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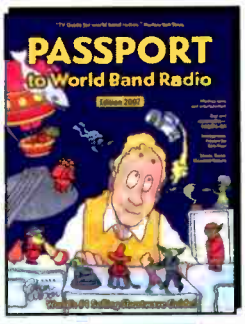

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Ed Claar, Transmitter Engineer/RF Specialist at the Fort Meyers Broadcasting Company,Fort Meyers, Florida checks the new Harris 60kw transmitter. WINK-TV, and 1583 other staions are "delivering in digital" as the National Association of Broadcasters say, in 211 markets nationwide. What does DTV mean for you and millions of other consumers? Be sure to read our special yer-end report on page 8, "Digital TV Update: What's In Store For You" for details. (Photo by Larry Mulvehill)

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by Harold Ort, N2RLL

Your Mileage *Will* Vary

Today it seems like those fast-talking announcers are everywhere on radio and TV. They brim with disclaimers, letting us know that "past performance is no guarantee of future earnings," or some such nonsense. Like we don't know that. Then there's the fine print now read aloud by announcers in the car commercials: "When you walk in the dealer's showroom all bets are off regarding what you just heard in this 60-second spot." And the epitome of disclaimers: "Hey, your actual cost of leasing this vehicle will vary—a lot, actually—from the low-ball estimates you just heard in this commercial."

You and I have known since grade school that there's little real truth in most advertising claims. The concept is pretty simple, really: companies pay big bucks to the media to air or print their messages, and they control the content (within reason, of course). And what self-respecting media type isn't going to take their money?

Over the years, though, I've found a great difference between the "claims" made by manufacturers who advertise in most of the mainstream media—whether it's vehicles, food, travel, etc.—and those made in our radio hobby media. Frankly, there's very little misleading or half-truths out there in Radioland about our antennas, radios, and accessories. I know many hobbyists who think that some manufacturers' claims about antennas, in particular, are a bit unusual, so to speak; but for the most part our radio goodies are advertised in a truthful, professional manner when it comes to what they'll do and not do.

Think about it for a moment. We are—to paraphrase one non-radio commercial here in the New York metro area says about clothing—"educated consumers." There really isn't much that could be stretched or massaged to give the illusion of something radio being light-years better or more powerful than it is in reality.

You and I know this is especially true when it comes to transceivers. The specs speak for themselves and, unlike mainstream consumers, we're likely to actually compare specs on sensitivity, selectivity, audio output, cable shielding, battery capacity and use, plus a multitude of items that largely go unnoticed by most general consumers. The same holds true, I suppose, for other hobbies, from archery and track to bird watching and amateur astronomy. Claims about a telescope's optics and power are carefully scrutinized and, moreover, *understood* by those in that hobby.

What's troubling to me, though, are the claims mainly directed at consumers when it comes to the range of those small FRS or GMRS transceivers, you know, the handheld variety that can be purchased in department store chains and on the Internet. Depending on the manufacturer and model of walkie-talkie, there are outrageous claims of anywhere from three to a whopping 17 miles of coverage! Keep in mind they're talking about non-repeater use, *simplex* that is, of units that include some GMRS frequencies. But even with the higher power allowed by GMRS, you're not going to get 17 miles between like units in *any* world I've visited recently!

The packages, usually with a pair of units, are really so in-your-face eye-catching that they practically scream, "buy me and get 10 miles range." These manufacturers have crossed a line and have gone beyond a little misrepresentation into a realm of totally deceiving the public about these little radios' capabilities. Let's face it, if you weren't a scanner enthusiast, you probably wouldn't know that even high-power public safety radios don't get that kind of range. Or if you weren't a ham you wouldn't know that a $300 2-meter HT doesn't offer that. There but for the grace of our hobby, you might have fallen victim to the baloney and bought not just one package, but perhaps even two or three, thinking you could talk all over town with no airtime charges or license!

License—that's another part of the deception that few people want to talk about with these radios. While some operate strictly on the unlicensed FRS frequencies, others (the great majority, in fact) are combination FRS/GMRS walkie-talkies, and a license *is* required for GMRS use. Sure, there's some small print on the package, but in most instances I had to put my glasses on and search out the "license required" caveat for GMRS use that manufacturers print on the packages.

I think it'd be fun to hear a fast-talking announcer give a disclaimer in a radio broadcast spot for one of these packages. Try this one on for size:

> These tiny walkie-talkies are intended for having fun and staying in touch with family and friends in the park, shopping mall, and around your immediate neighborhood. You're not going to get more than a few blocks' range if you're lucky, unless your family picnic is held atop the Empire State Building, Sears Tower, Mt. McKinley, or on the ocean. Plus, you need a license to operate on GMRS frequencies (the small print on our box tells you that you do, but it's so small you probably won't see it or ignore it because that's our real goal because once you realize the five-year GMRS license costs more than the pair of radios, you'll probably get licensed and get a ham radio.) If, by some unusual phenomenon you actually do get 10- or 17-mile range we'd like to hear about it because we could use you and your fish story FRS/GMRS radio experience as testimony to entice future users of these low-power radios to buy something that doesn't perform as expected.

The fact is, you can't get V8 performance from a four-cylinder puddle jumper or a 10-speed bike—only a fool would think you could. But it seems that the manufacturers spouting these wild claims about tiny radios think consumers are stupid, illiterate, or both. *Then* factor lawyers into the mix—most of whom wouldn't know an FRS radio from a left-handed monkey wrench—and you've got the ingredients for some Corporate Wordsmithing that would make the Pentagon wish they had signed a contract with them as their new PR firm!

One leading radio manufacturer boldly shows eight linksfor radios on its website for "2, 3, 5, 6, 7, 8, 10 and 15," indicating "range transmits up to 15 miles." And there's absolutely no indication of a license required for the GMRS transceivers, or even an asterisk after that "15 mile" range claim. Pretty amazing. You'd think that at least they'd say something like, "Claim quite exaggerated, but you'll probably get three or four miles over

(Continued on page 82)

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

News, Trends, And Short Takes

WorldSpace Hits Ownership Hitch

WorldSpace-South Africa may be forced to ditch its plans to offer satellite radio services to local consumers unless it amends its shareholding to meet the regulatory requirements or it receives an exemption from the government. WorldSpace SA is a wholly owned subsidiary of Nasdaq-listed WorldSpace group.

According to section 64 of the Electronic Communications Act, "a foreigner may not, whether directly or indirectly, exercise control over a commercial broadcasting licensee; or have a financial interest or an interest, either in voting shares or paid-up capital, in a commercial broadcasting licensee exceeding 20 percent. Not more than 20 percent of the directors of a commercial broadcasting licensee may be foreigners."

The clause has been carried over into the new Electronic Communications Act, which came into effect in August, from the old Independent Broadcasting Act. WorldSpace founder Noah Samara, who was in South Africa recently, said regulatory uncertainty was an impediment to the group as it needed to aggressively roll out the services. He said there was no indication why the license would not be awarded.

WorldSpace group did not reveal how many subscribers it has in South Africa, where it offers 40 radio stations, satellite radio receivers for homes, and plans to negotiate with local car manufacturers so that the services can be installed in cars.

International Press Institute Blames Chinese For Jamming SW Radio Africa

The International Press Institute (IPI) has condemned the jamming by the Zimbabwe government of the mediumwave signal of the London-based SW Radio Africa. The IPI says that it believes the jamming is coming from the broadcasting center at Pockets Hill, rather than ZBC Gweru, which has previously jammed SW Radio Africa on the shortwave band. It is widely believed that the Chinese government has provided the Zimbabwean government with the technology that allows the signal of private radio stations to be jammed inside the country.

VOA Central Africa Service Celebrates 10th Anniversary

The Voice of America's (VOA) Central Africa Service, created following the Rwanda genocide to provide news and information to the Great Lakes region of Africa, celebrated its 10th anniversary this summer. The service broadcasts radio programs in the Kirundi and Kinyarwanda languages to Burundi, Rwanda, Tanzania, and the eastern Democratic Republic of Congo. In recent years, programming has included interviews with major public figures from the Great Lakes region, such as Burundian President Pierre Nkurunziza, Rwandan President Paul Kagame, and Paul Rusesabagina, who inspired the movie "Hotel Rwanda," a story about the 1994 Rwanda genocide in which some 800,000 people were killed. The Service also gives a voice to ordinary listeners by airing in-depth features on HIV/AIDS patients, orphans, single mothers, medical professionals, NGO leaders, and separated families.

VOA's Central Africa Service broadcasts seven days a week at 0330 to 0430 UTC to the Great Lakes region on shortwave (6095, 7340, and 13725 kHz), as well as on VOA's own FM frequency in Kigali, Rwanda. VOA also broadcasts on FM through Radio Publique Africaine in Bujumbura, Burundi, and Radio Kwizera in Ngara, Tanzania.

Radio Australia On New Platforms In Cambodia And Vietnam

Radio Australia is moving from shortwave broadcasting to online technology and local FM rebroadcasting to develop new audiences in Vietnam and Cambodia. Cambodian broadcasts will revolve around the successful placement of Khmer content on "third-party" FM platforms in Cambodia. It's estimated that the services will reach 85 percent of the population.

In Vietnam, the declining popularity of shortwave broadcasts and the surging demand for online services has opened the path for a live interactive "Australia-Vietnam" information and cultural exchange Web portal. This service is located at www.bayvut.com/.

Radio Australia is now broadcasting from two new transmitters, located near Townsville, that are DRM (Digital Radio Mondiale)-capable. These transmitters will enable RA to test digital shortwave radio to Asia and the Pacific. DRM is also being tested in China by Chinese National Radio, with over 800,000 radios and 14 transmitters, while Radio New Zealand International (RNZI) has already tested and is successfully implementing DRM in the South Pacific.

Still 100 Illegal FM Stations In Pakistan's NWFP

The Pakistan Electronic Media Regulatory Authority (PERMA) recently admitted that more than 100 seminaries were still operating illegal FM radio stations across the North West Frontier Province (NWFP). They said that while most seminaries used FM radio broadcasts to impart Islamic teachings, many used them to spread sectarian hatred. When PERMA first launched its crackdown on illegal stations, the police claimed to have put 90 such stations out of operation. However, PERMA sources described these claims as being far from reality, pointing out that all these radio stations were still broadcasting.

In addition to being used to stoke sectarian unrest, PERMA officials stressed that the illegal broadcasts posed a serious threat to the police's wireless systems as well as to passenger and fighter plane navigation systems. ■

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.*

They're Coming!

Dear Editor:

I just read your "Homeland Security" column titled, "Turtles." I found this very interesting and hope that you'll have some more such articles in future issues of *Popular Communications*. What I would like is articles that cover how to use RVs and travel trailers for EmComm operations and how to go about modifying these vehicles for that purpose.

Stephen H.
Via e-mail

Giving It Away To TheHighest Bidder?

Dear Editor:

New laws forbid us to listen to cell phones, cordless phones, and baby monitors for crying out loud. We bicker and we fight over band plans, whose antenna is creating havoc while we watch *Friends* on TV, Congress jumps on the bandwagon every time there seems to be a dollar to made, though they have nary a clue about what knob turns a scanner on.

I had a city elected person ask me, "Why do you want to spy on the fire dept?" We can't sit by the airport and listen to planes talk, we can't sit by the rail yards and hear the engines work, you get stopped by a cop and he spots a scanner in your car and asks, "why do you need to hear us? What are you up to anyhow?" One took my BC350 and tossed it on the ground and stepped on it—his reply was, "so sue me—it's illegal to listen to police calls." I was darned lucky (not his words, I might add) that he didn't arrest me for interfering with a police officer. Perhaps when they take our guns, our radar detectors, our scanners, shortwave sets, and then even our CB radios, we will become a land of slaves, but they won't be happy when that's all done; next it will be free radio, maybe TV next.

The hams say it won't happen to us, they need us. Well, let me tell you, if they need it and can make mucho dollars off the radio spectrum where hams live, you can bet your bottom dollar they will toss the ham on their ear and take those bands away and give 'em away to the highest bidder.

So the point of this is, people wise up. It's time we as radio people (I don't care if it's one tiny handheld scanner or one huge shack full of the latest high tech gear) wise up, speak up, support our hobby, and stand as one.

Emmitt
Via e-mail

The Promise Vs. Reality

Dear Editor::

I'd like to thank Joe Cooper for his informative article (October 2006 "Computer-Assisted Radio Monitoring"). I'm really glad to see someone point out in a respected magazine the differences between the "promise" and "reality" of digital processing. Many people in the electronics fields don't recognize these differences at all. Some of them even get emotional about the promise because their college instructors carelessly omitted the discussion you provide in his article.

However, I see one additional problem that Joe didn't mention: band limiting. The analog output of a digitally transmitted signal accurately reproduces the band limited analog input signal, not the original signal. There is a difference, and it requires increasing effort (and cost) to make the difference insignificant to the user. In fact, both classical and rock musicians and music fans argue even today about parts of the sounds getting lost on a CD compared to an LP. I don't claim to know who is right, but I only note that the discussion drags on.

Don Wilkins
Via e-mail

POPULAR COMMUNICATIONS

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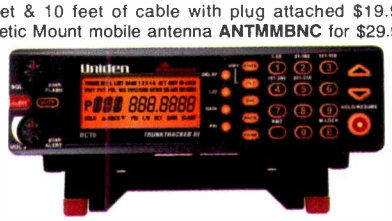

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Suggested list price $799.95/CEI price $519.95

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

Frequency Coverage:

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

The handheld BCD396T scanner was designed for National Security/Emergency Preparedness (NS/EP) and homeland security use with new features such as **Fire Tone Out Decoder**. This feature lets you set the BCD396T to alert if your selected two-tone sequential paging tones are received. Ideal for on-call firefighters, emergency response staff and for activating individual scanners used for incident management and population attack warning.

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

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Bearcat 244CLT 30 channel base AM/FM/weather alert scanner	$94.95
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Bearcat BCT8 250 channel information mobile scanner	$169.95
Bearcat 350C 50 channel desktop/mobile scanner	$96.95
AOR AR16BQ Wide Band scanner with quick charger	$199.95
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AOR AR8200 Mark IIIB Wide Band handheld scanner	$594.95
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Deluxe Independent Dual Volume Control Racing Headphone	$29.95
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Bearcat® BC246T Trunk Tracker III

Suggested list price $399.95/CEI price $214.95

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

Frequency Coverage:

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

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

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Digital TV Update: What's In Store For You

That New DTV Picture Is Awesome, But There's A Catch

by Harold Ort, N2RLL

Many Americans are still living in the analog world. In some ways, I suppose, I'm one of them. Our TV is still of the analog variety, even though we "just" purchased it in 2000. Sure, we Americans have our digital high-tech cell phones, computers, and cameras, but when it comes to TV, well, not everyone is on the bandwagon. And not all of our nation's television stations are either—at least not yet. That's okay, though. Contrary what consumer industry PR bobbleheads would have you believe, not everyone runs out to get the latest and greatest digital electronic device after hearing about it on the evening news or being wowed by an ad. That includes the new digital TVs, or DTVs.

But that's all changing by mid-February 2009!

"What's commonly referred to as "HD ready" means that new TV you just bought will require a top-of-the-set converter box!"

People Get Ready

To make the process move a bit quicker *and* turn over 60 MHz of spectrum to commercial and public safety users, the government mandated February 17, 2009, as the magic date for broadcasters to turn over those frequencies, after which they'll be auctioned off to the highest bidder. (Remember, it's all about money!) Who gets the money, you ask? Who do you think? Uncle Sam. Heaven knows, the federal deficit is *so* far in the red that even the billions generated will barely scratch the surface in bringing Sam out of debt—again. But that's part of the reasoning behind the auctions. The rest of the theory is that those frequencies will ease the over-burdened public safety communications systems, providing a more efficient use of spectrum, especially now with the nation "at war" for the coming years. Time will tell, of course.

In the meantime, Congress gave the FCC authority to begin the auction process by the end of February 2008. What does all this mean to consumers regarding televisions? You get a choice (sort of): You can get an additional top-of-the-set box or a new TV that'll receive and decode DTV. The newer TV route is probably the better choice, frankly, because then you've got the DTV decoder *built in* and you're ready to go when DTV comes to your area!

The electronics industry loves to toss acronyms and buzzwords our way. But let's clear the air for a moment.

What's commonly referred to as "HD ready" means that new TV you just bought will require a top-of-the-set converter box!

If your TV is an older model such as this Magnavox, you'll need a set-top converter.

Without it, the TV is just a high-resolution monitor. Of course many Americans are still receiving broadcast TV, and many more are having difficulty just keeping their medicine cabinets properly stocked and eating at the same time. So in its infinite wisdom to help them, Uncle Sam will provide grants amounting to about *1/10th* of the approximately $10 billion from those auctions for underprivileged consumers who will need to make the switch or forget about watching TV. If you think you'll qualify for the two $40 coupons for the purchase of the box or boxes, you can get specific information from the National Telecommunications and Information Administration (www.ntia.doc.gov), which will be administering the Digital-To-Analog Converter Box Assistance Program.

The actual switch over to digital has actually been occurring since 1996 when Congress authorized stations to simultaneously broadcast their standard analog signal along with an adjacent digital channel. But remember, come February 17, 2009, all *analog* TV broadcasting stops.

Many TV stations across the USA are already broadcasting DTV programming, and the FCC says, "most will continue to

"Next March all TVs 13 inches or larger out in Retail Land that receive broadcast signals will have a DTV tuner built in or be DTV ready."

New TVs, like this JVC HD-70FH97 are ready to receive DTV signals out of the box. This one even includes a digital noise suppressor.

provide analog programming through February 17, 2009. At that point, full-power TV stations will cease broadcasting on their current analog channels..."

And at that time, remember, if you've still got that analog TV and you're getting your TV programming over the air, you can either buy a new TV or continue to use your "old" one—*with* a set-top converter box available at retail outlets. If you're a cable or satellite subscriber, contact the provider for more information about obtaining a converter box. I'll have more on the box in a moment.

But what if you're getting TV through a cable or satellite provider? You can rent or buy a separate top-of-the-set box and be sure to ask your cable or satellite provider for more information. You can also find out what stations are broadcasting DTV in your area by checking out www.nab.org and clicking the link "digital broadcasting" for the latest list of DTV stations. The main point to keep in mind is that the set-top converter box only converts the digital signals to analog signals your current analog TV can use; the picture quality will *not* be high definition. For that you need the new TV! That also goes for folks with cable or satellite TV. Remember, the converter box only converts the signal so you can watch it on your older TV.

All is not doom and gloom, however. Next March all TVs 13 inches or larger out in Retail Land that receive broadcast signals will have a DTV tuner built in or be DTV ready. The question is how much lower will TV prices go, *and* will those prices remain low or spike as the industry greed factor takes over in March of next year, and again in 2009.

It's Coming, So What's The Difference In Quality?

The short answer is plenty. Analog TVs provide pictures with a resolution of up to 480 horizontal lines; HDTV (high-definition TV) provides resolution of up to 1080 lines. The result, of course, is much better picture detail.

Here's some basic math about what's known as "aspect ratio," which is really nothing more than the comparison of the TV's screen width to screen height. Those "old" analog TVs have a ratio of 4 by 3, meaning the screen is four inches wide for every three inches high; widescreen HDTV has an aspect ratio of 16 by 9. The picture difference is indeed astounding!

What else will you get with digital? As it turns out, much more than just a better high-res picture. You'll also have the advantage of receiving Dolby Digital surround sound. And you thought your local theater sounded great!

There's a whole variety of other neat information and interactive programming you'll be able to receive, because the DTV signal, while it occupies the same amount of bandwidth, allows about six times more information to be transmitted.

HDTV, DTV, And All Those Acronyms!

Okay, let's recall that we said a moment ago that in the realm of DTV, HDTV (the name given to just *one* of the digital TV formats) is the highest quality. But there's also Standard Definition Television (SDTV) and Enhanced Definition Television (EDTV).

SDTV can be in either the familiar 4 by 3 format or the widescreen 16 by 9 format. EDTV is much better, giving you better picture quality than SDTV. But, again, HDTV is the highest quality.

The transition to DTV is, unlike what some industry "experts" have written, a very complicated issue. Years of greed in Corporate America and the government have brought us to this point, and like it or not, the transition is just over two years down the pike. Certainly small market stations, already strapped for cash, aren't thrilled about the mandate, and consumers with analog TVs—whether financially burdened by the prospect of buying or renting that converter box, or just plain inconvenienced—should be fuming.

Perhaps enough folks have expressed their concerns, because that's precisely what's now on the front burner for the powers that be at the Consumer Electronics Association and National Association of Broadcasters, and they'll soon be scrambling with a major PR initiative regarding those coupons mentioned earlier. They recently filed a lengthy paper with the NTIA, basically stating that it's the "continuity of service" issue for analog sets that should be covered by those coupons, not just a "subsidy program, but a consumer reimbursement program."

Meanwhile, the clock is ticking faster than most government agencies realize. ■

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State-Of-The-Art Holiday Ideas!

With the holiday season upon us, it's time once again to take a look at some scanners and accessories that you might be interested in putting on your wish list for this holiday season.

Of course, topping the wish list for every radio nut is a new radio, so we'll start there. Have a look through the pictures and captions for some suggestions and thoughts. Keep in mind that many of these units have not been reviewed by the *Pop'Comm* staff, so we're just presenting information based on manufacturer specs. We'll have more complete reviews when units are made available to us for testing.

Scanners

What could be more exciting than opening that package in the morning to find a shiny new scanner? If you've been extra good, maybe you can hope for one of the cool toys described below.

Uniden (www.uniden.com)

Uniden has long dominated the world of "pure" scanning, while other manufacturers specialized in communications receivers and ham equipment that also scanned. That's still true, but increasingly you need the functions of a true scanner to get serious about the hobby, except in isolated (that are getting harder and harder to find anyway). Trunking, which none of the ham or communications receivers offers, is becoming an essential feature for all but the most basic of scanners.

Uniden manufactures under its own name and provides many of the scanners for RadioShack as well. RadioShack still has a few models worthy of consideration that are not made by Uniden, but these days many of the Uniden radios sold by RadioShack are labeled Uniden and no effort has been made to disguise them.

BC996T—Combining trunktracker IV technology and APCO-25 with 6,000 (yes, six thousand!) channels, the BC996 is the current top of the line. Street price is around $550.

BR330T—A wideband receiver with trunktracking capability! This receiver covers 100 kHz to 1299.995 MHz, so includes the military airband and trunktracker III technology. If you don't need APCO25 digital this might be the radio to beat. Street price $270.

BC246T—This is a 2,500-channel trunking receiver. For years the BC24X series has been the mainstay of handheld scanning receivers, and the 246 continues the tradition. Slightly older with trunktracker III technology, it's still a good scanner for many users. Street price around $230.

BC396D—6,000 channels with Trunktracker IV and APCO25 digital, the BC396 represents a state-of-the-art scanner in a handheld package. Street Price around $530.

BC72XLT—If you don't need trunking and just want a basic scanner, the 72XLT might be up your alley. Its 100 channels in 10 banks will remind many of us of days gone by, and it comes in a nice, compact handheld package. Street price $120.

RadioShack (www.radioshack.com)

RadioShack offers a few models that are not manufactured by Uniden and are worth considering. Many are made by GRE, the company that manufactured the still popular PRO-2006 (an old conventional scan-only device that still excites people when you mention it).

PRO-96—We reviewed this digital unit in *Pop'Comm* and really liked it. It's a great handheld for conventional use as well as trunking. A whopping 5,500 memories are offered. There's also a PRO2096 base/mobile version if you're interested. Street price $500.

PRO-97—With 1,000 channels and trunking, plus a down to earth price, this one has been a perennial favorite. If it stays that way, only time will tell. Street price $200.

Here's a look at Uniden's BC72XLT handheld scanner. It's compact, has 100 channels in 10 banks, and carries a street price of around $120.

The Uniden BC996T is a top-of-the-line trunktracker and APCO-25 scanner with a whopping 6,000 channels. Street price is typically around $550.

There Are *Others*

Of course, Uniden and RadioShack don't have a lock on the receiver market, just the "scanner" market. Many ham and communications receivers are offered by companies like AOR, ICOM, JRC, and Yaesu to name a few. Most of these have some kind of scanning capability, but it's usually not their primary focus. Depending on where you are and what you want from a radio, you might be quite happy with one of these receivers. Don't count them out, but be aware of what features you're trading. If you have questions, let us know and perhaps we can do a column in the future on communications receivers and other specialized equipment.

Antennas

Antennas make a nice low-cost holiday gift for almost any radio enthusiast. It's difficult to have too many antennas, and it can be fun to experiment. Antennas run the gamut from simple wires to complicated machined directional beams that require towers, rotators, and support systems.

Most scanner enthusiasts stick with the antenna that came with the scanner and don't even realize how much they're missing. Those antennas are built to give reasonable performance over the wide range of frequencies that the scanner receives—and at the lowest cost to the manufacturer. Not exactly great criteria for antenna design!

If most of your listening is concentrated in one band, you might do well to consider a single-band antenna that's built for that range. If you listen to things on a wide variety of frequencies, you'll want to look at an antenna with broader coverage, but there are some very good dual- and tri-band antennas for ham use that work very well for scanner purposes as well.

MFJ Enterprises, as well as other manufacturers, sells good dual-band antennas that will work with your scanner. The company's 1712 Dual Bander 144/440-MHz telescopic antenna measures just over seven inches collapsed and 19 inches fully extended. It's $14.95 from www.mfjenterprises.com. The MFJ 1717 is a flexible "rubber duck" antenna that sells for $21.95. It's a dual-band ham antenna that does double duty as a great handheld scanner antenna.

The exception to the "what's good for the ham" rule is the 800-MHz range. There's just not much in the ham or commercial world that's near that range except for cell phone antennas (which work wonders) but cell phones are single-band devices. You'll have to assess what your needs are for your handheld before deciding on a strategy. It may prove wise to have a variety of antennas available, depending on what you're planning to listen to. But, again, ham radio antennas will normally work well for us as their frequencies are generally close to what we're listening to.

The AOR DA3000 16-element discone antenna is a wideband antenna that receives from 25 MHz to 2 GHz and includes 50 feet of RG58U coax terminated with a BNC connector! It makes a great gift simply because most radio enthusiasts always "need" another antenna.

The telescoping antenna used by many handheld enthusiasts overcomes some band limitations, but at a price. The telescoping antenna can vary its length—shorter for higher frequencies, longer for lower ones. But most of these antennas aim for a quarter wavelength. While probably better than the supplied antenna, it's not particularly high performance on any one band. A telescoping antenna, if you don't already have one, is a great accessory, but you may want other antennas as well. The other price you have to pay for using a telescoping antennas is that you have to be careful not to break them; they can be quite fragile.

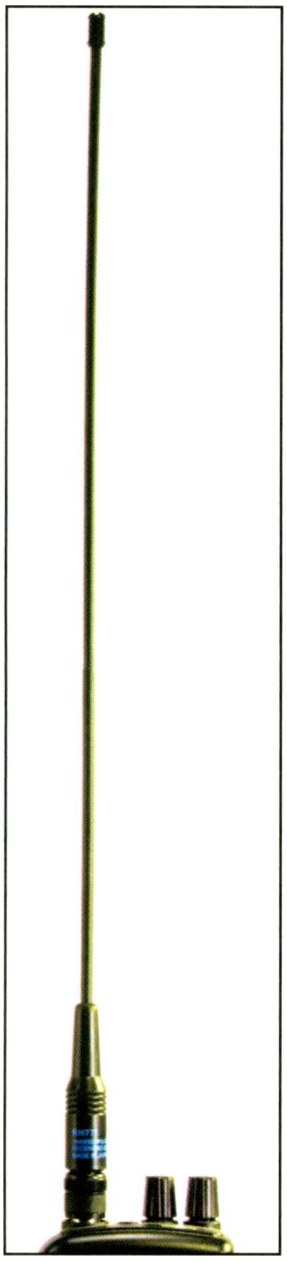
Base antennas are an entirely different subject. The difficulty of changing a base antenna that's been mounted high on a tower or in the attic makes it a bit less practical to experiment with. Many scanner listeners need (or choose) to keep antennas on base scanners simple *and* indoors. If you're in that category, then you can afford to experiment a bit more. If not, then you'll need to choose carefully based on the frequencies you listen to most often.

The new Alinco DJ-V17 handheld 2-meter amateur rig is a great all-around performer (we'll be reviewing it in an upcoming Pop'Comm!), and it also receives 130 to 174 MHz. If your public safety or other monitoring targets are in that VHF range, consider this transceiver (of course, you need a license to transmit on amateur frequencies!) because it also has 200 memories. →

With most base scanners, just getting the antenna close to an outer wall or window can improve performance considerably. Consider a length of coax and some small antenna that can be mounted high in the room or behind curtains. The C. Crane (www.ccrane.com) wire antenna that's pictured in this column might be one to look at for indoor base use. I'm also a fan of using quarterwave ground planes mounted on the backs of bookcases. You'll have to leave off a radial or two, but it does work.

Weather Radio

The recent hurricane season underscores the need to keep in touch with the weather in those areas that are affected by hurricanes and tornadoes. If you're in one of those areas, a dedicated weather radio is highly recommended. There are many radios that include the SAME (Specific Area Message Encoding) protocol, so you only have to listen to alerts for your area. Listening to weather alerts going off for an event two or three counties away is not a lot of fun after a while. Also you'll want to be considerate of pets that may have to listen to a squawking



C. Crane company is now offering this tall antenna for a handheld. Performance from the "Gainer Scanner Antenna" is excellent, but it's not exactly portable. With a right angle BNC connector you can use it on a base station with very good results indoors, unless you have something in the building blocking reception. At $24.95 it could make a great stocking stuffer.

If you need a base station antenna that's out of the way, C. Crane offers this portable and almost hidden antenna called the Coaxial Scanner Antenna. It's great to tack behind a curtain or bookshelf and can improve reception considerably over the built-in antenna on most base units. It also sells for $24.95, can be ordered with either a BNC or Motorola connector, and includes a 15-foot coaxial feed line.

The Midland WR-300 weather alert radio sells for $89.95.

weather siren for hours until someone comes home to turn it off. There's nothing worse than being greeted by a rottweiler with a headache. Seriously! The Midland Radio WR-300 that sells for $89.95 has a multitude of features, but most importantly the SAME localized weather protocol. Midland Radio is online at www.midlandradio.com.

Of course, any scanner that receives the VHF high-band can also receive the government weather channels in the 162-MHz range. You can just put the local frequency into a memory and lock it out until it's needed. I usually use the highest numbered channel in the scanner. Having it ready to go is handy if I get the idea (because thunder just rattled the windows) that I should listen to the weather while I'm out and away from the regular weather radio. It's also a convenient, always-transmitting station to use for testing antennas and making sure your scanner is working.

Other Accessories

Most scanners will benefit from an external speaker in one form or another. If you think about it for a second, the rules that apply to antennas also apply to speakers: cheap is better for the manufacturer. And with handhelds there's the additional requirement of making it small enough to fit into the radio, and smaller is always better with handheld designs.

Base scanners have a bit more room for the built-in speaker, but they tend to put the speaker someplace *other* than the front panel. If the scanner is sitting on a shelf and aimed up at the shelf above it, much of the sound can get lost before it bounces out into the room. In either case, external speakers for listening at home or in the car are a great idea.

RadioShack has several speakers that work well for this. It introduced a communications speaker (19-318, $26) that looks quite interesting although I've not had occasion to try one as of yet. You might even have a spare speaker floating around from something else that may improve your listening.

On a base scanner, almost any speaker that can be connected to the scanner will work fine. On a handheld, you might benefit from some additional amplification as well. Amplified speakers can give your scanner a boost in audio that is particularly helpful with many handhelds. With the rise in computer multimedia popularity, amplified speaker systems are available everywhere.

You don't want an expensive surround sound-type of speaker system for a computer, though. Just a single amplified speaker, or stereo speakers, will do it.

Table 1. FRS And MURS Frequencies

FRS Ch.	Freq.
1	462.5625 MHz
2	462.5875 MHz
3	462.6125 MHz
4	462.6375 MHz
5	462.6625 MHz
6	462.6875 MHz
7	462.7125 MHz
8	467.5625 MHz
9	467.5875 MHz
10	467.6125 MHz
11	467.6375 MHz
12	467.6625 MHz
13	467.6875 MHz
14	467.7125 MHz

MURS
151.820 MHz
151.880 MHz
151.940 MHz
154.570 MHz
154.600 MHz

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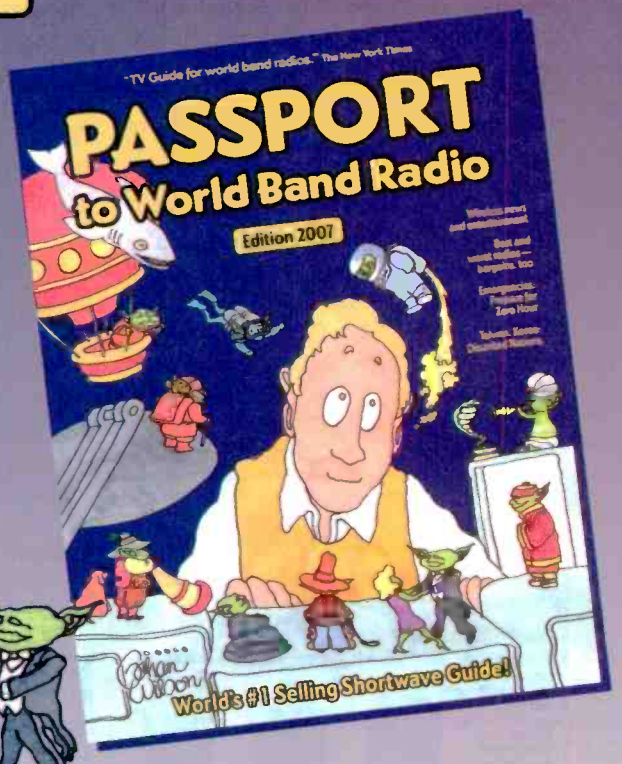

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High-end speakers can actually make the voice reception on scanners sound *worse* because they emphasize all the bad things present in voice audio transmission.

Finally, external speakers can be used to separate the audio. If you have more than one radio, the simple act of using your ears to determine where the sound is coming from can help you distinguish what radio is active. External speakers can be mounted on the ceiling or walls, or can just be placed at opposite ends of a desk. The idea is to put them in spots that will allow you to hear the difference!

Headphones are another option for scanner audio. If your scanner is located in a common area of the house, it might be helpful to have headphones so you can hear better *and* so other members of the household don't have to listen. There are very few headphones made for the shortwave market that are intended specifically for voice communications. If you choose you can seek them out, but you're more likely be adapting a set of stereo headphones intended for music listening.

Stereo headphones may or may not work as intended with your scanner. On many scanners you'll just get sound in one ear (usually the right) as the scanner only has a mono source, not stereo. Some scanner manufacturers have started to use stereo jacks so that you'll hear the same sound from both ears of the headset. There are also stereo-to-mono adapters available for this purpose if you find it distracting, but I always liked having the other ear free to listen to something else going on around me.

Frequency Of The Month

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

Our frequency for this month will be **462.5875**. Observant readers will note that it's one of the GMRS frequencies and may be quite active around the holidays. Let me know what you can hear. Even if you don't hear anything on that frequency in your local area, you can still enter with that information! We'll put all your reports in the drawing when it comes up!

Send reports, etc., via regular mail to Ken Reiss, 9051 Watson Rd. #309, St. Louis, MO 63126, or via e-mail to radioken@earthlink.net. "Frequency of the Month" entries must have the frequency in the subject of the e-mail or on the outside of the envelope in order to be processed and entered correctly.

Holiday Listening!

Scanning during the holiday season can get quite interesting at times. Police, fire, and ambulance services tend to be a bit busier as traffic is heavy and more accidents occur with all the people moving about. There will also be more medical calls and other sundry emergencies.

Another scanning opportunity is the local mall. I don't listen to mall security at any other time of year, but during late November and early December, I activate that bank on my scanner. It can be quite entertaining. Mall security usually hires additional part-timers who don't know all the rules and procedures. It can get very amusing as the rookies ask the more experienced staff question after question.

Larger malls may have their own dedicated system, complete with repeater. Smaller centers and individual stores are more likely to use simplex frequencies and handheld radios that don't transmit as far. You can find store and mall security on just about any business frequency, so you may have to do some hunting to find just what you're after.

Other good places to look are the FRS and MURS frequencies (see **Table 1**), particularly within individual stores. The equipment for these channels is available almost anywhere and is relatively cheap. Stores that may not have full-time security may resort to these radios during the crunch of the holiday season, even just for staff to ask the manager questions. Again, the range will be limited, but the conversations can be quite unusual.

With the increased awareness of security all around the country, I would not advise you to do anything to call attention to yourself or your scanner. Walking around the mall with a scanner is prohibited by mall rules in some of local centers (officially because they don't want other guests disturbed). Since malls are private property, they're allowed to have some strange rules that you have to abide by to keep from getting invited off the property. Do your listening and frequency hunting from a safe distance. And above all, have a safe and happy holiday yourself! ■

Pre-Winter Rx For Your Antenna System

It's The Little Things You Can Do That'll Keep You Listening And Talking Despite The Ravages Of Weather And Time

by Harold Ort, N2RLL

Most of us regularly check our homes and vehicles for signs of weather and critter damage, fixing seals around windows and doors, clogged gutters, cracked car door insulation and leaky trunks, but how many of us *really* take the time to inspect our outdoor antenna systems for signs of trouble? The fact is, not enough, even though the whole system would probably give years more service with a few simple, basic maintenance checks and tweaks before trouble arises.

Right now, before you're knee deep in snow (I'm hoping for a generally mild early winter), there's still time to get cracking on bringing the outside of your monitoring post or ham shack up to par. Many instances of degraded signals, antennas toppling in the wind, critters chewing cables, and water seeping into coax could have been prevented with some adjustments at the outset. Regardless, you've still got a couple of weeks to spruce up your system before Mother Nature takes aim this winter and makes you wish you had taken action!

How Old Is Your Coax?

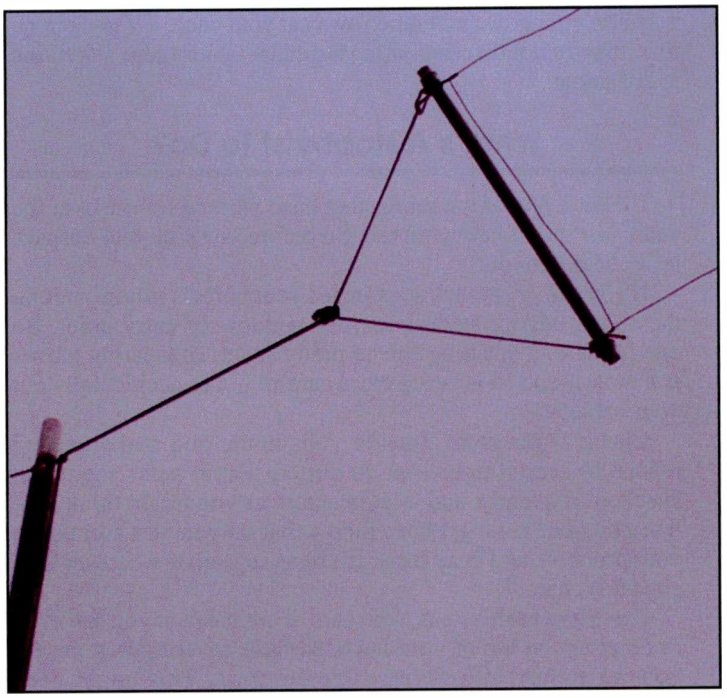
Let's face it, no one likes to think of replacing aging coax—it's like taking the car in for a transmission flush and being told your transmission's wingo-gizmo needs replacing (instant cash out: $400, if you're lucky). Yeah, you suspected there was a problem three months ago, and it turns out that faint grinding sound you heard on acceleration wasn't Aunt Beulah's teeth after all.

The same is true for those weaker BBC signals on 25 meters. Their power hasn't changed, but your antenna system has taken a beating. Again, you suspected it for a while, but since no one likes getting bad news, you decided to ignore the symptoms.

If your coax or feedline is exposed to the elements it won't last a lifetime. In reality, it won't last as long as you might think. Sure, we'd like it if once it went up it would be there to stay, but it's just not the way life is. Your coax is typically good for three to five years and then, depending on where you live and the quality of the coax, it's time for a change. At a minimum, it's time for an inspection.

I know there are folks who have successfully used the same coax and feedline for 10 or more years and never looked back (or outside at the antenna!) since the day it was installed. That's a big mistake. We wouldn't like it if those overhead power lines, telephone cables, and poles were only inspected every decade!

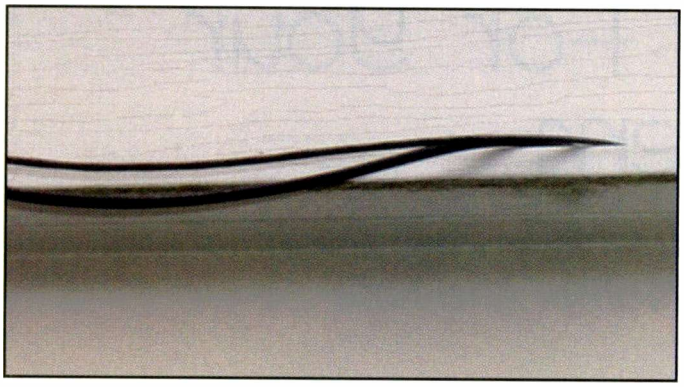
We'll assume you've already done the right thing when it comes to the basics of antenna *installation* (using stainless steel clamps and non-corrosive antenna hardware, proper grounding and lightning/surge protection and making drip-loops). But if you're putting up a new wire or other skyhook and are ready to think about system *maintenance*, please read on.



Don't forget to check that rope holding your longwire antenna for signs of wear and tear. Remember, ice and snow puts a tremendous strain on any antenna.

I live in New Jersey. Now, before you think it's a wonder my antennas are still standing because of the funky air, I assure you the air here is probably a lot less corrosive than many other areas of the country, salt water notwithstanding. Our nation's urban centers today are so sprawling that few places are immune from the effects of atmospheric crud. Even if the air could be as pure as that found in an oxygen tent, the heat, sun, water, and wind are still going to wreak havoc on your system. Once water gets in, it's not coming out, and replacing the cable is your only option.

Part of your annual maintenance should be going *outside* and checking the cables and antenna for signs of physical damage, including broken or bent elements, sagging longwires that need retightening, and even cable that's been chewed by squirrels or other critters. Let's face it, if they're crafty enough to chew their



Here the coax is tucked inside part of the home's siding on the way to the window entry point.

way into your attic and munch away at your cable TV and phone line, they're not discriminating animals—your radio's feedline is fair game!

What's A Hobbyist To Do?

I'll bet a few of the things that have worked for me over the years just might help you. too. So before you sink into despair, let's check 'em out.

If you can, try to tuck coax inside your home's siding or along the siding edging leading to your window or entry point. Be careful here; that siding can be pretty sharp, so wearing gloves is a must—and so is being extra careful not to accidentally cut your cable!

Check *other* areas outside your home and make needed repairs to keep it uninviting to critters. Dryer vents should be checked frequently, and as elementary as you might think it is, don't let your lawn get knee high—that only invites animals to your property, and once there, it's open season on whatever they choose as lunch!

I've never buried coax. You can, of course, and you can even run it along on top of your lawn, perhaps covering it with sections of rubber office-type cable covering. This might need replacing every couple of years, but if you're insistent on running cable across the lawn, it's a whole lot better than making small wooden conduits and having to paint or weatherproof them every season. Wherever your coax run is, carefully inspect it for signs of wear every year, or even more frequently.

Now, you'd think a seasoned radio enthusiast would know better, but sometimes that's just not the case, as in the story I heard about a fellow radio nut who helped a friend install a run of 300-Ohm TV twinlead—*over the peak* of a one-story home and down the other side of the roof. Did they "forget" to use stand-off insulators or, even better, consider an alternate route? Unfortunately they did not. Sure enough, early the next spring, their TV picture had drastically deteriorated. A check-up revealed that the cable had completely worn away at the roof's peak, and was only holding on by a couple of strands of now green-colored copper wire. I've heard of hams and SWLs doing similar goofy installations, but don't let yours be one of them! If you've done a similar installation, it's not too late to change it!

If you discover your coax is waterlogged, the best way—in fact, the only real way—to fix the problem is to replace the cable. Cutting and reconnecting the cable with new PL-259 connectors and a dual female SO-239 connector, even a few feet beyond the damaged area, is dicey business, because then you've *still* got to weatherproof the new connection, inviting problems down the pike. Just replace the cable and sleep well that night!

Birds love coax. It's a great "tree branch," but if it runs horizontally for any distance, it can suffer from our feathered friends using it as a takeoff and landing pad. Run your fingers along the cable and feel for small tears and holes in the coax from their feet or beaks. I don't have any horizontal coax runs, but I did at one time and found that covering that short run of cable with small diameter flexible conduit or foam works wonders in protecting your investment in time and money.

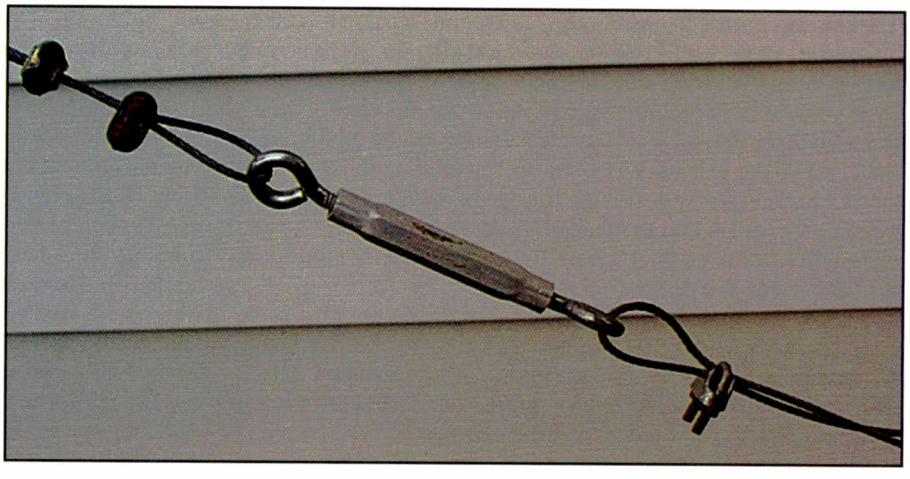
While you're out there, don't forget to check places where the cable touches the house on its way into your shack. Placing a small piece of conduit or foam (or even wrapping several layers of electrical tape) around that small area of coax will lengthen the life of your cable. It will prevent the outer jacket from wearing down to the copper braid because of the constant effects of wind rubbing the cable on the house. There are many times when you just can't use stand-off insulators, and finding alternatives will keep you on the air!

Sealing The Deal

How's that coax *connection* to the antenna looking? You probably remember the day you put up your antenna and exactly what you did—or didn't do—in the process. You *did* seal the PL-259, didn't you?

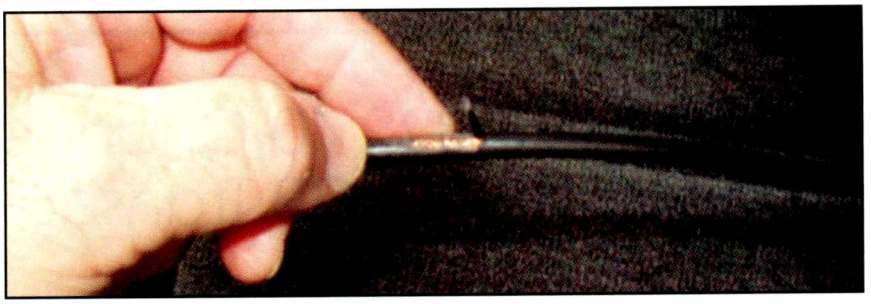
Short story time: Many years ago my father had the local TV antenna installer (remember *those* days?) put up my CB quad antenna. I had the antenna all ready for the fellow. I had used electrical tape to strap the coax (heavy-duty RG-8 cable, no less) and control cable down the two RadioShack 10-foot poles. I had also "weatherproofed" the PL-259 with a few layers of electrical tape.

That's the good news...sort of. I used the antenna for a year or more in all kinds of brutal weather. But I had bolted the three-



This guy wire desperately needs to be fixed. If you can, ditch the galvanized stuff and use good quality Mylar rope and secure it properly—not to a fence like this hobbyist did!

This vertical antenna's fiberglass joint could use some goop, in the form of silicone or marine grade sealant, before the rigors of winter ruin this radio enthusiast's day!



Might as well trash this short-run coax; the cut is too deep to make "fixing" it worthwhile. Sometimes a few extra dollars is worth it in the long run.

guy-wire assembly with galvanized nuts and bolts and didn't use stainless steel clamps. About a year later when I returned home on leave, Dad showed me what was left of the antenna in the backyard after a minor windstorm. He had kept the clamps to show how they had rusted away. And because I hadn't properly sealed the PL-259 with Coax Seal or other sealant, the now aging electrical tape had become the victim of time and weather; it fell off the 259's collar, allowing moisture to seep into the coax and on down the line. Even if the entire antenna hadn't toppled to the ground, the signal would have been trashed!

The moral of the story is to check those clamps and nuts and bolts *before* you raise the antenna. And be sure to layer the electrical tape, ensuring there are no creases or bubbles. If you're about to raise that antenna, it's still not too late to go back and redo that connection, first using a layer of good quality electrical tape, then a layer of vinyl mastic tape, and another layer of electrical tape. Seal the entire thing with a couple of wrappings of Coax Seal and then give it a final layer of electrical tape. If your antenna is already up and the connection point is within reach, check it out for signs of cracking, especially if you only did half the job. In short order, your signals could also be half what they once were!

Some readers have reported using some of Cross Devices' "STUF" on the inside threads of the PL-259. They say it works quite well in keeping moisture out (I've used a small amount of silicone grease applied with a cotton swab). Use just enough to completely coat the collar's threads, tighten the collar on the assembly, then wipe away all excess silicone with a dry cloth. Next, wrap the connector with electrical tape, Coax Seal, and another layer of electrical tape.

I've experimented with using electrical tape on the connection, followed by a layer of Coax Seal, another layer of electrical tape, and then heat-shrink tubing, which, when properly heated will tightly grab the connection keeping moisture at bay. Moisture stays out, and you keep on the air.

Any small nicks you've make in that coax just before you're ready to call it a day can sure make you say some nasty things you ordinarily wouldn't say aloud. All it takes is a quick pull of the coax over a metal fence or railing! After you've finished the expletive rant, check to see if you've also cut or scraped the coax braid. If you have, it's best to replace the cable. If it's not to the braid, I've got lots of mileage out of simply using a dab of liquid electrical sealant on it. I let it *completely* dry then wrap a couple of layers of electrical tape an inch or two either side of the scrape, and next time, I remind myself, I'll be a little more careful!

There's A Guy On My Antenna!

Actually, there should be at least three. And right now is a great time to check all of them for signs of damage and to ensure that they're tight. Use Mylar rope or Phillystran (available from amateur radio dealers and tower companies or online at www.phillystran.com) for guys; galvanized guy wire will eventually rust, requires ugly turnbuckles, and can affect your antenna's performance. Stay away from nylon clothesline rope as it will stretch. The idea is also to get the guys up high enough on the mast so the poles don't snap or sway in high winds; too low and you might as well not use any guys.

The Iceman Means Business

Just because you live down south or in areas that don't *ordinarily* get snow or ice, don't underestimate the problems your antenna system can suffer when you do get hit with an unusual storm. Folks in the north are all to familiar with ice build-up on everything outdoors, but when it comes to your antenna, the mixture of ice and wind sometimes spells the end of the line for an antenna.

You probably already know that ice build-up on your antenna can drastically change your antenna's radiation pattern, but how do you keep ice off an antenna that's up there on your roof or tower? What about longwires?

Some folks swear by spraying WD40 on a cloth and *lightly* coating the elements before final mounting of the antenna. I personally don't recommend it, but it might work for you. Others have told me that lightly waxing the elements with high-quality aircraft or vehicle wax works wonders in keeping ice off the elements. Your mileage may vary, of course, but it's probably worth the extra effort!

Fight Back!

Remember, few things are guaranteed in life, but you can be sure that weather and time will take their toll on your outdoor connections and antennas. You *can* fight back, though—just be sure you do it before it gets too cold. Remember, too, that if you've got plenty of radios and don't know what folks could get you for the holidays, Santa could bring you some quality coax, perhaps Belden 9913, or even some new guy rope or sealant. It's a whole lot better for you than a gift certificate from the donut shop. ■

by Harold Ort, N2RLL, Editor

Midland's 75-822 40-Channel Portable/Mobile CB Transceiver

Travelin' down that long, lonesome highway can sometimes be downright daunting: endless miles, bad weather, worse drivers, and lots of traffic. Factor in some unexpected construction closing the lane you're in, and those miles can really take a toll on you and your family. Never fear, though, Midland Radio is here—actually *there,* with you—for those journeys. Of course, I must be referring to Midland's 75-822 CB. Let's check it out!

This compact radio is a 40-channel (although you'll probably only end up using only a couple of those channels), full-power mobile Citizens Band transceiver that's as versatile as it is easy to use. It comes complete with a small rubber duck antenna that also allows the radio to be used as a portable walkie-talkie; two battery cases, one for your six "AA" alkalines, and another for your eight "AA" rechargeables (an AC wall charger for them is included); and a slide-on mobile adapter that allows you to use an external mobile antenna and your vehicle's 12-VDC cigarette lighter receptacle for power. You also get complete reception of 10 NOAA All Hazards weather channels.

The Midland 75-822 ready for action on Channel 19.

To operate mobile, simply slide the mobile bracket onto the body of the radio, connect your antenna, and plug the DC cord into your vehicle's cigarette lighter receptacle.

What's So Special About This CB?

Good question, glad you asked. The answer is simple: portability and features. Let's look at how this small wonder operates in a real world environment.

Operation straight out of the box is a cinch. If you're going mobile, slide on the adapter, connect your PL-259-equipped CB antenna, plug the other cord into the cigarette lighter or other vehicle 12-VDC (negative ground!) receptacle, turn on the CB, and you're in business. Changing channels is easy with the side-mounted up/down push buttons. In fact, it couldn't be easier! Seasoned CBers will like the great audio from the small speaker and the good signal reports they get. The 75-822 easily performs as well as a typical mobile CB (remember, how yours performs is to a great degree *directly related* to the quality of your mobile antenna; good antenna = good results!

I mainly used Channel 19 (the highway channel used by thousands of drivers across the United States), but did move to emergency Channel 9 with the "Instant Ch. 9" button on the front of the unit to monitor that for a short time. You also get a front-mounted Last Channel Recall button and memory buttons that allow you to set up to five memory channels for quick access. (Incidentally, programming the memory takes three seconds at the most; no complicated procedure, just a couple of button presses and it's done.) There's a Dual Watch feature that allows you to select two channels that are some distance apart but which you want to be able to access quickly.

Small Size Meets Big Value

What's really neat about the Midland 75-822 CB is that it's so small and compact—the microphones on many full-size mobile CBs are nearly as large as this radio!—that it can be placed in your change tray or even on the seat next to you as you travel. Of course, you can always clip it to the dash or side of the tray for a more permanent installation. I choose to place it in the change tray, orienting it so I could see the display and hear the activity on Channel 19.

A close-up of the 75-822 with the microphone hole noted by the arrow.

As a walkie-talkie using the provided flexible rubber antenna, the 75-822 performs quite well between like units or other CB users. Of course, then the range is much less than when it's used as a mobile connected to your vehicle CB antenna, but it's a great walkie-talkie for family activities or even in an emergency. You can also use it as a base CB with a good outdoor antenna!

I think most people would find the 75-822 a good value for the money. It can be unplugged and stored in a glove compartment in a matter of seconds, requires no hard wiring to your vehicle, and works as well as most mobile CBs. My only criticism—and a minor one really—is that you've got to get the radio close to your lips and talk a bit more loudly than you would with a standard CB microphone. Modulation reports from stations were all very good, but if you move the radio too far away from your lips, it'll be a bit low. The radio performed admirably on both transmit and receive, and signal reports were no different than using a larger mobile CB. Just speak up and you'll be heard!

The squelch adequately cut background noise while still allowing mobiles down the highway to break through with ease; there's no need to keep fiddling with the squelch on this radio! For the most part, set it and forget it.

One of the things I liked most about this CB is, actually, something very obvious: Since it has a front-firing speaker, depending on how you position the 75-822 in your vehicle, it can direct the audio toward you or toward your "radio operator" passenger if you choose. Try that with a mobile CB bolted to the dash or the transmission hump that typically sends audio to the floor—that true "mobile" CB speaker might be larger, but frankly, I like being able to easily direct the audio from this CB where I want it. I could mount it (with my ever-ready Velcro™ strips) on an available spot on the dash quite easily.

As I said, it's not complicated to use and can be a really useful traveling companion; remember, with CB you're going to get road conditions and "bear" reports that just aren't available anywhere else.

We Have A Winner

The 75-822 makes a great holiday gift, even if you or your radio friend has a room full of radio goodies! If you travel, you need the Midland 75-822 in your vehicle! We'll give it a solid 4.5 rubber duck antennas for performance and ease of use!

For more information on the Midland 75-822 CB, which sells for $124.95, contact the company at 816-241-8500, ext. 261 or visit them online at midlandradio.com. Please tell Midland you read about it in *Popular Communications*. ■

by Bruce A. Conti, BAConti@aol.com

Radio Gifts—Perfect To Get Or Give

For a non-radio person, trying to find that special gift for us radio hobbyists can be a challenge. Here are some interesting gift suggestions sure to please any DXer or broadcast enthusiast.

Pogo Radio Your Way

The Pogo Radio Your Way LX mp3 player/recorder is the perfect digital replacement for those who might still be using analog cassettes for recording DX, music, or other forms of audio (like me). Imagine no more fumbling with piles of cassette tapes, searching for recordings, or dealing with mechanical failures!

The Pogo LX is simple to use. It operates like a cassette recorder, with play, record, fast forward and reverse cue, erase, and volume controls, plus analog stereo line input, an internal microphone, an internal speaker, and analog stereo output. The basic controls are intuitive. You'll be well on the way to entering the world of digital recording within just a few minutes of becoming familiar with its operation.

The Pogo LX is powered by an internal Li-polymer rechargeable battery, USB port, or a supplied AC adapter. Similar in size to standard mp3 players, the largest dimension measures less than four inches. Prominent features on the front panel are an easy to read 160 x 96 dot matrix backlit LCD screen, a circular up/down left/right toggle, and dedicated push buttons. Controls are ergonomically designed for thumb navigation while it rests in the palm of your hand.

"Never miss another radio program again!" promises the manufacturer of the Pogo LX, which offers an internal AM/FM receiver designed for automatic recording of favorite radio programs for playback at your convenience, thus the name "Radio Your Way." A timer can be set to record on a daily or weekly basis for as many as 10 separate events.

However, its most useful feature is the stereo analog line input, a rare find in pocket-sized mp3 players. Whether recording from the internal receiver or an external source, such as a communications receiver or CD player, the analog audio is converted to mp3 digital and stored in memory, without the need for a computer. Furthermore, an expansion slot accepts a 1-GB SD memory card to store as much as 68 hours of audio per card. The Pogo LX also has a USB port and supplied cable for when you're ready to try interfacing to a computer. Connecting to a Windows XP computer is a piece of cake. Upon making the USB connection, the computer should automatically recognize the Pogo LX, and then you can upload files from the Pogo or download mp3s for playback. A Windows 98SE/2000/ME/XP driver CD is provided just in case your computer doesn't recognize the Pogo LX.

The Pogo Radio Your Way LX mp3 player/recorder has an internal AM/FM receiver.

After some practice with the basic operation, you'll want to explore more features of this extremely versatile mp3 player/recorder. There are six bit rates available for recording: 32, 64, 96, 128, 192, and 256 kbps. I've found 64 kbps to be fine for recording analog audio from AM radio, good for a total of 34 hours of recording time on a 1-GB memory card. Recording at 32 kbps is rather muffled but might still be useful in a quiet environment, such as recording a classroom lecture with the internal mic.

There are eight equalizer presets: normal, jazz, classic, pop, rock, live, lo-cut, and hi-cut. With the press of a button the playback speed can be slowed down—useful when transcribing information—or speeded up to fly through commercial breaks. Playback of audio files can be set for random or "shuffle" mode, repeat, single play, or in stacked order.

The AM radio performs surprisingly well. Like any portable AM receiver, the internal antenna is directional, so placement will effect reception. Inductive coupling to a loop or external antenna by proximity dramatically improves AM reception without overload problems. AM tuning is in increments of 10 kHz from 530 to 1710 kHz.

FM reception is rather disappointing, although acceptable for its intended purpose. The Pogo LX is only capable of receiving strong local FM signals reliably, and is subject to overload on adjacent frequencies by strong signals. It uses the headphones or a provided external wire as an FM antenna. Tuning is in increments of 0.10 MHz from 87.5 to 108.0 MHz.

The rechargeable battery is rather wimpy. Although battery life is specified for 15 hours between charges, life is significantly reduced by record time and the display backlighting. In actual field use, the Pogo LX has suddenly gone into shutdown protect mode within just a couple hours. An external power pack is suggested for heavy-duty use on battery power.

Overall, I'd highly recommend the Pogo Radio Your Way LX. I've been using my Pogo LX for recording mediumwave DX reception off the Drake R8B communications receiver at home and at remote DXpedition sites. It was only a matter of days before I mothballed the analog cassette recorder in favor of the Pogo LX. I'm entirely pleased with the Pogo LX as a portable mp3 recording device. Now the only question is how to deal with the piles of cassette tapes I've accumulated over decades of DXing.

The Pogo Radio Your Way LX is outfitted with either 128 or 512 MB of internal memory. The 128-MB model sells for

The 2007 Tower Site calendar.

just under $200 from C. Crane Company and Universal Radio. An optional 1-GB SD memory card sells for under $80 when purchased with the Pogo LX. SD memory cards are also available from most home and office electronics retailers.

Tower Site Calendar

The unique Tower Site Calendar has been rapidly growing in popularity among broadcast enthusiasts and professionals alike, almost to the point of ubiquity, and it's no wonder. The calendar is an example of a true passion for radio by Scott Fybush of WXXI and the Northeast Radio Watch. Anyone who's tried to photograph antenna towers knows it's not easy. I asked Scott a few questions about the calendar, and he was willing to share some trade secrets; our exchange follows:

Q. What sparked your interest in photographing broadcast antenna towers?

A. *I've been interested in broadcast towers since I was a kid. I think going to elementary school right next to a three-tower AM directional array (then WAXC 1460, now WHIC) and to middle school next to a four-tower DA (then WSAY 1370, now WXXI, my part-time employer) certainly helped develop the interest. I've been a DXer since I was about 10, and a Pop'Comm reader almost since the magazine started. Somewhere along the way, I developed a strong interest in seeing where those signals came from. I've never stopped being interested.*

Q. What led to the idea of a tower site calendar?

A. *The idea for the calendar stemmed from my "Tower Site of the Week" feature, which started in 2000 on my fybush.com website. Initially, "Site of the Week" was just a way to put a little extra content on the site in between the Monday updates of my "NorthEast Radio Watch" column, but it quickly took on a life (and a fan base) of its own. As a joke, a few readers suggested that some of the better site pictures should go into a calendar, and in 2001 I put a few together and had a local copy shop make up 200 copies of "Tower Site Calendar 2002." Much to my surprise, it sold out, and the calendar became an annual event, now using professional designers and printers to produce a higher-quality product.*

Q. What equipment do you use to photograph towers?

A. *After many years using a Pentax K1000 35mm SLR, I switched a couple of years ago to a Nikon D70 digital SLR, and I've never looked back. All but two of the pictures in the 2007 calendar were taken with the Nikon.*

Q. Any suggestions for those who would like to attempt tower photography?

A. *The most important piece of gear for a good tower site photo is a wide-angle lens, especially for capturing a large AM directional array or a tall TV/FM tower. My 18–70mm zoom lens on the Nikon is almost always in the 18mm position when I'm shooting towers. It's also important to keep the camera steady, using a tripod or at least some sort of solid surface. I often end up using the roof or door of the car. And when you're shooting a narrow subject like a tower against a sky, you want to get the lighting right. Some of my favorite tower shots were taken against dramatic partly cloudy skies, often at dusk. (Dawn would be good too, but I'm usually not up that early!) I've been experimenting lately with long-exposure shots of towers at night, and there's one such image (of the Roxborough tower farm in Philadelphia) in the 2007 calendar.*

The 2007 Tower Site Calendar is available for $17 exclusively at www.fybush.com by credit card through PayPal or by mail order. Limited quantities of previous calendars are also available while they last. While at fybush.com take a look at the "Tower Site of the Week."

Receiving Antennas

The Ewe and K9AY directional outdoor wire antennas have been recently rediscovered by mediumwave DXers for their "Beverage-like" performance and versatility in a small space. Originally designed for low-band amateur radio applications, these compact antennas have proven to be capable performers well below 160 meters into the AM broadcast band. Volume One of the *International Antenna Collection*, edited by Dr. George Brown, M5ACN, highlights these antennas, featuring reprints of the original Ewe and K9AY articles by the antenna designers, plus follow-up applications by experimenters. It's a worthwhile read for anyone interested in experimenting with antennas. Published jointly by the Radio Society of Great Britain and the ARRL, the book is available for under $20 from Ham Radio Outlet or any ARRL bookseller.

Once you have the book, you'll be looking for some wire. One readily available and economical option is wire by the 500-foot roll from the hardware store. Look for insulated 14 AWG stranded copper, THHN-type machine tool wire. Popular for its strength and durability, this type of wire can typically be scavenged from amateur radio swap meets or purchased brand new from The Home Depot in a variety of colors. Select black or brown for stealth antennas. A 500-foot roll should cost under $45, subject to change with the continued rise of copper value on the commodities market. Google search "BAMLog" for more outdoor wire antenna ideas.

AM Radio Log

The latest edition of the National Radio Club's venerable *AM Radio Log* is an indispensable resource for mediumwave DXing. The *Log* lists all the AM broadcast stations in the United States and Canada sorted by frequency, with a short-form appendix of stations sorted by callsign and location. The frequency listings include information such as format, network affiliations, mailing addresses, and phone numbers, unavail-

FCC Callsign Changes

New Call	Location	Freq	Old Call
	Pending		
WRLM	Irondale, AL	1480	WLPH
KGYM	Cedar Rapids, IA	1600	KCRG
WRBS	Baltimore, MD	1230	WITH
KQSP	Shakopee, MN	1530	KSMM
WDYT	Kings Mountain, NC	1220	WKMT
WNCV-FM	Evergreen, AL	93.3	WNCV
KZLO	Kilgore, TX	88.7	KTPB
	Changes		
WLGD	Birmingham, AL	1260	WYDE
KPTR	Cathedral City, CA	1340	KWXY
KLAA	Orange, CA	830	KMXE
KINF	Lompoc, CA	1410	KTME
WRJS	Swainsboro, GA	1590	WXRS
WIJR	Highland, IL	880	WCBW
WVSG	Neon, KY	1480	WEZC
WVKY	Nicholasville, KY	1250	WWFT
WBFN	Battle Creek, MI	1400	WRCC
WWWW	Dearborn, MI	1310	WDTW
KLBB	Stillwater, MN	1220	WMGT
WYSE	Canton, NC	970	WLZR
KXPD	Tigard, OR	1040	KLVP
KVCE	Highland Park, TX	1160	KMGS
KKBM	Mabank, TX	890	New
WCAT	Burlington, VT	1390	WVAA
WTSJ	Randolph, VT	1320	WWWT
WNCV	Evergreen, AL	93.3	WRKN
KABN-FM	Kasilof, AK	89.5	KWVK
KKLD	Cottonwood, AZ	95.9	KZGL
KFZA	Flagstaff, AZ	103.7	New
KZGL	Prescott Valley, AZ	98.3	KKLD
KVMZ	Waldo, AR	99.1	KWDO
KLRM	Lodi, CA	89.7	New
KMVN	Los Angeles, CA	93.9	KZLA-FM
KJOB-LP	San Diego, CA	107.5	New
KAAI	Palisade, CO	98.5	New
KRDO-FM	Security, CO	105.5	KSKX
WVVD-LP	East Tampa, FL	96.5	New
WRKN	Niceville, FL	100.3	WNCV
WSBH	Satellite Beach, FL	98.5	New
WJKD	Vero Beach, FL	99.7	WGNX
WOCE	Ringgold, GA	101.9	WTUN
KGCA-LP	Tumon, GU	106.9	New
KNAN	Nanakuli, HI	106.7	New
WRTB	Winnebago, IL	95.3	WYHY
WXKE	Fort Wayne, IN	103.9	WYLT
WWGL	Huntington, IN	102.9	WXKE
WJPR	Jasper, IN	91.7	WKJR
WFHS-LP	Fern Creek, KY	92.7	New
KBYO-FM	Farmerville, LA	92.7	KWJM
KLSM	Tallulah, LA	104.9	KBYO-FM
KLAA-FM	Tioga, LA	103.5	KLAA
WRBS-FM	Baltimore, MD	95.1	WRBS
WKAF	Brockton, MA	97.7	WILD-FM
WWWW-FM	Ann Arbor, MI	102.9	WFOR-FM
KNLW-LP	Rochester, MN	98.9	New
WMSO	Meridian, MS	101.3	WYHL
WYHL	Newton, MS	97.9	WMSO
KLJE-LP	Columbia, MO	107.9	New
KRVO	Columbia Falls, MT	103.1	New
WKMK	Ocean Acres, NJ	98.5	WKOE
WKDL	Brockport, NY	104.9	WKUV
WXKK	Cape Vincent, NY	102.7	WBDR
WBDR	Copenhagen, NY	106.7	WBDI
WQYQ	Hudson Falls, NY	101.7	WENU-FM
WSLP	Saranac Lake, NY	93.3	New
KHRU	Beulah, ND	97.9	New
KUSB	Hazelton, ND	103.3	New
KCVG	Medina, ND	92.3	New
WGJM-LP	Englewood, OH	97.9	New
WHLM-FM	Berwick, PA	103.5	WKAB
WTWF	Fairview, PA	93.9	WUSE
WPAG-LP	Gap, PA	92.9	WOMB-LP
WISX	Philadelphia, PA	106.1	WJJZ
WUBA	Philadelphia, PA	104.5	WSNI-FM
WBHV-FM	State College, PA	94.5	WSMO
WDLL	Dillon, SC	90.5	New
KXQL	Flandreau, SD	107.9	KWSF
KFND-LP	Rapid City, SD	97.1	New
WQGY	Dyer, TN	94.3	WLSQ-FM
KSAQ	Charlotte, TX	102.3	New
KWDH	Hereford, TX	88.7	KHFD
KXXN	Iowa Park, TX	96.3	New
KTTY	New Boston, TX	105.1	New
KSAG	Pearsall, TX	103.3	New
KLOW	Reno, TX	98.9	New
KCIN	Cedar City, UT	94.9	KXBN
WBOP	Buffalo Gap, VA	95.5	WZXI
WCNR	Churchville, VA	106.3	WBOP
WGCK	Coeburn, VA	99.7	WVSG
KWDR	Royal City, WA	93.5	New
WYTE	Marshfield, WI	106.5	WLJY
WLJY	Whiting, WI	96.7	WYTE
KHRW	Wright, WY	92.7	New
WMUM-TV	Cochran, GA	29	WDCO-TV
KTRV-TV	Nampa, ID	12	KTRV
KMTW	Hutchinson, KS	36	KSCC
KCWL-TV	Lincoln, NE	51	KOWH
WCWG	Lexington, NC	20	WTWB-TV
KMYT-TV	Tulsa, OK	41	KTFO
KOHD (DT)	Bend, OR	51	New
KLCW-TV	Wolfforth, TX	22	KWBZ-TV
KCWK	Walla Walla, WA	9	KAZW-TV

Note: New television station callsigns over the past few months that have included the letters "CW" designate affiliation with the new CW network, created by the merger of the UPN and WB networks. "MY" in new callsigns indicates affiliation with the new My TV network.

able from any other single source. New to this edition is a detailed analysis of station classes and directional antenna designations, plus a list of stations broadcasting in digital HD radio sorted by location. The *AM Radio Log* is available for $25.95 via the National Radio Club website at www.nrcdxas.org or through Universal Radio.

Broadcast Loggings

George Clement, KF4ZKU, kicks off this month's selected logs:

From north central Florida, I regularly monitor the AM and shortwave bands. I am also an avid reader of Popular Communications. I began DXing the AM broadcast band over 20 years ago, though I've only begun to seriously DX on it and shortwave for the past five years. My receivers consist of a Drake SW8 connected to an array of backyard wire Ewe antennas and a 1,000-foot longwire strung around my fence forming a huge loop antenna. Plus I have a small loop. My ham radio is a Yaesu FT736R, which I DX with on VHF bands, especially 6 meters (50 MHz) and 2 meters (144 MHz).

A while ago, I was intrigued by your article entitled "The Heard All 50 States Challenge." During the past five years I have logged a total of 30 states on and at least 10 countries on AM. DXing in Florida is still a challenge though I feel there is great potential.

A few of George's recent loggings, as well as those from our other loyal contributors, follow. All times are UTC.

530 R.Vision Cristiana, Turks & Caicos, religion in Spanish. (Clement-FL)

555 ZIZ Basseterre, St. Kitts & Nevis, at 0055 good with excited announcer live from some kind of outdoor festival, carnival, or similar event. Steel drum music with vocal followed. (Connelly-MA) At 0417 relaying BBC World Service with British-accented woman announcer. Poor, although they are very regular the past season! (Chiochiu-QC) At 0610 fair; noted in passing with British English man and woman announcers and little trouble from WIND in LSB. (Kazaross-WI)

600 CMKV R.Rebelde, Urbano Norris, Cuba, at 0147 with "Solo Musica" program featuring hardcore salsa and salsa dura tunes. Good to sometimes poor. (Chiochiu-QC)

640 R. Guadeloupe, Pointe-a-Pitre, Guadeloupe, at 0005 French talk and numerous Radio Guadeloupe IDs; good signal, well over co-channel CBN Newfoundland. (Connelly-MA)

700 RJR Hague, Jamaica, heard on several occasions. (Clement-FL)

750 ZYH709 R. Jovem Pan, Brasilia, Brazil, at 0837 fair; a man in Portuguese, "...ponto com" and "Radio Brasil Radio" mentions before fade out. (Conti-ME) This is R. Jovem Pan and the news program "Jornal da Manha." (Samuel Cassio Martins, Sao Carlos, Brazil, via Real DX)

750 HJLH Yopal, Colombia, at 0906 good; "la radio de Colombia" jingle with "La onda Yopal, 750 AM..." ID, then touch-tone phone sound effects and "RCN, la voz de Yopal..." (Conti-ME)

The NRC AM Radio Log.

780 YVNM R. Coro, Venezuela, at 0232 modern dance influenced merengue music followed by "Radio Coro, Siete-Ochenta, primer lugar de sintonia" and "patrinonio de la comunidad" IDs. Poor to very poor reception. (Chiochiu-QC)

790 WAXY South Miami, Florida, at 0300 sports news and information, ID as "Sportstalk 790, WAXY South Miami." Weak, but steady signal mixed with an unidentified urban contemporary gospel music station. (New-GA)

810 XEFW R. Estrellas, Tampico, Mexico, at 0400 heard signing off, under auroral conditions. (Clement-FL)

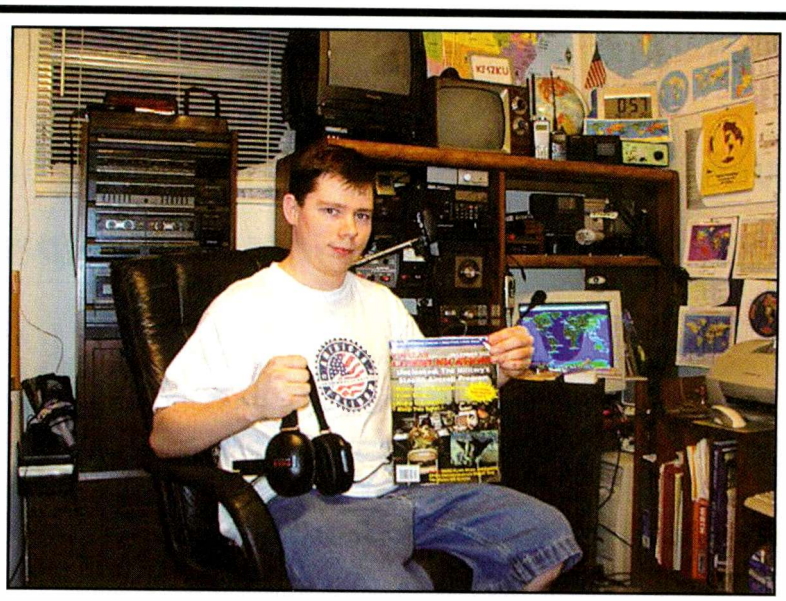
910 CMFA R. Cadena Agramonte, Camaguey, Cuba, at 0300, "Transmite Radio Cadena Agramonte, Camagüey, Cuba..." Poor at this time, but often quite good and the easiest of the smaller Cuban networks to receive. Also had what sounded like co-channel YVRQ Venezuela on a few occasions. (Chiochiu-QC)

1000 KOMO Seattle, Washington, heard at 0830 with sports. Weak signal. (Lowry-AZ)

1000 XEFV Cd. Juarez, Mexico, at 0312 poor to fair over/under phased WMVP; ranchero music and La Rancherita ID. West Beverages on ground null XEOY and Mexico City stuff quite well. (Kazaross-IL)

1010 CFRB Toronto, Ontario, heard at 1100 received on the car radio, one of only a few Canadian signals logged. (Clement-FL)

1039.61 YVLB La Voz de Carabobo, Valencia, Venezuela, heard at 0031 fast talk to good peak with receiver in LSB position, 1.8-kHz bandwidth. Signal was tangling with other Latin Americans on 1040.00 kHz. (Connelly-MA)



George Clement, KF4ZKU, at his well-equipped monitoring post.

1050 XEQOO R. Pirata, Cancun, Mexico, one of the best Mexican signals received here, with great music too. (Clement-FL)

1100 ZYK694 R. Globo, Sao Paulo, Brazil, heard at 0035 excited sports commentary, Globo ID, in WTAM null. (Conti-NH) At 0110 reverberated Portuguese sports coverage; very good. (Connelly-MA)

1130 YVRL R. Ideal, Maiquetia, Venezuela, at 0402 dominant on the channel with Spanish ballads and soft rock. A second (unidentified) Latin American noted underneath. No trace of WDFN Detroit or any other US station. CKWX Vancouver faded in an hour later. This during a scheduled silent period of 1130 WBBR New York. (DeLorenzo-MA)

1140 WQII Puerto Rico, at 1100 heard relaying Noti Uno 640 kHz. (Clement-FL)

1160 KSL Salt Lake City, Utah, at 0300, my most distant western station logged. (Clement-FL)

1160 VSB3 Hamilton, Bermuda, at 2322 BBC World Service with a woman talking about conditions experienced by children living in poverty; strong, way over WSKW, 1161 Spain het, and phased WOBM and WVNJ. (Connelly-MA) Heard Caribbean accented DJ mention "For the Bermuda Youths." (Clement-FL)

1180 CMBA R. Rebelde, Villa Maria, Cuba, one of many Cuban signals received in Florida. (Clement-FL)

1200 WCHB Taylor, Michigan, at 0046 gospel music, News/Talk 1200, WCHB ID. Decent signal with fades. (New-GA)

1230 WAIM Anderson, South Carolina, at 2100 "Newstalk 1230, WAIM Anderson, South Carolina" into ABC news. Decent, steady signal in the evening static. (New-GA)

1260 WDKN Dickson, Tennessee, at 0310 high school football with the Dickson County Cougars defeating the Henry County Patriots 27 to 22. Decent signal mixing with WSDZ in Belleville, Illinois. "...on WDKN, AM 1260, Dickson County." (New-GA)

1280 VSB2 Hamilton, Bermuda, at 0047 Bible Broadcasting Network announcements and preacher; good, over WFAU and others. (Connelly-MA)

1500 KSTP St. Paul, Minnesota, heard at 0835 with news and talk. Fair. (Lowry-AZ)

1580 CKDO Oshawa, Ontario, heard at 0200, "This is CKDO at 1580 AM and 107.7 FM, Oshawa's radio station for 50 years. You're listening to Oshawa's oldies, CKDO." (Conti-NH)

1620 WDHP Frederiksted, U.S. Virgin Islands, at 0000 received with a good signal for 1 kW. (Clement-FL)

1690 KDDZ Arvada, Colorado, heard at 0130 with Radio Disney. Strong. (Lowry-AZ)

1700 XEPE Tecate, Mexico at 0456 calling itself "Cash 1700" broadcasting a San Diego area minor league ball game. Very strong. (Lowry-AZ)

Thanks to Bogdan Chiochiu; George Clement, KF4ZKU; Mark Connelly, WA1ION; Marc DeLorenzo; Neil Kazaross; Bob Lowry, K7UNL; and Bert New for a nice round of logs. That clears my desk of current submissions. I did have some excellent tips in response to the FM/TV DX edition last summer, unfortunately all lost due to a hard disk crash, so please resubmit for the next update. I'm especially interested in photos of your TV DX catches. Of course, AM and FM logs are welcome, too. Let us know what you're hearing. 73 and Good DX! ■

by Richard Fisher, KI6SN

Capitol Hill And FCC Actions Affecting Communications

FCC Reviews License Eligibility Of Convicted Felon

The amateur radio license of an Atascadero, California man convicted on two felony counts of child molestation in 1991 is under review by the FCC. Under consideration is whether Robert D. Landis, N6FRV, will be allowed to continue to hold his Advanced class license, which was due for renewal in November. Landis received the license for N6FRV in April 1999.

Landis was fined $10,000 and sentenced to 11 years in prison in 1991 for "lewd behavior involving a minor," according to the American Radio Relay League's *ARRL Letter*. The FCC Order to Show Cause, which can be found at http://hraunfoss.fcc.gov/edocs_public/attachmatch/DA-06-1570A1.pdf, was released following a complaint regarding Landis' conviction. The Commission in recent years has applied character standards to amateur radio operators that previously have been applied only for broadcast licensees. "Thus, felony convictions, especially those involving sexual assault on children, raise questions regarding an amateur licensee's qualifications," the FCC said in its Order released in August.

Section 312(a)(2) of the Communications Act provides that the Commission may revoke any license if conditions come to its attention that would warrant refusal to grant a license on the original application, the FCC noted. "The foregoing makes plain that Mr. Landis' felony convictions raise serious questions as to whether he possesses the requisite character qualifications to be and to remain a Commission licensee and whether his captioned license should be revoked."

According to the *ARRL Letter*, "the FCC ordered Landis to show cause why his authorization for an Amateur Radio license should not be revoked, although the Enforcement Bureau will bear the burden of proof with respect to the issues raised. An Administrative Law Judge (ALJ) presides at such hearings, at which evidence and witnesses may be presented and heard."

Landis was given 30-days to respond to the Order.

PacStar Systems To Aid Afghan National Army

Portable, secure communications systems provided by PacStar have been selected by the United States Central Command for use by the Afghan National Army (ANA), according to a news release on Military Information Technology's website. The ANA will use seven PacStar 5500 units, capable of delivering wired/wireless voice, data, and video "to any location from anywhere in the world, to create a communications infrastructure to support counterterrorism and border control activities, along with other key anti-insurgency responsibilities," according to the website

PacStar's advanced networking technologies will be adapted for the ANA application, including translating the user guides and instructional materials into Dari, the most widely spoken language in Afghanistan. PacStar will also be responsible for training and equipping the ANA forces to deploy and manage the 5500 products and the networks they run. "The 5500 system employs single button, self-managed functionality, which allows the unit to be fully operational in less than 10 minutes, freeing field staff for other tasks while providing necessary secure communications between troops," continued the release

In an announcement, PacStar said that the company "is already delivering flexible communications technology for use in Afghanistan. In June, the company began supplying 62 PacStar/WWNS 3110 satellite system units to NATO's International Security Assistance Force in Kabul for security, surveillance and drug interdiction missions. The 3110 is contained in a suitcase sized transport package, is rapidly deployable throughout Afghanistan's varied terrain and provides the communications capabilities of a small office from remote areas to anywhere in the world."

Military Information Technology's website is located at www.military-information-technology.com.

MARS To Give Back-up To Transportation Security Administration

Army Military Affiliate Radio System (MARS) chief Kathy Harrison, AAA9A, has announced that amateur radio operators who are members of MARS will be called upon to provide back-up communication for the U.S. Transportation Security Administration (TSA). The primary focus of the MARS-TSA collaboration will be protecting airports during the hurricane season, she said in a statement reported in the *ARRL Letter*, and that responsibilities are "likely to expand to other Department of Homeland Security (DHS) areas" in the future.

"This is an extensive area and will require member support across the continental United States," Harrison said in a statement broadcast to members of U.S. Army MARS. "We will need many volunteers to man teams assigned to specific geographical areas, starting with airports throughout the hurricane corridor." "Physically capable" radio amateurs were encouraged to participate.

Florida airports in Miami, Ft. Myers, Jacksonville, and Pensacola—all located in the hurricane belt—were listed as first priorities. Harrison said that volunteers would be sought immediately for nine other hurricane-prone airports from Washington D.C., to Houston, Texas. A subsequent phase of the program will add additional locations including Puerto Rico, the Virgin Islands and in the rest of the continental United States.

"The emergency support teams—each consisting of four members of MARS—are being assembled under joint sponsorship of MARS and the TSA," the *ARRL Letter* reported, "with deployment assignments determined by the TSA when and if the government's communication systems fail."

The MARS-TSA plan calls for using MARS "networks, personnel and equipment to maintain communication during the first 72 hours of incidents involving aircraft, mass transit and

(Continued on page 83)

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

Winter DX Is At The Door

The autumn DX season is in full swing! Listeners throughout the Northern Hemisphere are actively chasing mediumwave (MW) DX of AM broadcast stations from all over North, Central, and South America, and from Europe and Asia. This is the season when it is easier to catch such difficult signals, because now is the time that conditions are most favorable to propagation of this spectrum of the radio frequencies. Shortwave (SW) DX is hot, too, especially on the mid- to low-HF bands from early evening until late at night, and then again from early morning through high noon.

December 21 marks the start of winter. At 0025 Universal Time, the sun will be at its lowest point in the sky in the Northern Hemisphere, making the shortest daylight period of the year for those north of the equator. This is the winter solstice (see http://en.wikipedia.org/wiki/Solstice for more information).

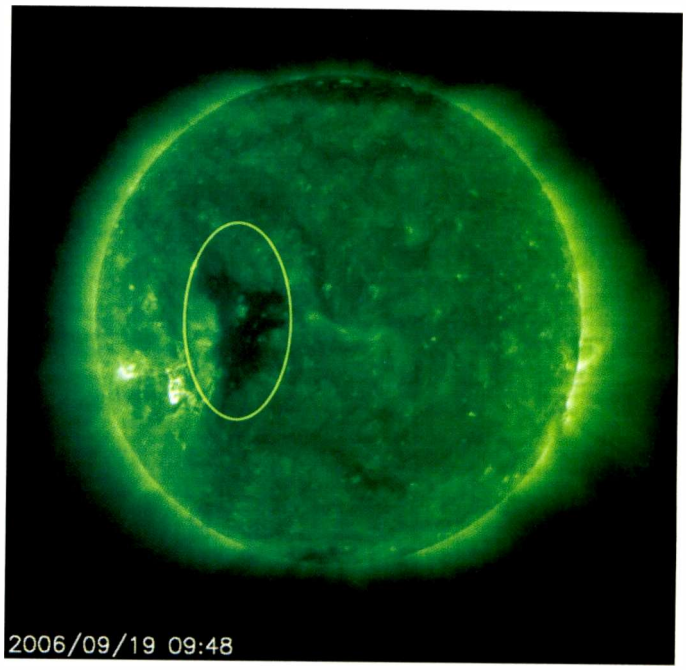
Long hours of darkness make for a less-energized ionosphere. Since the *D* layer of the ionosphere is less ionized during the winter, MW and SW frequencies are less absorbed, so they can be better propagated by the *E* and *F* layers. Additionally, the seasonal decrease in weather-related noise makes it easier to hear the weaker DX signals on the lower frequencies. With thunderstorms few and far between, storm-related static and noise are greatly reduced.

Seasonally, the geomagnetic activity tends to quiet down during the winter months. The most active geomagnetic seasons are centered on the two equinoxes, in the spring and autumn. Combined with the seasonal decrease in geomagnetic activity, the 11-year solar cycle geomagnetic activity is continuing its downward trend toward the end of the current cycle, which will occur sometime at the end of 2006 or during the start of 2007. This results in more stable and reliable propagation on the SW spectrum, especially on the lower frequencies.

December is well enough past the autumnal equinox and the associated peak auroral activity to support transpolar propagation. With this overall reduction of geomagnetic activity and the decrease of radio signal absorption comes more stable high-latitude propagation.

MW DXers enjoy catching broadcast station transmissions from over the North Pole. SW DXing over high-latitude paths can become quite exciting, even though the higher frequency bands might be dead.

This time of year is also the season when we experience an improvement of radiowave propagation below 500 kHz and the MW broadcast band, the MW broadcast band refers to the frequencies between 530 kHz and 1750 kHz. The low-frequency (LF) range is the band of frequencies between 30 kHz and 300 kHz. Very long frequencies (VLF) are those ranging between 3 kHz and 30 kHz, though the practical lower edge of the VLF band starts at 10 kHz. Medium frequencies (MF) range from 300 kHz to 3000 kHz. Radiowaves in the low and very low frequency (LF and VLF) spectrum propagate differently than those of the MF range and above. Between 300 kHz and 520 kHz, the lowest part of the MF and just below the MW broadcast band, the characteristics of propagation is a mix between those of the lower HF spectrum and those of LF. The VLF and LF bands are usually referred to as the longwave (LW) bands. The VLF band goes from 10 to 30 kHz, and the LF from 30 to 300 kHz. During the winter season, MW transmissions can be heard over much greater distances than during the summer season.



This photo is from September 19, 2006, and shows a well-defined, dark coronal hole. Coronal holes, regions of an "open" magnetic field, appear as dark areas of the corona when viewed in ultraviolet light (and in X-rays). This coronal hole area is smaller than many that have been observed. The open magnetic field in coronal holes allows strong solar wind gusts to escape from them and carry solar particles out to our magnetosphere and beyond. The influence of these particles and the solar wind on radio propagation is significant. Geomagnetic disturbances created by the solar wind, aurora effects, as well as other phenomena play a role in how radio signals propagate from transmitter to receiver. Solar wind streams take two to three days to travel from the sun to Earth, and the coronal holes in which they originate are more likely to affect Earth after they have rotated more than halfway around the visible hemisphere of the Sun. Coronal holes can last for months. (Source: NASA/SOHO)

Radiowave Propagation—Some Background Info

Radiowave propagation on Earth takes place between two boundary layers: the Earth's surface and the ionosphere. In attempting to explain how such propagation mechanisms work, ionospheric physicists and other scientists have created mathematical models that allow us to predict, or simulate, what we see in the real world.

But the real-world propagation mechanism is much more complex. Consider radiowaves emitted from an antenna somewhere above the Earth's surface: The antenna radiates energy

in an infinite number of directions, which excites a nearly unlimited number of propagation modes that then travel (propagate) through the area between the boundaries. Such modes do not travel in isolation, but interact whenever they come together to create other modes that are different from the original excitation energies. This process is called *mode combining*.

When the radio waves travel through uniform boundaries, such as over uninterrupted lengths of seawater under an all-daytime ionosphere, the combined modes are propagated with little change. But when an abrupt boundary change is encountered, such as a seacoast or a day-to-night change in the ionosphere, previously stable modes interact, mode combining again takes place, and a new set of modes is launched, different in all directions.

Thus, when considering the real-world environment—one in which complex water and ground terrain changes occur, as well as where the already unstable ionosphere is continually perturbed by the day-night terminator sweeping through the area—it is easy to see that the propagation medium is indeed so complex that any mathematical models conceived to simulate it must, in fact, be simplifications.

Scientists have studied and measured radiowave propagation for many years, but the resulting knowledge still doesn't permit us to exactly simulate the natural process. Nevertheless, for distances greater than a wavelength, where near-field distortions can be neglected, emerging theory considers two mechanisms: groundwave propagation and skywave propagation. The total field can be considered to consist of groundwave plus skywave energy, and that energy is best explained as being a number of interacting modes in which the total electromagnetic energy is propagated.

Groundwave propagation is easier to understand. The mechanism is one in which energy is propagated along a spherical Earth that is devoid of a surrounding ionosphere. As distance from the emitting device increases, the far-field energy decreases because of the spreading of energy, loss due to diffraction from objects, and absorption at the Earth's surface that varies with surface conductivity.

Skywave energy is infinitely more difficult to accurately model. Two techniques have been devised after many decades of work: 1. a ray-trace theory, where the principal propagation modes are consider to reflect (or refract) back and forth between the Earth's surface and the surrounding ionosphere; and 2. waveguide theory, where electromagnetic energy is considered to be guided between reflecting boundaries. Of the two, waveguide theory is thought to be more accurate.

But it must be understood that ray theory and waveguide theory inevitably lead to models that yield only approximations. Both are simply mathematical constructs, in which certain assumptions based on measurement and experimentation have been made.

The most accurate model yet conceived for simulating LW radiowave propagation is the Long Wave Propagation Capability (LWPC) model developed by Pappert and Ferguson of the U.S. Navy's SPAWAR Systems Center in San Diego, California, over a 20-year period. LWPC is a collection of inte-

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.

grated programs and is available for download from www.spawar.navy.mil/sti/publications/pubs/td/3030/td3030.pdf. It is not for the faint-hearted, however; years of experience are required before attempting to run this model and understand the results.

Although LWPC is a rigorous mode-theory model, it was designed for use on U.S. strategic communication circuits, mainly those relating to submarine communications. LWPC functions in the 10-kHz to 90-kHz frequency range, but it operates by computing the principal propagation modes that, for propagation between the Earth and the ionospheric *D* region, are few at the lower frequencies and rise to many at the upper frequencies. Near 90 kHz and beyond, there are so many computed modes that the program run-times become excessive and the mode-combining algorithms become unstable.

Thus, while one would prefer to use rigorous waveguide theory models for all propagation simulations in all bands, they become unsuitable for HF propagation. The alternative is ray theory modeling. Of all HF ray theory models, the one that has been the most highly developed and is considered the most accurate is VOACAP. (I've touched on VOACAP several times this year as well as one program that uses VOACAP as its core engine, the ACE-HF software for both SWL and ham radio operators; see http://hfradio.org/ace-hf./) Yet one must again recognize that all such HF models are merely mathematical constructs. They are the best tools we have for simulating real-world propagation, but inevitably the results are approximations of how complex radiowaves really behave.

The Exotic Realm Of LW Propagation

When you begin tuning your radio just below 530 kHz, you will likely hear lots of noise, but also repeating Morse code transmissions. These CW transmissions consist of one-, two-, or three-letter groups, repeated continuously. These are known as non-directional beacons (NDB), and are being transmitted from fixed locations for the purpose of navigation. For instance, a pilot will use a directional antenna and a radio to get a bearing on one of these beacons. The pilot can then reference a navigational chart for the exact location of the beacon heard. Noting that spot on the map, the pilot can then tune to another beacon and locate that point on the map. Drawing lines from those two fixed points, at the angle discovered by the directional antenna, the pilot can find the aircraft's location as being the point where the two lines intersect. If a third and forth non-directional beacon is vectored, the aircraft's location can confirmed that much more accurately.

These LF beacons exist all over North America and in many countries in Europe, Asia, and elsewhere. Beacon hunting DXers set up long-wire antennas hoping to hear beacons from across the ocean and other distant points. In addition to the NDB activity, there are LW broadcasts and more modern digital data transmissions used also for navigation. How well the DX can be heard depends on the propagation of radiowaves in this part of the radio spectrum.

Propagation Below 500 kHz

As has been explored in this column in past months, the ionosphere plays a crucial role in the propagation of HF signals. Does the ionosphere play any role in the long-distance reception of LW radio signals?

Remember, the ionosphere is made up of electrons and ionized particles. Earth's atmosphere is mostly filled with molecules having few free electrons. Radiowave transmission loss in the ionosphere is directly related to the collision frequency between electrons and molecules. At the very bottom of the ionosphere, the highest loss occurs, because this is where the highest electron collision frequency occurs. This part of the ionosphere is known as the *D* region.

Contrary to popular belief, the *D* region it is always present. In the daytime it's pretty dense and thick. At night, however, because the sun can no longer directly energize the ionosphere, the *D* region shrinks and becomes less thick. In the LWPC modeling method of VLF propagation, the *D* region starting height is set at 72 kilometers for daytime scenarios and at 87 kilometers for nighttime scenarios. LWPC includes a terminator model where the reflection height is changed in slices. Seven steps, where the starting height changes by discrete amounts, are used to model the transition zone. During the daylight hours, the *D* region is very absorbent of frequencies in the HF portion of the radio spectrum, hindering long-distance propagation on the lower HF frequencies. At night, the *D* region loses enough of its ionization that HF radiowaves pass through with much less loss. At longwave frequencies (LF and VLF), radiowave propagation occurs because of the complex mode combining, as modeled by the LWPC method.

There is speculation that the *D* region might be partially influenced by wind sheer, making it possible for clouds of ionized particles to form. These sporadic-*D* clouds act much like the sporadic-*E* clouds, except that the sporadic-*D* clouds add further to the complex environment at this boundary. These clouds may help reflect LF signals. If so, sporadic-*D* propagation of LF can add unique modes and open up a DX window on NDB and other LF transmissions. This speculation is not shared in the mainstream scientific community, however.

Another factor affecting radiowave propagation at the LF and VLF end of the radio spectrum is noise. During the winter season, the noise level that interferes with a LW radio signal is much lower than during the summer season. This decrease in the interference by noise makes it much easier to receive weak LF and VLF signals during this time of year. Additionally, daytime hours are typically noisier than nighttime hours.

It makes sense, then, that winter and nighttime listening of LW DX is better than midday and summertime listening. More importantly, the height of the reflective layer at LW frequencies is much higher during the night, causing propagation of the skywave component of the signal to reach farther than when the *D* region is lower.

This propagation involving the *D* region is made possible because of the modal interference that results from the cancellations and reinforcements of individual modes that occur along the signal path. LW radio signals, therefore, do not "skip" off of the *D* region boundary. Instead, this complex mechanism is referred to as *mode sum*, which is a commonly used term. Of course, there are other factors affecting the propagation of LW radio signals, as modeled by LWPC, but this serves as an overview of the way DX can be heard on these low frequencies.

What To Listen For,And When

If you have a radio that can tune below 520 kHz, you'll want to start listening for more distant beacons later in the afternoon

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

UTC TO/FROM US WEST COAST	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CARIBBEAN	17	13	11	10	10	9	9	9	9	9	8	8	8	8	13	16	18	19	19	20	20	20	19	18
NORTHERN SOUTH AMERICA	24	22	17	14	13	13	12	12	12	11	11	11	11	11	15	21	24	25	26	27	27	27	26	25
CENTRAL SOUTH AMERICA	23	21	15	14	13	13	12	12	12	12	11	11	11	11	16	22	24	25	26	27	27	27	26	25
SOUTHERN SOUTH AMERICA	25	23	20	15	14	13	13	12	12	12	12	11	11	11	11	20	24	25	26	26	27	27	27	27
WESTERN EUROPE	8	8	8	8	8	8	7	7	7	7	8	8	8	8	8	10	10	10	10	9	8	8	8	8
EASTERN EUROPE	8	8	8	8	8	8	8	8	7	7	8	8	8	7	7	7	9	9	9	9	8	8	8	8
EASTERN NORTH AMERICA	18	15	12	11	11	11	10	10	10	10	10	9	9	9	13	17	19	20	21	21	21	21	21	20
CENTRAL NORTH AMERICA	11	10	8	6	6	6	6	6	5	5	5	5	5	5	5	8	10	11	11	12	12	12	12	11
WESTERN NORTH AMERICA	6	5	5	3	3	3	3	3	3	2	2	2	2	2	2	2	4	5	6	6	6	6	6	6
SOUTHERN NORTH AMERICA	18	17	14	11	10	10	10	9	9	9	9	9	9	8	8	15	17	19	20	20	20	20	20	19
HAWAII	17	17	16	15	13	10	9	9	8	8	8	8	8	7	7	7	7	12	15	16	17	17	18	18
NORTHERN AFRICA	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	11	13	14	14	11	10	9	9	9
CENTRAL AFRICA	10	9	9	8	8	8	8	8	8	8	8	8	8	8	8	10	12	13	13	12	12	11	11	10
SOUTH AFRICA	16	12	11	11	10	10	10	10	9	9	9	9	9	9	13	16	18	19	19	20	20	19	19	18
MIDDLE EAST	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	10	10	9	9	9	8	8	8
JAPAN	16	15	15	14	12	9	9	9	8	8	8	8	8	8	8	8	8	8	8	8	8	11	14	15
CENTRAL ASIA	16	15	15	14	12	9	9	9	8	8	8	8	8	8	8	8	8	8	10	10	9	9	10	16
INDIA	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
THAILAND	15	15	14	13	10	9	9	8	8	8	8	8	8	8	8	8	8	8	10	10	10	10	9	9
AUSTRALIA	24	25	25	23	20	15	14	13	13	12	12	12	12	11	11	11	11	15	14	14	16	18	20	22
CHINA	13	14	13	12	9	9	9	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	10
SOUTH PACIFIC	26	26	25	23	19	15	14	13	13	12	12	12	12	11	11	11	13	15	16	19	21	22	23	25

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	18	13	12	11	11	11	10	10	10	10	10	9	9	16	19	21	22	23	23	23	23	23	22	20
NORTHERN SOUTH AMERICA	21	17	13	13	12	12	11	11	11	10	10	10	10	16	20	22	24	25	25	25	25	25	24	23
CENTRAL SOUTH AMERICA	21	15	14	14	13	13	12	12	12	11	11	11	11	19	23	25	26	27	28	28	28	27	26	24
SOUTHERN SOUTH AMERICA	24	21	15	15	14	13	13	12	12	12	12	11	11	14	21	22	24	25	26	26	27	27	27	26
WESTERN EUROPE	8	8	8	8	8	8	7	7	7	7	8	7	7	10	13	14	13	13	12	11	9	8	8	8
EASTERN EUROPE	8	8	8	8	8	8	8	7	7	7	8	8	8	7	11	12	13	11	9	9	8	8	8	8
EASTERN NORTH AMERICA	12	9	8	8	8	8	7	7	7	7	7	7	7	8	12	14	15	16	16	16	16	16	15	14
CENTRAL NORTH AMERICA	6	5	4	4	3	3	3	3	3	3	3	3	3	3	4	6	6	7	7	7	7	7	7	7
WESTERN NORTH AMERICA	11	10	8	7	6	6	6	6	5	5	5	5	5	5	5	8	10	11	12	12	12	12	12	12
SOUTHERN NORTH AMERICA	13	11	8	8	7	7	7	6	6	6	6	6	6	6	10	12	13	14	14	15	15	14	14	14
HAWAII	20	19	17	14	11	11	10	10	9	9	9	9	9	9	9	9	9	16	18	20	20	21	21	20
NORTHERN AFRICA	10	9	9	9	8	8	8	8	8	8	8	8	8	12	14	15	16	16	16	16	12	12	11	11
CENTRAL AFRICA	10	9	9	9	8	8	8	8	8	8	8	8	8	12	14	15	16	16	16	12	12	11	11	11
SOUTH AFRICA	16	14	13	13	12	12	12	12	11	11	11	11	11	20	23	24	26	26	26	26	26	25	23	21
MIDDLE EAST	8	8	8	8	8	8	8	8	8	8	8	8	8	9	12	14	14	12	10	9	9	9	8	8
JAPAN	15	14	12	9	9	9	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	9	13	15
CENTRAL ASIA	14	13	11	9	9	9	8	8	8	8	8	8	8	8	8	8	10	10	10	10	9	9	9	15
INDIA	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
THAILAND	13	12	9	9	9	8	8	8	8	8	8	8	8	8	8	8	11	10	10	10	10	10	9	9
AUSTRALIA	24	24	22	18	14	14	13	13	12	12	12	11	11	11	11	11	16	15	14	14	16	19	21	22
CHINA	12	12	9	9	9	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
SOUTH PACIFIC	26	24	22	16	14	14	13	13	12	12	12	11	11	11	11	16	15	15	18	20	21	23	24	25

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	13	10	10	9	9	9	8	8	8	8	8	8	11	15	17	18	19	19	19	19	19	18	17	16
NORTHERN SOUTH AMERICA	18	15	14	13	12	11	11	10	10	10	9	9	13	17	20	21	22	23	23	23	23	22	21	20
CENTRAL SOUTH AMERICA	18	16	15	15	14	13	13	12	12	12	11	11	20	22	24	25	26	27	28	28	28	27	25	23
SOUTHERN SOUTH AMERICA	22	18	17	16	15	14	13	13	12	12	12	12	17	20	21	23	24	25	26	27	27	27	27	25
WESTERN EUROPE	8	8	7	7	7	7	7	7	7	7	7	7	12	14	15	15	15	14	13	12	10	9	8	8
EASTERN EUROPE	7	7	7	7	7	7	7	7	7	8	7	7	9	9	9	9	9	9	8	8	8	8	7	7
EASTERN NORTH AMERICA	5	4	4	4	3	3	3	3	3	3	3	3	3	6	7	7	8	8	8	8	8	7	7	6
CENTRAL NORTH AMERICA	13	9	9	9	8	8	8	8	7	7	7	7	7	9	13	15	16	16	17	17	17	16	16	15
WESTERN NORTH AMERICA	18	15	12	11	11	11	10	10	10	10	10	9	9	9	14	18	20	21	21	22	22	21	21	20
SOUTHERN NORTH AMERICA	15	10	10	9	9	8	8	8	8	8	8	8	7	11	15	16	17	18	18	18	18	18	17	16
HAWAII	19	17	12	12	11	11	10	10	10	10	10	10	9	9	10	9	9	18	20	22	22	22	22	21
NORTHERN AFRICA	10	10	10	10	10	10	9	9	9	9	9	14	18	20	21	21	22	21	19	17	12	12	11	11
CENTRAL AFRICA	10	10	10	10	10	9	9	10	9	9	9	14	18	20	21	22	22	20	18	13	12	12	11	11
SOUTH AFRICA	14	14	13	13	12	12	12	11	11	11	11	19	23	25	26	27	27	28	28	27	26	24	22	16
MIDDLE EAST	9	9	9	8	8	8	8	8	8	8	8	10	14	15	16	17	17	17	12	12	11	11	10	10
JAPAN	12	9	9	9	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	12	14
CENTRAL ASIA	11	9	9	9	8	8	8	8	8	8	8	8	8	8	11	10	10	10	10	10	10	9	9	13
INDIA	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
THAILAND	9	9	9	8	8	8	8	8	8	8	8	8	8	11	12	11	11	10	10	10	10	10	10	9
AUSTRALIA	23	20	15	14	13	13	12	12	12	12	11	11	11	11	18	17	16	15	14	14	17	19	21	23
CHINA	9	9	9	8	8	8	8	8	8	8	8	8	8	9	8	8	8	8	8	8	8	8	8	8
SOUTH PACIFIC	24	20	15	14	13	13	12	12	12	12	11	11	11	13	17	16	16	17	19	21	22	24	25	26

or early evening, as the line between daylight and darkness gets closer to your location. You will first hear stations to your east, and then as the night progresses, stations to the north, south, and west will begin to be heard. Finally, just before and through local dawn, stations toward the west become strong. This is very similar to the characteristics of the MW broadcast band.

At 500 kHz, you will find an international ship calling and distress frequency for maritime communications in Morse code. Since 1999, however, it is rarely used since ship and shore communication stations are no longer required to monitor this frequency for calls. But, from 500 to 540 kHz, miscellaneous beacons and stations can be heard, like the 518-kHz maritime safety and navigation information data transmission. The system is known as NAVTEX and uses frequency shift keying to transmit weather bulletins as well as notices of missing and overdue vessels. In the United States and Canada, low-power road and traffic information broadcasts are offered on 530 kHz. There are quite a few hobbyists who enjoy hunting for these transmissions.

From 430 to 500 kHz, you used to be able to hear two-way Morse code communications between ships at sea and shore stations. Again, because the requirement was lifted in 1999 for maritime use of Morse code, the stations have all but disappeared.

Now we come to the segment where there's a lot of potential DX to harvest. Between 200 to 430 kHz you'll find the NDB navigation signals that are endlessly repeating their CW callsigns. Most of the NDB stations you'll hear are from Canada and the United States, while more distant ones exist in Europe, South America, the Caribbean, and Asia. You'll want to get access to listings of known beacon station IDs, or callsigns. Check out www.lwca.org/sitepage/lfutil/index. htm for this kind of information.

One interesting segment of the LW spectrum is found between 160 and 190 kHz. Unlicensed experimental transmissions are allowed in the United States, if the transmitter power is restricted to 1 watt and the maximum antenna length, including the transmission feed line, is no longer than 50 feet. What makes this even more exciting is that any mode of transmission can be used. This segment is referred to as the "lowfer" band, and these unlicensed stations have been heard several hundreds of miles away under favorable conditions.

Another broadcast band exists between 155 and 281 kHz in Europe and some of Asia. In these regions it's known as the LW band, which is not technically correct since the longwave spectrum includes VLF and LF. Using one 1,000,000 watts or more of power, European LW stations target entire European nations, like England or Germany, with reliable signals 24 hours a day. It's possible when conditions are favorable that these broadcasts can be heard in the eastern United States and Canada during the winter months. The best time to try for these signals is from local sunset to about 0600 UTC. It might also be possible to hear the few LW Asian stations like the ones in Asiatic Russia. The best listening post would be on the west coast of North America beginning and the best time an hour or so before local sunrise.

Then, below 155 kHz, where the skywave propagation finally fails, you'll hear signals that might have traveled for thousands of miles via groundwave. If the transmission is made with enough power, over salt water, reception is possible. However, signals at 50 kHz and lower can penetrate seawater very well. This is why submarine communications are conducted here.

As you will find, there can be plenty of exotic DX to be had during the winter months down below the MW AM broadcast band. You just need a decent receiver that can tune these frequencies and an indoor loop antenna designed for these bands, or a very long wire antenna and a good earth ground. There are many pages on the Internet where you'll find information on these stations, equipment, and logs from other DXers. A good starting point would be www.lwca.org/.

HF Propagation

Because the Earth is closer to the sun during the winter, the density of ionospheric ionization in the Northern Hemisphere is expected to increase more rapidly after sunrise than it does during other seasons. At the same time, static and atmospheric noise levels will be at seasonally low values during the month of December. This is a recipe for stable HF propagation openings on the lower frequencies, as well as for short strong periods of propagation on the higher SW bands.

Fairly good DX openings are expected on 19 and 16 meters, remaining open towards the west during the early evening. Nineteen meters will be the hottest daytime band, while 22 and 25 meters will become a close second. These start with early morning openings in all directions until about an hour or two after sunrise, and then remain open into one place or another through the day until early evening. When conditions are good (days with low geomagnetic activity and higher solar sunspot activity), 22 through 16 meters are likely to remain open toward the south and west from early evening until about midnight.

The best bands for around-the-clock DX will be 31 and 25 meters. Twenty-five meters continues to be an excellent band for medium-distance (500 to 1,500 miles) reception during the daylight hours, with longer-distance reception (up to 3,000 miles) possible for an hour or two after local sunrise and again during the late afternoon and early evening.

From midnight to sunrise, 41 and 31 meters promise some of the hottest nighttime DX during December. The first DX openings should be toward Europe and the east during the late afternoon, then move across the south through the hours of darkness, while remaining open into most parts of the world. Just after sunrise, openings will be more in a westerly direction. Low seasonal noise will make DXing a pleasurable endeavor.

For short-skip openings during December, try 90 through 41 meters during the day for paths less than 250 miles, and 90 down to 120 meters at night for these distances. For openings between 250 and 750 miles, try 41 meters during the day and both 90 and 120 at night. For distances between 750 and 1,300 miles, 22 through 31 meters should provide daytime openings, while 41 down to 90 meters will be open for these distances from sunset to midnight. After midnight, 90 meters will remain open out to 1,300 miles until sunrise. Try 31 and 41 meters again for about an hour or so after sunrise. For openings between 1,300 and 2,300 miles, openings will occur on 22 through 16 meters, with fewer on higher bands, during the daylight hours. From sundown to midnight, check 22 through 41 meters for these long-distance openings, and then check 41 down to 90 meters after midnight until sunrise. Try 41 and 31 meters again for an hour or so after sunrise.

DX openings on 120 and 90 meters during the hours of darkness and into the sunrise period, with considerably decreased static levels, are a sure bet during the longer hours of darkness

in the northern latitudes. Look for openings toward Europe and the south from the eastern half of the United States and towards the south, the Far East, Australasia, and the South Pacific from the western half of the country. Ninety meters should peak towards Europe and in a generally easterly direction around midnight, then open in a generally western direction with a peak just after sunrise. The band should remain open toward the south throughout most of the night.

Propagation On VHF And Above

Quite a bit of meteor shower activity is expected this month, which should result in improved conditions for meteor-scatter openings on the VHF bands for distances up to about 1,000 miles. When a meteor burns up in the atmosphere, its intense heat creates an ionized trail, making it possible for radio signals to propagate off the ionized trail, much like they would off of the ionosphere. The annual Geminid meteor shower, which will appear from December 7 to December 17, will peak on December 14. The maximum hourly rate typically reaches 80. The Geminids is a great shower for those trying the meteor-scatter mode of propagation since one doesn't have to wait until after midnight to catch it. The radiant rises early, but the best operating time will be after midnight local time. This shower also boasts a broad maximum, lasting nearly one whole day, so no matter where you live, you stand a decent chance of working some VHF/UHF signals off a meteor trail.

A secondary seasonal peak in sporadic-*E* ionization should also result in some short-skip openings on low VHF for distances between about 800 and 1,300 miles. A rare occurrence of aurora during days of stormy geomagnetic activity is possible, providing some unusual short-skip openings on low VHF.

There is considerably less likelihood for transequatorial VHF openings during December, but look for a possible opening between the southern states and locations deep in South America. The best time to look for these is between about 8 p.m. and 11 p.m. local time.

Current Cycle 23 Progress

The Royal Observatory of Belgium reports that the monthly mean observed sunspot number for August 2006 was 12.9. The lowest daily sunspot value recorded was zero (0), on August 4 through August 7. The highest daily sunspot count was 22 on both August 28 and August 31.

The 12-month running smoothed sunspot number centered on February 2006 was 18.7. A smoothed sunspot count of 7, give or take about 12 points, is expected for December 2006 (yes, that would make it possible for a smoothed sunspot count of zero to be calculated).

The Dominion Radio Astrophysical Observatory at Penticton, BC, Canada, reports a 10.7-centimeter observed monthly mean solar flux of 79.0 for August 2006. The 12-month smoothed 10.7-centimeter flux centered on February 2006 is 82.6, just down from 84.0 of January. The predicted smoothed 10.7-centimeter solar flux for December 2006 is 70, give or take about 14 points.

The observed monthly mean planetary A-Index (Ap) for August 2006 is 9. The 12-month smoothed Ap index centered on February 2006 is 9.2. Expect the overall geomagnetic activity to vary greatly between quiet to active during most days in December.

I'd Like To Hear From You

Let me know how you fare in hunting beacons and other signals on the low frequencies. I would love to share your propagation observations on the LF spectrum, so please send me an e-mail or drop me a letter. Don't forget to share a bit about your radio equipment and the antenna you use for your LW DXing.

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

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

Happy signal hunting! ■

Popular Communications December 2006 Survey Questions

My outdoor antennas get regular annual maintenance.
Yes....1
No....2
Sometimes....3

I live in an area that (mark all that are appropriate) is:
Near saltwater....4
Very windy much of the time....5
COld and icy much of the winter....6
Hot and humid much of the year....7
In an urban area with lots of smog...8

My outdoor antennas consist of (mark all that are appropriate):
Tower-mounted beam....9
Pole-mounted beam....10
Homebrew longwire antennas....11
Commercially made wire antennas 12
VHF/UHF vertical....13
Discone....14
Roof-mounted (tripod, etc.) beam or vertical....15
Vertical CB antenna....16
Stealth wire antenna close to the house....17
Stealth flagpole or similar antenna..18
Loop antenna....19
G5RV antenna....20
Multiband vertical....21

The last time I physically checked the coax and antenna was:
Just before winter....22
Last month....23
Last year....24
A couple of years ago....25
So long ago that I don't remember..26
Since you've just reminded me, probably later today....27

When I inspected my outdoor antenna system I found (mark all that are appropriate):
The guy wires/ropes were in need of adjustment/repair....28
Water had seeped in the coax....29
Nothing, it was in great shape....30
The elements on my antenna were bent out of shape from ice/wind....31
My wire antenna was in need of repair....32
My vertical antenna was cracked/broken....33
My coax had been chewed/cut....34

by Peter J. Bertini, radioconnection@juno.com

Repairing IF Transformers

The venerable Hallicrafters S-38 shortwave receiver, briefly mentioned in one of my earliest columns, generated a lot reader feedback from those interested in restoring these perennially popular classics. Many graying hams and SWLs fondly recall saving allowance and paper route money to buy their first set: an S38 receiver!

The Hallicrafters S-38 was an inexpensive beginner's receiver, and I suspect their current popularity is based more on nostalgia than performance. The original six-tube S38 was introduced in 1946 (one tube was dedicated to the BFO, later models used five tubes with a regenerative IF stage being for CW reception). The S-38E was the last of the line when production ceased in 1961. By that time the S38 was using glass subminiature tubes instead of octal tubes, and like its predecessor, the S38D, produced between 1955 and 1957, the S38E sported a more modern linear *slide-rule* style tuning dial instead of the half-moon tuning dials used for the main tuning and logging scales on the earlier models.

I've been restoring an S38 for a very patient reader, it's been one of those projects that never seem to get done, either getting pushed to the back burner or delayed because of unexpected problems that crop up as work progresses. This particular S38 had no shortage of unexpected gremlins. I don't have a photo of the receiver on the bench, but I'll try to take a few for our next column before it goes back to its original owner.

Miniature Snap-Mount IF Transformers

This particular S38 used a newer style miniature IF transformer. These transformers are mounted to the chassis using spring clips (these can be seen in **Photo A**) and feature inductive tuning instead of compression mica trimmer capacitors to align the IF stages. The inductance was varied by the use of threaded ferrite cups that could be moved over the primary and secondary windings of the transformer. For **Photo B** the aluminum cover of one transformer was removed to show the details of how these devices were made. The ferrite tuning cups are over the coil windings, hiding them from view. The two polystyrene plastic side supports are threaded with the same pitch as the threads on the ferrite cups. As the cups are rotated, they will follow the threaded racks and go further into, or away from, the coils, adjusting the resonant frequency.

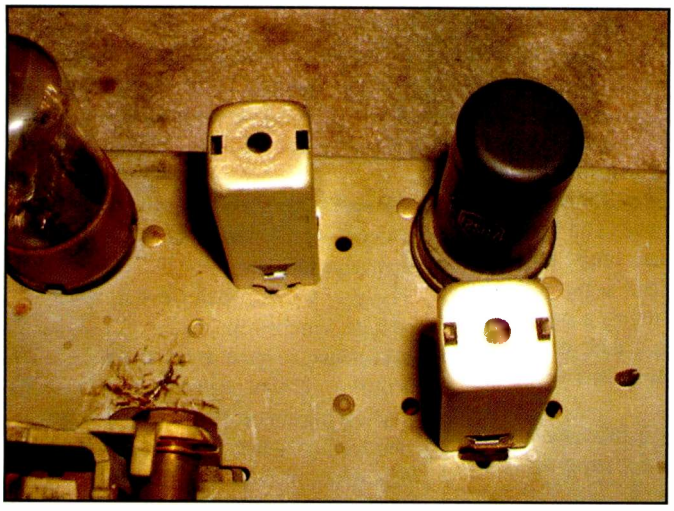


Photo A. These are the two snap-mount IF transformers on the S38 chassis. Removal techniques for the snap mounts are explained in the column.

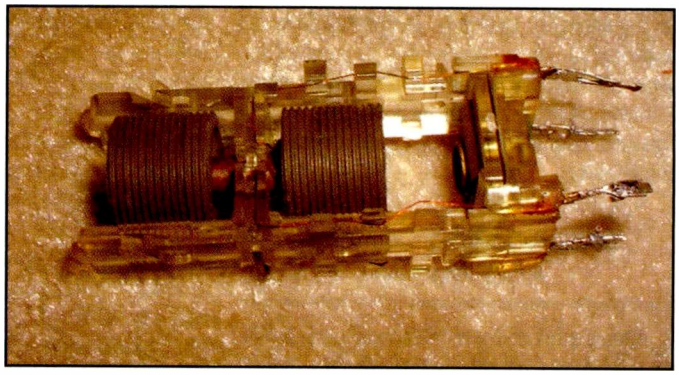


Photo B. This shows how the inside of the miniature snap-mount style IF transformers are made. The coils are tuned with ferrite cup cores, and the IF transformer body is made of polystyrene plastic.

A small flat blade-tuning tool is inserted into alignment holes on the bottom and top of the transformer to align the primary and secondary. Since the ferrite cores are ferrous, the inductance is increased as the cores come closer to windings. To some degree, the inductance is measurably lower when the coils are inserted back in the non-ferrous aluminum housing. The effect isn't enough to be bothersome, however. The transformers are removed from the chassis by gently pushing the metal snap towards the chassis bottom, while gently pulling the spring metal away from the aluminum shell of the transformer on top of the chassis. The spring metal mounting clip is tapered so the parts interlock and are held locked by the spring tension. It's easier to see than to describe, just proceed slowly while doing the extraction.

Leaky Fixed Capacitors

While the exact construction details vary between manufacturers, a common failure mode involves moisture interacting with the fixed mica capacitors in the base of the transformers. The silver plating migrates, creating conductive trails across the surface of the mica until the B+ voltage on the plate circuit eventually is able to arc to the grid or detector side of the transformer. When it happens, you'll hear very loud static in the speaker!

Testing For Leakage

Usually, you'll know when the transformers are bad because the static and noise coming from the speaker is unmistakable. If available, a good oscilloscope AC coupled to the AGC or

Photo C. The Heathkit IT-12 signal tracer features a noise test that applies a high DC voltage to the part under test. Any arcing or breakdown causes AC noise artifacts to ride on the DC level; they are then capacitor-coupled to the tracer's audio amplifier so they can be heard on the speaker. The test worked better than expected and proved the transformers were defective. Note that the probe leads are applied to both windings, not across the primary or secondary!

detector output will show large amounts of AC noise. The AGC buss may show positive-going noise pulses as well. The problem was so severe in the Hallicrafters S38 that I could see the positive AGC pulses on my digital meter. Several months ago I did a column on restoring Heathkit signal tracers along with suggestions on how to use them, and hinted they might be useful for testing for defective capacitors in IF transformers by using the *noise test* feature found on some signal tracers.

Photos C and **D** show a bench set-up using a Heathkit IT-12 signal tracer to test an IF transformer for leaky fixed mica capacitors. Caution! We'll be dealing with high voltages during this test, keep clear of the leads while the tracer is on! The IT-12 probe is set for *audio* and the probe is connected with the ground lead to one winding on the transformer, and the probe tip to the opposite winding (see **Photo E** for details.) This places a high DC voltage between the two resonant circuits, and if there is any leakage the high voltage will generate microscopic arcing that is amplified by the tracer and made audible.

Figure 1 shows a schematic representation of what we are doing. The high voltage is applied through a dropping resistor built into the analyzer. The resistance is high enough to limit the current to a safe level, and the resistor also allows any leakage to greatly influence the DC voltage at the device being tested. If there is leakage, the resulting noise will be AC-coupled into the tracer's audio amplifier and will be heard on the internal speaker. If the fixed mica capacitors are the cause of the

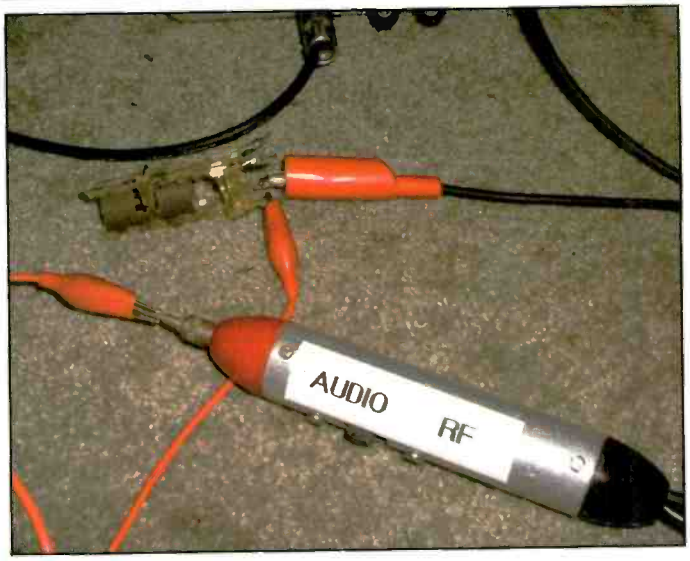


Photo D. Here's a close-up of the probe and hookup for the noise test. Note that the probe must be set for audio in order to pass the DC voltage to the part under test.

noise, they must be removed and replaced. Here's where the real fun starts.

Fragile: Handle With Care!

The S38 IF transformers were probably inexpensive off-the-shelf OEM generic parts; this style transformer was commonly used in the inexpensive series-strung tabletop radios of the day. Unfortunately the devices are fragile and easily damaged. The two side plastic racks supporting the tuning cores are held together with a small spring clip, and the base is also locked into place by the tension. With rough handling, they'll come apart like a cheap plastic clothes pin, which in turn usually breaks the fine coil wire leads going to the solder lugs. And since the styrene plastic is easily melted, extra care is needed not to overheat the lugs when soldering to them!

Hidden Caps?

Refer again to **Photo E**, which shows a close-up of one of the IF transformer bases. Note the brass rivet in the center. The rivet body provides tuning access for the alignment tool to tune

Photo E. Here's a view of the bottom of the transformer base. The rivet that holds the base assembly together is in the center.

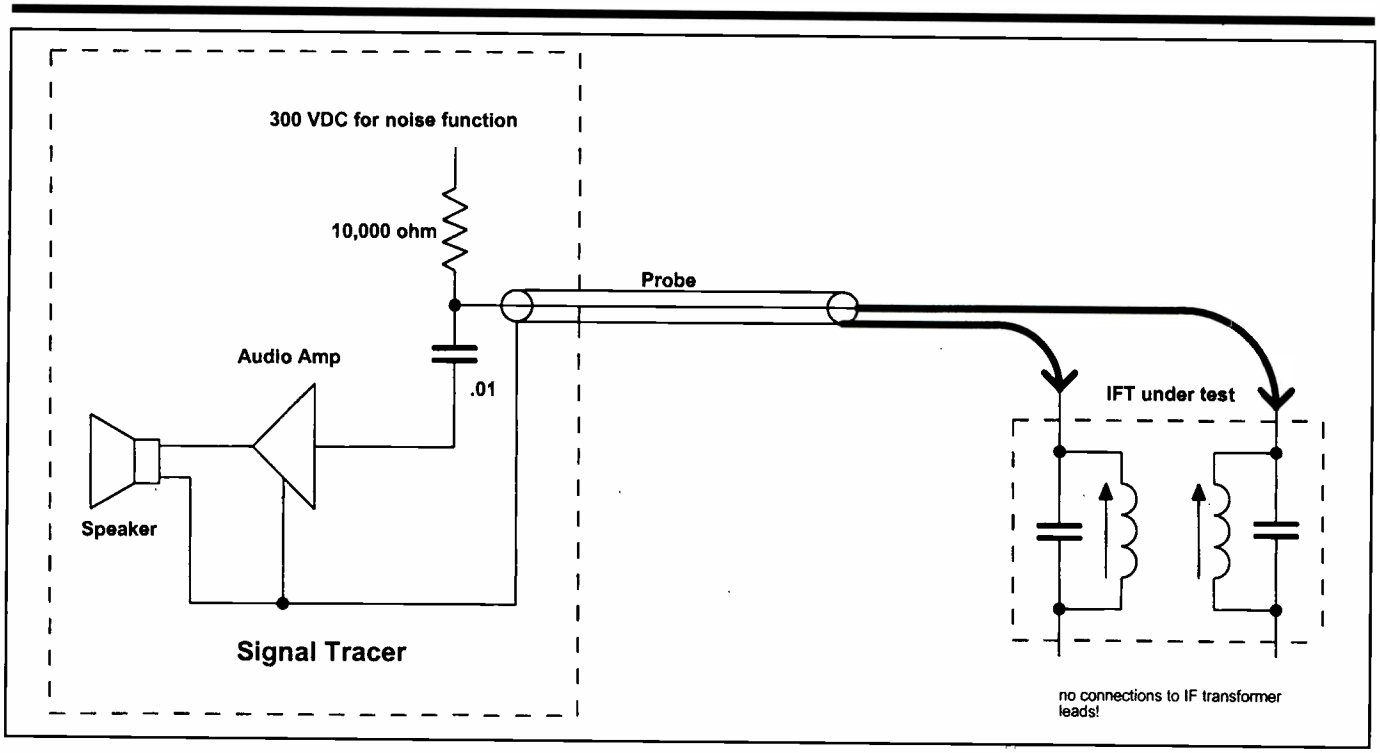


Figure 1. Here's how the noise test feature works. A DC voltage is applied to the part under test through a large-value dropping resistor. Any leakage paths will generate microscopic arcing and cause a voltage drop across the resistor corresponding tothe amount of arcing. This noise is basically an AC signal waveform that is riding on the DC voltage. A coupling capacitor will remove the DC potential, but allow the AC noise artifact to be passed on to the high gain audio amplifier in the IT-12, making the defect plainly audible.

the bottom core, and the rivet also holds the fixed mica resonating capacitor wafer in place. Sandwiched between the plastic base and another plastic insulator on top is a small mica wafer. Four conductive silver plates are deposited on both sides of the wafer to produce two fixed-value resonating capacitors. Electrical contact is made by folding the two solder lugs for each side of the transformer over each (parallel with the base) and inserting the wafer between each set of contacts. The rivet, along with a small rectangular spring tensioning washer, provides the tension needed to keep a good electrical contact.

Photo F shows the mica wafer, rivet, tensioning washer, and top plastic insulator after I removed it from one of the transformers. I was able to do this by gently heating the rivet with a small soldering iron, melting the plastic until it was soft enough to permit pushing the rivet through. Gently is the key word here! Once the mica wafer is removed, you'll need to trim away the two plates formed from the solder lugs that provided the electrical contacts for the capacitor plates with a pair of miniature diagonal cutters, otherwise they may short together if left in place as they are. Remember, once this is done, soldering on the lugs must be done quickly since they will be more prone to movement as the plastic base is heated and softens.

Not all snap-mount IF transformers are made exactly the same internally. In some styles the mica capacitor wafer is more accessible and can be cleaned using a Q-Tip swap and isopropyl alcohol to wash away the leakage paths. I can't vouch if this provides a long-term solution or not, but other restorers have claimed having good luck using this method.

Determining Replacement Capacitor Values

Once the capacitor wafer is removed, we'll need to determine the correct values for the replacements. Fixed value dipped silver micas or good quality NPO disc ceramics installed on the transformer lugs (under the chassis) will do fine. While the tunable ferrite cores have a large authority over the tuning range, it's still best to keep the value as close to original as possible for a couple of reasons. First, it will keep the tuning range within reasonable limits without having the cores at the extremes of their tuning ranges; second it's probably best to keep the cores in the same positions that the design engineers planned. The core placement will affect the coupling between the primary and secondary winding, and the amount of coupling has a large effect on the selectivity curve of the IF stages; in general, the tighter the coupling, the broader the bandwidth.

Avoid disturbing the core settings on the assumption that they were probably set very near proper alignment before the noise problems manifested. We'll do some backwards engineering to determine the capacitance of each winding. Once we know this, we can determine the capacitance needed to resonate each winding at the IF frequency; this can be accomplished using test equipment or with mathematical equations.

Measuring Inductances

Remember that each IF transformer *may* be different, depending on where in the circuit it was used. Sometimes a manufacturer will use the same transformer between the mixer and IF input and between the IF stage output and the detector to cut costs, but often a good engineer with a better budget would choose devices that provided the desired impedance matching as well. Be careful not to mix up the transformers if more than one is removed from the chassis at

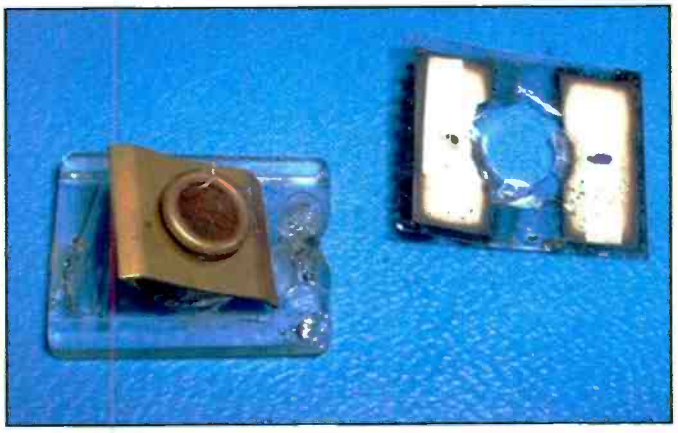


Photo F. In this photo I've gently heated the rivet and pushed it through the polystyrene material once it was softened enough to remove it. This permitted access to the silver mica capacitor wafer for removal. Note the square tensioning spring on the other side of the rivet, inside the transformer shell. These parts are discarded and not reused.

Photo H. The author's QM-1 Q meter is rather exotic and is seldom seen in service shops, but it proved its worth for determining the proper capacitor values needed to resonate each winding at 455 kHz.

a time! The painted green dot usually signifies the secondary winding, and the lug marked with the green dot will go to either the control grid of the IF stage if it's the first IF, or to the detector diode if it's the last IF stage.

The easiest way to measure the inductance of each coil is with a good inductance meter, and you'll see the Almost All Digital Electronics L/C meter[1] being used for that task in **Photo G**. Longtime readers may remember our review of the AADE meter several years ago. This is the preferred method; we'll have two of three unknown variables after measuring the inductance (frequency and inductance are known) to solve our equation (or computer program) for the capacitor value.

Here's what I found: The first IF transformer had coils with inductances of 1.386 mH (1386 µH) for the secondary (grid) and 1.307 mH (1307 µH) for the plate coil. That's close enough to assume that both coils are close to being identical and the errors are caused by small misalignment.

The detector, or last IF transformer, showed a difference between the windings. Unfortunately, I had moved the bottom core, so the exact differences aren't documented.

Photo G. The AADE L/C meter provides an accurate and quick means to determine the actual inductance value of the individual primary and secondary windings.

Finding Resonance

For the first example, I'm bringing out some heavy artillery! An easy method to find the desired capacitor value is with a Q meter, as shown in **Photos H** and **I**. Q meters are normally used to measure the Q, or quality, of a coil or capacitor, and the Q reading reflects the amount of losses involved in the coil or capacitor being tested. The higher the Q value, the lower the losses. Q meters are a bit exotic for the average home shop, but they're very popular with crystal set experimenters who use them to design super-selective and efficient DX-capable crystal set receivers. A low-loss high Q coil means selectivity and sensitivity for those folks.

Photo I. The coil (or IF transformer winding in this case) connects with short leads directly to the coil test terminals on top of the QM-1 test instrument.

Photo J. The author's Heathkit SG-8 signal generator and IT-12 signal tracer indicate that the IF transformer can be tuned to resonance.

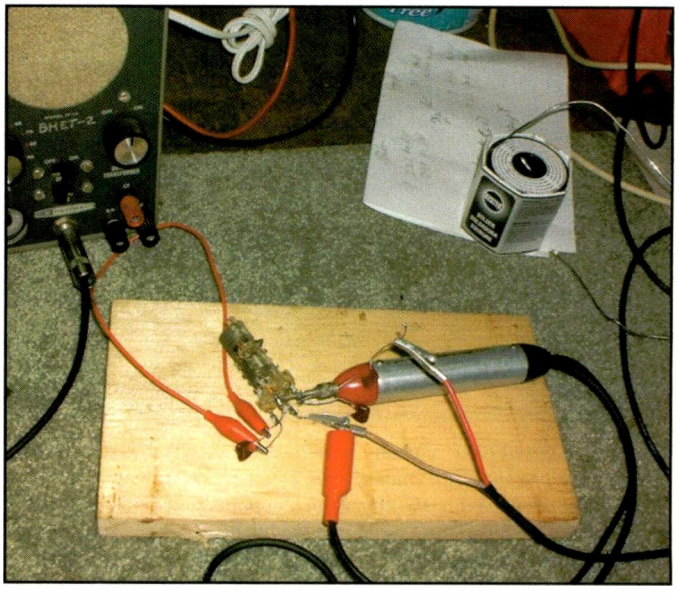


Photo K. This photo illustrates the bench setup for the IT-12 and probe, which is being used as in the RF position to work as an amplifier crystal receiver. The low-impedance RF output from the SG-8 signal generator is impedance matched to the IF transformer using a low-value (several pF) capacitor in series with the output of the generator test cable and the IF tuned circuit to avoid swamping the Q of the tuned circuit.

The meter shown in **Photo H** is a Heathkit QM-1, which can be found for between $50 and $100 *when* they appear on the market. Not many were produced, as you might imagine, so they are relatively scarce and highly sought after. The Heathkit QM-1 is relatively simple, foolproof, and easy to maintain. While better lab-quality Boonton Q meters are often readily available, some models use thermocouples or use other exotic parts that, if defective, are irreplaceable and make them less than a bargain at any price.

The Q meter includes a variable RF signal generator and a variable capacitor that can be used to resonate a coil at a given frequency. I found that capacitors between 90 to 100 pF would work for three of the tuned IF stages, and that a 120-pF was needed for the oddball winding on the detector IF transformer.

The Q meter makes short work of the process, since it solves the problem in a single step without needing to measure the inductor value, thus avoiding math equations or further detective work. The IF transformer is shown attached to the Q meter's coil test terminals in **Photo I**.

If you don't have a Q meter, the test bench setup shown in **Photo J** can also be used. Here I'm using my shop's Heathkit

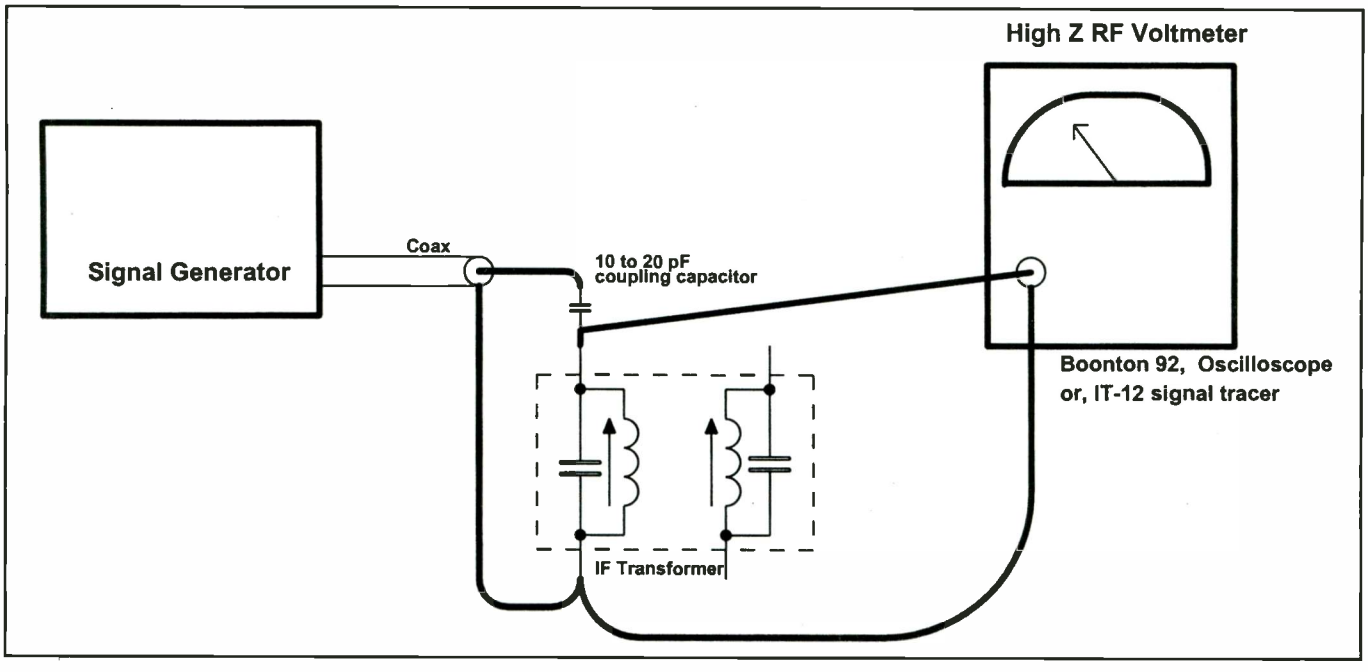


Figure 2. Here's how to couple the low-impedance output of your signal generator into a very high-impedance LC circuit without swamping it. This setup can be used with the IT-12 signal tracer as an RF detector (a sensitive wideband scope, or a sensitive high-frequency AC meter such as the Boonton 91 series of RF millivoltmeters will also work) to find the resonance.

SG-8, along with the Heathkit IT-12 signal tracer, to find whether the IF transformer winding under test will resonate with a particular capacitor. Most of the 455-kHz transformers I've encountered can be made to work with a fixed capacitor between 90 and 145 pF, so it's pretty easy to find a value that works by trial and error. Use whatever method works best for your skill and level of test bench equipment.

Figure 2 shows the schematic representation of how all this is being accomplished. The signal tracer probe is set to *RF* where it works as a simple amplified crystal detector. The signal generator is coupled into the resonant circuit through a small value capacitor in series with the signal generator RF output. The capacitor serves as an impedance matching device; without it, the low impedance signal generator output would load the tuned circuit, making resonance very hard to notice. Once the correct value capacitor is found, and the IF is able to be tuned to resonance, the internal 400-Hz modulated tone on the RF signal generator signal will be heard on the tracer speaker when resonance is achieved. The signal generator must be set to its highest output level. A good lab scope, such as a Tek 465, or an RF millivoltmeter similar to the Boonton 91 series, can be used in lieu of the signal tracer to monitor the RF voltage peak across the coil at resonance.

One caveat: Note that I'm shorting the opposite winding on the IF transformer when I'm conducting these resonance tests. The actual lash up, including the jumper shunting the opposing winding, is shown in **Photo K**. If the other winding happens also to be tuned to resonance, it will suck out the signal (like a *suck-out* trap) and you won't see (or just barely notice) the signal peak on the winding under test at resonance! On the plus side: the suck-out signal null can be used to verify that the other winding is capable of being tuned to resonance as well. Once resonance is found on the winding being tested you can remove the jumper shorting the opposing winding and watch or listen for the null as that winding is tuned to resonance.

If case you're wondering, at 455 kHz, short test lead jumpers won't have much of an effect on the final results. At worst, they'll add a few pF or µH to the actual values. These lead lengths would be more of a concern, say, when testing a 10.7-MHz transformer.

Mathematical Approach

For the faint hearted and computer literate, go to this URL www3.telus.net/chemelec/calculators/lc-calculator.htm and use the inductance and frequency to find the needed capacitor value. Otherwise, the formulas can be found in various amateur radio handbooks. Remember that the basic engineering formulas deal with Henries and Farads, and you'll need to keep track of the decimal point when dealing with µH, mH, mFd and pF values!

I'm running out of room as usual, so I'll sign off until next time. Keep those soldering irons warm and old tubes glowing until then! Happy holidays! ■

References

1. For information on the AADE L/C Meter IIB, contact Almost All Digital Electronics, 1412 Elm St. S.E., Auburn, WA 98092; Phone: 253-351-9316 (9 a.m.–9 p.m., Mon–Fri and usually on weekends); Fax: 253-931-1940; Web: www.aade.com; E-mail: neil@aade.com.

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	15385	Radio Exterior de Espana	
0000	7125	Voice of Russia via Moldova	
0000	4845	Radio Mauritanie, Mauritania	AA
0000	7450	RS Makedonias, Greece	Greek
0000	9570	China Radio International, via Albania	
0000	6005	Deutchland Radio, Germany	GG
0000	9935	VOIRI, Iran	AA
0000	6973	Galei Zahal, Israel	HH; USB
0000	9410	BBC via Cyprus	
0000	7450	Radio Tirana, Albania	
0000	7365	Radio Marti, USA	SS to Cuba
0000	9345	Kol Israel	HH
0030	9715	RDP International, Portugal	PP
0030	7475	Voice of Greece	Greek
0030	9800	China Radio Int-Kashi	SS
0030	9700	Radio Bulgaria	Bulgarian
0030	9870	Radio Austria International	
0030	6190	Deutschlandfunk, Germany	GG
0030	9770	Radio Budapest, Hungary	HH
0030	6115	Radio Tirana, Albania	
0100	6175	Voice of Vietnam, via Canada	
0100	9800	Radio France Int., via Fr. Guiana	SS
0100	13710	Radio Canada International	
0100	11800	RAI International, Italy	
0100	5025	Radio Rebelde, Cuba	SS
0100	7345	Radio Prague, Czech Republic	
0100	4319	AFRTS, Diego Garcia	USB
0100	4789	Radio Cultural Coatan, Guatemala	SS
0100	4845	Radio Norteno, Bolivia	SS
0130	11935	Radio Japan	unid
0130	3249	Radio Luz y Vida, Honduras	SS
0130	9870	Radio Austria International	
0200	3320	Radio Sondergranse, South Africa	Afrikaanns
0200	5890	Radio Thailand, via USA	
0200	15180	Voice of Korea, No. Korea	SS
0200	15515	Radio Australia	
0200	11700	Radio Bulgaria	
0200	9495	VOIRI/Voice of Justice, Iran	
0200	4800	Radio Buenas Nuevas, Guatemala	SS
0230	3279	La Voz del Napo, Ecuador	SS
0230	4815	Radio El Buen Pastor, Ecuador	SS
0230	15075	All India Radio	Hindi
0230	9795	Radio Budapest,. Hungary	
0230	9905	Radio Nile, via Madagascar	AA
0300	4810	Radio Transcontinental de America, Mexico	SS
0300	12005	RT Tunisienne, Tunisia	AA
0300	13730	Radio New Zealand International	
0300	17880	Radio Free Asia via No. Marianas	CC
0300	4780	Radio Djibouti	FF
0300	4052.5	Radio Verdad, Guatemala	SS
0300	13790	VOIRI, Iran	
0300	7110	Radio Republica, England	SS to Cuba
0300	9875	RTBF Int., Belgium	FF
0300	11920	RTV Marocaine, Morocco	AA
0330	15595	Voice of Russia - Petropavlovsk	
0330	11675	Radio Kuwait	AA
0330	5975	Voice of Turkey	
0330	17615	BBC relay, Thailand	
0330	4790	Radio Vision, Peru	SS
0330	11805	Sudan Radio Service, via UK	
0330	12080	Voice of America relay, Botswana	
0330	4965	The Voice-Africa, Zambia	
0400	3345	Channel Africa, South Africa	
0400	6185	Radio Educacion, Mexico	SS
0400	9704	Radio Ethiopia	Amharic
0400	11995	YLE/Radio Finland International	Finnish
0400	9780	Republic of Yemen Radio	AA
0430	13810	Bible Voice, England, via Germany	Sat/Sun
0445	4775	Trans World Radio, Swaziland	
0500	5446	AFRTS, Key West, Florida	USB
0500	4770	Radio Nigeria, Kaduna	
0500	9615	Radio New Zealand International	
0500	7250	Vatican Radio	
0500	5005	Radio Nacional, Equatorial Guinea	SS
0500	4777	Radio Gabon	FF
0500	4950	Radio Nacional, Angola	PP
0530	9685	Channel Africa, South Africa	
0530	5910	Marfil Estereo, Colombia	SS
0600	6010	Radio Mil, Mexico	SS
0600	7190	RT Tunisienne, Tunisia	AA
0600	6160	CKZN relay CBC, St. John's, Newfoundland	
0600	7460	Ntl. R of Saharan Arab Dem. Rep., Algeria	AA, cland.
0700	7125	RTV Guineenne, Guinea	FF

UTC	Freq.	Station/Country	Notes
0800	4885	Radio Clube do Para, Brazil	PP
0800	3291	Voice of Guyana	
0830	5020	Solomon Islands Broadcasting Corp.	
0830	6020	Radio Gaucha, Brazil	PP
0900	11735	Radio Pyongyang, No. Korea	KK
0900	6114.8	Radio Union, Peru	SS
0900	11530	Voice of Mesopotamia, via Moldova	Kurdish
0900	6155	Radio Fides, Bolivia	SS
0900	6010	La Voz de su Concencia, Colombia	SS
0930	5990	Radio Senado, Brazil	PP
0930	6070	Voz Cristiana, Chile	SS
0930	4819	La Voz Evangelica, Honduras	SS
0930	7275	CPBS, China	CC
1000	7145	Radio New Zealand International	
1030	11636	Radio Taiwan International	
1030	12130	Trans World Radio, Guam	CC
1030	5765	AFRTS, Guam	USB
1100	11830	Radio Romania Int.	FF
1100	9615	KNLS, Alaska	
1100	9730	Radio Veritas Asia, Philippines	CC
1100	13635	CVC International, Australia	
1130	9780	Radio Taiwan International	CC
1130	11990	Voice of America via No. Marianas	
1130	12040	BBC via Philippines	CC
1130	9430	FEBC, Philippines	CC
1200	11740	Radio Japan, via Singapore	CC
1200	13665	Radio Rossii, Russia	RR
1200	7320	Magadan Radio, Russia	RR
1200	11650	KFBS, Saipan, No. Marianas	RR
1200	9965	KHBN/V of Hope, Hawaii	CC
1200	11705	Radio Liberty relay, Philippines	RR
1200	17700	Radio Solh	Pashto/Dari
1200	11960	HCJB, Ecuador	SS
1200	17620	Radio France International	FF
1200	12130	KWHR, Hawaii	
1200	11880	Radio Australia	
1200	6350	AFRTS, Hawaii	usb
1200	6000	Radio Havana Cuba	SS
1200	7230	Xinjiang Peoples BS, China	CC
1200	7280	Voice of the Strait, China	CC
1200	11775	Caribbean Beacon, Anguilla	Gene Scott
1200	9525	Voice of Indonesia	
1200	4890	NBC, Papua New Guinea	
1230	15205	Radio Free Europe	RR
1230	15400	YLE/Radio Finland International	Finnish
1230	11825	Adventist World Radio, via Guam	CC
1230	6348	Echo of Hope, S. Korea	KK
1230	9310	IRRS, Italy	Sun.
1230	7185	Bangladesh Betar	
1300	9595	Radio Nikkei, Japan	JJ
1300	7235	Voice of America relay, Tinian, No. Marianas	KK
1300	9495	Shiokazi, Japan via Taiwan	KK, others
1330	15450	Voice of Turkey	
1400	15240	Radio Sweden, via Canada	Swedish
1400	17850	Radio Jamahiriya/ V of Africa, Libya, via France	
1400	15140	Radio Sultanate of Oman	AA
1400	11690	Radio Jordan	
1430	9625	CBC Northern Service, Canada	
1430	13865	Rikisuvarpid, Iceland	II
1499	13710	All India Radio	
1530	13775	Radio Austria International, via Canada	
1600	11805	Radio Okapi, Congo, via S. Africa	
1600	11570	Radio Pakistan	
1700	17770	Channel Africa, South Africa	
1730	13640	Voice of Turkey	GG
1730	15475	Africa No. One, Gabon	FF
1800	13710	Radio Sweden	Swedish
1800	13730	Radio Canada Int., via Germany	
1800	17680	Voz Cristiana, Chile	SS
1830	15360	KBS World Radio, South Korea	RR
1830	15495	Radio Kuwait	AA
1830	17810	Radio Nederland, via Bonaire, NWI	
1830	15560	RDP International, Portugal	PP
1830	15300	Radio France International	FF
1830	15630	Voice of Greece	Greek
1830	15380	RAI International, Italy	II
1900	15275	Deutsche Welle relay, Rwanda	GG
1900	15345	RTV Marocaine, Morocco	AA
1900	15410	Voice of America relay, Morocco	
1930	15730	Voice of America relay, Sao Tome	FF
1930	15455	Voice of Russia-Armavir	FF
2000	11735	Radio Tanzania-Zanzibar	Swahili
2000	13765	Vatican Radio	
2000	15120	Voice of Nigeria	
2030	12085	Radio Damascus, Syria	
2030	17850	Radio Exterior de Espana	SS
2030	15476	Radio Nacional Arcangel, Antarctica	SS
2100	9575	Radio Medi Un, Morocco	FF
2100	9960	Radio Farda, USA via Sri Lanka	Farsi
2130	15230	Radio Nacional Venezuela, via Cuba	SS
2130	12050	Radio Cairo/Egyptian Radio	AA
2130	11600	Radio Prague, Czech Republic	
2200	11820	BSKSA, Saudi Arabia	AA
2200	15220	Radio Japan, via Ascension Is.	
2200	9830	Voice of Turkey	
2200	15720	Radio New Zealand International	
2200	15345	RAE, Argentina	SS
2200	9925	Croatian Radio, via Germany	
2230	7320	Radio Jamahiriya/V of Africa, Libya, via France	AA
2230	9705	La Voix du Sahel, Niger	FF
2230	9300	Radio Varna, Bulgaria	BB; wknds
2300	9750	Vatican Radio	
2300	11950	Radio Cairo, Egypt	
2300	15640	Kol Israel	HH
2300	6070	CFRX, Toronto, Canada	
2300	9925	Voice of Croatia, via Germany	Croatian
2300	9665	Radio Marimba, Brazil	PP
2300	9675	Radio Cancao Nova, Brazil	PP
2300	11620	All India Radio	HH
2300	7235	RT Algerienne, Algeria, via UK	AA
2330	12010	Voice of Russia - Samara	PP
2330	11940	Radio Romania Int.	
2330	17810	Radio Japan	CC/EE
2330	9875	Radio Vilnius, Lithuania	
2330	7440	Radio Ukraine International	UU
2330	9505	Radio Record, Brazil	PP

by Harold Ort, N2RLL

New, Interesting, And Useful Communications Products

New SkySweeper Versions

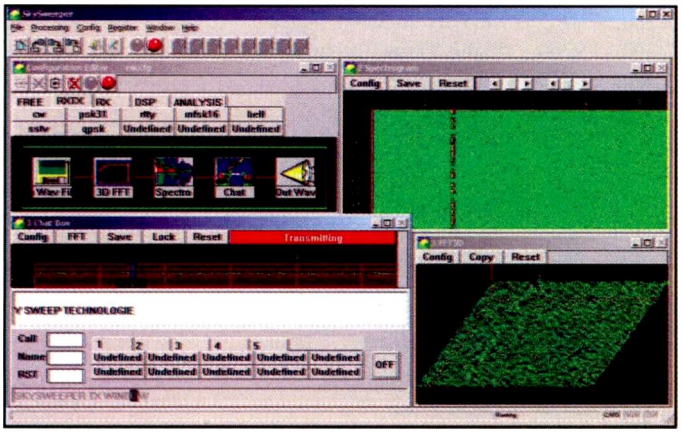
SkySweep Technologies has just released new versions of its SkySweeper, a sound card-based radio signal decoding, analysis, and transmitter software. The new versions do not need new activation codes if you have already registered a previous version.

Changes and new features in version of 3.10 (updated from version 3.9) include automatic sound card clock calibration function, OLIVIA decoder, OLIVIA transmitter, a new generation MIL-STD-188-141A (ALE) decoder, new generation AX.25 packet (HF and VHF) decoder, IQ constellation display, improved platform support for the sound card clock error correction, and spectrogram display optimized for weak signals.

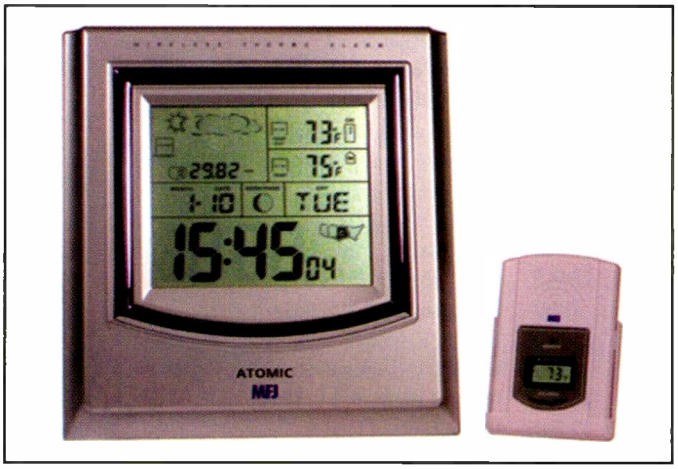
Version 4.10 improvements over version 4.09 include automatic sound card clock calibration function, OLIVIA decoder, OLIVIA transmitter, a new generation MIL-STD-188-141A (ALE) decoder, AX.25 packet (HF&VHF) decoder, MIL-STD-188-110A/B / STANAG 4539 decoder, MIL-STD-188-110A/B / STANAG 4539 transmitter, STANAG 4285 decoder, STANAG 5066 decoder, and AX.25 packet (HF&VHF) decoder.

Version 5.10 improvements over version 5.09 include automatic sound card clock calibration function, OLIVIA decoder, OLIVIA transmitter, new generation MIL-STD-188-141A (ALE) decoder, AX.25 packet (HF&VHF) decoder, MIL-STD-188-110A/B / STANAG 4539 decoder, MIL-STD-188-110A/B / STANAG 4539 transmitter, STANAG 4285 decoder, STANAG 5066 decoder, AX.25 packet (HF&VHF) decoder, and FSK speed analyzer. Also a packet end-sync feature has been added to the generic bit tool, which allows users to decode selected packets from the bit stream. Other improvements include better platform support for the sound card clock error correction, spectrogram display has been optimized for weak signals, the CROWD36/MFSK36 decoder and the IQ constellation display have also been improved.

SkySweeper Standard (version 3.10) sells for $155, SkySweeper Plus (verion 4.10) for $255, and SkySweeper Professional (version 5.10) for $640. The new versions can be downloaded from SkySweep Technologies' website at www.skysweep.com. Please tell them you read about the new SkySweeper versions in *Popular Communications*.



SkySweep Technologies has just released new versions of its SkySweepers. In this screen shot, simultaneous CW reception and transmission capabilities are shown.



The new MFJ-193RC gives users wireless indoor and outdoor temperatures, humidity, atomic clock, date/day display, and much more for $59.95.

New MFJ Solar-Powered Atomic Clock And Compact Deluxe Atomic Wireless Weather Stations

Here's a Solar Atomic Clock that never needs batteries. The MFJ-136RC, which sells for $29.95, has a large LCD display (time digits are 1 5/8 x 2 1/4 inches) and gives accurate atomic time from WWVB. Housed in a gray/silver plastic cabinet, it has an alarm function, green backlight, and measures (HWD) 4 1/4 x 3 x 1 1/2 inches

The new MFJ Compact Atomic Wireless Weather Station, MFJ-193RC, sells for $59.95 and gives you wireless indoor and outdoor temperatures, humidity, atomic clock, date/day display, back-light and forecast icons (sunny, slightly sunny, cloudy, rainy, stormy). This unit has large 2 1/4-inch time digits to give you forecasts in a single glance. You can use up to three separate sensors, and the outdoor remote sensor has a compact LCD display that is highly illuminated with a green background. The housing is made of tan metallic, tough, durable plastic for years of service.

The MFJ Deluxe Atomic Wireless Weather Station, MFJ-196RC, which sells for $259.95, is a professional-quality atom-

ic remote wireless weather station that gives you a base LCD display station, three sensors (thermo-hygro transmitter, wind and rain sensors), computer control RS-232 port, CD ROM software, and AC power adaptor. All the weather information is simultaneously displayed on the large user-friendly LCD for up-to-the-minute weather conditions. It receives and displays the WWVB radio-controlled time and date, indoor/outdoor relative humidity displays, air pressure, wind speed, wind direction with LCD compass, wind chill temperature, dew point temperature, weather tendency indicator, and storm warning alarm. A COM port makes an easy connection to your computer with programmable alarm functions for certain weather conditions as well as records of all minimum and maximum values along with time and date of their recordings. A detailed display gives rainfall data as one hour, 24 hours, and total since last reset.

To order, get a free catalog, or for the location of your nearest dealer, contact MFJ, 300 Industrial Park Road, Starkville, MS 39759; Phone: 800-647-1800; Web: www.mfjenterprises.com.

New Portable GPS Navigation System From TeleType Company

TeleType Company has just released a successor to its product line of vehicle GPS navigation with MP3 and Video player technology. The all-in-one device, called the WorldNav 3100, is a portable, touch-screen car navigation system that offers door-to-door GPS guidance with text-to-speech instructions including pronunciation of street names. The WorldNav 3100's convergence of portable in-car navigation with the popularity of the MP3 player, video player, and picture viewer, makes it possible for travelers to not only reach their destination with greater efficiency, but to easily carry along their favorite music, videos, and pictures.

Based on TeleType's GPS product line, the WorldNav 3100 is a compact system that weighs only six ounces. Users can navigate directly to a point of interest (POI) using the extensive included POI database, or to a business, home address, or even a desired street intersection. Currently, the U.S. version of the WorldNav 3100 offers these features: pre-installed, street-level maps for the entire United States, including Puerto Rico; "Auto Complete' when entering state, city, or street, allowing minimal keystrokes to obtain desired address; a built-in Li-Ion battery for using the GPS outside a vehicle; turn-by-turn route guidance with street name pronunciation; various settings that allow drivers to create the best possible routes; MP3 Player, Video Player, and Picture Viewer that can be used with your own SD card. The unit can be mounted to the windshield or dashboard and easily moved from car to car.

TeleType's WorldNav 3100 features a 3.5-inch diagonal screen and is available in two configurations, Deluxe ($399 MSRP) and Premium ($459 MSRP). WorldNav 3100 GPS can be purchased through online resellers such as Target.com, NewEgg.com, and PCMall.com. Dealers may contact TeleType directly for pricing. For further information, contact TeleType Company at contact@teletype.com, or 800-717-4478, or 617-542-6220.

The TeleType WorldNav 3100 GPS unit features a 3.5-inch diagonal screen and can be purchased through various online resellers.

Holiday Gifts Ideas from Pop'Comm ...

Heathkit - A Guide to the Amateur Radio Products

by Chuck Penson, WA7ZZE

Greatly expanded 2nd Edition- a must for collectors and Ham history buffs. A terrific trip down memory lane for any Ham who was there or wishes he had been. Pick up this 328 page volume and you won't be able to put it down!

Order No. HEATHKIT $29.95

The NEW Shortwave Propagation Handbook

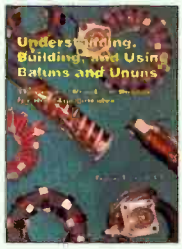
by W3ASK, N4XX & K6GKU

This authoritative book on shortwave propagation is your source for easy-to-understand information on sunspot activity, propagation predictions, unusual propagation effects and do-it-yourself forecasting tips.

Order No. SWP $19.95

Understanding, Building & Using Baluns & Ununs

by Jerry Sevick, W2FMI



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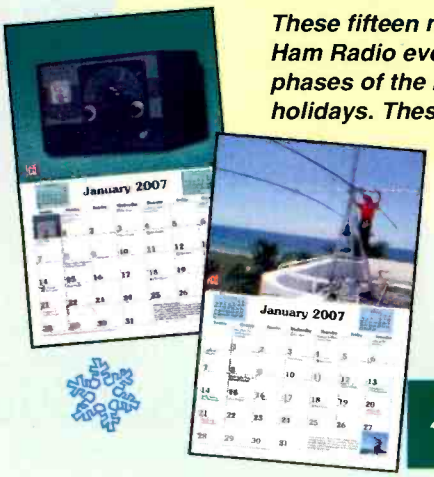

These fifteen month calendars (January 2007 through March 2008) include dates of important Ham Radio events such as major contests and other operating events, meteor showers, phases of the moon, and other astronomical information, plus important and popular holidays. These calendars are not only great to look at, they're truly useful, too!

Classic Radio Calendar - Fifteen magnificent full-color vintage radio images including Comcraft, Collins, GROSS, Heathkit, Hammarlund, Millen, National, Hallicrafters, E.F. Johnson, Allied Radio and more! **Order No. CCAL**

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W6SAI HF Antenna Handbook

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One of ham radio's most respected authors, W6SAI was known for his easy-to-understand, down-to-Earth, writing style. In keeping with this tradition, this book is a thoroughly readable text for any antenna enthusiast, jam-packed with dozens of inexpensive, practical antenna projects that work!

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by Sevick, W2FMI

This small but solid guide walks you through the design and installation of inexpensive, yet effective short HF vertical antennas. With antenna restrictions becoming a problem, this book could keep you on the air!

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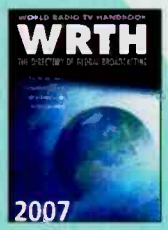
Are you a DX'er? Have you longed to be on the other side of the pile-ups? Do you dream of taking a rig to exotic locations? If your answer to any of the above questions is yes, this book is certain to bring you the vicarious thrills of operating from exotic places.

Order: UPTWO $19.95

2007 World Radio TV Handbook



The Directory of Global Broadcasting

The most up-to-date information on medium-wave, shortwave, and FM broadcasts and broadcasters. Includes articles on topics of great interest to both listeners and dxers, reviews of the latest equipment, updated maps showing SW transmitter sites and more.

Order No. WRTH $29.95

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The World's #1 selling shortwave guide! Have the world at your fingertips! Details on what to buy and where to tune.

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By Ian Poole, G3YWX

RSGB, 2000 Ed., 112 pages

Everything you will need to help you enjoy VHF/UHF to the fullest. Help choosing the right transmitter, receiver, antenna, utilizing the correct part if each band and more!

Order No. RSGVUAR **$14.50**

Antenna Toolkit 2

By Joe Carr, K4IPV

RSGB & Newnes, 2002 Ed.

256pages.A definitive design guide for sending and receiving radio signals. Together with the powerful suite of CD software included with this book, the reader will have a complete solution for constructing or using an antenna; everything but the actual hardware!

Order: RSANTKIT2 **$40.00**

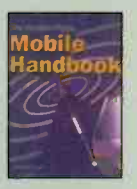
The Antenna File

RSGB. ©2001. 288 pages.

50 HF antennas, 14 VHF/UHF/SHF antennas, 3 receiving antennas, 6 articles on masts and supports, 9 articles on tuning and measuring, 4 on antenna construction, 5 on design and theory, and 9 Peter Hart antenna reviews. Every band from 73kHz to 2.3GHz!

Order: RSTAF **$32.00**

Amateur Radio Mobile Handbook



RSGB. 2002 Ed., 128 pages.

The Amateur Radio Mobile Handbook covers all aspects of this popular part of the hobby. It includes operating techniques, installing equipment in a vehicle and antennas, as well as maritime and even bicycle mobile. This is essential reading if you want to get the most out of your mobile station.

Order: RSARMH **$21.00**

VHF/UHF Handbook

Edited by Dick Biddulph, M0CGN

RSGB, printed 2002., 317 pages.

One of the most complete guides on the theory and practice of reception and transmission on VHF/UHF band. Hundreds of illustrations and photos.

Order: RXVUH **$35.00**

HF Antenna Collection

RSGB, 1st Ed., 1992. 233 pages.

A collection of outstanding articles and short pieces which were published in Radio Communication magazine during the period 1968-89. Includes ingenious designs for single element, beam and miniature antennas, as well providing comprehensive information about feeders, tuners, baluns, testing, modeling, and how to erect your antenna safely.

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Edited by Dr. George Brown, M5ACN

RSGB 2002 Ed, 224 pages.

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

Stealth Antennas—By Necessity!

"Life is a highway
I want to ride it all night long
If you're going my way
I want to drive it all night long"

—From "Life is a Highway" by Tom Cochrane

I have always liked that song. The lyrics are indicative of life in general, and we are always moving down life's highway. So it is with the Arland family. After almost 20 years living in Wilkes-Barre, Pennsylvania, about 100 miles north of Philadelphia in the beautiful mountains of northeastern Pennsylvania, it's time we pulled up stakes and moved. After 20 years in the U.S. Air Force, moving every two to four years (well, there were a couple of long tours overseas, actually) it was weird not moving for almost 20 years! I actually got "itchy feet" several times, wanting to pack up and hit the road to find new pastures. My wife, Tricia, feels the same way, since she was also in the Air Force.

My time in Wilkes-Barre has yielded quite a nice antenna farm at W30SS (oh, yeah, I changed callsigns a couple of months ago), which I will definitely miss after I move. We found property and a house near Lake Lanier near Buford, Georgia (just north and east of Atlanta), that we want to purchase. It will be our retirement home. There are several problems facing the two of us as we get set to move. Our present house is a three-story, 3,500-square-foot home, with basement, and includes a full-size city lot on the side, in-ground swimming pool, and lots of antennas. Our new home will be around 1,000 square feet and has a whole bunch of restrictive covenants regarding antennas. Needless to say there will be an "adjustment period" when we move.

Our biggest problem is going to be unloading 20 years' worth of "junque" that we've collected in order to transition into a house that is roughly one third the square footage of what we have enjoyed in the past.

The Antennas, Oh, The Antennas!

Then, there's the antenna situation. My 55-foot tower with the big HyGain TH-7DX tri-band Yagi antenna is a real pile-up buster and is especially useful when using QRP (under 5-watt) power levels. I have several wire antennas in the air, hung off the side of the tower, which acts as an antenna support structure. This allows me full access to the HF spectrum for both transmitting and receiving. Let's not forget the myriad VHF/UHF antennas on poles and chimneys that feed several scanners and VHF/UHF transceivers at W3OSS. Life at the new place will be different and that is an understatement.

Stealth And Clandestine Antennas

Over the years I've touched on the topic of low-profile antennas for the radio hobbyist. Little did I realize that *I* would be in a position to start taking my own advice! Covenants, Conditions, and Restrictions (CCRs) are a fact of life in today's real estate market. It seems that everyone wants a clear view of the polluted skyline, unobstructed by steel towers with big beams. Now I don't know about you, but I find a big tower with big beams very pleasing to the eye. Unfortunately, I am in a minority.

The Force 12 Flagpole antenna takes about an hour or so to install. Force 12 can be reached at 800-248-1985.

Once I found out about the CCRs at our new retirement home, I immediately contacted the development owners and requested a copy of their CCRs. Looking over the rules and what I could and couldn't do with my property (hmmm...now there's a dichotomy), I started reading the fine print in the contract. It seems that, while the development does not prohibit external antennas, they do require some rather radical approaches to keeping the offending antennas low key.

In talking with the owners, I found that there was another couple in our development who were also ham radio operators. Well, things were starting to look up. Now, at least I had a possible ally in the fight to erect an efficient clandestine antenna at our new location.

What You Can Do—More Than One Way To Skin A Cat

Stealth is your friend, and there are several approaches to stealth antennas and clandestine/low-profile radio operations.

At $249.95 from MFJ Enterprises, the MFJ-936B Deluxe Small High Efficiency Loop Tuner lets you drape a wire around a bookcase and attach both ends. It instantly turns into a small, high-efficiency multi-band transmitting loop antenna!

The first thing to remember is that you must be adaptable. Unless people know you're an active radio hobbyist, if you keep your antennas extremely low profile, and use QRP power levels to transmit, no one will be suspicious. That is a fact of life. I know QRPers who have used indoor HF antennas and their neighbors never even knew they were on the air enjoying ham radio in a development that prohibited any form of radio/scanner antennas at all!

As many of you have probably realized, antennas are one of my favorite topics. Following are several antenna maxims that you need to memorize if you plan on becoming an antenna guru:

"You can't work (or log) 'em if you can't hear 'em." This is oh, so true! The more wire you use and the higher you can erect it, the more you will work (hear), it's just that simple. Unfortunately, life is funny. Right now I have 'em "high and long," but not for long (sorry about the pun).

"All antennas are a compromise." You trade efficiency for convenience, bandwidth for size, take-off angle for height, etc. There is no such thing as a "death ray" antenna, one that will work efficiently at all heights over a wide bandwidth of frequencies and be invisible to your neighbors.

"CCRs are a fact of life for those who want to live in newer progressive communities." Among the things they specifically single out are external antennas. But CCRs vary between housing developments, and some *do* allow various types of antennas. Normally there are a whole bunch of caveats that must be taken into consideration, however, before you approach the housing commission to plead your case to put up an antenna.

So what do you do? I worked pretty hard to form a plan of attack for my future radio station, and I thought I would share some of my research with you. Luckily, there are a number of options.

First Option: No outside antennas at all. Use inside antennas in the attic/crawlspace for VHF and UHF and restrict your operating to those bands. Okay, being a died-in-the-wool HF enthusiast myself, I cannot abide by a VHF/UHF-only hamshack. If I wanted to do that, I'd sell off the whole station and by one of the do-it-all handhelds, more appropriately called "a shack on a belt"! No thanks—there's more to ham radio than the high bands.

Second Option: Use indoor HF antennas stapled to the roof supports inside the attic/crawlspace. Typically these take the form of either a mono-band dipole for 20 meters or higher or a multi-band random length dipole fed with 300- or 450-ohm twinlead/ladder line and an open wire antenna tuner. During my stay in England, I lived in an off-base housing estate that prohibited external antennas. So I got up inside the attic, stapled a dipole center insulator at the apex of the roof supports on one end of the house, ran the dipole legs down to the floor, and then ran them back the length of the attic. I had roughly a 40-meter dipole, sorta folded up, fed with 300-ohm ladder line via an MFJ tuner with a 4:1 balun. This worked very well for over two years and garnered me several hundred HF QRP contacts using a Ten-Tec Argonaut 515 with about 3 watts RF output!

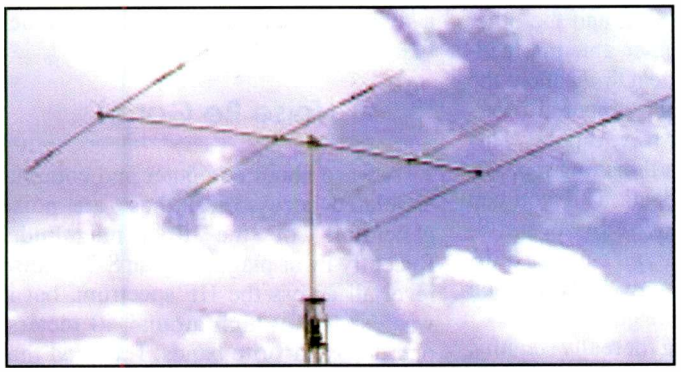
(As a matter of fact, I went over my logs a couple of years ago and found that during the time I was using that antenna, I worked 87 countries on my way to DXCC. Given another couple of months, I could have easily worked the additional 13 countries to qualify for DXCC from that location. Not bad for wire antennas, low power, and clandestine operations. Of course, this antenna worked great for shortwave listening, also. I logged a number of elusive SW outlets using the indoor attic dipole and an old British Army Mk-123 "spy set" as a SW receiver!)

Third Option: Commercial multi-band dipole antenna in attic/crawlspace. There are a couple of antenna companies that offer what looks to be a driven element from one of their smaller tri-band beam antennas configured as a tri-band dipole. Alternatively, you can purchase a set of mono-band mobile whips from companies like Hamstick, along with a special aluminum bracket/dipole feedpoint that will place the two whips end-to-end, forming a mono-band dipole antenna. Either one of these antennas could be suspended horizontally in the attic/crawlspace using monofilament fishline and fed with coax, via a tuner. No need for the 4:1 balun, since these antennas are coaxially fed. That brings the cost of the tuner down a bit, too.

The only drawback to this arrangement is the exhaustive time and effort needed to tune the elements to the proper lengths to get these types of antennas to perform well at the desired frequencies. Being short dipoles to begin with, and then coil-loaded (actually, they are called "traps" because they electrically shorten or lengthen the dipole elements as you change frequency bands), there is a bandwidth compromise. Bandwidth on these antennas is extremely narrow. Therefore, you should adjust the element lengths to accommodate the most often used portions of the bands the antenna is designed for and use the tuner to skew the operating window appropriately. Again, this is a compromise and probably my least favorite choice when it comes to clandestine HF antennas.

Fourth Option: Become intensely patriotic. Flagpoles are very nice to have on your property. They afford you the option to display our nation's flag, a POW/MIA flag, and possibly a favorite NFL team or NASCAR driver. Seriously, folks, you can get away with a lot by using a flag pole as a vertical antenna. No, I'm not kidding. There are at least three companies that currently sell some form of vertical that either is an actual flagpole or can be easily disguised as one! How's that for clandestine/stealth technology?

Force 12 (www.force12inc.com), IAC (www.iacantennas.com), and SteppIR (www.Steppir.com) all have vertical antennas that will work quite well and will be aesthetically pleasing to the housing commission of your gulag, er...compound...no, housing development—that's it! Having recently erected a flagpole (a 20-footer from Sam's Club that cost $80 on sale), I started thinking about how I could feed it to make an HF vertical antenna for 40 to 10 meters.



Restrictive covenants likely wouldn't allow you to put up an antenna like this Cushcraft A4S tri-bander, but you do have options.

The Force 12 is very similar (if not an exact duplicate) to the Sam's Club flagpole, consisting of an aluminum antenna about 16 feet long. The vertical antenna radiating element is made from four, four-foot-long aluminum tubes (about 2.25 inches in diameter) that fit together to form a 16-foot flagpole. On top is a shiny ball with a halyard loop to hold the flag halyard when it is raised and lowered. There's a cleat on the bottom section to tie off the halyard. It all fits into a short mounting post that's placed into a hole in the ground filled with one or two sacks of "Quick-Crete" concrete mix. In less than a day you can dig the hole, place the mounting post, fill it with concrete, let it cure, and erect your antenna/flagpole!

My Sam's Club flagpole came with an address where you can obtain extra four-foot aluminum pole sections, so making my flagpole into a full size 40-meter quarter-wavelength vertical (about 32 to 33 feet long) would not be a big deal. Ditto with the Force 12 16-foot flagpole/antenna. Adding extra aluminum poles will convert this 20-meter quarter-wavelength vertical into a quarterwave antenna for 30 meters (approximately 25 feet long) or 40 meters.

Getting The RF To The Antenna

There are several ways to get RF from your radio set to the antenna; coaxial cable being the most versatile. Dig a trench about 14 to 16 inches deep (to get below the frost line during winter) and run the coax out from a convenient window, or bulkhead coaxial fitting in a wall or window frame, into the trench to the base of the antenna/flagpole. Here, again, you have a couple of choices. You can shunt feed the flagpole for mono-band operation (in this case 20 meters), or place an antenna tuning unit or some kind of remote matching device (SGC offers a great series of tuners designed for just this type of operation, visit www.sgcworld.com) to allow multi-band operation.

One caveat regarding lengthening the Force 12 16-foot (or in my case 20-foot) flagpole to accommodate 25- or 40-meter operation: You're going to have to add more mass at the base of the antenna. This means considerably enlarging the hole for the mounting post, because you're going up in the air almost double the length of the original flagpole if you intend to use it for 40 meters. That's okay, though, there's nothing like a little added ballast at the base to ensure that the entire thing won't topple in a high wind. You might even consider some form of guying arrangement using Kevlar rope (available at The Radio Works, www.theradioworks.com) and a guy ring about three-quarters of the way up the flagpole for use during high winds. The Kevlar rope will not stretch nor will it be conductive, so it won't detune the antenna or skew the pattern. Don't forget to retire the flag during high winds as the mass of the flag adds dramatically to the wind loading of the flagpole.

Don't Forget The Ground Radial System

While you can get some outstanding SWR readings using a quarterwave vertical antenna without radials, your antenna efficiency is nearly zero! Why? The ground radials make up the other quarter wavelength of the vertical section and capture RF ground currents, greatly increasing the radiation resistance and the overall efficiency of the antenna. You'll be amazed how well a vertical antenna performs with as few as eight or 10 radials going out from the antenna like spokes in a wheel. You can bury these just under the ground using a hatchet or lawn edging tool to cut a shallow slit in the sod. Just be sure that they're deep enough that your lawn mower won't get caught in them. That could prove very embarrassing.

Getting Looped?

Lastly, in this section of clandestine/stealth antennas for the condo-dweller or CCR-beleaguered radio aficionado, we look at the loop antenna. Unlike dipoles and end-fed wire antennas, a loop is a "closed system." There are literally no loose ends. One end of the loop connects to an antenna feed point, the loop

goes out and comes back, and the other end connects to the other antenna feedpoint. Now the really neat thing about the loop is that it's very quiet compared to vertical antennas and half-wave dipoles. This goes a long ways toward making it possible to hear the other station. If you can reduce your received noise by several S-units (remember one S-unit equals a 6-dB change in received signal level) then you're way ahead of the game.

Since we're striving for really stealthy, I won't delve into the world of outside loop antennas. However, you should know that with some very small, very robust wire, you could easily put up a large outdoor loop, tune it with an antenna tuner and have a multi-band antenna system that's hard to spot from more than 10 feet away. One give-away would be some sparrows sitting in mid air with no "visible means of support," so to speak. One must be careful.

Interior loops are also picking up quite a following. So much so that MFJ Enterprises (www.mfjenterprises.com) has designed and marketed a series of loop tuners specifically designed to work a random length of wire, erected as an indoor loop for an HF antenna.

I've been doing some testing using the MFJ 936B Deluxe Small High-Efficiency Loop Tuner and some indoor loops at my present location. Results are mixed, but they're encouraging.

First, even though loops exhibit lower received noise than other wire antennas, erected indoors, loops have the disadvantage of being erected near manmade noise sources like lamp dimmers, fish tank heaters, electric blankets, and computer power supplies (more on this in a few minutes). Therefore, you're dealing with the proverbial double-edged sword, when it comes to indoor loops.

Second, indoor loops can be made to resonate using a loop tuner like the ones MJF markets; however, it doesn't mean that they're radiating RF efficiently. Likewise, the dwelling itself may have a few things going against using an indoor loop. Foremost drawbacks are aluminum siding and a steel roof, both of which are quite common in building and home construction. Think of an aluminum-sided house as being akin to a Faraday Cage, used in electronic labs to shield equipment under test from external RF fields. Add a steel roof and you have an almost RF tight enclosure. Vinyl siding does not inhibit RF energy from radiating, so if you have a choice, go for a dwelling that has vinyl siding rather than aluminum.

Noise Be Gone!

A word about computer and computer-related accessories: these are noise generators of the first magnitude. Recently I was plagued by an S-7/8 noise level all across the HF spectrum, but it was especially high around 40 meters, one of my favorite bands. I noticed that when I grabbed one of the handles on my TRC-77A transmitter/receiver, the noise was substantially reduced. This got me thinking that maybe I was adding enough body capacitance to the radio chassis to reduce the noise. That meant that I was probably sitting near the noise source.

I started unplugging "wall-warts" (those pesky little black cubes of electronic magic that provide DC power to operate computers, cordless phones, cell phone charges, etc.) in an attempt to isolate the noise source. As soon as I unplugged the small wall-wart supply to the Targus Cool-Deck (a plastic tray that sits under my laptop and provides cooling fans and multiple USB ports for the computer) the noise disappeared. I was amazed at how much noise this device's power supply radiated. With that problem solved operation with the TRC-77A was a lot more pleasurable.

As I previously stated, results of the indoor loops using the MFJ 936-B loop tuner are mixed but interesting. For now, suffice it to say that an indoor loop with an MFJ 936-B loop tuner *will* get you on the air in a clandestine way, but it's not for use with QRP power levels, at least not at this point. Running power levels in excess of 15 watts will generate contacts and, of course, using this loop with an HF shortwave receiver will allow you to cruise the bands in fine style.

Stay Tuned For An Update

As time progresses and I finalize my plans on a new antenna farm for our new home, I'll report back on my success or failure. There are a lot of factors at work here and the CCRs don't do me any favors. However, being adaptable is a big part of enjoying the radio hobby. No reason to sell off the station just because you hit a temporary speed bump in erecting effective antennas.

Happy holidays, and see you again next month! Remember, preparedness is not optional! ■

by Gordon West, WB6NOA, WB6NOA@arrl.net

Ultrasonic-Sensor Wired Weather Station

The WeatherStation PB100's big readout gives you wind direction and speed at a glance.

When the weather outside is frightful—and if you pay attention to such things—you may hear about wind cups flying off the outside weather monitor system. If such things pique your interest, you'll also want to know that the likely cause is not necessarily centrifugal force, but rather flying debris striking the delicate pickup units. And they *are* delicate; both the wind cup assembly and the wind direction vane must be in perfect balance and absolutely free of debris to read wind speed and wind direction properly. After the devastating hurricanes over the last couple of years, private and municipal weather station managers and meteorologists looked for a major design change to improve the mechanical spinning cups and rotating wind vanes.

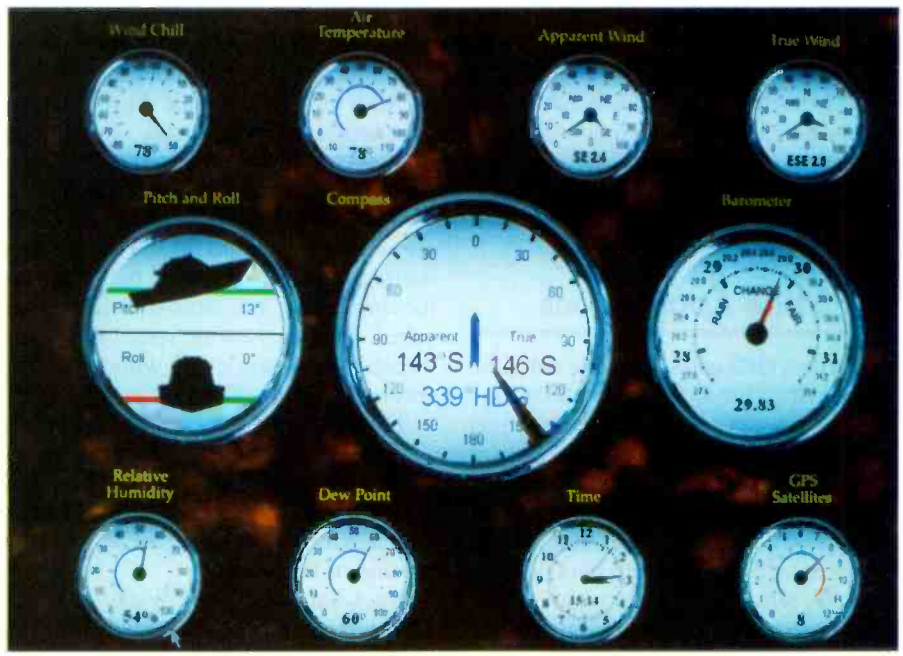
A company called Airmar Technology Corporation (www.airmar.com), based in Milford, New Hampshire, has stepped up to the plate. It introduced the WeatherStation PB100, a 12-VDC ultrasonic wind speed and wind direction sensor with *zero* moving parts—no cups to become damaged by flying debris and no wind vane to get wiped off by flying branches. Apparent wind speed and direction are instead calculated from pulses that are transmitted from the ultrasonic sensors. The air flowing through the wind channel determines how fast the pulses travel, providing the wind speed and direction reading. This is the same principle that has been used for years to measure fluid flows in industrial and medical equipment, as well as to measure apparent hull speed as a boat travels through the water.

"Mariners had the same problem as meteorologists," says Mark Reedenauer, product marketing manager for Airmar. "Old fashioned boat-speed spinning paddle wheels would constantly get clogged with sea debris and would show erratic operation as gunk built up on the paddle wheel blades." He points out that the ultrasonic measurement of wind speed and direction through the company's patented sensor continues to stay accurate even in driving rain. Water molecules and even thin ice on the blue reflective ultrasonic plate will not affect performance.

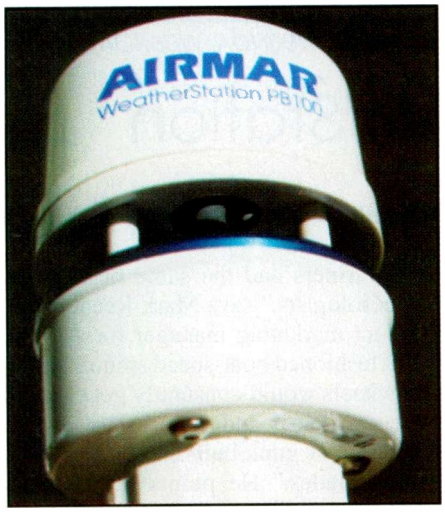
How It Works

Inside the Airmar solid-state sensor is a barometric pressure pickup, relative humidity pickup, solid-state compass (called a fluxgate compass), electronic level, accelerometer pickup, and even an optional GPS sensor.

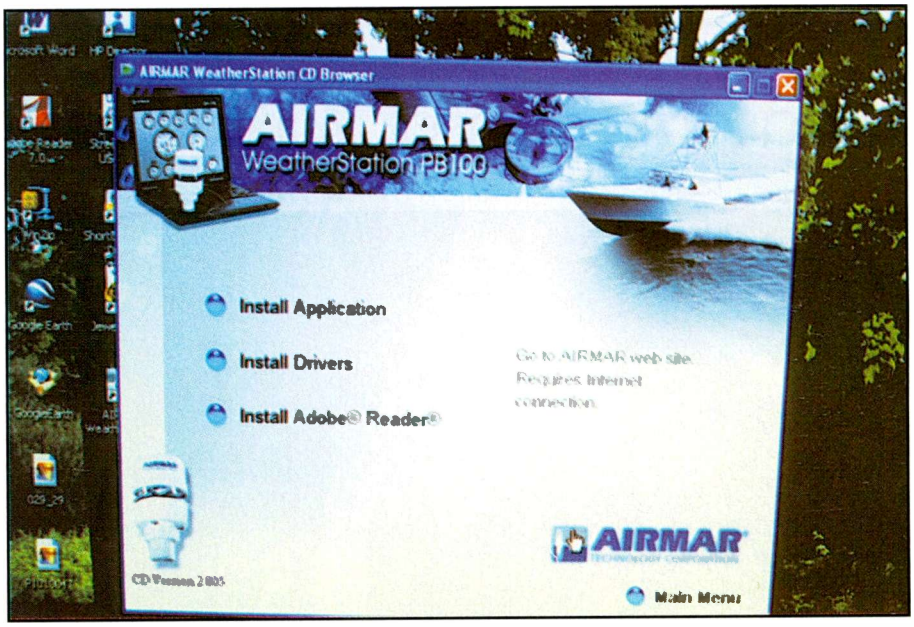
The weather sensor, weighing only a little over half a pound, feeds about 30 feet of supplied flexible multiconductor cable to a small black box that converts all sensor readings over to a small cable



Here's the laptop readout showing "vehicle" pitch and roll!



The antenna mount should be placed at the selected location, mark the holes for the screws and a hole in the center of the mount for the cable. Storm spotters will appreciate no moving parts that could fly off in a tornado!



The program took less than three minutes to install.

that, in turns, feeds your PC via a USB connector. There's also a "combiner" black box in case you also want to drive another type of NMEA 0183 data stream. But for your PC, just one nice neat connection to the USB port does the job.

The company supplies the instruction manual and software on a single computer CD, called WeatherCaster PC, which is simple to install. Amazing to me was that the weather station readouts popped up on the screen. You have multiple choices of what the screen could read out, including history graphs, to give you a quick review of weather trends leading up to the current readouts. My favorite was the large screen wind speed and wind direction display with barometric pressure, wind chill, and relative humidity registered on small digital boxes to the right. You can customize the screen for almost any type of event, so you simply pick and choose those options you want to dominate the readout.

Some Applications

But do a GPS and solid-state compass make sense for a house installation? Well, it's always good to know where you are and how to get pinpoint position for magnetic or true north. And when the equipment is installed in a moving vehicle or vessel, the solid-state compass and GPS will self-calibrate and read out true wind direction and true wind speed, regardless of how fast you're moving (a common home weather station installed in a storm chaser's vehicle might be confused by the motion).

Indeed, home and office installations of weather stations are common, and *this* one will work well in this type of fixed installation. If you don't plan to go mobile with the 12-volt station, however, you won't need the optional GPS engine that fits inside the weather head unit on the roof—unless you always want to see where you are on land!

The GPS engine is ideal for mobile use; it will correlate wind direction, computing your movement through the air and the real wind direction. Your heading in a moving vehicle is calculated by both GPS direction and the solid-state compass. When you're not moving, there can be no easy way to determine heading with only GPS, hence the dual heading sensors inside the head.

You could also tie this system into a computer address where anyone around could log on to your weather station to see what's happening at the location of the pickup unit. Because there are no moving cups or slow-to-react wind vanes, changes in wind speed and wind direction will dazzle you with their split second updates.

For the mobile storm chaser, the solid-state ultrasonic sensor offers minimal drag on vehicle performance, and the optional built-in GPS and solid-state compass continuously give you a true reading of the wind.

So what, you say? Well, let's say you're trying to outrun a tornado blasting at 80 mph directly on your tail. If you were driving 80 mph trying to escape the tornado, a regular wind indicator would show zero wind speed. But because the Airmar sensor has a built-in GPS that keeps track of your velocity and direction over land, plus the added built-in solid-state compass, your laptop screen will show your true wind speed and direction, even though your storm chaser driver tries a new route attempting to get out of the way of the observed tornado.

There are countless other uses in moving vehicles or mobile incident command units. With so much attention to biological terrorism, accurate wind sensors, which can react to a tiny puff of wind, will be in order. A micropuff in still air will *instantly* register as a fraction of wind speed and you'll get an accurate readout of that tiny puff.

Best of all, a laptop with a remote display can easily present a big screen readout of wind direction, or maybe wind and temperature history, that even Mr. MaGoo can make out at 100 feet! Look at the display for yourself at the company's website.

The Experts Say...

The WeatherStation PB100 was awarded the Best of Sensors Expo Silver Medal in the sensors category at Sensors Expo 2006. So if your activities call for top-notch, dependable monitoring equipment, the WeatherStation may be the answer you've been looking for. The MSRP is $1195 and includes the compass and GPS sensor. Contact the company for more information and be sure to tell them you read about it in *Popular Communications*!

by R.B. Sturtevant, AD7IL

Radio Fun And Going Back In Time

Q. When was the first football game broadcast?

A. That historic event occurred on November 18, 1919. Wesleyan was playing New York University in New York City. Although there was a large delegation from Wesleyan at University Heights, many students couldn't make the trip from Middletown, Connecticut. The authorities at NYU asked Dr. Lee de Forest if he could help. De Forest was enthusiastic about the project and established a communications center in the Physics Department of Wesleyan the night before the game. On game day a newspaper reporter from NYU wrote up the highlights of the game, and a messenger took the script to a telephone connected to the de Forest Lab. The lab then broadcast the script to the Wesleyan Physics Department. To make sure there were no slip-ups the script was then telegraphed to Wesleyan as a back-up. With that system students at Wesleyan could follow the game closely.

Q. What part did radio play in the beginning of World War II?

A. Most people consider the beginning of World War II in Europe to be Hitler's invasion of Poland. With that in mind, remember that Dr. Joseph Goebbels had already used radio extensively to lay down a blanket of propaganda before the troops moved into Austria and Czechoslovakia. Poland was to be no different. Germany had lost a considerable amount of pre-1918 territory to Poland, including the Silesian coal fields and the Danzig Corridor. Particularly painful to Teutonic pride was the Corridor, which split East and West Prussia in two and gave Poland its only link to the sea. Goebbels hammered away at the Poles over the radio concerning these and other indignities.

When the Poles showed no sign of buying into Goebbels tripe, some of Hitler's SS bullies rounded up a bunch political prisoners and dressed them in Polish Army uniforms. On August 31 the prisoners were taken to the German town of Gleiwitz near the Polish border. The prisoners were shot near the local radio station. The SS then used the station to broadcast a pro-Polish/anti-Nazi tape that had been prerecorded. The recording even included battle noise of the avenging German Army driving the invading Poles back across the border. The dead political prisoners added the element of truth to the whole operation. This "insult" to German sovereignty and pride could not go unchallenged. The next day, September 1, 1939, the German Army invaded Poland at 6 a.m.

As if that weren't enough, German military radio passed traffic on the Polish Army command nets, sowing confusion and panic in the ranks of Poland's smaller and ill-prepared army.

Q. How fast can a modern military direction finding (DF) station locate a transmitter?

A. Information of that sort is a little hard to find, as you can probably imagine. I have, however, found some figures from the '80s. A ground station—or even better, a helicopter at 1,000 meters altitude—located 25 kilometers behind the firing line can monitor transmissions for hundreds of kilometers. Any transmitter on the air for more than 30 seconds and located within 1 or 2 kilometers can be picked up with the latest model equipment. Two DF units can pinpoint even closer.

Q. Who was the first to start broadcasting the time on radio?

A. Well, it wasn't drive-time DJs telling you how late you were going to be getting to work. It was the Navy. The exact time information is required to calculate latitude, the long imaginary line that runs north and south through the North and South Poles. Get the time wrong by as little as 15 minutes and you could be hundreds or even thousands of miles from where you think you are located.

Around 1920 radio manufacturers started marketing to jewelers radio sets that tuned in to Navy frequencies. The jewelers were told that to be "up to date and accurate" in their business they needed to be able to put the exact time on the watches they sold. The easy-to-use set would allow them to tune in to any of 16 Naval transmitters for five minutes twice a day, at 11:55 to noon and 9:55 to 10 p.m. The various transmitters worked on 2500 meters, 2000 meters, and 750 meters and gave only the local time for the station transmitting. Some stations transmitted every day, while others took off Sundays and holidays. And remember, these were the days of CW only.

The stations would count off the seconds with dits for 29 counts, then pause for five seconds, then continue the count until the top of the minute. This was repeated for five minutes until the last half of the last minute. During the last 30 seconds there would be 20 counts, a 10-second pause, then a long dash signaling noon or 10 p.m. Over time this system was replaced by WWV and WWVH, which we all know and use for universal time.

Looking Back...

Five Years Ago In *Pop'Comm*

With a spectacular photo on our December 2001 cover of the cloud over the area where the World Trade Center once stood, writer Keith Stein looked at 9/11 with an ear to the radio, offering quotes from fighter pilots and frequencies monitored on that fateful day. Also covered was the 100th anniversary of Marconi's "Transatlantic Triumph" with details on just how he did it in 1901.

Ten Years Ago In *Pop'Comm*

New was the R.L. Drake SW1 shortwave receiver, reviewed on page 24 in December 1996 and priced at $299. As writer W.W. Smith reported, "The Drake SW1 receiver is a watershed event in the shortwave radio hobby. At a time when some pundits are trying to convince people that the shortwave hobby is no longer of any interest, Drake has come forward with a radio specifically designed to introduce this fascinating hobby to an entire new generation of radio hobbyists."

Twenty Years Ago In *Pop'Comm*

In the days before "The Internet" we did things like run three whole pages (!) of local VHF air route traffic control center (ARTCC) frequencies for air facilities around the country. We also offered detailed information on how the spider-web-like system worked in an article called, "ARTCC Remote Roundup" on page 18 of the December 1986 issue. New was the Realistic PRO-32 handheld scanner with 200-channel memory. You could even clip out the coupon in the magazine, send it to Fort Worth, and get a brand new Radio Shack catalog! Ahh, yes, those were the days.

by Kirk Kleinschmidt, NTØZ, kirk@cloudnet.com

Emergency Power

As I write this month's column, torrential rains have inundated much of Kentucky, with the Louisville area being hit particularly hard. Some spots saw as much as 4-1/2 inches of rainfall in a single hour! Needless to say, flooding was —and is—an ongoing problem. And then there's Katrina, the aftermath of which we're still struggling with. And the other day, the nation's heartland saw 40-plus tornadoes touch down.

Whether we live in an era of global warming, prophetic times or just one of those decades, the power has been going out a lot these days, and there's no end in sight. And when the power *does* go down, hams are still somehow expected to remain on the air, and often form a critical—or lone—link to the outside world.

Battery power, backed by solar and wind generation, can keep comms running for the initial response to most any emergency, but sooner or later someone's gotta fire up a gas- or diesel-powered generator. This month's column focuses on generator power and how to use it safely.

The Zen Of Gen

Basically, portable power generators are "backward" motors. They convert mechanical energy (shaft rotation) into electrical energy. Think of them as 120-volt "automobile-style" alternators that happen to be powered by lawnmower engines.

Portable power generators have been evolving much like portable HF transceivers. They're amazingly small, lightweight ,and packed with features! Yamaha's newest mini-gen, the EF2400iS, uses inverter technology (generally safe for solid-state devices) and is super quiet (53 to 58 dBA while running). The 70-pounder puts out a maximum of 2400 watts of AC. At about $1,200, the company doesn't exactly give them away, but if you fry your delicate radio gear by powering it with a bargain-basement generator, the "total cost of ownership" goes up! When purchasing compact generators, consider Yamaha and Honda models because of their long history of quality.

For most generators, as the engine spins an AC generator (alternator), the voltage and frequency of the AC output depend on the rotational speed of the engine. If the engine is running too fast or too slow, the unit's voltage and frequency will be high or low, accordingly. If the engine speed is correct, voltage and frequency will approximate the power supplied by the AC mains—a 120-VAC sine wave with a frequency of 60 Hz.

There are several electronic and mechanical methods used to keep voltage and frequency values stable as engine speeds vary. Many gens use mechanical "governors" to keep the shaft turning at the about the right speed. If the shaft slows down (because of increasing generator demand), the governor "hits the gas" to bring the shaft speed up to par (and vice versa). Sophisticated units also have electronic regulators to help keep things steady near 120 volts/60 Hz.

The most basic units have preset throttle/engine speeds that can be adjusted to match required loads. These are most useful for powering incandescent lights and small power tools that can safely tolerate "cruddy power." Use them to power solid-state devices at your own risk! As a rule, generators with better regulation and greater output power cost more money, while units that have little or no automatic regulation and less capacity are more affordable.

The Right Unit For You

To be useful, your generator must be able to safely power all of the devices that will be attached to it. For most ham radio stuff, simply add up the power requirements of all powered devices, add a reasonable safety margin (25 percent), and choose a suitably powerful generator that meets your other requirements.

Motors, however, need a lot more power to start up than they do to keep running. For example, a motor that takes 1000 watts to run may take 3000 watts to start the shaft turning. Light bulbs, soldering irons, space heaters, and most radios don't require extra start-up power, but be sure to plan accordingly.

This Honda EM3800S generator carries an MSRP of $2074.95 and has 3800 watts max output. It also features automatic voltage regulation, 12 VDC with100 watts output providing 8.3 amps, and weighs in at about 192 pounds.

Generator size and weight usually vary according to power output. Low-power units are lightweight and physically small, while beefier models are larger and weigh more. Tiny camper models (800- to 1000-watt output) are amazingly small and lightweight, but most micro-size gens lack sufficient regulation and may not be recommended for powering solid-state devices. On the other hand, some teeny gens can put out a whopping 90 amps of 12 VDC for charging batteries. If your gear is battery-powered, you may still be in luck. And strapping a big ol' battery across the generator's DC output can cure a multitude of sins.

Most portable generators are driven by small gas engines ("lawnmower engines"). Basic models are powered by standard side-valve engines. These are usually noisy and short-lived. More expensive models have overhead-valve (OHV) engines, pressure lubrication, low-oil shutdown, cast-iron cylinder sleeves, oil filters, and electronic ignition systems.

Smaller generators have small gas tanks (and vice versa)—but may not need more frequent refueling. Some small engines are more efficient than their larger counterparts and may run for half a day while powering small loads. Remember, generator run times are shown for 50-percent loads. If you're running closer to max capacity, your run times may be seriously degraded. The opposite is also true. "Extended run" models usually have more efficient engines and larger gas tanks. Typical portable generators run from three to nine hours on a full tank of gas at a 50-percent load.

As previously mentioned, voltage and frequency regulation—or lack thereof—should significantly influence your buying decision. While *any* generator can safely power light bulbs, heating elements, and power saws, when it comes to computers, TVs, and expensive ham radios, units with mechanical or electronic regulation are almost certainly required, if only for peace of mind! I test generators for "solid-state compatibility" with a small TV set I purchased for $5 at a garage sale!

Unloaded generators typically put out 130 volts at 62 to 63 Hz. As loads increase, frequency and voltage decrease. Under full load, output values may fall as low as 105 volts at 58 to 59 Hz. Normal operating conditions are somewhere in between. If "electronic voltage regulation" isn't mentioned on the box, consider calling the manufacturer before you buy. And although you might get lucky, don't expect expert help from the salesperson at your local hardware store; they're used to helping contractors who want to power lights and saws.

Safe, Not Sorry

Before starting the engine, read the user manual, at least twice, cover to cover. Carefully follow the instructions regarding engine oil, throttle and choke settings (if any). Be sure you understand how the unit operates and how to use the receptacles, circuit breakers, and connectors. Make sure the area is clean, dry, and unobstructed. Portable generators should be set up *outdoors*. Do *not* operate gas-powered engines in closed spaces, inside passenger vans, or inside covered pickup beds, etc. If rain is a possibility, set up an appropriate canopy or protective cover. Keep the generator and any attached cords dry!

Exhaust systems can get hot enough to ignite certain materials. Keep the unit several feet away from buildings, and keep the gas can (and other flammable stuff) at a safe distance. Don't touch hot engines or mufflers!

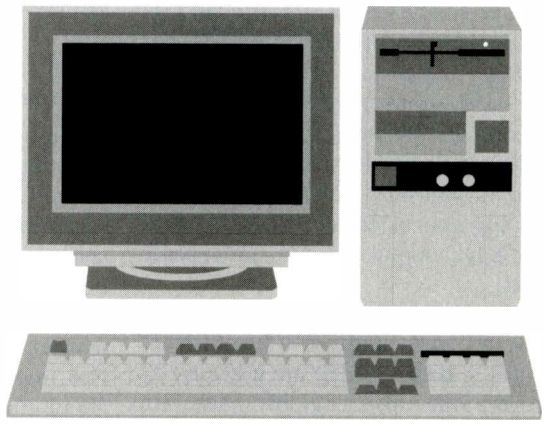
When refueling, shut down the generator and let things cool off for a few minutes. Don't smoke, and don't spill gasoline onto hot engine parts. A flash fire or explosion may result. Keep a small fire extinguisher nearby. If you refuel at night, use a light source that can't ignite the gasoline.

Your extension cords must have intact, waterproof insulation, three "prongs" and three wires, and must be sized according to loads and cable runs. Use 14- to 16-gauge, three-wire extension cords for low-wattage runs of 100 feet or less. For high-wattage loads, use heavier 10- to 12-gauge, three-wire cords designed for RV service. If you use long extension cords to power heavy loads, you may damage your generator and/or your radio gear. Try to position extension cords so they won't be tripped over or run over by vehicles. And don't run electrical cords through standing water or over wet, sloppy terrain.

If you buy the right generator up front you'll have reliable emergency AC for years to come. Use it correctly, stay safe and maintain it well. ■

by Joe Cooper, carm_popcomm@hotmail.com

Digital-to-Analog—The Technical Aspect Of The Conversion Process



On the morning of December 7, 1941, American code breakers uncovered startling information in some apparently routine Japanese diplomatic traffic: Japan had apparently given up on achieving a diplomatic solution to the growing problems it was having with the United States, and war seemed to be the only logical outcome.

The news quickly reached U.S. Army Chief of Staff General George Marshall, who was then faced with a serious decision. It was obvious that the new information needed to be disseminated as quickly as possible, but the question was which method of communications to use. Voice was the obvious choice for speed, but Marshall had serious misgivings about using this method of communication.

The only secure method the United States was using at that time was an analog device maintained by Bell Labs, known as the A-3 voice scrambler, which had been developed in the 1930s. The A-3 system was relatively simple, basically mixing the information signal with a second one containing noise, making it all but impossible to understand. This noise was removed from the signal at the receiving end by mixing it with a new signal containing identical noise, subtracting (or canceling) out the original noise.

Unfortunately, one or more German engineers were involved in the A-3 project during its development and understood the theory behind the technology. Therefore, when World War II began Germany knew exactly how the scrambling technology worked (though in reality it had been far from secret in the first place). As a result, Deutsche Reichspost, the government agency responsible for all telephone and telegraph transmissions in Germany and occupied Europe, developed effective methods for breaking the A-3 system by the early 1940s. Using an interception site located on the Dutch Coast, German intelligence was able to listen in to extremely sensitive military and diplomatic communications of the Allied forces, including those taking palace between President Franklin Roosevelt and Prime Minister Winston Churchill.

Since the Japanese were allied with Germany, Marshall was certain that they too had access to the technology needed to crack the A-3 system. So rather than using voice transmission, he opted for a coded radiotelegraph—and the message arrived after the sneak attack on Pearl Harbor had begun.

However, two years later, in the summer of 1943, the same German listening post that had been monitoring A-3 signals began to hear a new signal. It sounded like the buzz of an insect. At first the intelligence officers believed it to be a new type of high-speed telegraph signal. The Germans had used high-speed telegraph technology before the World War I in the form of a magnetic wire recorder. In that system, the original telegraph messages were transcribed to the wire recorder at normal speed. The recording was then played over a transmitter at a speed many times faster than could be achieved by a human operator, thus reducing the actual time required for transmission of a large amount of information. At the receiving station, another wire recorder, operating at the same speed as the one used in the transmission, recorded the transmission. When played back at a greatly reduced speed, the message was again intelligible and could be transcribed.

Believing this was what they were hearing, German intelligence officers dutifully recorded the transmission of these new signals and attempted to use the same technique of decoding them by slowing down the speed of the recorded signal. However, no matter how much they reduced the speed, they were unable to uncover anything remotely approaching a decipherable telegraph code. Undaunted, German intelligence continued to record countless hours of this buzz; recordings which the Allied forces later discovered when they overran the Dutch listening post.

A Radio First

What the Germans didn't realize was that what they were listening to was not telegraph code, but the first digitally sampled voice transmission. Code-named SIGSALY by the Allies, this new mode of voice communication was the first completely unbreakable technology to be devised for intelligence work. It was unbreakable because the data encryption made it undecipherable, rather than simply scrambling it with noise, as was done with analog technology.

The level of encryption provided by SIGSALY was so secure that Roosevelt and Churchill were once again able to speak to each other directly over a telephone, allowing vital ideas and information to be shared quickly. Thanks to the timely introduction of digital voice technology, the Allies were able to execute complex military maneuvers without having German or Japanese intelligence intercept and decode them. That ability to encrypt voice transmissions using digital technology, along with other important scientific advances, gave the United States and her Allies the advantage they needed to win World War II.

Making Digital Intelligible

The story of SIGSALY holds an important lesson for those of us who want to understand the practical application of digital technology in radio communication: it's simply that human

senses cannot use digital information. In fact, our senses of hearing and sight are very limited in their ability to process digital information. Anyone can witness this just by watching someone trying to master telegraphic code for a ham radio license. Of course, the human brain is very capable of deciphering extremely complex codes and patterns, but the time it takes to do this is can be very long. You can see this in watching chess players during a game, or reading about the solving of a mathematical riddle that took the best mathematical minds decades to unravel.

Yet today even the most inexpensive home computer can fly through, in less than a second, mathematical calculations that would have taken a human being months to work out. That, or course, is because today's computers can process millions of bits of information each second, something even mainframe computers had difficulty accomplishing 30 or 40 years ago. This cheap and accessible computer processing power now gives us easy access to digital signal processing (DSP) technology.

DSP is a critical component in any method of turning analog sound or video into digital information. When any digital mode is applied to analog voices, images, or data, the resulting flow of data is heard as that buzzing sound that engineers working on the SIGSALY project had dubbed "the Green Hornet," after the famous 1930s radio show of the same name.

The Underlying Difference

Let's look at the technical issues involved in converting a digital signal back into an analog form that human senses can understand. This is not a simple process, as German Intelligence quickly discovered, as there's no ready clue found in a digital data stream to help you decode the intelligence found in there.

So exactly how are the zeros and ones of digitally sampled information transformed back into analog form. Complicating the process is that there can be a wide range of problems encountered that can cause distortion and noise. Anyone who's worked with digital technology knows that the mode is not 100-percent noise free. A surprising number of clicks, crackles, skips and other noises can be introduced when a digital recording is made. The same is true for the reverse process, where digital signals are returned to their analog form.

Regardless of the technology employed—analog or digital—the goal for any method of communication is the same as that articulated by scientist Claud Shannon in his paper, *A Mathematical Theory of Communication*, published in the late 1940s. Shannon stated, "The fundamental problem of communication is that of reproducing at one point either exactly or approximately a message selected at another point."

What makes digital technology superior is that it can deliver an "exact or approximate" reproduction better than analog can, even with its potential for noise and distortion problems. Digital transmission is the preferred choice among communications specialists because of its primary characteristics, which are as follows:

- The quality of the received signal is equal to the state of the original signal.
- The quality of the received signal is independent of transmission media.
- The method of transmission is completely compatible with different media and intelligence (video, audio, and data).
- The technology involved in digital transmission and reception is low cost.
- New features can be embedded into digital transmissions very easily.

The bottom line is that analog transmission techniques cannot deliver the same results as digital. With analog technology, the quality of the received signal is not the same as the original unless very expensive technology is employed to remove the noise that is always present in its transmission and reception.

Since noise is generally an *occasional* event with digital technology, rather than a constant characteristic as it is in analog, let's see how one keeps those noise events to a minimum. More importantly, let's also see how digital samples are successfully converted back into their original analog form and how they can actually sound and look better than the original, thanks to the employment of DSP technology.

Basics Of DSP

Two devices are used to convert digital signals back to their analog form: a Codec (for compressor-decompressor), also referred to as a Coder-Decoder or compression/decompression algorithm, which is DSP software; and a hardware-based digital-to-analog converter (DAC). The primary function of a DAC is to change numbers (digital information) into a voltage that corresponds to the value of those numbers. A DAC only works with pulse code modulation (PCM) encoded signals.

PCM was invented by the British engineer Alec Reeves in 1937 while working for the International Telephone and Telegraph in France. Later, Bell Labs would discover PCM independently from Reeves when they created the SIGSALY device, although Reeves received the U.S. patent for the technology in 1943. Interestingly, recent historic research has uncovered evidence that digital sampling techniques using mechanical (rather than electronic) devices were employed as early as 1853 (I'll touch on that in a future column).

Theoretically PCM is a very simple technique, wherein a signal is sampled (that is, has its voltage level measured) at a precise interval and that sample is then converted into a binary value made up of 0s and 1s. While that sounds simple enough, it's relatively tricky to create a perfect sample because errors can find their way into the calculation of the digital values and because of the frequency range of the sample itself. If any errors do take place in the sampling, the result is very distinct noise (pops and clicks) or distortion in the resulting digital signal (see **Figure 1**).

Fortunately there are several techniques available to minimize sampling errors. But generating a properly sampled PCM data stream (sometimes referred to as "essence") is only half the job; there are just as many potential problems when it comes to converting digital information back into an analog form. It's when the PCM data is in its sampled form, however, that the real value of digital technology becomes apparent.

Remember that Shannon postulated that ideal communication takes place when you have "exact or approximate" reproduction at the received end. The key word here is "approximate"; you do need a perfect representation of the original information (sound or data) to have achieved successful communication. So practically all digital sampling techniques aim to *approximate* the analog signal through data processing, which is where the Codec comes into play.

The Codec processes the digital information to reduce as much as possible the number of 0s and 1s of the original sampling. When the total amount of digital information is

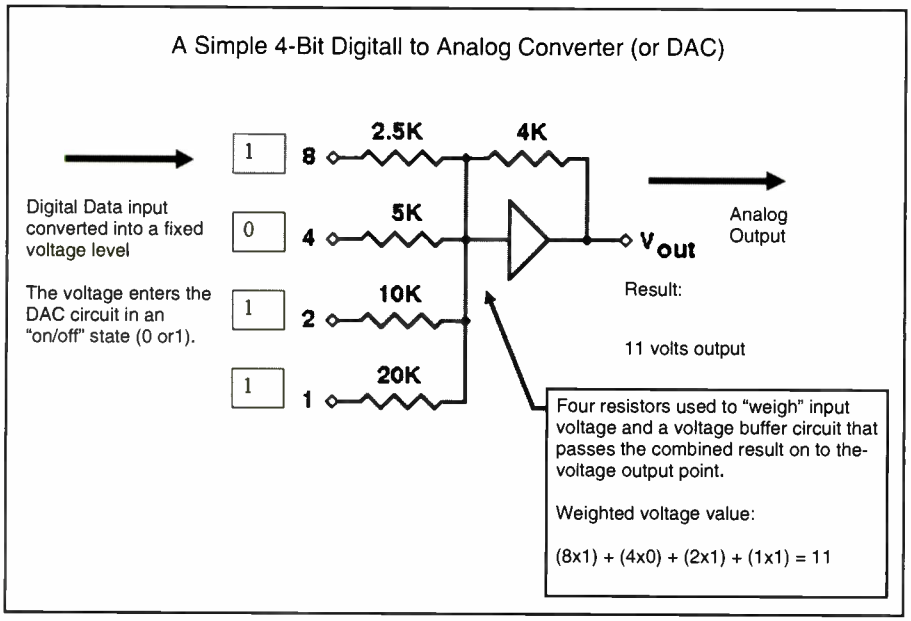


Figure 1. An illustration of two possible errors that can occur in a DAC when digital and analog processing is not linear.

reduced, the chances for errors occurring in that data are reduced significantly. Codecs do this through different data compression techniques, with specific techniques used for specific results. There are actually thousands of types of Codecs that can be used in DSP. For example, a Codec could be chosen for audio sampling that emphasized bass sounds over treble. Or in the case of video, a Codec could be used to produce good motion reproduction (for a sports event) over color. Another Codec could be used to emphasize color over motion (for a drama with close-ups of the actors' faces).

While data compression of a Codec does reduce errors, it also reduces the quality of the signal because of the reduction of information contained in it (digital systems are inherently restricted in the amount of bandwidth available for DSP). The sad reality, then, of DSP is that the Codec used for data compression will always result in a final output that is compromised in some way.

Fortunately, the average human ear, or eye, or brain is not sensitive enough to actually perceive that reduced quality so such data losses are acceptable. In fact a well-designed Codec can introduce "wrapper" data into the data stream that can overcome those losses, creating a new stream of "metadata" that can look or sound even better than the original.

So when digital information is ready for conversion back into analog form, it's no longer in its original sampled "essence," nor is it PCM. It is now a "metadata" signal. For the DAC to use that signal, it must first be decompressed by passing it back through the Codec, which decodes it back into PCM. Once that has been done, the DAC can then turn it into an analog signal.

How The DAC Operates

Ideally, a DAC operates in a purely linear manner, so that whatever value is presented to it in digital form is accurately represented in its analog output. To achieve that linearity, the DAC must process the digital information into analog form at precisely the same clock rate at which the original analog information was converted into digital information. Of course, no matter how well a DAC is designed, it will never be able to achieve an idealized linear output.

Remember, the design goal for a DAC is to achieve an "approximate" representation, which is often simply a matter of making the best choice of the DAC methodology for a given application. The basic design of a DAC is actually very simple. **Figure 2** shows a 4-bit DAC designed to convert digital information into a voltage. On the left of the diagram is a series of voltage inputs that are determined by the digital information presented. The range of the digital information is from 0000 to 1111, which when "weighed" by the DAC will produced voltages ranging from 0 to 15 volts, or a total of 16 possible voltage levels (4 x 4).

How the voltage values are actually produced is based upon the weighted value of each of the digital place holders in the circuit. In this particular case the weighted values are 8, 4, 2, and 1, where each of those values is multiplied by either 0 or 1. So if a digital value of 1111 is presented, then the total weighted value would be (8x1)+(4x1)+(2x1)+(1x1) = 15 volts output. Likewise, if the value presented is 1011, then the total weighted value would be (8x1)+(4x0)+(2x1)+(1x1) = 11 volts output.

The actual weight in the circuit is determined by four resistors, each providing the necessary voltage drop for the weight they represent in the equation. If you refer to **Figure 3** you will see that as the digital values change, the voltage output changes, and it does so in a linear manner.

Of course in the real world, DAC circuits are much more complicated than this, and there are a great many different types an engineer can choose from. You'll find descriptions of over sampling DACs, Binary Weighted DACs, R-2R Ladder DACs, and even Hybrid DACs when reviewing the literature on the subject. Nevertheless, the basic principles I've outlined apply in even the most complex examples. There is always a digital value being converted into an analog signal (generally a voltage) in as linear a fashion as possible, and with as few errors and distortions as can be achieved within a particular design.

DAC Characteristics

So now that we have our basic DAC circuit, how do you measure or describe its operation? There are many ways to do so, but there are five that are most commonly used:

Resolution—The range of information that can be represented, generally stated as the number of bits it uses. In our example circuit, the resolution is 2 to the 4th power, or 16. If there were 8 bits, it would be 2 to the 8th power, or 256. Chips exist today that have a resolution greater than 17 bits, which yield than 262,144 levels of resolution.

Maximum Sampling Frequency—As stated in the Shannon-Nyquist sampling theorem, a signal must be sampled at over twice the bandwidth of the desired signal. So if you're sampling in the average audio range of the human ear (20 kHz), the sampling frequency would have to be over 40 kHz. The standard used for audio CDs is 44.1 kHz, so the maximum sampling frequency for most audio DACs is that value.

Monotonicity: This refers to the abil-

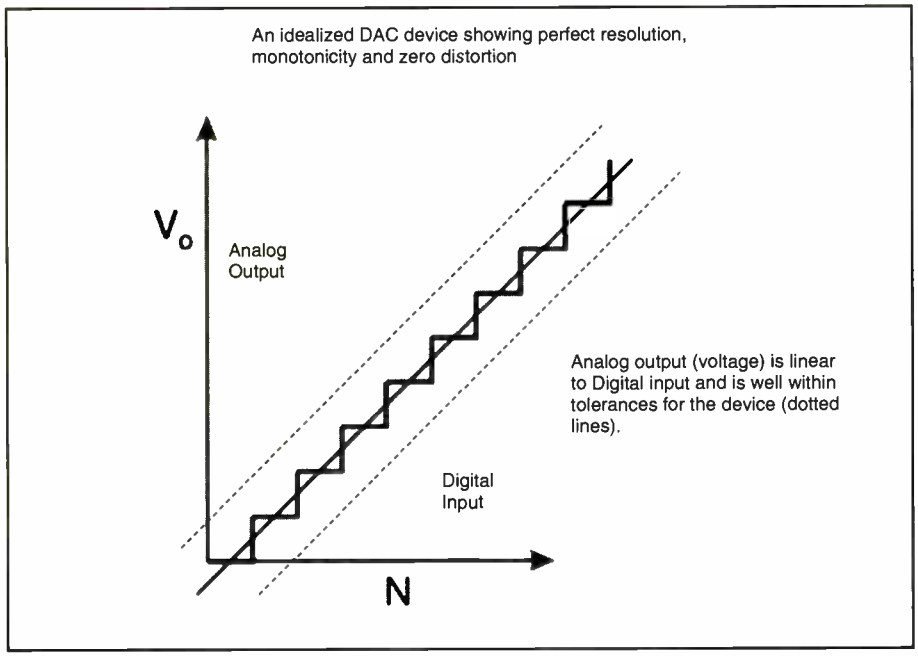


Figure 2. An illustration of the ideal linear relationship between digital and analog signals that would be found in a "perfectly designed" DAC.

ity of a DAC's analog output to increase with an increase in digital code, or the converse. The term comes from the study of order between sets of numbers in calculus. Good monotonicity is achieved when digital and analog functions are properly balanced.

THD+N: This formula represents the percentage of distortion and noise the DAC introduces to the signal. This is a very important DAC characteristic. Obviously the lower the percentage the better.

Dynamic Range: This is a standard measurement employed in many electronic amplifying devices. It is the difference between the largest and smallest signals the DAC can reproduce. It's expressed in decibels.

After the DAC has converted the digital signal to analog form, all that is generally required is a conventional amplifier and filter to bring the resulting signal up to usable form (say, to drive a speaker or headphones, if the signal is audio).

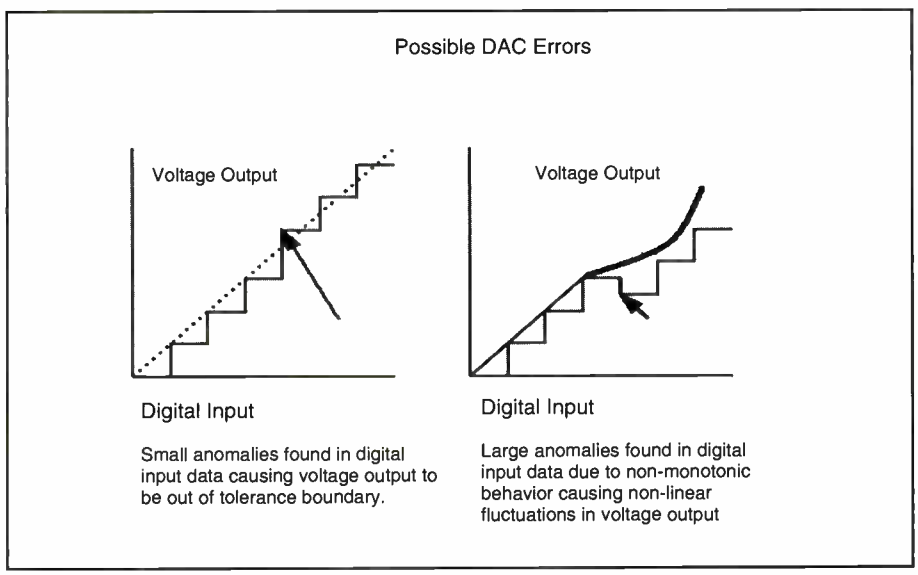


Figure 3. This simple circuit illustrates the basic function of a DAC, as outlined in this month's column.

The simplest and most prevalent DAC in commercial use is probably the sound card in your computer. So if you want to know more about this subject, simply learn more about that device, which also happens to be an ADC (analog-to-digital converter). In future columns I'll be looking at computer sound cards in more detail as they're actually very good laboratories for learning about DSP and other data processing functions. We'll look specifically at how to use the Microsoft Visual Basic development environment to create your own DSP software programs to use with your sound card.

Coming Next Month

Next month I'll return to computer programming and look again at how to use Microsoft's Visual Basic to control Ten-Tec's RX-320/320D.

For now, you can e-mail me directly with any questions at carm_popcomm @hotmail. com. I can't answer general questions on computers, but will be more than happy to help you with any issues raised in the columns.

As I write this, we have still not been hit by a major storm, but if that changes, please send a donation to the American Red Cross at www.redcross.org/donate/donate.htm. Of course, there are other good (and ethical) organizations you can contribute to if you don't wish to use the Red Cross, so please use them if you wish, but try not give into "charity fatigue." As I've said many times before, if you do have a job, a family around you, and are living in a stable neighborhood, then frankly show your thanks for that wonderful good luck by sharing with someone less fortunate, and do so regularly.

Let's also not forget our troops overseas, especially during the holiday season. They continue to need our visible support, particularly as fighting in the Middle East and Afghanistan now seems destined to move into other parts of the world. Please refer to the U.S. Department of Defense's official webpage, "Defend America." The section found at www.defendamerica.mil/support_troops.htm has an amazingly wide range of practical and useful ways that you can directly help.

Again, if you are fortunate enough to live in the United States of America, please remember to give thanks for your personal blessings by passing on that blessing to others through regular acts of selfless sharing.

See you again next month! ■

by John Kasupski, KC2HMZ, kc2hmz@wzrd.com

The Coming Winter: Good News For Radio Hobbyists! Plus Holiday Radio Gift Ideas!

If the old adage that "time flies when you're having fun" is really true, then the year 2006 must have been a real treat. I find myself wondering how it can possibly be over already. It just doesn't seem as if a whole year has already gone by, yet here it is, December again.

Since December finds us at the height of the holiday season, I'd like to extend to everyone my best wishes to you and yours for a very safe and happy holiday season. Also for the best of luck in 2007, whether it's at your radio equipment or away from it.

The coming of the holidays isn't the only good news for radio hobbyists. Despite the arrival of snow, ice, and biting winds to the northern latitudes, Mother Nature has some good news for many of us as well. While most thunderstorm activity in June, July, and August occurs 10 to 20 degrees north of the equator, during December, January, and February most thunderstorm activity is 10 to 20 degrees *south* of the equator. This puts thunderstorm activity, and the resulting static crashes we hear on our HF receivers during a thunderstorm, the farthest away from the northern hemisphere, promising an improvement in conditions on the lower bands.

In fact, if you're one of those who are fortunate enough to have a directional antenna, this places most thunderstorm activity off the back of the directional antenna for the major ham/SWL population in North America, Europe, and Japan. Furthermore, there's also a seasonal decrease in geomagnetic activity during December, which is not as marked as the minimum yearly activity that we see during June and July, but enough to contribute to a noticeable increase in the number of loggings reported on the lower bands.

In addition, the longer hours of darkness give us a sharp decline in *D*-layer signal absorption on the lower bands. The improved conditions on the lower bands come at the expense of somewhat less favorable conditions on the higher bands, but by tuning low you can take best advantage of the changing conditions and continue to put interesting catches in your logbook.

Photo A. A P-3C Orion leaves the ground to commence the first of many missions flown during KEFTACEX-03 exercise. (U.S. Navy photo)

A Radio Adage To Remember

Another old adage, one that comes to us from ham radio lore, holds that the efficiency of an antenna system is inversely proportional to the weather conditions prevailing during the time of the installation. Translated into less technical terms, that means the worse the weather is on the day you put up an antenna, the better it supposedly will perform. If that's the case (and there seems to be no shortage of anecdotal evidence to support the idea, though empirical evidence is somewhat more difficult to come by), then we should, I guess, all be gearing up to perform major overhauls of our antenna systems...in the dead of winter!

If you live in the northern latitudes, this could be problematic. In fact, it could be downright suicidal. Picture climbing onto a steeply pitched rooftop that's covered with ice and snow, amid 50-mph winds and a blinding snowfall, while carrying the precious cargo you hope will constitute your primary station antenna for several years to come. I think you get the idea of what I'm talking about here. There is ample potential for disaster. Of course, the farther south you live, the more your mileage may vary. I'm absolutely certain that's the reason many of you who are reading this live in the south! But up here in the northeastern United States, putting up antennas in mid-December is not a task for the faint of heart, and some would call it a task to be attempted only by the most foolhardy among us.

Should you decide to be foolhardy, er, I mean *brave*—sorry—don't go it alone. One of the other facets of the radio hobby that I happen to enjoy is scanner listening, and I can attest from personal listening experience that there is inevitably a distinct increase in the number of EMS calls answered by the fire departments and ambulance services around Buffalo, New York, in the weeks prior to the holiday season. The cause is people climbing ladders, gutter pipes, porch roofs, and whatever else they can climb (or *think* they can climb!) to put up lights and other Christmas decorations on their homes. All too often snow, ice, and gravity have a predictable, but tragic, effect on their efforts, and someone ends up going on an unexpected trip to the hospital emergency room. That's if they're lucky; if not, an entire family's holiday season is ruined.

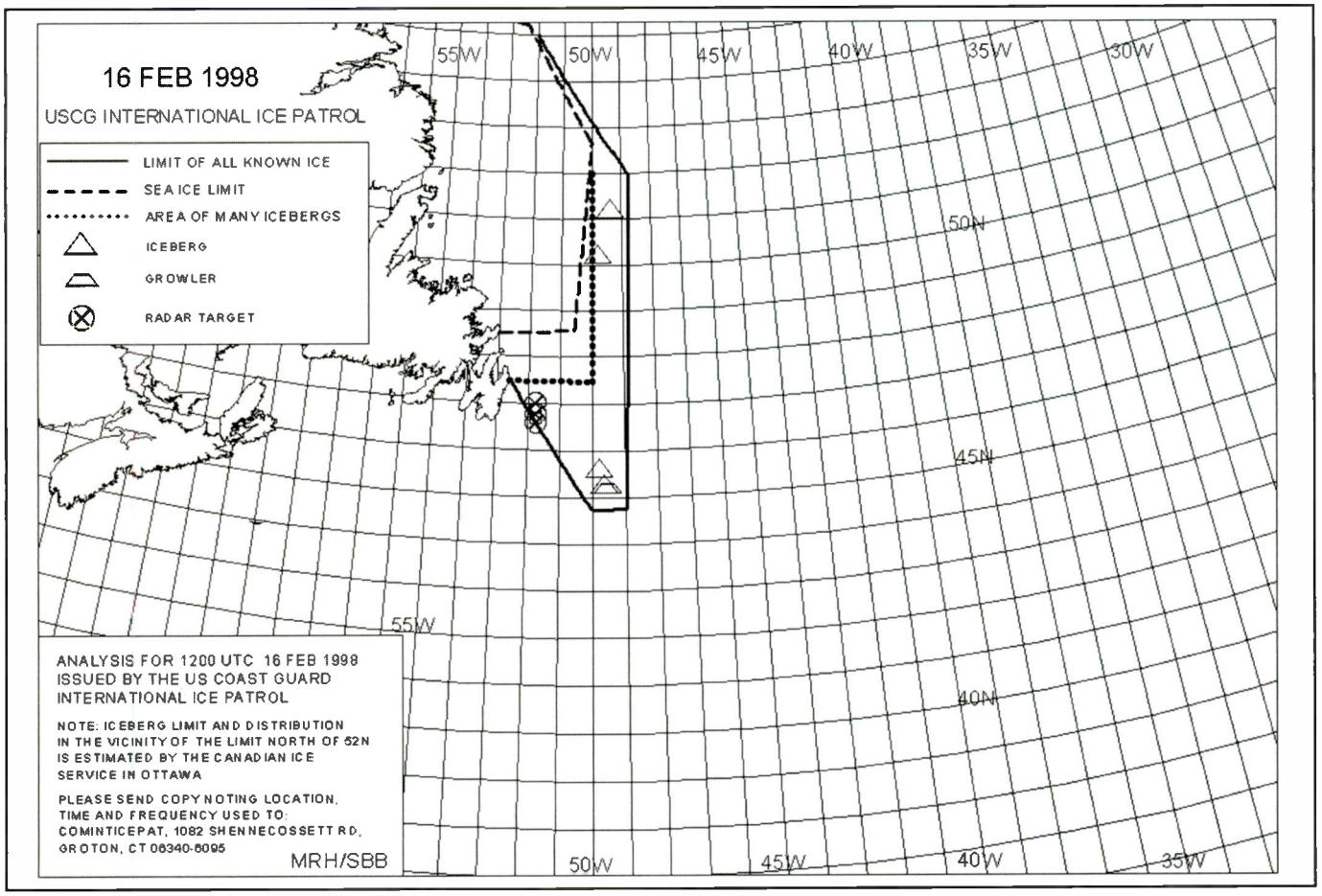


Photo B. Sample ice map produced by the International Ice Patrol. (Courtesy International Ice Patrol)

Last year a ham in my area, who shall remain nameless, attempted to climb a ladder to attach some sort of Christmas decoration to his house. While working alone outside, this gentleman fell off the ladder and landed on top of a metal pole sticking out of the lawn, rupturing his spleen, puncturing a lung, and causing sundry other injuries. This might have been avoided if he'd simply arranged to have some help on hand when he tackled the chore. Suffice to say, his XYL was not amused. In fact, she might have killed him, if he hadn't come so close to doing so himself!

I'm mentioning this only because I'd prefer not to have any of our readers fall victim to the dangers inherent in climbing around on the outside of your residences during the winter months. Stay warm, stay safe, stay inside—or at least on the ground—and put up that new antenna in the spring. It's much easier, and a lot less painful, to manipulate the controls on your radios when your arm isn't in a cast!

Speaking of ice, cold, and snow, even though I live in Buffalo, I can take solace in the fact that there are still other places where the weather can get much worse than it does here. One of those places should need no further introduction than the images conjured up by the mere mention of its name: Iceland (nice segue, eh?)

Farewell To NAS Keflavik

By the time you read this, Naval Air Station Keflavik (NASKEF) will be nothing more than a memory, having officially been disestablished on September 8 during a ceremony ending its 45 years of operations in support of the defense of Iceland. This marked the end of a transition that began in March, when personnel there began the task of cleaning and clearing 550 facilities and shipping 6.6 million pounds of goods and over 1,400 vehicles.

Located on the Reykjanes Peninsula on Iceland's southwest coast, NAS Keflavik had been operated by the U.S. Navy since 1961, when the Navy assumed responsibility for its operation from the U.S. Air Force. The base was the foundation of numerous operational capabilities throughout World War II and the Cold War, and from that time on into the modern era. Rotational P-3 Orion aircraft (see **Photo A**) and crews were housed here in support of anti-submarine warfare as recently as 2004.

USAF 85th Group F-15 fighters used its flight line as a launching point, and Army National Guard and Interim Marine Security Forces troops stormed the lava fields surrounding the base during training exercises, such as Northern Viking. Although manned primarily by U.S. forces, there were also a permanently stationed Dutch P-3 aircraft and crew as well as officers from Canada, Denmark, Norway, and the UK. This was necessary because Iceland has never had a military, and when it reluctantly joined NATO in 1949, it was with the understanding that Iceland would not be expected to establish an indigenous force. Instead, Iceland's contribution to the common defense effort would be in the form of rent-free access to sites for military facilities, by far the largest and most important of which was Keflavik.

Cold War radar monitoring, fighter intercept, aerial refueling, and SAR operations were provided by the forces at Keflavik.

Photo C. Glenn Valenta, KCØSHS, sent in this nifty photo of his Colorado shack.

Military fiction fans may recall that Tom Clancy used the base as a setting for an important story line in his novel *Red Storm Rising*, though his descriptions of the base, geography, and station equipment were apparently somewhat inaccurate.

The first U.S. military involvement in Iceland dates back to 1941, when U.S. Marines arrived as replacements for a British garrison that had been stationed there after a British occupation in May 1940, following an agreement between the governments of Iceland, Britain, and the United States. In addition to their defense role, American forces also built the Keflavik Airport as a refueling point for aircraft deliveries and cargo flights to Europe. After World War II, all military personnel were withdrawn from Iceland as specified in the original agreement.

In 1946, however, another agreement between Iceland and the United States permitted the U.S. to continue to provide all the maintenance and operation of the airport through a civilian contractor. That set the stage for Iceland's entry into NATO in 1949, and a subsequent defense agreement with the United States that was the beginning of the Icelandic Defense Force. The Defense Force subsequently spent four decades at the forefront of the Cold War and was credited with playing a significant role in deterring nuclear war with the USSR and its Warsaw Pact allies.

Keflavik was also home to a Navy Communications Station (NAVCOMMSTA), which operated numerous transmitters and receivers scattered around the Icelandic countryside, including the Inter-Island TROPO site, a DYE-5 transceiver site, a Special Communications facility, and Naval Radio Transmitter Facility (NRTF) Grindavik. The receiver site was housed at the Inter-Island TROPO site beginning in 1968.

By 1992 the facility had been redesignated a Naval Computer and Telecommunications Station and was equipped with 100-percent standby auto-start power provided by dual 900-kW diesel generators, and featured HF, EHF/UHF SATCOM, and terrestrial communications systems, including three T-1s and transoceanic cable between Keflavik and Chesapeake, Virginia.

The ground defense of Iceland was the responsibility of the U.S. Army, and the Army component of the Iceland Defense Force consisted entirely of reserve components from the United States, which would have deployed to augment Marine, Navy, and Air Force security units at the base.

Undoubtedly, although the lights have gone out at NAS Keflavik, there will be many radiomen and women with memories of walking out of the NAVCOMMSTA at 1100 hours to see a brilliant night sky full of stars, and the Northern Lights as well. To them we offer a tip of the "Utility Communications Digest" hat, along with our sincere thanks for having served to safeguard freedom, especially in a place that probably wasn't high on most people's wish lists of places to be stationed while in the military.

Speaking Of Ice...

From Iceland, we'll move to discussions of ice—or to be more precise, the International Ice Patrol. With winter coming into full swing, this might be a good time to remind everyone about the International Ice Patrol's HF SITOR broadcasts from the U.S. Coast Guard's Boston transmitters.

The broadcasts use the call letters NIK (instead of the usual NMF) to distinguish them from the regular Coast Guard broadcasts, and begin at 0030Z and 1218Z. I made passing reference to this in my September column, while talking about the Coast Guard's SITOR broadcasts during that month's discussion of hurricane monitoring. If you're like me, though, you may have read that in late August and dismissed it, with winter seemingly so far away, and forgotten all about it by now. **Photo B** shows a sample ice map from a few years back. The primary mission of the International Ice Patrol (IIP) is to advise mariners on ice conditions in the vicinity of the Grand Banks of Newfoundland, especially icebergs south of 48 degrees north latitude. Mariners report the position, time, size, and descriptions of icebergs to the IIP, which enters this data into a computer program that predicts the icebergs' drift.

In addition to the HF SITOR broadcasts (0030Z on 6314.0, 8416.5, and 12579.0 and 1218Z on 8416.5, 12579.0, and 16806.5), the IIP also transmits FAX at 1600Z, again from the USCG Boston COMMSTA. Additional FAX transmissions at 0930Z and 2100Z on 3855.0, 7880.0, and 13882.5 originate from Offenbach, Germany, via the Hamburg (callsign DDH) and Pinneberg (callsign DDK) transmitters.

For those without digital monitoring capabilities, voice transmissions originating from the Canadian Coast Guard Maritime Communications and Traffic Service (MCTS) at St. Anthony (callsign VCM) can be heard at 0107Z, 0907Z, and 1907Z on 2598.0 kHz. Special broadcasts in USB and originating from Canadian Coast Guard MCTS at St. John's (callsign VON) are at 0007Z, 0837Z, 1637Z, 2207Z, and as otherwise required, also on 2598.0 kHz.

In addition, you should also monitor the international maritime distress and calling frequency 2182.0 in USB, which is monitored by the numerous report-receiving stations of the Canadian Coast Guard, located at St. John's, St. Anthony, Port aux Basques (callsign VOJ), Newfoundland; Labrador (VOK); Placentia (VCP), Sydney (VCO) and Dartmouth (VCS), Nova Scotia; and Saint John, New Brunswick (VAR). You should be able to log vessels providing reports, as these frequencies are guarded 24 hours a day by the stations I just listed.

Finally, A Shack Photo!

After months of shameless begging on my part, someone has finally taken the hint and sent us a nice photo of his shack to accompany this month's column. Please direct your attention to **Photo C**, and have a look at the rather nice operating position of Glenn Valenta, of Lakewood, Colorado, a longtime utility and milcom enthusiast, who also holds a Technician class ham license (he's KCØSHS). Situated in picturesque Jefferson

County, Glenn is well within range of Buckley AFB, as well as a FEMA facility and numerous other juicy listening targets. He also enjoys logging aero and maritime stations, and he submits loggings via the logbot he operates on several of the radio-related IRC channels.

As you can see from the photo, Glenn is well equipped for digital reception as well as analog HF and ham operation on VHF/UHF. And the presence of a CW key on his desktop may very well indicate that he's practicing for an eventual license upgrade following a successful Element 1 exam. We wish him well in that and other future endeavors. *And* we hope the rest of you will follow Glenn's example and send us a photo of your own for the rest of us to gaze at in wonderment!

Holiday Gift Shopping For Utility Enthusiasts

According to legend, holiday gift-giving has been a tradition since Saint Nick discovered he could safely navigate chimneys and started keeping lists on the behavior of children. For the purposes of this month's column, we'll proceed with two assumptions: 1. That you're not a radio hobbyist, but have someone in your family who is, for whom you will be doing some holiday gift shopping, and who just happened to leave this magazine lying around for you to look at; and 2. That said radio hobbyist is on Saint Nick's "nice" list. We make this second assumption, because if he or she is on the "naughty" list, we're quite sure you don't need our help in finding a stick or a piece of coal! So with those two considerations in mind then, how does one go about selecting a suitable holiday gift for the resident radio nut in the family?

If money is no object, it's probably a pretty simple matter of talking to the radio hobbyist to find out what the ultimate dream radio for his or her "shack" might be, then tracking down the appropriate dealer and buying it. We cannot safely make that assumption here, though, because the "money is no object" approach probably doesn't work for most of us here in the real world. Therefore, the first thing you need to do is figure out how much you want to spend on that holiday gift. That not only allows you to shop for your family's resident ham or SWL without finding yourself awash in debt come January, it also allows us to neatly break down potential gift items by price range.

We'll keep things below, say, $1,000 here. Any more than that and we're venturing close to the "money is no object" realm again, and as we've already pointed out, that's not very realistic for many of us to spend on one gift.

$500–$1,000

While the top-of-the-line radios run well over $1,000 (I just read a review of a recently introduced ham rig going for more than $10,000!), fortunately there's some very useful communications gear priced in this range.

For example, the AOR 8200Mk3B (a portable receiver covering 500 kHz to 3 GHz AM, FM, SSB, CW) and AOR 8600Mk2B (a mobile/base receiver covering 100 kHz to 3 GHz AM, FM, SSB, CW) both fall into this price range. So do several offerings from Yaesu, including the FRG-100B (a traditional HF receiver with nice features, well designed, and with excellent performance for the price range), the FT-817, FT-857D, and FT-897D transceivers, and the VR-5000 receiver. ICOM's new R1500, as well as its PCR1500 and PCR2500, and Kenwood's TM-D700A and TS-570D transceivers are also within the price range.

$200–$500

Moving down to slightly less expensive offerings, in this price range we find numerous offerings from the Big Three (ICOM, Yaesu, Kenwood) ham radio manufacturers. The ICOM 208H, 2720H, P7A, R3, and T90A all fall into this range. So do the Yaesu FT07800R, FT-8800R, FT-9900R, VR-500, VX-6R and VX-7R, and the Kenwood TH-D7A, TH-F6A, and TM-V708A.

The Sangean ATS-909 portable receiver is also in this range, as are Alinco's DR-135R and DR-635R transceivers, and the Ten-Tec RX-320D receiver. And just in case you're shopping for yourself and don't mind being a bit adventurous, you can find factory-reconditioned Grundig Satellit 800 receivers in this price range as well.

Many of these offerings are the better-quality ham VHF/UHF mobile transceivers or top-of-the-line handheld transceivers, which of course require a ham license for you to transmit. For those without a ham license, they still make great *receivers*, plus they serve as an excellent incentive towards getting the license.

However, if you're looking for a receiver only, you could do a lot worse than the VR-500 (portable, 100 kHz to 1300 MHz AM, FM, SSB, CW) or the RX-320D (computer-based, 100 kHz to 30 MHz AM, SSB, CW; see the April 2004 issue of *Pop'Comm* for a full review).

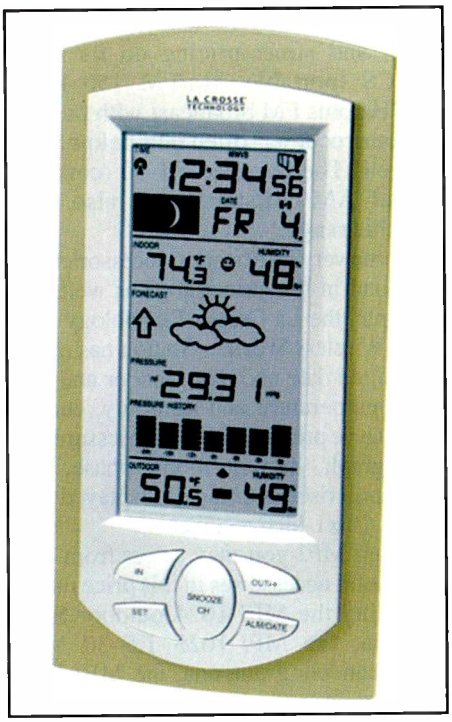


Photo D. La Crosse Technology WS-9032U Wireless Weather Station. (Courtesy WeatherShack.com)

For those who like gifts they can really sit down and play with, the MFJ-784B Deluxe Tunable DSP Filter falls into this price range. I've got one and can attest that there are numerous stations in my log that wouldn't be there if I didn't have it. With three tuning knobs, a multi-function switch, and eight pushbuttons (not counting the power on/off button), there's plenty of controls to play with, and I've found that if used intelligently, it can definitely enhance your reception.

$100–$200

Moving down another step on the price list ladder, several of the ham manufacturers offer handheld and mobile VHF/UHF transceivers that fall into this range. The portable Grundig Yacht Boy 400PE, for instance, is a popular portable for shortwave broadcast listeners, though its lack of SSB capability makes its usefulness for utility monitoring purposes very limited.

Also found in this range is the ICOM R5 (portable 495 kHz–1309.995 MHz AM/FM), which also lacks SSB capability, but does feature a weather alert function, 1250 memory channels with alphanumeric naming, and is computer programmable. Sangean offers the ATS-505P (a portable that covers from

1.711–29.999 MHz with SSB reception), and street pricing on its ATS-18ACS (portable AM/FM 150 kHz–30MHz plus FM broadcast with built-in cassette recorder) often falls below $200 as well. The Sangean PT-80 (compact digital AM/FM/shortwave) also falls into this range.

Some very nifty station accessories can be found in this price range as well. For example, the La Crosse Technology WS-8025 Wireless Weather Station has radio-controlled date and time, indoor and outdoor temperature and humidity, current barometric pressure, 30-hour pressure history graph, current moon phase, and sun/moon rise/set times all displayed on a 7.75 x 10 x1-inch receiver.

From MFJ you may select from several useful accessories in this price range, including the MFJ-1024 outdoor SWL antenna, the MFJ-1025 1.5–30 MHz noise canceling antenna, the MFJ-1026 deluxe noise canceller, and two models of passive preselector (one for receivers, one for transceivers), along with several limited-space antenna options, power supplies, antenna switches, and other helpful goodies. The MFJ-616 Speech Intelligibility Enhancer even falls into this price category. There's also a wide variety of SWR meters, power meters, and other test equipment for those with licenses to operate a transmitter.

$50–$100

While radios under $100 generally lack SSB reception and are not going to be of much value for utility listening, some quality accessories can be found in this price range.

LaCrosse Technology, mentioned above, has another wireless weather station that falls into this price range, the WS-9032U, shown in **Photo D**. Equipped with a display of current barometric pressure as well as a bar graph of the past 24 hours, this unit also features the indoor/outdoor temperature and humidity, current moon phase, and radio-controlled time/date. It can be wall mounted or placed upright on a table using its fold-out stand.

The MFJ-1022 SWL Active Antenna falls into this price range, as does the MFJ-1045C receiver preselector covering 1.8 to 50 MHz. MFJ also offers several DC power outlet strips in this range as well as a plethora of antennas and test equipment.

Last, but certainly not least, a two-year subscription to this magazine just barely misses the "under $50 range" and so falls into this category!

Under $50

In this price range, the list of available station accessories is truly too numerous to cover in great detail. There's a wealth of station clocks, antennas, replacement microphones, books, and gadgets available from MFJ alone. You would do well to obtain a catalog by visiting the company's website at www.mfjenterprises.com where you can request a catalog via snail-mail or download it in portable document format (PDF) that's readable on just about every modern computer platform (PC, Macintosh, or Linux).

Of course, a one-year subscription to *Pop'Comm* also falls comfortably into this price range, and if the person you're buying it for already has a subscription, your gift can be used to simply *extend* the existing subscription for another year.

The Not-So-Obvious Gifts

This category could just as easily be called, "What To Buy For The Person Who Has Everything." The answer to that problem is that while he or she may *seem* to have everything, there are some potential gifts that aren't as obvious as the possibilities covered above.

For example, many, and perhaps most, radio enthusiasts these days have a computer in their shacks and use the machines for logging purposes, for decoding digital signals, or for accessing the Internet to obtain information and stay in touch with others through IRC, e-mail, online forums, etc. Perhaps that computer could use some more RAM memory. Or maybe the monitor is starting to go on the blink and a new one is needed. Or perhaps all he or she needs to connect the radio to the computer (thus opening up a whole new world of computer-assisted monitoring) is an inexpensive cable or interface. On the other hand, maybe the hobbyist in your could use a fresh supply of blank CD-ROMs or DVD-ROMs on which to store the sundry items that eventually need to be saved lest they fill up the computer's hard disk.

Speaking of hard disks, this is another item that makes a nice upgrade to a computer—additional storage space. There are two types of hard disk drives for computers: internal and external. If internal, you'll need someone who knows his or her way around the inside of a computer to open the case, install the hardware, then put everything back together and get the software to get the other hardware—and the operating system—to talk to it. The external type of drive connects to a computer's USB port. You still need to format and/or partition them, which requires some expertise with your operating system, but they're a lot easier to set up than internal drives, and you don't need to open the case to install them.

Shedding Some Light On The Hobby

Here's another idea: What does the light in your hobbyist's "shack" look like? Perhaps a nice desk lamp would be appreciated. Just avoid those lamps that go on and off when you touch them, as they have a tendency to produce RF that interferes with radios. It's also not unheard of for the touch-lamps in a ham's house to flip out when the ham starts transmitting, especially at higher power levels! The basic incandescent desk lamp works best. *Avoid fluorescent lamps.* They may be more economical to operate but they, too, are a frequent source of radio interference. Edison got this one right the first time.

Radio enthusiasts also tend to quickly end up with a sizable collection of radio-related books and magazines. This means that a bookcase to store them all in might be a welcome gift, as well as a much better storage option for such items than a stack of boxes in a basement corner!

Speaking of storage, I already mentioned CD- and DVD-ROMs, and these need somewhere to hide when they're not in use, too. The desk in my shack has a CD storage space in it, which holds 18 CD-ROMs. That's great, but I have a few hundred CD-ROMs. Fortunately, there are commercially made storage towers out there, ranging in style from the simple to the elegant, and in price from dirt-cheap to surprisingly costly. Most of them can be placed conveniently near a desk so that the contents are easily accessible. There are even a few pieces of furniture available that are a combination bookcase/CD tower, making them ideal for a computer user with a lot of CDs, DVDs, user manuals, and sundry other books and magazines to keep handy. For many of us, these might be the ultimate solution, one place to keep all our computer storage media, reference materials, and back issues of *Pop'Comm* neatly stored someplace where they are handy when we want them!

So, even the radio hobbyist who seems to have everything might not *really* have

everything. It just takes a little bit of thought to figure out some of the not-so-obvious items they don't have to come up with a nice gift—well, that and a little bit of cash to make the purchase. The latter part I can't help you with much, but hopefully I've given you a few ideas in gift shopping for the resident radio nut in your social circle. Now hurry out and do your shopping before everything's gone—and have a happy, safe holiday!

Your Contributions Welcome

We now come to the part of the column where I take off my hat that says "Writer" and put on the one that says "Contributing Editor" to offer *you* the opportunity to be published. In order for your contributions to be immortalized here in the pages of *Pop'Comm* for the enjoyment of your fellow readers, your posterity, and your own satisfaction, simply send in your logs to the e-mail address that appears at the top of the column. If you don't have e-mail, send them to John Kasupski, P.O. Box 681, Tonawanda, NY 14151-0681. That will take a little longer for your logs to appear in print, of course—they don't call it "snail mail" for nothing—but I'll accept them just the same as if they were sent in electronic form.

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."

We also welcome shack photos, although these need to be in electronic format, as I cannot scan in hardcopy photos to produce the electronic version needed for publication in the magazine. Photos should be in JPEG format and may be either black and white or color.

Getting back to the loggings, not all reader logs that are submitted are used. Some of them are obviously in error and are edited out, are not in the format we need for the loggings, or are missing important information, such as the mode of transmission used or the frequency. I try not to get too strict about the format, as I can move things around to get them in the proper order, provided that all the necessary information is there. However, it's much easier if you observe the logging format we use in the magazine, which basically goes like this: Frequency (in kHz), Station(s) heard, summary of traffic, in Mode at 0000Z. (monitor/location). Several excellent examples appear in the logs that accompany this article, which come to us from the following contributors this month:

Glenn Valenta of Lakewood, Colorado (GV/CO); Stephen Jones of Lexington, Kentucky (SJ/KY); Mark Cleary of Charleston, South Carolina (MC/SC); and your columnist, John Kasupski, of Tonawanda, New York (JK/NY).

Reader Logs

3175.5: LOR, Argentine Navy, Puerto Belgrano, Argentina w/navigation notices in Spanish, ITA2, 75 baud/850 Hz RTTY at 0645Z. (SJ/KY)

3287.0: CKN, Canadian Forces, Esquimalt, British Columbia, Canada w/ITA2 marker (NAWS DE CKN ZKR F1 2740 4167 6260 8318 12371 16558 22209 AR), 75 baud/850 Hz RTTY at 0702Z. (SJ/KY)

4015.0: MARS net, NNN0LAB as net control station, in USB at 0220Z. (GV/CO)

4030.0: MARS net with AAM8UT and others in USB at 0227Z. (GV/CO)

4041.0: NNN0XEX net control in USN/USMC MARS 5M1B-Net in USB at 2303. (MC/SC)

4396.0: WLO Maritime robotic WX discussing Mexican Baja storm warning, holding tfc for WAYWARD WIND and MOVING ON. In USB at 0606Z. (GV/CO)

4446.5: R00082 (CH-47D # 87-0082) clg T2Z3 (2-3 AVN, Hunter AAF) in ALE USB at 0352. (MC/SC)

4446.5: R24464 (UH-60A # 85-24464) clg T50GND in ALE USB at 0420. (MC/SC)

4470.5: MARS net with NNN0XF, NNN0XB, and others in chit-chat mode, in USB at 0236Z. (GV/CO)

4675.0: Gander R., Newfoundland working LUFTHANSA 441, USB monitored at 0359Z. (SJ/KY)

4721.0: 280054 (C-17A # 98-0054, 62 AW) clg Croughton HF-GCS in ALE USB at 0233. (MC/SC)

4790.0: R26604 (UH-60L # 95-26604) clg B1Z171 (1-171st AVN) in ALE USB. Also on 5778.5 and 6911.5 kHz at 0127. (MC/SC)

5320.0: SECTOR SAN JUAN radio check with CAMSLANT, in USB at 0153. (MC/SC)

5505.0: Shannon VOLMET (Ireland), weak but readable, in USB at 0614Z. (GV/CO)

5696.0: CG 2105 (HU-25) airborne from Borinquen en route Curacao requests guard from CAMSLANT, in USB at 2312. (MC/SC)

5696.0: AIR STATION CAPE COD advises CAMSLANT that CG 2131 is safe on deck, in USB at 0114 (MC/SC); W6Z calling/raising CAMSLANT, reports being on final approach to E3Z and secures guard, in USB at 0042Z (JK/NY); CG1715 working CAMSLANT while on the ground at CGAS Sacramento, both good copy. Also tested on frequency 8983.0. In USB at 0437Z. (GV/CO)

5833.5: G23730 (UH-60A # 82-23730) clg STPOPS (AASF, St. Paul Airport, MN) in ALE USB at 0240. (MC/SC)

6264.5: KRNJ, *SEALAND QUALITY*, 58,869-ton U.S.-registered container ship w/brief tfc to NMN, USCG Portsmouth, VA in SITOR-A at 0310Z. (SJ/KY)

6265.5: *CP LIBERATOR* 44,966-ton U.S.-registered container ship w/SELCAL for WLO, Mobile R., AL at 1200Z; C6FX7, *DOLE HONDURAS* (16,337 ton Bahamas-registered container ship w/AMVER/PR), 300 mi W of Quito, Ecuador, en route S to Paita, Peru; in SITOR-A at 0505Z. (SJ/KY)

6464.0: FUM, French Navy, Papeete, Tahiti w/ITA2 marker, standard RY/SG and LE BRICK GEANT, 75 baud/850 Hz RTTY at 0730Z. (SJ/KY)

6719.4: Link-11 data transmission at 2057. (MC/SC)

6908.5: U.S. Army MARS WINLINK net, AFA3AR calling AAB4TN w/solar flux index, PACTOR at 2322Z. (SJ/KY)

7527.0: 52A position report to PANTHER in USB at 2313. (MC/SC)

7650.0: R23313 (UH-60A # 79-23313) clg T1Z137 (1-137th AVN Ohio NG) in ALE USB at 0136. (MC/SC)

7680.0: Cuban ENIGMA M8 w/machine-sent cut numbers, slightly modulated MCW at 1910Z. (SJ/KY)

7710.0: VFF, Canadian CG, Iqualuit, NWT w/Ice Analysis FAX chart at 0500Z, good signal. (SJ/KY)

7887.0: Cuban ENIGMA V2a, YL w/5N groups in SS at 1955Z, AM. (SJ/KY)

7918.0: Israeli ENIGMA E10, female w/slow well-enunciated phonetics in English at 0145Z, back on at 0201Z repeating "YHF2," non-U.S. accent, USB. (SJ/KY)

8184.5: R23313 (UH-60A # 79-23313) clg R26049 (UH-60A # 88-26049) in ALE USB at 0154. (MC/SC)

8379.0: C6QD2, *MARACAS BAY* (30,957-ton Bahamas-registered chemical/oil products tanker) w/telex via WLO, Mobile R. at 2212Z; 3FXI3, *HERO* (99,469-ton Panama-registered crude oil tanker) w/AMVER/PR, 300 mi E of Honduras headed NW at 15 knots to Lake Charles Pilot St., LA. SITOR-A monitored at 0740Z. (SJ/KY)

8381.0: 9VKH2, *EAGLE PHOENIX* (106,127-ton Singapore-registered crude oil tanker) w/AMVER/PR, 500 mi S of New Orleans, at 1725Z; S6FZ, *IKAN SELANGAT* (37,554-ton Singapore-registered bulk carrier) w/AMVER/SP at 2051Z; WHBH, *PATRIOT STATE* (9,382-ton U.S.-registered passenger/general cargo ship) w/msg check to WLO at 0035Z; C6QZ5, *DOLE COLOMBIA* (30,106vton Bahamas-registered container ship) w/AMVER/FR for arrival at Santa Marta, Colombia to load fresh fruit for US E coast market, at 0715Z; V7IM4, MV *BAUTA* (41,756-ton Marshall Islands-registered bulk carrier) w/monthly test at 1033Z; All in SITOR-A. (SJ/KY)

8384.5: Unid. vessel w/SELCAL MCKX (4631) for VRX, Hong Kong R., China, SITOR-A at 1415Z, no contact. (SJ/KY)

8388.0: JKES, *MACKINAC BRIDGE* (40,982-ton Japan-registered container ship) w/OBS rpt at 0805Z; H8JD, *ROSELLA* (29,870-ton Panama-registered bulk carrier) w/AMVER/PR, en route to Barra dos Coquieros Pilot Station, Brazil, at 1618Z; WFKW, *OVERSEAS NEW ORLEANS* (43,644-ton U.S.-registered oil products tanker) w/OBS rpt at 1745Z; Unid. vessel w/SELCAL QSPV (2850) for SAB, Goeteborg R., Sweden at 2125Z, SAB not listed for this freq. and no contact. All in SITOR-A. (SJ/KY)

8424.0: SVO, Olympia R., Athens, Greece w/response to unknown command in English, then PRESS repeated several times, into news in Greek, SITOR-A at 0105Z. (SJ/KY)

8431.0: Unid. w/steady machine-sent CW cut 5N groups at 0835Z, no standard ENIGMA listed. (SJ/KY)

8776.0: HOMESPUN with EAM broadcast in USB at 2113. (MC/SC)

8828.0: Honolulu VOLMET, with Auckland VOLMET underneath, in USB at 0626Z (GV/CO); Honolulu VOLMET manually being read. Announcer pronouncing Hono—lulu—radio and over—cast w/long pauses. In USB at 0403Z. (GV/CO)

8888.0: Unid. w/handsent whole numbers mixed w/T, H and B, CW at 1210Z. (SJ/KY)

8912.0: CG 1503 (HC-130, CGAS Elizabeth City) ops normal report to CAMSLANT, in USB at 2330. (MC/SC)

8933.0: NY ARINC w/various A/C doing SELCAL checks, at 0349Z. (GV/CO)

8980.0: USCG RESCUE 1503 via CAMSLANT p/p to LANTAREA (District 5) re: ELT hunt, in USB at 1926Z. (JK/NY)

8983.0: USCG 2133 (HU-25, stated HOMEPLATE was AirSta Miami) working CAMSLANT for flight following (radio guard), in USB at 2106Z (JK/NY); CG2131 (HU-21, stated 5 POB) establishes guard with CAMSLANT for a local trainer out of ATC Mobile, given this freq as primary and 5696.0

as secondary, in USB at 2154Z (JK/NY); Rescue 2131 (HU-25) working CAMSLANT with flight ops and posrep (41.11N 67.01W) while on ELT hunt, in USB at 2134Z. (JK/NY)

8992.0: BUMSTEAD p/p via Offutt HF-GCS to STANWIX for Orderwire coordination in station GEODETIC, in USB at 2303. (MC/SC)

9007.0: RESCUE 339 (CC-130) p/p to RCC via TRENTON MILITARY. RCC states they have a sighting report from a USCG helo and requests 339 try a p/p through Thunder Bay CG Radio; in USB at 0040. (MC/SC)

9022.0: Link-11 data transmission at 2302. (MC/SC)

9025.0: CG 2139 (HU-25) ALE initiated p/p to CAPE AIR at 0041. (MC/SC)

9081.5: R26049 (UH-60A # 88-26049) clg T1Z137 (1-137th AVN Ohio NG) in ALE USB at 1816. (MC/SC)

9996.0: RWM: Moscow Time Station w/good levels here, in CW at 0319Z. (GV/CO)

11175.0: HAPPY 52 (KC-135, 126 ARW) wkg Puerto Rico HF-GCS for complete text of EAM, in USB at 2347 (MC/SC); SNOOP 56 (RC-135) p/p via Offutt HF-GCS to RECON OPS, in USB at 1322 (MC/SC); STARDUST telling CAMPHILL to QSY to 6739 kHz or 8992 kHz, in USB at 2311Z. (GV/CO)

11205.0: SHARK 12 clg SMASHER in USB at 1942. (MC/SC)

11232.0: CANFORCE 2309 (CC-130) wkg TRENTON MILITARY for WX at Edmonton and Calgary, in USB heard at 1410. (MC/SC)

12479.0: Unid. vessel w/SELCAL QVXQ (2012) for Tianjin R., China at 1555Z, no contact; C6FR7, *TROPICAL MORN* (11,979-ton Bahamas-registered refrigerated cargo ship) w/AMVER/FR for arrival at Cartagena, Colombia, at 1705Z; S6NK3, *EAGLE TOLEDO* (107,092-ton Singapore-registered crude oil tanker) w/AMVER/PR, 200 mi S of Jamaica, at 1910Z; 3FAU3, *ZEUS* (99,450-ton Panama-registered crude oil tanker) w/AMVER/PR, central Gulf of Mexico en route to Lake Charles, LA Pilot Station, at 2000Z; 9V6485, *TOBA* (31,396-ton Singapore-registered vehicle carrier w/AMVER/FR, for arrival at Balboa, Panama for canal transit, at 2002Z; same vessel heard 5 days later at 2338Z, 500 mi S of Jamaica and headed N to Miami Pilot Station. All in SITOR-A. (SJ/KY)

12490.0 9VCL, *ATLANTIC FRONTIER* (28,678-ton Singapore-registered general cargo ship) w/partial AMVER/PR in SITOR-A at 1535Z; AUCT, *DESH SHANTI* (157,975-ton India-registered crude oil tanker) w/AMVER/FR for arrival at Freeport, Bahamas, in SITOR-A at 2305Z. (SJ/KY)

12492.5: XCIU, B.T. *NUEVO PEMEX I* (45,202-ton Mexico-registered oil products tanker) w/telex recap of itinerary for previous 6 weeks, cargo list, 50 mi W of Mexico's Pacific coast, in SITOR-A at 2353Z. (SJ/KY)

12501.0: Unid. vessel w/SELCAL XYFV (1780) for SVO, Olympia R., Athens, Greece, no contact, in SITOR-A at 2047Z. (SJ/KY)

13927.1: PEACH 26 (E-8 JSTARS, airborne off the Georgia coast) p/p via AFA1EN to PEACHTREE with line code report in USB at 1600Z; TEAL 70 (WC-130J Hurricane Hunter) p/p to TEAL OPS to pass ETA to Keesler and report Satcom inoperative. Heard during TS Ernesto, in USB at 2234Z. (MC/SC)

16685.5: 3FZO8, *ATLANTIC ACE* (28,671-ton Panama-registered bulk carrier) w/AMVER/PR, in SITOR-A at 1750Z. (SJ/KY)

16699.0: Unid. PEMEX vessel w/telex outlining corrected petroleum cargo manifest, en route to Puerto de Guaymas, Sonora, Mexico, SITOR-A at 1602Z. (SJ/KY)

16914.0: KSM QSX marker w/freq list in CW at 2053Z. (GV/CO)

17230.0: CW Marker -cq de CWA qsx- w/freq list, in CW at 2050Z. (GV/CO)

17362.0: WLO: YL robotic message in EE. Holding tfc for WDC9253 and WDB3672. In USB at 2016Z. (GV/CO)

22383.5: WLO, Mobile R., Mobile, AL w/CW+SITOR-A marker at 0000–0350Z. (SJ/KY)

22389.5: NMN, USCG CAMSLANT Portsmouth, Chesapeake, VA w/CW+ SITOR-A marker at 2124Z. (SJ/KY)

25950.0: KOA Studio to Transmitter Link (STL) with broadcast audio programming for 950 kHz, local to me. In FM at 2140Z. (GV/CO) ■

by Harold Ort, N2RLL, Editor

Solomon Islands: Thirty-Five Airports—Only Three Radio Stations!

Editor's Note—Each month Pop'Comm *will present a snapshot of one of the nearly 200 countries of the world, covering a little bit about the geography, politics, and, of course, radio. It's our hope that this additional insight into our world will make your hobby even more interesting as you consider the facts about these places while listening to the evening news, catching a shortwave broadcast, or talking to a ham in a far-flung country.*

This archipelago nation of nearly 1,000 islands is home to about 550,000, 2005 est. including people of Melanesian, Polynesian, and Micronesian descent. English is the official language, though few of the population speak it—in an area only about the size of Maryland, there are roughly *120* other languages spoken!

Located in the South Pacific about 6,000 thousand miles from California, the Solomon Islands are indeed remote; even Hawaii, to the northeast, is 3,555 miles distant. What many consider a beautiful paradise, others think of as a nation barely "in check" because of recent political and ethnic unrest. "The Solomons" is certainly a place of wondrous beauty; but remember, beauty can be short lived and sometimes is only surface-deep.

Recent History

Actually, the Solomon Islands are probably best known for the battles fought there during World War II. Within six months of the bombing of Pearl Harbor, the Japanese expanded their empire extremely quickly, and in doing so became overconfident in their quest. Suddenly, in May 1942, in the Battle of the Coral Sea their over-confidence was cut down as they attempted to move toward the Solomon Islands and New Guinea. For the "boots on the ground" the Solomons was anything but paradise (if ever soldiers experienced weather that could be called hot, wet and humid, the Solomon Islands gave it to them).

With limited resources, Admiral Chester Nimitz attacked the island of Guadalcanal in the Solomons in deplorable battle conditions. The official U.S. Army history report says that for every two soldiers and Marines lost in battle, another five were lost because of disease. The Marines landed on August 7 and faced little opposition, quickly taking an airfield. But that victory on Guadalcanal was the easiest, by far.

The U.S. Army report says,

The carriers sailed away almost as soon as the marines went ashore. Then Japanese warships surprised the supporting U.S. naval vessels at the Battle of Savo Island and quickly sank four heavy cruisers and one destroyer. Ashore, the Japanese Army fought furiously to regain the airfield. Through months of fighting the Marines barely held on; some American admirals even thought that the

beachhead would be lost. But gradually land-based aircraft were ferried in to provide air cover, and the Navy was able to return. As the Japanese continued to pour men into the fight, Guadalcanal became a battle of attrition.

Slowly American resources grew, while the Japanese were increasingly unable to make up their losses. In October soldiers of the Americal Division joined the battle; in November the Navy won a smashing victory in the waters offshore; and in early 1943 the Army's 25th Infantry Division was committed as well. Soldiers now outnumbered marines, and the ground forces were reorga-

nized as the XIV Corps, commanded by Army Mail Gen. Alexander M. Patch. As the Japanese lost the ability to supply their forces, enemy soldiers began to starve in the jungles. But not until February—six months after the initial landing—was Guadalcanal finally secured.

Many will remember John F. Kennedy and the surviving crew of his PT-109 taking refuge on a tiny island in the Solomons after their boat was rammed by the Japanese destroyer, *Amagiri*. To the 26-year-old Navy officer, despite the harrowing adventure—lack of water and food, injured crewmen, and determined Japanese invaders—the Solomons, thanks to the help of its islanders ("scouts" as they were called), was indeed paradise found.

The Solomons Today

The Solomon Islands have come a long way since WWII. To be sure, the weather and terrain haven't changed, but this "paradise" has experienced other developments.

Just over six years ago, in June 2003, because of rising crime and ethnic violence, the prime minister asked Australia to intervene with a multinational force to help restore order. (The Solomon Islands has no military forces, just Royal Solomon Islands Police numbering about 500). The effort, dubbed the Regional Assistance Mission To The Solomon Islands, has so far been successful. All is not well in the Solomons yet, however. As recently as this past April violence and rioting again broke out and Australia sent another 300 troops/police officers to quell the violence.

The Solomon Islands has celebrated Independence Day as a national holiday since 1978 when independence from the UK was achieved. The monarch is hereditary and the governor general is appointed by the monarch, but with the advice of Parliament, for a five-year term. It almost sounds like the "good old boy network" with that position carrying a second term renewal eligibility. Other positions are "appointments" by the governor general.

The Solomon Islands economy is slowly recovering from the past violence and near depletion of the national treasury. Agriculture and fishing are the main industries and are fueling some growth, although the current revenues show as a modest $49 million along with *expenditures* of some $75 million. Most of the Solomons' exports go to China, South Korea, and Thailand. The country imports manufactured goods and food from Australia, Singapore, and New Zealand.

Thirty-three of those 35 airports mentioned in the article's title have unpaved runways. As for those radio stations...

The Sounds Of Solomon

Of the country's three radio stations, one is AM, one FM, and the third shortwave. You can indeed hear the latter, from the capital, Honiara, identifying as Radio Happy Isles on 5020 and 9545 kHz. The best times to catch it are early mornings, around 1000 to 1300 UTC.

You won't hear it unless you're in the neighborhood, but the Solomon Islands Broadcasting Corporation (SIBC) also operates on 1035 kHz and 96.3 MHz FM.

One would imagine their stations will remain on the air for the foreseeable future, but remember, there are times that the situation in the Solomons is anything but "happy," so as we always say, "stay tuned for more." Even the SIBC official website says,

> At this time of Reconciliation, Restoration and Reconstruction, the SIBC will prepare and transmit well packaged programs and news to promote a sense of national unity and Reconciliation—uphold the cultural values of Solomon Islands, and create programs that meet the educational and informational needs of the listener.

Of course, the proverbial "bottom line" is what our world is ultimately about these days, so it's not entirely surprising to learn that the SIBC charges a whopping $70 to access "Today's News" on its website—you can't just log in and read the news, it'll cost you!

While in many other parts of the world the Internet is taking hold and in some instances surpassing radio as a mainstream stay-in-touch tool, such is not the case in the Solomons, where by last years' estimate, there were only about 8,400 people using one Internet Service Provider!

Listening to the much of the South Pacific is relatively easy on shortwave, including stations that are outside the shortwave broadcast spectrum. For instance, for those long-distance air routes on HF for keeping track of aircraft traversing the oceans, monitor 3425, 6553, 8846, and 11339 for comms in the area of the Solomons.

Since Australia is a contributor to the overall well-being of the Solomons, it pays to listen to Radio Australia from time to time on their various frequencies on shortwave, including 6020, 9580, 9590, and 12080 early mornings. Mid-mornings catch R. Australia on 5995, 7240, 9590, and 9710. Evenings and overnight it's on 15160 and 17795 kHz.

Note: Some of the information for these monthly reports was obtained from official U.S. government sources, including the CIA World Factbook. ■

by Gerry L. Dexter, gdex@genevaonline.com

Voice Of Armenia Shuts Down, Plus Radio Japan's World Shrinks

Here we are nearly at the end of another year of shortwave listening. And, aside from wondering how the heck it managed to go by so fast, I have to say that the shortwave picture at the close of 2006 is not a very pretty one. It's as if there were a "bad news of the month club" that, like it or not, we've been forced to join. And there's no card to return to indicate you don't want this month's selection!

The latest broadcaster to have pushed the countdown button to self-destruct is the Voice of Armenia, which was scheduled to close down for good at the end of October.

And Uzbekistan's Radio Tashkent International, which discontinued operations a few months ago, appears to be nearing a shutdown of their transmitter site at Dushanbe, leaving that avenue unavailable to its several clients, Radio Nederland among them.

Even Radio Japan's world is beginning to shrink. Come late next year North America and most of Europe will no longer be a part of NHK's "world." Spanish to South America, French to Africa, and Russian to Russia will be about all there is once the dust has settled. Other languages will be cutback and more emphasis placed on TV.

Radio Australia is also moving towards an increased focus on TV, as well as experimenting with digital broadcasts.

Well, not to worry. We'll always have WYFR, the Worldwide Shortwave Ministry!

More of the WEWN antennas on top of Vandiver Mountain, Vandiver, Alabama. (Thanks Charles Maxant, West Virginia)

Meanwhile, Nigeria Upgrades!

On the other side of the ledger, a semi-major broadcaster is about to experience a serious upgrade in its facilities. Nigeria is getting a whole new broadcasting center for its high-frequency transmissions. The Voice of Nigeria will be adding at least one new 250-kW transmitter capable of DRM use, with two more to be added later, complete with a new building to house them—even a rotatable antenna configuration. You have to hope these improvements will include a fix of the modulation problems VON has suffered from for so long. This new facility will be located near the Nigerian capital, Abuja. At present VON has a transmitter there operating on 7275 from around 0530, though it hasn't been heard all that well. Meanwhile, other FRCN (Federal Radio Corporation of Nigeria) regional outlets, including Kaduna-4770, have had their correspondents pulled out and transferred to the Abuja headquarters. This move apparently was largely politically motivated.

Tough To Hear, But They're Back

There is also good cheer in the form of the return of formerly active stations you probably can't pick up anyway—at least not with anything approaching regularity. Radio Clube, Marila, on 3235 has returned, as has Radio Educadora 6 de Agosto in Xapuri, Brazil, on 3255. And two more Brazilians have also returned: Radio Rural in Petrolina (4945) and the 6010 frequency of Radio Inconfidencia from Belo Horizonte.

Bolivian Changes

Major changes have taken place on the radio scene in Bolivia. A new nationwide network—Radio Patria Nueva—is being set up on AM and FM in cities throughout the country as a government-controlled operation. This has already affected Radio Illimani (6025), which now uses the new name in its announcements. Once completed the network will air over some 30 transmitters to more or less blanket the country.

And From Down Under...

Also, the local Aboriginal Resource and Development Service (ARDS) in Australia has fired up 5050 again with newly improved (but still low-power) equipment at its Humpty Doo site. Frequency 5050 operates 24 hours, but the low power and antenna configuration used don't make it easy for any of us to hear.

Surprise SW News From Niger And Bahrain

More positive news is the return of La Voz du Sahel, Niger, on 9705, which is being heard at widely varying times (1500, 1700, 2200, 0500) and listed in *Passport to World Band Radio*

Help Wanted

Month after month the "Global Information Guide" offers you more logs than any other monthly SW publication! (**508** shortwave broadcast station loggings were processed this month!). Why not join the fun and add your name to the list of "GIG" reporters? Send your logs to your editor at 213 Forest St., Lake Geneva, WI 53147. Or e-mail them to or to gdex@genevaonline.com. Or, if you have problems getting through, to Editor Harold Ort at popularcom@aol.com (see the column for formatting tips). Our deadline is the 25th of each month.

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

from 0500 to 2300. Its lower 5020 frequency, silent for some time, is also reported to be active.

Another surprise is the news that Radio Bahrain is, indeed, active—at least sometimes. Word is that this station, often thought to be silent, actually broadcasts only on special occasions when events occur that affect people in the near and Middle East. The station was active late last July on 9745 USB. It seems likely

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

there should be activity during important Moslem holy days.

New Transmitter For Bangladesh

And Radio Bangladesh has recently commissioned a new 100-kW transmitter at Savar. It will be interesting to see whether this addition is put to use in a manner that will make Radio Bangladesh more hearable in North America. We're going to go out on a very short limb and guess not, and that the move is rather an effort to improve reception in Asia. No word yet on what times and frequencies are in play.

Southwest Radio Africa, the anti-Zimbabwe government opposition station—which has many staff members on trial in Zimbabwe—has resumed use of 4880.

Radio Fana in Ethiopia has changed both of its operating frequencies: 6110 has replaced 6210 and 6940 has given way to 7210. Neither of these looks like an improvement for listeners in North America.

Cycle 24 News

It's still a very long tunnel but there may be a glimmer of light just visible up ahead. Atmospheric scientists at the Marshall Space Flight Center in Alabama think they may have spotted the first sunspot of Cycle 24 back on July 31. If that was for real we can say we've turned the corner, or at least we've sighted the exit ramp! Things aren't going to change overnight, of course, but there are better days ahead for shortwave reception!

Reader Logs

Remember, your shortwave broadcast station logs are always welcome. But please be sure to double or even triple space the items, list them country name first, and include your last name and state abbreviation after each log. Also very welcome are spare QSLs you don't need returned, station schedules, brochures, pennants, station photos, and anything else you think would be of interest. And the postman continues to cause tears—where's that pic of you at your listening post?

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

ALASKA—KNLS, 9615 in CC at 1718. Closes at 1758. (MacKenzie, CA)

ALBANIA—Radio Tirana, 6115 at 0051 to NA. (DeGennaro, NY) 6115//7450 at 0230. (Weronka, NC) 7455 (*now replaced by 7450—gld*) in Albanian at 0012. (Charlton, ON)

ANGUILLA—Caribbean Beacon, 11775 with Dr. Gene Scott at 1200. (Northrup, MO)

ARGENTINA—Radio Nacional/ RAE 6060 in SS at 0914. 15345 in SS heard at 1830. (Maxant, WV) 2226. (Charlton, ON)

ASCENSION IS—BBC Relay, 15400 at 2154. (DeGennaro, NY) 1842. Also 17830 at 1852. (Charlton, ON)

AUSTRALIA—Radio Australia, 5995 at 0400, 9660 at 0510 and 15160 at 0525. (Maxant, WV) 5996-Brandon in Pidgin at 1031, 6020 in Pidgin at 1035, 6080 at 1030, 9560 at 1125, 9580 at 1128, 9590 at 1131 and 9710 in Pidgin at 0859. (DeGennaro, NY) 6020 at 1225. (Northrup, MO) 6020 in Pidgin at 1035, 9580 at 1736, 11650 at 2123, 11880 at 1700, 13630 at 2204 and 17795 at 2315. (MacKenzie, CA) 9560 at 1150, 11880 at 1237 and 15515 at 0221. (Brossell, WI) 15515 at 2215 and 13775 at 1530. (Linonis, PA) 15515 at 0417. (Linonis, PA) 0450. (Weronka, NC) 0607. (Yohnicki, ON) 17785 heard at 2315. (Charlton, ON)

AUSTRIA—Radio Austria Int., 9870 at 0044 and 13730 in GG at 1600. (DeGennaro, NY) 9870 at 0114. (Taylor, WI) 0044. (Charlton, ON) 17715 in GG at 1220. (Brossell, WI)

BOLIVIA—Radio Fides, La Paz, 6155 in SS at 0910 with music, anmts, ID. (DeGennaro, NY)

BOTSWANA—VOA Relay, 12080 at 0326. (MacKenzie, CA)

BRAZIL—(All in PP) Radio Nacional Amazonas, 6180 with ID heard at 0615. (Yohnicki, ON) 0917 and 11780 at 0951. (DeGennaro, NY) 2133. (MacKenzie, CA) 2252. (Charlton, ON)

Radio Anhanguera, Goiania, 4915 at 0836 and 11830 at 1043. (DeGennaro, NY) 11830 with live sports event at 2245. (Brossell, WI)

Radio Congohas, 4775 at 0821. (DeGennaro, NY)

Radio Brazil Central, Goiania, 4985 at 0833. (DeGennaro, NY) 11815 at 2207 with rapid PP futbol coverage. (D'Angelo, PA)

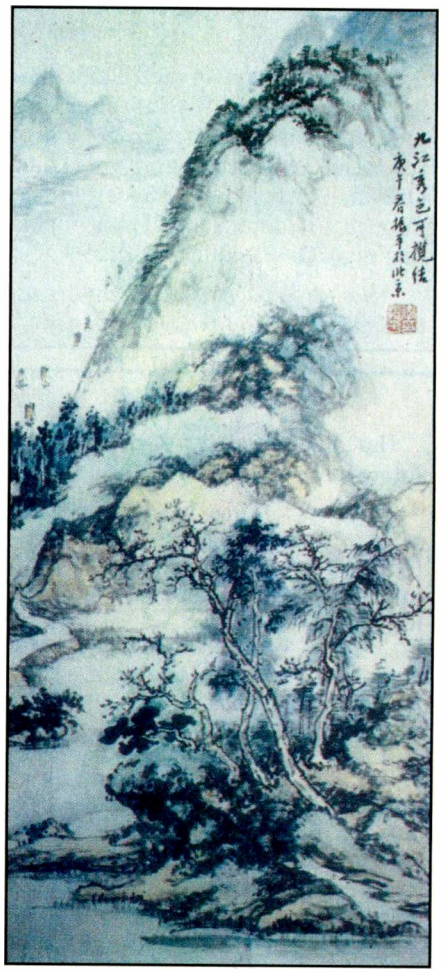
Radio Tupi, Curitiba, 6060 with religious message at 0846. (DeGennaro, NY) 9565 with preaching heard at 0620. (Alexander, PA)

Radio Bandeirantes, Sao Paulo, 9645 with talk, anmts, commls, jingles at 2245, // 11925, which was very weak. (Alexander, PA)

Radio Guaruja Paulista, Guaruja, 5940 at 0550 with US and Brazilian pops, //3384 and 5045. (Alexander, PA)

Radio Gaucha, Porto Alegre, 6020 at 0842. (DeGennaro, NY)

Radio Difusora do Amazonas, Manaus, 4805 with sign on anmts heard at 0928. (DeGennaro, NY)



A typical response from China Radio International. (Thanks David Weronka, North Carolina)

Radio Senado, Brasilia, 5990 with music pgm at 0945. (Jeffery, NY)

Radio Cancao Nova, Cachoeira Paulista, 9675 with religious talk heard at 2316. (DeGennaro, NY)

Radio Clube do Para, Belem, 4885 with man anncr, music and commls at 0832. (DeGennaro, NY)

Radio Marumby, Florinapolis, 9665 heard at 0215 with talk, short music breaks, weaker on //11750. (Alexander, PA) 2320 with religious message, hymns. (DeGennaro, NY)

Radio Record, Sao Paulo, 9505 at 2340 with anmts, ads, jingles, local music, //6150. (Alexander, PA)

BULGARIA—Radio Bulgaria, 9500 in SS at 2335, 9700 at 0048 and 15700 in BB at 1020. (DeGennaro, NY) 11700 at 0217. (Brossell, WI) 11800 in SS at 2136. (MacKenzie, CA)

Radio Varna, 9300 in BB with various US and European selections at 2230. (Taylor, WI)

CANADA—Radio Canada Int., 9515 in FF at 1119 and 13730 via Germany at 1814. (DeGennaro, NY) 13710 monitored at 0115. (Charlton, ON)

CHU, Ottawa, 14670 with FF and EE time anmts at 1835. (Charlton, ON)

Rich D'Angelo got this QSL card from the Voice of Armenia.

Shiokaze is the broadcast intended for Japanese persons believed to have been kidnapped by North Korea. (Thanks Rich D'Angelo)

CBC Northern Service, 9625 at 1322. (Wood, TN) 1430. (Maxant, WV) 2310. (D'Angelo, PA)

CKZN, St. John's, Newfoundland, 6160 at 0610. (Yohnicki, ON) 0715. (Maxant, WV) 0909. (DeGennaro, NY)

CFRX, Toronto, 6070 relay CFRB at 0857 with call-ins. (DeGennaro, NY) 2310. (D'Angelo, PA)

CHILE—Voz Cristiana, 5960 in SS at 0848, 6070 in SS at 0944 and 6110 in PP at 0900. (DeGennaro, NY) 9635 in SS at 1935. (Maxant, WV) 17680 in SS at 1845. (Charlton, ON)

CHINA—China Radio Int., 6020 via Albania at 0025, 9490-Kashi in Sinhala to S. Asia at 2140, 9570 via Albania at 0004, 9590-Kashi in SS at 0002, 9745 via Canada in SS at 0038, 9800-Kashi in SS at 0027, 13650 via Albania at 1216, 13655-Urumqi in RR at 1753, 13760-Kashi at 1609 and 13860-Shijiazhuang in RR at 1624. (DeGennaro, NY) 9570 via Albania at 0005, 9580 via Cuba at 0115 and 13740 via Cuba at 1436. (Charlton, ON) 11885 in CC at 1215 and 11990 in CC at 1215. (Northrup, MO) 11975 via Mali in FF at 2147. (MacKenzie, CA) 9450 via Russia in CC at 1211, 11975 via Mali in CC at 2251 and 13650 via Albania at 1233. (Brossell, WI) 13630 via Mali at 2051. (Wood, TN)

Voice of the Strait, Fuzhou, 7280 in CC dialects monitored at 1203. (Taylor, WI)

CPBS, 4460-Beijing in CC at 1100 and 7275-Beijing in Asian language at 0926. (Barton, AZ) 6090-Geermu in CC heard at 1207. (Brossell, WI)

Xinjiang PBS-Urumqi, 7230 in Mongol at 0040 and 11885 in Uighur at 2350. (DeGennaro, NY) 9705 (p) in Kyrgyz heard at 1212. (Taylor, WI)

China Music Jammer (*aka "Firedrake" after the CC opera music used—gld*) 9455 at 1705, //9540. Also 11935 monitored at 2145 and 13715, //9355, 9455 and 13715. (MacKenzie, CA) (*Who were the targets of these?—gld*)

COLOMBIA—La Voz de su Concencia, Puerto Lleras, 6010 in SS with religious message at 0940. (DeGennaro, NY)

Marfil Estereo, Puerto Lleras, 5910 in SS with ballads, rancheras at 0550. (Alexander, PA) 0845. (DeGennaro, NY)

COSTA RICA—University Network, 7375 with Gene Scott at 0955. (Maxant, WV) 9725 with Dr. Scott programming at 1325. (Wood, TN)

CROATIA—Voice of Croatia, 9925 via Germany in Croatian at 0033. (DeGennaro, NY) 2320 in Croatian with ID at 0000. (Charlton, ON) 2345 in Croatian. (Charlton, ON)

CUBA—Radio Havana Cuba, 6000 in SS at 1240, 11760 in SS at 1205, 11805 in SS at 1245 and 12000 in SS at 1210. (Northrup, MO) 6060 in SS at 0021, 9820 in EE at 0118 and 15230 in SS at 1606. (Charlton, ON) 9505 in SS at 1116 and 9820 in SS at 0024. (DeGennaro, NY) 11760 at 0235. (Wood, TN)

Radio Rebelde, 5025 in SS at 0840. (DeGennaro, NY) 6120 in SS at 0330 with Cuban jazz. (Barton, AZ)

CYPRUS—BBC Relay, 9410 to West Asia heard at 0019. (DeGennaro, NY)

CZECH REPUBLIC—Radio Prague, 7345 in SS at 0040, 6200 at 0103, 9440 at 0026 and 9880 to Northern Europe at 0909. (DeGennaro, NY) 7345 at 0105. (Charlton, ON) 11600 at 2145. (Maxant, WV)

DJIBOUTI—RTV Djibouti, 4780 heard at 0300 with local music, vernacular talk, Koran at 0303. More music and talk at 0308. (Alexander, PA)

ECUADOR—HCJB, 3220 in QQ at 1011, 6125 in QQ at 0905, 12020 in PP at 2326 and 12040 in GG at 2322. (DeGennaro, NY) 9745 at 1326. (Wood, TN) 11960 in SS at 1220. (Northrup, MO) 12040 in GG at 2257. (Charlton, ON)

La Voz del Napo, Tena, 3279 in SS at 0820. (DeGennaro, NY)

EGYPT—Radio Cairo/Egyptian Radio, 7270 in SS at 0052 and 9735 in AA at 0043. (DeGennaro, NY) 11950 in AA at 0234 and 12050 in AA at 2235. (Brossell, WI) 11950 in AA at 0043 and 12050 in AA at 1926. (Charlton, ON) 12050 in AA at 2150. (MacKenzie, CA) 2300 opening EE to NA. (Linonis, PA) 2350. (Maxant, WV)

ENGLAND—BBC, 11865 via Fr. Guiana at 1101, 13550-Skelton in AA at 1756 and 17610-Skelton in AA at 1040. (DeGennaro, NY) 9410-Skelton at 0420. (Weronka, NC) 11675 via Fr. Guiana at 2128. (MacKenzie, CA) 11865 via Fr. Guiana with "Newshour" at 1230. (Fraser, ME) 1200. (Northrup, MO) 17585 in AA at 1211. (Brossell, WI) 21470 at 1645. (Maxant, WV)

EQUATORIAL GUINEA—Radio Nacional, Bata, 5005 at 0503 with SS talk, ID, talks by two men. (D'Angelo, PA)

ETHIOPIA—Radio Ethiopia, 9704.2 at 0354 with HoA music, flutes, man with ID at 0400 and news in Amharic. (D'Angelo, PA)

FINLAND—YLE/Radio Finland, 11995 with O/C at 0359, instl music at 0400, ID and man in Finnish. (D'Angelo, PA) 13715 at 1223. (DeGennaro, NY) 15400 at 1240 in Finnish. (Linonis, PA)

FRANCE—Radio France Int., 9805 in possible RR at 0355. (Linonis, PA) 9800 via Fr. Guiana in SS at 0124, 15160 via So. Africa in EE at 1602, 15300 in FF at 1832 and 15515 via Fr. Guiana in SS at 1608. (Charlton, ON) 11600 via China in an Asian language at 1252.

In Times Past...

And now for some nostalgia. We give you a blast from the past here each month, perhaps a logging or a station tidbit from the *Pop'Comm* shortwave history book. Here's one:

FALKLAND ISLANDS—Falkland Island Broadcasting Station, Port Stanley, 2370 at 0042 with local EE programming on 11/16/70. 500 watts. (Dexter-WI)

Also 17620 in FF at 1212. (Brossell, WI) 15300 in FF at 1000. (DeGennaro, NY)

GABON—Africa No. One, 15475 in FF at 1620. (Fraser, ME) 1715 in FF. (Taylor, WI) 1839. (Charlton, ON) 1850 to 1900 close. (Wood, TN) 1901. (D'Angelo, PA) 17630 heard at 1215. (Brossell, WI)

Radio Gabon, 4777 at 0458 sign on with anthem, ID, woman with numerous IDs, man with news. (D'Angelo, PA) 0459 sign on. (Alexander, PA)

GERMANY—Deutsche Welle, 5905 via Bonaire in GG at 1026, 9430-Wertachtal in GG at 0006, 9505 via Sri Lanka in GG at 0015, 9545-Wertachtal in GG at 0008, 9825-Wertachtal in EE to S. Asia at 0021, 11865-Wertachtal in GG at 2355, 11970-Nauen in Romanian at 0929 and 13780-Wertachtal in GG at 1617. (DeGennaro, NY)

Deutschland Radio, Berlin, 6005 in GG at 0022. (DeGennaro, NY)

Deutschlandfunk, Berlin, 6190 in GG at 0033. (DeGennaro, NY)

Universal Life, 9430 in GG heard at 0107. (Charlton, ON) (*probably via Julich—gld*)

GREECE—Voice of Greece, 5865 in Greek at 0309. (Brossell, WI) 7475 in Greek at 0255. (Weronka, NC) 7475 at 0032 and 9420 at 0022 both in Greek. (DeGennaro, NY) 15630 in Greek at 1842. (Charlton, ON)

Radio Makedonias, 7450 in Greek at 0000. (DeGennaro, NY) 0017. (Paszkiewicz, WI)

GUAM—AFN/AFRTS, 5765u at 1050. (DeGennaro, NY)

Trans World Radio/KTWR, 12130 in CC to S. Asia at 1053. (DeGennaro, NY)

Adventist World Radio, 11825 in CC at 1240. (Brossell, WI)

GUATEMALA—Radio Buenas Nuevas, San Sebastian, 4800 with SS talks, phone calls at 0225. (Paszkiewicz, WI)

Radio Verdad, Chiquimula, 4052.5 at 0358 in EE with music in SS and EE. (Wood, TN)

HAWAII—KWHR, 12130 with Jack Van Impe sermon at 1214. (Brossell, WI)

AFN/AFRTS, 6350u with news items at 1208. (Brossell, WI)

HONDURAS—La Voz Evangelica, 4819 with SS religious message and phone-ins at 0932. (DeGennaro, NY)

Radio Luz y Vida, San Luis, 3249 with religious talk at 1015 and lady translating from EE to SS. (DeGennaro, NY)

HUNGARY—Radio Budapest, 9590 at 0100 with economic news. (Linonis, PA) At 0108 with "Hungary Today." (Charlton, ON) 9770 at 0030 in HH to NA. (DeGennaro, NY) 9795 at 0235. (Maxant, WV) 12030 in SS at 2235. (Brossell, WI)

INDIA—All India Radio, 9470-Aligarh, in Hindi at 0013, 9910-Aligarh in Hindi to SEA at 0036, 10330-Bangaluru in Hindi at 1627, 13770-Bangaluru in Hindi to ME at 1614 and 17510-Delhi in EE at 1031. (DeGennaro, NY) 9950 at 2055, 10330-Bangaluru in Hindi at 0215 and 13710 in EE at 1400. (Maxant, WV) 11620-Bangaluru in Asian language at 1254 and 15075 in Hindi at 0238. (Brossell, WI) 11620 in EE with Indian pops at 1940. (Fraser, ME) 2300 in presumed Hindi. (Linonis, PA)

China Radio International

Broadcasts home and world news, reports and commentaries and features on current events in this country, as well as music.
Address: English Service, China Radio International, P.O. Box 4216, CRI-2, Beijing, 100040, China

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UTC (GMT)	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
12:00	News and Reports*	News and Reports*	News and Reports*	News and Reports*	News and Reports*	News and Reports*	News and Reports*
12:30	Front Line	Biz-China	China Horizons	Voices from Other Lands	Life in China	Listeners' Garden	In the Spotlight
12:55	Chinese Studio	Chinese Studio	Chinese Studio	Chinese Studio	Chinese Studio	Chinese Studio	Chinese Studio
13:00	News and Reports	News and Reports	News and Reports	News and Reports	News and Reports	News and Reports	News and Reports
13:30	Front Line	Biz-China	China Horizons	Voices from Other Lands	Life in China	Listeners' Garden	In the Spotlight
13:55	Chinese Studio	Chinese Studio	Chinese Studio	Chinese Studio	Chinese Studio	Chinese Studio	Chinese Studio
14:00	News and Reports	News and Reports	News and Reports	News and Reports	News and Reports	News and Reports	News and Reports
14:30	Front Line	Biz-China	China Horizons	Voices from Other Lands	Life in China	Listeners' Garden	In the Spotlight
14:55	Chinese Studio	Chinese Studio	Chinese Studio	Chinese Studio	Chinese Studio	Chinese Studio	Chinese Studio
15:00	News and Reports*	News and Reports*	News and Reports*	News and Reports*	News and Reports*	News and Reports*	News and Reports*
15:30	Front Line	Biz-China	China Horizons	Voices from Other Lands	Life in China	Listeners' Garden	In the Spotlight
15:55	Chinese Studio	Chinese Studio	Chinese Studio	Chinese Studio	Chinese Studio	Chinese Studio	Chinese Studio
16:00	News and Reports	News and Reports	News and Reports	News and Reports	News and Reports	News and Reports	News and Reports
16:30	Front Line	Biz-China	China Horizons	Voices from Other Lands	Life in China	Listeners' Garden	In the Spotlight
16:55	Chinese Studio	Chinese Studio	Chinese Studio	Chinese Studio	Chinese Studio	Chinese Studio	Chinese Studio
17:00	News	News	News	News	News	News	News
17:05	China Drive	China Drive	China Drive	China Drive	China Drive	CRI Roundup	Reports from Developing Counties
17:10	China Drive	China Drive	China Drive	China Drive	China Drive	China Roots	China Beat
17:55	Chinese Studio	Chinese Studio	Chinese Studio	Chinese Studio	Chinese Studio	Chinese Studio	Chinese Studio
18:00	News and Reports	News and Reports	News and Reports	News and Reports	News and Reports	News and Reports	News and Reports
18:30	Front Line	Biz-China	China Horizons	Voices from Other Lands	Life in China	Listeners' Garden	In the Spotlight
18:55	Chinese Studio	Chinese Studio	Chinese Studio	Chinese Studio	Chinese Studio	Chinese Studio	Chinese Studio
19:00	News and Reports	News and Reports	News and Reports	News and Reports	News and Reports	News and Reports	News and Reports
19:30	Front Line	Biz-China	China Horizons	Voices from Other Lands	Life in China	Listeners' Garden	In the Spotlight
19:55	Chinese Studio	Chinese Studio	Chinese Studio	Chinese Studio	Chinese Studio	Chinese Studio	Chinese Studio
20:00	News and Reports*	News and Reports*	News and Reports*	News and Reports*	News and Reports*	News and Reports*	News and Reports*
20:30	Front Line	Biz-China	China Horizons	Voices from Other Lands	Life in China	Listeners' Garden	In the Spotlight
20:55	Chinese Studio	Chinese Studio	Chinese Studio	Chinese Studio	Chinese Studio	Chinese Studio	Chinese Studio
21:00	News and Reports	News and Reports	News and Reports	News and Reports	News and Reports	News and Reports	News and Reports
21:30	Front Line	Biz-China	China Horizons	Voices from Other Lands	Life in China	Listeners' Garden	In the Spotlight
21:55	Chinese Studio	Chinese Studio	Chinese Studio	Chinese Studio	Chinese Studio	Chinese Studio	Chinese Studio
22:00	News	News	News	News	News	News	News
22:05	China Drive	China Drive	China Drive	China Drive	China Drive	CRI Roundup	Reports from Developing Counties
22:10	China Drive	China Drive	China Drive	China Drive	China Drive	China Roots	China Beat
22:55	Chinese Studio	Chinese Studio	Chinese Studio	Chinese Studio	Chinese Studio	Chinese Studio	Chinese Studio
23:00	News and Reports*	News and Reports*	News and Reports*	News and Reports*	News and Reports*	News and Reports*	News and Reports*
23:30	People in the Know	People in the Know	People in the Know	People in the Know	People in the Know	Listeners' Garden	In the Spotlight
23:55	Chinese Studio	Chinese Studio	Chinese Studio	Chinese Studio	Chinese Studio	Chinese Studio	Chinese Studio

* This program is an update.

China Radio International sports an extensive program schedule. (Thanks David Weronka)

IRAN—VOIRI, 9495 at 0220. Lost or off suddenly at 0225 and 11860 in EE at 1940. (Maxant, WV) 9905 in SS at 0039 and 9935-Sirjan in AA at 0007. (DeGennaro, NY) 15085 in FF at 1837. (Charlton, ON)

ISRAEL—Kol Israel, 9345 in HH at 0115 with pops and no mention of Lebanon conflict! (Linonis, PA) 9345 in HH at 0023, 13675 (t) in HH at 1803 and 15760 in HH to W. Europe at 1026. (DeGennaro, NY) 11585 at 2240. (Brossell, WI) 2251 in HH. (Charlton, ON) 11585 in HH at 2120 and 15640 in HH at 2324. (MacKenzie, CA)

Galei Zahal, 6973 in HH with older pops at 0004. (DeGennaro, NY)

ITALY—RAI Int., 9780 monitored at 1957 sign on with usual musical opening, ID f/by the Sunday Danish program. Off at 2021 with ID and IS. (D'Angelo, PA) 9840 in II to SA at 0014. (DeGennaro, NY) 11800 in EE at 0103 and 15380 in II at 1837. (Charlton, ON) 11800 in EE at 0100 with IS, ID and news. (Linonis, PA)

JAPAN—Radio Japan/NHK, 6120 via Canada in EE to NA at 1044, 6145 via Canada with EE to NA at 0054, 11710 via Skelton, UK in JJ to Europe and 17585 via Dhabbaya, UAE with EE to Europe at 1035. (DeGennaro, NY) 6145 via Canada at 0015 with "Forty-Four Minutes." And 11895 via Fr. Guiana in JJ at 2234. (Charlton, ON) 9535 at 1730, //11970, 15355. 9685 at 1800 in EE/JJ. Also 17810 in CC/EE at 2355. Also 17825 in JJ at 0323, //5960 via Canada, 15325, 17560, 17685 and 17810. (MacKenzie, CA) 11935 in unid language at 1155. (Northrup, MO) 11740 via Singapore in CC at 1217. (Brossell, WI) 15220 via Ascension in JJ at 2215. (Linonis, PA)

Radio Nikkei, 6055 in JJ at 1140. (Brossell, WI) 9595 in JJ at 1255. (MacKenzie, CA)

JORDAN—Radio Jordan, 11690 heard at 1425 with usual FM programming relay. (Maxant, WV)

KAZAKHSTAN—Deutsche Welle Relay, 17845 in GG at 1225. (Brossell, WI)

KUWAIT—Radio Kuwait, 9855 in AA at 2348, 15495 in AA at 1844 and 15505 in AA at 1840. (Charlton, ON) 11675 in AA at 0345.

(Linonis, PA) 15495 in AA at 2158. (DeGennaro, NY) 15505 in AA at 1915. (Strawman, IA)

LIBYA—Radio Jamahiriaya, 7320 via France at 2343 in AA. (DeGennaro, NY) 2245-2300 in AA. (Linonis, PA) 17850 via France at 1402 to 1440 fade out with "Voice of Africa" segment. (D'Angelo, PA)

LITHUANIA—Radio Vilnius, 9875 in EE at 2350. (Charlton, ON)

MAURITANIA—Radio Mauritanie, 4845 in AA with men talking at 0010. (DeGennaro, NY)

MEXICO—Radio Educacion, 6185 in SS with music and commls at 0919. (DeGennaro, NY) SS hip hop and rap at 0603. (Wood, TN)

XERTA/Radio Transcontinental de America, 4810 at 0353 with various male anncrs and SS talk through top of the hour without an ID. Music at 0419 f/by ID and anmts. (D'Angelo, PA) PA) 0920 with man in SS. (Barton, AZ)

Radio Mil, 6010 at 0549 with EE preacher and SS translations. (Wood, TN)

MOLDOVA—Voice of Russia, 7125 with EE to NA at 0031 and 9665 with SS at 0054. (DeGennaro, NY)

MOROCCO—RTV Marocaine, 15345 in AA heard at 1820. (Charlton, ON) 1917. (Jeffery, NY) 2151. (DeGennaro, NY)

Radio Medi Un, 9575 in FF at 2120. (DeGennaro, NY)

VOA Relay, 15410 with sports news at 1923. (Jeffery, NY) 17785 in FF at 1850 and 17895 in EE at 1855. (Charlton, ON)

NETHERLANDS—Radio Nederland, 7400 via Madagascar in Indonesian at 2354 and 9895-Flevo in DD at 0924. (DeGennaro, NY) 9700 at 0650, 11665 at 1930. (Maxant, WV) 1950 with "Newsline." (Fraser, ME)

NETHERLANDS ANTILLES—Radio Nederland Bonaire Relay, 9845 at 0022 and 17810 at 1919. (Charlton, ON) 17810 at 1859 and into "EruoQuest." (Jeffery, NY)

NEW ZEALAND—Radio New Zealand Int., 6095 with Pacific news at 1200; also 9870 with news at 1200 and 15720 at 0220. (Brossell, WI) 7145 at 0930 and 13730 to 0500 close. (Barton, AZ) 7145 at 0945 with old time tunes on National Radio. Also 9615 at 0500 sign on. (Maxant, WV) 7145 at 1006 and 9870 at 1148. (DeGennaro, NY) 9615 at 0517. (Wood, TN) 13730 at 0318 with a talk on Togo and Cook Islands. (MacKenzie, CA) 15720 with sports at 2230. (Charlton, ON) 0300. (Linonis, PA)

NIGER—La Voix du Sahel (p) 9705 at 2247 with vocals and male host in FF and choral anthem to 2301 close. (D'Angelo, PA)

NIGERIA—Voice of Nigeria, 7255 in Hausa at 2246 and 15120 in EE at 1832. (Charlton, ON) 7255 in FF at 2114. (DeGennaro, NY) 15120 at 1835. (Maxant, WV) 2010 with interview. (D'Angelo, PA)

Radio Nigeria, 4770 at 0524 with talk on economy, religious pgm heard at 0530. (D'Angelo, PA)

NORTH KOREA—Voice of Korea, 15180 in SS at 0227. (Brossell, WI)

KCBS, 11710 in KK at 1705. (MacKenzie, CA) 11735 in KK to East Asia at 0920. (DeGennaro, NY) 15180 in KK at 1235. (Brossell, WI)

NORTHERN MARIANAS—KFBS, Saipan, 11650 in RR at 1214. (Brossell, WI)

VOA Relay, 11990 at 1128 competing with Chinese "Firedrake" jammer. Also on 11785 and 11825. (Taylor, WI) 11990 in CC at 1200. (Brossell, WI)

OMAN—Radio Sultanate of Oman, 9760 in AA at 0033. (DeGennaro, NY) 15140 with news at 1410. (Maxant, WV)

OPPOSITION—Radio Farda, 15690 via Sri Lanka in Farsi to Iran at 1017. (DeGennaro, NY)

Radio Solh, 17770 to Afghanistan in Pashto/Dari at 1216. (Brossell, WI)

Sudan Radio Service, 11805 via Skelton, UK, at 0332 with EE talk on HIV, ID at 0335. (D'Angelo, PA)

Radio Nile, 9905 via Madagascar with EE s/on at 0359 to 0457 close, partly in vernaculars. (Alexander, PA) 0417. (Paszkiewicz, WI) 0431 to 0500 close. (D'Angelo, PA)

Radio Free Asia via No. Marianas 13760 in CC at 0310 and 17880, //15685 in CC at 0320. (MacKenzie, CA)

Radio Free Europe, 7175 via Germany in RR at 0230 and 15205 via Greece in RR at 1235. (Brossell, WI)

Radio Liberty, 11705 via Philippines in RR at 1218. (Brossell, WI)

Voice of Mesopotamia, 11530 via Moldova in Kurdish monitored at 0919. (DeGennaro, NY)

PALAU—KHBN/Voice of Hope, 9965 in CC at 1224. (Brossell, WI)

PERU—Radio Vision, Chiclayo, 4790 at 0355 with SS religious talk, IDs, OA music. (Alexander, PA) 0407 with religious talk and live audience. (D'Angelo, PA)

Radio Victoria, Lima, 9720 at 0425 with SS sermon. (Wood, TN) 0452 with anmts, ID, SS preaching. (D'Angelo, PA)

Radio Union, Lima, 6114.8 in SS at 0851. (DeGennaro, NY)

PHILIPPINES—FEBC Int., 9430 in CC at 1130. (Barton, AZ)

VOA Relay, 9890 at 1228 with EE news sound bites being translated into an Asian language. (Brossell, WI)

PIRATES—The Crystal Ship, 6875 at 0038 with JFK space quotes, "Duck and Cover" recording, German tunes. (Martin, MO) 6876 (t) at 0200 with rock and brief bit of child talking, no ID and signal lost at 0211. Also 6876 at 0047 with American Indian powwow music, rock and "Blue States" ID. Belfast address not announced. (Zeller, OH)

WBNY, 6925u at 0034 with digital noises, possibly SSTV and into a CW segment that included some WBNY IDs. Also 0058 with yodeling at sign on, hard-to-follow pgm with Cmdr Bunny with several IDs and Belfast address to 0130 close. Also another date at 2127 with similar pgm. (Zeller, OH)

International Voice of Pickle's Worth, 6925u at 0131 sign on with not much more than an ID over the QRM from WBNY's digital noise on frequency. Also 2303 with "Hello Radio" test, then 3–4 IDs. The whole pgm consisted of IDs. No address anncd. (Zeller, OH)

KIPM, 6925u at 2045 fade in with seemingly a new story including the line "now I know why the other galaxies are rushing away from ours." Also 2212 with new program "Nine Audio Signals From Space."(Hassig, IL)

WTPR 6925u at 0036 with talk of pirate DXers in Michigan and IDs as "Tire Pressure Radio" and talk of other pirate operators. (Wood, TN)

MAC Shortwave, 6850 (t) at 0128 ending pgm, "Dr. Who" theme and US NA by brass band. Also 6871.3 monitored at 0035 with classic rock and macshortwave@yahoo.com for reports. Ended with brass band version of national anthem. (Zeller, OH)

Lowbuck Radio? 6925u at 2200 with modern voiceovers, perhaps computer-generated and real voices for old heavy metal things from Iron Man and The Wall. Unsure of name even though it was repeated many times. (Hassig, IL)

Radio Six Pack, 6932 at 0123 with 50s oldies. Also 6933 at 0030 with oldies, doo-wop, said to be from 1957. Frequency varying. (Hassig, IL)

This Month's Book Winner

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

Our book winner this month is **Brian Alexander** who receives a copy of the 2007 edition of *Passport to World Band Radio* from Universal Radio. Universal offers a great catalog of shortwave receivers, antennas, numerous gadgets and other aids, books, and even replicas of classic radios! Get your free copy by calling (614) 866-4267 or send an e-mail to dx@universal-radio.com or drop a note to them at 6830 Americana Parkway, Reynoldsburg, OH 43068.

WMPR-6925 at 2337 with new age and techno. (Wood, TN)

The Crooked Man, 6925u at 0053 sign on with IDs with songs "Satisfaction" and "Walk of Life." (Wood, TN)

PORTUGAL—RDP Int., 9715 in PP at 0045, 12020 in PP at 0933 and 15295 in PP at 0023. (DeGennaro, NY) 15560 in PP at 1841. (Charlton, ON)

ROMANIA—Radio Romania Int., 7365-Galbeni to NA at 2356, 9645 to ECNA at 2321, 11830-Galbeni in FF at 1106 and 11940 in EE to ECNA at 2346. (DeGennaro, NY)

RUSSIA—Voice of Russia, 7125 via Moldova in RR at 0009, 9725-Armavir in RR at 0117 and 15605 in EE at 1406. (Charlton, ON) 7300-Armavir in SS at 0057, 7330-Moscow in PP at 2347, 9830-Armavir in SS at 0018, 12010-Samara in PP at 2328. (DeGennaro, NY) 15455-Armavir at 0210. Also 15595-Petropavlovsk at 0422. (Wood, TN) 15455 in FF at 1929. (Jeffery, NY) 13590-Novosibirsk in CC at 1227, 15550-Novosibirsk (QSL says Moscow) in Urdu at 1251. Also 15595-Petropavlovsk in RR at 0225. (Brossell, WI) 15595-Petropavlovsk at 0342, //15555-Vladivostok, 15455-Armavir and 15470-Amore. (MacKenzie, CA) (*Komsomolsk-Amure?—gld*)

Magadan Radio (t), 7320 heard at 1219 with RR classical music. No ID noted. (Taylor, WI)

Russian Int. Radio 13855-Moscow in RR at 1621. (DeGennaro, NY)

Radio Rossii, 13665-Moscow in RR at 1219. (DeGennaro, NY)

RWANDA—Deutsche Welle Relay, 11865 at 2115, //15205. (Fraser, ME) 15410 in FF at 1245. (Brossell, WI) 15275 in GG at 1831. (Charlton, ON) 1912 in GG. (Jeffery, NY) 1914. (MacKenzie, CA) 17860 at 0655. (Weronka, NC)

SAO TOME—VOA Relay, 4960 heard at 0413. (Wood, TN) 15730 in FF at 1937. (Jeffery, NY)

SAUDI ARABIA—BSKSA, 11820 in AA at 2253. (Charlton, ON) 17805 in AA at 1043. (DeGennaro, NY)

SOUTH AFRICA—Channel Africa, 3345 at 0442 with talk, music, close down ID and anmts to 0456. (D'Angelo, PA) 17770 at 1554. (Charlton, ON) 1500 with Afro and Western pops, weather for major African cities. (Linonis, PA)

Radio Sondergrense, 3320 in Afrikaans at 0024. (DeGennaro, NY)

SOUTH KOREA—KBS World Radio, 9560 with news. (Maxant, WV) 11795 via Canada in SS at 1120. (DeGennaro, NY) 15360 via UK in RR at 1836. (Charlton, ON)

SPAIN—Radio Exterior de Espana, 9535 in SS at 0010, 9620 in SS at 2358, in SS at 1139, 15110 in SS at 2140, 15385 in SS at 0026 and 15585 in SS at 1013. (DeGennaro, NY) 11815 via Costa Rica in SS at 1240. (Northrup, MO) 11680 in SS at 0120 and 17850 in SS at 2030. (Barton, AZ) 15110 in SS at 1907. (MacKenzie, CA) 15385 in EE at 0017, 17715 in SS at 1846 and 17850 via Costa Rica in SS at 1853. (Charlton, ON)

SWEDEN—Radio Sweden, 9490 via Canada in Swedish at 0016, 13710 in Swedish at 1810 and 15735 in Swedish to E. Asia at 1023. (DeGennaro, NY) 15240 at 1355. (Maxant, WV) 1400–1430 in Swedish via Canada. (Linonis, PA) 1401. (Charlton, ON) 15735 at 1333. (Wood, TN)

SYRIA—Radio Damascus, 9330 in AA at 0012 and 12085 in SS at 2314. (DeGennaro, NY) 2045 but lost at 2050. (Maxant, WV)

TAIWAN—Radio Taiwan Int., 9780 in CC at 1155 and 11935 in RR at 1224. (Brossell, WI) 11635 at 1039 in EE to SEA. (DeGennaro, NY)

THAILAND—Radio Thailand, 5890 via Greenville at 0225 with business news. (Weronka, NC) 0045 with news and stock market info and 9570 with news at 0010. (Charlton, ON)

BBC Relay, 11945 in CC at 1205. (Brossell, WI) 17615 in CC at 0337 and 17760 in EE at 0333. (MacKenzie, CA)

TUNISIA—RT Tunisienne, 7190 in AA at 0606. (Yohnicki, ON) 12005 in AA at 0313. (Barton, AZ)

TURKEY—Voice of Turkey, 5975 in EE at 0330 with lots of exotic Turkish music. (Linonis, PA) 9785 at 1915 with music and talk and 9830 at 2225. (Maxant, WV) 9830 to close at 2255. (Charlton, ON) 13640 in GG at 1745. (DeGennaro, NY)

UKRAINE—Radio Ukraine Int., 7440 heard at 0035 with EE to North America. (DeGennaro, NY) 0340 with woman EE host. (Wood, TN) 2343 in UU. (Charlton, ON)

UNITED STATES—AFN/AFRTS, Key West, 5446u at 0418. (Wood, TV) 7811u with talk show at 0027 and 12133.5u with news heard at 1046. (DeGennaro, NY)

WYFR/Family Radio via Ascension Is., 11985 in FF at 2110. (Brossell, WI)

VATICAN STATE—Vatican Radio, 7250 in EE at 0605. (Wood, TN) 7250 at 0520 and 9750 at 2315. (Maxant, WV) 9600 in VV at 2328. (DeGennaro, NY) 11935 in II at 1200. (Northrup, MO) 13765 in EE at 2010. (Charlton, ON)

VENEZUELA—Radio Nacional, via Cuba, 6180 in SS at 1033, 13750 in SS at 1604 and 15230 in SS at 2148. (DeGennaro, NY)

VIETNAM—Voice of Vietnam, 6175 via Canada at 0059 with news and ID. (DeGennaro, NY) 0110 on Vietnam Musical Academy. (Charlton, ON)

ZANZIBAR—Radio Tanzania-Zanzibar, 11735 at 1949 with local vocals and woman anncr in Swahili. 5 + 1 time pips heard at 2000, ID, news, more music. Off at 2059. (D'Angelo, PA)

TUNING IN *(from page 4)*

open water or mountaintop to mountaintop." That's hardly a realworld situation, but they don't even say that much.

Another manufacturer has the wildest range claim I've ever seen for a small GMRS handheld: "up to 17 miles." Holy cow, let's get them while they're still available! They do, however, say that "range will vary depending on terrain and conditions." I'd sure like to see the conditions that would give my family and me that kind of range! This company offers a short one-liner regarding the requirement for a license to operate the radios, stating, "FCC licensing information is included in the owner's manual." Bravo, it's a start and better than nothing, I guess.

Perhaps we should sell the house and buy a place at that *exact spot* where someone got "up to 17 miles" using a GMRS HT. I could put up an inconspicuous antenna, talk around the world, *and* likely hear 500-mile distant public safety dispatchers without really trying. Then again, I'd need to hire a pack of lawyers to write a clever disclaimer: "Sorry, but this home comes complete with a restrictive covenant prohibiting use of any radio whatsoever at any time on any frequency; the range of which you *would have* achieved is only available in a corporate boardroom."

Merry Christmas and Happy Hanukah from the *Pop'Comm* staff! See you again next year!

And that wraps it! A roaring salute to the good guys who provided the fuel this time, namely Joe Wood, Greenback, TN; David Weronka, Benson, NC; Jack Linonis, Hermitage, PA; George Zeller, Cleveland, OH; William Hassig, Mt. Prospect, IL; Charles Maxant, Barboursville, WV; Robert Fraser, Belfast, ME; Robert Charlton, Windsor, ON; Stewart MacKenzie, Huntington Beach, CA; Robert Brossell, Pewaukee, WI; Mark Northrup, Gladstone, MO; Arnold Zeck, Bayberry, NY: Rich D'Angelo, Wyomissing, PA; Dave Jeffery, Niagara Falls, NY; Rick Barton, Phoenix, AZ; Michael Yohnicki, London, ON; Ciro DeGennaro, Feura Bush, NY; Sheryl Paszkiewicz, Manitowoc, WI; Brian Alexander, Mechanicsburg, PA and Mark Taylor, Madison, WI. Thanks to each one of you!

Until next month, good listening! ■

WASHINGTON BEAT

(from page 27)

pipelines," the *ARRL Letter* said. "Seventy-two hours is considered the maximum time needed for federal response organizations to deploy internal emergency communications systems."

Harrison said that she and her staff met with TSA and DHS officials "to formalize the details of the cooperative arrangement." She added that "MARS area coordinators will provide specific requirements to state MARS directors to recruit members and equipment capabilities to support TSA."

Hearings Called Following Alleged License Misrepresentations

Two cases before the FCC involving alleged misrepresentations to the Commission have placed the validity of two amateur radio licenses in question.

Gordon D. Young, WB6NKJ, was notified by Riley Hollingsworth, special counsel, FCC Spectrum Enforcement Division, that his Amateur Extra upgrade application would be designated for hearing to "determine whether you are qualified to remain a Commission licensee, and, if so, whether your Extra class application should be granted," according to the *ARRL Letter*. Records show Young to be a resident of El Cajon, California. "The FCC alleges that Young made misrepresentations to the Commission regarding repairs to his transmitter after he received a Warning Notice for allegedly operating on a frequency not allowed to Advanced class licensees," the League reported.

In a separate action, "the Commission plans to designate the Amateur Radio Technician class application of Frank C. Richards of Mooers, New York, for hearing because of unresolved circumstances surrounding his 2004 filing of applications to change the address and call sign on a license that apparently belonged to a man of the same name in Florida," the *ARRL Letter* said. After Richards submitted the license for KG2IJ for cancellation in June 2004, the FCC said it planned no further enforcement action. The Commission said, however, that it would review the circumstances of the applications should Richards apply for an amateur radio license in the future. In March, Richards passed the Technician exam and applied for a license in late June, the ARRL said. ■

ADVERTISERS' INDEX

readers' market

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by Bill Price, N3AVY

All About Wire

Good morning, class. Today's lesson will be about wire. What's that? You there, in the back row with your hand up—you say it's not much of a subject?

Well, yes, in a way, you're right. It's not much more than stretched copper. Sometimes tinned, sometimes coated with lacquer or plastic insulation. Sometimes solid, sometimes stranded. There's coaxial wire with braided shield, or twisted shield, and sometimes it even has an additional foil shield. Hardline has solid core or tubular center with solid corrugated shield, Eventually, you get to rigid coax, which can be six inches in diameter! It's hardly "wire" at all.

There is an entire "school" of highly overrated, overpriced cables for moving sound from one point to another. It has spawned an entire industry for people who don't realize that good old "zip-cord" is more than adequate for absolutely any home audio application. P.T. Barnum was right. This way to the egress.

"Today's lesson is about the simpler types of wire that we're more likely to encounter in our daily lives as hams and other radio hobby people. Most interesting is the power that wire has over a person trying to work with it."

But today's lesson is about the simpler types of wire that we're more likely to encounter in our daily lives as hams and other radio hobby people. Most interesting is the power that wire has over a person trying to work with it. Picture yourself sitting by a body of water late at night while all your friends are fishing, catching enormous tunas or bass or whatever it is that's biting in the local stream. And while they're all filling their ice chests with next week's delicacies, you've got a tangled mass of monofilament resulting from a backlash and you're sitting in the dark wondering if this might be a good time to change religions or just go to an all night Mega-Lo-Mart (forgive me, friend to remain nameless) and just buy a new reel.

That's how it was when I decided to save money on a dipole.

It was actually more than a dipole; it was several dipoles with a common feed point. Some called it a fan, others called it a "crow's foot," but whatever you call it, it was damn difficult to unwind and split one dipole from that nice dollar-store speaker wire (which really is good enough for a medium-power dipole). But I was sure I could make this entire acre's worth of wire into an antenna in the living room of an apartment and sneak it out across a common driveway in the dark of night, and then fasten it to such forbidden structures as the local police station, two neighbor's trees, and an unused utility pole.

As a person who now buys 1,000-foot spools of audio and video cable and makes up various lengths of them in the course of a day's work, and who has helped an electrician friend on occasion, I know that there is only one proper way to get wire off a spool. That way is to set up the reel much like a roll of...er...paper towels and then roll the wire off while the spool turns on an axle. It might be okay to take off three turns by slipping it over the end of the spool and cutting that short piece, then straightening it, but there's no way you can do that with 50- or 100-foot lengths. You'll quickly understand more about spaghetti than you ever wanted to if you try to do it that way.

Worse yet is to take the nice neat little coil of 100 feet of zip cord-type speaker wire (one side tinned, the other side copper, in clear plastic insulation) sold at the dollar store, and try to unwind it in a living room after removing it from its blister pack (I've done it). Truly, the only way is to put it on some kind of spindle OUTSIDE and walk 100 feet with one end in your hand. But even if you do that and have it all laying out neatly before you in a straight line on a sidewalk (which I have also done), if you want to make a dipole out of it, you must SPLIT the wire. That is, take the silver strand in one hand and the copper strand in the other hand and pull them apart, causing the insulation to "zip" apart on its seam (hence the term "zip cord").

As you do this, you induce a curl into the insulation that is more relentless than any force known to man. I've even gone so far as to tie one end of the evil dollar-store speaker wire to a nail on a tree, then tie the silver end to another nail 100 feet away while splitting and winding the copper part into what began as a neat coil of wire, which I tied with twist ties when I was finished and went back to do the same to its silver brother.

After I neatly coiled the 100-foot silver strand and also tied it with twist ties, I then took the two neat coils inside, soldered an end of each to an SO-239 and put a little strain relief on the wires so the wind wouldn't pull the solder joints loose. Then with the confidence of a fool, I set the plug on my third-story windowsill and unfastened the two coils of wire, intending to let them drop to the ground.

What the two coils did at that point could only be described as "mating," and any further description of their action would not be in keeping with the morals of this magazine. After five minutes of trying to get them apart, I cut the plug, put it in my pocket, and tossed the ball of wire into the trash.

Oh...for those who might suggest that I would do well to chuck one end into my electric drill and twist it slowly in the proper direction while someone held the far end—or while that far end was tied to a nail in a tree—don't even bother. With steel and bronze, you can wind your own guitar or piano strings that way, but with dollar-store speaker wire, you do nothing more than give the nearest person yet another reason to laugh into their hand.

It would be fair to say that I have so far thrown away at least half of the 100-foot lengths of dollar-store speaker wire that I bought. But to be honest, it's not that it is in any way defective or unsatisfactory for its intended purpose. It's just that even with all I know about this stuff, I'm still too cheap to spend the 16 cents/foot for zip cord. It's that "frugality" which will prove that I'm a licensed amateur radio operator in case I ever lose my wallet and can't produce a copy of my license. ■

AOR SR2000 Frequency Monitor

Seeing is Believing!

The SR2000 is an ultra-fast spectrum display monitor with a high quality triple-conversion receiver

AOR puts the power of FFT (Fast Fourier Transform) algorithms to work in tandem with a powerful receiver covering 25 MHz ~ 3 GHz continuous. The result is a compact color spectrum display monitor that's ultra-sensitive, incredibly fast, yet easy to use. The SR2000 is perfect for base, mobile or field use and can also be used in combination with a personal computer. It's another example of why so many Federal and State law enforcement, military units, surveillance agencies, government users, hospitals, RF labs, News Media and monitoring professionals rely on AOR, the Serious Choice in Advanced Technology Receivers.

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