, and the **Z** terminal is jumpered to the **G** terminal. This arrangement places the primary antenna winding of coil 1 or coil 2 across the **G** and **A** terminals for both the SW and AM BCB bands (see **Figure 3A**).

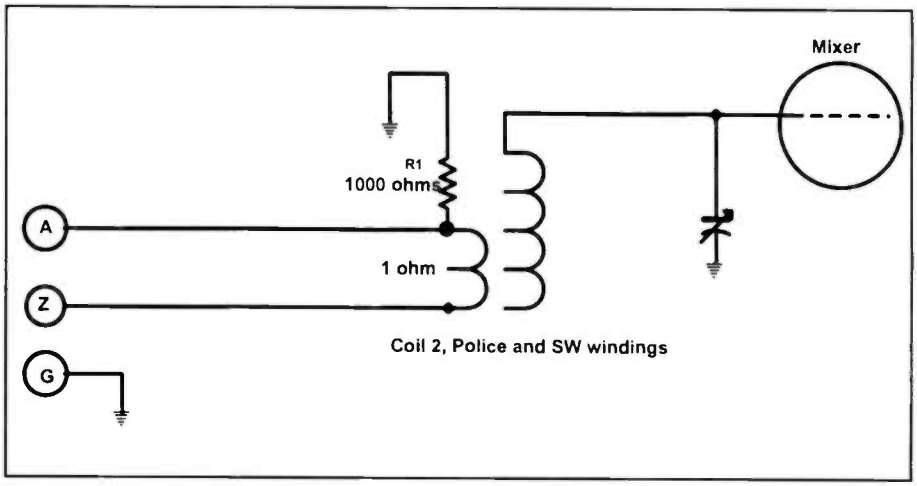


Figure 2B. Only coil 2 is used to provide a single tuned stage of RF preselection for the shortwave and police bands.

Early Antennas—Balanced Dipoles

Another antenna that works well for shortwave and broadcast reception with these sets is a balanced dipole with open-wire feedline. The dipole is mounted as high as possible, with balanced feedline brought down vertically and connected to the **A** and **Z** terminals of the set. A good ground is connected to terminal **G**.

Here's where the Zenith bandswitching design does its magic. On the shortwave bands the dipole antenna works as a dipole. On the AM broadcast band the dipole is bandswitch-connected as a top-loaded long-wire antenna working against the earth ground on terminal **G**! Even though the balanced line leads are insulated from each other, the stray capacitance between the paralleled wires effectively combines both halves of the antenna into a single radiator.

Here's another tip: You should read 1000 ohms (R1, the static discharge resistor) from terminal **A** to **G** on the shortwave bands (see **Figure 3B**). I'll show you how to build practical antennas for your vintage sets in a future column.

Once you decipher how the bandswitch works—and all sets *are* different—it's possible to trace the wiring continuity using an ohmmeter and schematic. The most common problems are damaged primary antenna coils (lightning discharges causing open windings) or bandswitch contacts that don't make continuity due to corrosion or physical damage.

The 7S232A bandswitch is shown in **Photo D**. My troubleshooting involved tracing the antenna primary windings of the two antenna coils from the coil terminals, through the bandswitch, and to the antenna terminal strip on the back apron of the radio.

I immediately found some problems. The antenna primary winding for coil 1

was open. On the AM band there was no continuity through the bandswitch contacts from solder lugs for the primary winding coil 1, through the bandswitch, to the antenna terminals **A** and **G** on the rear apron. Gentle heating of the coil (it can be seen in **Photos E** and **F**) with a hot air gun removed most of the wax from the windings and allowed finding the break in the winding and repairing it.

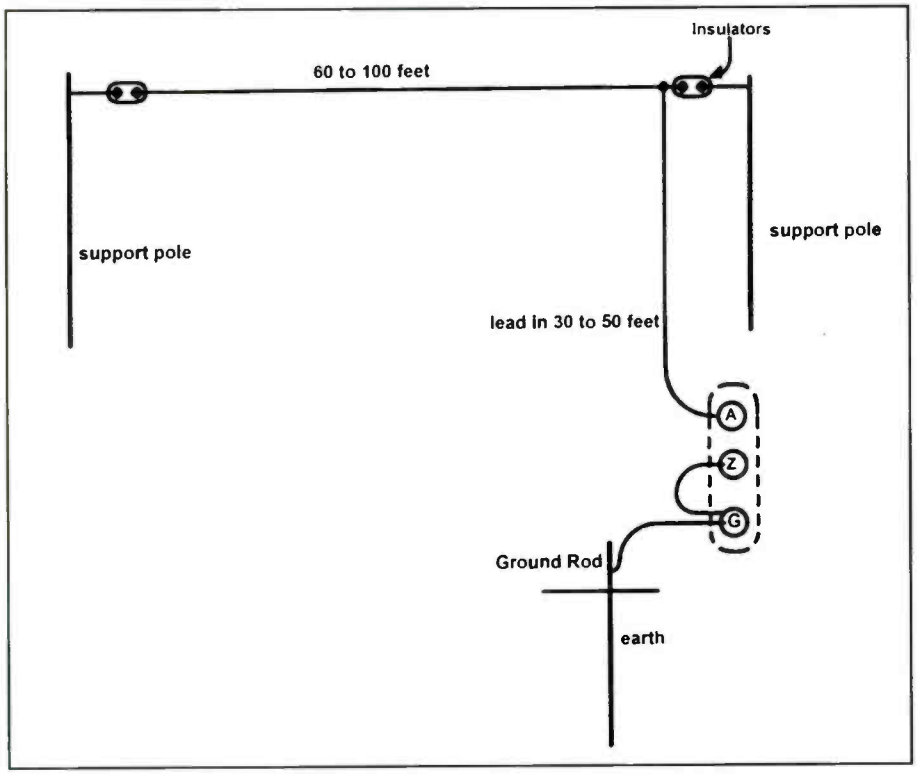


Figure 3A. A single longwire antenna can be used for both shortwave and AM broadcast reception. Note that the Z terminal is jumpered to the G terminal on the radio.

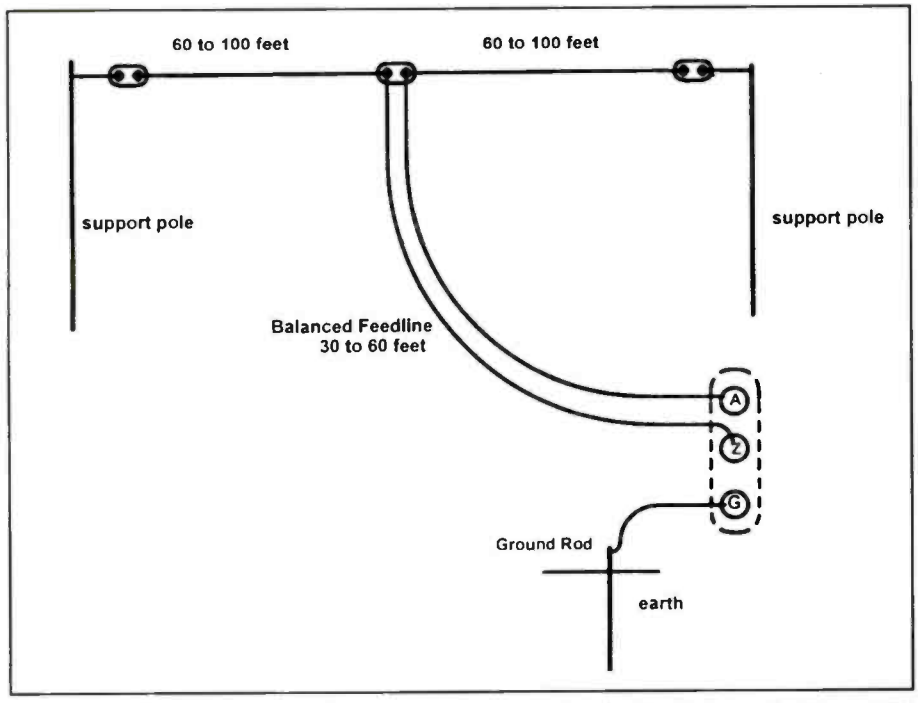


Figure 3B. Here's how a doublet antenna is connected to the Zenith for both AM and SW reception. The antenna works as a doublet on the police and shortwave bands, and is worked against ground as a "T" antenna (similar to an Inverted L) on the broadcast band for a good low-angle DX window.

The next problem involved a moved lead on the bandswitch. The radio was hacked! Someone decided a *good fix* would be to move the wire lead from antenna terminal **A** to the primary winding on coil 2 by rewiring the bandswitch. How clever. Mere words cannot convey my feelings for this person!

Once these problems were repaired and the set's wiring was returned to original condition, two more problems surfaced. This set was becoming a challenge. The shortwave bands were still intermittent; my ohmmeter showed that wiggling the bandswitch would break and make the connection to the antenna primary winding on coil 2. Gently reforming a damaged wiper on the wafer bandswitch (found by ohmmeter tracing) followed by a light application of DexoIT-D5 to remove oxidation cleared this problem.

Removing The Bandswitch

The last problem I encountered was the toughest to fix! Someone had forced the bandswitch past its indexed stop position in the past, probably an accidental act by a youngster. This resulted in rotational slippage between the shaft and wafer switch as the switch was indexed between band stops. I discovered the cause was the mechanical bond between the shaft and the mechanism that moved the switch wafer. This was a unique switch. My options were removing the bandswitch and repairing it, or finding a donor chassis with a good bandswitch to replace it. No donors were found.

Note: This is vital—document everything before attempting to remove the switch! I took numerous close-up digital photos of the switch and nearby wiring, and I also took time to make a drawing that I could follow to restore the wiring once the repairs were finished.

Photo E shows the bandswitch moved out and in the clear. I cut only as many wires as were needed to free the switch. Several broke of their own accord due to the flexing and stress of being moved. Next, I carefully drilled and removed the rivets holding the switch wafer to the bracket (see **Photo F**). I tried several fixes, involving epoxies or soldering, but since the repair was along the edge of seam the shear-strength was very poor and none of the repairs held when tested.

The final fix was to drill the shaft (**Photo G**) for a 4-40 machine screw tapping. The screw head would now tightly hold the small bracket that was original-

Photo C. Ever wonder how an antenna should be connected to the A, Z and G terminal strips found on many vintage radios? The mystery is explained in this column.

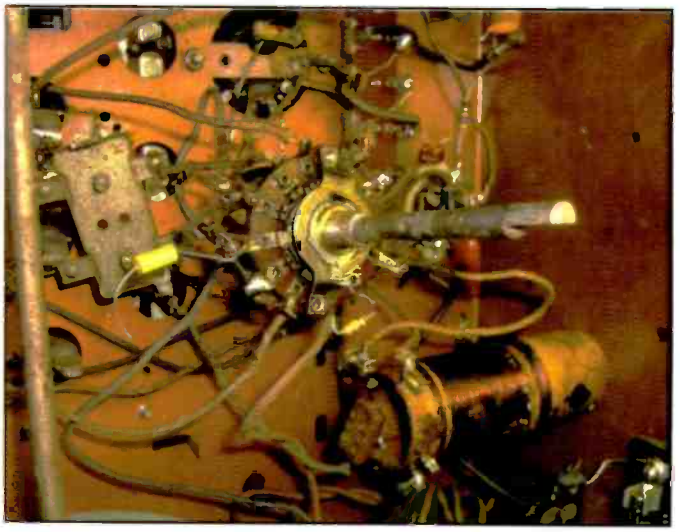


Photo E Carefully document every wire before attempting to remove a bandswitch for repair or replacement!

Photo D Fortunately the bandswitch for the 7S232 uses only a single phenol wafer section, but even so an impressive rat's nest of wires interconnects the complex bandswitching used in these early radios!

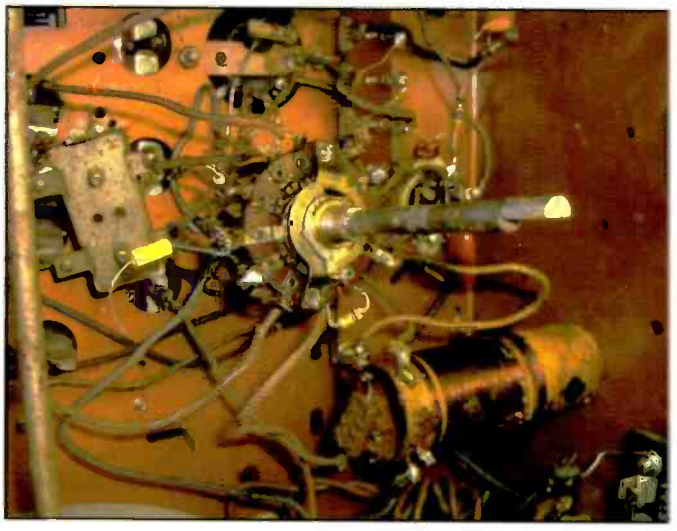


Photo F The rivet heads holding the phenolic switch wafer to the switch body are carefully drilled for removal. The large exposed coil to the right is Coil 1.

ly wedged on the end of the shaft. After tightly securing a brass machine screw into the shaft, I carefully soldered the entire repair for a very strong bond.

I replaced the rivets holding the switch wafer with 4-40 nuts and screws. Between the wafer and switch assembly 4-40 nylon washers were needed to replace the original phenolic spacers damaged when the switch wafer was removed.

Now for the moment of truth: Everything was put back together and the wiring restored to factory original. Once a final alignment was performed and an antenna connected, the radio roared to life, just as it did 70 years ago on the assembly line in Zenith's Chicago factory in 1938. Mission accomplished!

Your Thoughts?

If you enjoyed this column and found it useful, please let me know. If you didn't, let me know why with input on what you'd like to see instead.

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

Photo G Here's a good view of the end of the shaft where the device that drives the switch wafer is attached. The repair involved drilling and tapping the shaft so a 4-40 screw could be used to hold the assembly together.

by Rich Arland, W3OSS, richard.arland@verizon.net

Things We Take For Granted— In Tough Times, They're Necessities!

The recent "Homeland Security" column on the CBS drama series, "Jericho," with its nuclear disaster theme, apparently struck home with more than just a few of you. This is obviously also a hot button item in Hollywood since the start of the new season of the TV drama series *24* has Special Agent Jack Bauer tracking down some lowlifes that just triggered a nuclear man-pack device in Los Angeles.

"NO!" I did not have any conversations with the writers on *24*. However, both Fox News Channel and CNN had the theme of the season premier of *24* as a news feature for several days under the heading of "could this happen?" The usual parade of consultants and pseudo-experts vied for camera time to expound on their pet theories of whether or not a nuclear device could be smuggled into the United States and ignited at the whim of a sleeper cell.

"Radio is our link to the world outside our microcosm of friends and family."

One comment that I heard repeated on the various talking heads' news programs had a number of these low-yield nuclear devices already in place, hidden near large population centers, just waiting to be triggered. I don't know where their information sources came from, but it's a sure bet that the bad guys are well aware of how unprepared America in general is for such a terrorist attack.

Pulling Through

These news programs led me to do some further in-depth research into the nuclear survival phenomenon. One of the books I highly recommend reading, and that I touched on in that same column, is *Pulling Through* by Dean Ing. Ing is one heck of a good writer. I've read a number of his works and he's a very thought-provoking writer who gets the reader thoroughly involved with the story line and, at the same time, instills in-depth research into various aspects of the plot, based upon hard scientific information from credible sources.

The basic plot is an End-Of-The-World-As-We-Know-It (EOTWAWKI) scenario and focuses on the efforts of one small family unit to survive the initial thermonuclear exchange and to cope with the aftermath. Ing's nuclear war survivors are just an average group of folks like you and me who must make do with whatever they have at hand, or on their backs. Interspersed with this is an underlying theme that places a whole lot of common sense at the top of the list of prerequisites to surviving anything more serious than a hang nail!

Unlike the *Jericho* TV series, the novel *Pulling Through* is taken right out of the pages of *Nuclear War Survival Skills* by Cresson H. Kearney, also mentioned in that column. Do a search at www.amazon.com and find the best price, because if you are serious about preparing for the unthinkable this is the *one* book you must have in your collection to give you a fighting chance at pulling through. Story line aside, you get some great ideas on how to become a survivor, so you get two books in one: a great story and a "how-to" guide about nuclear war survival.

Photo 1 -This is a shot of the front of the FR-200 Grundig "survival" radio. Nice, clean, functional, AND analog! Radios with digital displays hog battery power while an analog display doesn't.

The Necessary Stuff

This month let's focus on those little things we take for granted that bring us pleasure and are very hard to live without when we don't have them. Whether it's a full-blown nuclear exchange, a couple of terrorists detonating some low-yield devices in large cities, or a hurricane that flattens the Gulf Coast, you'll find these ideas transcend the obvious disaster scenarios. It's also good practice to implement them when "normal" things happen at home, say during a severe winter storm.

What's the one thing that we, the readers of this particular magazine, have in common? One word: radios. Radio is our link to the world outside our microcosm of friends and family. Sure, we have television, but how many times do the talking heads get it partially wrong, or leave out specific, often vital details on a breaking story? Those of us who know where to listen will often have more up-to-date information on what's happening in our immediate locale or a nearby community than the newsies. Using

Photo 2 -Here is a shot of the back of the FR-200 Grundig "survival" radio. Note the green bundle of small cells on the bottom left: these are the NiMH rechargeable cells. These cells can be recharged by an external 4.5 V DC wall-wart or using the crank generator on the side of the radio. The three "AA" alkaline cells are shown above the NiMH pack.

Photo 3 - A close up of the analog display and controls. It's very well laid out and ergonomic. It's not a DXing radio but will definitely bring in local AM/FM and world band SW stations.

our scanners, along with a selection of HF radios, we can often piece more details together than the news media want to release on a timely basis. How, by the way, do you think newsrooms get the "news"? Those scanners are running at full tilt!

This brings us to our first major piece of gear: a "survival" radio of some sort. While wandering (and drooling) through Lowe's or The Home Depot some day, let your mind run wild; you'll find all sorts of non-radio items that will work well in the radio hobby. Try it, you'll like it! I went through Lowe's the other day and saw a display that showcased LED flashlights, headband lights, various "AA" and "AAA" batteries, *and* a Grundig FR-200 Recycle Power receiver that covers the standard AM band (530 to 1710 kHz), the American FM band (88 to 108 MHz), and two shortwave bands, 3.2 to 7.6 MHz and 9.2 to 22.0 MHz (see photo 1). Also included in this radio is an LED light for reading or providing illumination in your shelter or car.

This innovative receiver uses three power sources: internal "AA" alkaline batteries, a nickel metal hydride rechargeable pack, and a hand-cranked generator. The hand-cranked generator is used to recharge the NiMH pack. On the back of this receiver (see photo 2) is a mini-coaxial power connector that will accept 4.5 VDC to power the radio and recharge the NiMH pack simultaneously. In other words, this radio pretty much can operate indefinitely, without commercial power, from virtually anywhere. Not a bad deal for $50!

Lowe's no longer stocks the Grundig FR-200. But the good news is that it instead offers an Eton version of the same thing. Since Eton bought out Grundig a couple of years ago, the new Eton is probably a bolt-for-bolt copy of the Grundig FR-200, with some cosmetic changes on the case. Not that it matters one darned bit. When you need a radio for emergencies, either one of these two will suffice. So, should you find something similar for a great price, pounce on it quickly.

Maybe A Couple Of Drawbacks, But...

This Grundig/Eton receiver isn't a DX special, that's for sure. At $50 it doesn't have a digital readout (see photo 3) and tuning is pretty iffy on the SW bands, but the AM and FM bands are spot-on and the receiver sounds good when used on these two bands. Using this receiver on the SW bands takes a deft hand to accurately tune in a station. There's some backlash in the dial that makes tuning "interesting," to say the least.

The receiver has a built in whip antenna for FM and SW. I don't recommend adding any active antenna or amplified antenna system to boost SW performance. Even adding additional wire to the end of the whip antenna may not be a good idea, since the extra capture area of the wire antenna might induce receiver overload. These inexpensive radio-on-a-chip receivers have severe overload problems when a large, efficient gain antenna is used in place of the normal whip antenna. The more RF signal that's coupled into the receiver, the worse the receiver sounds.

Therefore, since this rig is designed to work with a short whip antenna, leave well enough alone and use the whip. You definitely won't gain any performance and will, in most cases, degrade performance dramatically. And besides, DXing stations thousands of miles away isn't what this radio is all about!

For another inexpensive choice, keep you eye on RadioShack. It had a closeout special about a year ago on one of it imported digital readout SW receivers. The price was again around $50, as I remember, which was a good deal at the time. The only thing I can say about this type of radio is that seldom are digital radios nice to batteries. In short, SW radios that offer a digital readout are power hogs and not necessarily the kind of receiver one would want for prolonged use during an emergency. However, if it's a choice between one of the power hogs and no receiver at all, well I guess you know what I'd opt for having.

Your Scanner

Okay, we've got the AM/FM news sources covered and enough SW frequencies to keep us happy for a while, so how about tactical two-way FM transmissions from fire, police, EMS, ham radio, and public service agencies? How are you going to listen in on these folks who are normally the first responders to disasters?

Photo 4 -My old faithful Radio Shack PRO-79 that I picked up on closeout sale a few years ago for under $100. This is a nice little 200 channel conventional scanner. It WILL NOT track or decode analog or digital trunked systems, which is not a problem in my area. Pick your hand held scanner carefully, look for sales and spend your money wisely; your safety and that of your family's might well be at stake.

Here's where a good handheld scanning radio is indispensable. RadioShack, Uniden, AOR, and other folks have numerous scanners available at reasonable prices.

Of course, you first need to do some research on the VHF/UHF FM frequencies used in your area. If there *hasn't* been a big swing to trunked radio systems (either analog or digital) you're in luck, and a simple 200- to 1000-channel handheld scanner will be all the radio you need for monitoring the "action bands." However, if your area has gone to either analog or digital trunked radio systems over the last couple of years, you'll need a scanning receiver capable of intercepting and decoding the trunked information.

Naturally, this directly equates to spending more money: standard non-trunked scanners are relatively inexpensive (under $100 on sale); however, trunk-tracking scanners are considerably more, depending upon whether or not it's an analog or digital algorithm used to decode and follow the transmissions. The RadioShack PRO-98 is a great example of a 1000-channel handheld scanner that will follow digital trunking action on the high bands. Last time I checked the MSRP of a PRO-98 was around $450, not cheap by any stretch of the imagination. The choice is yours, so be prepared. There are always on-line auctions and flea markets. Just do some homework and you'll hopefully save some money.

Stay Informed To Stay Prepared

That's it for this month. Do your homework—as usual—and buy only what you need for your survival radio gear. Remember our mantra: "Preparedness is not optional." ■

by Gerry L. Dexter, gdex@genevaonline.com

New Station In Madagascar...Soon!

We're all aware that shortwave broadcasting is not exactly a growth industry these days. But every now and again there is an upswing in activity that emits a few waves of hope. One such is the recent news that World Christian Broadcasting says it's making steady progress toward completion of its new shortwave operation in Madagascar, which will broadcast in Arabic to the Middle East. As yet, however, no opening date, schedule, or frequencies have been announced.

World Christian Broadcasting also operates KNLS in Anchor Point, Alaska, on a two million dollar annual budget—a sum that's expected to double once the Madagascar station gets going. KNLS has always been well programmed and friendly to SWLs, giving us two excellent reasons to wish them well.

On National Register Today—Someday A Museum?

The former transmitter building of The Voice of America at Bethany, Ohio, has been placed on the National Register of Historic Places, which, it is hoped, will be the first step in converting it into a museum. VOA-Bethany discontinued operations in 1995, and most of the facility has since been torn down.

News From Africa

A few months back the National Radio of the Democratic Saharan Arab Republic changed its operating frequency to 6215 from 7425. Prior to that move it used 7460. Then, having used 6215 for a month or two, it reverted back to 7460. In other words, over the last 12 to 14 months the station has dropped from 7460 to 7425 to 6215 and back to 7460! And, "this just in"—it moved again and is now on 6458! The station supports the Polisario Front and is funded by Algeria, with the broadcasts coming from Rabuni, Algeria.

More International SW Happenings

Radio UNAM (National Autonomous University of Mexico) has begun tests on its former 9600 spot, where it had been silent for quite some time. These tests may have ended by now and the station may be fully active. So far, though, the tests haven't shown much in way of signal strength. XEYU is using a transmitter formerly owned by the now silent Radio Mexico International.

Two new shortwave transmitters are being added in Sarawak by Radio TV Malaysia. But, as usual, it's too early to be specific about times, locations, and frequency.

The area around 5009 is once again supporting broadcasts by a station in the Dominican Republic. In the current version the ID most often used is Radio Pueblo operating out of Santo Domingo. Sometimes it announces as Radio Cristal, a repeat of a situation that existed back in 2002.

Reader Logs

Remember, your shortwave broadcast station logs are always welcome. But please be sure to double or triple space items, list them (separately) 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? Step right up and get your 15 minutes of fame!

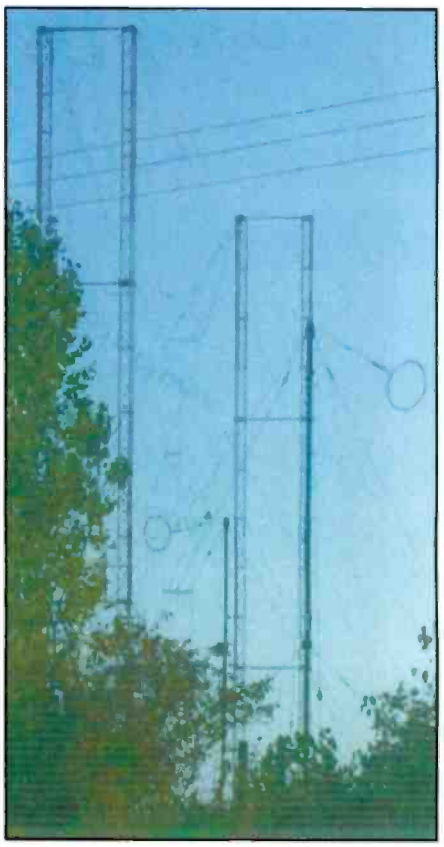
Here are this month's logs. All times are in UTC. Double capital letters are language abbreviations (SS = Spanish, RR = Russian, AA = Arabic, etc.). If no language is noted the broadcast is presumed to have been in English (EE).

ALBANIA—Radio Tirana, 6115 with news at 0246 and 7105 in Albanian at 0925. (DeGennaro, NY) 7465 at 0340. (Maxant, WV) 2110 to Europe. (Charlton, ON)

ANGUILLA—University Network, 6090 with music at 2315. (Maxant, WV)

ARGENTINA—RAE, 11710 at 0200. (Charlton, ON) 0213. Also 15345 in SS at 2021. (DeGennaro, NY)

ASCENSION IS.—BBC Relay, 15400 to West Africa at 2024 and 17830 with African news at 2006. (DeGennaro, NY) 17830 at 2014 and 21470 at 1650. (Charlton, ON)



Part of the antenna system at Radio Tirana, Albania. (Thanks Charles Maxant, WV)

AUSTRALIA—Radio Australia, 5995-Brandon in Pidgin at 0926, 6020-Shepparton in Pidgin and EE at 0929, 9580-Shepparton at 0953, 9590-Shepparton at 0955, 9710-Shepparton in Pidgin at 1004 and 11880-Shepparton at 1155. (DeGennaro, NY) 6020 at 1145. (Charlton ON) 12080 at 0540, 13630 at 0835 and 17785 to fade at 2238. (Maxant, WV) 15230//15515 at 2200. (Wood, TN) 15515-Shepparton at 0346, //15240-Shepparton. (MacKenzie, CA)

CVC International, 15715 via Julich, Germany, in AA at 1207. (DeGennaro, NY)

AUSTRIA—Radio Austria Int., 7325 in GG at 0009, 6155 in GG at 0845 and 13730 in GG at 1441. All from Moosbrunn. (DeGennaro, NY) 13675 at 1415. (Maxant, WV) (*via Canada—gld*) 1647 in GG. (Charlton, ON)

BENIN—Radiodiffusion du Benin (p) 5025-Parakou, 2035 mixing with Rebelde. Two women in FF talk and pop vocal. (D'Angelo, PA)

BOLIVIA—Radio Mallku, Uyuni, 4796.4 in SS/QQ at 0932 with music, ID at 0934. (DeGennaro, NY)

Help Wanted

The "Global Information Guide" consistently presents more shortwave broadcast loggings than any other monthly SW publication! (A whopping 732 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.*

Radio Mosoj Chaski, Cochabamba, 3310 in QQ at 0948, (DeGennaro, NY)

Radio Santa Cruz, Santa Cruz, 6134.8 in SS monitored at 0116. (DeGennaro, NY)

Radio Nacional Huanuni, Huanuni, 5964.7 in SS at 0955. (DeGennaro, NY)

La Voz del Campesino, Sipe Sipe, 5680.8 with SS talk at 1000. (Alexander, PA)

Radio Yura, 4716.8 with animated SS talk at 0035. (Strawman, IA

BONAIRE—Radio Nederland Relay, 6165 at 0015. (Maxant, WV) 11675 at 1210

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

with "Weekend Connection." (Fraser, MA) 15525 at 2029. (DeGennaro, NY) 17810 at 2010. (Charlton, ON)

BOTSWANA—VOA Relay, 9885 at 0404 with "Daybreak Africa." (D'Angelo, PA) 15580 at 1632. (Charlton, ON)

BRAZIL—(All in PP) Radio Alvorada, Londrina (p) 4865 at 0020. (Strawman, IA)

Radio Capixaba, Vitoria, 4935 at 0031 with apparent sermon. (Strawman, IA) 0040. (Alexander, PA)

Radio Difusora do Amazonas, Manaus, 4805 with ballads at 0031. (Strawman, IA) 0944. (DeGennaro, NY)

Radio Guaiba, Porto Alegre, 6000 monitored at 2315 to 2330 when Prague signs on. Weaker on parallel 11785. (Alexander, PA)

Radio Educadora, Guajara Mirim, 3375 at 0953. (DeGennaro, NY)

Radio Cancao Nova, Cachoeira Paulista, 9675 at 2127. (DeGennaro, NY)

Radio Brazil Central, Goiania, 4845 at 0307, //11815. (D'Angelo, PA) 0847 and 11815 at 2036. (DeGennaro, NY)

Radio Anhanguera, Goiania, 4915 at 0850. (DeGennaro, NY)

Radio Cultura Ondas Tropicais, Manaus, 4845.2 to 0200 close after talk and vocal selections. (D'Angelo, PA) 1004 with religious message. (DeGennaro, NY)

Radio Nacional, Macapa, 4915 heard at 0853 with two men talking. (DeGennaro, NY)

Radio Aparecida, Aparecida, 5035 with songs and talk. (DeGennaro, NY) 6135 at 0821 and 9630 at 0007. (DeGennaro, NY) 9630 at 0840, //5035, 6135 and 11855.1. (Alexander, PA)

Radio Nacional da Amazonia, Brasilia, 6180 at 0851 and 11780 with sambas at 1113. (DeGennaro, NY)

Radio Novas de Paz, Curitiba, 9515 with mostly talk heard at 2223. (DeGennaro, NY)

Radio Marumby, Florinapolis, 9665 with ballads at 2245, //11750. (Alexander, PA) 0012 with religious message and 11750 heard at 0217. (DeGennaro, NY)

Radio Difusora, Taubate, 4924.5 at 1010 with rapid-fire talk and commls. (DeGennaro, NY)

Radio Rio Mar, Manaus, 9695 at 0959 opening with schedule, commls. (DeGennaro, NY)

Radio Tupi, Curitiba, 6060 at 0830 with religious message. Also 9565 at 2358. (DeGennaro, NY)

Radio Difusora Roraima, Boa Vista, 4875 heard at 0936. (DeGennaro, NY)

Radio Alvorada, Parintins, 4965 at 0942 with ID, commls. (DeGennaro, NY)

Radio Clube do Para, Belem, 4885 at 0859 with ID at 0900. (DeGennaro, NY)

Radio Trans Mundial, Santa Maria, 11735 at 1059 with full ID, schedule and hymns. (DeGennaro, NY)

Radio Senado, Brasilia, 5990 heard at 0922 with woman reading commls. (DeGennaro, NY)

Radio Inconfidencia, Belo Horizonte, 6010 heard at 0822. (DeGennaro, NY)

Radio Difusora da Maranhao, San Luis, 4735 heard at 0859. (DeGennaro, NY)

Radio Guarani, Belo Horizonte, 6050 at 0827 with religious message. (DeGennaro, NY)

Radio Missoes da Amazonias, Obidos, 4865 heard at 1035. (DeGennaro, NY)

Radio Novo Visao, Santa Maria, 9530 with religious conversation at 1041. (DeGennaro, NY)

Radio Alvorada, Londrina, 4865 heard at 0351 with music and anmts. (DeGennaro, NY)

Radio Educacao Rural, Tefe, 4925 with possible phone calls at 1054. (DeGennaro, NY)

Radio Guaruja Paulista, Guaruja, 5045 at 0838 at 0006 with pop vocals, //5045. (D'Angelo, PA) 0700 with pops, //5045, 5940 weak but readable. (Alexander, PA) 5045 at 0828. (DeGennaro, NY)

Radio Clube, Marilia (p), 3235 with pop vocals heard at 0405. (D'Angelo, PA)

Radio Bandeirantes, Sao Paulo, 6090 at 0550 with talk, promos. Anguilla was off the air. Also 9645 at 0155, with //11925 very weak. (Alexander, PA)

Radio Educadora, Braganca, 4825 at 0925. (DeGennaro, NY)

BULGARIA—Radio Bulgaria, 5800 at 2210 and 7400 at 0315. (Maxant, WV) 5800 at 1811 in FF, 7400 at 0018, 7500 in SS at 0025, 9700 at 0027, 11700 in GG at 1143 and 15700 in FF at 1203. (DeGennaro, NY) 7400 at 0050. (Fraser, ME) 0107 in BB. (Charlton, ON) 11500 heard at 1630 with ID and into GG. (Brossell, WI)

BURKINA-FASO—Radio Burkina, 5030 monitored at 0558 sign on with open in FF, anmts, FF talk, Afro-pops. (Alexander, PA)

CANADA—Radio Canada Int., 5840 via Horby in AA at 0353, 6180-Sackville in SS at 0311, 9640-Sackville in SS at 0016, 15305-Sackville in PP at 2019 and 17765-Sackville in PP at 2009. (DeGennaro, NY) 9770 at 2130 and 13655 at 0430. (Maxant, WV) 11765 via Germany at 2044 and 13650 in AA at 2030. (Charlton, ON)

CBC Northern Quebec Service, 6925 at 0510. (Maxant, WV)

CKZN, St. John's, 6160 at 0848. (DeGennaro, NY)

CHU, Ottawa, 7335 with EE/FF time anmts at 0345. (Maxant, WV)

CHAD—Radio Nationale Tchadienne, 6165 at 2127 with FF talk, ID by woman, more talk. Largely under Croatia. (D'Angelo, PA) 2210-2230 close with anthem. (Alexander, PA) 2220 to 2229 off. (Strawman, IA)

CHILE—CVC/La Voz, 6070 in SS at 0840. (Maxant, WV) 0833 in SS. Plus 11745 in PP at 0050 and 15410 in PP at 2029. Also 17680 in SS at 2016. (DeGennaro, NY) 11745 in PP at 0305. (Brossell, WI) 17680 in SS at 1646. (Charlton, ON)

CHINA—China Radio Int., 5915-Hohhot at 1113, 5960 via Albania at 2025, 7135-Beijing at 1054, 7180-Kashi in Italian at 2045, 7215 via Albania in AA at 2150, 7285 via Albania at 2143, 9425-Jinhua in Cantonese at 2351, 9440-Xi'an in CC at 0944, 9590-Kashi in SS at 0002, 9800-Kashi in SS at 0036, 11700-Kunming in Indonesian at 1051, 11725 via Albania in AA at 1621, 11885-Xi'an at 0039, 11980-Kunming in CC at 0921, 13630 via Mali at 2038, 13670 via Albania in FF at 1437, 15210-Kunming at 0940 and 15440-Kunming in CC at 0949. (DeGennaro, NY) 7345-Kashi at 0106, 9580 via Cuba at 0112 and 17880 via Mali in AA at 1647. (Charlton, ON) 7110-Jinhua in JJ at 2231. (Strawman, IA) 7130 at 0133, 11640 in VV at 0437. (MacKenzie, CA) 9415 in VV at 2358. (Taylor, WI) 9790 via Cuba at 0345. (Maxant, WV) 13645 heard at 1736. (Barton, AZ)

China National Radio/CPBS, 4800-Geermu in CC at 1051, 7620-Beijing in CC to Taiwan at 1132, 9500-Shijiazhuang in CC at 0947, 9810-Xi'an in CC at 1009, 9830-Beijing in CC at 1012 and 13610-Nanning in CC at 0932. (DeGennaro, NY) 4980-Urumqi listed in Uighur at 0019. (Strawman, IA) 5060-Urumqi in CC at 0045, 9820-Xi'an at 0035. (Mackenzie, CA) 6165 in CC at 1204. (Brossell, WI)

Xizang PBS-Lhasa (Tibet) 4905 in Tibetan at 1057 and 4920 in Tibetan at 1101. (DeGennaro, NY)

In Times Past...

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

CAMEROON—Radio Bafoussam, Bafoussam, 4000 with its domestic service in FF at 0440 running 20 kW on November 29, 1989. (Dexter-WI)

One of the four 500-kW transmitters housed in WEWN's transmitter hall at Vandiver, Alabama. (Thanks Charles Maxant)

China Huayi Broadcasting Station (p) 6165 in Mandarin heard at 1335. (Strawman, IA)

Voice of the Strait, 7280-Fuzhou in CC at 1102. (DeGennaro, NY) 1235. (Brossell, WI)

Firedrake (China Music Jammer), 11785 against VOA via Thailand at 1210. (Brossell, WI)

COLOMBIA—La Voz de Guaviare, San Jose de Guaviare, 6035 in SS at 0049. (DeGennaro, NY) 0110 with futbol coverage. (D'Angelo, PA)

Radio Lider, Bogota (t) 6139.8 in SS at 1010. (DeGennaro, NY)

Marfil Estereo, Puerto Lleras, 5910 in SS heard at 1108. (DeGennaro, NY)

La Voz de su Concencia, Puerto Lleras, 6009.5 at 0215 with sermon in SS. (Alexander, PA) 0957 with music. (DeGennaro, NY)

CONGO (REP.)—Radio Okapi, 11890 via South Africa in FF at 1630. (DeGennaro, NY)

COSTA RICA—University Network, 7375 heard at 0845 with the transmitter causing severe noise. (Maxant, WV)

CROATIA—Voice of Croatia, 6165 in Croatian at 2246 and 7285 via Germany in Croatian at 0049. (DeGennaro, NY)

CUBA—Radio Havana Cuba, 6000 in SS at 1114, 9550 in FF at 0008, 9600 in SS at 1208, 11760 in SS at 1108, 11800 in AA at 2033, 11805 in SS at 1122, 12000 in SS at 1146 and 13750 in SS at 1446. (DeGennaro, NY) 6060 in SS at 0115. (Charlton, ON) 6180 heard at 0520. (Maxant, WV)

Radio Rebelde, 5025 in SS at 0909. (DeGennaro, NY) 0920 in SS with basketball game. (Maxant, WV) 15570 in SS heard at1754. (Charlton, ON)

CZECH REPUBLIC—Radio Prague, 6200 in SS at 0118. (MacKenzie, CA) 0148 in SS, 7345-Litomysl in Czech at 0033 and 13580-Litomysl at 1426. (DeGennaro, NY) 0102 with News. (Charlton, ON) 2350 with an interview. (Maxant, WV) 9870 at 0304 on tourist sites. (Brossell, WI)

DIEGO GARCIA—AFN, 12579u at 1440 with NPR pgmng and ID on the hour. (D'Angelo, PA)

DJIBOUTI—RT Djibouti, 4780 with sign on at 0258, O/C, music, ID and opening anmts by woman, then man with Koran. (D'Angelo, PA)

DOMINICAN REPUBLIC—Radio Pueblo, Santo Domingo, 5009 at 1055 in SS with "Radio Cristal" mentioned several times. (DeGennaro, NY)

ECUADOR—HCJB, 3220 in QQ at 1009, 6050 in SS at 1132, 6125 in QQ at 0842 and 11960 in SS at 1147. (DeGennaro, NY) 9745 in SS at 0445. (MacKenzie, CA) 12020 in PP at 0102. (Charlton, ON)

Radio Quito, Quito, 4919 in SS at 0903. (DeGennaro, NY)

Radio Chaski, Otavalo, 4909.3 in SS at 1058. (DeGennaro, NY)

La Voz del Napo, Tena, 3279 at 0338 in SS with ads, talk. (DeGennaro, NY)

Radio Buen Pastor, Saraguro, 4815 with religious message at 1047. (DeGennaro, NY)

EGYPT—Radio Cairo/Egyptian Radio, 7270 at 0320 about Palestine and 9990 asking for reception reports at 2255. (Maxant, WV) 7270 in SS at 0052, 9470 in FF at 2050, 9990 in Italian at 1819 and 12050 in AA at 1153. (DeGennaro, NY) 12050 in AA at 1744. (Charlton, ON)

ENGLAND—BBC, 3255 via South Africa at 0325, 5875 via Cypress Creek at 1101, 6195 via Singapore at 2051, 7135 via Singapore in Indonesian at 1197, 9480-unlisted at 2210, 9740 via Singapore at 0939, 11680-Skelton in AA at 1525, 11820 via Cyprus in AA at 1128, 11920 via Singapore at 1135, 12095-Rampisham in AA at 1139 and 13640-unlisted at 1150. (DeGennaro, NY) 6035 via Thailand in an Asian language at 1300, 7330 via Russia in CC at 1240 and 9915 via Cyprus in AA at 0305. (Brossell, WI) 9660 via Australia at 2100. (Charlton, ON) 9740 via Singapore at 1131 (D'Angelo, PA) 12095 at 0500. (Maxant, WV)

EQUATORIAL GUINEA—Radio Nacional, Bata, 5005 at 0512 abrupt sign on with Afro-pops f/by religious pgm heard at 0528. (Alexander, PA)

ETHIOPIA—Radio Ethiopia, Gedja, 9704 in unid language at 1843 with man/woman talking. (DeGennaro, NY)

FRANCE—Radio France Int., 5925 via South Africa in FF at 0308. (Brossell, WI) 5995 via French Guiana in SS at 0103. (MacKenzie, CA) 7135-Issoudun in FF at 2130, 7160 via South Africa in FF at 2138, 7315-Issoudun in FF at 2147, 11615-Issoudun in EE at 1607, 15160-Issoudun at 1605, 15300-Issoudun in FF at 1618 and 15515 via French Guiana in SS at 1220. (DeGennaro, NY) 11705-Issoudun in FF at 1816, 17630 via French Guiana in SS at 1820 and 15160 via South Africa in EE at 1624. (Charlton, ON)

GABON—Africa No. One, 15475 in FF at 1722. (Charlton, ON)

RTV Gabonaaise, 4777 in FF at 0510. (Brossell, WI)

GERMANY—Deutsche Welle, 5900 via Komsomolsk, Russia, in CC heard at 1110, 6040 via Sackville in GG at 1004, 6075 in GG at 0836, 7175-Nauen in GG at 0909, 7265 via Irkutsk, Russia, at 1058, 9545-Nauen in GG at 1735, 9735-Nauen in FF at 1711, 11510 via Kazakhstan in GG at 1043, 11695-Nauen at 1614, 11995-Nauen in Bengali at 1552, 13780 via Sri Lanka in GG at 1455 and 15275 via Wooferton in FF at 1614. (DeGennaro, NY) 7225 via Portugal at 0435. (Strawman, IA) 7225 at 0435 and 7285 at 0535. (Maxant, WV) 11725 via Rwanda in GG at 1808, 15275 via Rwanda in FF at 1714 and 17610-Nauen in FF at 1638. (Charlton, ON) 15335 via Russia in RR heard at 0100. (Barton, AZ)

Deutschland Radio, Berlin, 6005 in GG at 0813. (DeGennaro, NY)

Deutschland funk, Berlin, 6190 in GG at 0948. (DeGennaro, NY)

GREECE—(All in Greek) Voice of Greece, 7475 at 0022, 9420 at 1751. (DeGennaro, NY) 15630 heard at 1725. (Charlton, ON)

RS Makedonias, 7450 with Greek ballads at 2016. (Wood, TN) 2200 opening and 9935 at 1602. (DeGennaro, NY)

GUATEMALA—Radio Cultural Coatan, San Sebastian, 4780 at 0220 with religious music in SS. (Barton, AZ) 1042. (DeGennaro, NY) 1125. (Alexander, PA)

Radio Verdad, Chiquimula, 4052.5 in SS at 0215. (Taylor, WI) 0300. (Brossell, WI) 0315. (D'Angelo, PA)

HONDURAS—Radio Luz y Vida, San Luis, 3249 in SS at 0330. (DeGennaro, NY) 1130 with ID, SS talk, music. (Alexander, PA)

HUNGARY—Radio Budapest-Jaszbereny, 5980 in HH at 0337, 6025 in FF at 2059, 6110 in HH at 0104 and 6140 in HH at 2238. (DeGennaro, NY) 6035 at 0335. (Maxant, WV) 6110 in HH at 0110. (MacKenzie, CA) 9795 with "Inside Central Europe" at 0247. (Brossell, WI)

INDIA—All India Radio, 5010-Thiruvananthapuram in presumed Hindi at 1148, 11620-Aligarh in unid language at 1252 and 11620-Bangaluru in presumed Hindi at 2053. (Brossell, WI) 9425 at 2220. (Barton, AZ) 9425-Bangaluru in Hindi at 1742, 9445-Bangaluru in EE at 2203, 11620-Bangaluru at 1533, 10330-Bangaluru in Hindi at 0208

Radio Waaberi transmits to Somalia via Julich, Germany. (Thanks Rich D'Angelo, PA)

in Swahili at 1545. (DeGennaro, NY) 13605 at 1945 with Indian and Western music. (Maxant, WV) 15075 in Hindi at 0357. (MacKenzie, CA)

INDONEISA—Voice of Indonesia, 9525 at 1640 with vocals, drums, many mentions of Indonesia, URL given as rrionline.com. Into SS heard at1700. (Barton, AZ) 2015 with string instrumentals. (Maxant, WV) 2103 ending EE, anmts at 2105 and off at 2106. (Alexander, PA)

IRAN—VOIRI/V of Justice, 6065-Sirjan in AA at 2112, 7130 in SS at 2057, 9940 in Dari at 1306 and 15545-Sirjan in AA at 1215. (DeGennaro, NY) 7205 at 1950 with music and anti-Western rhetoric. (Maxant, WV) 11730 at 1230 with anthem and ID in unid Asian language. (Brossell, WI)

ISRAEL—Kol Israel, 7545 with EE news at 2008. Into FF at 2030 and //9345. (D'Angelo, PA) 7545 in HH at 0027, 9345 in SS at 1824 and 15760 in HH at 1156. (DeGennaro, NY) 9400 in HH at 1935. (Maxant, WV)

Galei Zahal, 6973 in HH at 2304. (Wood, TN) 0205. (DeGennaro, NY)

ITALY—RAI Int., 6010 in PP at 2051, 6045 in AA at 2134, 9655 in RR at 1609, 9840 in II at 0041, 9845 in II at 1702, 11765 via Ascension in II at 0220, 11800 in II at 0046, 11860 in II at 1600, 11920 via Singapore in II at 1037, 11970 in RR at 1607 and 15230 in II at 1835. (DeGennaro, NY) 11855 ending II at 1630. (Brossell, WI) 15250 in II at 1711. (Charlton, ON)

IRRS, 5775 at 1900 with EE religious pgm to 1930 close. (Alexander, PA)

JAPAN—Radio Japan/NHK, 5960 via Canada in JJ at 0333, 6120 via Canada in EE at 1010, 7115 via UAE in JJ at 2256, 7225-Yamata in JJ at 2145, 9575 via UAE in JJ at 1728, 9750 via Rampisham in JJ at 1730 and 11920 via Singapore in JJ at 0917. (DeGennaro, NY) 6145 via Canada at 0005 and 15355 at 1710. (Maxant, WV) 11740 via Singapore in CC at 1211. (Brossell, WI) 11910 in JJ at 2242 and 15355 at 1745, //11970. (Barton, AZ) 15355 via Gabon at 1716. (Charlton, ON) 17825 at 2140. (Wood, TN)

Radio Nikkei, 3925 in JJ at 1022. (DeGennaro, NY)

JORDAN—Radio Jordan, 11690 at 1537. (DeGennaro, NY) 1600 with news. (Brossell, WI; D'Angelo, PA) 1640 under RTTY QRM. (Charlton, ON) 1645. Using ECSS or synchronous detection will eliminate the QRM. (Maxant, WV) 1715 with pop and dance. (Barton, AZ)

KUWAIT—Radio Kuwait, 6055 in AA/EE at 2005. (Maxant, WV) 9855 in AA at 2102. (DeGennaro, NY) 11990 in AA at 1620. (Brossell, WI)

LIBYA—Radio Jamahiriya, 7205 via France in AA heard at 2145 and 7320 via France in AA at 2209. (DeGennaro, NY) 7320 with Voice of Africa segment at 2224. (Alexander, PA)

LITHUANIA—Radio Vilnius, 7320 at 2340 on inter-European tourism. (Fraser, ME) 11690 in LL at 0001. (Charlton, ON)

MALAYSIA—Voice of Malaysia, Kajang, 15295 in Malay heard at 0944. (DeGennaro, NY)

MALI—RTV Malienne, 4835.4 at 2220 but very poor. (Strawman, IA) 2310 in FF with Afro-pops, ballads. Also 5995 at 0555 sign on. (Alexander, PA) 5995 in unid lang at 2042. (DeGennaro, NY)

MAURITANIA—Radio Mauritanie, 4845 heard at 0235 apparently running all night with non-stop talk in AA, sometimes alternating with another voice. (D'Angelo, PA) 0250. (Brossell, WI)

MEXICO—Radio Educacion, 6185 at 0854 in SS. (Brossell, WI) 0930. (Maxant, WV) 0932. (D'Angelo, PA)

XERTA, Radio Transcontinental, 4810 at 0042 with SS hosting vocal numbers, ID at 0102. (D'Angelo, PA) 0200. (Barton, AZ)

Radio Mil, 6010 in SS at 0818. (DeGennaro, NY) 1156. (Brossell, WI)

MOROCCO—RTV Marocaine, 5980-Briech in AA heard at 0403, 7135-Briech in AA at 2300 and 15345-Nador in AA at 1532. (DeGennaro, NY) 1715 in AA. (Charlton, ON)

Radio Medi-Un, Nador, 9575 in FF at 1034. (DeGennaro, NY)

MOLDOVA—Voice of Russia relay, 9665 in RR at 0246. (Brossell, WI)

NETHERLANDS—Radio Nederland, 5955-Flevoland in DD at 0959, 6035 via Sweden at 0942, 6040 via Russia in DD at 2103, 7120 via Madagascar in DD at 2125, 9895-Flevo in DD at 1614 and 11655 via Madagascar at 2018. (DeGennaro, NY) 9895-Flevo at 1600 in DD to 1700 when the Madagascar site picks it up. (Barton, AZ) 11655 via Madagascar in EE heard at 2039. (Charlton, ON)

NEW ZEALAND—Radio New Zealand Int., 9630 carrying National Radio at 1257 before switching to 7145. (Brossell, WI) 9870 at 1021. (DeGennaro, NY) 15720 at 0340. (MacKenzie, CA)

NIGER—La Voix du Sahel, Niamey, 9705 in FF at 2112. (DeGennaro, NY) 2125 with FF phone calls. (Strawman, IA)

NIGERIA—Voice of Nigeria, 7255-Ikorodu in Hausa monitored at 2207 and 15120-Ikorodu in EE at 2011. (DeGennaro, NY) 1754 with national news. (Charlton, ON) 1915. (Maxant, WV)

NORTH KOREA—Pyongyang Broadcasting Station, 6250 in KK heard at 1210. (Brossell, WI)

Voice of Korea, 13650 opening in FF at 0100. (Barton, AZ)

KCBS, 15180 in KK at 1230. (Brossell, WI)

OPPOSITION—Radio Nacional de la RASD (to Western Sahara) 6215 at 2210 to 0000 close in SS. (Alexander, PA) ex-7425 at 2041. (DeGennaro, NY) *(now on 6458—gld)*

Radio Farda (to Iran) 9805 via Morocco in Farsi at 0300. (Brossell, WI) 15410 via Wooferton in Farsi at 1627. (DeGennaro, NY)

Tensae Ethiopia (Voice of Ethiopia) 11900 at 1458 open with IDs, anmts, news. (D'Angelo, PA)

Radio Okapi (Congo) 11690 via South Africa in FF at 0428. (MacKenzie, CA)

Radio Free Asia, 12025 via No. Marianas in CC heard at 1620. (Brossell, WI)

Radio Zamaneh (to Iran), 6245 with news heard at 2033. Close at 2059. (D'Angelo, PA)

Radio Republica (to Cuba) 6185 via England in SS at 0205; address given in Hialeah, Florida. (Taylor, WI) 7205 via England in SS at 0000. (Charlton, ON)

Voice of Peace (to Zimbabwe) 11695 heard via Madagascar from 1700 sign on

This Month's Book Winner

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

This month's winner is **Charles Maxant** of Hinton, West Virginia. Charles receives a brand new full color National Geographic world map. Now all he needs is a wall to put it on and a box of map pins to mark his DX conquests!

with music, anmts, talks in various langs. (D'Angelo, PA) 1729 with good signal but difficult copy due to flat audio and a heavy accent. EE anmt at close. (Barton, AZ)

Radio Free Europe, 9520 via Hungary in RR heard at 0240. (Brossell, WI)

Voice of Mesopotamia, 11530 via Moldova at 1228 with "Denge Mesopotamia" ID around 1228. (Brossell, WI)

Radio Liberty, 7220 via Morocco in RR at 0430. (Strawman, IA) 2123 via Thailand in RR (MacKenzie, CA)

Radio Marti, 7405-Greenville in SS to Cuba at 1320. (Fraser, ME)

OMAN—Radio Sultanate of Oman, 6085 in AA heard at 0317, 9760 in AA at 0019 and 15140 in AA at 1539. (DeGennaro, NY) 15140 at 1400 with EE news. (Alexander, PA) 1655 in AA. (Charlton, ON)

PALAU—KHBN-Voice of Hope, 9965 in CC heard at 1226. (Brossell, WI)

PERU—Radio Huanta 2000, Huanta, 4755 heard at 1036. (DeGennaro, NY)

Reina de la Selva, Chachapoyas, 5486.6 in SS heard at 1028. (DeGennaro, NY)

Radio Santa Monica, Cusco, 4965 in SS at 1017. (DeGennaro, NY)

Radio Maranon, Jaen, 4835.6 in SS at 1105. (DeGennaro, NY)

Radio Tarma, Tarma, 4775 in SS at 1039. (DeGennaro, NY)

Radio Altura, Cerro de Pasco, 5014 in SS at 1107. (DeGennaro, NY) 0300 to 0357 close. (Alexander, PA)

Radio Ancash, Huaraz, 4991 in SS at 0946. (DeGennaro, NY)

Radio Vision, Chiclayo, 4790.1 at 0111with chanting and prayers, talk before an audience, ID. (Taylor, WI) 0916 with several IDs. (DeGennaro, NY)

Radio Atlantida, Iquitos, 4790 at 0328 with long SS talk, several mentions of "Atlantida." (Taylor, WI) (*This old timer is still, or again, active.—gld*)

La Voz de la Selva, Iquitos 4824.4 with election results in SS at 1032 with OA vocals. (D'Angelo, PA) 1049. (DeGennaro, NY)

PHILIPPINES—FEBC Int., 9430 in CC at 1212. (Brossell, WI) 12095 in unid language at 1140. (DeGennaro, NY)

PIRATE—Undercover Radio, 6925u at 0145, 0300, 0405 about stringing an antenna, meeting a woman on a beach, a man who came back to life. (Hassig, IL) 1452 and 0245 with Dr. Benway "broadcasting from the middle of nowhere," girl and beach story as above, undercovedradio@mail.com for reports. (Zeller, OH) 0323 with ID and email address. (D'Angelo, PA)

WBNY/Radio Bunny, 6925u at 2158, 0038 and 1350 with Commander Bunny, rock and novelty records, occasional Peter Cottontail song. (Zeller, OH) 2202 with tire pressure reminder, frequent IDs. (D'Angelo, PA) 2101 with several IDs and special broadcast from "Rodent Revolution Headquarters." (Wood, TN)

Take It Easy Radio, 6925u heard at 0310 with rock, ID. (D'Angelo, PA) 2139, 2233, 0052 with rock, IDs, "Take It Easy" song. (Zeller, OH) 0050 remember overseas service members, rock things. (Hassig, IL)

The Crystal Ship, 3275.7 at 0245 with rock, ID. (Alexander, PA)

Altered States Radio, 6925u at 2345 with reggae, X-rated rock, Johnny Cash. (Hassig, IL) 2334 mentioning "Pirate radio for people who like to get high" and Merlin address. (Zeller, OH)

MAC Radio, 3200.7 at 0040 with Beatles, off with NA at 0119. Also 6850.9 at 1917 with Beatles, requesting reports. (Alexander, PA) 6851 at 2345 with classical bit, TV theme music, old radio jingles. QSL: macshortwave@yahoo.com. (Hassig, IL)

WDDR, 6925u at 1718 and 1841 with rock, "Outer Limits" theme, listeners will suffer from low tire pressure and flats. Highly negative consequences of listening to this broadcast. (Zeller, OH) 1934 with rock numbers. Muffled voice modulation. (D'Angelo, PA)

Voice of Influenza, 6925u at 1841 with rock and annor complaining about being very sick, Led Zeppelin things and parodies of same. (Zeller, OH)

WHJO, 6925 heard at 2340 with several playings of the song "Hey Joe." (Hassig, IL)

Voice of the Runaway Maharishi, 6925u with old pgm of rock and some Indian sitar. Gave outdated Wellsville address, which long ago changed to Belfast. (Zeller, OH)

Ground Zero Radio, 6925.7 with trumpet open at 2141 and 2157 logs, Burt the Turtle, old "Duck and Cover" jingle, "Happy Trails" by Roy Rogers. gzrsw@yahoo.com. (Zeller, OH)

Voice of Captain Ron, 6925u at 0253 with a TX tune up, f/by ID and CQs mentioning Jolly Roger. (Zeller, OH)

VOTL, Voice of the Linkfest, 6920 at 2338 with piano music and orchestra with host "Mike O. Farad," e-mail as votl_radio@yahoo.com. (Zeller, OH)

Northwoods Radio, 6925u at 2244 with annor Jack Pine Savage and parody music about hunting, some bluegrass. (Wood, TN)

Cupido Radio (Euro) 15070 at 1405 with US pops. (Zeller, OH)

PORTUGAL—RDP Int., 9455 in PP at 0040, 9815 in PP at 1204, 12020 in PP at 1150 and 15540 in PP monitored at 2024. (DeGennaro, NY) 2025 in PP. (Charlton, ON)

ROMANIA—Radio Romania Int., 6055 in FF at 2108, 6140 in SS at 0308, 6150 at 0131, 7140 in SS at 2050, 7145 at 2133, 9640 at 1838 and 11970 in Romanian at 1504. (DeGennaro, NY) 9715 in FF at 0250. (Brossell, WI)

RUSSIA—Voice of Russia, 6195-St. Petersburg in SS at 0144, 6240-Moscow at 0255, 7330-Moscow in PP at 0013 and 12075-Moscow in RR at 1156. (DeGennaro, NY) 6075-Petropavlovsk-Kamchatka in RR at 1245, 9880-Armavir heard at 0305, 15595-Petropavlovsk-Khamchatka in RR at 0228. (Brossell, WI) 7150-Armavir in RR at 0159 and 9840-Petropavlovsk at 0443. (Strawman, IA) 7350 with classical music at 0450. (Maxant, WV) 11510 via Armenia at 1816. (Charlton, ON) 12030 at 0405. (MacKenzie, CA)

Russian International Radio, 5965 via Julich in RR at 2030 and 5975 via Julich in RR at 2035. (DeGennaro, NY)

Radio Rossii, 13665 in RR at 1250. (Brossell, WI)

RWANDA—Radio Rawandaise, 6055 at 2040 with some U.S. pop, EE/vernacular talks with phone calls and dedications. Abrupt sign off at 2101. (Alexander, PA)

SAO TOME—VOA Relay, 4960 at 0457 and 9830 at 2047 with FF to EE lessons. (Brossell, WI) 11915 at 0415 in Kirundi. (MacKenzie, CA) 13735 at 2025 to 2030 close. (Wood, TN)

SAUDI ARABIA—BSKSA, 9555 in AA at 1832, 11935 in AA at 1139 and 15435 in AA at 1523. (DeGennaro, NY)

SEYCHELLES—BBC Relay, 6005 to Africa at 2048 and 9630 at 1724. (DeGennaro, NY) 2042. (Brossell, WI)

SINGAPORE—Radio Singapore, 7235-Kranji in Malay at 1136. (DeGennaro, NY)

SLOVAKIA—Radio Slovakia Int., 7345 in FF to Europe at 2034. (DeGennaro, NY) 9440 at 1409 in RR. (Taylor, WI)

SOLOMON ISLANDS—SIBC, 5020 with BBC news heard at 1210. (Brossell, WI)

SOUTH AFRICA—Channel Africa, 3345 with conversation at 0335 and 15235 in FF at 1610. (DeGennaro, NY) 9685 with African items at 0510. Also 15235 at 1720 on drinking water in several countries. (Maxant, WV) 15235 at 1745 and 17770 at 1527. (Charlton, ON)

Radio Sondergrense, 3320 at 0042 with long talk in Afrikaans. (Strawman, IA) 0320. (DeGennaro, NY)

SPAIN—Radio Exterior de Espana, 6055 in SS at 0058, 6125 in SS at 0100, 7270 in SS at 2213, 7275 in SS at 2218, 12035 with SS for Arabic speakers at 2050, 12045 in SS with futbol at 2044, 15125 via Costa Rica in SS at 2014, 15385 in SS at 1622, 15585 in SS at 1211 and 17850 via Costa Rica in SS at 2002. (DeGennaro, NY) 6055 in SS at 0000. (Barton, AZ) 0020. (Fraser, ME) 6125 at 0235. (MacKenzie, CA) 17755 in SS at 1645 and 17850 via Costa Rica in SS heard at 2017. (Charlton, ON)

SRI LANKA—SLBC, 7300 in Malay at 1123 and 11905 in EE and Hindi at 1510. (DeGennaro, NY)

SURINAME—Radio Apinte, 4990 in DD heard at 0906. (DeGennaro, NY)

SWEDEN—Radio Sweden, 6010 via Canada in Swedish at 0323, 6065-Horby in Swedish at 0831. Also 9490 via Canada in Swedish at 0108. (DeGennaro, NY) 11550 at 1330. (Fraser, ME) 15240-Horby at 1554. (Charlton, ON)

TANZANIA—Radio Tanzania-Zanzibar, 11735 in Swahili at

2010. (DeGennaro, NY) 2058. Off at 2100. (Brossell, WI; Barton, AZ)

TAIWAN—Radio Taiwan Int., 6120 via Julich in SS at 2119 and 11715-Tainan in Cantonese at 1055. (DeGennaro, NY) 9355 via Florida at 2220. (Maxant, WV) 11665 via Florida in FF at 2040. (Charlton, ON) 15465-Paochang at 0100. (Barton, AZ)

THAILAND—Radio Thailand, 5890 via USA at 0050. (MacKenzie, CA) 7285 at 1053, 9680 at 0018 and 11805 in Malay at 1159. (DeGennaro, NY)

VOA Relay, 11785 in CC under the Firedrake jammer at 1234. (Brossell, WI)

TURKEY—Voice of Turkey, 5980 in TT at 2038, 7155 in FF at 2120, 7205 in GG at 1848, 7300 in TT at 0045, 9525 at 2128, 9840 in Greek at 1134, 13770 in Hungarian at 1128 and 15195 in AA at 1456. (DeGennaro, NY) 6020 at 0440. (Maxant, WV) 6055 with EE to Europe to 2020 close. (D'Angelo, PA) 7300 in TT at 2344 and 12035 in EE at 1413. (Charlton, ON)

TUNISIA—RT Tunisienne, 7190 in AA at 2142, 9720 in AA at 1716 and 12005 in AA at 1634. (DeGennaro, NY) 9720 in AA at 0250. (Brossell, WI)

UGANDA—Radio Uganda, 4976 in unid lang at 0306. (DeGennaro, NY) 2048 to 2103 close. (D'Angelo, PA)

UKRAINE—Radio Ukraine Int., 5820 at 0430. (Maxant, WV) 0347 in UU. Also 7420 in UU heard at 2205. (DeGennaro, NY)

UNITED STATES—Trans World Radio, 3240 via Swaziland in unid lang at 0334. (DeGennaro, NY)

Adventist World Radio, 11640 via Guam with ID heard at 1600. //11680. (Brossell, WI)

Far East Bc. Co./KFBS, Northern Marianas, 11580-Saipan in CC at 1250 and 11650 in RR at the same time. (Brossell, WI)

Voice of America, 11730 via Morocco in FF with EE sound bites at 2057. (Brossell, WI). 17640 at 1640 and 17895 at 1657. (Charlton, ON)

University Network, 11870 via Costa Rica at 1205. (Brossell, WI) 13750 via Costa Rica at 0010. (Charlton, ON)

WMLK, Bethel, 9265 at 1900. Strong carrier, weak modulation. Gone at 1940 re-check. (Alexander, PA)

AFRTS, 5446.4u-Key West at 0253, 7811u-Key West at 0032, 6350u-Pearl Harbor at 1010 and 12133.5u-Key West at 0925. (DeGennaro, NY)

United Nations Radio, 9565-Skelton at 1732. (DeGennaro, NY)

VATICAN—Vatican Radio, 5885 in Latin at 0913, 7250 in AA at 2158, 7305 in PP at 0038, 7365 in FF at 2030, 11740 in Italian at 1103 and 13765 in Hindi at 1452. (DeGennaro, NY) 7305 at 0320 and 7340 at 0355. (Maxant, WV) 9310 via Uzbekistan at 1535. (Barton, AZ) 11625 heard at 2018. (Wood, TN) 2020. (Charlton, ON)

VENEZUELA—Radio Nacional, 6060 in SS at 1134, 6180 in SS at 1013, 11705 in SS at 1210 and 17705 in SS at 2013, all via Cuba. (DeGennaro, NY) 13750 via Cuba in SS heard at 1610. (Charlton, ON)

VIETNAM—Voice of Vietnam, 6175 via Canada at 0125. (Charlton, ON) 6175 via Canada in SS at 0304 and 9840-Son Tay at 1014. (DeGennaro, NY) 12020 at 1248. (Brossell, WI)

YEMEN—Republic of Yemen Radio, 9779.5 in AA with talk and male vocals at 0402. (D'Angelo, PA)

ZAMBIA—Radio Zambia/ZNBC, 3396 at 0130 in EE/Vern and Afro-pops, local vocals. Also 5915 at 0241 sign on with fish eagle IS, choral anthem. (Alexander, PA) 0357. (DeGennaro, NY)

And, once again, order is restored! Eleven zillion thank-you's to the following who came through this time: Robert Fraser, Belfast, ME; George Zeller, Cleveland, OH; Charles Maxant, Hinton, WV; Jerry Strawman, Des Moines, IA; William Hassig, Mt. Prospect, IL; Joe Wood, Greenback, TN; Robert Brossell, Pewaukee, WI; Stewart MacKenzie, Huntington Beach, CA; Arnold Zeck, Bayberry, NY; Bruce Burrow, Snoqualmie, WA; Rick Barton, Phoenix, AZ; Robert Charlton, Windsor, ON; Mark Taylor, Madison, WI; Rich D'Angelo, Wyomissing, PA; Brian Alexander, Mechanicsburg, PA, and Ciro DeGennaro, Fuera Bush, NY.

Thanks to each one of you. And, until next month, good listening. ■

TUNING IN *(from page 4)*

because the international requirement for telegraphy proficiency has been eliminated, we should treat Morse code telegraphy as we do other communications techniques.

In this connection, we note that our Rules do not require individuals to pass a practical examination to demonstrate some degree of proficiency in non-telegraphy communications techniques, rather, individuals demonstrate knowledge of other communication techniques and technical qualifications by passing written examinations composed of questions that prove that the examinee possesses the operational and technical qualifications required for the privileges authorized by the operator license.

The final chapter of the Commission's new book, appropriately titled, "Get Over It and Move On," had a couple of startling comments about the Morse code issue. At the onset it begins by stating,

Let's cut right to it—which is something we at the Commission always do—this whole issue of retaining Morse code as a licensing requirement is about as relevant as requiring hams to pass a 30-wpm keyboarding test in order to use the newer digital modes at the PC. The same hams that will complain about dropping the code requirement would be lucky if they're able to peck out 5 wpm on the keyboard. We'll never devise a keyboarding test for access to the digital modes.

Many hams are still complaining about the 16-year-old code-free Technician ruling of February 1991 that was probably one of the best and most insightful things the Commission has accomplished in 20 years. The fear from hams at the time, and still repeated over cheeseburger lunches yet today, is that in eliminating the code requirement to become a Technician class ham it would open the proverbial flood gates, allowing so-called "bad apples"—CBers, essentially—to penetrate amateur radio's ranks. Thankfully that prediction didn't happen, and the Technician class license has been a stepping stone for many hams wanting to reach higher and become licensed for the HF bands.

But no longer is there a code requirement for even access to the HF bands here in the United States. Despite that, the moaning and groaning hasn't stopped, and will likely continue for many years. "As noted in the record," the FCC said, "the claim that 'code requirements help eliminate bad apples from the radio hobby has not proved correct in the past and is not a viable argument for the present, or future.'"

That final chapter of the Commission's new book also cuts right to it saying, "You can take this to whatever bank you wish, but in the near future there will probably be changes made to the equipment certification rules, requiring manufacturers to put higher-quality notch filters and noise blankers on transceivers in an effort to further quiet hams' complaints about BPL interference. After all if you can't hear the noise, it doesn't exist..."

This ground-breaking endeavor isn't likely to be duplicated by any other government agency in my lifetime, however short that might be! We get a clue to that fact in their own words on the last page—I'd call it the rest of the story:

But if you ever in your wildest dreams imagine the Commission coming clean in any book about what really goes on behind our closed doors, you've been April fooled into buying yet another government publication that isn't worth its weight in Twinkies.

by Kirk Kleinschmidt, NTØZ, kirk@cloudnet.com

Play Nice With The Other Kids, Dear (Or Ham Etiquette)

The last time I touched on this month's topic—good behavior—we were "at war" with terrorists, blowing stuff up in Iraq, trying to ignore some kind of genocide in Darfur, and thinking about sending Martha Stewart to the Big House. Sadly, the only thing that's different today is that Martha did indeed go to prison, but got out early for—you guessed it—good behavior.

Cake decorating and cooking tidbits aside, Martha Stewart makes a pretty good role model for hams operating in a seemingly ever-more-hostile world. Few people want to go to prison, even a Club Fed type with plenty of amenities. But she took her bitter medicine without complaining. She kept her composure. She didn't lash out. She took one for the team. And she was a real Elmer (mentor) to other women inside, several of whom credit her with making a real difference in their lives.

Ham radio needs more Martha types! And if Martha were a ham, she'd tell you that without constant vigilance, hostility can creep into the relative sanctity of our beloved amateur radio.

Ham radio is a friendly pursuit, but just like a typical kid who's seen 13,000 murders and more than a million TV commercials by age 16, the influence of the outer world can affect us. That crud can creep under our skin or get under our collars and spill over into our friendly hobby!

Small, seemingly innocent infractions can accumulate and drag you down. Being rude on the air. Being a lid, intentional interference, kerchunking the repeater, letting the thrill of the chase transform you into an amateur radio monster: all of these bad behaviors are committed by ops who started out as helpful, friendly hams.

On The Receiving End

We've all been on the receiving side of bad on-air behavior. I've been on the butt end of more than a few bad radio encounters. Some can be called to mind instantly, despite the fact that they happened years ago! Like the 8-land lid who kept calling an op in Oman on 80 meters—while the Middle Eastern op was asking for me only ("the station ending in 'zero zee' only, please"). In my 30 years as a ham (thanks to the "respected Big Gun DXer" in Ohio) I've yet to work the Middle East on 80 meters.

I'm sure you've encountered something similar, and if you haven't yet, you will. Be prepared. Practice forgiveness in advance or your blood pressure will likely suffer (as mine did)!

A lot of this type of bad behavior has been worsened by the proliferation of DX spotting nets/systems worldwide. My opinion isn't shared by everyone, but I'd love to roll back the clock on that "helpful technology!" But that's another story...

Pretending To Be Civilized

The specifics of how bad radio behavior comes about are probably moot. The fact is, ham operators—though technical pioneers, housewives, carpenters, and wonderful comrades—are people, too. And people act strangely every now and then. Always have...always will.

In case you're partial to minty freshness, you should know that hams (and electronics experimenters of every stripe) have been building electronic doo-hickeys into Altoids tins. The tins are cheap, readily available and offer good RF shielding. I must confess that you could hardly force me to build a radio or a other gadget into a mint tin, but I have been looking for a similar-sized aluminum enclosure to house/shield the various circuit modules that will make up a multiband receiver. At a buck a pop (dollar stores in the United States), that's a lot of inexpensive shielding! Shown here is NØRC's work in progress at www.radioactivehams.com.

Every generation of new hams seems to think radio rudeness is a modern creation, but it's not. Old-timers often contribute to this myth by recounting radio's fabled "good old days" which, when reviewed impartially, weren't always so good. Uncrowded, yes. Pioneering, sure. Filled with friendship and imbued with a sense of wonder, absolutely. Free of bad behavior, no way!

Poor operating is probably more noticeable nowadays because the number of hams has dramatically increased over

No-Code Licensing Finally A Reality

No-code amateur radio licensing in the United States has become a reality. The FCC, acting on dockets and proposals that have been under review for many months has eliminated the Morse code testing requirement from all amateur license classes as of February 23, 2007.

Once the new rules are in place, amateur radio license applicants will no longer have to demonstrate Morse code proficiency at any level to gain access to the HF bands. Whether this will open the floodgates for beginning hams who were otherwise held back by the historical Morse requirement has yet to be determined. Stay tuned! For more information, check out Washington Beat on page 46.

the decades which, ironically, increase the need for good on-air behavior.

To our credit as members of a radio *service*, the ranks of those hams who are habitual offenders comprise a tiny minority. But a healthy dose of prevention is always a good idea. And erring on the side of courtesy is more desirable than its alternative. This month's column is really about common sense and common courtesy, qualities every new ham should cultivate (along with patience!).

Nobody Owns A Frequency!

Hams, or groups of hams, who for whatever reason seem to have "laid claim" to certain frequencies can be problematic in any era. FCC regulations and common courtesy clearly indicate that emergency communications *always* have priority. And when emergencies do not exist, frequencies are appropriately utilized on a "first-come, first-served" basis.

And even if everyone's not playing by the rules, *you* should. Here's how considerate operators find clear frequencies!

First, tune up your rig and/or antenna tuner with as little power as possible. Carelessly laying down a strong carrier on an "in-use" frequency is rude at best, life-threatening at worst. Most modern antenna tuners and SWR/power meters will tune up just fine with 5 or 10 watts instead of 100 or 1000. If you're really considerate, use one of several new devices to tune up your antenna system without radiating *any* power.

Then, before you call CQ, tune the part of the band you want to operate on and listen. Then listen some more. You'll get a good initial idea of propagation and general activity, both of which vary daily, seasonally and yearly.

When you've found what seems to be an unused, clear HF "channel," say (for voice modes), "Is this frequency in use? This is NTØZ" (use your own callsign). If you're using Morse code send, "QRL?" No matter what "QRL?" meant in the early days, it now means, "Is this frequency in use?"

If a frequency *is* occupied, you should hear a polite, "Yes it is, thanks for asking," or something similar. On CW you might hear "QRL" or the Morse letters "C" or "R."

Even if you get no immediate reply, the frequency may still be in use. This happens most often on 15 through 6 meters where, because of propagation, two ops may be conversing, but you can hear only one of them. Be patient! Keep your first transmission short just in case.

Considerate operating procedures should be the rule, not the exception. Set the best possible example for others. When that DX station says he's "listening for nines," if you're callsign doesn't have a nine, don't transmit, even if a dozen other ops do. When the DX is listening "up five," don't transmit on the DX op's calling frequency.

Always listen before you key up a repeater. If others are using the machine and you need to make a call, simply say your callsign between their transmissions. When one of the ops acknowledges you, say, "This is NTØZ, I'd like to make a quick call." Wait for the go-ahead, then make your call. If your friend responds, ask him to move to a simplex frequency where you both can talk. Then, thank the others for letting you make the call and pop over to your new simplex frequency. If your call gets no reply, offer a quick "thanks" and clear off the machine so the others can resume. It's simple. It's common courtesy.

Emergencies are a whole different ball game. Interrupt an in-use repeater by saying, "Break," or "Break—emergency." Emergency situations *always* take priority, so don't worry about upsetting anyone's conversation.

Whenever you use the repeater, be sure to pause between transmissions so others can break in if necessary. And don't blab on endlessly during "prime time" repeater hours (early morning and late afternoon for most regions).

What Matters Most

Exhibiting good behavior isn't always easy. Setting a good example may mean that you don't get through. You might miss that DX station (maybe a ham in Oman?). You might not get a chance to work that rare Special Event station. That long-winded op in New Hampshire or Wyoming may blab with his or her friends all morning, and never get around to you. If your operating practices win out, however, your dignity will still be intact, which is more important in the end. It's also more important for amateur radio.■

The Amateur's Code

Written by Paul M. Segal, W9EEA, in 1928, the following Amateur's Code has appeared in every *ARRL Handbook* (and in other ARRL pubs) for decades. This updated version is essentially the same as the original, but it's less "League-centric." Despite his religious fervor, the essence of his message is still completely relevant.

The Radio Amateur is:

CONSIDERATE...never knowingly operates in such a way as to lessen the pleasure of others.

LOYAL...offers loyalty, encouragement and support to other amateurs, local clubs, and the American Radio Relay League, through which Amateur Radio in the United States is represented nationally and internationally.

PROGRESSIVE...with knowledge abreast of science, a well-built and efficient station and operation above reproach.

FRIENDLY...slow and patient operating when requested; friendly advice and counsel to the beginner; kindly assistance, cooperation and consideration for the interests of others. These are the hallmarks of the amateur spirit.

BALANCED...radio is an avocation, never interfering with duties owed to family, job, school or community.

PATRIOTIC...station and skill always ready for service to country and community.

by Joe Cooper, carm_popcomm@hotmail.com

My Last Column: What We've Covered—And Why

Welcome to my final column for *Popular Communications* readers. For the past six years I have done my best to provide you with practical information on how to use a personal computer to assist you in your radio monitoring. I began writing the column with the belief that everyone who uses radios for hobby monitoring would benefit from the use of computer technology in some form. I also tried to write with the beginner in mind, while not ignoring the needs of the more experienced computer user.

After all these years, what has the title of my column, "Computer-Assisted Radio Monitoring," come to mean? Well the bottom line is still that anything you can do with a personal computer that helps you achieve better results when monitoring is the essence of "computer-assisted."

As you have seen over the years, that assistance can be anything from looking up monitoring frequencies on the Internet, logging a station using computer software, filtering the sound of a weak station so it can be heard, to the direct control of a radio with your PC. Each month I've provided you with some practical information from four main topic areas: computer software, computer hardware, the Internet, and computer theory.

Personally, the columns I enjoyed writing the most were the ones on computer theory, especially those that dug down into the history of digital communications. If there's one bit of wisdom I hope I've conveyed it's this: analog transmission techniques cannot deliver the same results as digital. With analog technology, the quality of the received signal is never the same as the original unless very expensive technology is employed to remove the noise that's always present in its transmission and reception. More importantly, I hope you learned that it sometimes it takes a long time for practical technology to catch up with the initial theory, which has certainly been the case with all digital modes, from telegraph to today's software-defined radio (SDR) technology.

I want to ask all of you, as radio communications becomes increasingly digital in nature, not to be afraid of learning digital theory. I hope I've shown you, through my sometimes-lengthy examinations of the history of digital modes and the science behind their discovery, that there's nothing to be afraid of.

Understanding Why!

It's better to be able to understand why you're doing something, rather than simply pushing a button and hoping for the best. If you understand the "why" of it, the "how" of any activity becomes a much more satisfying experience. This is why I believe that the best way to gain a proper understanding of computer technology is to begin by learning the theory properly and then doing a "hands-on" project to make the theory "real."

Far too often people become discouraged about learning how digital modes work because the technology appears too abstract or intimidating (particularly the math). I won't say that these technologies are not challenging, but if you take the time and dig around for an explanation or example that works for you, then surprisingly soon you'll find yourself mastering them. One certainty is that if you don't try at all, you definitely will *not* learn.

Radio Monitoring Is Still "Hands-On"

I also hope I've provided you with many different types of projects in my columns so that you've been able to make your computer "talk" to your radio. You've certainly seen that a wide range of computer software and hardware products is now available either very cheaply or even free.

If you do some research you'll find that you don't have to spend a lot of money to make your radio shack computer friendly. In this regard I've introduced you to a number of interesting software packages that can be used to decode and display a wide range of digital signals, including Morse code (CW), Radio Teletype (RTTY), Facsimile (FAX), and many other methods of transmission.

What's best about most of these software packages is that you don't need a powerful or expensive computer to perform this kind of decoding. Using either a soundcard or inexpensive serial modem, you can display text and graphics on many older computers that can be purchased inexpensively on the used market.

If there's been one truly significant change in technology that occurred over the past six years, it's the phenomenal growth of affordable SDRs (Software Defined Radios). Thanks to the emergence of inexpensive "computers on a chip," the radio hobbyist can now experiment with a powerful technology once found only in engineering laboratories.

Today there are many SDR kits and software packages that provide easy access to a completely new class of radios, offering performance better than that of traditional analog designs. In addition, the software used with SDR radios can control frequency, bandwidth, and volume and will allow you to access databases of frequencies so you can easily find a radio station, or scan a set of frequencies, almost instantly.

So, for better or for worse, radio monitoring has now entered the computer age, and being skilled in both technologies is going to become increasingly important if you're to get the most out of the hobby. Still, while writing my columns, I did not forget that I started out with vacuum tube-based radios with big analog dials and more knobs and buttons than I knew what to do with. Even though I own SDR radios and enjoy the advantages they offer, I still keep a few old tube sets in my shack and enjoy restoring and listening to them.

Still, I have to say that personally I've come to find that taking the computerized approach has put a lot of the fun back into listening to radio. I find I spend less time trying to find a signal, or understanding it once I've it captured, than I ever did with

"Make sure you take the time to learn the wide range of accessory software and hardware packages that you can use to make your radio monitoring more productive."

analog radios. I also have an easier time keeping track of my logs and other housekeeping tasks because they're all there in one place and easy to find.

Some Final Advice

One bit of advice I want to impart to you in my final column is that the best way to learn how to use a personal computer to help you monitor your favorite radio service is to have a clearly defined goal in mind *before* you begin. Rather than just rushing out and buying a computer and software, sit down and plan how your computer-assisted monitoring station will be used.

If you take your time, do the proper research, and choose the right products, then you'll be able to assemble and operate your equipment successfully. By doing the tasks systematically, and understanding why each step is taken, you'll be able to have better control over the equipment you're using. You'll also be better able to deal with any problems you may encounter along the way.

So where do you start? Well the first question is what do you want to monitor? Is the monitoring target going to be a simple one, such as the "big name" shortwave stations (BBC, Voice of Russia, Deutsche Welle, etc.)? Or will the stations be more specialized, such as utility or commercial/public service stations using VHF/UHF frequencies? Is the goal of the monitoring project to be able to find these stations quickly on the dial, listen to them, log what you hear, and then send off a report for a QSL card? Or do you want to sit back and simply listen to "the action" rather than logging?

Assuming that you're starting from scratch, the first thing to do is work out a basic station design and suitable computer to go with it. The computer is actually the easier choice today, given the reasonable prices for both new and used systems. You can get a re-conditioned Pentium 1-based computer with 250 Meg of RAM and 10 Gigabyte hard drive storage for as low as $50. From there you can move up the line, through used Pentium 4-based computers to a new system costing several thousand dollars.

Learn what to look for in a computer based upon the type of monitoring station you want to set up and operate, not based on marketing hype. At the same time, remember that you get what you pay for, and a bargain computer that doesn't work is no bargain at all.

Your Radio Choice Is More Critical

A monitoring radio that's suitable for computer control is the more critical choice. Unless you can control the radio using software in a personal computer, it won't be suitable for a true computer-assisted project. Fortunately, there are many different models to choose from, and not all of them have to be expensive to be useful. The main brand name choices for good monitoring radios that can be computer-controlled include AOR, Drake, Kenwood, Lowe, ICOM, Japan Radio, RadioShack, Ten-Tec, and Yaesu.

In general, a good *used* radio of this type will cost you between $200 and $1000, depending on make and model. Certainly, nothing is stopping you from going out and buying a new model if you can afford it. Once you've made your choice, you need to focus on the type of software you want to use to control the radio with the computer. That's more complicated as there are many different software packages available today.

Some developers are very commercially oriented and sell their software to make a profit. Other people develop software as a part time occupation or hobby and do so because they enjoy it. Whether or not a software program is created for profit or fun, they're increasingly being distributed over the Internet.

I want to stress here that if a software program is offered for sale, then you should always pay for it, particularly if it's been created by a computer programmer for the radio monitoring hobby. It's all too easy to overlook that someone has taken the time and effort to write a computer program because it's so easy to load a copy on your computer and run it. The chances of someone getting caught doing this are negligible, but each time something is stolen computer programmers feel less inclined to help support the hobby with their time, effort, and skills. The bottom line is that we all lose out when this happens.

Not All Created Equal

Another point I want to make is that not all computer control software is the same and great variations are to be found in design, performance, operation, and price. Different software packages also have a wide variety of uses as well. Some simply

change frequencies and control certain functions, such as bandwidth and tuning rate. Others have many more features, such as the ability to create databases of logged frequencies or display propagation conditions at a given time. Some software packages allow you to use lists of shortwave or commercial stations that are updated on a regular basis as radio schedules change.

In addition to providing direct control of your radio, there are also a number of software packages that let you digitally process the audio that comes out of your radio so you can reduce noise or customize the size of the listening bandwidth. Many of these packages can be used to decode digital signals, as mentioned before, as well as display faxes or slow scan TV. Make sure you take the time to learn the wide range of accessory software and hardware packages you can use to make your radio monitoring more productive.

Overall, the bottom line is to balance out what you want to accomplish in your monitoring hobby against the cost and time investment in skill development needed to assemble a computer-assisted monitoring station. The real guide here is common sense. Going out and buying nothing but the most expensive of everything is not going to give you the best result if you don't have the *skill* to make full use of it. Unless you plan properly, and balance everything out so that no one product outperforms the other, then you're going to be facing some real frustrations.

I've tried to keep you from experiencing some of the frustration that can arise when you fail to assemble the components of a computer-assisted radio monitoring station properly. Remember, when putting a station together treat it as a case of "measure twice and cut once." Think it out, plan it out, and then think about it again. There's nothing more satisfying than sitting down to a well-thought-out computer-assisted monitoring station and have everything work for you, rather than against you.

Wrapping It Up

Thanks again for six enjoyable years of sharing ideas and information. I've learned a tremendous amount from you, and I hope that you've learned something of value from me. Don't forget that you can e-mail me with any final questions at my e-mail address carm_popcomm@hotmail.com. I'll be monitoring this e-mail address for about two months after the publication of this column.

As mentioned before, I cannot answer general questions on computers, but will be more than happy to help you with any issues raised in the columns. As I have requested in each of my columns for many years now, do remember our troops overseas and give them your support. The "Any Service Person" mail program no longer exists for security reasons, so please refer to the U.S. Department of Defense's official webpage, "Defend America." They have a specific section found at www.defendamerica.mil/support_troops.html with an amazingly wide range of practical and useful ways that you can directly help.

Again, if you are fortunate to have a home, a job, and your loved ones around you in these times when so many don't, please remember to give thanks for your personal blessings by remembering to pass on that blessing to others through regular acts of selfless sharing. ■

by Bill Hoefer, flacap388@hotmail.com

The "Center" Of Jacksonville

I must apologize for my lack of columns in recent months; please know that I will do my best to remedy this situation this year. I hope that the one I work on in June (for the September issue) will be one of my better ones as I'll be TDY (on temporary duty) for about six or seven weeks in the Washington, D.C., area learning the new FS21 equipment that will be in use starting later this year in the 20 flight service stations. It should be very interesting.

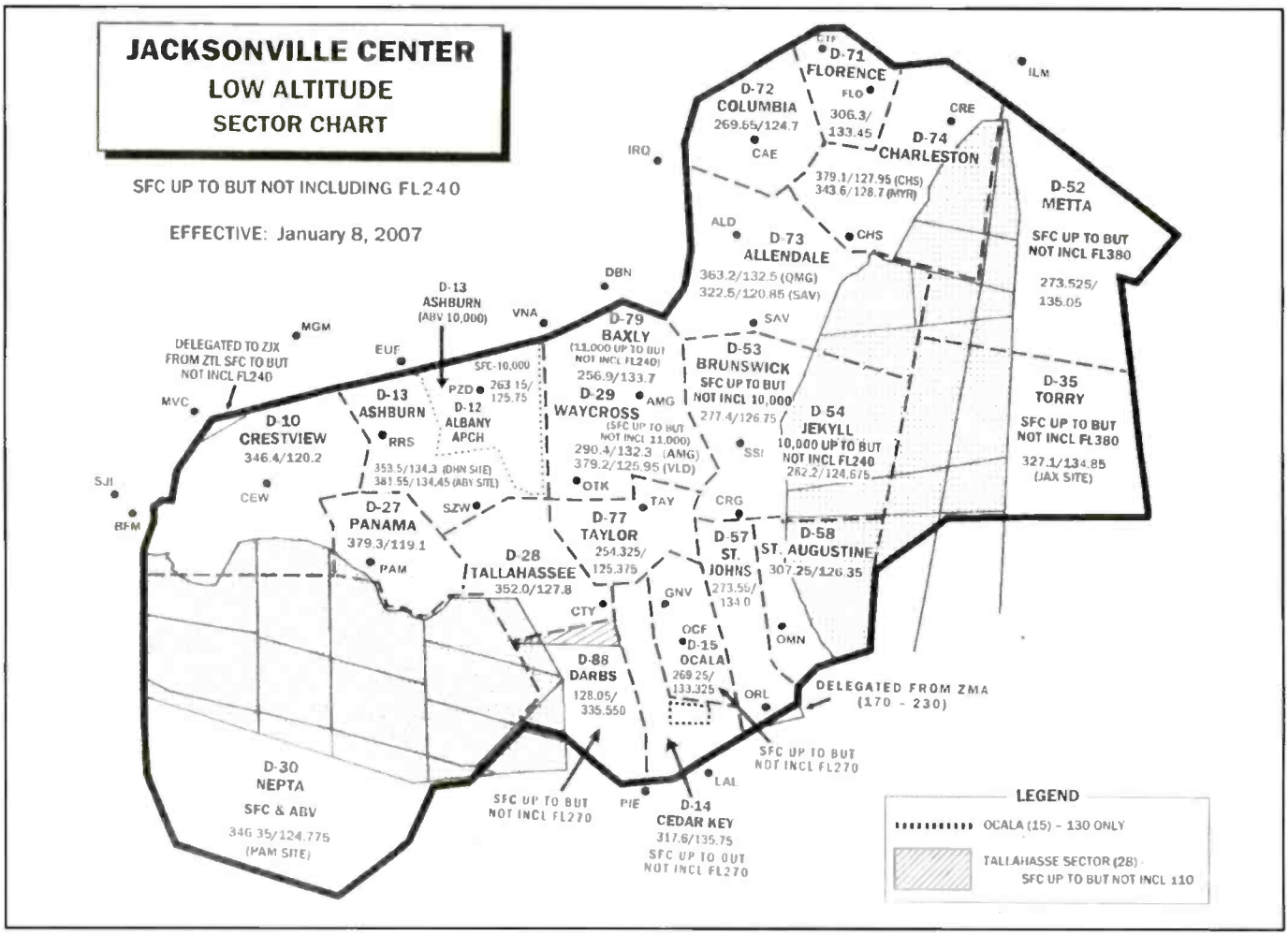
Right now, though, in the nice sunny state of confusion known as Florida, we're having our first "cold" snap of the winter in January as this month's column is being written. It may get down to the upper '40s/low '50s tonight. Not bad since the Plains States are currently in a deep freeze, and I can't get in touch with some friends in Oklahoma City.

Last year wasn't a particularly enjoyable year personally, in spite of a new job with Lockheed Martin. My father and one of my grandson's have been quite ill, especially over the last few months and I spend much of my "weekends" commuting nearly two hours to my parents' home in central Florida to be with my folks.

On the positive side, I may have created a monster. I assisted Santa Claus in getting a scanner to the 10-year-old son of a single mother I know. He's expressed an interest in flying, and while he can't yet be part of an airplane radio contact, Santa ensured he could at least *hear* the local traffic with a pre-programmed scanner for his use and enjoyment. A pilot map of the local Tampa/St. Pete area should also help him in this endeavor.

The Big Four

When I first started writing this column a few years back I mentioned that there are four distinct parts of air traffic, of which I've worked all: control tower, approach control (radar and non-radar), center, and flight service. The air route traffic control center (ARTCC) or just known as "center" takes up the largest amount of airspace, not just in regard to area, but also altitude. Jacksonville Center (ZJX), for example, covers parts of Alabama, Florida, Georgia, and South Carolina and has, like



Here's the Jacksonville Center low-altitude sector chart.

most other centers, low-altitude, high-altitude, and ultra-high-altitude sectors.

The Low-Down...

The low-altitude sector for Jacksonville covers from the surface (not including approach control or tower airspace) up to, but not including, 24000 MSL (mean sea level), or flight level 240. This is surprising since the low-altitude structure goes up to, but does not include, 18000 feet MSL, or flight level 180. Here are the frequencies:

Albany (GA) approach: 125.75/263.15
Allendale (SC): 120.85/132.5/322.5/363.2
Ashburn (GA): 134.3/134.45/353.5/381.55
Baxly (GA) (11000 MSL to FL240): 133.7/256.9
Brunswick (GA) (surface to 10000 MSL): 126.75/277.4
Cedar Key (FL) (surface to FL270): 135.75/317.6
Charleston (SC): 127.95/128.7/343.6/379.1
Columbia (SC): 124.7/269.55
Crestview (FL): 120.2/346.4
DARBS (Gulf of Mexico) (surface to FL270): 128.05/335.55
Florence (SC): 133.45/306.3
Jekyll (GA) (10000 MSL to FL240): 124.675/282.2
METTA (Atlantic Ocean) (surface to FL380): 135.05/273.525
NEPTA (Gulf of Mexico): 124.775/346.35
Ocala (FL) (surface to FL270): 133.325/269.25
Panama City (FL): 119.1/379.3
St. Augustine (FL): 126.35/307.25
St. Johns (FL): 134.0/273.55
Taylor (FL): 125.375/254.325
Tallahassee (FL): 127.8/352.0
TORRY (Atlantic Ocean) (surface to FL380): 134.85/327.1
Waycross (GA) (surface to 11000 MSL): 125.95/132.3/290.4/379.2

...The Highs

The high-altitude sectors primarily run above the low-altitude sectors up to, but not including, FL350, with exceptions:

Aiken (SC): 127.875/319.2
Alma (GA): 135.97/282.3
Brewton (AL/FL): 124.475/323.05
Geneva (FL): 125.05/360.8
Green Cove (FL) (FL240 to FL340): 127.475/346.25
Lake City (FL): 133.875/322.475
Mayo (FL): 125.175/360.7
METTA (Atlantic Ocean) (surface to FL380): 135.05/273.525
NEPTA (Gulf of Mexico): 124.775/346.35
Perry: 135.62/317.52
Seminole (AL/FL): 128.075/307.2
St. Augustine (FL) (FL240 to FL330): 126.35/307.25

Spot The Not

Having the name Bill, I've been called many things over the years. In the 1980s when I was delivering pizza for the Noid (if you don't know who the Noid was, ask a friend or family member) my nametag said Mr. Bill, after the clay-creature from *Saturday Night Live*. For Christmas my wife gave me a DVD album of Mr. Bill. So, feeling somewhat nostalgic, I ask you to Spot The Not. Which one of these four airspace fixes doesn't really exist? No peeking.(*Answer at end*)

MISTR BILLL HANDD SLUGO

Glossary Of Terms And Acronyms

ARTCC (Air Route Traffic Control Center)—A facility established to provide air traffic control service to aircraft operating on IFR flight plans within controlled airspace, principally during the en route phase of flight.

ATC (Air Traffic Control)—Means what it sounds like.

FSS (Flight Service Station)—Air traffic facilities that provide pilot briefing, en route communications and VFR search and rescue services. They also assist lost aircraft and aircraft in emergency situations and relay ATC clearances. Similar is *AFSS (Automated Flight Service Station)*.

ICAO (International Civil Aviation Organization)—Headquartered in Montreal, Canada, this agency of the UN develops the principles and techniques of international air navigation and fosters the planning and development of international air transport to ensure safe and orderly growth.

IFR (Instrument Flight Rules)—A set of rules governing the conduct of flight under instrument meteorological conditions.

ILS (Instrument Landing System) Approach Plate—Diagram published by the FAA and privately that depicts the procedure pilots need to follow to execute an ILS approach.

NAVAID (Navigational Aid)—Transmitter that helps pilots navigate from one point to another.

NOTAM (Notices To Airmen)—A notice of information that contains timely data concerning the establishment, condition, or change in any component (facility, service, or procedure of, or hazard in the National Airspace System) which is essential to personnel concerned with flight operations.

UNICOM—An aeronautical advisory station primarily for private aircraft.

VFR (Visual Flight Rule)—A set of regulations that a pilot may operate under when weather conditions meet certain minimum requirements. They are to be followed when there is sufficient visibility for aircraft to be seen and avoided.

VORTAC—The VOR system is the backbone of air navigation in the US and most other countries. It is composed of usually round buildings, about 30-feet in diameter, with a cone sticking out of the top. Many are painted in a red and white checkerboard pattern. VOR is an acronym for Very high frequency Omni Range. VORTAC is the same with TAC, standing for TACAN, a military designation for its distance information on a VOR signal.

WSI (Weather Services International)—Headquartered in Andover, Massachusetts with offices in Birmingham, England, WSI provides weather-related products and information to professionals in the energy, aviation, and media markets, as well as multiple federal and state government agencies.

NEW/DELETED/CHANGED FREQUENCIES

NEW

AK
Anchorage, Elmendorf AFB (EDF)
CD 128.8/306.925
Kokhanok (9K2)
Anchorage ARTCC (ZAN) Apch 124.8/354.0
Homer (HOM)
ATIS 135.65
Wasilla, Upper Wasilla Lake Seaplane Base (3K9)
CTAF 122.9

AR
Texarkana Regional, Webb Field (TXK)
CTAF 123.875

CA
Half Moon Bay (HAF)
ASOS 127.275/650-728-5649

CO
Boulder Municipal Airport (1V5)
CTAF/UNICOM 122.725

FL
Leesburg International Airport (LEE)
ATIS 134.325
GC 121.725
LC 119.35
Sarasota, Hidden River (22FA)
CTAF 122.9

GA
Eastman, Heart of Georgia Regional (EZM)
ATIS 119.425
CTAF 124.55
GC 121.175
LC 124.55
Jefferson, Jackson County (19A)
ASOS 118.125/706-367-1607
Toccoa, RG LeTourneau Field (TOC)
AWOS-3 119.625/706-297-7473

KS
Tribune Municipal (5K2)
AWOS-3 119.075/620-376-2336

ME
Patten, Shin Pond Seaplane Base (85B)
CTAF 122.9

NV
Hawthorne Industrial Airport (HTH)
AWOS-3 120.225/775-945-0727

NH
Nashua
Boston ARTCC (ZBW)
Utica NY RCAG High 342.25/353.925

NY
Lake Placid (LKP)
Plattsburg International (PBG)
Plattsburg, Clinton County (PLB)
Saranac Lake, Adirondack Regional (SLK)
Boston ARTCC (ZBW) (Burlington RCAG) (in use when Burlington Apch is closed) 120.35/342.25

NC
Elizabeth City Regional Airport (ECG)
ILS Rwy 10 (I-ECG) 111.35

PA
Harrisburg, Air One Heliport (PN81)
UNICOM 123.05

TN
Sweetwater, University of Tennessee Lifestar Sweetwater Heliport (37TN)
UNICOM 123.0

TX
Fort Worth NAS JRB, Carswell Field (NFW)
ANG Ops 226.9
San Antonia, Boerne Stage Field (5C1)
San Antonio Apch 125.1/307.0

VT
Burlington International (BTV)
Highgate, Franklin County State (FSO)
Boston ARTCC (ZBW) (Burlington RCAG) (in use when Burlington Apch is closed) 120.35/342.25

VA
Lynchburg Regional, Preston Glenn Field (LYH) 119.9

DELETED

AK
Cold Bay (CDB)
ELFEE NDB (CD) 341 kHz
Eureka, Skelton Airport (AK04)
CTAF 122.9

LA
Thornwell, Lyon Airport (LS14)
CTAF 122.9

MI
Roscommon Conservation Airport (3RC)
UNICOM 123.0

MO
Gravois Mills, Harbour Airport (MO30)
CTAF 122.9

SC
Lancaster, Kirk Air Base Airport
UNICOM 122.8

CHANGED

AK
Big Lake (BQG)
Anchorage ARTCC Apch was 290.9, now 290.5

AR
Texarkana Regional, Webb Field (TXK)
LC was 125.7, now 123.875

IL
Chicago, Rockford International (RFD)
LC was 118.1, now 118.3

NH
Nashua
Boston ARTCC (ZBW)
Burlington VT RCAG was 380.3, now 342.25
Rockdale NY RCAG High was 388.8, now 353.925
Turin NY RCAG Low/High was 380.3, now 352.25

NEW/CHANGED IDs/CLOSED & ABANDONED AIRPORTS

NEW

FL
Jasper, Squires Aviation Ranch Airport FD63

GA
Cumming, Apple 1 Heliport 11GE
Lafayette, Hogjowel Airport GE11
Valdosta, McClellan Airport 7GA2

KY
Louisville, Jeffries Farm Airport 6KY6

MA
Sheffield, Cmelak Field Airport MA18

ME
Fryeburg, Lovewell Pond Seaplane Base 4ME4

NC
Elizabeth City Regional Airport ILS/DME Rwy 10 I-ECG
Madison, Lindsay Airport 0NC7

PA
Harrisburg, Air One Heliport PN81
Kittanning, Snyder Office Heliport PN77

TN
Chattanooga, Memorial Health Care System Heliport TN03
Sweetwater, University of Tennessee Lifestar Sweetwater Heliport 37TN

CHANGED IDs

AK
Eureka, Skelton Airport
was AZK, now AK04

DC
Bethesda, Sibley Memorial Hospital Airport
was MD38, now DC52

LA
Thornwell, Lyon Airport
was 3L0, now LS14

MO
Gravois Mills, Harbour Airport
was 7L7, now MO30

CLOSED & ABANDONED AIRPORTS

AK
Cantwell, Igloo Heliport C36
Cape Beaufort, Cape Sabine Airport Z53
Sagwon Airport SAG
South Naknek, PAF Cannery Airport 3AK

CA
Goffs, Conner Airport 41CL

IL
Amboy Fire Protection District Heliport 7IL5

MI
Glennie, Stier Airstrip Airport 0MI2

NM
Roswell, El Paso Natural Gas Company Airport 91NM

OK
Idabel Airport IBO
Morris, Ashley Airport O36

PA
Galeton, Cherry Springs Airport 5G6

TX
Cedar Lane, Fay Ranch Airport 0XS9
Fort Worth, Health Department Heliport 9TE7

WI
Babcock, Speedwing Field Airport WI90

States (GA): 126.125/285.65
Summer (SC): 124.075: 351.7
TORRY (Atlantic Ocean) (surface to FL380): 134.85/327.1

...And The Ultra-Highs

Finally, the ultra-high sectors run above FL350. These sectors run high-performance military aircraft, some airliners, and many business jets. They are:

Georgetown (SC): 133.62/370.95
Hunter (GA): 132.425/290.35
Keystone (FL): 135.45/256.875
KNEMO (Atlantic Ocean): 120.125/307.05
Lawtey (FL): 132.825/269.6
Micanopy (FL): 135.325/380.25
Moultrie (GA): 133.3/346.3
Ridgeway (SC): 134.975/278.3
Zephyr (FL): 128.42/291.7

I hope to be having more ARTCC as well as approach frequencies in future issues for your use. Keep monitoring, and let me know what you're hearing on the air band!

Spot The Not

Surprisingly it's HANDD. In fact there's no HANND or HAAND. MISTR is 11 miles southwest of Westfield-Springfield MA (BAF) airport. BILLL, my namesake, is 16 miles southwest of Wilmington NC (ILM). But few of you have heard of SLUGO, which is 45 miles northwest of St. Maarten (TNCM) in the Caribbean Sea.

Reader Mail

In closing, I want to share with you an e-mail sent to me by David, N5SRC. Dave says:

Thanks so much for providing an interesting article about VORTACs and NAVAIDs in the January edition of Popular Communications magazine. I've been off work battling leukemia and have time on my hands. I picked up a copy of the new Flight Simulator X in December and have been playing with that over the last few weeks. Your article about how the navigational aids works helped me quite a bit with my game play. AND you provided a list to the local airports here as well. What a bonus for me!

Thanks for your effort and keep up the good work!"

Thank you, David, for the letter. I appreciate it, and I'm praying for you as I'm sure most *Pop'Comm* readers are. Hope you can use more of my columns in the future. ■

by Harold Ort, N2RLL, Editor

Zambia: Safaris And Adventure—Along With Lots Of Problems

Officially known as the Republic of Zambia, this nation that's only slightly larger than the Lone Star State is home to nearly 11.5 million people. Old-timers will recall the country being known as Northern Rhodesia. The name change took place 43 years ago after it gained independence from the UK.

Elections there four years ago didn't make the top slot in our evening news, but for Zambia it was just another in a long string of problems with the process. Three parties filed legal petitions challenging the election of Levy Mwanawasa, ruling party candidate. Back in '91 one-party rule in Zambia ended, but then a short five years later, opposition parties were the targets of widespread harassment.

Last year in an election that the CIA said was "free and fair" Mwanawasa was reelected. No one has been prosecuted for past election wrongdoings—and likely never will be.

While English is the official language in this landlocked nation bordered by seven countries, a total of seven vernaculars and about *80* other languages are spoken. No wonder, when you consider that in the past two years nearly 160,000 refugees entered Zambia from Angola, the Congo, and Rwanda.

Tourism And Other "Going's On"

Home to Victoria Falls (and 17 other waterfalls), visitors can do it all in this country, whose official tourism department says is "the real Africa" and "one of the safest countries in the world to visit." With all the spectacular scenery and activities from rafting to canoeing and safaris, it truly is wondrous and exciting.

Don't let those visions of wild safaris fool you, though; the country is actually about 40 percent urban, with the majority living in Lusaka, Zambia's capital and largest city, and secondary cities Ndola and Livingstone.

News from Zambia is as varied. At the top of the list of topics are the recent $38 million loan from China to build roads and "buy equipment" and the ubiquitous call to "come together." The Zambia National Broadcasting Commission (ZNBC) states on its website,

President Mwanawasa says time has come for all Zambians to unite and work towards developing the country. The President says after the elections last year, Zambians should concentrate their efforts on developing the country. Mr. Mwanawasa said the Movement for Multi-Party Democracy (MMD) will adopt any opposition councilor or Member of Parliament who will be expelled from their parties for supporting government programmes. He was speaking when he addressed MMD cadres and government official who welcomed him at Ndola International Airport, Thursday.

He commended Mayors from various copper belt towns who went to welcome him and urged them to ignore threats against them for performing their civic duties. Mr. Mwanawasa said there is no need for any political party to behave like a rebel movement.

Beneath The Surface

Zambia suffers severely from the AIDS crisis and high infant mortality and death rates. Life expectancy is only about

40 years and the infant mortality rate is 86 deaths per 1000 live births. Based on the most recent statistics nearly a million people are living with HIV/AIDS in Zambia. In some areas of the country malaria and plague are high risks. There are also numerous other risks to residents, including inadequate water treatment and air pollution, particularly in the mineral refining region.

The country still faces serious debt issues that began in the early 1970s when world copper prices began to decline. With the steady increase in copper prices, however, growth is again being seen in this important industry, which

Landlocked Zambia is also in the middle of the AIDS crisis.

was recently privatized. Still, nearly half the population is unemployed and more than three-quarters are living below the poverty level. Nevertheless, the country remains rich in natural resources, besides copper; cobalt, zinc, lead, coal, emeralds, gold, silver, uranium, and hydropower are also important components of its economy. While the country is making economic headway, the HIV/AIDS crisis weighs heavily on its resources, and this once middle-income nation is struggling to make a go if it in a tough world.

If your boat comes in, so to speak, and you opt to travel to Zambia to see it first-hand, be sure to see a doctor first and bring your medicine with you. The official Zambia Tourism site says it all,

> Medical services are underdeveloped and only in Lusaka, Ndola and Livingstone can you find anything resembling western standards. There are a number of small clinics in Lusaka which are better than the general hospitals, but the clinics in the rural areas have little more than quinine, aspirin and band aids.

Communications

In this ethnically diverse country there are about 50 FM stations and a handful of shortwave stations, including government-run ZNBC One on 4910 and 6265, also state-run ZNBC 2 (in English) on 6165, Christian Voice International on 4965, 6065, 9430, 9355, 9865, 13820, 15640, and 15715. Some audible in North America depending on conditions. Christian Voice Int'l also broadcasts in English on 106.2 FM to Lusaka, on 105.8 FM to the Copper belt, and on 99.3 FM to the Ndola region. Their shortwave broadcasts are "a blend of Radio Christian Voice and The Voice (Africa) to Central and Southern Africa."

Christian Vision (operator of the Christian Voice Int'l with headquarters in England) established a major facility near Lusaka. It says, "The site includes a 12,000-acre farm, a school, a Bible College, a church planting project and a radio station. Over 190 students have graduated from the Bible College, and almost 170 churches have been planted."

The Zambian communications infrastructure is good—compared to the rest of Africa—with nearly 240,000 Internet users and communications that includes microwave radio relays linking major urban areas. The official government station ZNBC's website at www.znbc.co.zm allows you to listen to radio stations online and is reasonably informative, even including links to CNN, the BBC, and local Zambian newspapers. And the news today as this is written is also up to date, with these official words at the top of the site, "A US Senate committee has rejected President Bush's plan to send extra troops to Iraq..." Other timely top news stories were found on the website with ease.

Regular *Pop'Comm* shortwave log contributor Bruce Alexander of Pennsylvania recently reported hearing Zambia, telling us he caught, "ZNBC, 5915 from sign on at 0242 with Fish Eagle IS, instrumental anthem and talk in unid language."

Give those shortwave stations a shot, and sit back in your comfortable chair and think of this landlocked country with the spectacular scenery, amazing wildlife and beautiful sunsets. Let us know what you hear! ■

by John Kasupski, KC2HMZ, kc2hmz@wzrd.com

HF Comms In Troubled Times, And A Special Invitation To *You!*

In case you failed to take notice (or should I say, take warning?) when you looked at the cover of this month's issue of *Pop'Comm*, this is the April issue. For some reason undoubtedly related to the fact that this month kicks off with what is variously known as April Fools' Day or All Fools' Day on April 1, it's become customary for the April issue of some radio-related publications to contain some sort of an April Fools' joke.

Often in the form of a fabricated news story, authors, columnists, and editors use the April column to unleash their devious nature upon unsuspecting readers. Well, maybe not entirely unsuspecting; there is the date on the cover to provide sufficient warning for those savvy enough to take heed. But the gist of the situation is that in the April issue, those of us who are privileged to write for one of these publications are given license to basically waste the editorial space of our columns this month for the purpose of trying to pull the wool over our readers' eyes.

Now, when I sat down to write this month's column, I gave serious consideration to taking advantage of that literary license and subjecting you to some sort of clever ruse in honor of April Fools' Day. A phony news story about a new super-receiver that connects to a computer and an antenna and uses real-time noise-level data from the Internet to achieve phase-shift cancellation of various types of unwanted noise from the shortwave bands is about what I had in mind. An explanation of the technical aspects of phase-shift cancellation and its application in the new receiver to improve the quality and tonality of received signals would have accompanied a hands-on review of this new super-receiver. Naturally, I'd have also provided the manufacturer's warning that an external speaker connected to the radio had to be connected with the proper polarity to avoid inverting the audio signal, resulting in a boost in received noise instead.

In the end, though, I decided that if I was going to waste an entire month's article talking about something that can hardly be considered related to utility monitoring since it doesn't even exist, I might as well use it talking about something that does, at least, exist, and *can be listened to* by UTE enthusiasts, and might even convince some of you to expand your horizons and your enjoyment of the radio hobby. So, here is this month's column, which, on my honor as a writer and serious practitioner of the radio arts, is 100 percent free of any April Fools' jokes of any kind.

As I write this it's mid-January, and the weekend that has just ended featured waves of freezing rain, sleet, and snow that were blamed for 21 deaths across four states. Utility crews were trying to restore power to some 330,000 Missouri households that were without electricity. About 122,000 Oklahoma customers lacked power as of last night. Passenger train service was interrupted due to fallen debris on railroad tracks. At Dallas-Fort Worth International Airport, 415 flights were cancelled. Trees, roads, runways, and power lines were coated with ice, and the whole mess was reported to be headed northeast, towards where I live.

Regular *Pop'Comm* readers will recall that we had a weather-related disaster here in my area this past October (see my column and feature article in the January issue). That was far from being the first such event here in western New York State, and I'm sure it won't be the last. As I race against the clock and Mother Nature to get this column finished before the storm arrives here and sends me away from the comfort of my shack and out into the icy cold to work emergency communications for the local emergency management agency, it would seem that an in-depth examination of disasters and communications for the utility monitoring enthusiast would be in order.

Bill Busch, N2WUT, hard at work in the communications room at the North Tonawanda, New York, Emergency Management Emergency Operations Center (EOC).

Anatomy Of A Disaster: The Five Phases

Disasters come in many forms. Natural disasters like hurricanes, tornados, floods, earthquakes, and severe winter weather (to name a few) come most readily to mind, perhaps because the destruction that results when the awesome power of nature is unleashed is often widespread and devastating. Hurricane Katrina gave those of us in the United States an unprecedented demonstration of these destructive effects, and in the September 2006 issue of *Pop'Comm*, I devoted considerable space to hurricane monitoring, but much of the material in that column pertains to other disasters as well.

Not all disasters are of the "natural disaster" genre, of course. We humans have time and again proven that we can conjure up some pretty serious disasters on our own, and I'm not just talking about FEMA's response to Katrina, or the last 99 years of Chicago Cubs history. Think Chernobyl, Bhopal, the World Trade Center, and the sinking of the *Titanic*. These were all man-made disasters. What's important to realize is that regardless of whether a disaster is man-made or results from the forces of nature, the chronology of our response to it is basically always the same and can be divided into five phases.

The first phase of any disaster response is in some respects the most important: the *preparation phase*. Relative to the next disaster that may affect you personally, you are in the preparation phase right now. As you recline in your comfortable chair reading this magazine, perhaps in your shack beside the radios, the computer that has a high-bandwidth DSL connection to the Internet, the landline phone on the desk, the cell phone in your shirt pocket, the cup of hot coffee in front of you, and the good desk lamp shining brightly to illuminate the pages this article is printed on (your taste in reading material is to be commended), I have some sobering news for you: You are the thickness of one cable away from losing it all.

One cut-through electrical power line is all it takes. A tree falls, perhaps because of high winds, the weight of snow and ice, or perhaps because somebody with a chain saw and *half* a mind to cut down a tree decided to go ahead and do it. Either way, the result is the same: the tree falls neatly into the area between two utility poles, taking down all the carefully strung utility cables dangling between those poles. Suddenly, your computer goes down. The coffee pot shuts off. The lamp goes out. Your landline telephone goes dead. You fish your cell phone out of your pocket to call the power company, and find that you can't even get a dial tone because the system is overloaded because 25,000 other people are trying to do the same thing at the same time and the system can't handle the sudden increase in demand.

This could happen at any time, and right *now* is when you are in the preparation phase for that disaster. *This* is the time before a disaster actually occurs, during which you should be plan for how you'll cope with the effects of the disaster when it happens.

Now, as is the case with all five phases of a disaster, the length of the preparation phase varies. We don't know when the next disaster will strike. If we're lucky, it could be years from now. If we're not, it could be before you finish reading this paragraph. Either way, you have from now until then to do whatever you're going to do to get ready to deal with whatever the disaster throws your way. The reason this phase is perhaps the most important phase of any disaster is that preparation is the key to getting you and your loved ones safely through the next disaster. Again, the time for you to prepare for the next disaster is also right *now*.

The second phase is the *warning phase*. This begins when we become aware that a disaster is going to happen. Again, the duration of this phase varies widely according to the nature of the disaster. In the case of a hurricane, you'll often turn on the TV news and see a weather person pointing to an ominous radar blob a full week before the storm actually makes landfall and starts unleashing destruction. In the case of a tornado, the warning phase will be much shorter, perhaps a matter of minutes. With some events, such as a terrorist act, there may be no warning at all, or by the time any signs of impending trouble are evident, it's too late to do anything more than watch as you move into the third phase: the disaster itself.

This third phase is when the disaster, whatever it is, is actually occurring. It's when the tornado is ripping through town, undoubtedly going out of its way to lay waste to the nearest trailer park. It's when the hurricane's heavy rain and high winds are blowing trees and rooftops around and dumping several feet of water onto streets and roadways, and into basements. It's when the nuclear power plant is going up in flames, emitting clouds of radiation into surrounding areas, and rendering them unsuitable for human inhabitation for decades.

N2WUT operating a station at the EOC during a 2006 disaster preparedness exercise. An APRS display for tracking vehicles by radio can be seen on the computer monitor at right.

How long the third phase lasts (all together now, class...) also varies with the nature of the disaster. A crashing airliner takes only seconds to hit the ground, scattering aircraft parts, burning fuel, and the dead or injured people throughout its path until its momentum is exhausted and it comes to a halt. The snowfall and high winds generally associated with a severe winter storm can last for a couple of days. A nuclear power plant can burn for over a week; the main graphite fire inside the reactor crater at Chernobyl was not extinguished until nine days after the accident.

Once the disaster has occurred, the event moves into the fourth phase: the *relief phase*. During the relief phase of a disaster, the focus is on alleviating its effects. This involves, among other things, rescuing people and animals, providing food and shelter for survivors, and medical attention for the injured. The time frame involved depends on the scope of the disaster; that is, the size of the affected area, the number of people affected by it, and the degree of damage caused. Depending on what has happened, the relief phase could go on for only a few hours or, as we saw with Hurricane Katrina, disaster relief efforts may take considerably longer.

The fifth, and final, phase of a disaster is the *recovery phase*, and it's during this phase that a community that has been the victim of a disaster attempts to repair the damage and return to normal. This phase of a disaster can take years or even decades. Damaged or destroyed infrastructure must be repaired or replaced so utility services and communications may be restored. People who have lost jobs, possessions, their homes, friends and relatives may receive counseling to help them deal with the toll a disaster has taken on their lives. Buildings are rebuilt or replaced and businesses attempt to resume their normal operations.

The recovery phase is a prolonged period of adjustment that a community and individuals must go through in the aftermath of a disaster as they face the task of bringing their lives and activities back to normal.

Putting This Knowledge To Use As UTE Monitors

Now that we know about the five phases of a disaster, a bit of analysis should enable us to observe that the type of related

radio communications we might have the opportunity to monitor will differ from one phase to the next. For example, anyone who saw my column on hurricane monitoring this past September knows that there's certainly no shortage of listening targets during the relief phase following a hurricane.

Relief operations generate massive amounts of radio traffic, and the images we see on our TV sets every night ingrain events into the national consciousness, so that practically every HF utility monitoring hobbyist is sitting in front of his or her receiver listening to some of the resulting communications. What may not be as readily apparent is that radio traffic can also be found even when the results of a disaster aren't being beamed into our living rooms every night on the six-o'clock news.

I mentioned preparation earlier in this column, and stated that in my opinion, the preparation phase is the most important, because the key to getting through a disaster is preparedness. Rest assured that this does not apply only to individuals! This importance of the preparation phase of a disaster isn't something I pulled out of a hat. You'll find that both private and governmental agencies are out there right now preparing for the next disaster—and generating radio traffic as they conduct drills, test equipment, and do whatever they can to be ready for when it all hits the fan.

While much disaster communications are done on a local basis using VHF/UHF frequencies (and thus a subject best left to my *Pop'Comm* colleagues like Ken Reiss who regularly write columns about scanning those bands every month), the tests you hear being conducted on Wednesday mornings by various federal agency HF nets are part of the preparations for the next disaster. The same goes for the ham radio ARES (Amateur Radio Emergency Service), RACES (Radio Amateur Civil Emergency Service), and NTS (National Traffic System) nets, as well as some of the nets conducted by ham radio clubs.

Private national and international organizations like the Salvation Army and Red Cross as well as religious organizations that are active in disaster relief also make extensive use of volunteer ham radio operators during emergency situations. The hams who work with these organizations regularly participate in drills, training exercises, and other activities where preparation is the underlying theme. It's during these activities that hams hone the skills they'll need when something bad happens. No self-respecting EmComm volunteer depends on a piece of equipment during a real emergency unless and until that piece of equipment has been tried and tested during drills and exercises and is known to be dependable and suitable for its intended use.

Uncle Sam Practices, Too!

Governmental agencies also practice and prepare for disasters. At the federal level, there are several of these that utilize HF, including FEMA, the Department of Defense, and the agencies falling under the umbrella of the Department of Homeland Security (DHS). At the state and local levels, various emergency agencies often have support from ham operators, with systems in place for linking hospitals and clinics with emergency services locally, and also for HF to serve as a link to the outside world during a major disaster.

Many of these systems have been in place, or at least were being put into place, well before Katrina struck the Gulf Coast, but since Katrina brought home the point of communications problems, many localities have recently been calling on hams to help put together new agreements, or renew old ones, between the emergency services community and local hams. Whether they're run by the government or hams, these systems must be periodically tested, their operators trained, and drills conducted. All these activities provide radio communications for us to monitor.

The warning phase provides its own opportunities for monitoring. When severe winter threatens coastal regions, often it affects maritime interests as well, so the regularly scheduled HF broadcasts originating from the HF stations operated by the U.S. Coast Guard and entities from other countries that perform the same mission will contain information about threatening storms. The Hurricane Watch Net, another amateur radio activity, comes into play here as well.

Farther inland, SKYWARN teams, consisting largely of volunteer ham operators, work with local offices of the National Weather Service (NWS) as spotters during severe weather events. When the alarm on your scanner or weather alert receiver sounds and you find yourself being told to take cover because a tornado is headed your way, it's entirely possible that a ham volunteer working with SKYWARN has furnished some of the information on which the NWS has based its issuance of a tornado warning. While most SKYWARN activity takes place on the local VHF/UHF bands, many localities with special needs use HF to permit timely notification to other nearby cities and towns where VHF/UHF may not provide the needed capabilities.

Once an event moves to the third and fourth phases—the period during which the disaster is actually happening and the relief phase that follows—the volume of radio traffic associated with the disaster will, quite understandably, increase dramatically. This is when UTE monitors can log the most stations, partly because the volume of traffic is the highest and partly because there's a greater degree of monitor awareness, thanks to news reports. When a major disaster like Katrina strikes, the full gamut of disaster communications systems is up and running. FEMA, SATERN, ARES/RACES, NTS, DoD and DHS agencies, emergency services, religious organizations, utility companies (some of which have been know to utilize HF), and Citizen Emergency Response Teams (CERT), everybody you hear practicing and testing during the preparation phase is now running full tilt, and anybody who can still communicate by radio is on the air doing so...or at least trying to do so. How much success they have depends on what they were able to accomplish during the preparation phase.

Some time later, when the recovery phase is reached, the volume of radio traffic diminishes as cell phones start working again, commercial power distribution and communications systems are restored, and things start returning to normal. However, the agencies that provide services during this period are still very active, and continue to be long after we're no longer seeing video from the affected region on TV every night. Therefore—and this is true at any time, not just after a disaster—don't assume that just because you didn't see anything on the news tonight, there won't be anything for you to hear on your radios, because that's not necessarily the case. The organizations participating in disaster recovery still need to communicate with their own personnel and to coordinate their efforts with those of other organizations. Furthermore, although they may be in the recovery phase from the most recent disaster, they're also now in the preparation phase for the next disaster, and the cycle

starts over again with training exercises, drills, testing of systems, and the usual disaster preparedness fare!

And Now, A Few Words From Ham Radio...

During the preceding discussion of disaster-related communications, you may have noticed that I made frequent reference to ham radio operators and the role they play in the efforts to respond to a disaster. Because I happen to be a ham who participates in EmComm activities, I'm concerned that some might think it self-serving for me to keep on tooting ham radio's horn when it comes to emergency communications.

The fact is that hams have been using their unique capabilities and skills in emergency and public service since long before I was even born. RACES, for example, was originally conceived for wartime use, but has evolved over the years, along with the rest of our civil defense/emergency preparedness entities, to encompass all types of emergencies. Thus, RACES, which provides radio communications for civil-preparedness purposes, now is not limited to war-related activities, but can respond to disasters like hurricanes, earthquakes, floods, search-and-rescue operations, floods, and air crashes. They, along with ARES and even local radio clubs have proven themselves to be essential volunteer responders in both natural disasters and emergencies of human origin.

There are several reasons why ham radio is so important to emergency communications during emergencies. For one thing, while public safety agencies rely on centralized dispatch stations, the Amateur Radio Service is a decentralized system. Hams can get on the air and operate just about anywhere at any time. We can't be shut down by a terrorist attack; we operate nets all over HF, VHF, and UHF rather than having narrow two-way systems on just a few frequencies. We have widespread, distributed communications networks capable of voice, portable and mobile television and data services, vehicle location services (using APRS), and phone patches for telephone connections where cell phones don't have coverage.

Yet, while we do have a huge infrastructure in place, we aren't *dependent* in that infrastructure. We don't have to sit around and wait for technicians to show up and repair equipment or re-program radios. We can put our stations on the air at remote sites, and we can do it quickly, improvising when necessary. We can show up at the site of a disaster and carry emergency message traffic across town, across the state, across the continent, or around the world. When *every* other system and method of communications system has failed, hams can go on the air, and stay on the air.

Don't think it's all about the equipment, though, or you'll overlook the hams themselves. Members of groups like ARES and RACES are trained communicators. Most of us have experience and training in unexpected emergencies, and when functioning as part of an established EmComm group, we provide a group of experienced volunteers who know how to work together as a team. We have technical knowledge that allows us to do everything we need to do on the fly without waiting for someone to show up to reprogram a computer or fix something that's broken.

Furthermore, because we are dedicated communicators, we aren't as likely to miss key information that's shared on a net while local, state, and federal emergency managers are busy attending to other duties. The result is that often, we're able to provide "big-picture" informational support to emergency managers during an event, simply because we have been monitoring the emergency nets and can pay more attention to what's going on *right now* than the emergency managers are able to do given their multiple priorities.

Jim Livingston, N2SKT (left), and the author operate a PSK-31 digital communications station during a 2004 ARATS Field Day exercise. We're smiling because even though we're working, we're also having fun!

Cell Phones In Disaster Response?

To illustrate this point from a communications standpoint, consider the use of cell phones in trying to manage a disaster response. To begin with, the cell phone companies can't afford to build cell towers everywhere, so there are big holes in the coverage of cell phones in sparsely populated regions, away from cities and interstate highways. There are simple many places where cell phones do not work at all, ever. Moreover, when a disaster strikes the towers that *are* in existence may be disabled by the disaster. The cell networks can be flooded with panicked calls from the general public and overloaded.

But even if the cell phone system is working perfectly, it's impossible for a large group of emergency workers to get the big picture of how an event is progressing at the same time, due to the one-on-one nature of cellular telephone communications. When a cell phone user is taking a call from one person, he or she misses calls from others, and whatever an emergency manager says to an emergency worker over a cell phone is heard only by the emergency worker he says it to. The other emergency workers receive none of that information.

Compare that to a ham radio net: Whatever is transmitted by one station in a net is received simultaneously by every other station in that net. Everybody instantly gets the same exact information at the same time. If there is a dire emergency, the net can be interrupted for higher priority traffic, and, again, every station in the net immediately receives notification of it at the same time so everyone has the same overall picture of what's going on and how operations are progressing. In fact, the operator of a ham station in an emergency network is every bit is vital as the equipment he or she is operating. Which brings us to this question:

"What's In Your Wallet?"

Capital One has made that line famous in its commercials for its "no hassle" credit cards, but we're not concerned with your credit status in this column. Presumably, as a reader of this column, you're someone who understands the magic of radio. There's the magic of tuning in on the shortwave bands to listen

to the voice of a complete stranger on the other side of the world while you watch out the window of your shack as two feet of snow accumulate on the roof of your car. There's the magic of listening on the HF bands as law enforcement closes in and seizes another boatload of drugs that thus will never have the opportunity to pollute the bodies of your children.

Yes, listening to HF and scanning the VHF/UHF bands is a lot of fun. There are challenges. There's satisfaction. There are awards. There's a never-ending cycle of learning. What's not to love about radio?

But let me ask you this: Is there a ham license in your wallet?

The magic of radio isn't limited to *listening*. There's also magic in seeing the relief on the face of a young mother after your EmComm team that's providing communications for the parade at the annual community celebration has just safely located her lost child. There's magic in seeing the faces of young boys and girls light up when you do a demonstration of ham radio for a combined group of Boy and Girl Scouts and allow them to make their first contact on ham radio, with you acting as the control operator to keep everything legal. There's magic in not just hearing, but actually conversing with a complete stranger on the other side of the world while you watch that snow pile up on your car.

So if there isn't a ham license in your wallet, why not?

One common excuse that I've heard is, "I don't know Morse code." Well, neither did I until I learned it so I could upgrade from Technician to General. But that's now a non-issue here in the United States. You see, just before the end of 2006, the FCC announced that it would do away with the Morse code proficiency test for *all* ham license classes. That's right—if you've been using the code test as an excuse for not getting your Technician, General, or Extra class ticket, stand by to have that crutch kicked out from under you, because 30 days after the FCC's Report & Order is published in the Federal Register, there will be no more dots and dashes to keep you from getting a ham license.

What's that you say? Oh, yes, you're right—there are still the written tests, one for each license class. True, to go from zero to Extra you will need to pass three written tests. And those tests are tough! In fact, they're so difficult to pass that a seven-year-old girl in Oregon walked into a volunteer examination ses-

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."

sion at the Valley Amateur Radio Club in Eugene, Oregon, on January 14, 2004, and passed the written exam for Extra. She only had to take the one test because she'd gotten her Technician class license at the age of five and upgraded to General when she was six.

Get your license and you'll add so much to your enjoyment of the HF bands. Not only can you receive whatever you want, but now you can also *transmit* wherever your license grants you the privilege of transmitting. This will, incidentally, include full amateur privileges on the VHF/UHF bands, as well as at least some HF privileges, even if you only pass the first and easiest test and get your Technician class license. Then you can enjoy your Technician privileges while you continue to learn and upgrade to a General class ticket and, finally, the Extra class license for full privileges on all amateur bands.

Hidden Benefits

There are sometimes hidden benefits to having a ham ticket, too. For example, check the local laws where you live. Many states that have laws prohibiting the use of mobile scanner receivers exempt hams from these prohibitions, or at least contain some sort of language that specifies an amateur radio transceiver is not considered a violation of the prohibition against scanners. Since most modern VHF/UHF ham transceivers include a healthy dose of spectrum coverage outside the ham bands, you can use your ham rig to enjoy scanning during your drive time—that is when you aren't using it to chat up your fellow hams on the popular VHF and UHF bands, including the 2-meter band, which is the most popular ham band of all!

Best of all, as a licensed ham, you get to participate in the EmComm groups in your area, since your license opens the door for you to become a member of your local ARES, RACES, SKYWARN, and any EmComm groups provided by local radio clubs. Of course, this means that the next time disaster strikes, it might be *you* that fellow utility monitors are tuning in to, logging your participation in an NTS net passing emergency traffic, instead of you trying to log someone else.

That's going from being the hunter to being the hunted, and speaking as one who's been there and done that, I can assure you that you'll enjoy it more than any April Fools' joke I could have written for this column!

On With The Logs

This month's reader logs were submitted by the following individuals, whose contribution is greatly appreciated as always: Glenn Valenta, Lakewood, Colorado (GV/CO), Stephen Jones, Lexington, Kentucky (SJ/KY), Mark Cleary, Charleston, South Carolina (MC/SC), and Lupo Alberto, Venice, Italy (LA/IT).

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.

490.0—VAR-3, Canadian CG, Saint John, New Brunswick w/NAVTEX bulletin in French advising "LES NAVIGATEURS SONT PRIES DE FAIR ATTENTION ET DE PRENDRE DES MESURES AFIN D'EVITE COLLISION AVEC LES BALEINES" (avoid collisions with whales). SITOR-B, at 0321Z. (SJ/KY)

518.0—XMJ, Canadian CG, Prescott, ON w/NAVTEX Great Lakes wx forecast at 2113Z; NMG, USCG, New Orleans, LA w/notice re cessation of Spiny Dogfish fishery in 4 days due to quota fulfillment, at 2307Z; ZBR, Bermuda R., Hamilton, Bermuda w/bulletin about spit buoy repositioning during brief window between scheduled USCG NMA Miami and NMB Savannah broadcasts, at 0031-0039Z; NMG, USCG New Orleans, LA w/bulletin GL29 to fishing vessels re: restriction to 2,000 pounds of Atlantic Herring harvested per trip, another w/navigation warning re US government contractor working on foreshore dike repairs on the Mississippi River outlet to the Gulf of Mexico, at 0300Z; VAR-3, Canadian CG, Saint John, New Brunswick w/NOTSHIP (Notice to Shipping) bulletin re: "A RIGHT WHALE CONSERVATION AREA HAS BEEN DECLARED IN THE BAY OF SAINT JOHN BOUNDED BY THE FOLLOWING POSITIONS," at 0312Z; XLJ895, Canadian CG, Thunder Bay, ON on briefly w/msg PZ77 "No Message on Hand," at 0630Z; NMN, USCG, Portsmouth, VA w/BNM (Broadcast Notice to Mariners) navigation warning NA24 re: Vessel 9MGQ9, T/V *SERI AMANAH*, 67,800-ton Malaysia-registered LNG tanker transit of Chesapeake Bay w/"500 yard moving safety zone" in Port of Baltimore, MD, at 0951Z; all in SITOR-B at times indicated. (SJ/KY)

2187.5—P3BC8, UBC *BATON ROUGE*, 23,034-ton Panama-registered bulk carrier w/GMDSS (Global Maritime Distress and Safety System) DSC (Digital Selective Calling) distress call from position 21.20N 89.40W, just off the coast of Progreso, Yucatan State, Mexico, at 0718Z. (SJ/KY)

2656.0—NNN0ASA, VA w/msg to NNN0ALL from incoming Secretary of Defense Robert M. Gates in SHARES (Shared Resources) MARS Net plus info on MARSCOM satellite and parameters for packet tfc via it, in SITOR-B monitored at 0211Z. (SJ/KY)

3413.0—Shannon (Ireland) VOLMET with aero WX in USB at 0733Z. (GV/CO)

3167.0—USN vessels L7F, S5G, L9E in Link-11 coordination net, in USB monitored at 0022Z. (MC/SC)

4096.25—Pirate dasher beacon, in CW at 0452Z. (GV/CO)

4102.3—Pirate beacon W, in CW at 0457Z. (GV/CO)

4125.0—CAMSLANT wkg disabled vessel M/V *MAERSK SCOTLAND* in USB at 0619Z. (MC/SC)

4214.5—CBV, Chilean Navy, Valparaiso R., Chile w/CW+SITOR-A marker heard at 0435Z. (SJ/KY)

5550.0—NY Radio in conversation with unid aircraft who was looking for Bianca Radio; was handed off to this freq by San Juan; NY informed pilot that Bianca has been gone for years, in USB at 0343Z. (GV/CO)

5696.0—CAMSLANT asking OZC to switch to Channel 3E7 for secure comms, later returned to 5696 as apparently unable to establish contact on 3E7, asked for QSY to 3E11 (formerly 6815.6, but since moved to 6234.5), in USB at 0408Z. (GV/CO)

5708.0—CHARIOT 01 (E-3 AWACS) p/p to Tinker AFB Meteo in USB heard at 2257Z. (MC/SC)

5732.0—WGY9034 p/p via SERVICE CENTER to SOUTH CAROLINA EOC in USB at 1418Z. (MC/SC)

6224.0—Bratislava Radio, Slovakia, daily net with Danube River boats, status and position report, in Slovak USB at 1100Z. (LA/IT upo Alberto, Italy)

6265.5—V7ET3, *CROWLEY UNIVERSE*, 9,082-ton Marshall Islands-registered Ro-Ro cargo ship w/AMVER/FR for arrival at Port Everglades, FL, in SITOR-A at 1500Z; same vessel next day w/AMVER/SP for departure from Port Everglades en-route to Manzanillo, Mexico, in SITOR-A at 0800Z; WCZ7837, *DELTA MARINER*, 3,950-ton US-registered Ro-Ro cargo ship w/AMVER/SP for departure from Lake Charles, LA, en-route to Panama Canal transit, to arrive in 5 days, in SITOR-A monitored at 1035Z. (MC/SC)

6312.0—3FGV3, *ICARO*, 99,438-ton Panama-registered crude oil tanker in Venezuelan VENFLEET flotilla w/DSC call to sister tanker 3FCV3, *PROTEO* at 0638Z requesting SSB voice contact on 4143.0 kHz. Venezuelan tankers seem to meet up on that freq. nightly between 0600Z and 0800Z on their regular runs between home ports Puerto Jose and Puerto la Cruz, Venezuela to destinations Houston/Corpus Christi, TX or Lake Charles, LA. (SJ/KY)

6314.0—NMF, USCG, Boston, MA w/MSI (Maritime Safety Information) BC, also heard on parallel frequencies 8416.5 and 12579.0, in SITOR-B at 0140Z. (SJ/KY)

6449.0—Santiago OAC wkg various A/C in USB at 0649Z. (GV/CO)

6628.0—New York Radio with Iberia 4984, position report with good levels in USB at 0713Z. (GV/CO)

6881.0—NNN0ASA, Secretary of Defense msg from new Secretary Robert M. Gates to NNN0ALL in US Navy MARS SHARES Net, followed by msg from NNN0XOP concerning 2-meter packet tfc with the Space Shuttle, in PACTOR heard at 2110Z. (SJ/KY)

6969.0—Bulletin from NNN0ASA, former Secretary of Defense Donald Rumsfeld relayed in US Navy MARS Net, VA to ALDODACT (All Department of Defense Activities) and NNN0ALL re: "Farewell Message to the Troops," in PACTOR at 0251Z. (SJ/KY)

7832.5—AFA2ID calling AFA2PB in USAF MARS Net in SITOR-B at 2133Z asking to switch to MSFK. (SJ/KY)

7862.5—AFC2FL calling AAT1BS in USAF/US Army MARS Net, in PACTOR at 0030Z. (SJ/KY)

8135.0—Cuban ENIGMA M8a w/fast machine-sent MCW cut 5N groups using TANDUWRIGM for 0123456789 at 2300-2328Z, strong signal. (SJ/KY)

8379.0—WDD3060, *LAWRENCE H. GIANELLA*, 39,624-ton US-registered oil products tanker in US Navy Military Sealift Command w/TEST msg in SITOR-A at 1730Z. (SJ/KY) *(See the January 2007 issue for a photo of this vessel.—jk)*

8379.5—Unid vessel w/SELCAL XXVC (1106) for NOJ, USCG, Kodiak, Alaska, no contact, in SITOR-A at 1348Z. (SJ/KY)

8381.0—C6QZ5, *DOLE COLOMBIA*, 30,106-ton Bahamas-registered container ship w/AMVER/SP and detailed route leg list for departure on weekly fresh fruit run from Port Everglades, FL to Santa Marta, Colombia in SITOR-A at 1530Z; Same vessel heard again two days later at 1413Z w/AMVER/FR for arrival at Santa Marta and again eight days later at 1825Z for arrival at Wilmington, DE; S6FZ, *IKAN SELANGAT*, 37,554-ton Singapore-registered bulk carrier w/AMVER/SP for departure from Veracruz, Mexico en-route to New Orleans, LA, to arrive in three days; same vessel w/FR for early arrival NOLA two days later, in SITOR-A at 2101Z. DYRT, *STAR SAVANNAH*, 18,764-ton Philippines-registered bulk carrier w/partial AMVER/PR, en-route to Barranquilla, Colombia, in SITOR-A at 2205Z. (SJ/KY)

8383.5—YYIP, *MAERSK SCOTLAND*, 16,263-ton Venezuela-registered LPG tanker w/AMVER/PR, 50 mi off NC coast en-route to arrive Philadelphia next day, in SITOR-A at 1747Z; WCZ7837, *DELTA MARINER*, 3,950-ton US-registered Ro-Ro cargo ship w/AMVER/SP for departure from Southwest Pass, Mississippi River Delta 90 mi SSE of New Orleans, LA w/detailed route leg list for journey around FL peninsula to Cape Canaveral, to arrive in 4 days, in SITOR-A at 2140Z; Same vessel on this freq. 27 days later w/AMVER/FR for arrival at E end of the Panama Canal, in SITOR-A at 1741Z; S6NK3, *EAGLE TOLEDO*, 107,092-ton Singapore-registered crude oil tanker w/AMVER/SP for departure from La Salina, Venezuela en-route to Texas City, TX, to arrive in 5 days, in SITOR-A at 2251Z. (SJ/KY)

8388.0—WMLH, *MAERSK NEBRASKA*, 36,003-ton US-registered container ship w/msg to NMN, USCG, Portsmouth, VA re their CW/SITOR-A marker transmitting on wrong frequency, in SITOR-A at 1430Z; V7AL3, *LAKE SUPERIOR*, 35,630-ton Marshall Islands-registered bulk carrier w/AMVER/PR, 150 mi E of Norfolk, VA sailing toward destination Savannah, GA, in SITOR-A at 1810Z; S6NK2, *EAGLE TACOMA*, 107,123-ton Singapore-registered crude oil tanker w/AMVER/PR, central Gulf of Mexico sailing ESE to La Salina, Venezuela [sic], in SITOR-A at 1913Z; 9V6485, *TOBA*, 31,396-ton Singapore-registered vehicles carrier w/AMVER/PR, 250 mi S of New Orleans sailing ESE, in SITOR-A at 2135Z. (SJ/KY)

8391.0—V7AK9, *LAKE MICHIGAN*, 38,294-ton Marshall Islands-registered bulk carrier w/TEST msg for Direct Telex to vessel's managing company in Hong Kong, in SITOR-A at 0142Z. (SJ/KY)

8392.0—XCPI, *NUEVO PEMEX III*, 44,575-ton Mexico-registered crude oil tanker w/casual msg of New Year greetings in SS to unid. station, in SITOR-A at 1830Z. (SJ/KY)

8416.5—NMO, USCG Honolulu, HI w/MSI navigation warnings re "Intermittent missile firing operations in the Naval Air Warfare Center Sea Range" in the NE Pacific Ocean 100 mi W of Los Angeles, CA, in SITOR-B at 1410Z. (SJ/KY)

8912.0—CG 1720 (HC-130, CGAS Clearwater) requests CAMSLANT contact Key West to see if there are any TOIs [targets of interest], in USB at 2137Z. (MC/SC)

8971.0—GOLDENHAWK passes that WAFER 22's playmate is CG 1711 and freqs are 3253 kHz and 7710 kHz, in USB at 1637Z. (MC/SC)

8983.0—CAMSLANT wkg CG 2120 (HU-25, CGAS Cape Cod) regarding Medevac from vessel *CAROLYN CHOUEST* near Block Island, in USB at 1856Z. (MC/SC)

9007.0—CANFORCE 2604 wkg TRENTON MILITARY for WX at Trenton and Ottawa, in USB at 2119Z. (MC/SC)

9025.0—SENTRY 08 (E-3 AWACS) p/p via Andrews HF-GCS to RAYMOND 24 with line code report in USB at 1857Z. (MC/SC)

10242.0—CG 1711 (HC-130, CGAS Elizabeth City) p/p via SERVICE CENTER regarding their receiving imagery and chat message, in USB at 1700Z. (MC/SC)

10493.0—BACK STRETCH passing date time group to LIONS DEN, in USB heard at 1804Z. (MC/SC)

10993.6—CG 1720 (HC-130, CGAS Clearwater) clg SECTOR KEY WEST in USB at 2020Z. (MC/SC)

11153.5—Offutt HF-GCS wkg JAIL DOOR, in USB at 2134Z. (MC/SC)

11175.0—TRON 02 (EA-6B) p/p via Offutt HF-GCS to NAS Whidbey Island, in USB at 2227Z. (MC/SC)

11175.0—8SB (unid submarine) p/p via Andrews HF-GCS reporting Torpedo tube #4 valve spraying water, in USB monitored at 1438Z. (MC/SC)

11232.0—CHALICE FOXTROT (E-3 AWACS) p/p via TRENTON MILITARY to HUNTRESS with request they pass to CORNERSTONE they are RTB for an ill flight engineer and are dumping fuel, in USB at 1735Z. (MC/SC)

12479.0—3FWT9, *SOUTHAMPTON STAR*, 9,709-ton Panama-registered refrigerated cargo ship w/AMVER/PR, 350 mi E of Jacksonville, FL en-route to Delaware Pilot Station, next day arrival, in SITOR-A at 1744Z; C6QP3, *KYEEMA SPIRIT*, 113,357-ton Bahamas-registered crude oil tanker w/AMVER/PR, 600 mi E of Jacksonville, FL and sailing NNW, in SITOR-A at 1802Z; Same vessel heard this freq. again 7 days later, 325 mi E of Myrtle Beach, SC, en-route to Cape Henlopen, DE; 3FX13, *HERO*, 99,469-ton Panama-registered VENFLEET crude oil tanker w/AMVER/SP and detailed 9-segment Route Leg List for trip from Lake Charles, LA to Puerto Jose Terminal, Venezuela, to arrive in 6 days, in SITOR-A at 1821Z; 9HCU7, *VITAPRIDE*, 69,153-ton Malta-registered bulk carrier w/AMVER/PR, 125 mi W of Fort Myers, FL sailing SSE en-route to San Nicolas, Argentina, to arrive in 20 days, in SITOR-A at 1837Z; CBLR, *LAUREL*, 26,528-ton Chile-registered bulk carrier w/AMVER/PR, 40 mi E of Honduras coast, sailing SSE en-route to Cristobal, Panama for canal transit, to arrive in 2 days, in SITOR-A at 1905Z; 3FMP3, *TESEO*, 99,477-ton Panama-registered VENFLEET tanker w/AMVER/PR, central Gulf of Mexico en-route WNW to Corpus Christi, TX, next day arrival, in SITOR-A at 2020Z. (SJ/KY)

12481.0—3EFV8, *MOL THAMES*, 59,089-ton Panama-registered container ship w/radio check to CBV, Chilean Navy, Valparaiso, Chile in SITOR-A monitored at 2310Z. (SJ/KY)

12482.0—V7ET7, *MAR CARIBE*, 9,410-ton Marshall Islands-registered Ro-Ro cargo ship w/AMVER/PR, 40 mi off Honduras coast en-route to Puerto Santo Tomas de Castilla, Guatemala, to arrive next day, in SITOR-A at 1813Z. (SJ/KY)

12486.5—HOVA, *PACIFIC HONOR*, 45,800-ton Panama-registered oil products tanker w/AMVER/FR for arrival at Los Angeles, CA, in SITOR-A at 1750Z; VRWR7, *SAGA CREST*, 47,069-ton Hong Kong-registered general cargo ship w/coded weather observations in SITOR-A 1920Z; HBDF, *NORASIA SILS*, 39,425-ton Switzerland-registered container ship with AMVER/SP/PR combined report from 150 mi W of Panama coast following departure from Bilbao after canal transit, detailed route across the Pacific to pass by Hawaii en-route to Shanghai, China, arrival in 20 days, in SITOR-A at 2012Z. (SJ/KY)

12490.0—WFKW, *OVERSEAS NEW ORLEANS*, 43,644-ton US-registered oil products tanker w/coded weather observations in SITOR-A at 1310Z; ELCI9, *BRAUNSCHWEIG*, 14,620-ton Liberia-registered vehicles carrier w/ AMVER/PR, 500 mi off

US Atlantic coast sailing WSW, in SITOR-A at 1536Z: 3EEZ6, *STAR FIRST*, 13,300-ton Panama-registered refrigerated cargo ship w/AMVER/PR, 500 mi ENE of San Juan, PR, sailing WSW at 22 knots en-route to Turbo, Colombia, to arrive in three days, in SITOR-A at 1605Z; A8KK3, *VALPARAISO STAR*, 9,867-ton Liberia-registered refrigerated cargo ship w/AMVER/PR, 30 miles W of Point-a-Pitre, Guadeloupe, in SITOR-A at 1624Z. (SJ/KY)

12492.5—Unid vessel w/SELCAL KCPV (3650) for CUL, Lisbon R., Portugal, no contact, in SITOR-A at 2101Z. (SJ/KY)

12579.0—NMF, USCG Boston, MA w/MSI wx warning re: 60-90 knot hurricane force winds from 932mb low in N Atlantic between Greenland and Iceland, also heard with weaker signal levels on parallel frequency 8416.5 kHz, in SITOR-B monitored at 1633Z. (SJ/KY)

12749.9—Cerrito Radio, Uruguay, with "QSX CQ de CWA QSX 4/6/8/12/16/22" in CW at 2324Z. (GV/CO)

13125.0—Unid Russian YL with duplex PP through Varna Radio, in USB heard at 2328Z. (GV/CO)

13152.0—WLO Alabama, w/WX interrupted with YL doing test count, in USB at 2326Z. (GV/CO)

13257.0—SENTRY 61 (E-3 AWACS) p/p via TRENTON MILITARY to RAYMOND 24 with line code report, in USB monitored at 1851Z. (MC/SC)

15043.0—SENTRY 61 (E-3 AWACS) p/p via Offutt HF-GCS to RAYMOND 24 with line code report, in USB at 1931Z. (MC/SC)

16691.0—Unid. vessel w/SELCAL XFCV (1860) for CBV, Chilean Navy, Valparaiso, Chile, no contact, in SITOR-A at 2047Z. (SJ/KY)

16693.0—VRWR7, *SAGA CREST*, 47,069-ton Hong Kong-registered general cargo ship w/AMVER/PR, 300 mi NE of Belem, Brazil and sailing NW around Brazil en-route to Cristobal Pilot Station for Panama Canal transit, in SITOR-A at 1630Z. (SJ/KY)

16747.0—Unid. w/news and sports in English, mostly about the Philippines, ended with "Maligayang paska sa lahat" ("Merry Christmas to All" in Tagalog), in SITOR-B 2027-2044Z. (SJ/KY)

16806.5—NMC, USCG San Francisco, CA w/MSI (Maritime Safety Information) BC re: missing 36-foot sailboat S/V SUVAROV w/1 person on board near Malaysia and attempted piracy in Singapore Strait, in SITOR-B at 1831Z. (SJ/KY)

22297.5—Unid. vessel w/SELCAL XVSS (1099) for NMO, USCG Honolulu, HI, no contact, in SITOR-A at 1820Z. (SJ/KY)

22389.5—NMN, USCG Portsmouth, VA w/CW+SITOR-A marker at 2240Z. (SJ/KY)

Thanks to everyone who did the good deed this month: Lupo Alberto, Venice, Italy (LA/IT); Stephen Jones, Lexington, Kentucky (SJ/KY); Mark Cleary, Charleston, South Carolina (MC/SC); and Glenn Valenta, Lakewood, Colorado (GV/CO). ■

ADVERTISERS' INDEX

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by Bill Price, N3AVY

Stuff I Have Been Wrong About

Yes, it's hard to believe, but there are a few things I didn't get right. I think that one of my first disappointments was finding out that just because you couldn't hear anything but static (hash) on a CB radio, it did NOT mean that no one in the world was transmitting at that particular time.

I was sure that while somewhere in Connecticut, during one of these times when "no one else was on" I could just yell into the mic and my friends and family, some 300 air miles away, could hear me just fine. This was shortly before the U.S. Coast Guard taught me about ground waves, sky waves, propagation of various wavelengths, and "expecting the bloody impossible."

After my stint as a Coast Guard Radioman, I missed operating CW so much that I got a ham license. This is where a few of my other misconceptions were blasted from the sky by well-armed sharpshooters. I somehow expected the amateur CW bands to be similar to the commercial freqs, with a calling freq where initial contacts were made, and then people would shift off to some clear working frequency to carry on a leisurely conversation. What I found resembled the old video game, *Frogger*, and I was the frog, experiencing traffic on a crowded street for the first time.

Like a lot of others, I thought that computers would reduce our paper consumption, too.

And with the onset of e-mail and newsgroups, I thought for sure that the ability to find people of like minds with similar interests was just around the corner. Unfortunately, so were flame wars. This is another area where ham radio beats the computers hands down. First of all, there is an FCC to deal with intentional, malicious interference. Second, when you turn on your receiver, there are never any hostile messages waiting for you as there are in your "inbox" (this assumes you're not dealing with packet radio, of course). And has anyone's ham transceiver, key, mic, antenna, tower, or anything else ever been infected with a virus?

I'll skip over the painful misconceptions I had as a child. Well, okay, not all of them. I'm still upset that I believed my mother when she said I could be anything I wanted to, and then told me not to be ridiculous when I said I wanted to be a hippopotamus (*nobody* messes with hippos!).

Getting back to the Coast Guard days. After being indoctrinated to the "Coast Guard Way" of communicating in six months of radio school, I truly believed that *everyone* observed proper operating procedure, used only the approved abbreviations, Q (and Z) signals, and that if I just followed the procedure they taught me, everything would be fine. They lied.

Ward and June Cleaver *do not* operate shipboard radio. We were told repeatedly that we were to establish contact with a merchant vessel by sending its callsign, "DE," and our callsign, and then using the appropriate Q signals to shift them to their working frequency of 468Kc and ours of 466Kc. Oh, how life teaches real lessons.

The first "merchie" merely sent my callsign, which was, at the time, 4YD. Nothing else. Didn't say another word. My watch supervisor said, "Aren't you going to answer him?"

"And has anyone's ham transceiver, key, mic, antenna, tower, or anything else ever been infected with a virus?"

"Answer WHO?"

"That ship that just called you."

"I don't know his callsign."

"Just send "DE."

"I can't do that!"

My supervisor reached over to my hand key, banged out "DE" and the previously anonymous ship sent nothing but his callsign. Just four letters. Not another dit.

My supervisor sent "UP," to which the merchie replied "dit-dit," and my supervisor sent back "dit-dit."

While I was asking a hundred questions about procedure and what frequency was he using and how did he know he would go to 466/468 instead of some other working frequency pair, my supervisor tuned the receiver to 468Kc and heard "4YD," and answered with "DE."

The merchant operator sent his callsign and "OBS," which meant that he had a weather observation message to send us for relay to the national weather service via the Coast Guard HQ Radio Station in Alexandria, Virginia. As I waited for my supervisor to send the other ship's callsign, his own, and QRV (I am ready to copy), I heard my supervisor instead send the single letter "K."

The merchie zipped through a bunch of five-digit number groups, followed by "BT" and "K," and my supervisor sent "R TU SU" ("Roger, thank you, see you") and together they ditted off the "shave and a haircut' rhythm and my supervisor handed me the copy and told me to type it up for relay.

He could tell by my blank stare that this had not happened as I had expected it to, nor as I had been taught that it would. He said, "Forget that stuff from Groton, this is how it's *really* done," and shortly after that I fell into the groove of operating the same as all the others did, and would someday show the same thing to another "newbie" operator reporting aboard right out of radio school.

To this day, I'm proud of myself for not expecting a "bladder pressure measuring contest" to be a literal description of an actual event, but a nickname for the "I know more than you" discussions which take place both on the air and at any place where two or more radio operators get together. I have also resisted the temptation to line my hubcaps with aluminum foil on the remote chance that it will actually "foil" (forgive that) police radar.

Okay—gotta run. There's a full moon tonight, and I've got to go swing a dead cat around my head three times in a cemetery at midnight. You see, I've got this wart that I can't seem to get rid of... ■

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